GETTING IT RIGHT FIRST TIME

Respiratory Medicine

GIRFT Programme National Specialty Report

Dr Martin Allen *MBE*
GIRFT Clinical Lead for Respiratory Medicine

March 2021

GIRFT is delivered in partnership with the Royal National Orthopaedic Hospital NHS Trust, NHS England and NHS Improvement

Contents

Foreword from Professor Tim Briggs

I am delighted to recommend this Getting It Right First Time review of respiratory medicine, led by Dr Martin Allen.

This report comes at a time when the NHS has undergone profound changes in response to the COVID-19 pandemic. The unprecedented events of 2020/21 - and the extraordinary response from everyone working in the NHS – add greater significance to GIRFT's recommendations, giving many of them a new sense of urgency.

Respiratory medicine has been especially impacted by COVID-19, from dealing with the acute pandemic at the frontline to providing input for huge numbers of patients who are recovering from the virus. This is on top of addressing the backlogs which have built up as services have been closed or operating at reduced capacity.

On this point, it is important to remember that respiratory medicine is also crucial to the recurrent winter pressures that have dominated the NHS in recent years, leading to the cancellation of operations and substantially reduced performance.

Actions set out in this report, such as proactively managing predictable winter pressures, expanding non-invasive ventilation (NIV) services and using technology-enabled remote monitoring for CPAP, can help the NHS as it faces the substantial challenge of recovering services, while remaining ready for any future surges, by operating more effectively and safely than ever before.

Martin has applied the GIRFT approach to respiratory medicine, a specialty which includes some of the most prevalent and fastest rising causes of illness and death in the UK, with respiratory disease often disproportionately affecting people who face disadvantage or deprivation.

The recommendations set out in this report are based on the visits Martin made to trusts, in addition to other data, audits and a detailed survey of trusts. Implementing these recommendations will help improve acute care and outcomes for respiratory patients and the experience for their carers, while making better use of resources.

It is very rewarding to hear of the many examples of excellent care that Martin found on his visits and the strength of engagement from clinicians and managers. This is a testament to their commitment to providing the best care for their patients.

This commitment to looking at the evidence, sharing examples and finding solutions where needed is vital to GIRFT, which can only succeed with the backing of clinicians, managers and all of us involved in delivering care.

My greatest hope is that GIRFT will provide further support and impetus for all those involved in respiratory medicine, particularly during the COVID-19 era, to work shoulder to shoulder to improve the treatment, care and outcomes of our patients.

Professor Tim Briggs *CBE*

GIRFT Programme Chair and National Director of Clinical Improvement for the NHS.

Professor Tim Briggs is consultant orthopaedic surgeon at the Royal National Orthopaedic Hospital NHS Trust, where he is also Director of Strategy and External Affairs.
He led the first review of orthopaedic surgery that became the pilot for the GIRFT programme, which he now chairs.
Professor Briggs is also National Director of Clinical Improvement for the NHS.

Introduction from Dr Martin Allen

I have been fortunate in having the opportunity as the GIRFT clinical lead for respiratory medicine to visit colleagues in their working environment and have been very impressed by what they have accomplished. I have seen amazing innovation in small hospitals who have found solutions for wicked problems, and we have tried to capture these as good practice. I am pleased to say there are many.

Respiratory medicine is a broad specialty and nurses, physiotherapists, physiologists, coders, pharmacists, administrative and clerical staff and consultants have attended the deep dives. I am thankful for the time they have given me. They have listened respectfully and when the data has shown problems, they have looked for solutions from both within their trust and from examples from other deep dives.

Perhaps what has impressed me most is colleagues' dedication to do the best for their patients, and consequently I noted their frustration that organisations had not facilitated national recommendations to make such improvements. I hope by sharing and discussing national standards with colleagues and managers alike we can make differences at local and national levels.

However, the GIRFT process is much more than that, and compiling the enclosed report has been a labour of love. To review data and see the excellent care that is occurring has been very rewarding but with that comes dismay about how much more could be done for respiratory patients and their carers. While some improvements may require infrastructure to pump prime systems, the organisational, financial and, most importantly, clinical benefits are plain to see.

While I have discussed much in this report, including the role that respiratory medicine plays in acute care and some sub-specialty areas, there remain many aspects of respiratory medicine to cover. I could not review these, not because they are unimportant but because I needed the time to look in detail at major conditions where there is high morbidity, mortality and opportunities to improve practice.

Throughout the report I have tried to highlight where trusts and colleagues should review their own data and benchmark their service against standards and work to improve them, a process that never ceases.

The data collection, deep-dive visits and report process started before the COVID-19 pandemic. It is regrettable that I have been unable to undertake as many deep dives as I would have liked prior to writing this national report. The pandemic has not only imposed limitations upon us but placed a huge burden on respiratory teams, both in dealing with the current problem and in addressing the backlog of need, as huge numbers of patients will need the input of respiratory medicine post-COVID.

I hope the report goes some way to highlighting the huge importance that respiratory medicine plays in the current NHS and opportunities for further improvements.

Dr Martin Allen *MBE*

GIRFT Clinical Lead, Respiratory Medicine

Dr Martin Allen is a Consultant Physician at University Hospitals of North Midlands NHS Trust, and NHS National Specialty Adviser for Physiological Measurements. He co-chairs the joint British Thoracic Society and Association for Respiratory, Technology and Physiology board, as well as the Respiratory Expert Working Group on coding for NHS Digital. Martin sits on the Royal College of Physicians' commissioning group, together with the British Thoracic Society and Respiratory Long Term Plan Boards.

Statement of support

The British Thoracic Society (BTS) welcomes this important report. The report provides a comprehensive summary of where services for patients with respiratory diseases are in England and where they need to move to in the future. It clearly highlights the areas of patient need that require service improvement as well as showcasing innovative approaches across the country.

The GIRFT recommendations are vital to ensuring that improvements in key areas of respiratory health care are enhanced and the COVID-19 pandemic has brought the contribution of respiratory health care teams into ever sharper focus. We welcome recognition of the fact that health inequalities lead to a higher burden of respiratory disease in deprived areas, which in turn lead to higher admissions and increased resource use.

The report eloquently illustrates the broad and varied nature of respiratory medicine, a truly multi-professional team-based specialty which covers primary, secondary and tertiary care and supports all aspects of outpatient, day case, inpatient and acute care.

BTS has long highlighted the shortage of respiratory consultant and trainees, as well as insufficient numbers of nursing and allied health care professionals, which limit the specialty's capacity to provide high quality patient care all year round. The report provides ample evidence that in spite of the wealth of innovation taking place in many locations, there are simply not enough respiratory healthcare professionals.

Never before has the necessity of ensuring that respiratory patients are treated by respiratory specialist teams been so stark, and the recommendations for ensuring that all NHS trusts invest resources in appropriate NIV services, integrated care and in the establishment of Respiratory Support Units are more important now than ever before. It is particularly important that the issue of winter pressures and the need for a long term systematic solution has been highlighted in the hope that future pressure on respiratory services during winter can be prevented.

The recommendations are comprehensive but we recognise these do not cover all facets of respiratory services. Given the large number of services delivered by respiratory medicine it would have been impossible for GIRFT clinical lead Martin Allen and his team to address them all.

Our thanks go to Martin and his team for their dedication, commitment and sheer hard work which began before the pandemic and has continued throughout the most challenging healthcare times in our lifetimes in order to bring the report to publication.

BTS is justifiably proud of the respiratory community. We look forward to seeing the report's recommendations translated into practice, for the benefit of our patients as well as our skilled and dedicated respiratory professional teams. As a patient-centred specialty, our wish is that all those requiring our support receive the best possible care, irrespective of age, gender, ethnicity, socio-economic status and geographical location – a wish which becomes one step closer with effective implementation of these recommendations.

Professor Jon Bennett

Chair, British Thoracic Society Board of Trustees

Executive summary

Respiratory medicine covers many conditions, starting with diseases of the upper airway (sleep apnoea); through to the large and small airways, (asthma, COPD); the lung substance itself (interstitial lung diseases e.g. pulmonary fibrosis); the blood vessels within the lungs (pulmonary artery hypertension, pulmonary embolism) and the cavity in which the lungs sit (pleural diseases), with the breathing muscles and their neurological control playing an important role.

Unsurprisingly patients may present with a variety of symptoms such as breathlessness, cough, wheeze, chest pain and expectorating sputum or blood. It is no surprise given the amount of air we breathe in each day that pulmonary infections are a major issue, as highlighted with the seasonal impact of flu and other viral infections on respiratory admissions.

Respiratory medicine activity

Respiratory problems are one of the commonest reasons to consult a GP and account for a third of acute hospital admissions even before the COVID-19 pandemic is considered. Although many conditions, including infections, are self-limiting, there is a huge burden of chronic diseases that need an integrated care approach to their management to maximise the individual's wellbeing and function without recourse to hospital admission, something that is far from routine with continued management of acute episodes of care. It is thus no surprise that respiratory conditions are ranked in the Global Burden of Disease as producing the third largest impact on quality of life and the fourth greatest cause of mortality, and this excludes lung cancer, where there are some 30,000 deaths per year, a similar figure found in deaths from pneumonia and COPD.

As we are aware, acute admissions for many medical conditions are stable over time or gradually increasing at a few percent per year. This is in contrast to respiratory conditions where admissions appear to be increasing at around 13% annually. Moreover these are not evenly distributed throughout the year, peaking during the winter months, as can be seen in the acute care section of this report, leading to the usual 'winter pressures'.

The specialty of respiratory medicine encompasses many sub-specialties, as highlighted above, and not all could be covered in this report, with only some of the common conditions being reviewed. The report is broken into sections where colleagues can look at the specific areas and review the issues and recommendations. Each of these sub-specialties have somewhat different approaches to management but include a considerable amount of outpatient work, supported by a whole suite of physiological measurements, from simple tests to determine airway calibre to complex cardiopulmonary exercise tests to 'stress' the cardiorespiratory system to assess reasons for breathlessness and fitness for surgery.

While there is little planned inpatient care, we undertake a variety of elective procedures usually as day cases, e.g. bronchoscopy and pleural disease management, for diagnosis and/or treatment e.g. airway stenting, endoscopic valve placement for lung volume reduction in COPD and intrapleural drains. The key aspect of the services delivered is the multi-professional team approach to delivering high quality care.

However, the major activity for respiratory teams is in unplanned (non-elective) emergency admissions, which account for a third of the acute medical take. While we would expect a pro rata infrastructure to manage this, we found most respiratory departments were understaffed with an insufficient bed base. It would be expected that if a patient was admitted with a respiratory problem they would be managed on a respiratory ward by a respiratory consultant and the supportive respiratory team – however, regrettably, we found through our deep dive visits that this was an exception.

Respiratory medicine was a hard pressed specialty prior to COVID-19 but the pandemic has highlighted both the importance of the specialty and the massive shortfall in staffing across all disciplines, leading to colleagues working extended hours. The lack of workforce and infrastructure to deliver the services for the benefits of patient, to improve outcomes and be efficient, is a theme throughout the report and highlighted in the relevant sections.

Outpatient services

Reducing DNAs

We found long wait times present in many outpatient services, suggesting high outpatient demand is stretching respiratory services. A contributing factor to long wait times are high 'did not attend' (DNA) rates. We found wide variation in DNA rates across different trusts, with an interquartile range of 9-15% and a median of 12%. Reducing DNAs in those trusts with the highest rates would reduce waste of resources in financial, time, and workforce terms, and reduce time to referral (TTR) for all patients.

Reducing follow-up

We found wide variation in new to follow-up (N:FU) ratios across trusts. High numbers of follow-ups may be a feature that patients have not received appropriate testing, diagnosis, and advice upon first attendance. This is inefficient, and we have outlined recommended actions to reduce unnecessary follow-ups.

Discharge at first appointment

We found wide variation in the percentage of patients discharged in each trust after first attendance. This ranged from 18% to 33% with a median value of 25%. Pre-testing, senior consultant oversight, and one-stop clinics have all been shown to be effective methods of increasing rates of discharge at first attendance, which is resource-efficient and beneficial to patients.

Our recommendations

- We recommend respiratory services take steps to reduce DNA rates and limit unnecessary follow-up in order to reduce waste and improve patient experience. We recommend trusts look at the role of virtual consultations and 'one-stop' clinics to achieve these goals.
- We acknowledge, however, that patient choice should be factored into any service developments. Patients who cannot access virtual clinics, for example, cannot be forgotten.

Acute and inpatient care

Beyond outpatient work, respiratory teams deliver day case and elective care. However, the major activity is in non-elective work. This places a huge demand on respiratory services. Additionally, virtually all respiratory physicians are also 'on-call' for the hospital out-of-hours and contribute in most trusts to the acute medical review out-of-hours/at weekends. This commitment to deliver acute unselected care to emergency admissions consumes sessions which are also needed for respiratory inpatients.

A key theme that emerged from our review of acute and inpatient care was the insufficient number of respiratory staff to deliver respiratory care in proportion to what is admitted. The inpatient care of respiratory patients is often by staff not trained in respiratory medicine. This is due to an insufficient respiratory bed base to meet the number of admissions and is compounded by the incorrect allocation of patients to the appropriate wards. In some trusts, less than 10% of respiratory patients were managed by respiratory teams. At almost every deep-dive visit we were told that the respiratory wards had 'general medical' patients occupying beds, often leading to delay in discharge, while respiratory patients were managed on 'non specialist' wards. In many examples this was associated with an increased length of stay and a high readmission rate

Our recommendation

- We recommend that trusts improve acute care for respiratory patients by reviewing their processes of care. This should include: considering measures to increase ward productivity; the appropriate distribution of patients to the correct specialty ward; and ensuring the bed base and infrastructure maps to the acute demand.

Winter bed pressures

Each year, the pressure on acute services during the winter months increases. The high rate of flow through trusts can take up time usually dedicated to elective activity, in turn increasing wait times, and increasing financial pressure. There is an 80% variation in respiratory admissions between August and January.

The winter bed pressure prompts many trusts to hire locums but this comes at a high cost and, where locums are not respiratory trained, can increase workload for other team members. With the knowledge that this is a perennial issue, a systematic approach is needed. One approach would be to reduce outpatient clinic times during the winter to allow for increased inpatient load.

Our recommendation

- Rather than an annual winter plan prepared each year, systems, including acute providers, should have a systematic approach to dealing with the increased respiratory admissions that occur predictably every year. This should include an expansion of staff and infrastructure to allow respiratory patients to be managed by appropriate respiratory teams.

Activity and information flows

Clinical coding is the process whereby information from a variety of sources is expressed as a series of disease and procedure codes that can be aggregated in Health Resource Groups (HRGs) that form the basis of payment under the Payment by Results (PbR) system. Such codes provide information both locally and nationally on activity and complications/ comorbidities associated with different interventions. Inaccuracies in coding can impact greatly on the apparent activity and funding of departments and trusts, especially if the PbR system is being used as the payment mechanism. Activity in hospitals can also be attributed to different consultant groups by use of the appropriate Treatment Function Code (TFC).

We found a general lack of understanding of codes, HRGS, TFCs and payment mechanisms during our deep dives in many clinical and managerial groups. Data may have been captured but did not always flow through the business intelligence system to accurately capture the activity and enable subsequent payment.

Implications of TFCs and HRGs

We used TFCs (which tell us who is doing the activity) and HRGs (which tell us which specialty it comes under) to calculate the amount of respiratory work being coded to respiratory consultants. We found that only ten trusts achieved over 70% of patients with respiratory conditions being managed by the respiratory team. The average was 38%.

While there may be good reasons for some patients to be seen under non-respiratory physicians, the variation in percentage of respiratory patients being managed by respiratory teams is unwarranted.

Our recommendations

- Ensure respiratory activity undertaken by respiratory teams is captured using Treatment Function Code 340 (respiratory medicine).
- Where the TFC/HRG ratio is low this needs to be explored to understand the reasons and correct the data capture process.
- Trusts should aim to achieve the top quartile proportion of patients with a respiratory diagnosis being looked after by the respiratory team.
- Where there are apparent inconsistencies in the activity being performed and recorded (e.g. in sleep studies), a detailed review of data capture and data flows should be undertaken.

Coding meetings and education

We found that appropriate education in coding for junior medical staff and broader respiratory team members was vital to ensure accuracy in coding. A good relationship between clinical teams and coding teams is also beneficial as it enables open communication. Few trusts stated that they undertook formal teaching to the junior medical staff beyond that which occurred at induction.

Our recommendation

- Improve education and relationship building for medical and coding staff within trusts.

Physiological and imaging services

We focused on full respiratory function test activity and the coding thereof, cardiopulmonary exercise testing, and the important and expanding area of sleep medicine.

Coding of physiological activity

We found 53 trusts were not coding their physiological activity at all. Deep-dive discussions highlighted a breakdown in data flows. For some departments who had tried to move to the appropriate TFC method of capturing activity, there was a reluctance for this to be accepted by both internal and CCG commissioners.

Our recommendation

- Ensure physiology outpatient activity is accurately captured and remunerated using Treatment Function Code 341.

Cardiopulmonary Exercise Testing (CPET)

CPET is used to determine unexplained breathlessness and help identify perioperative risk (risk of complications during or after surgery). With the increasing recognition of the management of complex breathlessness in the NHS Long Term Plan, the demand for CPET is expected to grow.

However, we found wide variation in CPET use. Around half of all trusts were not using CPET for breathlessness investigation or perioperative risk. Only 61 trusts were carrying out more than 50 CPET tests per year, while 34 trusts were doing more than 200 per year.

Our recommendation

- Increase the use of Cardiopulmonary Exercise Testing (CPET) with interpretation by senior physiologists to manage breathlessness and determine patients' fitness for major or complex surgery.

Sleep medicine

The sub-specialty of sleep medicine covers over 100 different diagnoses, but the most common reason for referral to secondary care is for the confirmation or exclusion of sleep apnoea. Referrals for sleep apnoea have increased in recent years with the recognition of the impacts on cardiovascular diseases, ability to work, hold a valid driving licence and on family relationships.

As noted above we found discrepancies in data between the number of studies being performed and those that were being paid for. These inaccuracies in coding will influence financial reimbursement, and any accurate analysis of service delivery.

Treatment of obstructive sleep apnoea with CPAP

Due to the medical, financial and social implications for patients with sleep apnoea, CPAP treatment should be started as soon as possible. Having skilled physiologists who can undertake a clinical history and initiate treatment without seeing a medical practitioner speeds up the pathway, but was only occurring in 50 services. All sleep apnoea patients should be treated within 18 weeks of referral.

Technology-enabled CPAP follow-up allows for remote checking of adherence and mask leaks, allowing remote setting modification. This reduces the amount of times a patient needs to return to hospital, the reduced departmental footfall being a major benefit during the COVID-19 pandemic. Not all patients are given technology-enabled machines, but this should become the norm, with sleep departments given the resources to deliver care this way.

Our recommendations

- Improve care for patients in sleep medicine by addressing delays in diagnosis of sleep problems, ensuring the activity is captured and coded.
- Ensure timely initiation of CPAP with a device that allows remote monitoring.
- Ensure the infrastructure for delivering a sleep service is sufficient to meet demand.

Managing pulmonary embolism: use of CT Pulmonary Angiograms (CTPA)

CTPA are diagnostic tests used to identify a pulmonary embolism, but there is a question about whether their use is excessive. Unnecessary CPTAs expose the patient to ionising radiation which carries a significant risk, and wastes the time of the imaging department. We found wide variation in the number of CTPAs performed per pulmonary embolism diagnosis.

NICE guidelines recommend using the pulmonary embolism rule-out criteria (PERC) to help determine which patients need a CTPA. We found that, in trusts where CTPA use was higher than expected, pre-testing scores were not being utilised, or staff without adequate training were requesting CTPAs. Clear protocols should be in place to follow-up patients with confirmed pulmonary emboli, something we found generally occurred but with few robust protocols to ensure all patients were followed up.

Our recommendation

- Improve experience and outcomes for patients with pulmonary embolism by appropriate PERC use to reduce unnecessary CTPAs.

Improving patient care

As the range of care for clinical conditions and infrastructure of services provided for respiratory patients is large and could not all be reviewed during deep dives, we selected three common clinical diseases and four 'services' as priority focus areas for this review:

- pleural services;
- asthma care;
- pneumonia care;
- COPD care;
- non-invasive ventilation (NIV);
- integrated care;
- treating tobacco dependency.

Improving care for patients with pleural disease

Pleural disease places an increasing burden on both elective and non-elective respiratory workload. With the shift to thoracic ultrasound (TUS) being routinely performed by respiratory physicians rather than radiologists, there has been a shift to day case and elective management of pleural effusions to reduce acute admissions and reduce length of stay, encouraged by the Best Practice Tariff (BPT) for pleural effusions.

Unfortunately we found that this shift in workload to respiratory medicine has not usually been accompanied by an expansion of consultant sessions/workforce, nor supportive pleural teams. Moreover we found during deep dives that the BPT was not always being achieved due to errors in coding, but more often due to organisational issues such as an appropriate day case facility to perform the procedures.

A recent NHS National Reporting and Learning System alert identified 16 incidents of harm over a three-year period related to uncontrolled drainage of effusion. This builds on previous safety alerts about insertion of chest drains without appropriate imaging. Such alerts highlight the importance of local safety standards for such procedures (LocSSIPs) that follow British Thoracic Society recommendations.

Improving pleural services: workforce and infrastructure

To run an efficient service that provides high-quality care, minimises urgent admissions and reduces length of stay (LoS), an appropriate workforce and infrastructure is essential. We found that across all levels of complexity of care (comorbidities, more diagnostic tests, sicker patients) LoS appeared longer in those trusts where no nurse was present. There is an expanding role for both nurses and physician associates in performing some procedures with support.

In terms of infrastructure, pleural packs should be available together with an ultrasound machine of appropriate specification, and this activity should be accurately captured for the BPT or future incentive schemes as a dedicated day case.

Our recommendation

- Reduce acute admissions and length of stay, and deliver a high quality pleural service which achieves the Best Practice Tariff by addressing workforce and infrastructure requirements.

Improving care for patients with asthma

Asthma is characterised by a reversible airway obstruction leading to intermittent cough, breathlessness and wheeze. Most asthma patients are cared for in primary care, with a smaller number seen in secondary care. Additionally there is a population of patients with severe or difficult asthma who fulfil the criteria to be managed under specialised care, although we are unsure of the number of patients who are eligible for this treatment in primary and secondary care that are not referred into specialised services.

We looked at the variation in hospital attendances and admissions across England for patients with asthma, recognising that the emergency department (ED) attendances data was incomplete at the time of generating data packs, but is now available if trusts wish to look at their own activity. For some trusts where there are high ED attendances and few admissions, we heard a variety of explanations, including poor provision of care in the community, but the data could not substantiate these reports. Likewise, where the number of attendances was low compared to admissions this may reflect a tendency to admit all patients or it may reflect excellent community care where those that do attend ED are patients that need admitting.

Overall the burden of asthma was variable for trusts; 25% admitted fewer than 200 patients per year, and five hospitals admitted over 800 patients. When corrected for population size, there remains a wide variation in the number of admissions for asthma that is not easy to explain but is important as hospital admission is a marker of poor control and risk of death.

Our recommendation

- Review referral systems and patient pathways in collaboration with community, primary and acute services to improve care for patients with asthma.

Length of stay

There is wide variation in LoS for asthma inpatients, ranging from an average 0.4 days to 2.7 days for asthma patients under 80 years old. During our deep dives, we found that LoS was less when there were asthma nurses in post, but our data was too limited to confirm this statistically. The number of zero LoS patients also varied greatly, from around 5% up to 55%, variations that should be explored further as they may be opportunities to improve care.

Readmissions

We found that some trusts have a high percentage of readmissions at 30- and/or 90- days depending on whose care the patient was discharged from. This is a cause for concern as early readmission is a marker of instability and potential asthma death. Where this was identified we asked trusts to review their data in detail and if found to be correct, to make systematic changes to how asthma care is delivered.

National Asthma and COPD Audit Programme (NACAP)

The NACAP is a key driver for improving asthma care nationwide. However, a lack of resource is impacting on trusts' ability to complete data entry for the audit. 65% of trusts reported inadequate resources to complete both standard BTS audits that are part of the trust's quality accounts and the NACAP. Incomplete or non-existent data can only hamper the NACAP's effectiveness.

Our recommendation

- Review departmental resourcing to improve outcomes, reduce length of stay and reduce the likelihood of readmissions for patients with asthma.

Improving care for patients with pneumonia

Pneumonia is a common problem that affects between 0.5% and 1% of adults in the UK annually. It is a common reason for admission to hospital and for death, impacting on many trusts' mortality figures. A major factor here is the poor coding of pneumonia and where trusts have made systematic attempts to improve both coding and care delivery, as detailed in the pneumonia section, the trust mortality is often significantly better.

Despite this coding caveat, we found marked variation in the number of pneumonia admissions, and the LoS between trusts. We learned from deep-dive discussions that pneumonia admissions are generally higher in areas with higher levels of deprivation although this was difficult to illustrate in our data.

One area of significant concern were pneumonia mortality rates in the 18-40 age group. We learned from deep-dive discussions that these patients are often unknown to respiratory teams. Pneumonia is a known common cause of premature and often preventable death in adults with learning disabilities, but respiratory teams were unaware if the 18-40 age group deaths occurred in this group of patients – an area we encouraged trusts to review in their data.

Our recommendation

- Optimise care for pneumonia patients by ensuring the correct diagnosis (and that it is coded correctly), as well as reviewing patient pathways and infrastructure to enable care bundle delivery, reduce length of stay, readmissions, morbidity and mortality.

Improving care for patients with Chronic Obstructive Pulmonary Disease (COPD)

COPD mainly affects people over the age of 50 and is the second most common reason for hospital admission. We found variation across trusts in the delivery of multiple aspects of COPD care.

Admissions were highest in hospitals in the most deprived areas of England, highlighting the increased risk of COPD that comes with deprivation. Readmission for COPD is a concern as it is poor for patients, constitutes a significant workload and can be improved by management interventions. These include more support and explanation for patients when they are admitted, followed by early supportive discharge and ongoing community care, supported by technology.

Regrettably, consultant oversight and delivery of community care was very variable across health systems which misses the opportunities for all patient groups, including patients with COPD, to benefit from holistic and supportive local care.

Our recommendations

- Optimise care for patients with chronic obstructive pulmonary disease (COPD) to reduce length of stay, readmission rates, and overall mortality by using discharge bundles. Where demand exists, consider implementing seven-day services.
- These services should be comprehensive and have respiratory consultant involvement. They should be available to all patients admitted to a trust and should not be dependent upon which CCG the patient is from.

Provision and access to non-invasive ventilation (NIV)

NIV is a technique of supporting a patient's breathing (ventilation) by a non-invasive means (i.e. the patient is not intubated), usually via a snugly-fitted mask. This is a life-saving treatment with a huge evidence base confirming benefit in many situations but especially when the body is too acidic due to raised carbon dioxide found in exacerbations of COPD.

Regrettably, we found a gap in provision between trusts with only 77 acute providers having dedicated NIV beds, only 43 having five or more beds and many lacking sufficient nursing numbers to support these beds. This was perhaps one of the most distressing findings from the GIRFT review - a very severe shortfall in a life-saving therapy. It explains why there are few patients in the NACAP audit who have NIV within two hours of needing it.

Our recommendation

- Ensure a dedicated non-invasive ventilation (NIV) service is in place, with the recommended infrastructure that will produce improved outcomes and reduced mortality.

Integrated care

The NHS Long Term Plan (LTP) outlined the government's ambition to prioritise integrated care to improve outcomes. We have seen from our deep dives that where integrated care is already or being established, there are clear benefits.

However, we found that system 'culture' remained a big barrier to developing effective integrated care, with respiratory consultants wanting to deliver care in the community but not being allowed to do so or not being involved in system-level discussions. Even when there was consultant time in the community it was insufficient, with only four trusts having seven or more consultant sessions in the community and in contrast 71 trusts (67%) having no sessions outside the acute provider service.

Our recommendations

- Review all aspects of respiratory care integration and supporting infrastructure at system-level to produce a comprehensive consultant-led community service.
- In parallel with the above, ensure there is improved and consistent information flow between providers.

Improving treatment for tobacco dependency

Smoking remains the single biggest cause of preventable morbidity, mortality and health inequalities in the UK. Ascertaining the smoking status of patients admitted for any reason is key prior to any intervention, although it is poor across many trusts. The lack of standardised and commissioned services for smoking cessation services was seen across 125 hospitals, with just 1 in 8 smokers being referred to a smoking cessation service.

Prescription of nicotine replace therapies (NRT) is an effective treatment for tobacco dependency, but we found wide variation in spend on NRT per 1,000 admissions. We did, however, see some examples of good practice, such as prescribing of NRT by ward pharmacists, which we explore in this report.

Our recommendation

- Improve access to smoking cessation therapies and reduce tobacco dependence in patient populations through a comprehensive range of interventions.

Specialised services

Respiratory medicine has several specialised services. We explored three of these - severe asthma, interstitial lung disease (ILD) and complex home ventilation (CHV) - by questionnaires and data flows where possible, although the lack of commissioned registries made the validation impossible. There are standard specifications that centres should meet to deliver care and we found marked variations. Some centres were commissioned but were too small to have a sufficient volume of patients and others seemed not to be commissioned despite having large patient numbers. This suggested a lack of standardisation in the process of specialised commissioning, exacerbated by no central data flows. In some disease areas, such as asthma, a hub and spoke model had evolved, while in others the services were too small to perhaps be viable and maintain the necessary expertise. Overall, staffing numbers often did not meet those outlined in the specification and were a cause for concern, especially in the low volume providers.

Severe asthma

Patients with severe or difficult to control asthma should be seen under specialised services. We found variation in access to speech and language therapy and mental health services for these patients. Where asthma has a proven immunological background, biologic therapies are often helpful, but we found long delays in access to biologics in some services prior to COVID-19.

Interstitial lung disease (ILD)

ILD comprises a broad spectrum of conditions, all of which cause inflammation and scarring in the lungs. We found variation in the availability of rehabilitation services for ILD patients who attended specialised services, which resulted in a 'postcode lottery' where someone without access might live adjacent to postcodes that did.

Workforce infrastructure posed another key challenge for specialised ILD services. We found variation in waiting times, from five weeks to above 15. This variation is in part down to too few physicians able to contribute to the ILD service, and, in some cases, too few appointment slots appointed to those physicians. Similarly, we found variation in the availability of ILD specialist nurses.

Complex Home Ventilation

Home ventilation is when assisted breathing methods normally provided in an acute care setting of intensive treatment unit (ITU) or high dependency unit (HDU) are provided in the community. CHV services also include weaning centres – units that support step-down care from ventilation in the ITU.

We found variation in the numbers of patients needing ventilation, with some services having very low referral rates. While there is no minimum number of referrals, centres initiating few patients on CHV may not have the necessary infrastructure to meet the specification. A review of whether these centres should be managing such difficult patients should be undertaken, possibly with a view to developing a hub and spoke multidisciplinary team approach.

We found variation in adequate workforce infrastructure across trusts, with only four of the 19 units meeting the specification. In addition to insufficient physician and nurse staffing, we found inadequate levels of dedicated physiotherapy, dietetic support, occupational therapy, and speech and language therapy.

We also saw variation in the availability of emergency support for people ventilated at home, and variation in availability of replacement ventilatory equipment.

Our recommendations

- Review service infrastructure to ensure delivery against national specialised service specifications, ensuring high quality care is delivered which will reduce the likelihood of delays in treatment or discharge. This is especially so when reviewing recommended workforce numbers and skill mix.
- In order to determine activity to both allow the volume of work and its nature to be captured and as a method of ensuring payment, formal registries should be established for the three services. Data submission should be mandated to allow payment.

Medicines optimisation

Medicines optimisation is the process of finding the most safe and effective use of medicines to enable the best possible outcomes. On our visits, we found variation in uptake/use of staff flu vaccination, antibiotic stewardship and opportunities for minimising the carbon footprint of inhaler therapy.

Flu vaccination

We found variation in staff flu vaccination uptake between trusts, ranging from just below 50% to above 90%. In the subsequent year, some organisations improved uptake while several showed deterioration from their previous position. In those trusts that improved and maintained their standing this seemed to relate to ensuring sufficient opportunities to provide vaccination and making sure it was high on the trust agenda and promoted by senior staff.

Antimicrobial resistance

Antimicrobial stewardship is a term used to describe an organisational or healthcare system wide approach to promoting and monitoring the correct and appropriate use of antimicrobials to preserve their future effectiveness. We found wide variation in stewardship practices, for example, variation in the number of antibiotic prescriptions reviewed within 72 hours at trust level.

Environmental impact of inhaler medication

Proper inhaler technique is essential in order that patients can effectively self-manage their airflow limitation and fully benefit from treatment. Ensuring patients use their inhaler correctly together with education around the rationale of use, i.e. appropriate inhaled steroids in asthma, and involving patients in their choice of inhaler to improve adherence will produce significant reductions in the carbon footprint from inhalers. If needed, using dry powder inhalers (DPI) which do not contain the hydrofluorocarbons found in metered dose inhalers (MDIs), may further aid the carbon reduction.

Our recommendation

- Improve patient outcomes by reviewing infrastructure to support appropriate medicines use.

Workforce

Respiratory medicine is delivered via a multi-professional team approach. We found a number of challenges facing the respiratory workforce:

- Marked variation in the number of hospitals where patients with respiratory problems were managed by respiratory teams, with few trusts achieving the target of 65% of respiratory patients managed by respiratory physicians. There are several reasons for this which include insufficient respiratory consultants appointed (services often supported by locums), too small a bed base to reflect the volume of work, and inefficiencies of patient distribution, with respiratory patients being cared for by other clinicians;

- Too few respiratory medicine training posts as there are insufficient registrars to fill the advertised consultant posts. Additionally, many of the existing registrars spending time on the acute take and therefore missing out on respiratory training;
- Underuse of physician associates and a need for more advanced respiratory training to enable them to take on more complex tasks, freeing up nurse and physician time;
- Few consultant nurse posts and many senior respiratory nurses nearing retirement, leaving a gap in leadership;
- Too few applicants for physiology training, leading to a gap in the workforce;
- Insufficient numbers of administrative staff, leaving physicians and nurses to undertake administrative work;
- Additional roles for pharmacists and physiotherapists, although we were unable to get data on these staff groups.

Shortfalls in appropriate staff can lead to poorer care for patients, and increase the need for other staff to often perform more routine tasks, contributing to inefficiency. There is a need to support and develop competencies in all staff groups to allow them function at the 'top of their licence' with confidence.

Our recommendation

- Address variations in service delivery and meet the needs of the local population by staffing respiratory departments with the appropriate numbers and skill mix of doctors, specialist nurses, physiologists and allied health professionals.

Patient safety and litigation

Data obtained from NHS Resolution shows that potential estimated clinical negligence claim costs in respiratory medicine were estimated to have risen from £12.3 million per year to £16.5 million per year over the five years reviewed. Learning from mistakes, mortality, and litigation helps individuals and trusts become safer and more effective. Litigation in respiratory care was most common in the areas of diagnostic and treatment delay, together with disease monitoring.

We found during the deep dives that litigation was discussed at a senior level, but did not always percolate down to the consultants, although most were aware of serious events and these were discussed at Morbidity and Mortality (M&M) meetings. These M&M meeting were well attended and of sufficient frequency to be relevant and most used the structured judgement review process.

Our recommendation

- Reduce litigation costs by application of the GIRFT five-point plan and share learning by ensuring claims, inquests and complaints are reviewed in regular M&M meetings.

Procurement

SCS analysis indicates that NHS spend on key products for respiratory medicine amounts to over £164.7 million per year, one of the top ten highest specialty spends. The COVID-19 pandemic led to a steep rise in the procurement of respiratory products from March-April 2020.

Key product categories which we considered in the deep dives included small portable ventilators used for acute and chronic home ventilation, Continuous Positive Airway Pressure (CPAP) devices, masks/interfaces for both of the above, indwelling pleural catheters (pleural drains) and Cough Assist devices.

We identified wide variation in the average price of a number of items. For auto-adjusting CPAP machines, prices varied from £179 to £3,358, a presumed spurious cost. There was significant variation for the same mask products from the same supplier.

Our recommendation

- Enable improved procurement of devices and consumables through cost and pricing transparency, aggregation and consolidation, and by sharing best practice.

Impact of COVID-19

COVID-19 typically causes respiratory symptoms and patients with severe illness are likely to develop respiratory failure. As a result, the pandemic has put particular strain on respiratory medicine teams and their services.

The impact on outpatient services has been significant: we saw a 42% reduction in outpatient activity in May 2020 compared with May 2019. There has been a shift to virtual clinics and pre-testing, this is increasingly difficult to deliver as most respiratory physicians are, and continue to be, actively involved in delivering acute COVID-19 care. It will be a major problem to see these routine or urgent referrals within an 18-week timeline.

While most organisations attempted to continue lung cancer care (clinic, bronchoscopies), referrals for lung cancer care decreased significantly. This will lead to delayed presentation, often as an acute admission, with advanced disease where curative interventions are less likely to be employed. This is likely to lead to increased mortality from lung cancer in the coming years.

As many of the diagnostic tests employed in respiratory medicine are aerosol generating procedures (AGPs), physiology departments have been heavily impacted. While clear advice has been produced, the throughput of most services is, and remains, significantly less than pre-COVID-19. This has highlighted the poor estate of most laboratories with multiple tests being performed in one room separated only by screens and with inadequate ventilation.

As the pandemic has progressed, the importance of providing respiratory care outside of intensive care has become apparent. In trusts that had a low mortality rate there was widespread and early use of respiratory support units where proning, high flow oxygen therapy and CPAP were administered. Such units are staffed and run by respiratory teams who are stretched in delivering this service but have been asked by the acute providers to also remain on the acute take. Such RSUs take much of the work off critical care who can deal with patients who need invasive ventilation or other complex support.

Finally, we have the issue of early and 'post COVID-19' follow up. The bulk of COVID-19 patients are managed outside ITU by general and especially respiratory physicians. In every hospital visited since COVID-19, it has been the respiratory physicians who have undertaken the early follow up, with review of the six week chest x-ray with some patients who were in ITU being seen by ITU teams. With the realisation of post COVID-19 syndrome, it has fallen on respiratory consultants to provide the oversight and staff MDTs for these patients.

Respiratory teams are providing the bulk of acute COVID-19 care, including some of the sickest patients in RSUs, while organising and delivering acute care and post COVID-19 follow up. It is no surprise that there are difficulties delivering 'routine' and 'specialised' services for patients when the respiratory workforce was already overstretched to meet the demand.

Our recommendation

- Ensure respiratory services are able to provide optimal care for patients with COVID-19 and post-COVID-19 syndrome by establishing respiratory support units, enabling remote treatment monitoring and optimising multidisciplinary expertise. Long term reviews of workforce and funding for respiratory medicine are needed in light of the impact of COVID-19.

Recommendations

Outpatient services

Recommendation	Actions	Owners	Timescale
1. Optimise respiratory outpatient services by reducing DNAs, limiting unnecessary follow-up, considering increased virtual consultations, one-stop clinics and moving care closer to home.	**a** Explore options to reduce DNAs, including through considering increased use of non-face-to-face consultations where clinically appropriate, in line with NHS Long Term Plan ambitions to reduce OP attendances by 30%. Patient preferences need to be considered as part of this. Regular monitoring and evaluation of the effectiveness of virtual clinics is also needed.	Trusts	Within 12 months of publication
	b Explore options to increase the proportion of patients discharged at first appointment, including through: • ensuring sufficient consultant supervision, decision-making and leadership of outpatient clinics; • reviewing the referral letter and using an initial call with the patient to pre-book diagnostic tests in advance of clinic attendance where relevant; • considering 'one-stop' clinic models where feasible.	Trusts	Within 12-18 months of publication
	c Liaise closely with system partners to deliver care closer to home through integrated care models.	Trusts, ICSs, PCNs	Within 12 months of publication

Acute and inpatient care

Recommendation	Actions	Owners	Timescale
2. Improve acute care for respiratory patients by reviewing patient flow and considering measures to increase ward productivity.	**a** Review protocols and consider adopting a physician of the week model to improve respiratory ward efficiency.	Trusts	Within 6 months of publication
	b Consider 'hot' clinic models to enable primary care teams to access specialist input without the need for referral.	Trusts	Within 6 months of publication
	c Improve preventative measures in the community for respiratory patients by ensuring i) flu vaccination and pneumococcal vaccination; ii) rescue packs are available together with management plans.	ICSs	Within 12 months of publication
	d Consider joint appointments between acute medicine and respiratory medicine to increase respiratory expertise among acute physicians.	Trusts	Within 12-18 months of publication
	e Consider embedding respiratory teams in acute/emergency settings to help facilitate discharge.	Trusts	Within 12 months of publication
	f Review patient flows to ensure admitted respiratory patients go to a respiratory ward, with a long-term goal of 65% of respiratory patients to be managed and followed-up by chest specialists. Thereafter with full respiratory ward occupancy, review the respiratory bed base to ensure sufficient respiratory beds exist within the trust with an associated expansion of workforce where required.	Trusts	Within 18 months of publication
	g Support trusts to proactively manage predictable winter pressures by establishing systematic solutions in discussion with respiratory teams.	GIRFT, NHSE/I, ICSs, STPs, trusts	Within 12 months of publication

Activity and information flows

Recommendation	Actions	Owners	Timescale
3. Improve education and relationship building for medical and coding staff within trusts.	**a** Nominate a respiratory physician as the 'coding lead' for the respiratory department to provide linkages between respiratory and coding departments.	Trusts	Within 6 months of publication
	b Ensure that all junior medical staff receive education and a simple guide to clinical coding from the coding department when they join the respiratory department.	Trusts	Within 12 months of publication
4. Ensure respiratory activity is coded using Treatment Function Code 340 (respiratory medicine).	**a** Respiratory consultant activity should be mapped to TFC 340 and not general medicine TFC 300, to appropriately reflect the specialty activity.	Trusts	Ongoing
5. Explore the reasons for variability in the number of respiratory patients being cared for by respiratory consultants.	**a** Explore opportunities to ensure that trusts achieve the top quartile proportion of patients with a respiratory diagnosis being looked after by the respiratory team (i.e. appearing under TFC 340).	Trusts	Within 18 months of publication

Coding for physiological activity

Recommendation	Actions	Owners	Timescale
6. Ensure physiology outpatient activity is accurately captured and remunerated using Treatment Function Code 341.	**a** Ensure general physiology activity is set up and recorded as outpatient activity using TFC341.	Trust physiology departments and IT	Ongoing
	b Ensure data flows correctly to commissioning for payment.	Trust business intelligence units	Ongoing

Cardiopulmonary Exercise Testing

Recommendation	Actions	Owners	Timescale
7. Increase the use of Cardiopulmonary Exercise Testing (CPET) with interpretation by senior physiologists to manage breathlessness and determine patients' fitness for major or complex surgery.	**a** Ensure access to CPET for managing complex and unexplained breathlessness.	Trusts	Ongoing
	b Review current levels of CPET activity and agree protocols to ensure preoperative testing is optimised.	Trusts	Within 6-12 months of publication
	c Review international evidence around CPET usage to inform a potential update of guideline NG45: routine perioperative tests for elective surgery.	NICE	Within 12-18 months of publication

Sleep medicine

Recommendation	Actions	Owners	Timescale
8. Improve care for patients in sleep medicine by addressing delays in diagnosis of sleep problems and CPAP initiation, together with resolving gaps in infrastructure.	**a** Model demand and expand provision of full polysomnography services in line with expanding referral base where appropriate.	Trusts	Within 12 months of publication
	b Deliver an optimal and expedited pathway with direct-to-test and, with appropriately trained physiologists in place, direct-to-CPAP-treatment.	Trusts	Within 12 months of publication
	c Establish a fast-track service for vigilant critical occupations which ensures a clearly marked referral from primary care leads to treatment initiation within one month.	Trusts	Within 12 months of publication
	d Ensure all patients are initiated on treatment within 18 weeks of referral and given the medical associations, ideally sooner.	Trusts	Within 12 months of publication
	e Ensure accurate coding and data capture to inform payment under PbR or local negotiations under block contracts to sufficiently fund sleep services and enable investment in improving pathways.	Trusts, CCGs, ICSs	Ongoing
	f Ensure technology-enabled CPAP follow-up becomes normal practice.	ICSs, Trusts, CCGs	Within 6 months of publication

Managing pulmonary embolism

Recommendation	Actions	Owners	Timescale
9. Improve experience and outcomes for patients with pulmonary embolism by reducing unnecessary tests and ensuring respiratory or joint clinician-led follow-up where possible.	**a** Establish a pulmonary embolism pathway to include seven-day access to the performing and reporting of CT pulmonary angiography and outpatient management	Trusts	Within 12 months of publication
	b Assess the clinical probability of all patients with suspected pulmonary embolism by using an appropriate likelihood score system in conjunction with D-Dimers, where indicated, prior to requesting a CT pulmonary angiogram. Carry out a systematic review if variation is identified.	Trusts	On publication
	c Ensure robust processes are in place for following up patients post pulmonary embolism (including review by a respiratory physician where possible).	Trusts	Within 6 months of publication

Pleural services

Recommendation	Actions	Owners	Timescale
10. Reduce acute admissions and length of stay, and deliver a high quality pleural service which achieves the Best Practice Tariff by addressing workforce and infrastructure requirements	**a** Allocate sessions in the consultant's job plan who leads the pleural service. The number of sessions will relate to activity but should be a minimum of three per week to ensure activity before and after the weekend is picked up.	Trusts	Ongoing
	b Secure nurses and additional infrastructure to support the pleural service and provide care for drains in the wards.	Trusts	Within 12 months of publication
	c Secure administrative support to drive efficiencies in booking patients into the service.	Trusts	Within 12 months of publication
	d Secure an appropriate venue for performing day case procedures where these can be coded to respiratory medicine (not as emergencies or ward walk-ins), with standardised documentation in line with both NatSSIPs and LocSSIPs.	Trusts	Within 6 months of publication
	e Ensure appropriate equipment i.e. pleural packs are available, together with a selection of drains and an appropriate specification ultrasound machine.	Trusts	Within 12 months of publication
	f Ensure data capture is correct to enable achievement of Best Practice Tariff or other incentive schemes.	Trusts	Ongoing
	g Consider early referral to thoracic surgery for unresolved pneumothoraces and parapneumonic effusion / empyema.	Trusts	Ongoing

Asthma

Recommendation	Actions	Owners	Timescale
11. Review referral systems and patient pathways in collaboration with community, primary and acute services to improve care for patients with asthma.	**a** Ensure only appropriate patients are referred and admitted to hospital through establishing more effective links with community services across Integrated Care Systems.	Trusts, ICSs	On publication
	b Where referral criteria defined by NICE (NG80) are not being followed consistently, initiate local discussions to understand barriers.	ICSs, PCNs	Within 3-6 months of publication
	c Monitor frequent attendances to emergency departments and explore reasons for this in collaboration with ED colleagues so that appropriate interventions can be made in line with NRAD recommendations.	Trusts	Within 12 months of publication
	d Review trust-wide data around readmission rates for asthma to understand opportunities for intervention.	Trusts	Within 12 months of publication
	e Review pathways to ensure patients admitted to hospital with asthma are managed by respiratory physicians, with onward referral to specialised centres where appropriate.	Trusts	Within 6 months of publication
	f Ensure patients are provided with sufficient education and support to enable correct inhaler use.	PCNs, ICSs	Within 12 months of publication
	g Ensure patients are provided with plans for follow-up post attendance or at discharge.	Trusts, CCGs, ICSs	Within 12 months of publication
12. Review departmental resourcing to improve outcomes, reduce length of stay and reduce the likelihood of readmissions for patients with asthma.	**a** Ensure at least one consultant in the department has overall responsibility for asthma which is reflected in their job plan.	Trusts	Within 6 months of publication
	b Staff respiratory departments with the appropriate level and makeup of respiratory team members to facilitate effective triage and deliver NACAP care bundles, with a minimum target of 1 asthma nurse per 300 admissions (excluding nurse time spent delivering specialised services for more complex patients).	Trusts	Within 18 months of publication
	c Ensure departments have access to data collection / data entry resource to contribute fully to NACAP.	Trusts	Within 12 months of publication
	d Review and discuss data on asthma activity to explore opportunities to improve services.	Trusts	Within 18 months of publication

Pneumonia

Recommendation	Actions	Owners	Timescale
13. Optimise care for pneumonia patients by ensuring the correct diagnosis (and that it is coded correctly), as well as reviewing patient pathways and infrastructure to enable care bundle delivery, reduce length of stay, readmissions, morbidity and mortality.	**a** Ensure a named respiratory consultant is appointed as a clinical lead for pneumonia, with this leadership responsibility reflected in their job plan.	Trusts, ICSs	Within 6 months of publication
	b Review pathways to ensure prompt diagnosis and point of care testing for viral pathogens.	Trusts, ICSs	Within 6 months of publication
	c Review infrastructure to support pneumonia care and enhance the role of specialist teams to improve outcomes, with a minimum target of one nurse per 400 admissions, pro rata; which could be increased if average readmission rate is over 20%.	Trusts	Within 18 months of publication
	d Use the British Thoracic Society (BTS) care bundle for community-acquired pneumonia to support safe and prompt discharge by a respiratory team.	Trusts	Within 3 months of publication
	e Ensure chest x-rays are formally reported for patients not managed by respiratory physicians to prevent underlying diagnoses being missed and reduce the likelihood of readmission.	Trusts	Within 3 months of publication
	f Ensure all patients are discharged with clear supporting information to explain persistent symptoms and reduce the likelihood of readmission.	Trusts	On publication
	g Agree clear processes for follow-up chest x-rays post-discharge with results being shared across primary, secondary and community care as appropriate.	ICSs	Within 12 months of publication
	h Audit inpatient pneumonia mortality, particularly in patients aged 18-40. Ensure a structured judgement review is carried out for all patients under 40 who have died from pneumonia, with further discussion at regular Morbidity and Mortality (M&M) meetings.	Trusts	Within 18 months of publication

Chronic obstructive pulmonary disease (COPD)

Recommendation	Actions	Owners	Timescale
14. Optimise care for patients with chronic obstructive pulmonary disease (COPD) to reduce length of stay, readmission rates, and overall mortality by using discharge bundles. Where demand exists, consider implementing seven-day services.	**a** Ensure a named respiratory consultant is appointed as a clinical lead for COPD, with this leadership responsibility reflected in their job plan.	Trusts	Within 6 months of publication
	b Consider implementing seven-day services and extending working days (e.g. to 8am-8pm) where possible/indicated to increase the potential for patients to receive facilitated discharge, reducing the likelihood of readmission.	Trusts	Within 18 months of publication
	c Appoint sufficient dedicated competency-based teams to consistently deliver discharge bundles designed to reduce likelihood of readmission –working toward a target of 1 nurse for every 300 COPD admissions.	Trusts	Within 12 months of publication
	d Model the number of patient discharges to track whether implementing the actions above has sufficiently reduced COPD LoS, readmission rates and overall mortality.	Trusts, GIRFT	On completion of actions above
	e Review the number of patients sent home under a supportive early discharge scheme against readmission rates to establish whether there is scope to increase zero LoS patients working toward a target of 20% zero LoS without increasing readmission rates beyond 15%.	Trusts	Within 12 months of publication

Non-invasive ventilation

Recommendation	Actions	Owners	Timescale
15. Ensure a dedicated non-invasive ventilation (NIV) service is in place, with the recommended infrastructure to improve outcomes and reduce mortality.	**a** Review consultant and nursing infrastructure against BTS standards to deliver NIV services in line with existing NCEPOD 2017 and BTS recommendations.	Trusts	On publication
	b Ensure infrastructure is sufficient to enable timely initiation of NIV, using BTS quality statement and NACAP timeline for guidance	Trusts	Within 12 months of publication
	c Enable close liaison between respiratory and critical care units to ensure that escalation plans are in place for all patients on NIV, and that these plans are implementable.	Trusts	On publication
	d Ensure processes are in place to enable early follow-up post-acute NIV for consideration of home ventilation as per HOT-HMV.	Trusts	Within 3 months of publication
	e Consider development of an acute NIV CQUIN or other incentive that will facilitate data collection.	NHSE/I, GIRFT	Within 6 months of publication

Integrated care

Recommendation	Actions	Owners	Timescale
16. Review aspects of respiratory care integration and supporting infrastructure at system level to reduce variation in service provision, enable better care delivery and facilitate information flow between providers.	**a** Review service provision across the STP to ensure services are uniform and equitable for respiratory patients, regardless of where they live.	ICSs, CCGs, Trusts	Within 12 months of publication
	b Consider how respiratory departments interface with diagnostic hubs and community services to deliver truly integrated care.	Trusts, ICSs, GIRFT, Respiratory Networks	Within 6-12 months of publication
	c Ensure there are sufficient staff with the appropriate skill mix to deliver integrated care. This should include respiratory consultant sessions in the community.	Trusts	Within 12 months of publication
	d Integrate electronic systems to allow for data access and sharing across providers and commissioners. This data should be used to review and evaluate progress in improving outcomes at system level.	ICSs, Trusts	Within 18 months of publication

Improving treatment for tobacco dependency

Recommendation	Actions	Owners	Timescale
17. Improve access to smoking cessation therapies and reduce tobacco dependence in patient populations through a comprehensive suite of interventions.	**a** Use ward-based non-medical prescribers to prescribe nicotine replacement therapy (NRT) within 12 hours of admission.	Trusts	Within 3 months of publication
	b Identify a clinical lead for tobacco dependency treatment services with adequate protected time.	Trusts	Within 6 months of publication
	c Ensure an electronic method of recording smoking status is in place.	Trusts	Within 6 months of publication
	d Use free online training on treating tobacco dependency for staff through the 'e-learning for health' platform available for all NHS staff.	Trusts	Within 18 months of publication
	e Monitor the success using the BTS online audit platform and applying QI practice to improve results until they reach the standards set out by NICE and the NHS Long Term Plan.	Trusts	Within 18 months of publication

Specialised services

Recommendation	Actions	Owners	Timescale
18. Review service infrastructure to ensure delivery against national specialised service specifications, reducing the likelihood of delays in treatment or discharge.	**a** Review infrastructure against national specifications and identify areas where additional support or resource is needed to ensure optimum service delivery.	Trusts	Within 12 months of publication
	b Consider how to support trusts in addressing gaps or inequities in service provision which arise as a result of services not meeting all requirements of national specifications.	GIRFT, NHSE Spec Comm	Within 12 months of publication
19. Consider hub and spoke models to amalgamate low volume specialised services.	**a** Review specialised activity levels across regions and consider consolidating services or moving to hub and spoke models where possible to improve shared decision-making and reduce the likelihood of low volume services.	Trusts, ICSs	Within 2 years of publication
20. Review how trusts achieve and maintain specialised status; updating service specifications. Where service demands have changed over time, specifications and subsequent resources need to be aligned to deliver appropriate care.	**a** Update national specification for complex home ventilation to: i) formalise guidance around developing weaning centres; ii) review tariffs to ensure appropriate remuneration, notably for services delivering significant volumes of tracheostomies and >14h NIV together with home visits; iii) consider additional remuneration for transitional services.	NHSE Spec Comm, Clinical regional networks	Within 12 months of publication
21. Establish formal registries to capture patient-level information which can support monitoring and inform commissioning decisions.	**a** Determine key metrics to be collected that include outcome and process measures that reflect costs and benefits of delivering specialised services. Consider how such registries can be used to sensibly support payment.	NHSE Spec Comm, Specialised respiratory CRG	Within 18 months of publication

Medicines optimisation

Recommendation	Actions	Owners	Timescale
22. Improve patient outcomes by reviewing infrastructure to support appropriate medicines use.	**a** Improve uptake of staff flu vaccination using NICE QS190.	Trusts	Within 12 months of publication
	b Ensure patients are offered flu and pneumococcal vaccination.	Trusts	Within 12 months of publication
	c Appoint an antibiotic steward at department level.	Trusts	Within 6 months of publication
	d Improve adherence to inhaler therapy, especially for inhaled steroids to reduce the reliance on reliever therapy. This will improve outcomes and reduce the carbon footprint of inhalers	Trusts, PCNs	Within 6 months of publication
	e Develop guidance at ICS level to standardise formularies. This should include patient education on inhaler therapy, ensuring patients use their inhaler correctly and shared decision-making in choice of inhaler.	ICSs, PCNs, Trusts	Within 12 months of publication

Workforce

Recommendation	Actions	Owners	Timescale
23. Address variations in service delivery and meet the needs of the local population by staffing respiratory departments with the appropriate numbers and skill mix of doctors, specialist nurses, physiologists and allied health professionals.	**a** Review the trainee numbers for respiratory medicine to ensure the specialty evolves in line with ambitions set out for respiratory care in the NHS Long Term Plan.	GIRFT, BTS, HEE	Within 12 months of publication
	b Consider optimising skill mix by appointing specialist/enhanced roles for Physician Associates, nurses and Allied Health Professionals within the respiratory team.	Trusts	Within 18 months of publication
	c Consider how to address recruitment and retention challenges in the respiratory workforce.	HEE / NHSEI, GIRFT	Ongoing
	d Consider appointing more band 2 physiologists to conduct spirometry and support sleep diagnostics, with view to these staff developing into band 4 roles with experience. Where advanced diagnostics are required, ensure there is sufficient numbers / skill mix to deliver results in a timely way to achieve the 6-week RTT target.	Trusts	Within 12 months of publication
	e Appoint enough administrative staff to address clerical workload and reduce clinical time spent on administrative tasks in line with NHS People Plan ambitions.	Trusts	Within 18 months of publication
	f Carry out detailed workforce planning including scoping extended practice for nurses, AHPs and pharmacists.	Trusts, ICSs	Within 18 months of publication

Litigation

Recommendation	Actions	Owners	Timescale
24. Reduce litigation costs by application of the GIRFT five-point plan. Share learning by ensuring claims, inquests and complaints are reviewed in regular M&M meetings.	**a** Assess benchmarked position compared to the national average when reviewing the estimated litigation cost per activity. Trusts would have received this information in the GIRFT 'Litigation data pack'.	Trusts	On publication
	b Discuss with the legal department or claims handler the claims submitted to NHS Resolution included in the data set to confirm correct coding to that department. Inform NHS Resolution of any claims which are not coded correctly to the appropriate specialty via CNST.Helpline@resolution.nhs.uk – notably any claims which should have been classified to thoracic surgery.	Trusts	On completion of 24a
	c Once claims have been verified, further review claims in detail including expert witness statements, panel firm reports and counsel advice as well as medical records to determine where patient care or documentation could be improved. If the legal department or claims handler needs additional assistance with this, each trusts panel firm should be able to provide support.	Trusts	On completion of 24b
	d Triangulate claims with learning themes from complaints, inquests and serious incidents (SI) / Patient Safety Incidents (PSI) and where a claim has not already been reviewed as SI/PSI we would recommend that this is carried out to ensure no opportunity for learning is missed. The findings from this learning should be shared with all front-line clinical staff in a structured format at departmental/directorate meetings (including Multidisciplinary Team meetings, Morbidity and Mortality meetings where appropriate. Sustainable and effective interventions that measurably reduce risks to patients should be implemented and where these are successful, should be shared through multiple routes, including discussion at meetings.	Trusts	On completion of 24c
	e Where trusts are outside the top quartile of trusts for litigation costs per activity GIRFT we will be asking national clinical leads and regional teams to follow-up and support trusts in the steps taken to learn from claims. They will also be able to share with trusts examples of good practice where it would be of benefit.	Trusts	On completion of 24d
	f Review categorisation of medical negligence claims to separate thoracic surgery claims from respiratory medicine / cardiac surgery.	GIRFT, NHS Resolution	On publication

Procurement

Recommendation	Actions	Owners	Timescale
25. Enable improved procurement of devices and consumables through cost and pricing transparency, aggregation and consolidation, and by sharing best practice.	**a** Use sources of procurement data, such as SCS and relevant clinical data, to identify optimum value for money procurement choices, considering both outcomes and cost/price.	Trusts, GIRFT	Within 6 months of publication
	b Identify opportunities for improved value for money, including the development of benchmarks and specifications. Locate sources of best practice and procurement excellence, identifying factors that lead to the most favourable procurement outcomes.	GIRFT	Ongoing
	c Use Category Towers to benchmark and evaluate products and seek to rationalise and aggregate demand with other trusts to secure lower prices and supply chain costs.	Trusts, STPs, GIRFT	Within 12 months of publication

COVID-19

Recommendation	Actions	Owners	Timescale
26. Ensure respiratory services are able to provide optimal care for patients with COVID-19 and post-COVID-19 syndrome by establishing respiratory support units, enabling remote treatment monitoring and optimising multidisciplinary expertise.	**a** Establish staffed respiratory support units in line with national recommendations, including a multi-professional outreach service. Aim for a minimum nurse to patient ratio of 1:4, with nurses trained in administering CPAP and HFNO.	Trusts, ICSs/CCGs	Within 3 months of publication
	b Review job plans to allow introduction of twice daily respiratory consultant-led ward rounds for COVID-19 patients, by reducing respiratory consultant commitments to the acute take where feasible.	Trusts	Within 3 months of publication
	c Procure CPAP devices with capability for remote monitoring where possible through co-ordinated discussions between respiratory and IT departments.	Trusts	Within 12 months of publication
	d Review tariff arrangements to support providers in offering CPAP treatments with remote monitoring to reduce departmental footfall.	CCGs / NHSE/I	Within 6 months of publication
	e Prioritise restoration of bronchoscopy and Endobronchial Ultrasound, recognising the pressures on GI endoscopy.	Trusts	Within 3 months of publication
	f Develop COVID-19 follow-up services in line with national recommendations.	ICSs, Trusts	Within 6 months of publication
	g Ensure adequate multidisciplinary resourcing is in place to review patients with post-COVID-19 syndrome through MDTs.	Trusts, ICSs	Within 6 months of publication

About respiratory disease

One in five people are affected by respiratory disease in England and it is the third largest cause of death.[1] Hospital admissions for lung disease have also risen at three times the rate of other admissions over the last seven years.[2] Incidence and mortality for those with respiratory disease is higher in disadvantaged groups and areas of social deprivation.

Respiratory infections are a cause of significant morbidity, in particular exacerbations of Chronic Obstructive Pulmonary Disease (COPD) and pneumonia. Many respiratory patients also have co-morbidities including (but not limited to) heart disease, diabetes, osteoporosis and frailty.

For these reasons, respiratory disease has become a primary focus area for the NHS and forms a key part of its Long Term Plan and prevention programme.

About the specialty

Respiratory medicine involves the diagnosis and treatment of a wide variety of diseases of the airways and lungs, their linings and blood vessels, and the muscles and nerves required for breathing.

The specialty sees acute and chronic infections affecting the lungs. Bronchitis, for example, is the most common presentation in primary care, and pneumonia leads to high numbers of admissions to hospital and is a leading cause of mortality.

Respiratory conditions with underlying exacerbation impact on wider care by contributing to the 'winter bed crisis' in trusts, where the number of respiratory admissions increases, exceeding the capacity for delivering care established during summer months. This is a recurrent problem that needs a systemic fix.

There are around 1,365 respiratory consultants in England.[3] Their work in respiratory encompasses outpatient clinics, procedures, inpatient care and community in-reach.

Following a detailed history and physical examination, a variety of diagnostic tests are used for respiratory patients. For many, a plain chest x-ray (CXR) and simple blowing tests of spirometry are often sufficient to confirm the diagnosis. However, more detailed tests are often required including imaging, mainly CT thorax, and some procedures e.g. bronchoscopy, EBUS (endobronchial ultrasound), and exploring the pleura (the membrane enveloping the lungs) by ultrasound or actual visual inspection by thoracoscopy. Physiological investigations underpin most of the investigative process and in some examples, e.g. sleep, the whole diagnosis and often management is dependent upon physiological tests and interventions. Given their key role, this GIRFT review has placed a particular focus on lung function and cardiopulmonary exercise testing together with sleep medicine.

Inpatient care

Respiratory consultants are one of the few specialties who routinely work across the trust, interfacing closely with other specialties, in particular acute and general medicine. Respiratory problems are a major reason for admissions and contribute up to one third of the take.[4] As a consequence, respiratory physicians have their own inpatient beds and make a significant contribution to the 'acute take', both by providing on call (out of hours) cover for the hospital and supporting the Acute Medical Unit (AMU) and in some trusts the Emergency Department (ED). Details of this are included in the *Acute and inpatient care* section on page 38.

Outpatient care

In addition to the heavy inpatient workload, respiratory consultants have significant outpatient activity, both to diagnose the reasons why patients present with complaints such as breathlessness, cough and chest pain, but also in follow-up of conditions, many of which are mandated by bodies such as NICE or the British Thoracic Society (BTS) in their comprehensive suite of guidelines.

[1] *BLF (2016) Estimating the economic burden of respiratory illness in the UK, https://www.blf.org.uk/policy/economic-burden*

[2] *BLF (2017) Out in the cold: lung disease, the hidden driver of NHS winter pressure, https://www.blf.org.uk/policy/out-in-the-cold*

[3] *BTS (2019) Respiratory medicine workforce survey report, https://www.brit-thoracic.org.uk/media/70308/bts-workforce-survey-report-2019-final-nov-2019.pdf*

[4] *NHS Digital (2018) Hospital Admitted Patient Care and Adult Critical Care Activity, https://files.digital.nhs.uk/B3/DCC543/hosp-epis-stat-admi-summ-rep-2017-18-rep.pdf*

Specialist respiratory units

Some respiratory units provide specialised services commissioned by NHS England for rarer or complex conditions or treatments. We look at specialised respiratory units in more detail in the *Specialised services* section on page 114.

Clinical coding

Clinical coding is an essential process for capturing accurate data about diagnosis, treatment, and who delivers this activity. This data is vital to ensuring the true level of activity in respiratory departments is known for reimbursement of costs, for future planning, and for information gathering about the nature of respiratory disease. As a result, we have developed a section on coding and used this to highlight variations in care.

About our analysis

Scope of the review

The GIRFT respiratory workstream identified 130 trusts with respiratory activity to visit. We conducted a total of 58 deep-dive visits - due to the restrictions from COVID-19, seven of these deep-dive visits were virtual visits.

There are around 20 subspecialties of respiratory medicine, which means that covering all areas was not feasible for this report. This review, therefore, concentrated on the most common conditions of:

- pleural diseases;
- asthma;
- pneumonia;
- chronic obstructive pulmonary disease (COPD).

This focus was intended to cover areas with the highest level of unwarranted variation, and ensure the report is as broadly useful as possible.

Lung cancer will be covered by a separate standalone GIRFT workstream, and is not covered here. Other respiratory conditions, such as bronchiectasis, cystic fibrosis, and tuberculosis, were out of scope for this review.

Respiratory physiology services, including exercise testing and sleep medicine, were also reviewed, as well as three areas of specialised commissioning:

- severe asthma;
- interstitial lung disease (ILD);
- complex home ventilation.

Recommendations and actions in this GIRFT national report should be considered alongside all trust-level actions provided on deep-dive visits, as well as any ongoing work by the British Thoracic Society, NICE, NHS RightCare, NACAP, NHS England and NHS Improvement and other bodies designed to improve care for respiratory patients. We have consulted with these groups in the development of our recommendations, and as such, our recommendations largely align with the goals of these organisations.

Data sources

In analysing respiratory medicine as part of the GIRFT process, we have reviewed Hospital Episode Statistics (HES) data from 2018 to 2019 relating to attendances, admissions, interventions and activity. The core issues we have examined include:

- length of stay and readmission rates for patients with common respiratory conditions;
- infrastructure for respiratory physiology and testing;
- coding of respiratory activity.

Other sources of data

In addition to our core HES data, we have considered questionnaire data from individual trusts about service organisation, workforce and departmental infrastructure. Together with the HES data and questionnaire data we have also included a range of other sources. These are:

- Association of Respiratory Technology and Physiology (ARTP) activity spreadsheet data;
- Define data on medicine use and spend;
- National Asthma and COPD Audit Programme (NACAP) data;
- Public Health England (PHE) data on flu vaccinations and antibiotic use;
- ONS mortality data;
- Data from Blueteq forms.

Gaps in our analysis

There is variation in HES data related to variations in clinical coding (see below), data management and data flows in trusts. This was especially obvious in physiological activity where, despite activity data being captured at the time of doing the test, information on this activity did not flow through the trusts' business intelligence units to be formally captured.

The GIRFT questionnaire data, both general and related to specialised commissioning, together with that from the Association for Respiratory Technology & Physiology (ARTP) questionnaire, is open to individual interpretation and hence variation in results. Where unusual data was identified we attempted to "clean" this before entering it into the data packs used for trust-level deep-dive visits. This information was then validated in the deep dives and, as such, we are confident that the data presented in this national report reflects the reality of the services provided.

Findings and recommendations

Respiratory medicine is a mostly hospital-based specialty, although some respiratory care is delivered in a community setting. A shift to integrated care is being encouraged (see *Integrated Care*, page 103).

Patients with respiratory problems will visit hospital as both outpatients and inpatients, with the specialty leaning more heavily towards inpatient care than many medical specialties.[5] Respiratory medicine is closely linked to acute and general medicine as respiratory conditions account for around one-third of the acute general medical take. Most respiratory physicians will also work in acute medicine, supporting the general intake in evenings, weekends and being 'on call' for general medicine.

A large number of respiratory inpatients are admitted as non-elective (emergency) admissions. Nearly all acute trusts will have a respiratory ward. These patients will also commonly require follow-ups upon discharge, adding to outpatient numbers. The majority of outpatient referrals come from primary care; respiratory problems are one of the most common reasons for a GP to refer to hospital.

For outpatients, there are generally two types of clinic: general respiratory clinics and specialist clinics. Patients with more common respiratory conditions, such as cough or breathlessness, are diagnosed and treatment is started in general clinics, with increasingly sub-specialty clinics even in District General Hospitals (DGHs) for common conditions of sleep, asthma and chronic obstructive pulmonary disease (COPD).

General respiratory outpatient clinics will usually have an attached lung function laboratory, led by physiologists who run and interpret complex testing[6] (see *Physiological and imaging services*, page 51).

More tertiary level specialist respiratory clinics are only found in a small number of hospitals, commissioned by NHS England and NHS Improvement Specialised Commissioning (see *Specialised services*, page 114).

Outpatients and inpatients, and general and specialised services, present different challenges for the specialty and require different approaches for improved management and care.

Outpatient services

Outpatient work makes up a large proportion of respiratory medicine work, with only cardiology and dermatology as the medical specialties seeing consistently more outpatients. Most chest physicians do three clinics a week as programmed activity (PAs), seeing a mixture of new and follow-up patients in line with Royal College of Physicians (RCP) guidelines. However, long wait times persist (discussed in this report) suggesting the level of demand for outpatient work is putting pressure on stretched respiratory services, despite innovative practices to reduce post-ward discharge follow-ups, for example, in pneumonia care.

Improving outpatient attendance rates

When patients do not attend their outpatient appointments, measured as 'did not attend' (DNA) rates, this can cause an unnecessary and significant waste of resources. We found high variation in DNA rates in respiratory medicine across trusts, with an interquartile[7] range of 9-15% and a median of 12%. We also found some trusts were able to achieve better than this, for example at Portsmouth Hospitals NHS Trust, with a DNA rate of 8.6%, and Wirral University Teaching Hospital NHS Foundation Trust with figures of 7.2%.

Reducing DNA rates across high DNA rate trusts would reduce costs, reduce waits for patients, improve RTT (referral to treatment time) and reduce the waste in workforce and infrastructure resources.

While some measures may improve DNA rates, such as providing clinics out of normal working hours so that individuals who are at work do not have to take time off to attend appointments (as occurs in the sleep service at University Hospitals of North Midlands NHS Trust), trusts need to explore other options for reducing DNAs, such as text reminders and increasing the use of non-face-to-face consultations. It should be noted that, while patients may fail to attend for a number of reasons which can be investigated, multiple changes of appointments by hospitals do not help adherence to appointment times. The NICE guidelines on patient experience in adult services makes recommendations on effective communications with patients.[8]

If all trusts were to reduce their DNA rate to the median, it is estimated that around 40,000 respiratory outpatient appointments would be saved across England per year (see *Notional financial opportunities*, page 156).

In our deep-dive visits, we found several trusts had implemented quality improvement programmes designed to reduce their outpatient DNA rates.

[5] *RCP (2018) Medical Care, Workforce and job planning, https://www.rcpmedicalcare.org.uk/developing-physicians/specialties/respiratory-medicine/workforce*

[6] *NHS Health Careers, Respiratory Medicine, https://www.healthcareers.nhs.uk/explore-roles/doctors/roles-doctors/medicine/respiratory-medicine*

[7] *An interquartile range is a measure of variability which describes the range in the middle 50% of a dataset.*

[8] *NICE (2012) CG13: Patient experience in adult NHS services: improving the experience of care for people using adult NHS services, https://www.nice.org.uk/guidance/cg138*

CASE STUDY

A multifaceted approach to reducing DNAs

Chelsea & Westminster Hospital NHS Foundation Trust

Chelsea & Westminster Hospital NHS Foundation Trust sought to address a high did not attend (DNA) rate, which was generating a loss of income and administrative burden.

The trust took a multi-faceted approach:

- text message reminders are sent seven days and two days pre-appointment;
- before leaving the ward, a date and time for follow-up is agreed for patients discharged from the ward;
- there is continual review of clinic capacity and demand;
- setting up of virtual clinics;
- selected patients move onto a 'straight to test' pathway;
- consultant triage of all referrals into respiratory care.

The introduction of these systems led to a significant reduction in DNA rate for appointments and the trust is now expanding the digital option by giving patients direct access to appointment and clinic letters.

CASE STUDY

A telephone clinic to identify patients in need of follow-up to reduce DNAs

Chesterfield Royal Hospital NHS Foundation Trust

Chesterfield Royal Hospital NHS Foundation Trust identified a high did not attend (DNA) rate for asthma follow-up appointments. As per British Thoracic Society (BTS) guidelines, all asthma patients at the trust were being offered respiratory clinic follow-up appointment with a respiratory specialist nurse at one month.

Verbal patient feedback suggested that many patients were younger, working age patients who felt they had improved and so did not attend the appointment. A telephone clinic was established to provide a telephone follow-up call at two weeks after discharge. This clinic identified those who felt completely well after two weeks and who could therefore be safely discharged.

Patients who wanted or needed a face-to-face appointment were then motivated to attend and understood the rationale for doing so. This benefited patients who believed they were improving, but who were still identified as needing further clinical follow-up.

Patients have provided positive feedback on the service, and it has appeared to reduce did not attends at clinic.

Reducing follow-up activity

Follow-up outpatient attendance may occur after seeing the patient as a new patient, or following a period as an inpatient to determine their response to treatment or, less frequently, to discuss the results of investigations (given these are increasingly communicated to the patient and GP by letter or phone call).

Some trusts are very efficient in their new to follow-up (N:FU) ratios, including Buckinghamshire Healthcare NHS Trust, which has a 1:1 ratio, and North Middlesex University Hospital NHS Trust, which has a ratio of 1:1.3. This has been achieved by a high discharge rate at first attendance due to ease of accessing diagnostic tests and pre-testing, as described below. High initial discharge rates are also found in other organisations, such as University Hospitals of Leicester NHS Trust, where 37% of patients are discharged at first attendance.

However, in some of the trusts we reviewed we found poor N:FU ratios in respiratory departments. This high number of follow-ups may be a result of a variety of reasons. Clinical Commissioning Groups (CCGs) may insist on defined N:FU ratios, with the consequence that if there are not enough follow-up appointment slots the list grows to give an artificially high follow-up number. We found examples in some trusts where the N:FU ratio was maintained, but with the consequence of a backlog of follow-up patients that were "hidden". One trust had over 6,000 patients on a hidden waiting list. This is a concern as these patients have potentially gone well past their planned follow-up appointment, creating potential for lesions to be missed and disease management to be delayed, leading in turn to harm and hospital admission. Such "hidden" waiting lists should be reviewed and activity commissioned to ensure such long waits are addressed. A clear mapping of outpatient new and follow-up activity needs to be commissioned to deliver what is required.

However, we also have to recognise that clinics may not be run efficiently and patients are always given a 'routine' follow-up appointment, something that may occur with locum or junior staff who do not always have the experience to discharge effectively from follow-up. This can be helped by more senior oversight in clinics and we would recommend that all consultants are aware of their individual N:FU ratios and are encouraged to actively manage patients.

While complex patients with mandated follow-up are often given as a reason for a high number of follow-ups, this is not always the case. As seen in efficient trusts, for example those with large sleep services that have large numbers of CPAP follow-ups, or patients under specialised services, many have excellent new to follow-up ratios - as found at the University Hospitals of North Midlands NHS Trust. It has one of the largest sleep services in the country, and all respiratory specialised commissioning except pulmonary hypertension, with a ratio of 1:1.3.

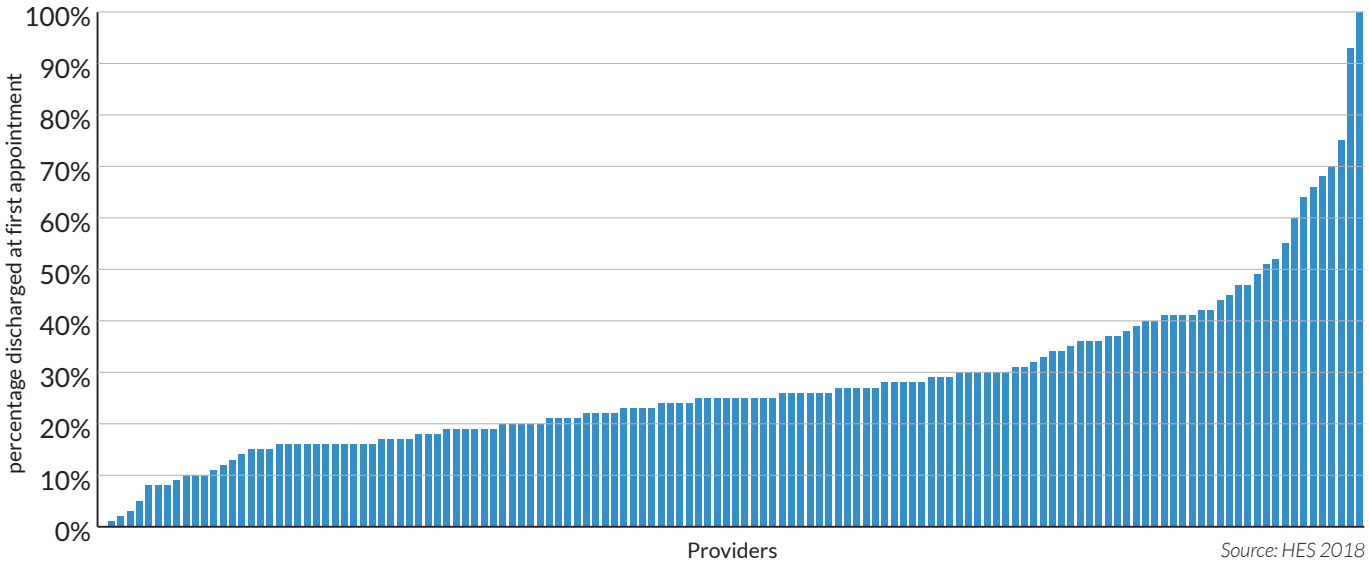
Pre-testing is one possible way to facilitate discharge on first attendance. This requires a review of the referral letter and sometimes a call to the patient to validate their symptoms, followed by booking a series of diagnostic tests. While some patients may be discharged at this stage, often new patients need a clinic where a detailed history and examination, together with the results that are available, lead to discharging the patient with a management plan. We found several hospitals where this was being evaluated, and provisional information shows there is a benefit to both patient and the health economy in supporting discharge at first attendance.

However, it does need to be recognised that this is a time-consuming process with consultants reading letters, arranging tests, and then reviewing results prior to clinic. If trusts wish to develop such processes it is essential the time taken to do this pre-testing is recognised in job plans.

Discharge at first appointment

We have explored the number of patients discharged at first appointment, and although there were some valid reasons identified in deep dives, for example, how straight-to-test in sleep was recorded, we found wide variation in the percentage of patients discharged in each trust after first attendance. This ranged from 18% to 33% with a median value of 25% (**Figure 1**). If all trusts were to increase the proportion of patients discharged at first appointment to the median, this would save 19,000 follow-up appointments per year in England (see *Notional financial opportunities*, page 156).

Figure 1: Variation in proportion of respiratory outpatients discharged at first appointment



Source: HES 2018

More consultant supervision, alongside pre-testing (recognised in job plans, as described above), would help to increase the number of patients discharged at a first appointment.

However, doing the tests on the day of the appointment in a "one stop service" is very effective for the patient but does need considerable organisation within the service and is only possible for a limited number of services and conditions. Activity also needs to be sufficiently captured for each of the interventions to ensure appropriate remuneration.

Advice and Guidance is a service used by primary care teams to seek specialist opinions from consultants and their teams. From our deep-dive visits we found that it was used variably across England with the time taken to access images of x-rays and physiological measurements making it time-consuming in some circumstances. It should enable clinicians to seek opinions on managing patients with respiratory problems, but the tool is limited by the lack of access to results from physiological investigations which may exist, or which have been performed in primary care.

Since COVID-19, there have been radical changes in how outpatient services are delivered including an increase in virtual clinics and exploration of new models of follow-up, such as patient initiated follow-up (see *COVID-19 impact on respiratory medicine*, page 146).

The process of delivering care in clinics is variable and will depend on the nature of the underlying condition and is discussed in the relevant sections of this report which follow, including integrated care. Many trusts, but not all, have recognised the opportunities for non-medical teams to deliver care. This is well-established in sleep medicine where physiologists/clinical scientists play a key role and often run the service from diagnosis through to treatment and follow-up.

Specialist nursing staff appear to be used variably and, while they may see patients in the acute setting, do not always follow patients up in clinic for routine care, despite the essential role they play in managing patients who fall under the care of specialised commissioning.

Beyond the specialised areas, there are excellent examples where nurses and clinical psychologists deliver support to patients, as found at Royal United Hospital Bath NHS Foundation Trust and The Newcastle Upon Tyne Hospitals NHS Foundation Trust.

We have little information on the role of physiotherapists beyond specialised commissioning where they, together with pharmacists, are increasingly used. Clearly, there are opportunities for these professions and physicians associates to play an increasing role in delivering outpatient care.

Recommendation: Outpatient services

Recommendation	Actions	Owners	Timescale
1. Optimise respiratory outpatient services by reducing DNAs, limiting unnecessary follow-up, considering increased virtual consultations, one-stop clinics and moving care closer to home.	**a** Explore options to reduce DNAs, including through considering increased use of non-face-to-face consultations where clinically appropriate, in line with NHS Long Term Plan ambitions to reduce OP attendances by 30%. Patient preferences need to be considered as part of this. Regular monitoring and evaluation of the effectiveness of virtual clinics is also needed.	Trusts	Within 12 months of publication
	b Explore options to increase the proportion of patients discharged at first appointment, including through: • ensuring sufficient consultant supervision, decision-making and leadership of outpatient clinics; • reviewing the referral letter and using an initial call with the patient to pre-book diagnostic tests in advance of clinic attendance where relevant; • considering 'one-stop' clinic models where feasible.	Trusts	Within 12-18 months of publication
	c Liaise closely with system partners to deliver care closer to home through integrated care models.	Trusts, ICSs, PCNs	Within 12 months of publication

Acute and inpatient care

Beyond outpatient services, respiratory medicine activity can be considered as day case, elective and non-elective. There are few elective inpatient admissions in respiratory medicine, but there is a large amount of day case work in sleep medicine, bronchoscopy, pleural diagnostics and interventions. This activity is not always captured as such, and can lead to loss of income and activity recording. Ensuring this activity is recorded appropriately by discussing this with clinical coding and trust business intelligence units is an important step.

The large area of activity for respiratory medicine is non-elective or emergency work, as would be expected with up to one third of the acute take being patients with respiratory problems.[9] It is important to appreciate that interventions in the community may make significant impacts on the number of patients attending emergency departments and being admitted.

The key role of primary care is highlighted in different sections of this report, but some actions can make important differences to acute work - for example, ensuring all asthma patients have a personalised asthma action plan (PAAP); early follow-up post discharge; early and accurate diagnosis for COPD; vaccination; and, when appropriate, rescue packs. Self-management plans need to address physical symptoms, physical activity and psychological/mental health factors to be effective.[10]

We can consider inpatient activity under four broad headings:

1. Contribution to acute medicine;
2. Facilitating discharge from acute medicine;
3. Inpatient management;
4. Winter pressures.

Contribution to acute medicine

Apart from in highly specialised units, or the 20 out of the 126 trusts who replied to our questionnaire indicating they have their own respiratory take, the majority of respiratory physicians play a significant part in the acute take. This involves being on call overnight and covering the acute admissions at weekends. As a consequence of this weekend acute medicine working, 77 hospitals did not have regular reviews of respiratory patients at weekends. A similar pattern was found for overnight cover for respiratory patients, being present in only 31 trusts. For many trusts, there was a fixed commitment into AMU during the working week (in 71 trusts), with 30 also having regular in-reach in Emergency Departments or occasionally being based within the ED, as found at The Royal Wolverhampton NHS Trust. This use of respiratory consultant time to support acute care has a direct impact on availability for caring for respiratory patients.

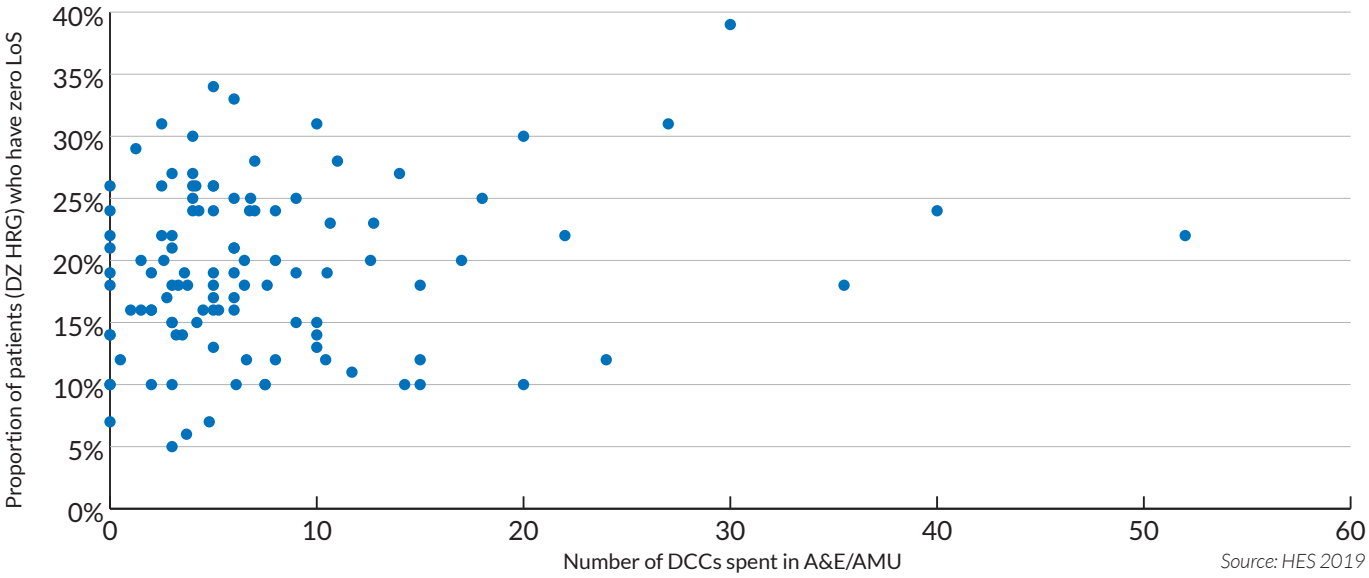
This activity for each trust, excluding the out-of-hours on call, is displayed against the number of zero length of stay (LoS) patients in **Figure 2**. This significant support of the acute take consumes considerable numbers of Direct Clinical Care (DCC), some of which could be allocated to delivering respiratory care.

DCC is a type of Programmed Activity (PA), and any given job plan for a physician is made up of PAs (each PA being four-hour slots of work during a working week, three-hour slots outside of a working week). DCC is work that directly relates to the prevention, diagnosis, or treatment of illness, such as ward rounds and outpatient clinics.[8]

[9] *BMA (2012) SASC implementation guidance – programmed activities, https://www.bma.org.uk/media/1293/bma-nhs-employers-joint-job-planning-guidance-for-sas-doctors.pdf*

[10] *Heslop-Marshall et al. (2018) Randomised controlled trial of cognitive behavioural therapy in COPD, RJ Open Research, 4(4): 00094-2018.*

Figure 2: Number of DCCs spent in ED/AMU and patients with zero LoS



Source: HES 2019

Facilitating discharge from acute medicine

There is considerable interest in minimising LoS so we have explored this throughout this report, looking in detail at different medical conditions. The graph above **(Figure 2)** shows that a few trusts have a significant respiratory workforce based upon DCC to support acute care. It would further suggest that where more DCCs are available, there are a greater number of patients with a zero LoS for respiratory conditions.

This is shown by the respiratory Health Resource Groups, a marker of all respiratory admissions. The data, however, is not 'clean' enough from the questionnaire to make strong correlations, but in our deep dives we saw that where there were more physicians with a respiratory background present in AMU there were more zero LoS patients - as found in the University Hospital of North Midlands NHS Trust, where four of the acute physicians have a respiratory background (holding a certificate of completion of training (CCT) in respiratory medicine) and the number of respiratory zero LoS patients was the highest in England, at 32%. Another trust where a different model of care has resulted in a high respiratory zero LoS is Royal United Hospital Bath NHS Trust, where the figure is 27%.

CASE STUDY

Joint working across general and respiratory teams to reduce LoS

University College London Hospitals NHS Foundation Trust

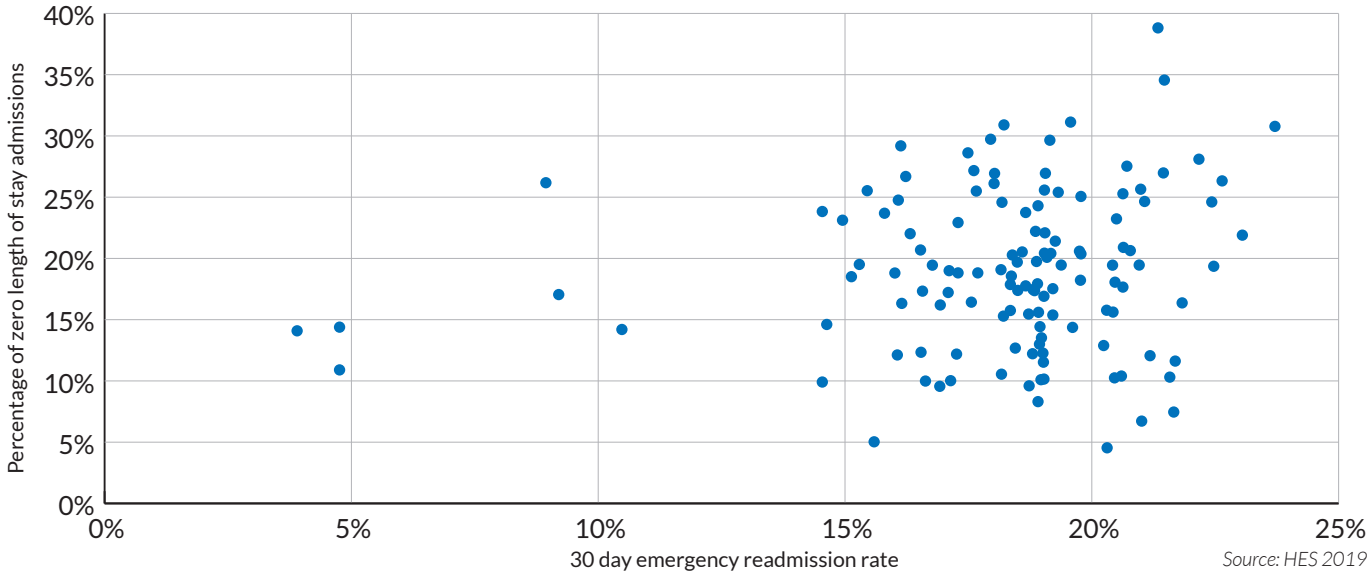
UCL Hospital (UCLH) has been successful in delivering a low length of stay (LoS) for respiratory patients at 5.6 days with a high zero LoS at 30%. This is achieved through a combination of joint working between general and respiratory medical teams, and input from Clinical Nurse Specialists.

UCLH patients are admitted through the emergency department to either an acute admissions ward (AMU), or via an Emergency Day Unit (EDU), enabling a multi-layered approach to the evaluation of medical patients and joint working between the respiratory and general medical teams.

Systematic review of all patients with airways disease by the team of skilled and dedicated Clinical Nurse Specialists (CNSs) who also maintain strong connections with community respiratory teams, ensures that patients with asthma and COPD are rapidly identified on admission, and chronic disease management expertise is brought on early in their admissions. At-risk patients in the community are also more easily identified.

While the high zero LoS appears good, this may be associated with a high readmission rate and therefore the ideal is a high zero LoS with low readmissions rate. Examples are shown in **Figure 3**, with a 30-day admission rate of 10% or less, with a high zero LoS. Six trusts appear to achieve this by a variety of methods that are being explored during deep dives. It would be optimal to achieve a percentage of zero LoS for respiratory patients above 15% and a readmission rate of 10%, but this was found in only two trusts. A more realistic expectation would be a 15% or above zero LoS and an 18% or less readmission rate. Further economic modelling is required to determine the optimal ratios, but if the percentage of zero LoS respiratory patients were increased to the median (19%) – 17,000 bed days would be saved (see *Notional Financial Opportunities*, page 156).

Figure 3: Relationship between zero length of stay and readmission rates



Source: HES 2019

Use of 'hot clinics' could improve flow

An opportunity to improve flow by limiting either hospital admission or attendance lies in the use of 'hot clinics'. In the initial description of this model, any GP, primary care or community health care worker could phone a dedicated number during working hours and speak to a consultant for advice. If needed, patients could then be seen in clinic on the same or subsequent days to organise management. In a 2008 study, this was found to contribute to avoided hospital admission in 80 out of 88 patients, 91%.[11] Despite this effective service model, we found from our questionnaire that only 37 trusts ran such 'hot clinics'. To be effective they should be running 4 – 5 days a week, but this was only found in 12 trusts. From our deep dives, we found that the clinics appeared to be on a fixed day and did not have the flexibility of the original model. The 'hot clinic' concept should be considered to help reduce hospital attendances and should certainly be in place during winter.

Inpatient care

For respiratory consultants, supporting the AMU and ED is usually in addition to running the respiratory ward. During our deep dives, we found several areas for improvement in how respiratory wards operate. A common issue was that a third to a half of the respiratory ward bed base was occupied by non-respiratory patients. In parallel, there were a large number of respiratory patients, as expected from the number of patients admitted, on non-respiratory wards. These patients required regular consultations from respiratory consultants or specialist registrars (SPRs) and/or requests for ward discharge to respiratory clinic appointments – an inefficient service delivery model.

Patients not being allocated to the most appropriate expertise is often linked to patient flow through the hospital, and is often organised by bed flow co-ordinators. The wrong patient in the wrong bed has the consequence of generally increasing their

[11] *Lim A, Mustafa N, Hussain I, Allen M. (2008) Is easy access by primary care to respiratory consultants helpful? Thorax, 63 (Suppl VII):A4–A7*

length of stay, and the correct tests potentially not being ordered at the correct time. Furthermore, there is likely to be an increased LoS when the patient is not managed by the correct specialty, adding to a potentially increased risk of falls, deconditioning and hospital-acquired infections associated with increasing LoS.[12]

A more logical approach is to ensure that the correct patient goes to the correct ward, which requires some co-ordination of patient flows from acute portals, especially out of normal working hours. This may also require steps to increase respiratory expertise and knowledge among all physicians. While this may produce some improvement in respiratory patients being in respiratory beds, it is likely that a more systematic review of the respiratory bed base will be required. We found the overall respiratory bed base is commonly too small to reflect the number of respiratory admissions.

We have explored this by looking at the proportion of admitted respiratory patients, excluding those with a zero LoS, who were managed by a respiratory consultant (**Figure 7**). This graph highlights the marked variation in the number of patients with a primary respiratory condition in each trust managed by a respiratory consultant. This is less than 10% in some trusts, with only ten trusts succeeding in 70% of their respiratory patients being managed by respiratory physicians. One of the best examples is at Portsmouth Hospitals NHS Trust, where 79% of admitted respiratory patients are managed by a respiratory physician.

While this is a crude measure and we recognise that ward consultations and respiratory / nursing team visits are not captured, there is a marked variability in respiratory patients receiving disease-specific care.

If there is a need to increase respiratory beds then workforce would need to match this. We have looked at the consultant workforce by looking at the number of DCCs per bed, another crude measure that does not consider outpatient and procedure activity (**Figure 4**). Some providers appeared to have a high DCC per bed, but on further interrogation of this data during deep-dive discussions this was found to be either factually inaccurate or there were too few respiratory beds and DCCs were consumed on outlying wards. For other trusts there were too few DCCs per bed and as a consequence they were unable to actively manage patients on their ward. Moreover, these DCC plots assumed a full consultant team, but we found that many trusts have at least one consultant vacancy, further reducing overall efficiency of the respiratory unit.

Given that facilitating discharge is an important role of the consultant to maximise efficiency, there are a variety of ways doing this. One example includes a 'physician of the week' model where the same consultant will be responsible for that ward during the week and/or week and weekend. This consistency of senior decision maker has been shown to reduce length of stay by some two to three days. The amount of time required on the ward would depend very much on case mix but ideally for the rapid flow of patients we would expect one PA of clinical time per day for managing approximately 18 inpatients.

CASE STUDY

Physician of the Week model

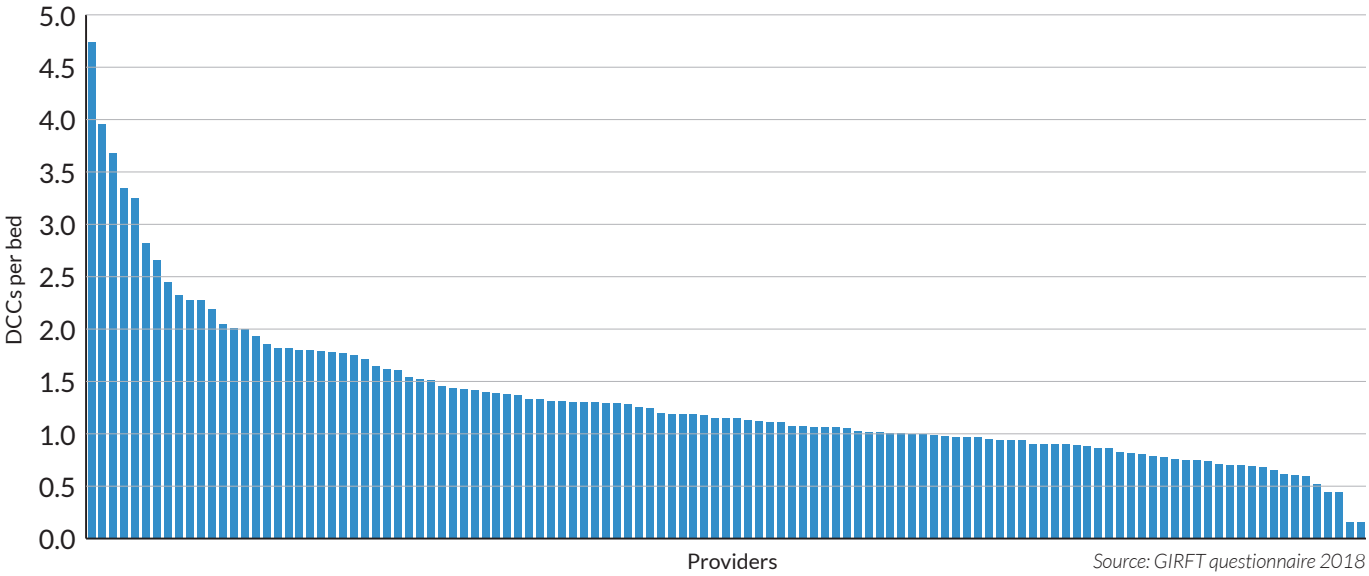
University Hospitals of North Midlands NHS Trust

In 2012 University Hospitals of North Midlands NHS Trust (UHNM) enhanced the standard ward-based care in which consultants did ward round on their own patients twice weekly on fixed days. A new Physician of the Week (POW) model was established. This is where one consultant provides one working week of cover with daily ward rounds, each patient being seen by the same consultant to assess progress more accurately and ensure the consistency in ordering investigations. This process was started on respiratory wards and adopted throughout medicine and some surgical specialties. To ensure this continuity other fixed commitments are cancelled for that week. This has led to:

- patients and relatives becoming more familiar with the clinical team;
- continuity of patient care;
- a reduction in patient complaints;
- consultants enabled to daily manage patients in a proactive way by the daily contact;
- an ability to witness the patients' progress in real time;
- facilitating earlier discharge;
- a fall in average length of stay by around two days at the start of the programme.

[12] *NHS England Reducing Length of Stay, https://www.england.nhs.uk/urgent-emergency-care/reducing-length-of-stay/*

Figure 4: Number of respiratory medicine DCC sessions per respiratory medicine bed



Source: GIRFT questionnaire 2018

Ward rounds can be made more efficient through preparation by an initial board round (a summary discussion of the patient journey and what is required that day for it to progress) to identify patients who should be seen first, i.e. the sickest patients, then potential ward discharges, new patients who may need urgent test requesting, followed by the actual ward round. A "wash up" board round should follow with the multi-professional team and then the consultant meeting relatives when appropriate. If the bed base is enlarged pro rata, then consultant time also needs to increase. To facilitate efficient ward working, senior nurses should be available to update the medical team of issues, and there should be sufficient junior staff and IT systems that are easy to use and work at a running speed to order and review investigations, radiographs and other interventions as required.

Of those trusts with sufficient infrastructure (eight or more respiratory consultants) – which only makes up 52% of all trusts reviewed – it was found that 71% (37 trusts) provided ward rounds at the weekend and 29% (15 trusts) did not. The trusts which did not review their respiratory patients, even when there were sufficient numbers to run a weekend ward round rota, were unable to do so as their weekend DCCs were committed to providing acute care.

Winter bed pressures

The pressures on acute services during the winter months cause perennial problems. Flow through the system and encroachment of medical patients into surgical wards limits and occasionally stops elective activity, increasing waiting lists and financial issues. These winter issues are due to a marked increase in respiratory admissions during this period, as shown in **Figure 5**, with an 80% change between the August nadir and the January peak, and in **Figure 6**, showing an increase in COPD admissions every winter.

To deal with this perennial 'winter pressure' due to increasing respiratory admissions, a systematic solution is needed. As we appreciate, if patients with respiratory problems are managed by non-specialists, issues around increased length of stay and ward consultations for patients dispersed around the hospital occur, as highlighted above.

In its report *Out in the Cold*, the British Lung Foundation highlights that respiratory is the only major disease area which sees a spike in admissions during the winter months. We know that many respiratory winter illnesses can be better managed by a variety of interventions, such as improved uptake of vaccination programmes, basic care, and ensuring people are able to self-manage throughout colder months, including through ensuring a warm home.[13]

We have seen examples where trusts have developed innovative, preventative initiatives that attempt to reduce winter bed pressures by addressing some of these challenges.

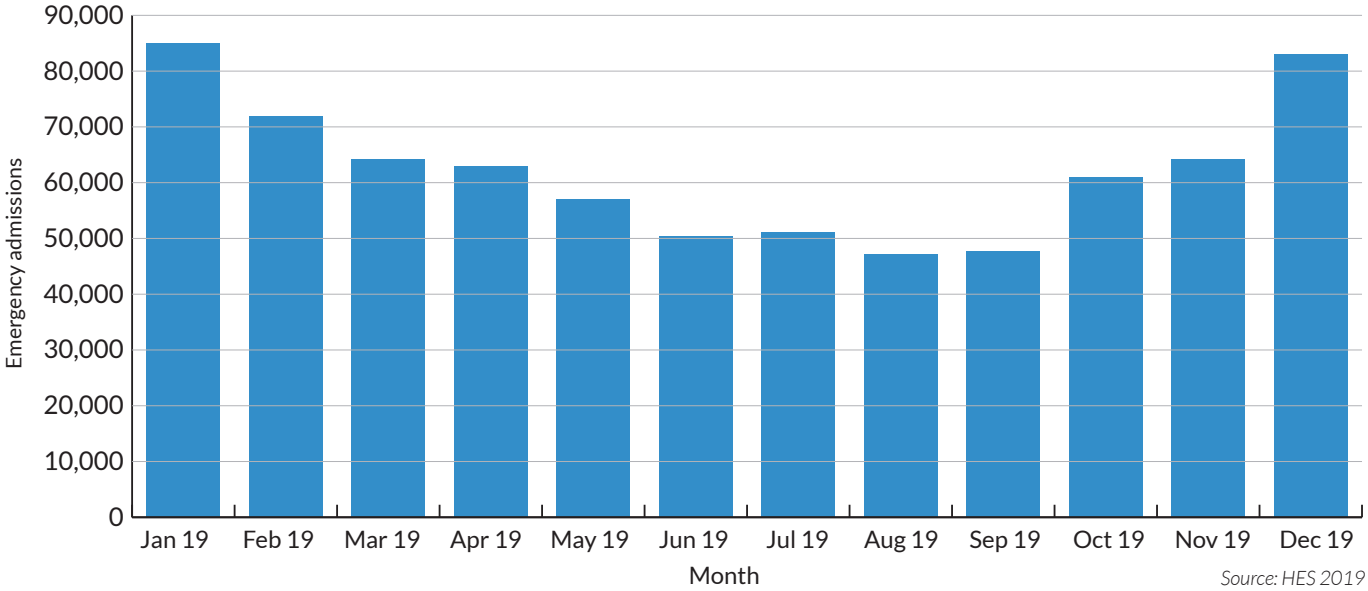
[13] *BLF (2017) Out in the cold: lung disease, the hidden driver of NHS winter pressure, https://www.blf.org.uk/policy/out-in-the-cold*

Rather than producing a sustainable solution, however, many trusts attempt to allocate increasing numbers of respiratory patients to respiratory consultants with an extended bed base. Trusts may employ locums to help, but they are usually not respiratory trained which can lead to an increased burden of work, especially for post discharge follow-up activity. We asked about this practice and found from the questionnaire, and validated by deep dives, that there was a median of ten additional patients (interquartile range 5-15) during the winter period, with a peak estimated at a median of 15 additional patients (IQ 10-25). For 85 trusts, this expansion of bed base was not associated with any additional staff and 74 trusts commented that they thought this was too many patients to meet the standard of care expected under GMC standards.

It would seem logical that the fully staffed respiratory medicine bed base is increased during the periods of winter activity. To facilitate care for these patients, clinicians would reduce their clinic activity from perhaps three to one clinic per week. Clearly such an expansion of beds would require additional consultants, nurses and junior medical staff. During the summer months this 'spare' bed capacity could be handed over for increased surgical flow or mothballed. The additional medical time that has been recruited could concentrate on undertaking planned and outpatient activity.

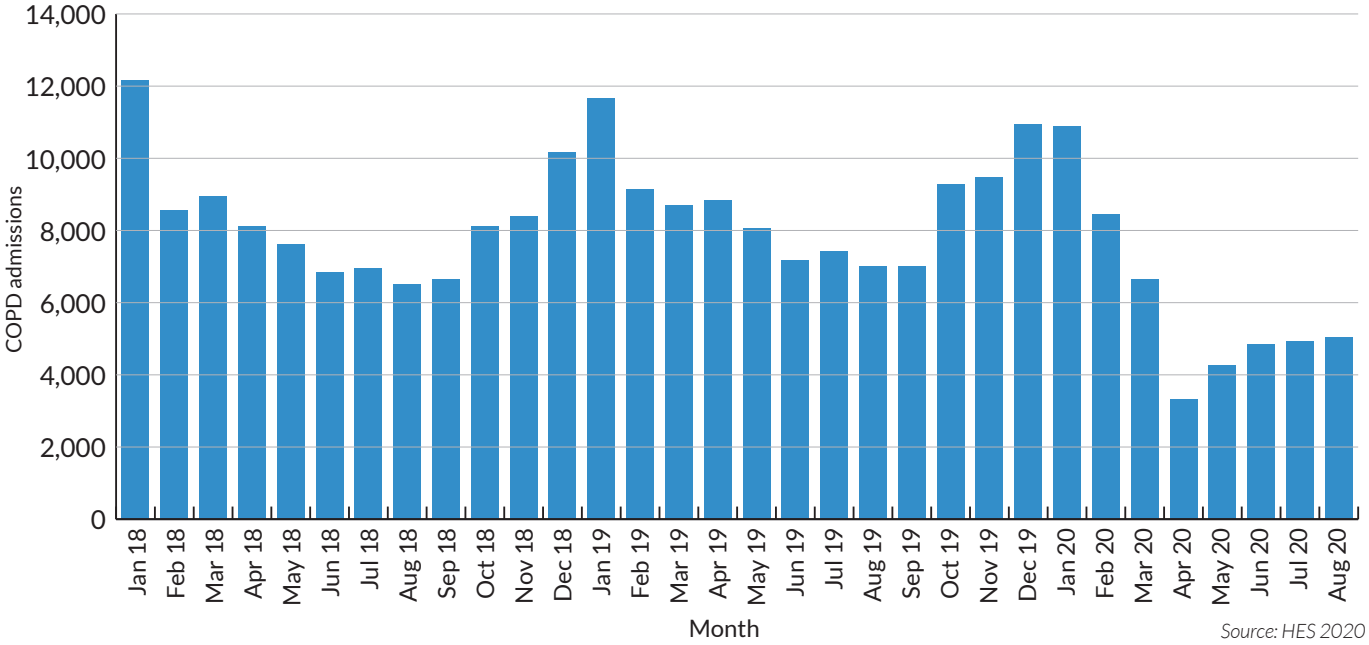
This would at least ensure patients with respiratory problems are cared for by the appropriate teams. However, a more structured approach to identifying why patients are admitted and providing a better infrastructure in the community, and in primary care to limit admissions, is an important factor.

Figure 5: Respiratory medicine emergency admissions by month



Source: HES 2019

Figure 6: COPD admissions by month



Source: HES 2020

CASE STUDY

Saving lives with solar

University Hospitals of North Midlands NHS Trust

The NICE document in March 2015 *Excess winter deaths and morbidity and health risks associated with cold homes*[14] highlighted the importance of the home environment. It was estimated at University Hospitals of North Midlands NHS Trust that a cold environment may contribute to the excess admissions and deaths of 1,432 and 179 respectively. This impact is especially so for the elderly and those with underlying respiratory diseases who experience fuel poverty.

A consortium was formed between respiratory and care of the elderly clinicians and the estates department at the University Hospital of North Midlands, together with community services, Southern Staffordshire Community Energy (a community benefit company) and Beat the Cold (a local fuel poverty charity). Approximately 1,100 solar panels were purchased by a share offer and installed on hospital roofs and used to provide electricity for the hospital. The feed in tariff provided a return for investors and the surplus provides funds for the charity to support patients with fuel poverty at home. Over the last few years, the hospital has saved over £11,500 in electricity purchased from the national grid and reduced its carbon dioxide equivalent emissions by 200 tonnes.

From a clinical perspective, respiratory patients for the scheme are identified by the supportive early discharge team. Information on the scheme is provided to patients by the team and informed consent obtained. The Beat the Cold team visit patients at home and make a variety of interventions to provide affordable warmth in their homes which include:

- behavioural change advice to enable people to make the most of the energy that they use;
- ensuring patients are claiming the correct benefits, with onward referral to the appropriate organisations;
- reviewing their energy tariff and supporting them to switch where appropriate;
- identifying any grants or subsidies from energy companies for the benefit of the patient / their comfort;
- helping with issues of fuel debt;
- ensuring the individual is registered as a priority with the power company;
- resolving other energy related supply issues.

The advice is impartial and allows individuals to make an informed choice.

This is a win-win scenario for the trust, the environment and especially patients. Over the lifetime of the solar panels the scheme aims to reduce 4,000 tonnes of CO2 emissions as well as offering cheaper energy costs and improving health inequalities and outcomes. The scheme is cost-effective and replicable across the NHS and beyond.

This pioneering work has also been recognised by the scheme winning the BMJ 2020 award for sustainability.

[14] *NICE (2015) Excess winter deaths and illness and the health risks associated with cold homes, https://www.nice.org.uk/guidance/ng6*

Recommendation: Acute and inpatient care

Recommendation	Actions	Owners	Timescale
2. Improve acute care for respiratory patients by reviewing patient flow and considering measures to increase ward productivity.	**a** Review protocols and consider adopting a physician of the week model to improve respiratory ward efficiency.	Trusts	Within 6 months of publication
	b Consider 'hot' clinic models to enable primary care teams to access specialist input without the need for referral.	Trusts	Within 6 months of publication
	c Improve preventative measures in the community for respiratory patients by ensuring i) flu vaccination and pneumococcal vaccination; ii) rescue packs are available together with management plans.	ICSs	Within 12 months of publication
	d Consider joint appointments between acute medicine and respiratory medicine to increase respiratory expertise among acute physicians.	Trusts	Within 12-18 months of publication
	e Consider embedding respiratory teams in acute/emergency settings to help facilitate discharge.	Trusts	Within 12 months of publication
	f Review patient flows to ensure admitted respiratory patients go to a respiratory ward, with a long-term goal of 65% of respiratory patients to be managed and followed-up by chest specialists. Thereafter with full respiratory ward occupancy, review the respiratory bed base to ensure sufficient respiratory beds exist within the trust with an associated expansion of workforce where required.	Trusts	Within 18 months of publication
	g Support trusts to proactively manage predictable winter pressures by establishing systematic solutions in discussion with respiratory teams.	GIRFT, NHSE/I, ICSs, STPs, Trusts	Within 12 months of publication

Activity and information flows

Clinical coding is the process whereby information from a variety of sources, including the case notes or discharge summary for each patient, is expressed as a series of codes. It is a way of capturing the diagnosis, comorbidities and any procedures that have occurred for each patient. Codes exist on their own or can be aggregated to inform payment or to support the development of epidemiological and national business models.

Coding is essential for trusts as no coding, incorrect codes or those beyond the agreed date (freeze point) can lead to incorrect payment for activity performed and misrepresentation of trust activity. Codes are held centrally and are accessible as hospital episode statistics (HES) data. They form an important source of data for clinicians and high-level decision makers to understand the demands within national services.

Understanding coding is essential to many of the areas for improvement identified in this report. Where we found inaccuracies in coding, this impacted greatly on the funding and infrastructure of those trusts or departments, and, as a result, on the delivery of care. This section, therefore, seeks to outline what coding is, and how inaccurate coding can often occur. We will talk about how coding relates specifically to different services and/or departments in the relevant sections of the report.

Classification and attribution

Diseases are classified using the WHO International Classification of Disease 10 (ICD10) which has a series of letters and numbers to identify both conditions and symptoms. To identify procedures there is a second classification system originally from the Office of Population and Census Surveys (OPCS) now managed by the Terminology and Classifications Delivery Service in NHS Digital.

While ICD10 and OPCS codes can be searched separately, they are often aggregated into healthcare resource group codes (HRGs), which are a less granular way of looking at diseases and categorising care. HRGs often have a disease focus, for example pneumonia, and by using a series of HRGs or 'splits' for one condition, the complications and interventions involved in that patient's care can be captured and thus remunerated.

HRGs are the principle way of paying for hospital care prior to block contracts (a block contract is a payment made to a provider to deliver a specific, usually broadly defined service[15]). To add an additional layer of clarity, HRG activity can take place as outpatient, day case, elective, or non-elective. The HRGs are aggregated into chapters reflecting the specialties involved in care delivery.

An important facet of activity data is to correctly identify who undertakes that activity, which is done using the individual consultant code, the Main Specialty Code (which matches the main specialty of the responsible consultant) and the Treatment Function Code (which identifies the service, often a subspecialty of the main specialty). Respiratory activity is identified by the TFC value 340.

Many trusts will use different sources for coding; sometimes the discharge summary, the original case notes, an electronic patient record, or a combination of these. Coders will also have access to other reports such as those contained within imaging. Coding activity is clearly prescribed, with little latitude, so coders cannot interpret data and can only code what is written. If case notes are unclear or what is written is vague, such as the word 'possible', it cannot be coded in contrast to more definitive statements like 'diagnoses of' and 'treat as'. Being specific allows the coders to capture the intervention and diagnosis accurately, and therefore improve the overall accuracy of the coding records. This also saves time by not having to source a variety of different information.

Clinical coding is a highly skilled task carried out by qualified coders. Coders undergo considerable training to develop wide knowledge. There exists a National Clinical Coding Qualification (NCCQ), which involves an examination. Additionally, there are annual audits where the accuracy of the coding is reviewed by trusts.

We found that variation in the following areas was having an impact on accurate information flows:

- Treatment Function Code use;
- healthcare resource group use;
- interdepartmental relationships and education.

[15] *BMA (2020) Models for paying providers of NHS services, https://www.bma.org.uk/advice-and-support/nhs-delivery-and-workforce/funding/models-for-paying-providers-of-nhs-services*

Treatment Function Code (TFC) use

Respiratory activity should always be attributed to the Treatment Function Code (TFC) 340. The TFC is a unique identifier for treatment based around a specialty and approved sub-specialties and treatment interests.[16] By knowing the activity in TFC 340 it is possible to know the whole of the department's activity and potential income. It is important that consultants and respiratory departments are aware what TFC their clinical activity is attributed to. Previously, many consultants were appointed as general physicians with an interest in respiratory medicine, so their main specialty is general medicine, which has the TFC 300. This means that while the respiratory physician may be seeing patients in clinic, the activity and funding may go to general medicine but the expense (the consultant's salary) may be attributed to the respiratory department. Clearly the TFC 340 should be used for respiratory physicians. There is a second TFC (TFC 341), which reflects activity for pulmonary physiology - which is discussed on page 51.

Healthcare Resource Group (HRG)

While information at the granular level of different codes, co-morbidities, interventions and other procedures is important, this level of detail is unnecessary as a payment mechanism. Instead, such codes as noted above are entered into a computer algorithm called an HRG Grouper,[17] which aggregates the codes into HRGs.

The HRGs are arranged into "chapters" that describe the conditions within that specialty, for respiratory medicine the chapter is DZ. If all of the HRGs for respiratory medicine are aggregated i.e. the DZ chapter, it allows us to know for each particular acute provider the total amount of respiratory activity that passes through that trust, i.e. all of the DZ HRG activity reflects the total respiratory work for that trust.

The system has evolved to the current HRG4+ which expanded the number of HRGs from 600 to 2,832. This enabled more HRGs to describe the complexity of care: for example, there are ten HRGs for COPD, with DZ65 A-K 'splits' that describe the interventions and comorbidities and/or complications associated with a particular disease. In contrast, some disease-specific HRGs have less. There are also HRGs that describe procedures, such as full respiratory function test, exercise test, sleep studies. These examples are associated with a mandatory tariff, while other respiratory HRGs do not have a mandatory payment. The HRGs are used by Payment by Results, an activity-based payment system that determines the income some trusts in England receive for hospital stays and procedures. Many acute trusts are now on 'block' contracts where a fixed budget is agreed in advance with commissioners for a certain period of time. This fixed budget will, however, be informed by the trust's activity estimates for that period, which are determined using HRGs and other metrics.

Implications of TFCs and HRGs

As highlighted above, the TFC 340 relates to activity purely undertaken by a respiratory physician and is 'speciality' activity. While there are caveats, such as that activity undertaken by specialist nurses not being captured, we can use TFC340 to gain a picture of the activity undertaken by respiratory medicine. In contrast, if we look at the HRG DZ chapter, we know the total amount of respiratory work performed by the trust, so dividing the two gives an indication of the number of admitted respiratory patients managed by respiratory physicians. This is displayed in **Figure 7**.

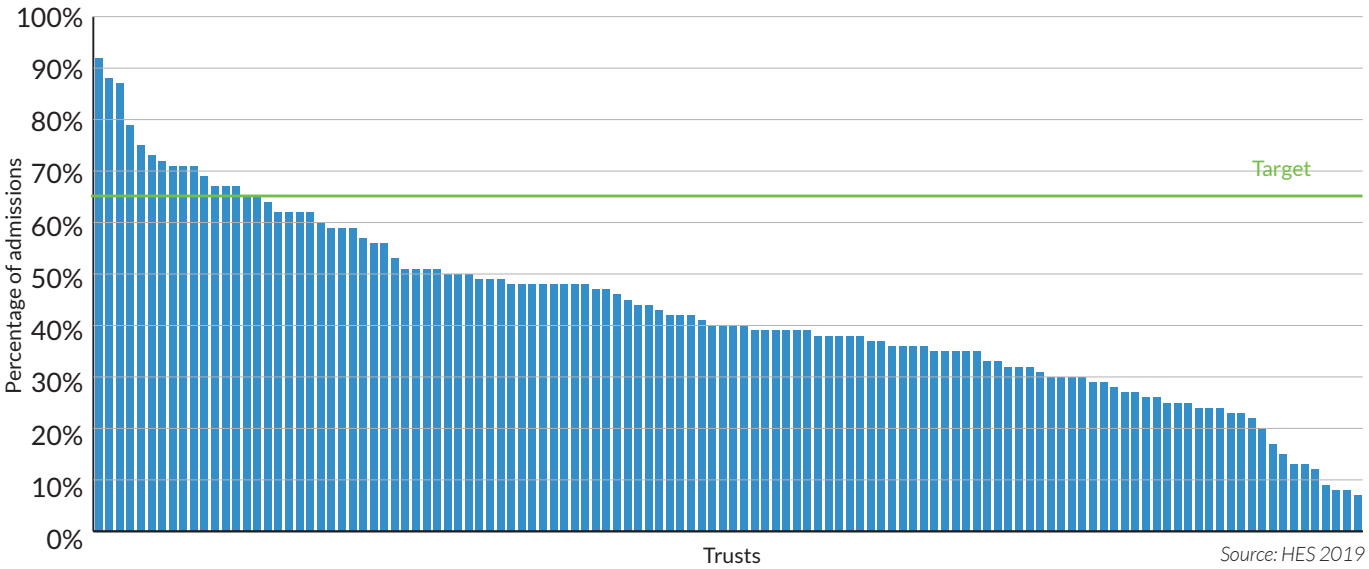
We would not expect all respiratory patients to be managed by respiratory physicians as, for example, a patient may be admitted with COPD but their underlying health needs may be very much around frailty and re-enablement with lots of comorbidities. Such patients may be better served by being managed by elderly care physicians, so the patient would be discharged with a COPD diagnosis from a different TFC. However, as we can see from the graph there is a wide variation. In 84 trusts, less than half of the respiratory patients were being cared for in respiratory medicine by respiratory consultants. We found only ten trusts achieved over 70% of patients with respiratory conditions being managed by the respiratory team. The average was 38%. Some of this may be explained by consultants being appointed as general physicians and their activity not then being coded to the respiratory TFC, as noted above. The respiratory medicine department will not then be reimbursed accurately for clinician time and activity.

Given the assumptions above we would expect a much greater number of patients to be managed by the disease experts, who are likely to reduce LoS and may well order less investigations. We estimate trusts should be aiming for 65% of respiratory patients to be managed by respiratory physicians.

[16] *NHS Data Dictionary, Treatment Function Code, https://www.datadictionary.nhs.uk/data_dictionary/classes/t/treatment_function_de.asp?shownav=1*

[17] *NHS Digital, Health Reference Groups, https://digital.nhs.uk/data-and-information/information-standards/information-standards-and-data-collections-including-extractions/publications-and-notifications/standards-and-collections/isb-0070-healthcare-resource-groups-hrgs*

Figure 7: Percentage of admissions (excluding zero LoS) for respiratory medicine HRGs coded to specialty 340



Source: HES 2019

Coding meetings and education

Good relationships between clinicians and coders allow for questions around coding to be answered and having a nominated consultant who has an interest in coding helps develop such a rapport, as seen at Doncaster and Bassetlaw Hospitals NHS Foundation Trust where there are close links. This is also true at The Rotherham NHS Foundation Trust where queries with coding are passed back to the consultant to review. This level of interaction was found at few trusts. Some organisations, such as South Warwickshire NHS Foundation Trust, York Teaching Hospital NHS Foundation Trust, University Hospitals of Leicester NHS Trust and The Royal Wolverhampton NHS Trust, had developed templates to help junior doctors with coding but this level of engagement with coding was generally poor. Of the 127 trusts who responded to the GIRFT questionnaire, just 40 (31%) said they engaged with their coding department on a regular basis and only 34 had initiated any coding review to check the accuracy of their respiratory coding.

Perhaps of greater importance is the education of junior medical staff and, where relevant, broader respiratory team members, in aspects of coding and data flows. Ensuring the correct information is recorded allows activity to be captured and coded appropriately, and saves time for the coding department. Only 35 trusts stated that they undertook formal teaching to the junior medical staff, but when we explored this during the deep dives the training on aspects of coding was delivered during induction, at a time when there is often "information overload". Given how important coding is, we found very few trusts had a regular teaching session with each junior doctor 'house'. It would be expected that this lack of training has a direct impact on the clarity of information included in case notes and discharge summaries, and how interpretable this information is for coding teams. One trust had tried to improve on this by providing access to online teaching.

CASE STUDY

Improving coding quality

University Hospitals of North Midlands NHS Trust

University Hospitals of North Midlands NHS Trust (UHNM) recognised poor quality of respiratory coding leading to a considerable loss of revenue, poor data and an apparent high mortality due to pneumonia.

Respiratory physicians worked with the coding department to review the most commonly miscoded conditions, especially pneumonia. A coding educational programme for trainee doctors and colleagues who do discharge summaries was implemented, not only at induction but also as part of the regular journal club.

For more than five years, the coding department has presented on the importance of coding, supported by respiratory consultants, stressing to juniors that this is important for the reasons above. Consequently, Payment by Results income has been secured and 'apparent' mortality from pneumonia has decreased.

Recommendations: Activity and information flows

Recommendation	Actions	Owners	Timescale
3. Improve education and relationship building for medical and coding staff within trusts. .	**a** Nominate a respiratory physician as the 'coding lead' for the respiratory department to provide linkages between respiratory and coding departments.	Trusts	Within 6 months of publication
	b Ensure that all junior medical staff receive education and a simple guide to clinical coding from the coding department when they join the respiratory department.	Trusts	Within 12 months of publication
4. Ensure respiratory activity is coded using Treatment Function Code 340 (respiratory medicine).	**a** Respiratory consultant activity should be mapped to TFC 340 and not general medicine TFC 300, to appropriately reflect the specialty activity.	Trusts	Ongoing
5. Explore the reasons for variability in the number of respiratory patients being cared for by respiratory consultants.	**a** Explore opportunities to ensure that trusts achieve the top quartile proportion of patients with a respiratory diagnosis being looked after by the respiratory team (i.e. appearing under TFC 340).	Trusts	Within 18 months of publication

Physiological and imaging services

A good clinical history and physical examination informs the diagnosis of respiratory conditions, supported by diagnostic tests with those relating to physiology and imaging being the most important. Moreover, many of these tests are required by NICE, BTS, and other bodies to confirm diagnoses and trigger the ability to prescribe certain drugs, e.g. antifibrotics in interstitial lung disease. Such tests are performed and interpreted by trained physiologists who are essential in delivering respiratory services (see *Workforce* page 133).

Recognising that there are many areas that could be explored as part of our GIRFT review, we focused on full respiratory function test activity (lung volumes and gas transfer) and the coding thereof, cardiopulmonary exercise testing, and the important area of sleep medicine. To review these areas we have used national activity returns from HES, together with a self-completed questionnaire sent to the medical clinical lead at each trust (127 responses received) and a questionnaire designed by the ARTP that was completed by 113 trusts. We found variation in the way diagnostics and physiology, as well as sleep studies, are being delivered, resulting in patients receiving varied levels of care.

There are many areas in imaging important for respiratory medicine, some of which are covered in the GIRFT radiology report, so we concentrated only on the area of managing pulmonary thromboembolism and CT pulmonary angiography.

Coding for physiological activity: full respiratory function tests

Full respiratory function tests are one of several respiratory physiological investigations that have their own specific HRG code (DZ52Z) that is also associated with a mandatory tariff. Theoretically, each time such a test is performed the activity should be recorded and the CCG invoiced for this activity. However, there is an alternative way of capturing physiological activity - by the Treatment Function Code (TFC) - and respiratory medicine is the only specialty with a dedicated TFC for physiological activity (TFC341). This can be used to capture outpatient attendances either as a new or follow-up each time a patient attends, attracting a mandatory tariff.

This has the potential advantage that all attendances to the physiology department can be captured and with appropriate invoicing this should lead to payment. The benefit of using this route of capturing activity is that routine tests performed by physiologists which do not have mandatory tariffs, such as spirometry, can be captured. Additionally, using the TFC allows for the activity to be charged if patients are attending respiratory outpatients, as this activity will be under TFC340, a different TFC.

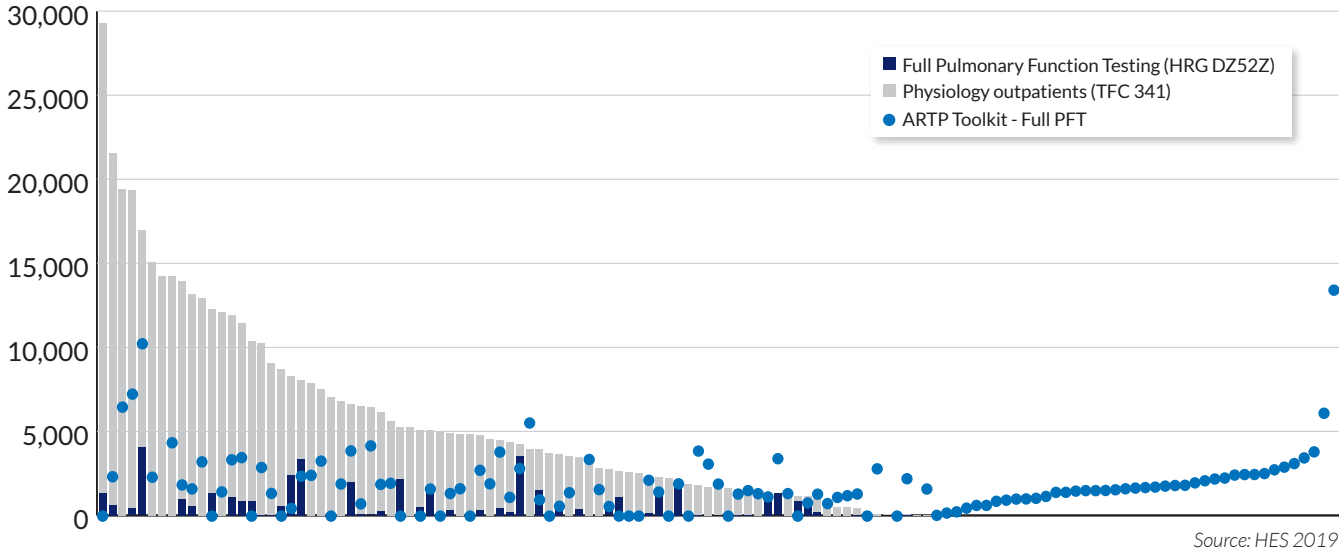
We have explored the methods of activity capture across England by examining whether departments are using the TFC or the HRG methods of data capture. To validate this, we also used the returns from the ARTP questionnaire, as displayed in **Figure 8**.

We found 53 trusts were not coding their physiological activity at all (as shown by the blue dots but absence of grey (TFC) or dark blue (HRG) histogram bars). Discussing this during deep dives highlighted a breakdown in data flows. Most physiology departments captured the activity, but this was not noted by either business intelligence or hospital contracting. For some departments who had tried to move to the appropriate TFC method of capturing activity there was a reluctance for this to be accepted by both internal and CCG commissioners.

While there is considerable variation in the activity, we found opportunities for trusts to highlight their potential loss of income (see *Notional financial opportunities*, page 156). With many trusts now on 'block' contracts with their CCGs, accurate records and coding are integral to ensuring those contractual arrangements reflect true levels of activity and future demand, and that there is appropriate investment in staff and infrastructure from this income to deliver the required services in a timely way. The ARTP outlines the appropriate estate and infrastructure necessary to run effective pulmonary function testing.[18]

[18] *Sylvester KP, Clayton N, Cliff I, et al. (2020) ARTP statement on pulmonary function testing, BMJ Open Respiratory Research, 7:e000575.*

Figure 8: Full pulmonary function test activity (spirometry lung volumes and gas transfer)



Source: HES 2019

Recommendation: Coding for physiological activity

Recommendation	Actions	Owners	Timescale
6. Ensure physiology outpatient activity is accurately captured and remunerated using Treatment Function Code 341.	**a** Ensure general physiology activity is set up and recorded as outpatient activity using TFC341.	Trust physiology departments and IT	Ongoing
	b Ensure data flows correctly to commissioning for payment.	Trust business intelligence units	Ongoing

Cardiopulmonary Exercise Testing (CPET)

CPET is a non-invasive way of assessing the integration of cardiac and respiratory function by performing exercise while undertaking a variety of measurements. It plays a major role in determining the cause of unexplained breathlessness and helping to identify perioperative risk (risk of complications during or after surgery).

With the increasing recognition of the management of complex breathlessness in the NHS Long Term Plan, the demand for CPET is expected to grow. An important aspect to be considered is the need for skilled analysis of the detailed 12-point plot interpretation in identifying the reason for the breathlessness - a role for experienced, senior physiologists.

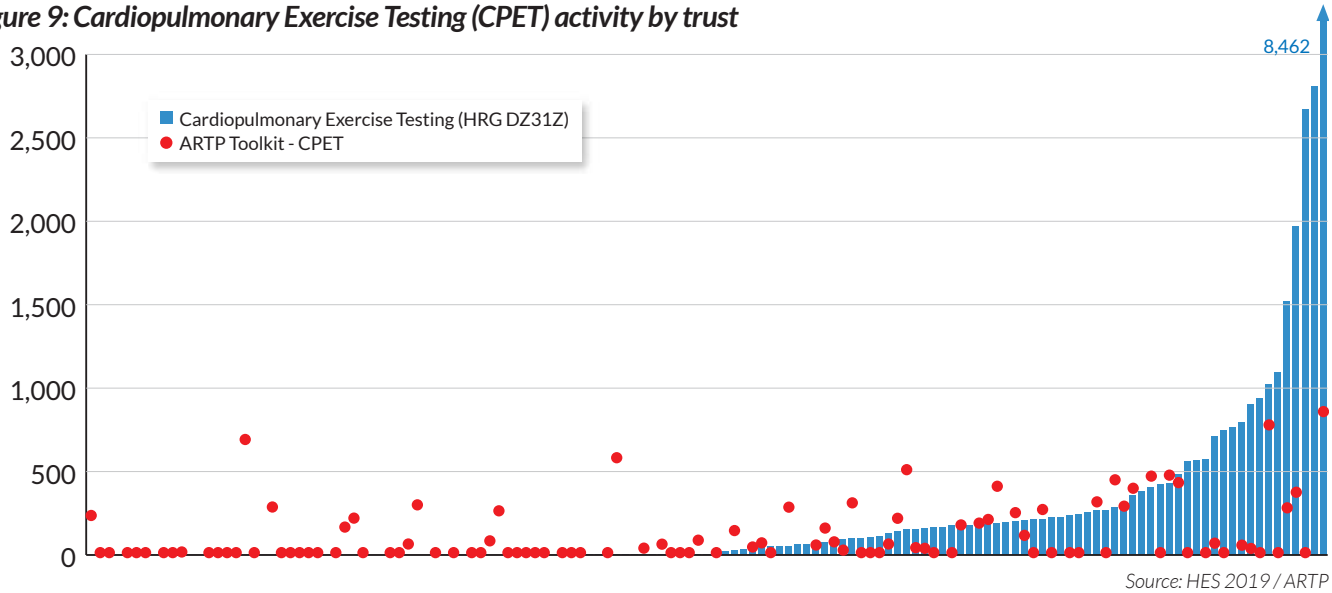
An additional and expanding role for CPET is in assessing a patient's fitness before major or complex surgery, for example for vascular surgery or colorectal surgery, because exercise capacity is a useful indicator of perioperative risk. While this is not explicit in the 2016 NICE guideline on routine preoperative tests for elective surgery, it is mentioned in its closing context section.[19] The role of CPET in this setting has been acknowledged by The Perioperative Exercise Testing and Training Society (POETTS) guidelines in 2018.

Perioperative CPET expertise incorporates an understanding of the equipment and exercise protocols, expertise in exercise physiology and pathophysiology and an understanding of perioperative risk.[20] These POETTS guidelines, endorsed by the Association of Respiratory Technology and Physiology (ARTP) present expert consensus on indications and organisation of CPET to assist clinicians and patients in decision making. Updated NICE lung cancer guidelines also recommend CPET in borderline fitness patients.[21]

Despite the important role of CPET, we found variations in its use. From HES data, around half of all trusts are not using CPET to assess either breathlessness or relevant patients before surgery. Only 61 trusts are carrying out more than 50 CPET tests per year and 34 trusts are doing more than 200 per year, as shown in **Figure 9**. One trust that reported undertaking over 8,000 tests was found during deep-dive discussions to be incorrectly coding tests, which has now been corrected.

Many trusts we visited recognised the importance of CPET in the clinical pathway, but have not been supported in its development. Given there is a mandatory tariff for this investigation, HRG DZ31Z, this is sufficient for the development of CPET services. We would suggest that respiratory physiologists and respiratory physicians, in collaboration with surgical teams and imaging services, explore options for ensuring more widespread use of CPET within their trust.

Figure 9: Cardiopulmonary Exercise Testing (CPET) activity by trust



Source: HES 2019 / ARTP

[19] *NICE (2016) Routine preoperativative tests for elective tests for elective surgery, https://www.nice.org.uk/guidance/ng45*

[20] *Levett, D.Z.H. et al. (2018) Perioperative cardiopulmonary exercise testing (CPET): consensus clinical guidelines on indications, organization, conduct, and physiological interpretation, British Journal of Anaesthesia, Volume 120, Issue 3.*

[21] *NICE (2019) Lung cancer: diagnosis and management, https://www.nice.org.uk/guidance/ng122/resources/lung-cancer-diagnosis-and-management-pdf-66141655525573*

Recommendation: Cardiopulmonary Exercise Testing

Recommendation	Actions	Owners	Timescale
7. Increase the use of Cardiopulmonary Exercise Testing (CPET) with interpretation by senior physiologists to manage breathlessness and determine patients' fitness for major or complex surgery.	**a** Ensure access to CPET for managing complex and unexplained breathlessness.	Trusts	Ongoing
	b Review current levels of CPET activity and agree protocols to ensure preoperative testing is optimised.	Trusts	Within 6-12 months of publication
	c Review international evidence around CPET usage to inform a potential update of guideline NG45: routine perioperative tests for elective surgery.	NICE	Within 12-18 months of publication

Sleep medicine

The sub-specialty of sleep medicine covers over 100 different diagnoses,[22] most of which are managed in larger sleep laboratories that have access to full polysomnography (recordings of eye movements (EOG), muscle tone (EMG), brain wave activity (EEG) and cardiorespiratory activity) and are often led by respiratory physicians, neurologists, anaesthetic departments and sometimes other specialties, recognising the breadth of conditions that sleep medicine encompasses.

However, the most common reason for referral to secondary care is for the confirmation, or exclusion, of sleep apnoea. This is a condition where there is repetitive narrowing and obstruction of the upper airway leading to limited airflow, producing loud snoring and episodes of breath holding usually observed by the bed partner. The disruption to sleep as a consequence leads to daytime sleepiness. The diagnosis is made by monitoring a series of parameters during sleep that normally include body position, continuous oxygen saturation and heart rate, together with oronasal airflow and breathing effort. Most of these limited sleep studies for obstructive sleep apnoea are run by respiratory physicians.

Over recent years, the importance of obstructive sleep apnoea has been recognised, with an increase in the number of referrals. In many of the trusts we visited, sleep medicine accounts for one third of referrals into respiratory medicine. This is in part related to an increased awareness among both the general public and primary care due to the clear association between sleep apnoea and a variety of cardiovascular and metabolic diseases: ischemic heart disease, heart failure, cardiac arrhythmias and diabetes. For hypertension, the link is well-established with obstructive sleep apnoea found in up to 80% of people with severe hypertension requiring four drugs to manage their condition. There are considerable social consequences of obstructive sleep apnoea, including family disharmony and increased occupational and driving accidents. As expected, treating obstructive sleep apnoea with continuous positive airways pressure (CPAP) is associated with marked social and financial benefits with a fall in healthcare utilisation.

Coding and information flows in sleep services

As part of the review of sleep services we explored respiratory services offering full polysomnography by using the OPCS activity code of A84.7 which attracts an income of approximately £700 to appropriately fund the activity. We found there are only 27 trusts that undertake more than 50 studies, of which only four are in the ARTP returns. This may reflect the fact that many full polysomnography laboratories are not run by respiratory physiologists or, more likely, the data flows are incorrect. This was suggested by one trust apparently performing 240 studies from the ARTP return but where only 12 were recorded in HES - a potential huge loss of income to support their services if the findings are correct. Six trusts, some of which have been visited during deep dives, have marked inaccuracy of their coding, with some using this code when they did not have the equipment and others mapping any sleep intervention to this code, reducing the reference costs and artificially deflating prices.

These issues have been addressed, as it is important that there are sufficient full polysomnography sleep laboratories with appropriate tariffs to offer a tertiary level service without building up large waiting lists.

Limited sleep studies are used in the diagnosis of predominately obstructive sleep apnoea and map through to the code U33.1. We have plotted the activity of limited sleep studies, together with ARTP returns (navy dots in **Figure 10**) and the national monthly return to NHS England and NHS Improvement for sleep studies (that may include overnight oximetry) included in the Diagnostics Waiting Times and Activity (DM01) returns, shown as the blue histograms in **Figure 10**.

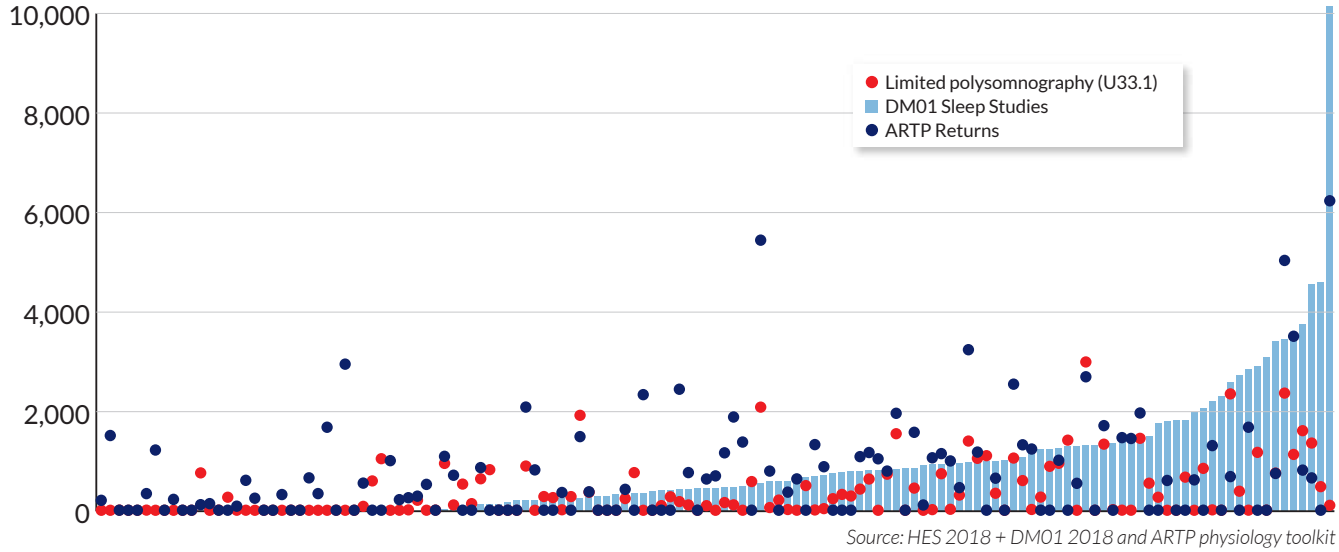
As can be seen from the graph, 98 trusts had more than 50 annual returns, although 107 trusts advised they provided a service in our questionnaire. 33 trusts had no return from activity under DMO1 (no blue histograms), while 79 trusts submitted an ARTP return with sleep studies activity.

Some centres were recording sleep studies by the physiologists but were not counting the activity as U33.1, and there was disparity throughout most of the country between limited sleep studies performed and those recognised by the ARTP.

Clearly there are challenges around the recording of activity which will potentially have considerable financial implications and therefore an impact on service provision. The tariff for limited polysomnography is £342. It is clear that many trusts are not capturing such activity and therefore are unlikely to be paid for this. A review of hospital data collection processes from physiology laboratories through into business intelligence needs to be undertaken. It is clear from **Figure 10** that one centre is apparently undertaking 10,000 sleep investigations per year while the physiology department think this is just over 6,000, yet those formally recorded as limited polysomnography is very small. This wide variability highlights the importance of further review of hospital activity data.

[22] *Darien, IL (2014) International Classification of Sleep Disorders, American Academy of Sleep Medicine, 3rd ed., Chest, ;146(5):1387-1394.*

Figure 10: Cardiopulmonary sleep studies activity



Source: HES 2018 + DM01 2018 and ARTP physiology toolkit

Of the 20 trusts that did not provide sleep services, six were reviewed during our deep-dive visits. A common issue seems to be poor engagement between the commissioners and hospital provider to develop sleep services. We reviewed two hospitals that were ten miles apart where one had been attempting to develop a sleep service for many years and had been unsuccessful in getting this commissioned, with patients having to travel to a different trust for both the diagnostic test and treatment. The trust providing the service had six-week diagnostic breaches and wanted the other trust to set up a service. We thus had clinician agreement on what would be in the patients' best interest, and a willingness to undertake this, yet the same commissioners would not agree to decouple the services.

We expect the forthcoming NICE review (currently on hold due to COVID-19) will explore how local hospitals can deliver local sleep services both for diagnosis and treatment. This would allow some of the larger centres to concentrate on delivering the more complex sleep services that are required.

Treatment of obstructive sleep apnoea with CPAP

Treatment of obstructive sleep apnoea is by the use of continuous positive airways pressure (CPAP). A snugly-fitted mask is connected to a 'blower' that pressurises the upper airway, preventing its collapse and therefore abolishing the snoring, witnessed apnoeas, and (by normalising sleep architecture) the excessive daytime sleepiness. This is a highly effective treatment, confirmed by NICE technology appraisal guidance (TA139).[23] Patients with excessive sleepiness due to sleep apnoea may have restrictions placed on their driving licence but once on treatment, providing continued adherence is shown, there is no limitation on standard licensing nor HGV/PSV. This is particularly important for those with jobs that require such licensing.

The standard clinical pathway is to see a consultant who then requests the appropriate investigation before seeing the patient again. Returned questionnaires, confirmed during deep dives, show that 87 centres ordered the sleep investigation before seeing the patient with only 23 trusts following the standard way.

When sleep apnoea is diagnosed treatment should be started as soon as possible for all patients, given the implications for driving and vigilance critical occupations, as well as psycho-social and medical implications. However, the standard pathway of seeing the patient with the results before organising CPAP leads to significant delays. Having appropriately skilled physiologists who can undertake a clinical history and initiate treatment without seeing a medical practitioner speeds up the pathway but was only occurring in 50 services. To aid diagnosis and ensure appropriate red flags are identified, computer-aided history taking and decision making are an advance and have been shown to work in both the face-to-face and virtual environments[24].

[23] *NICE (2018) Technology appraisal guidance, https://www.nice.org.uk/guidance/ta139/documents/sleep-apnoea-continuous-positive-airways-pressure-cpap-appraisal-consultation-document*

[24] *Chakrabarti, B. et al. (2020) Implementation of a computer-guided consultation in the assessment of suspected obstructive sleep apnoea syndrome, ERJ Open Research, 6: 00362.*

CASE STUDY

Technology-enabled sleep services

Aintree University Hospital NHS Foundation Trust

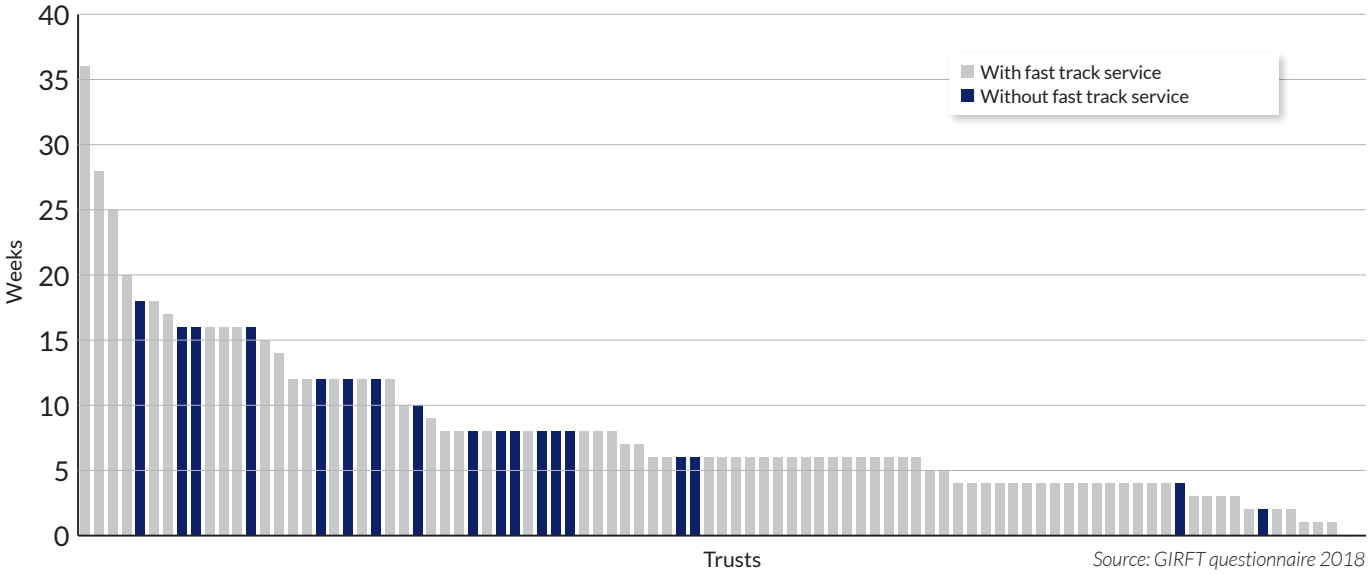
Obstructive sleep apnoea is underdiagnosed and places a burden on NHS services due to increased health care utilisation. Aintree University Hospital NHS Foundation Trust sought to address these challenges through the use of technology.

A Clinical Decision Support System (known as the Sleep Management System) was created for the assessment, diagnosis, management and follow-up of patients with obstructive sleep apnoea.

Information is obtained either face-to-face or virtually using an electronic platform that facilitates history taking, ensuring key areas are not missed and with 'red flags' for important items. The system can be operated by non-specialty staff and has a concordance of 90% compared to use by specialty sleep staff. Due to the systematic approach it was also better than specialists at producing a complete record. Additionally, the electronic clinical record can be added to following the introduction of treatment and also generates a database allowing interrogation of outcomes.

Prompt treatment is required for all patients, and would be of particular benefit to individuals with vigilance critical occupations such as medical staff, train drivers, pilots, and commercial drivers. There is very clear guidance from appropriate organisations, including the DVLA, that patients with sleep apnoea syndrome should not be driving. It is therefore important that such patients are fast-tracked through the system given their potential public health risks and their occupational requirements, especially if their job depends upon driving, such as those with HGV and PSV licences. Trusts should have such a fast-track system in place with the time from referral to treatment being less than one month. 76 trusts said they did run a fast-track service, but this may be at the expense of other patients. **Figure 11** highlights marked delays in initiating treatment, with only 27 trusts offering treatment within four weeks. This does not take into consideration any delays between referral and the sleep study as it appears there are some 37 trusts that breach the six-week referral to diagnostic time scale.

Figure 11: Time between diagnostic tests and initiation of CPAP treatment



Source: GIRFT questionnaire 2018

CPAP may be started either individually, or as a group; 20 trusts were found to be delivering 'group' initiations. When a patient starts on CPAP, the educational component is recognised as being important for ongoing adherence to a relatively expensive therapy. This may involve several visits by the patient to the department. More recently, technology-enabled care has led to patients being able to have their adherence checked, leaks noted, and settings modified by remote care. While this saves footfall in the department, it is not more cost effective as the physiologists and nurses need to interpret the download from the machine and then have a clinical interview remotely with the patients.

While not all machines are enabled for this interactive care, where they are there are considerable advantages in reducing patient attendance, something that very much came to the fore during the COVID-19 pandemic. To enable this advance to continue, technology-enabled machines should now be issued as the norm, recognising that there is an additional cost for both the equipment, the spend for enabling technology and time spent by physiologists interpreting the 'download' and discussing the results with the patient in a virtual clinic. To facilitate the reduction in footfall, with all the potential reduction in infection risk, a new pathway and tariff would need to be recognised and funded.

We heard from many trusts that they are limited in their ability to deliver CPAP and get the diagnostics done in a timely way due to insufficient space and staffing. This is perhaps not surprising given the increase in referrals into sleep services over time. From almost every deep dive we undertook, we found there was limited space (hence the need for technology-enabled care to reduce footfall) and insufficient numbers of physiologists to support the service. We recommended the appointment of Band 2-4 physiology staff pending a review of services in virtually all deep dives. For some trusts the problems are, as highlighted, a failure to accurately capture the activity and thus the income to support service development. However, we did find examples that even when there was appropriately coded activity and income to the trust, this did not flow through to sleep departments who were struggling with their service delivery timelines.

Recommendation: Sleep medicine

Recommendation	Actions	Owners	Timescale
8. Improve care for patients in sleep medicine by addressing delays in diagnosis of sleep problems and CPAP initiation, together with resolving gaps in infrastructure.	**a** Model demand and expand provision of full polysomnography services in line with expanding referral base where appropriate.	Trusts	Within 12 months of publication
	b Deliver an optimal and expedited pathway with direct-to-test and, with appropriately trained physiologists in place, direct-to-CPAP-treatment.	Trusts	Within 12 months of publication
	c Establish a fast-track service for vigilant critical occupations which ensures a clearly marked referral from primary care leads to treatment initiation within one month.	Trusts	Within 12 months of publication
	d Ensure all patients are initiated on treatment within 18 weeks of referral and given the medical associations, ideally sooner.	Trusts	Within 12 months of publication
	e Ensure accurate coding and data capture to inform payment under PbR or local negotiations under block contracts to sufficiently fund sleep services and enable investment in improving pathways.	Trusts, CCGs, ICSs	Ongoing
	f Ensure technology-enabled CPAP follow-up becomes normal practice.	ICSs, Trusts, CCGs	Within 6 months of publication

Managing pulmonary embolism: use of CT Pulmonary Angiograms (CTPA)

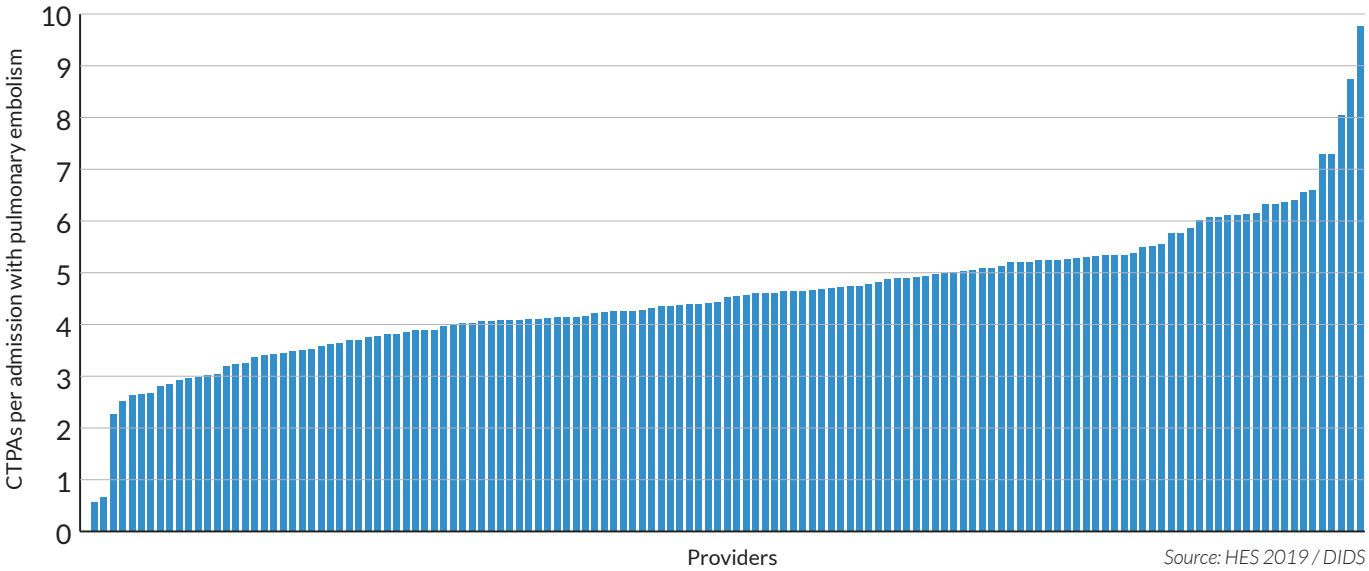
A pulmonary embolism is a blocked blood vessel in the lungs. Management of pulmonary embolism is an important aspect of respiratory medicine although over recent times care of this has moved into an outpatient or ambulatory care setting with an increasing role for acute physicians,[25] as shown by the few respiratory physicians who run the service.

Key to making the diagnosis of pulmonary embolism is a CTPA. This diagnostic test requires contrast injected into the peripheral vein whilst the patient is having a CT scan of the chest. This is used to outline the pulmonary vasculature and identify if there are any obstructions to this vasculature which are usually related to blood clots. CTPAs have revolutionised the management of pulmonary embolism, but there is a question about whether their use is excessive. Identifying patients at risk of having a pulmonary embolism by a pre-test scoring process is important to prevent unnecessary investigations which are time-consuming for the imaging department and may expose the patient to significant ionising radiation. A variety of different scoring processes have been identified to assess who should go forward for a CTPA, and the NICE guidelines recommend using the pulmonary embolism rule-out criteria (PERC) to help determine whether further investigation for pulmonary embolism are needed.[26]

We can see in **Figure 12**, however, that there is wide variation in the number of CTPAs performed per pulmonary embolism diagnosed. In line with BTS guidelines, and quality standards currently in development, we would expect a figure of 4-6 CTPAs per diagnosis.[27] Low utilisation of CTPA may relate to some departments still performing isotope ventilation perfusion scanning. Of note is the high use of CTPA in several trusts and we explored the reasons for this during deep dives. We found that prediction scoring pre-tests were not universally being used, while in one trust requests for CTPA were being made out-of-hours by staff who worked part-time in the emergency department or acute medical unit, and were being requested in patients who were breathless with a normal chest x-ray. Trust-level recommendations about ensuring appropriate use of pre-testing and ensuring good governance were made together with auditing requests during our deep dives.

Joint working at local level with radiology services, and possibly with Imaging Networks, to ensure both access and timely reporting, will be necessary to developing a seven-day imaging service.

Figure 12: Number of CTPAs undertaken per admission with pulmonary embolism



Source: HES 2019 / DIDS

[25] *BTS (2018) Guideline for the initial outpatient management of pulmonary embolism. Thorax Vol 73 Supl 2.*

[26] *NICE (2020) NG 158: Venous thromboembolic diseases: diagnosis, management and thrombophilia testing, https://www.nice.org.uk/guidance/ng158*

[27] *BTS (2018) Guideline for the initial outpatient management of pulmonary embolism. Thorax Vol 73 Supl 2.*

While management of pulmonary embolism is well-established, there are issues with long-term complications of pulmonary embolism including chronic thromboembolic pulmonary hypertension (CTEPH) - high blood pressure in the arteries of the lungs. It is therefore recommended that patients are followed up to ensure complications do not develop.[28] We questioned this during deep-dive visits, and while many trusts advised they routinely follow-up patients, not all had robust protocols to ensure all patients with pulmonary embolism, including those who may not be admitted, are followed up either in respiratory medicine or jointly with respiratory medicine and haematology (or acute medicine). Good examples of this joint working across disciplines was found at Leeds Teaching Hospitals NHS Trust and University College London Hospitals NHS Foundation Trust.

Recommendation: Managing pulmonary embolism

Recommendation	Actions	Owners	Timescale
9. Improve experience and outcomes for patients with pulmonary embolism by reducing unnecessary tests and ensuring respiratory or joint clinician-led follow-up where possible.	**a** Establish a pulmonary embolism pathway to include seven-day access to the performing and reporting of CT pulmonary angiography and outpatient management	Trusts	Within 12 months of publication
	b Assess the clinical probability of all patients with suspected pulmonary embolism by using an appropriate likelihood score system in conjunction with D-Dimers, where indicated, prior to requesting a CT pulmonary angiogram. Carry out a systematic review if variation is identified.	Trusts	On publication
	c Ensure robust processes are in place for following up patients post pulmonary embolism (including review by a respiratory physician where possible).	Trusts	Within 6 months of publication

[28] *Konstantinides SV, Meyer G, Becattini C,et al. (2019) ESC Guidelines for the diagnosis and management of acute pulmonary embolism developed in collaboration with the European Respiratory Society (ERS).European Respiratory Journal, 54: 1901647.*

Improving care for patients with pleural disease

The pleural diseases of pneumothorax, pleural effusion, and empyema contribute a significant elective and non-elective workload. Management of these conditions has evolved over many years, with aspiration[29] overtaking intercostal drainage for managing pneumothorax.[30]

For pleural effusion, a common presentation of cancer, blind drainage (drainage without imaging guidance) and biopsy was the norm. However, a series of adverse events led to the 2008 National Patient Safety Agency alert highlighting the training and supervision required of individuals placing drains and the need for thoracic ultrasound (TUS). Initially, imaging directorates took on the role of either inserting chest drains or marking the position for placement, but chest physicians rapidly learned the technique of TUS to allow safe placement of drains within a more convenient timeline. While reducing the workload on imaging departments, this shift has increased the work for chest physicians, although this has not necessarily been recognised in job plans.

More recently the NHS National Reporting and Learning System has identified 16 incidents of harm over a three-year period related to uncontrolled drainage of effusions.[31] There was a lack of adequate monitoring with rapid fluid egress leading to re-expansion pulmonary oedema (RPO). Whether these events occurred in established pleural effusion services is not known, but would seem unlikely as the services we visited in deep dives where nurses or other professions were part of the service appeared to have good systems for monitoring and were aware of the risks of RPO. Having local safety standards for such procedures (LocSSIPs) that follow BTS recommendations are important and highlight the ongoing care that is required following drain placement, an area that nursing and other colleagues can lead.

The data around length of stay for pneumothorax was questioned during many deep dives, perhaps reflecting that many simple pneumothoracies were discharged and were only an attendance following aspiration, leaving some patients with persistent air leak and a longer LoS. We did however find the good practice of patients with a pneumothorax being only admitted to a respiratory ward if admission was required. This should become routine practice where it does not currently occur.

There are relatively few admissions with empyema, but we noted a variation in LoS in our deep dives. Some of this may relate to lack of a pleural infrastructure to identify 'complex' effusions but delays in transfer to thoracic surgical units in some trusts are important. Clear recommendations exist for transfer as in the 2018 GIRFT national report for cardiotohoracic surgery, and it is important these are followed.[32]

Process of care for pleural effusions

As previously noted, the standard of care for many patients with pleural effusions was admission for radiological ultrasound marking / drain placement. To improve care and attempt to manage pleural disease as a day case, a best practice tariff (BPT) incentive was introduced. The BPT was designed to incentivise day case care by paying a premium for managing patients with a pleural effusion as a day case over a non-elective admission. To fulfil the incentive's requirements, patients need to have procedures performed by a respiratory physician in a day case setting and use ultrasound to guide the intervention. The aim is to ensure that patients are not admitted and that the respiratory team is responsible for managing these patients. This has the double aim of reducing hospital attendances and admissions, and ensuring the management of the disease is by the expert who can both take appropriate samples and hasten the patient's management, reducing LoS and cost.

Despite its introduction, the rules around the pleural effusion incentive scheme are not always followed, with a clear variation in achievement across hospitals, as shown in **Figure 13**. In this graph the navy dots represent the percentage of BPT achievement per trust and the histograms reflect the activity as elective and non-elective, with the axis on the left representing overall activity. As can be seen there is a marked variation, too, in the number of patients with pleural effusions. Hospitals with attached cancer units are especially active, some of which is not apparent as the pleural effusion in the graph attracts the primary code.

We found from our deep dives that not meeting the BPT is occasionally related to errors in coding, but more often relates to organisational issues. We found many pleural services were unable to provide an adequate service as they lacked adequate

[29] *BTS (2010) BTS Pleural Disease Guideline, https://thorax.bmj.com/content/65/Suppl_2*

[30] *Hallifax, R et al. (2020) Ambulatory management of primary spontaneous pneumothorax: an open-label, randomised controlled trial, Volume 396, (10243).*

[31] *NHS (2020) National Patient Safety Alert: Deterioration due to rapid offload of pleural effusion fluid from chest drains, https://www.england.nhs.uk/wp-content/uploads/2020/12/NatPSA-Pleural-Effusion-v6.4-FINAL.pdf*

[32] *GIRFT (2018) Getting it Right First Time National Report: Cardiothoracic Surgery, https://gettingitrightfirsttime.co.uk/wp-content/uploads/2018/07/CardiothoracicReportMar18-F.pdf*

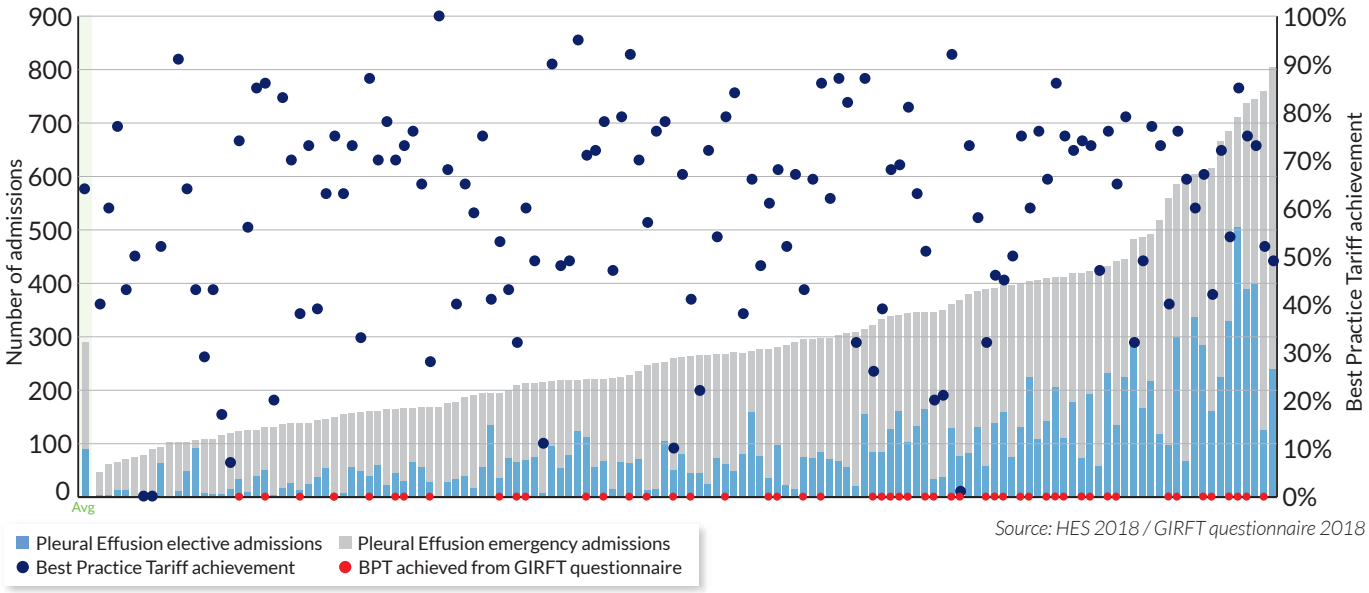
staffing, particularly a dedicated pleural nurse/physicians' associate, and sufficient administrative resource to book patients into the service.

Given the procedure must be performed by a respiratory physician as a day case, a lack of a suitable venue is a major obstacle that leads to loss of funds via the BPT to support such developments.

However, there are examples of good practice, for example in The Rotherham NHS Foundation Trust, where there is an efficient system for identifying patients with pleural problems as part of the lung cancer service, with pleural disease being flagged and consultants taking responsibility for management. Consequently, the percentage of admissions achieving the BPT is the second highest in the country.

For emergency and out of hours services the British Thoracic Society Thoracic Ultrasound Training Standard[33] describes a standardised framework for training a broad range of clinicians to a level of skill that allows provision of basic thoracic ultrasound in the out of hours setting, termed 'Emergency Operator'.

Figure 13: Pleural disease Best Practice Tariff achievement



Source: HES 2018 / GIRFT questionnaire 2018

Improving pleural services: workforce and infrastructure

To improve the care of patients and reduce LoS, we would recommend a number of changes to infrastructure and how pleural diseases are managed.

Medical time

Medical time is required to assess referrals from within hospitals and primary care, and to undertake the pleural procedure itself. These referrals may be from emergency attendances to the ED, AMU, and from other inpatient activity, which may be significant if there is an attached oncology service.

As an indicator, we would expect a minimum of three medical sessions per 300 patients. Ideally these should take place on a Monday, Friday, and midweek to facilitate activity before and after the weekend. To cover annual or study leave, more than one person should be part of the service, trained to level two ultrasound. This activity should be recognised in job plans and one person should be recognised as the lead and have time allocated for service development. Where there are increasing

[33] *Stanton AE, Edey A, Evison M, et al. (2020) British Thoracic Society Training Standards for Thoracic Ultrasound (TUS) BMJ Open Respiratory Research;7:e000552.*

numbers of effusions, the time should be increased pro rata to provide a weekday daily service and if possible, advice at weekends, depending on the size of the respiratory department. Within this time is the need to review current and old CXRs / scans etc to optimise care. We found several areas of innovation, with Kingston Hospital NHS Foundation Trust developing a consultant led non-face-to-face triage/assessment of referral of new pleural disease patients,

Nursing time

To facilitate an effective pleural service, dedicated nurse time is required (or in some organisations physicians associates). From clinical discussions on deep dives, we would suggest that a minimum Band 6 registered nurse is needed per 300 pleural procedures, pro rata. This is not only to ensure trained staff are able to facilitate performing the pleural procedures, and when trained, potentially undertake some themselves, but to also ensure appropriate aftercare.

Another key role for nurses is in ensuring drains are placed and managed correctly for inpatients on other wards, with such proactive management allowing early removal and discharge, contributing to reduced LoS. We did attempt to look at effectiveness in this peripatetic role, but due to the complexities of coding we could not make a link in the data for the role of the pleural nurse in reducing LoS beyond the deep-dive discussions. We did note, however, across all levels of complexity of care (comorbidities, more diagnostic tests, sicker patients) LoS appeared longer in those trusts where no nurse was present. There is an expanding role for both nurses and physicians associates in performing some of the procedures with support, something that the team at Kettering General Hospital NHS Foundation Trust is actively supporting.

Administrative time

Greater clerical support is required, with ideally a dedicated phone line to allow emergency medicine, acute medicine, other wards, and primary care to book appointments. This allows the clerical staff to ensure a checklist is completed, for example to ensure the patient is not taking anticoagulant therapy.

Equipment and venue requirements

Pleural packs should be available together with an ultrasound machine of appropriate specification.

To ensure this activity is captured for the BPT/incentive schemes as a dedicated day case, a pleural area needs to be identified and any activity going through this needs to go through the coding department and business intelligence to ensure data flow is captured and to obtain the BPT or any future incentive schemes.

Recommendation: Pleural services

Recommendation	Actions	Owners	Timescale
10. Reduce acute admissions and length of stay, and deliver a high quality pleural service which achieves the Best Practice Tariff by addressing workforce and infrastructure requirements	**a** Allocate sessions in the consultant's job plan who leads the pleural service. The number of sessions will relate to activity but should be a minimum of three per week to ensure activity before and after the weekend is picked up.	Trusts	Ongoing
	b Secure nurses and additional infrastructure to support the pleural service and provide care for drains in the wards.	Trusts	Within 12 months of publication
	c Secure administrative support to drive efficiencies in booking patients into the service.	Trusts	Within 12 months of publication
	d Secure an appropriate venue for performing day case procedures where these can be coded to respiratory medicine (not as emergencies or ward walk-ins), with standardised documentation in line with both NatSSIPs and LocSSIPs.	Trusts	Within 6 months of publication
	e Ensure appropriate equipment i.e. pleural packs are available, together with a selection of drains and an appropriate specification ultrasound machine.	Trusts	Within 12 months of publication
	f Ensure data capture is correct to enable achievement of Best Practice Tariff or other incentive schemes.	Trusts	Ongoing
	g Consider early referral to thoracic surgery for unresolved pneumothoraces and parapneumonic effusion / empyema.	Trusts	Ongoing

Improving care for patients with asthma

Asthma is a potentially life-threatening condition that can vary in severity and affects one in 11 (over 4.5 million) people in England, and 8% of the UK's adult population.[34] One in ten cases of adult onset asthma are related to the workplace, termed occupational asthma. This is an effectively treatable disease and should be considered in all new cases of asthma.[35]

Asthma is characterised by a reversible airway obstruction leading to intermittent cough, breathlessness, and wheeze. While readily treatable with inhaled corticosteroids, there remains a large number of difficult cases (e.g. other conditions misdiagnosed, such as laryngeal dysfunction, psychological problems with or without asthma) and severe asthma that, despite therapy, is difficult to manage.

Treatment stages are well described with numerous BTS and international guidelines on management, although BTS and SIGN guidelines do differ from NICE guidelines in terms of management. However, failure to recognise the severity of acute asthma episodes, varied adherence to standard therapy, and the failure to act on deterioration means there remains 1,484 deaths every year in the UK. Causes of these deaths are well identified in the National Review of Asthma Deaths[36] (NRAD). The Review provides information on these important interventions and makes 19 key recommendations but they are not routinely followed. 60% of people with asthma do not receive the three most basic elements of care including an annual review, written asthma action plan and inhaler technique check.[37] Identifying individuals at risk by reviewing prescribing data is one opportunity and can be done at CCG level[38] using specific audit tools (see case study below).

Although many patients with mild symptoms can be cared for in the community with advice from their GP, practice asthma nurse, community asthma nurse, and community pharmacist, those with more problematic asthma should be reviewed by a respiratory physician. Clear guidelines on when to refer are available but not always used.[39] It has however been highlighted that the number of nurses and GPs in the community with specific training in asthma management may not be as numerous as in the past.[40] There is also a gap in the NICE guidelines for difficult and severe asthma, with the asthma guideline NG80 not specifying when someone with suspected difficult/severe asthma should be referred to secondary or tertiary care. This should be developed further by NICE. These, and several other issues relating to asthma care, have been noted in a recent All Party Parliamentary Group (APPG) Report *Improving Asthma Outcomes in the UK*, with clear recommendations made.[40]

Patients with severe and difficult to control asthma should be reviewed at a specialised asthma centre to ensure the diagnosis is correct in those patients and to appropriately prescribe biological therapies, often in conjunction with a local hospital via a multidisciplinary team (see *Specialised services* page 114).

CASE STUDY

Asthma audit tool to identify at risk patients

National Services for Health Improvement Ltd

Despite evidenced-based guidelines for asthma management, admissions have continued to rise and despite the NRAD report showing two-thirds of deaths were preventable they have not fallen since the report in 2014. To identify at-risk patients in primary care, an electronic MIQUEST/SNOMED respiratory audit tool was created which is hosted on the NHS intranet (HSCN). This can be run within any GP practice in England, either from within the practice or remotely with necessary permissions in line with GDPR and NHS information governance requirements. Key metrics which reflect asthma control are captured.

50 GP practices with a population of 415,152 found 7% had a code of asthma. Patients 'at risk' were identified. Excess short-acting beta agonists were commonly noted together with patients not collecting their inhaled steroids, actions that are amenable to simple interventions.

The utility of the tool is that it can readily be applied to primary care to allow appropriate interventions.

[34] *Asthma UK (2020) Asthma facts and statistics, https://www.asthma.org.uk/about/media/facts-and-statistics/*

[35] *Asthma UK (2020) Occupational Asthma, https://www.asthma.org.uk/advice/understanding-asthma/types/occupational-asthma/*

[36] *RCP (2015) National Review of Asthma Deaths: Why asthma still kills, https://www.rcplondon.ac.uk/projects/outputs/why-asthma-still-kills*

[37] *Asthma UK (2019) Annual Asthma Survey, https://www.asthma.org.uk/support-us/campaigns/publications/survey/*

[38] *Levy, Mark L, et. al. (2018) A Review of Asthma Care in 50 General Practices in Bedfordshire, United Kingdom, NPJ Primary Care Respiratory Medicine. 28.1 29.*

[39] *NICE (2017) Asthma: diagnosis, monitoring and chronic asthma management, https://www.nice.org.uk/guidance/ng80*

[40] *All Party Parliamentary Group for Respiratory Health (2020) Improving Asthma Outcomes In The UK, https://www.ed.ac.uk/usher/breathe/latest/appg-respiratory-health-asthma-report*

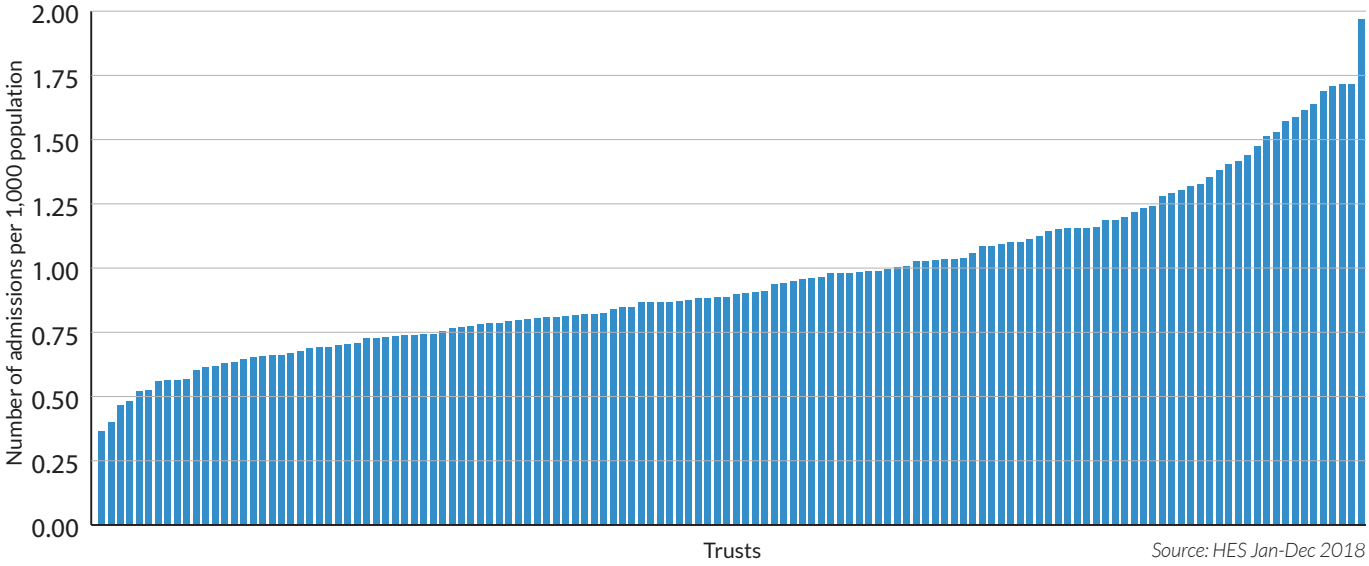
Variation in admissions

Given that acute admission is a marker of less than ideal care and a risk factor for poor outcomes, we have looked at the variation in in hospital attendances and admissions across England for patients with asthma. 25% of trusts admitted fewer than 200 patients per year, and five hospitals admitted over 800 patients. When corrected for population size, there remains a wide variation in the number of admissions which is not clearly explained (**Figure 14**).

We did find wide variation in the number of ED attendances from provisional ED data on asthma admissions, suggesting that care pathways could be improved. We heard from deep dives that high attendances may relate to poor community infrastructure, lack of access to primary care, and some patients inappropriately attending ED for non-emergency treatment. We could not, however, substantiate these reports from the data.

Asthma UK's report *On the Edge* has shown that those living in more deprived areas are more likely to be admitted to hospital, which may explain some of the variation shown here.[41] It is widely accepted that better infrastructure, education, and support has beneficial effects on attendances and admissions. It is, for example, important for respiratory teams to link asthma care with pharmacy colleagues as non-adherence to medicine is a common factor for patients who attend an emergency department with asthma. Risk stratification should be used to identify those patients most at risk and who are attending the emergency department frequently.

Figure 14: Asthma emergency rate per 1,000 catchment population



Source: HES Jan-Dec 2018

We were pleased to note that deaths at 30 days post-admission were uncommon in the 40-75-year population, with only 72 deaths from 18,283 admissions and 133 deaths at 90 days post-admission. Fourteen trusts had two or more asthma deaths at 30 days post-discharge, two had three deaths, and one trust had four deaths. Of interest, in those trusts with two or more deaths, all but four had fewer than 200 admissions. Trusts need to be aware of and review these deaths in their morbidity and mortality (M&M) meetings. Any such deaths are highly significant but are not currently listed as a never event (serious incidents that are preventable because guidance or safety recommendations or protective barriers exist and should have been implemented).

[41] *Asthma UK (2018) On the edge: How inequality affects people with asthma, https://www.asthma.org.uk/support-us/campaigns/publications/inequality/*

Variation in Length of Stay

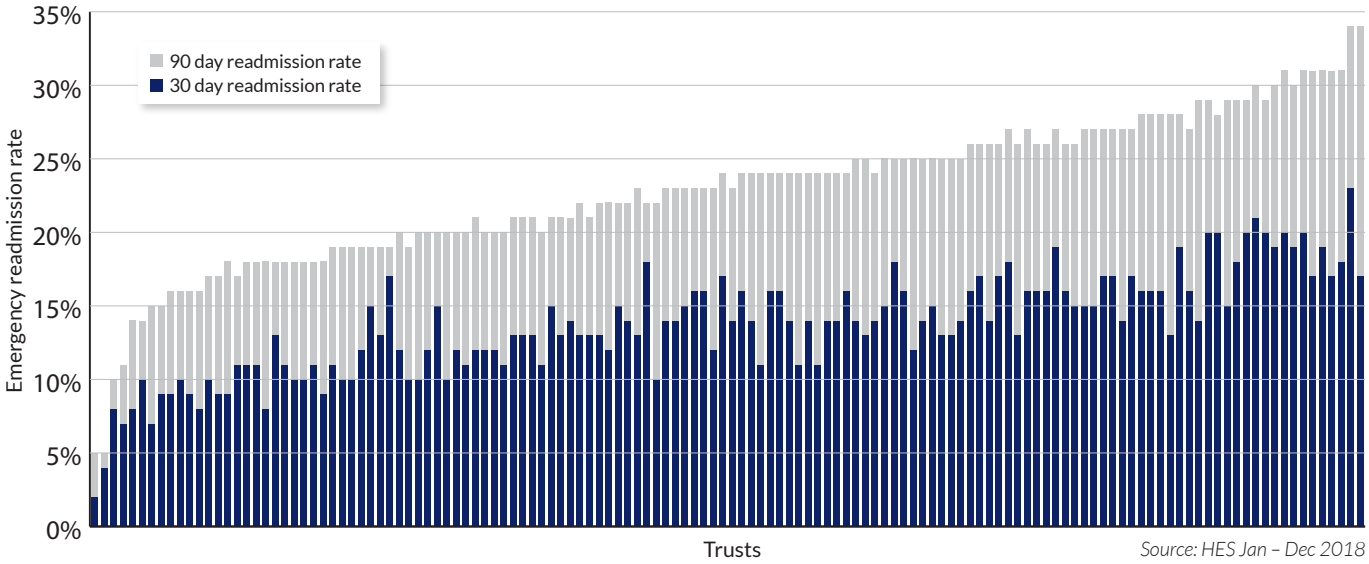
Length of Stay (LoS) for asthma inpatients is highly variable: ranging from an average 0.4 days to 2.7 days for asthma patients under 80 years old. There is considerable variation in the number of patients with zero LoS, and patients with greater than two days LoS across trusts, but little variation in age as a predictor for LoS. We looked into whether some of this variation in LoS related to the presence of a specialist asthma nurse but there was such variability in the presence of nurses and their role it was difficult to do any statistical analysis, although in deep dives we found that LoS was lower when there were asthma nurses in post.

We also explored the number of zero LoS patients and found the percentage ranged from around 5% up to 55%. Once again it was difficult to tease out the associations as some patients were admitted while others were an attendance. What is clear however, was that trusts often did not know the activity in the different settings. Trusts should make data outlined above and below more readily available to asthma teams so they can systematically identify the issues and take appropriate interventions to improve care pathways, reduce the burden of disease and risk of harm. Such data could be presented at regular M&M meetings to gain ownership of any interventions.

Readmissions

Readmissions are a cause for concern in asthma, as they are a marker of poor control and risk of death.[42] We found some trusts have a high percentage of readmissions at 30- and/or 90-days, shown in **Figure 15**. The reasons for which are not apparent but are likely to reflect suboptimal care in some instances, reflected by the lack of asthma care infrastructure, as below.

Figure 15: Asthma 30 and 90-day emergency readmission rates

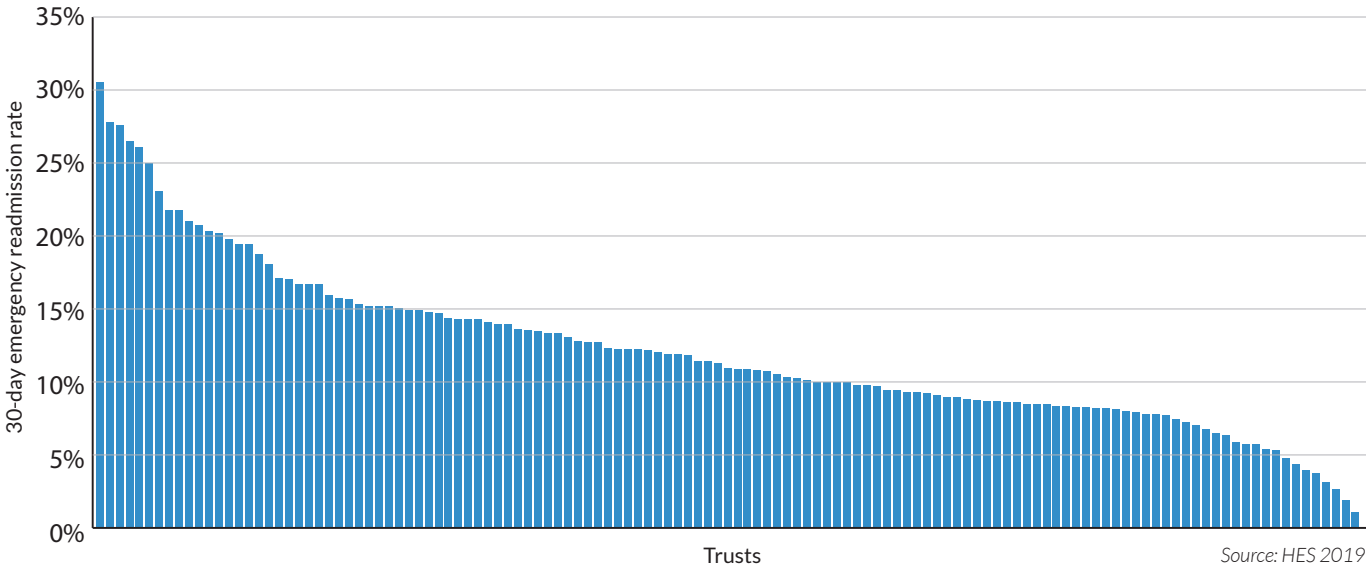


Source: HES Jan – Dec 2018

One factor for variation in readmissions may be the poor selection of patients to be discharged early, for example, those with a zero LoS are preferentially readmitted. We explore this in **Figure 16** which shows a histogram of the percentage of readmissions in those patients whose initial LoS was zero. A caveat here is the low numbers of patients. Again, there is wide variation but clearly some trusts fall well below 5% and in others the readmissions are over 25%, and almost appear worse than the standard 30-day readmission rate for all patients shown in **Figure 15**.

[42] *RCP (2015) National Review of Asthma Deaths: Why asthma still kills, https://www.rcplondon.ac.uk/projects/outputs/why-asthma-still-kills*

Figure 16: Variation in 30-day readmission rate for asthma patients under 80 with zero length of stay



Source: HES 2019

This is a cause for concern as it appears that in some trusts patients are being sent home early only to then readmit. This reflects poor control and a lack of necessary infrastructure for early follow-up as detailed in NICE national guidelines.[43] NICE recommends a follow-up appointment within two working days after an admission or attendance, but we know from Asthma UK's *Annual Asthma Survey 2019* that this is missed in almost two-thirds of cases.[44] Given this finding, nurse input into managing early discharge of patients is essential, and early follow-up can be achieved. To incentivise the review of patients by asthma teams, and the delivery of a care bundle that includes optimising inhaler technique and a personalised asthma action plan, an incentive was due for launch in April 2020 but has been delayed due to COVID-19. This is an important step as we know from our GIRFT questionnaire returns that the BTS care bundle for asthma is poorly used, as shown in **Figure 26**.

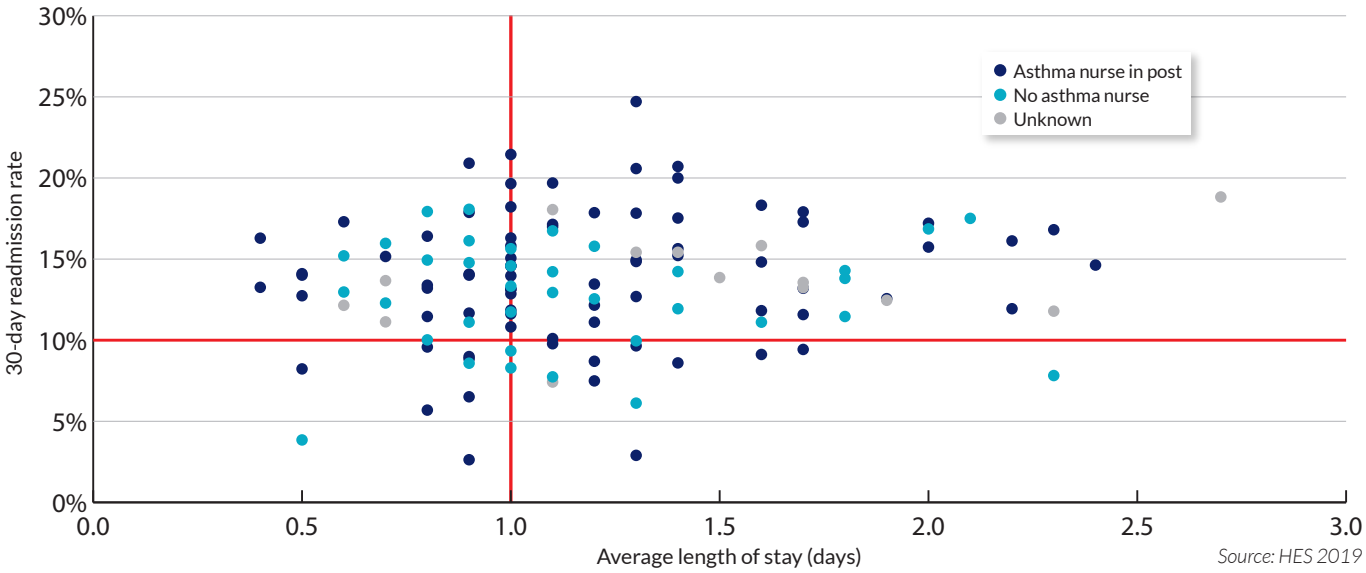
To explore the relationships between ideal care of both low LoS and low 30-day readmission rates, we plotted the data for these metrics (**Figure 17**). The trusts in the lower left quadrant achieved a low average LoS and a low readmission rate, while other trusts have a higher LoS and high readmission rate. Our deep-dive discussions suggest that the trusts in the bottom quadrants achieved these results by proactive nurse management of care across both acute care or AMU, and respiratory medicine.

As noted previously, organisations need to be aware of their own data around readmission rates, something that most organisations we visited during deep dives were not aware of. We have also found from the NACAP data some associations with readmissions and the failure to prescribe inhaled steroids at discharge. The latter information was not as complete as desired to make these links clear, but organisations with a high 30-day readmission rate should also review the discharge medication processes to ensure inhaled corticosteroids are prescribed. Patients should be supported in understanding this therapy and how to use their inhaler correctly.

[43] *NICE (2020) Asthma: diagnosis, monitoring and chronic asthma management, https://www.nice.org.uk/guidance/ng80*

[44] *Asthma UK (2019) Annual Asthma Survey, https://www.asthma.org.uk/support-us/campaigns/publications/survey/*

Figure 17: Relationship between length of stay and 30-day readmission rate for asthma patients under 80 years old



Source: HES 2019

Infrastructure to deliver asthma care

As can be seen from the data above, there are considerable concerns around readmissions, especially in those trusts which send patients home early. Fortunately, deaths are not high but were still identified at 30 days and are likely to be a reflection of asthma care delivered during the admission. These issues must be addressed.

Trusts need to be providing data, as outlined above, that is openly discussed as the first step to understanding the size of the problem and to facilitate change in care pathways. Beyond the data, good working relationships with sufficient staff are required. Patients who are not stable in primary care and fulfil NICE guidelines should be referred into hospital clinics for assessment by an asthma team with a named and recognised consultant with an interest in asthma, supported by a trained asthma nurse with access to the appropriate diagnostic tests including FeNO (fraction of expired nitric oxide).[45]

Once the correct diagnosis is established, patients should be supported by an asthma specialist nurse trained in providing education and advice, including inhaler technique, and a personalised asthma action plan (PAAP) should be developed. When the diagnosis is in doubt, or the patient may be eligible for other treatments, they should be referred to specialised services.

Where there are frequent attendances to emergency departments, referrals to asthma nurses and/or primary care need to be prompt to allow early review as per NICE guidelines. For patients who are admitted, nurse review is important for the patient on short stay and admissions wards, and those in hospital beds on base wards (which should be a respiratory ward), but we noted from our deep dives that this is often not the case. We found high readmissions in some hospitals for patients who were not managed by respiratory medicine for what is potentially a life-threatening illness.

To enable this quality of care there should be a nominated consultant with responsibility for asthma services who has appropriate time to deliver this care. As seen in the *Workforce* section on page 133, only 40% of consultants have time in their job plan for asthma MDTs, in contrast to the consultants delivering specialised asthma care. Appropriate nursing needs to be in place, but we found during deep dives visits that those trusts with asthma nurses were often those in larger or specialised commissioning centres, and they spent the bulk of their time delivering care to the severe asthma population.

Appropriate asthma nurse staffing at Band 6 level is therefore necessary in all hospitals, with a proposed minimum of one nurse per 300 asthma admissions a year. This will enable the delivery of acute care and develop links between the acute and emergency medicine departments, base wards and the community, fulfilling the roles identified above, supported financially by the pending Best Practice Tariff.

[45] *NICE (2017) Asthma: diagnosis, monitoring and chronic asthma management, https://www.nice.org.uk/guidance/ng80*

National Asthma and COPD Audit Programme (NACAP)

One key driver for improvement of asthma care is the National Asthma and COPD Audit Programme (NACAP). The audit programme was commissioned by the Healthcare Quality Improvement Partnership and is led by the Royal College of Physicians, working closely with professional society and charity partners. The audit measures performance against key metrics relating to asthma and COPD services across the UK.

For asthma, the NACAP process commenced in November 2018[46] and assesses several key interventions including delivery of care bundles. Clearly nursing staff are needed to deliver such care bundles. Also applicable to the COPD section in this report is the lack of resource for data entry with 74 of 114 surveyed (65%) trusts reporting inadequate resources to complete both standard BTS audits that are part of the trusts quality accounts and the NACAP audit. We look further at the NACAP in *Improving care for patients with COPD*, page 82).

[46] *RCP (2020) National Asthma and COPD Audit Programme (NACAP): secondary care workstream – adult asthma, https://www.rcplondon.ac.uk/projects/national-asthma-and-copd-audit-programme-nacap-secondary-care-workstream-adult-asthma*

Asthma

Recommendation	Actions	Owners	Timescale
11. Review referral systems and patient pathways in collaboration with community, primary and acute services to improve care for patients with asthma.	**a** Ensure only appropriate patients are referred and admitted to hospital through establishing more effective links with community services across Integrated Care Systems.	Trusts, ICSs	On publication
	b Where referral criteria defined by NICE (NG80) are not being followed consistently, initiate local discussions to understand barriers.	ICSs, PCNs	Within 3-6 months of publication
	c Monitor frequent attendances to emergency departments and explore reasons for this in collaboration with ED colleagues so that appropriate interventions can be made in line with NRAD recommendations.	Trusts	Within 12 months of publication
	d Review trust-wide data around readmission rates for asthma to understand opportunities for intervention.	Trusts	Within 12 months of publication
	e Review pathways to ensure patients admitted to hospital with asthma are managed by respiratory physicians, with onward referral to specialised centres where appropriate.	Trusts	Within 6 months of publication
	f Ensure patients are provided with sufficient education and support to enable correct inhaler use.	PCNs, ICSs	Within 12 months of publication
	g Ensure patients are provided with plans for follow-up post attendance or at discharge.	Trusts, CCGs, ICSs	Within 12 months of publication
12. Review departmental resourcing to improve outcomes, reduce length of stay and reduce the likelihood of readmissions for patients with asthma.	**a** Ensure at least one consultant in the department has overall responsibility for asthma which is reflected in their job plan.	Trusts	Within 6 months of publication
	b Staff respiratory departments with the appropriate level and makeup of respiratory team members to facilitate effective triage and deliver NACAP care bundles, with a minimum target of 1 asthma nurse per 300 admissions (excluding nurse time spent delivering specialised services for more complex patients).	Trusts	Within 18 months of publication
	c Ensure departments have access to data collection / data entry resource to contribute fully to NACAP.	Trusts	Within 12 months of publication
	d Review and discuss data on asthma activity to explore opportunities to improve services.	Trusts	Within 18 months of publication

Improving care for patients with pneumonia

Pneumonia is a common problem that affects between 0.5% and 1% of adults in the UK annually and is present in 5–12% of adults who present to GPs with symptoms of lower respiratory tract infection.[47] Of those diagnosed, between 22–42% are admitted to hospital, accounting for 100,000 admissions per year.[48] Pneumonia can be fatal: death from pneumonia is the fifth most common reason for death worldwide, and accounts for some 30,000 deaths in England, a figure that continues to rise. High mortality from pneumonia is often a factor in an acute provider's Summary Hospital-level Mortality Indicator (SHIMI) and mortality statistics.

Coding

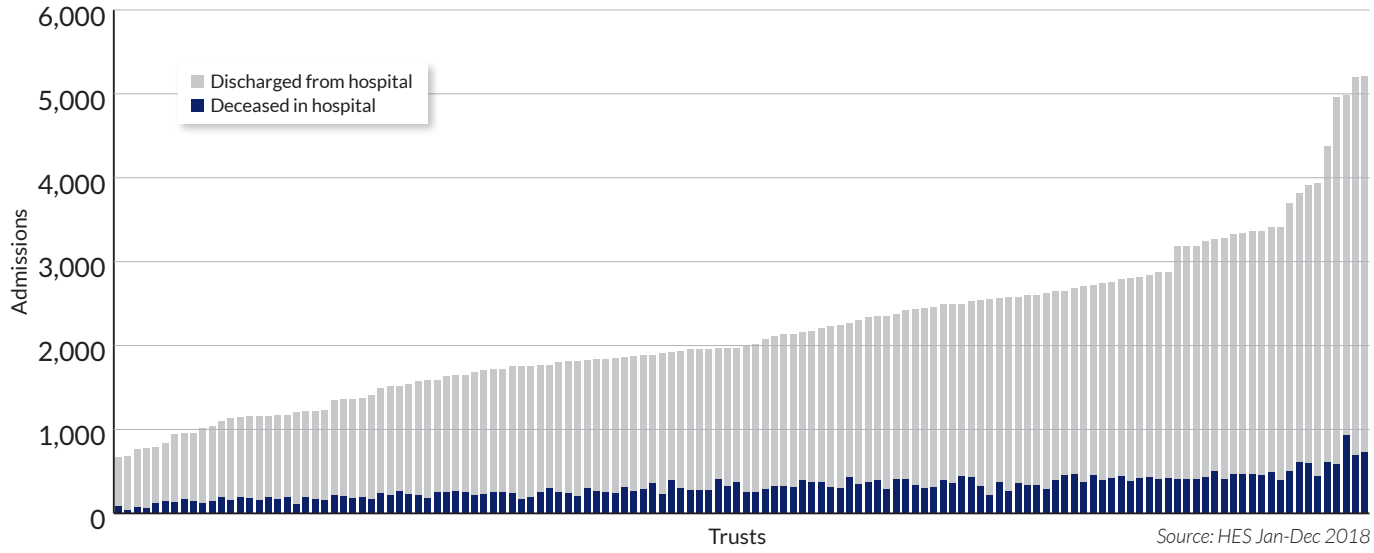
Pneumonia is considered clinically to be broadly of two types: acquired in the community (Community Acquired Pneumonia - CAP) or in hospitals or such institutions (Hospital Acquired Pneumonia - HAP). Currently, national coding cannot easily differentiate between HAP and CAP, which can lead to clinical confusion. Coding audits have also highlighted miscoding of different conditions, such as heart failure as pneumonia[49] or COPD, as a consequence of coding advice – the latter from the National Clinical Coding Standards of ICD-10 that COPD with unspecified consolidation maps to pneumonia codes. All this means that the true picture of pneumonia may not be clear from hospital reporting. We did find an excellent example at the Royal Free London NHS Foundation Trust, where over the years they had addressed the issue of poor coding in pneumonia. This undoubtedly was an issue in the trust's low Standardised Mortality figures but had enabled them to construct an electronic pneumonia care pathway leading to good outcomes, exemplified by a high discharge rate and low readmission rate.

Admissions

Admission rates for pneumonia are high, and often twice that of COPD admissions. It is of interest that despite this, and in contrast to COPD, there is little if any infrastructure to support the management of pneumonia.

There is a marked variation in the number of admissions, as shown in **Figure 18**, with deaths generally increasing in line with admission numbers. However, if we correct for the catchment population, as in **Figure 19**, we still see a wide variation in admissions. We also understand from deep-dive discussions that pneumonia admissions are generally higher in areas with higher levels of deprivation although this was difficult to illustrate in our own data.

Figure 18: Total pneumonia admissions and number of in-hospital deaths



Source: HES Jan-Dec 2018

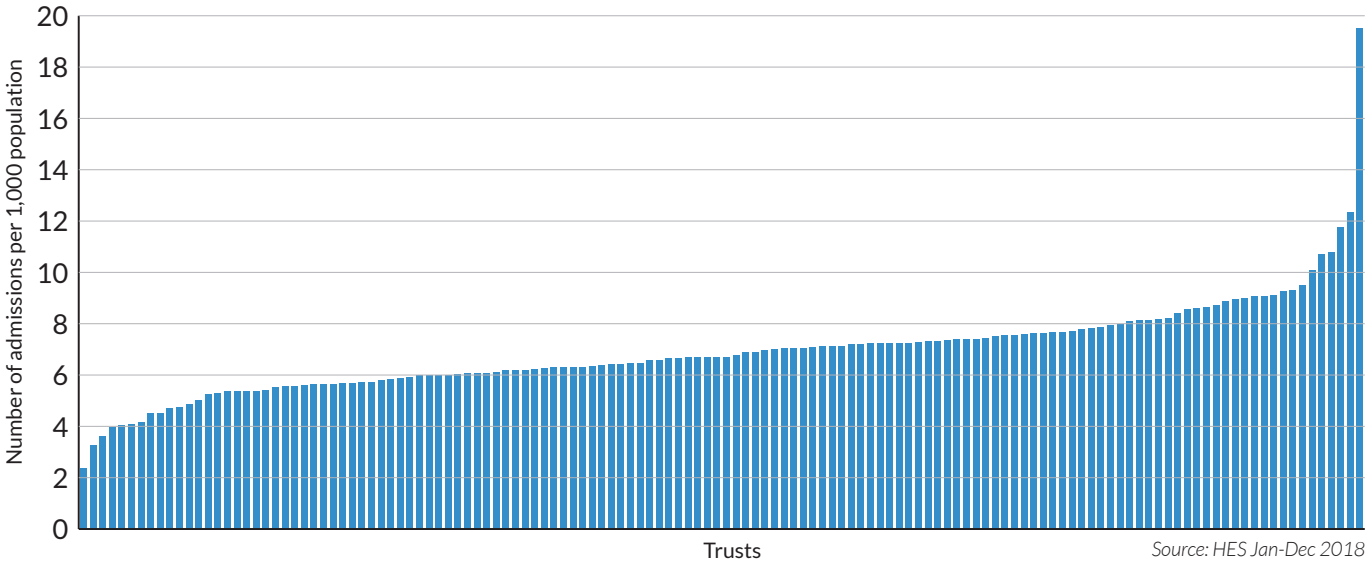
[47] *NICE (2019) Pneumonia in adults: diagnosis and management, https://www.nice.org.uk/guidance/cg191.*

[48] *NICE (2016) Pneumonia in Adults Quality Standards, https://www.nice.org.uk/guidance/qs110/resources/pneumonia-in-adults-pdf-75545291391685*

[49] *Wei S L, Dr H L (2018-2019) BTS National Audit Report: Adult Community Acquired Pneumonia Audit, https://www.brit-thoracic.org.uk/quality-improvement/clinical-audit/bts-national-audit-reports/*

Figure 19: Total admissions for pneumonia per 1,000 catchment population*

* calculated using trust-wide emergency admissions at LSOA level



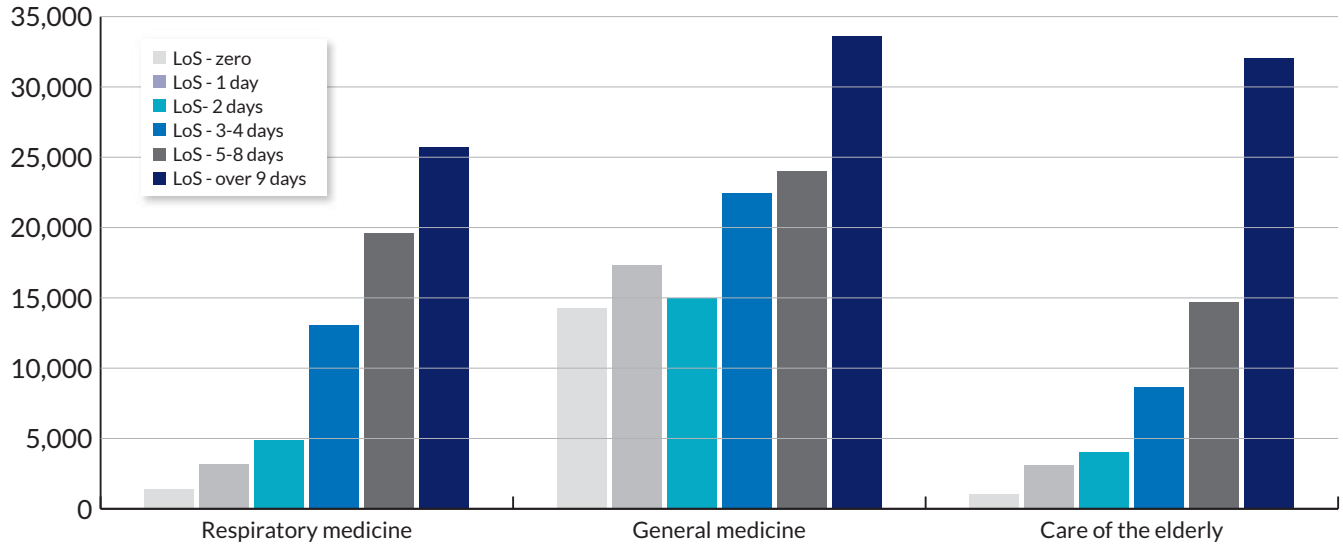
Source: HES Jan-Dec 2018

Length of stay (LoS)

Unnecessarily long stays in hospital result in poorer patient outcomes and increase the risk of subsequent healthcare associated infections, including hospital acquired pneumonia. We found high variability between trusts in LoS for patients with a primary diagnosis of pneumonia, ranging from 5.4 to 10.9 days. Moreover when we examined the duration of stay broken up in segments of zero, 1 day, 2 days, 2-4 days, 5-8 day and over 9 days and the discharging specialty (**Figure 20**) and age of the patient (**Figure 21**) for each trust against the profile of the English average, as displayed in the graphs, we could identify where the variations in LoS occurred.

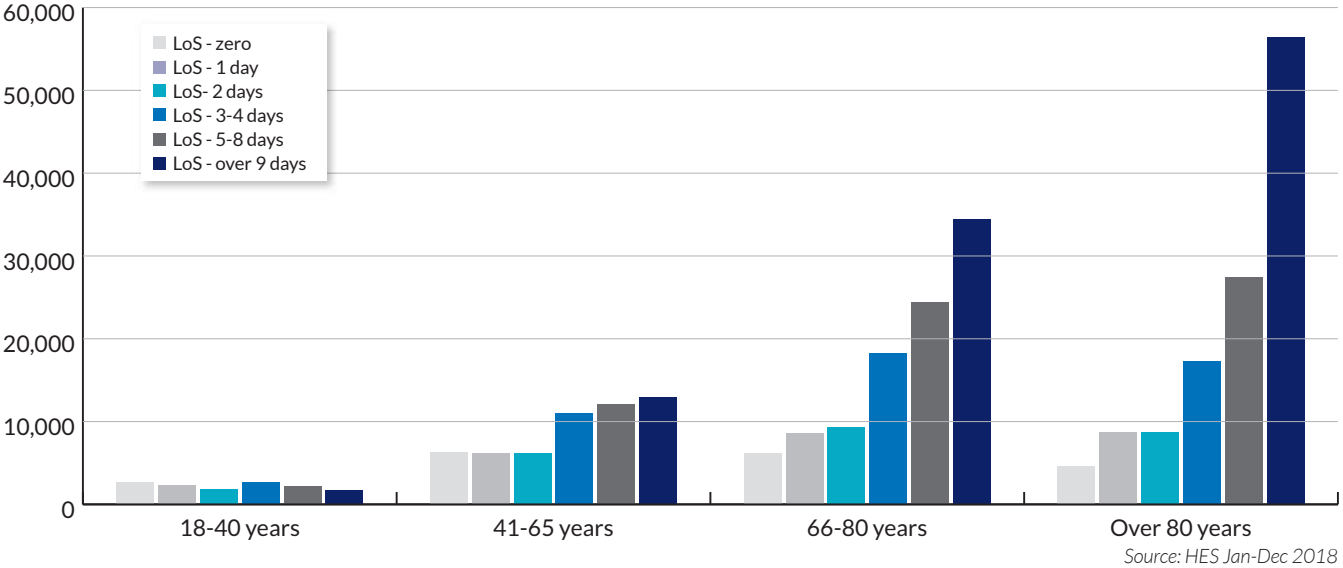
Some trusts have a high zero LoS under general (acute) medicine and some have a very long LoS when admitted under care of the elderly physicians. For age spread and LoS, some trusts were able to have a low LoS across all age bands, while for others it was selectively younger patients who were discharged. We have not expressed the variation in these differences as they will vary with each trust's processes, however our deep dives highlighted clear opportunities where resources and support was needed to reduce overall LoS. Trusts should understand their own profile of activity and use this as a method of targeting where interventions should be considered.

Figure 20: Length of stay by discharging specialty (national averages)



Source: HES Jan-Dec 2018

Figure 21: Length of stay by age band (national averages)



Source: HES Jan-Dec 2018

Readmission rates

We found significant emergency readmission rates at 30 days and 90 days across all age groups, as shown below.

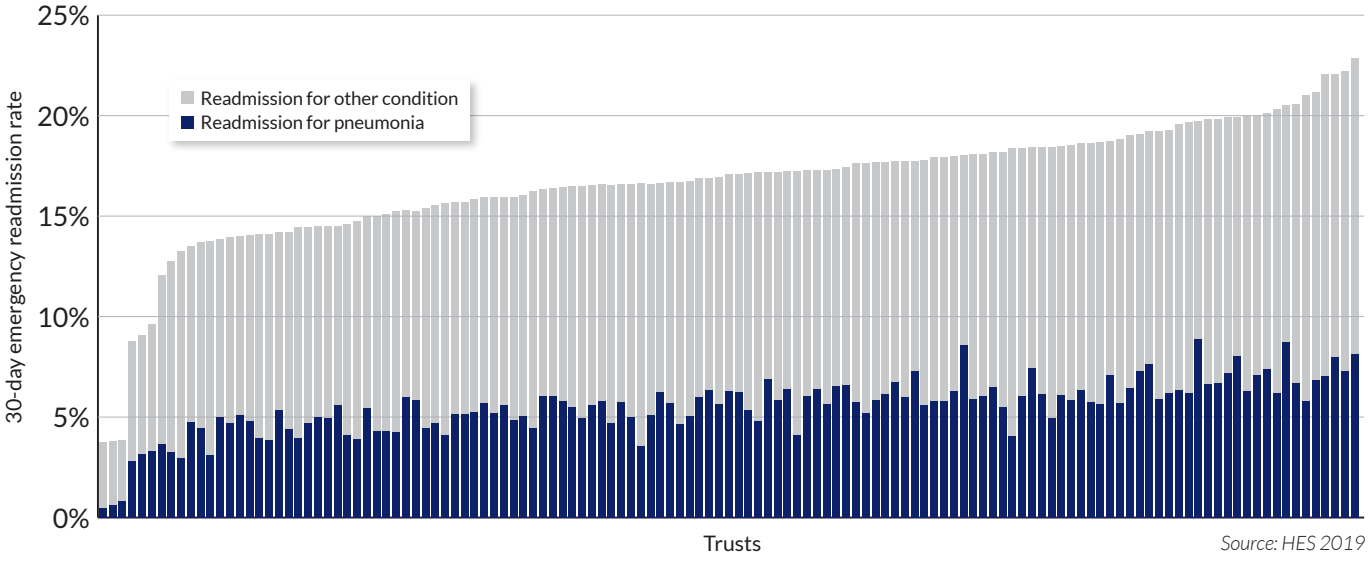
Table 1: Average pneumonia emergency readmission rates by age band across all trusts in England

	Age 18-40	Age 41-65	Age 66-80	Age 80+
Readmission within 30 days	12.4%	15.3%	17.8%	17.0%
Readmission within 90 days	17.8%	22.7%	27.1%	26.9%

Source: HES 2017-2018

Given the 90-day readmissions may be due to a variety of factors we have concentrated on the 30-day readmissions. We found that two-thirds of patients were readmitted at 30 days due to reasons other than pneumonia, as shown in the grey bars on **Figure 22**. The average figure was around 17%, but there was a wide range – between 4 and 23%.

Figure 22: 30-day readmission rates for pneumonia patients aged 80 and under



Source: HES 2019

To look at why these readmissions occurred and if they varied with age group, we explored the ICD10 (diagnosis) codes for patients readmitted after 30 days.

Within the 18-40 age group, there were 1,374 readmissions within 30 days across all trusts; the majority due to recurrence/failed resolution of the pneumonia, but 5% were due to asthma which may point to an inaccuracy in the initial diagnosis. Eight readmissions were miscoded as lower respiratory tract infection; 2% were coded, probably incorrectly, as COPD, and 4% had a pleural or parapneumonic effusion. Cardiac events in this age group were rare.

In the 41-65 age group, there were 6,697 readmissions, with 776 identified as COPD (11.6%). This highlights some confusion in NHS classification about admissions of patients with COPD who have radiographic changes, as noted at the outset of this pneumonia section.

In the 66-80 age group, there were 13,120 readmissions of which 1,997 were for COPD, 607 for heart failure, 204 for cardiac arrythmias. Relatively few patients had pleural disease with 178 presumably new pleural effusions which may have been parapneumonic and 88 empyema. There were 327 patients with lung cancer.

We did not look in detail at the readmissions in the over 80 years population, but it is worth noting the practice at the Royal Free London NHS Foundation Trust where clear electronic pathways documents, noted above, facilitated a very proactive management of elderly (>80 years) patients in a frail elderly unit. Both 30- and 90-day readmissions were some of the lowest in the country.

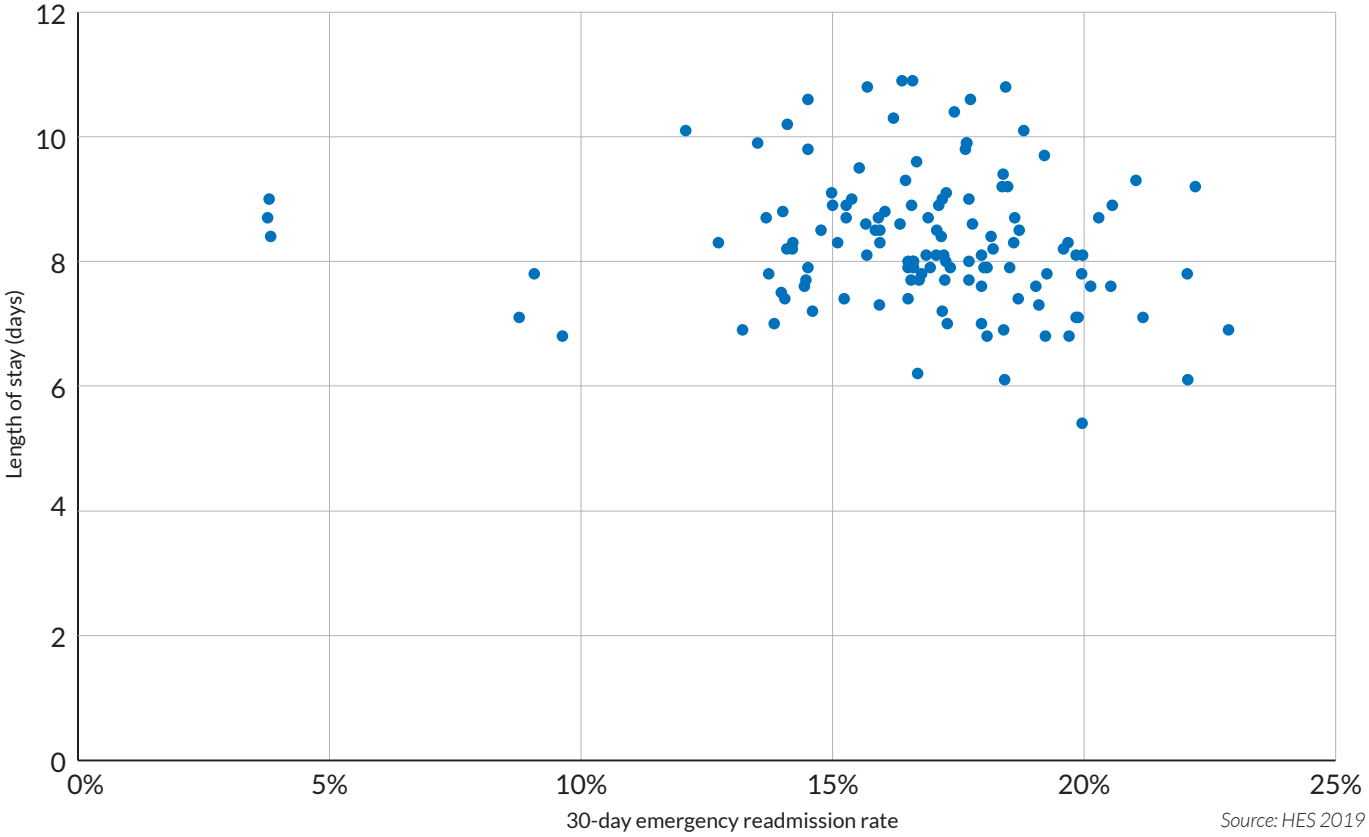
Recognising some of these reasons for readmission at the outset and taking a proactive management approach to some of the potential problems may well prevent readmission from occurring. If the readmission rate improved across all hospitals to 15% or better – which occurs in 29 trusts – 4,200 emergency admissions could be avoided every year (see *Notional Financial Opportunities*, page 156).

Readmissions and Length of Stay

Shorter lengths of stay may be associated with higher readmission rates, which if found to be true, may suggest that patients have been discharged too early. We explored this by looking at the average LoS for each trust and the risk of readmission, be that for any reason (**Figure 23**) and when the readmission was for recurrent pneumonia (**Figure 24**).

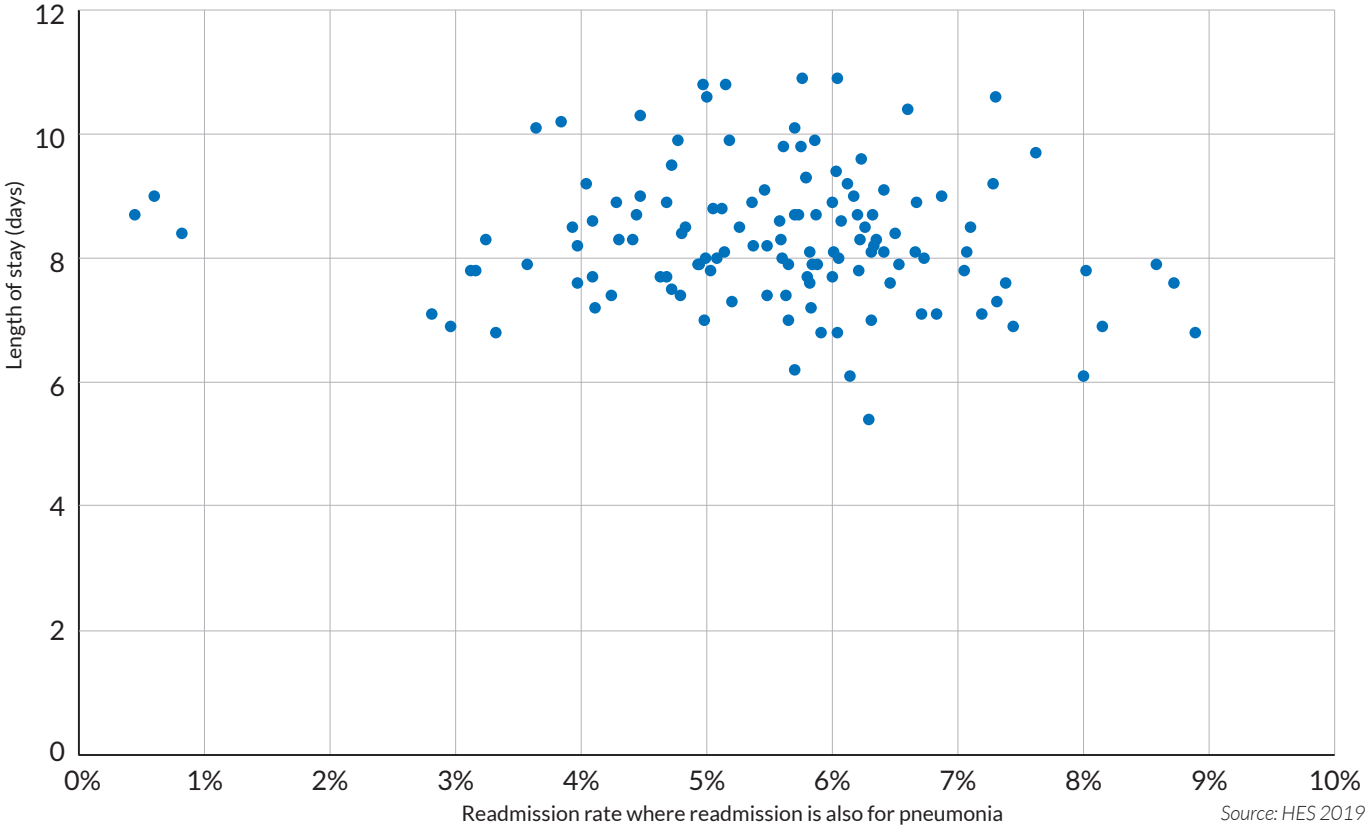
We found several trusts are managing to maintain both shorter lengths of stay and low readmission rates. Six trusts have a low LoS of around eight days and a low readmission rate of 10% when the admission is for any condition, while three trusts have a low readmission rate for pneumonia.

Figure 23: Relationship between length of stay and 30-day emergency readmission rate for patients aged 80 and under, where the readmission was for any reason



Source: HES 2019

Figure 24: Relationship between length of stay and 30-day emergency readmission rate for patients aged 80 and under, where the readmission was also for pneumonia



Source: HES 2019

In-hospital mortality

The mortality rate for those admitted to hospital with pneumonia is between 5-14%. There is little variation in mortality rate between hospitals, with few outliers. This remains the case whether patients were discharged from respiratory medicine, care of the elderly, general (acute) medicine, or whether the patient was diagnosed as having lobar pneumonia or bronchopneumonia.

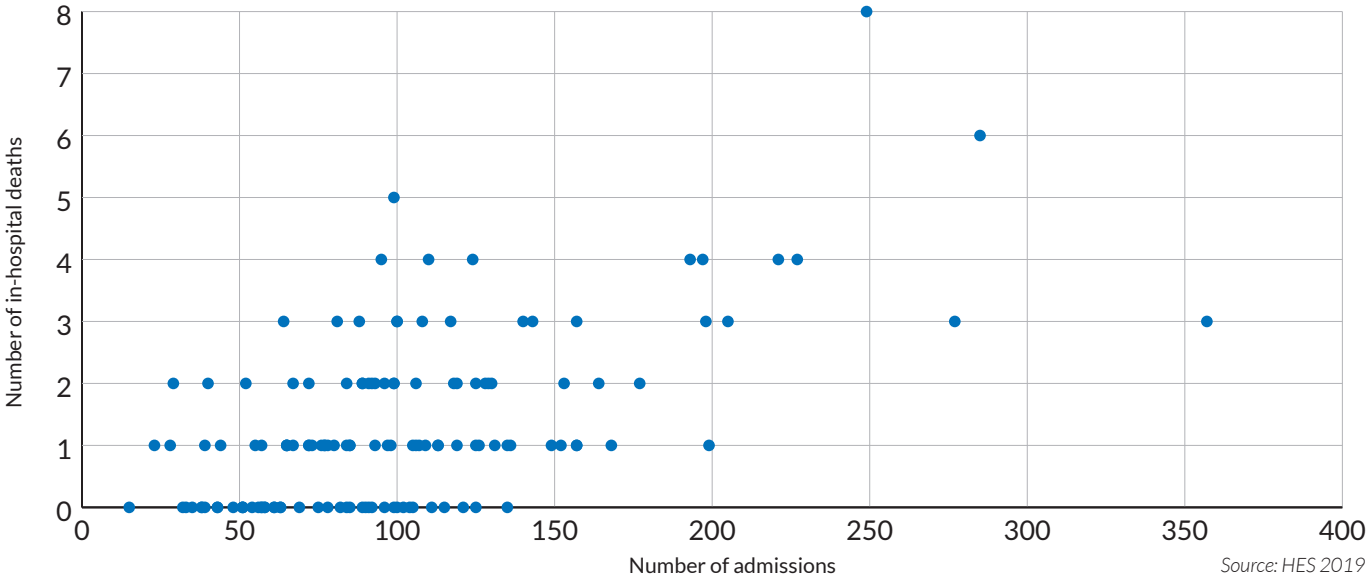
There was one outlier case where a trust recorded a very high mortality from influenza, but low overall mortality for pneumonia. Our deep dive confirmed that this was an example of good practice, as all patients attending the Emergency Department at that time were swabbed for flu. This meant, where swabs were positive, the cause of mortality was attributed to influenza.

However, one area of concern in mortality is in the 18-40 age group where there seems to be little relationship between the number of admissions and the mortality rate (**Figure 25**). Through deep-dive discussions we have established that often these patients are not known to respiratory physicians, nor is it known if these deaths occurred in patients with learning disabilities, where pneumonia is known to be one of the most common causes of premature and potentially preventable death.[50]

We would expect these patients who die prematurely to be flagged and discussed at Morbidity and Mortality (M&M) meetings, although our deep dives indicated this did not appear to be happening. As a result, there was limited opportunity for systematic learning about why these deaths had occurred. It would, therefore, be appropriate if all deaths under 40 years of age were subject to structured judgement review (SJR) to identify learning for that trust and to improve outcomes.

[50] *NHS England and NHS Improvement (2019) Learning Disability Mortality Review (LeDeR) Programme: Action from Learning, https://www.england.nhs.uk/publication/leder-action-from-learning/*

Figure 25: In-hospital mortality for pneumonia patients aged 18-40



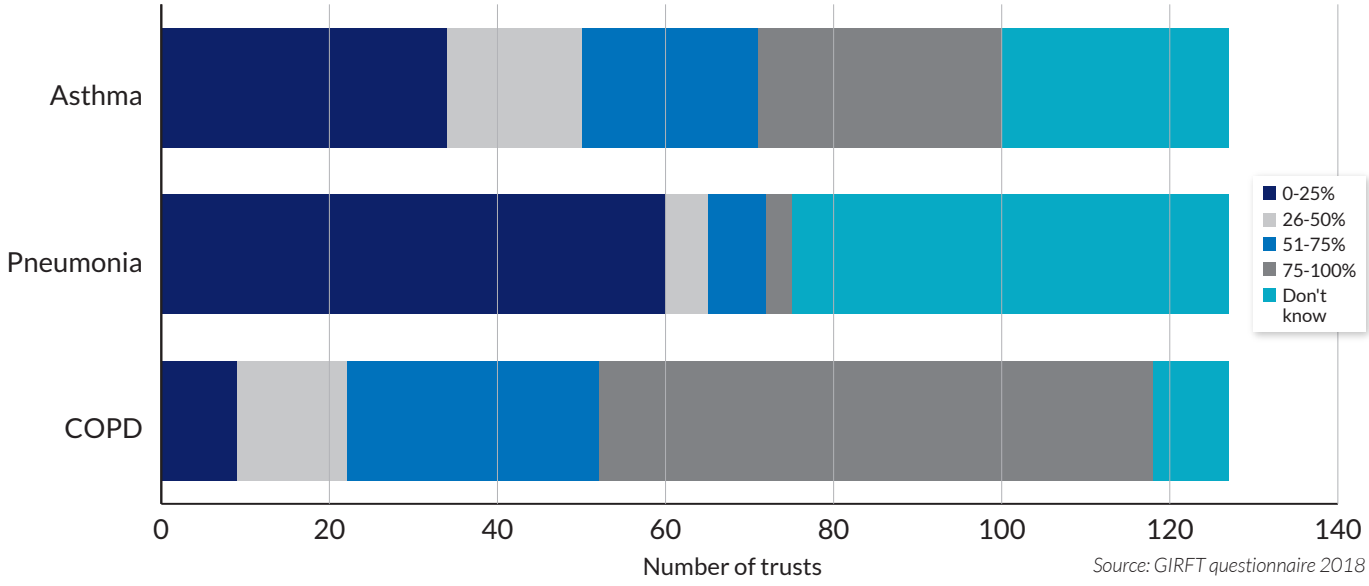
Source: HES 2019

Care bundles in pneumonia

Systematising care is recognised to improve outcomes, and this has been shown in pneumonia management by the Advancing Quality Alliance (aqua).[51] Care bundles (sets of three to five evidence-informed practices performed collectively and reliably to improve the quality of care[52] - see *CURB 65*, page 79) are a way of doing this, but we found they are not implemented consistently.

We asked in our GIRFT questionnaire about use of care bundles (**Figure 26**). Of those trusts who responded, nearly half did not know if they were implementing care bundles for patients with pneumonia and only three trusts reported 75-100% compliance. These disappointing findings were confirmed during our deep-dive visits.

Figure 26: Self-reported care bundle compliance



Source: GIRFT questionnaire 2018

[51] *AQUA (2020) Advancing Quality launch new formal measure set for Hospital Acquired Pneumonia, https://aqua.nhs.uk/advancing-quality-aq-launch-new-formal-measure-set-for-hospital-acquired-pneumonia/*

[52] *Lavallée JF, Gray T, Dumville J, Russell W, Cullum N. (2017) The effects of care bundles on patient outcomes: a systematic review and meta-analysis, Implement Sci. 12(1):142.*

One way of attempting to encourage use of care bundles is by incentivising trusts financially. This is a key part of an incentive scheme that was due for introduction in April 2020 but was overtaken by COVID-19's withdrawal of CQUINs. It is hoped that an incentive will be in place in April 2021. The current CQUIN builds upon the previous one of using CURB 65 in emergency departments to facilitate discharge. The new incentive uses not only CURB 65, but measures from both the NICE pneumonia guidelines[53, 54] and the BTS to improve care. It is anticipated the incentive's funding will allow improved pneumonia care, with a subsequent reduction in mortality, LoS and readmission by supporting pneumonia nurses and infrastructure.

CURB 65

The CURB 65 score is a method of measuring risk by which one point is assigned for each of five measurable symptoms including:

- C - new confusion
- U - urea > 7mmol/L
- R - respiratory rate ≥ 30/min
- B - blood pressure <90mmHg systolic or ≤ 60mmHg diastolic
- 65 - age ≥ 65 years

Infrastructure in pneumonia care

Despite the significant patient populations and huge burden that pneumonia places on acute providers, there was surprisingly little infrastructure to support pneumonia care, in contrast to both asthma and COPD which generate far fewer admissions. It is clear care needs to improve and having a named consultant as pneumonia lead with some sessional time is required to develop an infrastructure and raise the profile of pneumonia; a rare finding during deep dives. This would ensure the correct diagnosis and management is in place for many patients, improve coding accuracy and supporting antibiotic stewardship, issues recognised by NICE.

Given the high mortality rates, patients identified by high CURB 65 scores should be under the care of a respiratory physician unless the pneumonia is a terminal event where palliation may be the most appropriate intervention. Additionally, younger patients who can be readily discharged and reviewed in virtual clinics and those with lower CURB 65 scores but have underlying respiratory problems should be prioritised for respiratory care. For those patients not managed by respiratory physicians, who ideally should be the minority, chest x-rays should be formally reported. As this does not occur in all trusts, underlying diagnosis may be missed, leading to potential readmission for other problems.

While underlying cancers are not common, clear processes need to be in place for follow-up chest x-rays post-discharge to ensure resolution, with results communicated to all parties, including primary care teams, and only the occasional patient being recalled to clinic. In addition, simple interventions such as providing patients with an information leaflet (such as the one produced by NICE) can allay some of the anxiety and explain the persistence of some symptoms post-discharge, e.g. cough and sputum, which may be a reason for readmission. Unfortunately, such information is only used in about 7% of patients discharged with pneumonia.[55]

Innovative approaches to care have shown outcomes for pneumonia can be improved, but few trusts have implemented such changes. By the use of regional data and developing clear guidelines, marked improvements have been shown in Royal Liverpool and Broadgreen University Hospitals NHS Trust, while other acute trusts in Derby and Leicester have delivered improved diagnosis and follow-up, producing benefits in a variety of metrics (see case study below).

[53] *NICE (2019) Pneumonia in adults: diagnosis and management, https://www.nice.org.uk/guidance/cg191*

[54] *NICE (2019) Pneumonia (community-acquired): antimicrobial prescribing, https://www.nice.org.uk/guidance/ng138*

[55] *BTS (2019) National Adult Community Acquired Pneumonia Audit, https://www.brit-thoracic.org.uk/quality-improvement/clinical-audit/national-adult-community-acquired-pneumonia-audit-201819/*

Key to all initiatives designed to improve pneumonia care is the enhanced role of specialist teams, usually nurses, to deliver disease-specific care. It is anticipated that the upcoming pneumonia incentive (CQUIN or otherwise) will allow pump priming (a financial investment) for the recruitment of such nursing teams to improve outcomes. While there are few figures about the ideal numbers, we would anticipate appointments at Band 6 with one nurse per 400 admissions, pro rata. If extended/weekend working is required, additional staff are needed, but data suggests such investments are repaid both clinically and financially.

CASE STUDY

Appointment of a lead nurse to improve pneumonia care

Royal Liverpool and Broadgreen University Hospitals NHS Trust

Royal Liverpool Hospital identified poor performance against Advancing Quality (AQ) pneumonia measures. It created the post of lead nurse in pneumonia to improve all aspects of care for the pneumonia patient and to ensure that the trust complied with NICE guidelines and BTS recommendations.

A weekly 'Missed Opportunities' meeting with staff in A&E and AMU identified patients where targets were not achieved, with feedback delivered to staff as a learning exercise. A mortality review of all deaths coded as being due to pneumonia was also established, to check whether any patients were incorrectly coded and to identify any learning points.

The effectiveness of the lead nurse role is audited every 12 weeks by an external auditor. This showed that the Royal Liverpool and Broadgreen University Hospitals NHS Trust had become the second best performing trust in the region and brought in £200,000 for best practice.

Recommendation: Pneumonia

Recommendation	Actions	Owners	Timescale
13. Optimise care for pneumonia patients by ensuring the correct diagnosis (and that it is coded correctly), as well as reviewing patient pathways and infrastructure to enable care bundle delivery, reduce length of stay, readmissions, morbidity and mortality.	**a** Ensure a named respiratory consultant is appointed as a clinical lead for pneumonia, with this leadership responsibility reflected in their job plan.	Trusts, ICSs	Within 6 months of publication
	b Review pathways to ensure prompt diagnosis and point of care testing for viral pathogens.	Trusts, ICSs	Within 6 months of publication
	c Review infrastructure to support pneumonia care and enhance the role of specialist teams to improve outcomes, with a minimum target of one nurse per 400 admissions, pro rata; which could be increased if average readmission rate is over 20%.	Trusts	Within 18 months of publication
	d Use the British Thoracic Society (BTS) care bundle for community-acquired pneumonia to support safe and prompt discharge by a respiratory team.	Trusts	Within 3 months of publication
	e Ensure chest x-rays are formally reported for patients not managed by respiratory physicians to prevent underlying diagnoses being missed and reduce the likelihood of readmission.	Trusts	Within 3 months of publication
	f Ensure all patients are discharged with clear supporting information to explain persistent symptoms and reduce the likelihood of readmission.	Trusts	On publication
	g Agree clear processes for follow-up chest x-rays post-discharge with results being shared across primary, secondary and community care as appropriate.	ICSs	Within 12 months of publication
	h Audit inpatient pneumonia mortality, particularly in patients aged 18-40. Ensure a structured judgement review is carried out for all patients under 40 who have died from pneumonia, with further discussion at regular Morbidity and Mortality (M&M) meetings.	ICSs	Within 18 months of publication

Improving care for patients with Chronic-Obstructive Pulmonary Disease (COPD)

In contrast to many other chronic diseases, the prevalence of COPD has not decreased in recent years[56] and the direct costs of care are estimated to increase from £1.5 billion in 2011 to £2.3 billion in 2030.[57] It is estimated that three million people in the UK have COPD, of whom two million are undiagnosed. In recent studies where spirometry has been performed as part of lung cancer screening, some 37% of 2,525 individuals were noted to have airflow obstruction, of which over half were unknown to primary care[58] and in a similar study design, 560 of 986 people had prebronchodilator spirometry in-keeping with COPD, of which 67% were 'undiagnosed'.[59]

COPD mainly affects people over the age of 50 and is closely associated with levels of deprivation. COPD is the second most common reason for hospital admission and the fifth biggest killer in the UK, accounting for a quarter of all deaths from lung disease.[60] From the Global Burden of Disease, it is ranked fourth for mortality and third as a cause of disability.[61] While some occupations may increase the risk, for example for pottery workers,[62] or exposure to biomass fuels, the main reason for the destructive process that occurs is inhalation of tobacco (see *Improving treatment for tobacco dependency*, page 109), although smoking of illicit drugs is increasingly being recognised as a highly destructive contributor to COPD.[63]

Management of COPD

Overall management of COPD can be considered along the lines of securing a diagnosis, ongoing management, and the issue of exacerbations and hospitalisation. Given the large number of undiagnosed patients, as noted above, the NHS Long Term Plan has a key element of early and accurate diagnosis that is focused on COPD, with performing quality-assured spirometry being a prerequisite for confirming the airflow obstruction. We note that up to 30% of GP registries for COPD may be incorrect for a variety of reasons. Guidelines to improve care have existed since 1997,[64] but are not always adhered to. This can be improved by using a web-based tool to facilitate history taking and management, with national guidelines embedded in the tool (see case study on page 90).

The co-development of a personalised self-management plan is highlighted as one of the fundamentals of COPD care in NICE guidelines. However, they are often not available to all patients – a British Lung Foundation analysis of data from the Patient Passport showed that only 24% of respondents reported getting support to manage their care and a written action plan.[65] The Taskforce for Lung Health recommends every person with lung disease should have a personalised care and support plan.

Following a secure diagnosis, smoking cessation advice should be offered as it is the most cost-effective intervention, as noted in the *Improving treatment for tobacco dependency* section. Vaccination likewise is a very effective intervention but not always accessed, especially in some hard-to-reach or housebound individuals with respiratory disease.

Two areas not covered in detail in the current GIRFT review, but essential to respiratory medicine and especially COPD, are pulmonary rehabilitation and oxygen services.

Pulmonary rehabilitation (PR) is a key intervention for managing respiratory disease and it is encouraging that the services usually provided in the community setting are being supported and encouraged in the NHS Long Term Plan to both expand and become quality assured by gaining RCP accreditation. Although beyond the scope of this review, it is essential that PR services are available and accessible for all patient groups. During deep dives we heard many examples where the services

[56] *NICE (2011) Quality Standards COPD, https://www.nice.org.uk/guidance/qs10/*

[57] *McLean, S., Hoogendoorn, M., Hoogenveen, R. et al. (2016) Projecting the COPD population and costs in England and Scotland: 2011 to 2030. Sci Rep 6, 31893 3.*

[58] *Balata H, Harvey J, Barber PV et al. (2020) Spirometry performed as part of the Manchester community-based lung cancer screening programme detects a high prevalence of airflow obstruction in individuals without a prior diagnosis of COPD, Thorax ;75:655-660.*

[59] *Ruparel M, Quaife SL, Dickson JL, et al. (2020) Prevalence, Symptom Burden, and Underdiagnosis of Chronic Obstructive Pulmonary Disease in a Lung Cancer Screening Cohort. Ann Am Thorac Soc. ;17(7):869-878.*

[60] *NCEPOD (2017) Inspiring change: a review of the quality of care provided to patients receiving acute non-invasive ventilation, https://www.ncepod.org.uk/2017report2/downloads/InspiringChange_FullReport.pdf*

[61] *The Lancet (2017) Global Burden of Disease, https://www.thelancet.com/gbd*

[62] *Prowse K, Allen MB, Bradbury SP. (1989) Respiratory symptoms and pulmonary impairment in male and female subjects with pottery workers' silicosis. Ann Occup Hyg.;33(3):375-385.*

[63] *Nightingale, R, Screening (2019) Heroin Smokers Attending Community Drug Clinics for Change in Lung Function, Volume 157(3), P558-565.*

[64] *NICE/BTS (2019) COPD in over 16s: diagnosis and management, https://www.nice.org.uk/guidance/NG115*

[65] *Philip K, Gaduzo S, Rogers J, et al. (2019) Patient experience of COPD care: outcomes from the British Lung Foundation Patient Passport, BMJ Open Respiratory Research 2019;6.*

had insufficient capacity to cope with referrals and some patient groups such as those with ILD, despite being a clear NICE recommendation, were excluded. The NACAP 2019 COPD[66] report found that only 56% of people were assessed for suitability for PR, and ultimately, only 6% attended PR appointments, suggesting either patients are not accepting the offer and/or PR is not being offered as part of the discharge bundle.

Developing PR services is essential as a cost-effective way of improving care for patients with respiratory disease, but especially COPD. The Taskforce for Lung Health[67] highlights the importance of access to PR for everyone who would benefit, and recommends that every person with an MRC dyspnoea scale breathlessness score of grade 2 and above is referred to and has the opportunity to complete a PR programme.

Oxygen therapy is likewise an important area with a high spend. Some services are delivered in hospital, with patients identified and therapy initiated by the home oxygen order form (HOOF) for ambulatory or long-term oxygen therapy. However, given that a period of stability is usually adhered to post-exacerbation, many oxygen services are now run from within the community.

Few of either PR or oxygen services have consultant oversight as shown by the sessional commitment to community services (see *Integrated care*, page 103). Both these services are key to delivering a truly integrated respiratory service and would benefit from medical leadership.

Other aspects of managing stable patients are dealing with the ongoing breathlessness and associated anxiety that stems from this, and the limits to exercise capacity, again an important area of the NHS Long Term Plan. Psychological therapies, including through the Improving Access to Psychological Therapies (IAPT) programme have an important role, and again though not formally assessed, we noted variation in provision for such key interventions. A similar finding was noted for access to palliative care in both hospitals and especially in the community setting where much of this care takes place. For a minority of patients, following detailed investigations and an MDT discussion, lung volume reduction is an effective option.

While respiratory consultants have a major role in supporting patients in the community and providing leadership, we found there were a paucity of consultant sessions to do so, as highlighted in the *Integrated care* section on page 103.

Exacerbations of COPD

We found that many patients with COPD accept that their breathlessness and exercise limitation is a natural aspect of ageing, or an inevitable result of smoking, and as a result are often not self-motivated to seek help. With an intercurrent viral or bacterial infection, the load on the respiratory system leads to increasing breathlessness and an acute presentation either at primary care, or often at the emergency department. For many patients, the diagnosis is made on this first exacerbation, although when admitted under a non-respiratory team and/or spirometry is not performed, the diagnosis may not always be correct, adding to the inaccuracy of primary care registries.

Such exacerbations are distressing for patients and carers and take a long time to resolve, during which time patients further decondition, hence the importance of considering early referral for pulmonary rehabilitation. While some interventions, such as rescue packs[68] can help, further early re-exacerbations follow with a high number of readmissions, as noted below.

For most patients the infection is sufficient to tip patients into respiratory failure, requiring controlled supplemental oxygen, but for some with significantly impaired lung function there is inability to maintain normal ventilation with a rise in carbon dioxide – hypercapnia – and this is termed ventilatory failure. This occurs in approximately 13-18% of admitted patients and is of huge significance as the raised carbon dioxide causes the body to become acidic, as measured by the pH. If untreated, previous studies show over a 26% mortality rate[69, 70], with more recent studies confirming this with 10% mortality if the pH is 7.35 or below and 50% mortality if the pH is 7.25 or below[71].

[66] *RCP (2020) National Asthma and COPD Audit Programme (NACAP): Pulmonary rehabilitation clinical audit interim report, https://www.rcplondon.ac.uk/projects/outputs/national-asthma-and-copd-audit-programme-nacap-pulmonary-rehabilitation-clinical*

[67] *BLF, Taskforce for Lung Health, https://www.blf.org.uk/taskforce/plan*

[68] *Bucknall C E, Miller G, Lloyd S M, Cleland J, McCluskey S, Cotton M et al. (2012) Glasgow supported self-management trial (GSuST) for patients with moderate to severe COPD: randomised controlled trial BMJ; 344 :e1060.*

[69] *Sylvia Hartl, et al. (2016) Risk of death and readmission of hospital-admitted COPD exacerbations: European COPD Audit, European Respiratory Journal 47:113-121.*

[70] *Andrew, A et al. (1992) Acute hypercapnic respiratory failure in patients with chronic obstructive lung disease: risk factors and use of guidelines for management, Thorax; 47:34-40.*

[71] *Plant PK, Owen JL, Elliott MW. (2001) Non-invasive ventilation in acute exacerbations of chronic obstructive pulmonary disease: long term survival and predictors of in-hospital outcome, Thorax;56:708-712.*

Organisationally, the impacts of COPD exacerbations on hospital activities are huge, especially during the winter months when viral infections peak (**Figure 6**). The number of exacerbations increases, contributing to the respiratory admissions that produce the annual 'winter bed crisis'. Flu vaccination is an important factor to limit the impact but there is wide variation in both patients and healthcare professionals accessing vaccination as shown in *Medicines optimisation*, page 126.

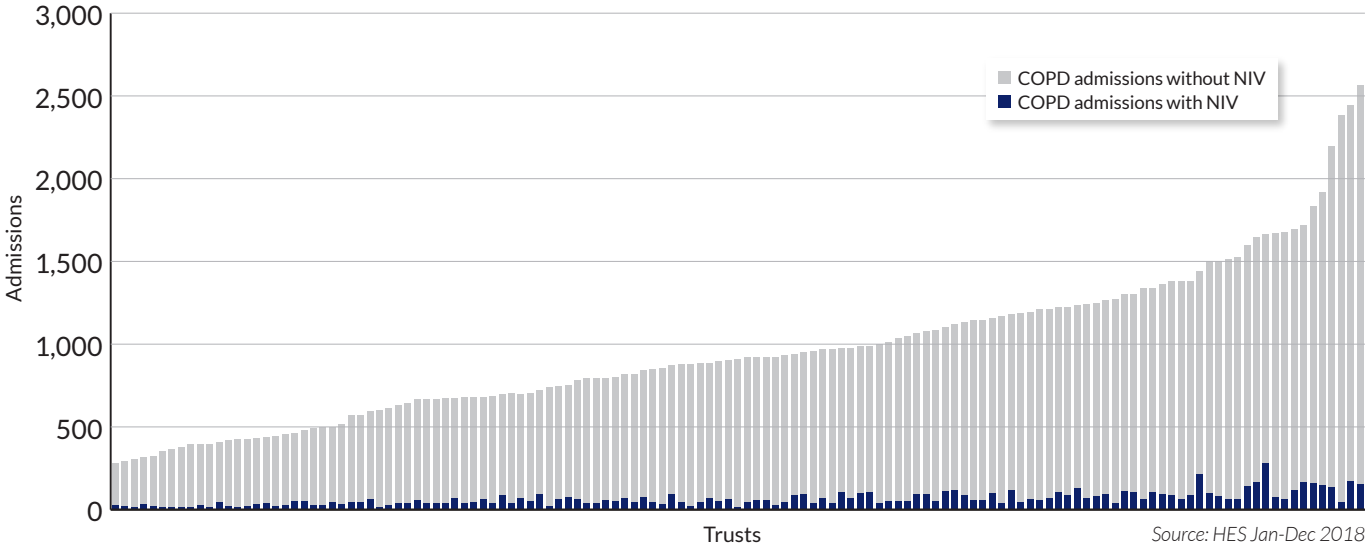
As can be appreciated from the above, delivering comprehensive COPD care is a complicated area. To ensure it is delivered effectively, consultant oversight is needed within the hospital, with sessional commitments for service development and delivery. For smaller trusts, the oxygen and COPD lead can be the same but given the wider brief of oxygen services, larger trusts will need a separate lead which should cross into the community so there is true integration of oxygen services.

For COPD, recognising the role in the community is large and sessional time is needed to support COPD services in the community. These should include a large educational component, joint community and hospital MDTs, supporting primary care, oversight of spirometry services with physiology colleagues and providing governance for the out-of-hospital services leading to seamless care. As discussed in *Integrated Care*, on page 103, this is a major challenge. To facilitate this process there needs to be IT integration – this was lacking in virtually all the systems we visited but is an issue that needs to be addressed.

Variations in admissions

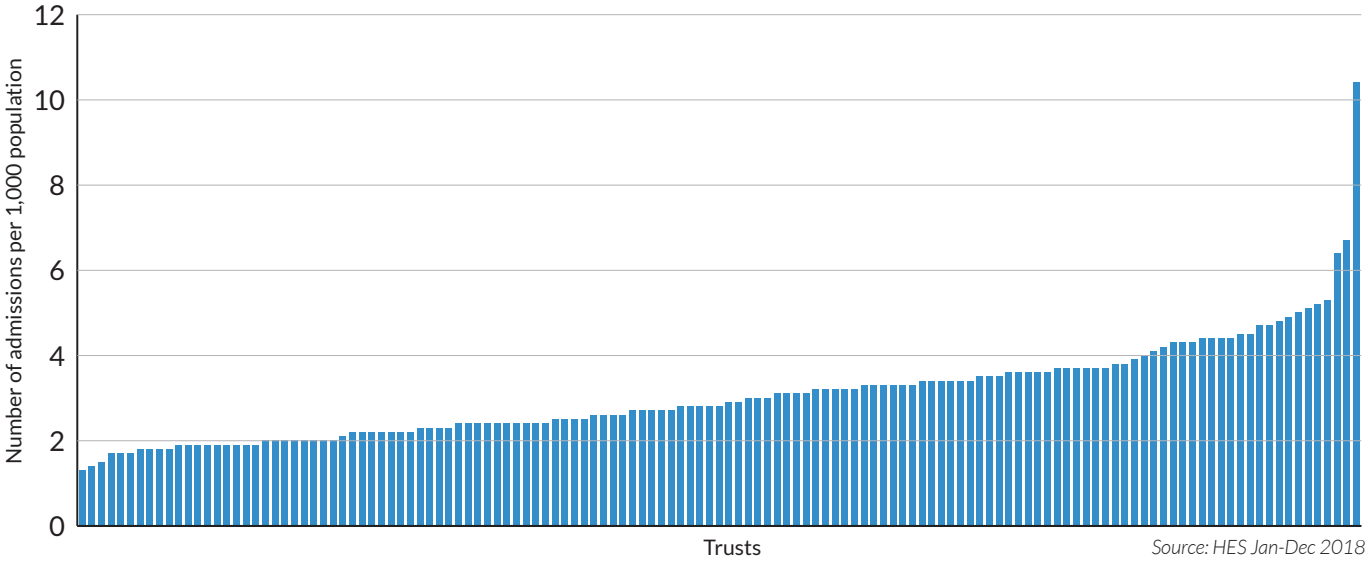
General medical admissions to hospital have increased by around 3% per year while exacerbations of COPD are estimated to have increased by around 11% per year according to the British Lung Foundation. There is variation in the number of admissions across hospitals, as shown in **Figure 27**, but less marked variation when looking at admissions per 1,000 population, as shown in **Figure 28**. The three hospitals with greater than six admissions per 1,000 population are in some of the most deprived areas in England, highlighting the increased risk of COPD admission from deprivation.

Figure 27: COPD admissions for each provider and the number that receive NIV



Source: HES Jan-Dec 2018

Figure 28: COPD emergency admission rate per 1,000 catchment population



Source: HES Jan-Dec 2018

Process of care

For many years, the process of care for an exacerbation of COPD was hospitalisation, with patients being admitted under any physician, leading to a length of stay of around 10 days. Following pioneering work[72] it was clear that many patients could go home earlier if assessed by an expert respiratory team who supported the patient home and followed them up in the community. This led to widescale development of some form of supported early discharge. The success of this is highlighted by the specific HRG DZ65K for patients admitted with LoS 1 day or less - 41,726 patients, 32.5% of all COPD admissions. Such supportive discharge was not present in all trusts though.

The model for delivering the supportive discharge varies, with some trusts having a combination of nursing and physiotherapy staff who see patients within the hospital and then follow-up in the community with a combination of virtual, phone calls or actual visits, often loaning compressors that are then returned to the acute provider. Some hospitals have a mixed model where a hospital team identifies and manages acute COPD patients and facilitates discharge, with a community team following the patient up post-discharge. Irrespective of the model and associated funding, governance of the system is required together with clear lines of responsibility for patient care that should have senior clinician oversight. From the deep dives we learned that this governance aspect does not routinely occur, as highlighted in *Integrated care*, page 103.

An additional issue, depending upon the model, is the extent of the service. During deep dives we found many examples where the service was very limited in its reach and timing, irrespective of the funding or model used. In hospitals, many services are only provided to the acute medical unit and/or on the respiratory wards, which probably leads to variations in LoS. On an individual trust basis, it was possible, by using the data on LoS for different discharging specialties compared to the England average, to recognise where extra COPD team input was required.

The days and duration the team worked is also likely to have an impact on facilitating discharge, although the data to confirm this was limited. Ideally an extended day of 08.00 to 20.00 during the working week, and a shorter time at weekends, allows a greater number of discharges. To ensure this extended working is as efficient as possible, some teams combine the supportive discharge role with that of undertaking ward based oxygen assessments and completing the home oxygen order form (HOOF).

Funding for some of this infrastructure is available by completion of a COPD incentive – currently the Best Practice Tariff (BPT). This was introduced for the period 2017/19 to incentivise optimal care with components that include: a specialist review of a patient's care within 24 hours of emergency admission; checking and correcting inhaler technique, identification for pulmonary rehabilitation; and general management advice all delivered as a care bundle. To qualify for the incentive (and thus, be able to increase income), 60% of COPD patients must receive the above bundle.

[72] *Cotton MM, Bucknall CE, Dagg KD, et al. (2000) Early discharge for patients with exacerbations of chronic obstructive pulmonary disease: a randomized controlled trial, Thorax.;55(11):902-906.*

While most trusts self-report appropriate use of COPD care bundles at 75-100% (see *Improving care for patients with pneumonia*, page 72, for bundle compliance data), there is still a large number of trusts not reaching the 60% COPD care bundle threshold, and therefore not meeting the incentive scheme criteria and missing out on increased income to support service improvement. A key change that was to be introduced in April 2020, but deferred due to COVID-19, was to use the inhaler with the lowest carbon footprint, an area discussed in *Medicines Optimisation*, page 126. Compliance with these criteria is measured by the National COPD Audit Programme, NACAP, hosted by the Royal College of Physicians.

National Asthma and COPD Audit Programme (NACAP)

Recognising that care for COPD could be improved, the Healthcare Quality Improvement Partnership has funded a rolling audit that includes both adult and childhood asthma, pulmonary rehabilitation, and acute COPD care, called the National Asthma and COPD Audit Programme (NACAP).

While NACAP is a mandatory audit that contributes to quality accounts, we found the uptake for COPD was better than for asthma but not uniform. It is based upon key data points being entered for each patient admitted with an exacerbation of COPD to allow a rolling profile of care with intermittent organisational surveys. There are twice-yearly national updates of key metrics and each trust should look at the outputs from the audit at board level and consider what changes are required to improve patient outcomes. Trusts can submit data and review their own progress and outcomes, something that is being supported by the Academic Health Science Networks (AHSNs).

A major factor in ensuring patients are entered into the dataset is sufficient data entry support, but we found several problems with this. In many trusts there was no data entry clerk, consequently patient information was abstracted from clinical notes by nursing staff, but not entered. This effectively gives the trust a poor performance as the number of returns versus the number of admissions is low – the case ascertainment ratio is low, as well as dropping below the 60% incentive payment threshold. Case ascertainment is a measure of data quality, and gives an indication as to how well a trust is submitting data about patients. Frequently we found Band 6 clinical staff not actually seeing patients but entering data, a very inefficient use of their limited time and their expertise. Consequently, we made numerous recommendations at trust level to ensure there were sufficient administrative staff available for data input.

An additional area around case ascertainment was ensuring the underlying diagnosis was correct. As noted previously, many patients with breathlessness may be 'labelled' on their first admission by non-respiratory clinicians, with an apparent absence of spirometry as having COPD, potentially leading to patients being started on the wrong treatment. With these false diagnoses, the denominator for COPD admissions is disproportionately high, potentially affecting payment. We found several examples where consultant staff proactively reviewed the case notes of patients 'diagnosed' with COPD and corrected the diagnoses, including at The Royal Wolverhampton NHS Trust, University Hospitals of Leicester NHS Trust and Nottingham University Hospitals NHS Trust.

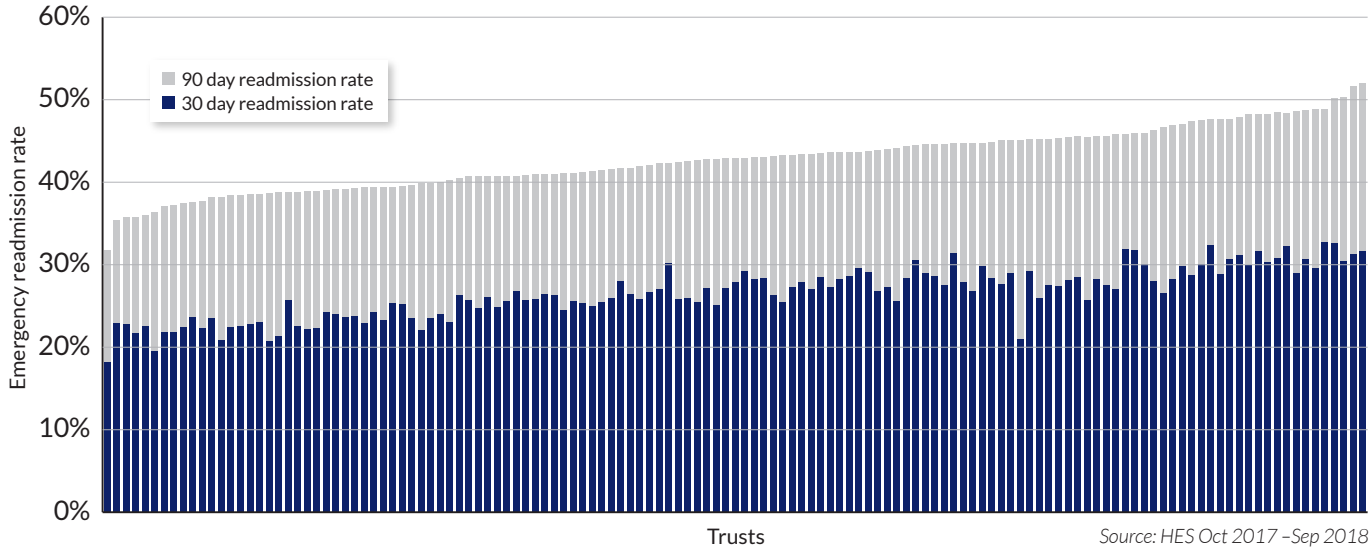
There were excellent examples of high quality COPD care, for example at Harrogate and District NHS Foundation Trust, where care is overseen by nurses and is associated with relatively low 30- and 90-day readmission rate and, by using a data capture form, a high case ascertainment at 62%. Patients are followed up in 72 hours and seen face-to-face on day 14, which is automatically arranged before discharge in the assessment room. On the wards or at home, patients are reviewed by the integrated care team. These findings were not routine and the greatest concern we found on the deep dives were insufficient numbers of nurses and physiotherapists, or equally qualified, competent professionals, to review all patients admitted with COPD. This means that patients who would benefit from care are unable to access this vital input. We expected this would affect both LoS and readmission rates and this was what we found in our data, and confirmed during deep dives. We made many recommendations at trust level to expand the COPD assessment team to other wards, often care of the elderly, where there was no input. The key areas that the COPD teams deliver in the care bundles, including inhaler technique, are therefore neglected. This is not good for the patient nor the trust as it will contribute to an increased LoS and to readmissions (see below) that lead to progressive deconditioning with each admission.

To ensure care can be delivered, we would expect a minimum of one Band 6 COPD nurse per 300 admissions to deliver the care bundles and education, together with administrative time for the team to help with general correspondence concerning contacting primary care and rehabilitation teams, together with data entry into NACAP. Additional consultant medical time is needed within the hospital, with a nominated COPD lead, who is responsible for the NACAP audit, supports the COPD team and undertakes the MDTs in hospital. Ideally there should be close links between this lead and the community integrated care services if they are different individuals. This activity should be reflected in the consultant's job plan.

Readmissions for COPD

Readmissions for COPD are common, but European figures suggest around 35% of patients may readmit at 90 days, an important finding given that this is a predictor of mortality.[73] We explored the percentage readmission rates at 30 and 90 days and found considerable variation in the population aged 80 years and less as shown in **Figure 29**. While readmission may occur for a variety of reasons, the marked variation would suggest that some are amenable to interventions, as outlined above. If all hospitals were able to achieve a target of 20% for readmissions, then 6,000 subsequent emergency readmissions could be avoided (see *Notional Financial Opportunities*, on page 156).

Figure 29: COPD 30-day and 90-day emergency readmission rates



Source: HES Oct 2017 –Sep 2018

We explored the reasons for readmission by looking in more detail at the 30-day readmission rates. As shown in **Figure 30**, around half of the readmissions were due to further exacerbations of COPD. These readmissions could potentially be open to intervention by enhanced support, including rescue packs (a pack of medicines that COPD patients can keep at home and take at the beginning of a flare up to prevent their conditions worsening). This suggestion has substance as Salford Royal NHS Foundation Trust has one of the lowest 30-day readmissions for COPD in England. This is achieved by the supportive early discharge team following patients up at home for the 30 days and also using telemonitoring to help identify problems to allow the team to intervene and usually prevent the admission.

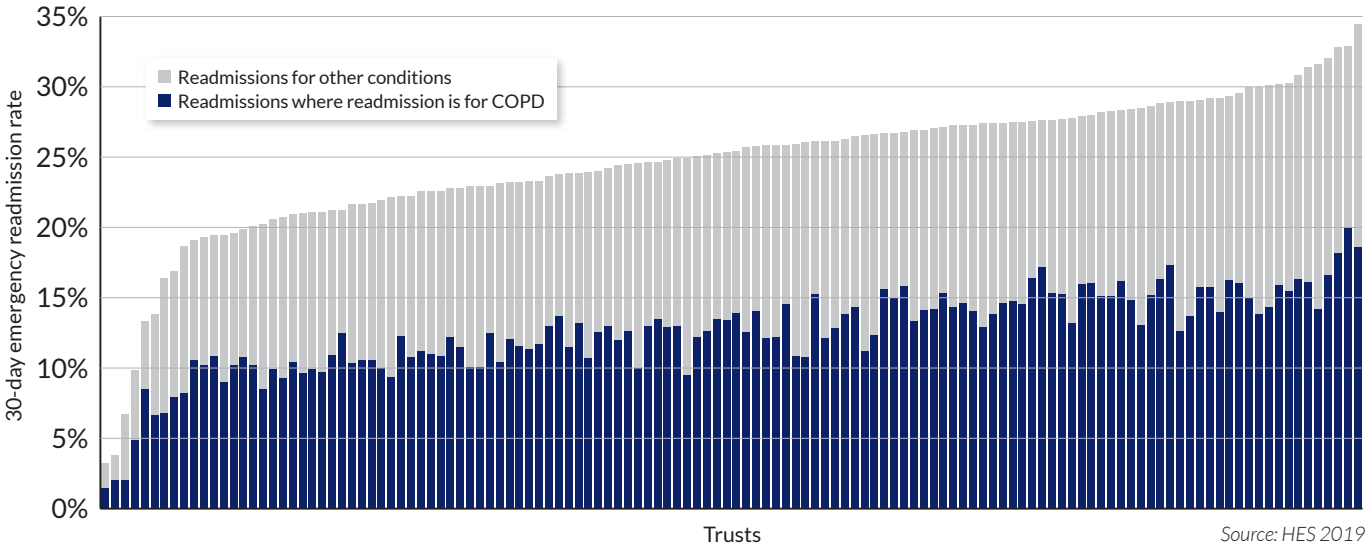
For the 12,875 readmission episodes at 30 days where the reason for readmission was not coded as COPD, we found from the ICD10 discharge codes that the largest number - 3,940 cases (30%) - were due to pneumonia. It is uncertain whether these readmissions were due to true pneumonia, or COPD with radiographic changes, a problem of the classification hierarchy noted in the pneumonia section. Potentially, this 30% of patients readmitted with infection, if true, may be amenable to management by modifying antibiotic strategies and a more detailed explanation to the patient that it is normal to continue to have cough and breathlessness as recovery from the infection takes place[74].

A relatively small number - 3.7% - were classified as respiratory failure, but again, this may represent an error of coding or be correct, though it was not clear from the codes (see below) that they received non-invasive ventilation. There is perception among clinicians that many readmissions are due to cardiac causes, however this group accounted for only 6% of the 12,875 episodes of readmission, with 425 due to heart failure, 221 due to any sort of arrhythmia and 133 to acute myocardial injury.

[73] *Sylvia Hartl, Jose Luis Lopez-Campos, Francisco Pozo-Rodriguez, Ady Castro-Acosta, Michael Studnicka, Bernhard Kaiser, C. Michael Roberts (2016) Risk of death and readmission of hospital-admitted COPD exacerbations: European COPD Audit, European Respiratory Journal Jan, 47 (1) 113-121.*

[74] *NICE (2017) Asthma: diagnosis, monitoring and chronic asthma management, https://www.nice.org.uk/guidance/ng80*

Figure 30: Variation in 30-day emergency readmission rates for patients 80 and under with a primary diagnosis of COPD split into whether readmitted for COPD or for another reason



Source: HES 2019

A further exploration of the reasons for readmissions at trust level will allow for better targeted management to limit patients' repeat hospital attendance. While we could not correlate the nursing numbers with readmissions, there is evidence that readmissions relate to infrastructure.[75] It would be expected that failure to deliver the known beneficial intervention of care bundles would contribute to readmissions, and so ensuring all patients get a COPD bundle would be the first step. Such an assessment also helps identify the importance for some patients and their carers of addressing their social and psychological factors. This in turn may have a positive impact on readmission rates, with patients better prepared and motivated for home management of their condition.

Length of stay (LoS) and readmissions

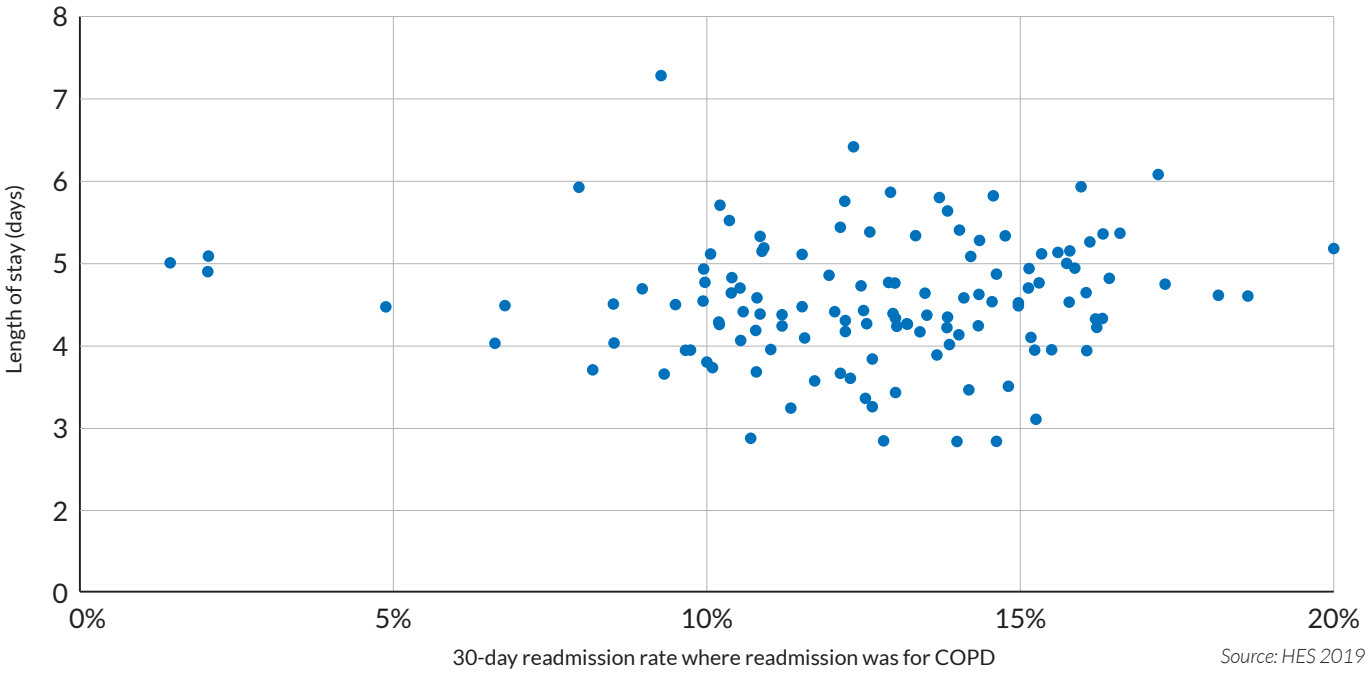
Managing LoS is important to reduce bed occupancy. We found 31% of patients had a LoS of 1 day or less. The average LoS was 4.5 days with a median of 3 days and an interquartile range of 1-6 days. However, there is always a concern that reducing LoS may lead to excess readmissions. We looked at the readmission rates of patients whether these were for a COPD or non-COPD readmissions.

Figure 31 explores the 30-day readmission rate for each trust expressed as a percentage against LoS when the readmission was due to COPD alone. As can be seen, there were four trusts that managed to have a low average LoS, and had a low readmission rate of below 5%.

When we undertook a similar review for the data relating to any reason for readmission (**Figure 32**), we found six hospitals that had a similar overall LoS but the readmission rate was below 15%. The four trusts in **Figure 31** are the same trusts that perform well in **Figure 32** for COPD readmission, suggesting they have good systematic processes in place for managing readmissions. If all trusts were able to get average length of stay for COPD down to 5.4 days (national mean) or 5.1 days (best quartile), there would be 24,000 or 40,000 respective bed days saved (see *Notional Financial Opportunities*, page 156).

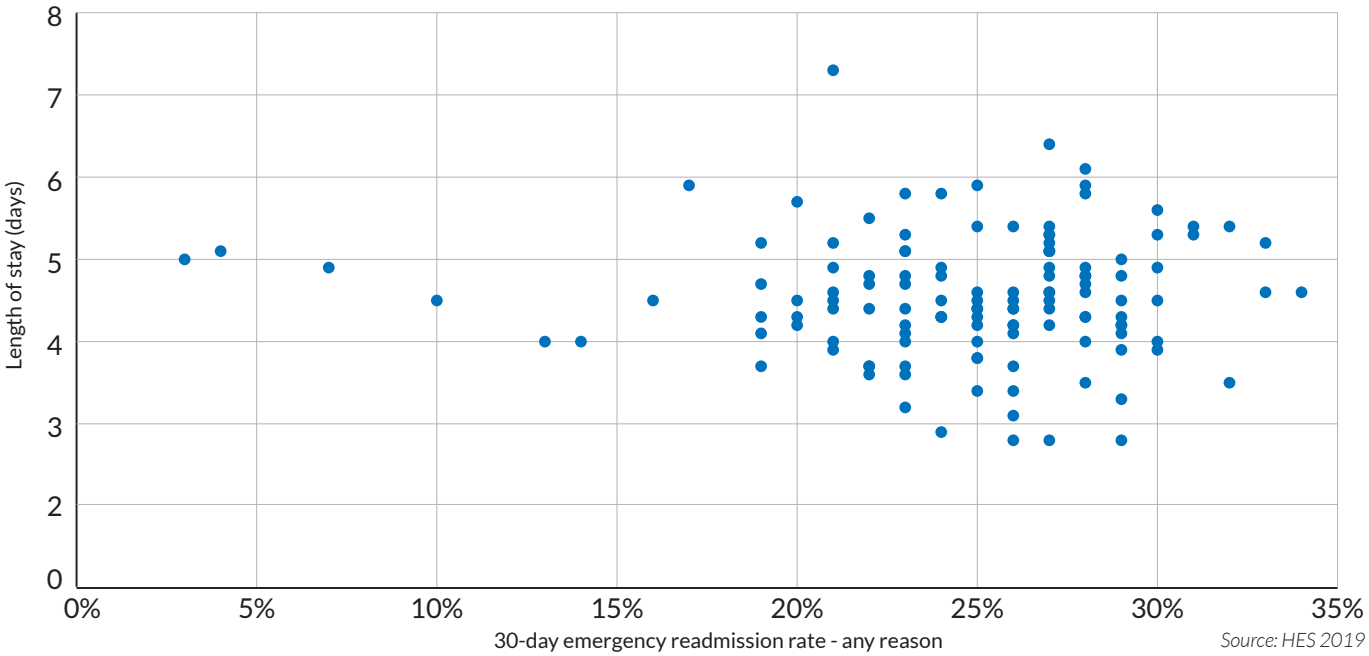
[75] *Sylvia Hartl, et al. (2016) Risk of death and readmission of hospital-admitted COPD exacerbations: European COPD Audit, European Respiratory Journal 47: 113-121.*

Figure 31: Relationship between length of stay and 30-day emergency readmission rate for patients with COPD, where the readmission was also for COPD



Source: HES 2019

Figure 32: Relationship between length of stay and 30-day emergency readmission rate for patients with COPD, where the readmission was for another reason



Source: HES 2019

CASE STUDY

Algorithm aided consultations improve accuracy of COPD diagnoses

Aintree University Hospitals NHS Foundation Trust

Diagnosis and management of COPD is not easy, with variable symptoms and changing guidelines. To aid this process 'Lung Health COPD', has been developed. Using algorithm-driven consultations healthcare professionals are able to undertake face-to-face or virtual reviews, with the software helping in the interpretation of spirometry and providing management advice that is based upon the most current guidelines. Pathways flag where alternative diagnoses need to be considered and educational material for patients can be printed or emailed to support self-management.

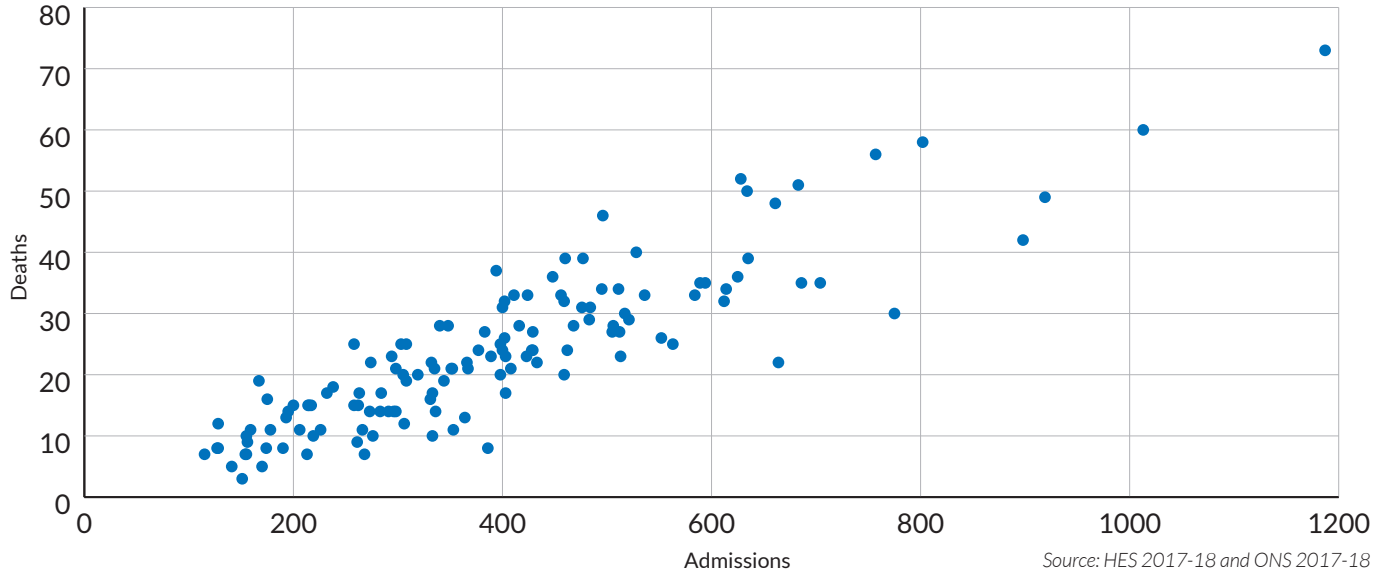
Implementation of Lung Health in primary care showed that 18% of patients had spirometry readings that were not consistent with COPD; adequate inhaler technique jumped from 68% to 95%. Prior to introducing the system, 44% of patients had a written management plan and this increased to 92% post use of the innovative software. Increases in referrals for smoking cessation interventions and pulmonary rehabilitation were also noted.

Mortality in COPD

Mortality from COPD in hospital is shown by the scatter plots in **Figure 33**, although some trusts are below the line of identity. As expected, this increases at 30 and 90 days and is worse in the elderly (note the change in axis). Deaths may occur from overwhelming infection, but often the issue is ventilatory failure as discussed above. Interventions to improve this are non-invasive ventilation (NIV), discussed below, and access to critical care for either provision of NIV, more advanced invasive support for patients who are either not candidates for NIV, or those who have failed NIV. The lack of NIV provision highlighted below places additional demands on critical care services.

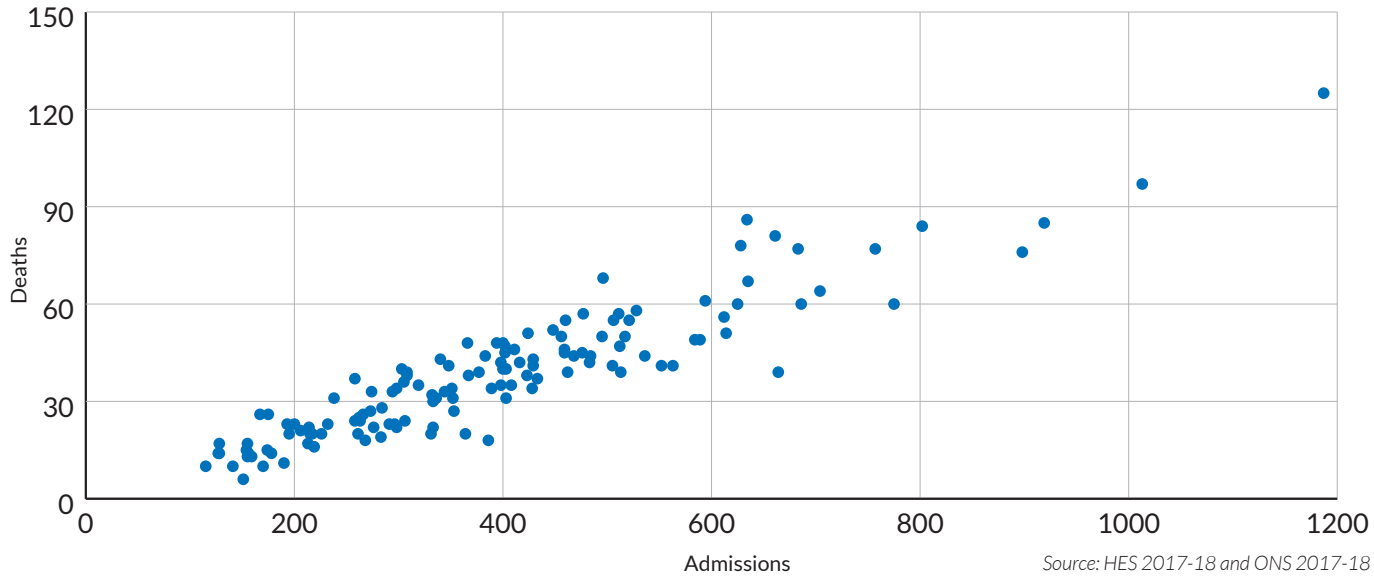
There is marked variation in patients accessing critical care and generally the number is small, with an average of 2% going to ITU. However, ITU seems to provide effective treatment with relatively low mortality both in hospital and at 30- and 90-days post discharge (**Figure 34**). This is in parallel with mortality among those not accessing or needing ITU. In some trusts, when there was a low number of patients going to ITU, we found evidence of excellent practice where colleagues used the ReSPECT (Recommended Summary Plan for Emergency Care and Treatment) documentation, with patients not being escalated to critical care as the appropriate documentation had been completed by the respiratory team, as in Chesterfield Royal Hospital NHS Foundation Trust. In Chelsea and Westminster Hospital NHS Foundation Trust, there is a strong palliative care focus which is adopted early in the patient pathway, also reducing the need for escalation. A form has been designed where the patient is involved in choosing their care, supported by a palliative care approach and education that starts at junior doctor induction.

Figure 33a: COPD – Scatterplots showing mortality rates (in and out of hospital) by age group
Overall 30-day mortality, 40-75 years



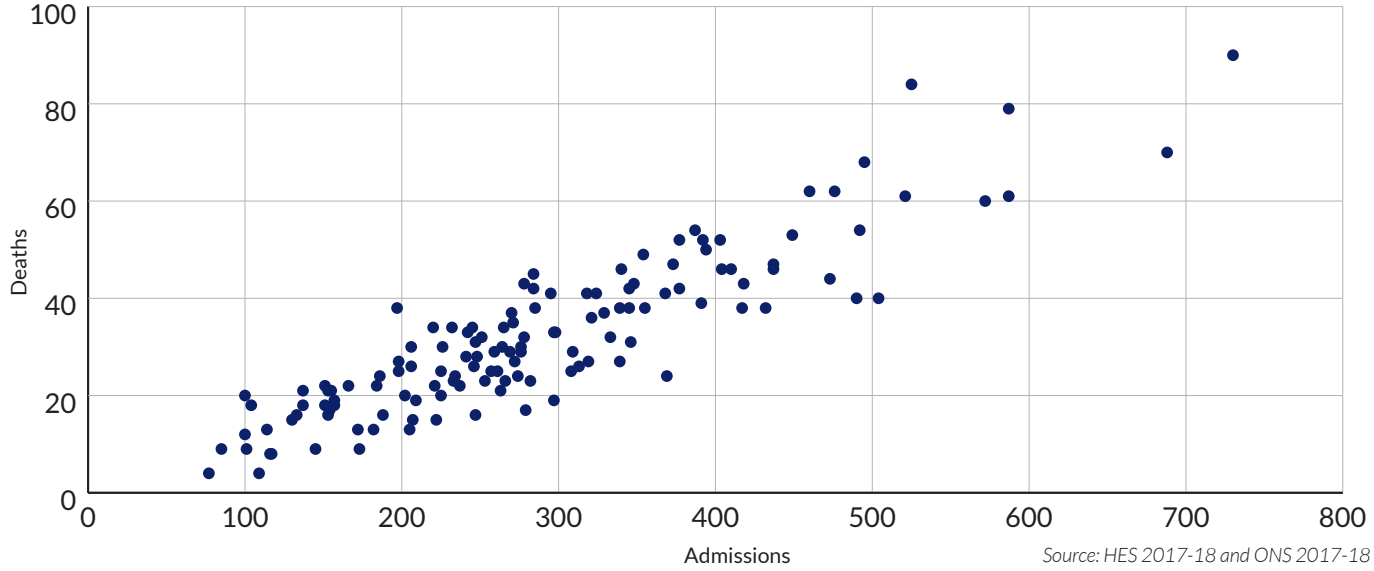
Source: HES 2017-18 and ONS 2017-18

Figure 33b: COPD – Scatterplots showing mortality rates (in and out of hospital) by age group
Overall 90 day mortality, 40-75 years



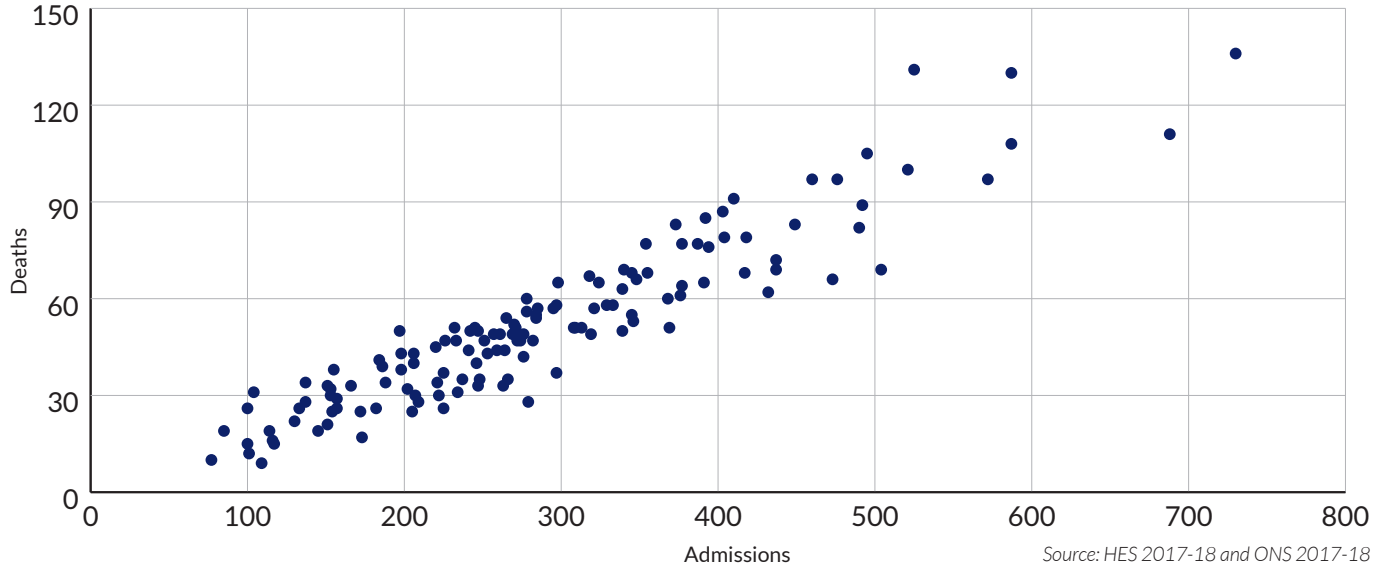
Source: HES 2017-18 and ONS 2017-18

Figure 33c: COPD – Scatterplots showing mortality rates (in and out of hospital) by age group
Overall 30 day mortality, 75+ years



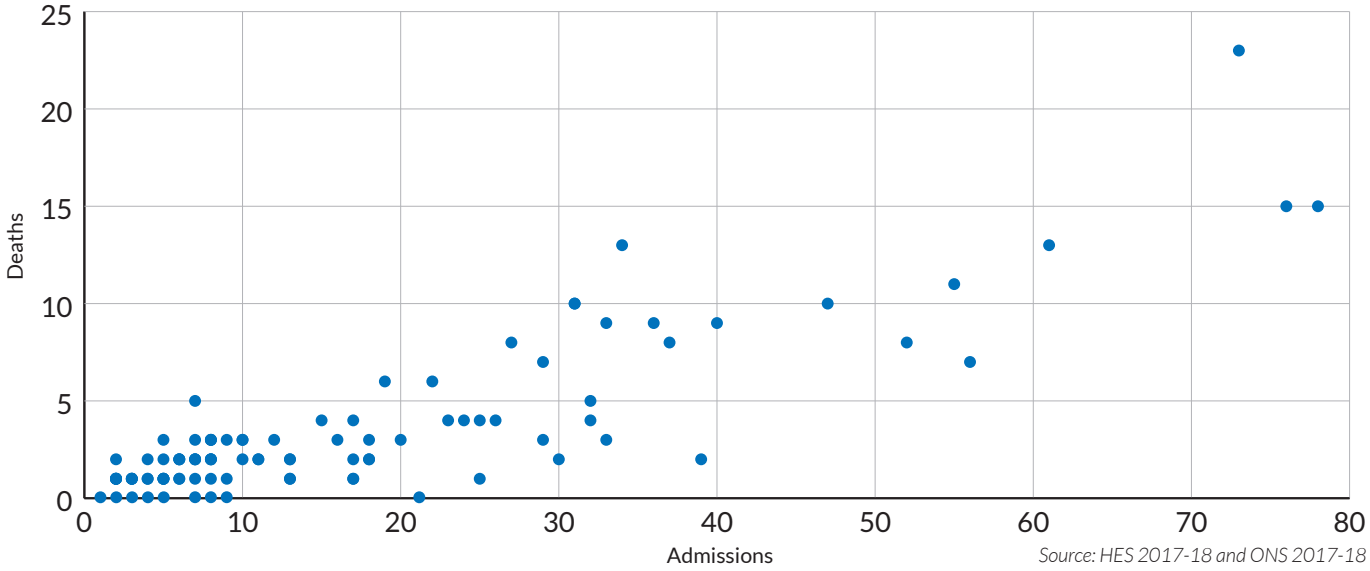
Source: HES 2017-18 and ONS 2017-18

Figure 33d: COPD – Scatterplots showing mortality rates (in and out of hospital) by age group
Overall 90 day mortality, 75+ years



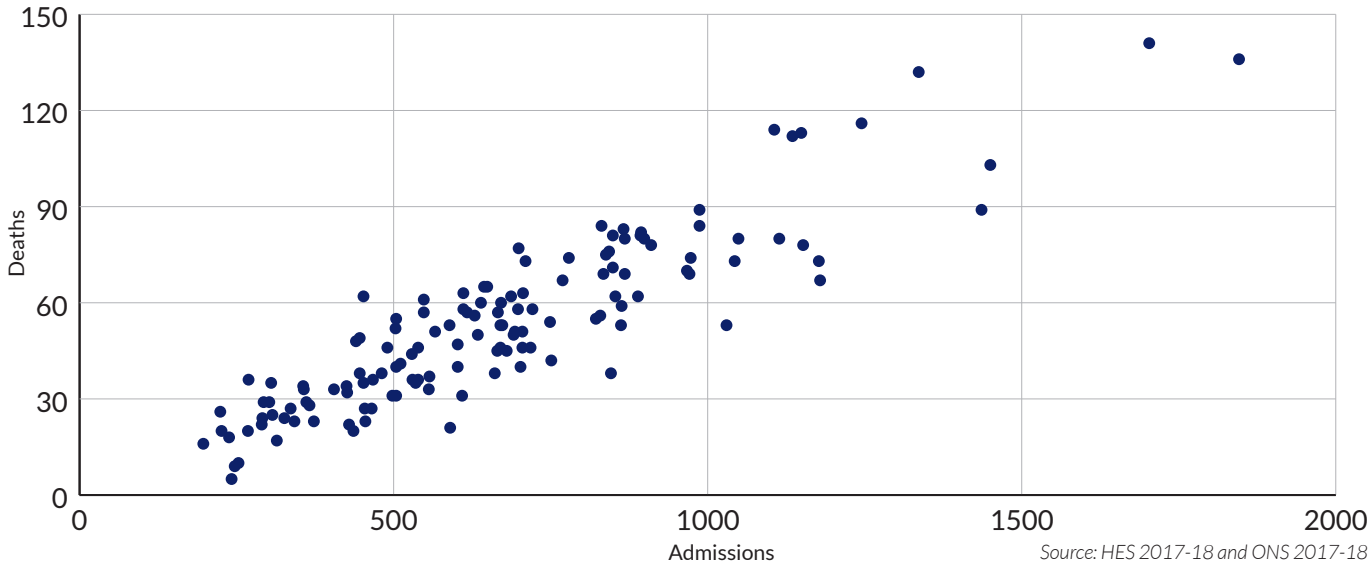
Source: HES 2017-18 and ONS 2017-18

Figure 34a: COPD – Scatterplot showing mortality (in and out of hospital) by ITU admission
ITU stay - 30 day mortality - 40+ years



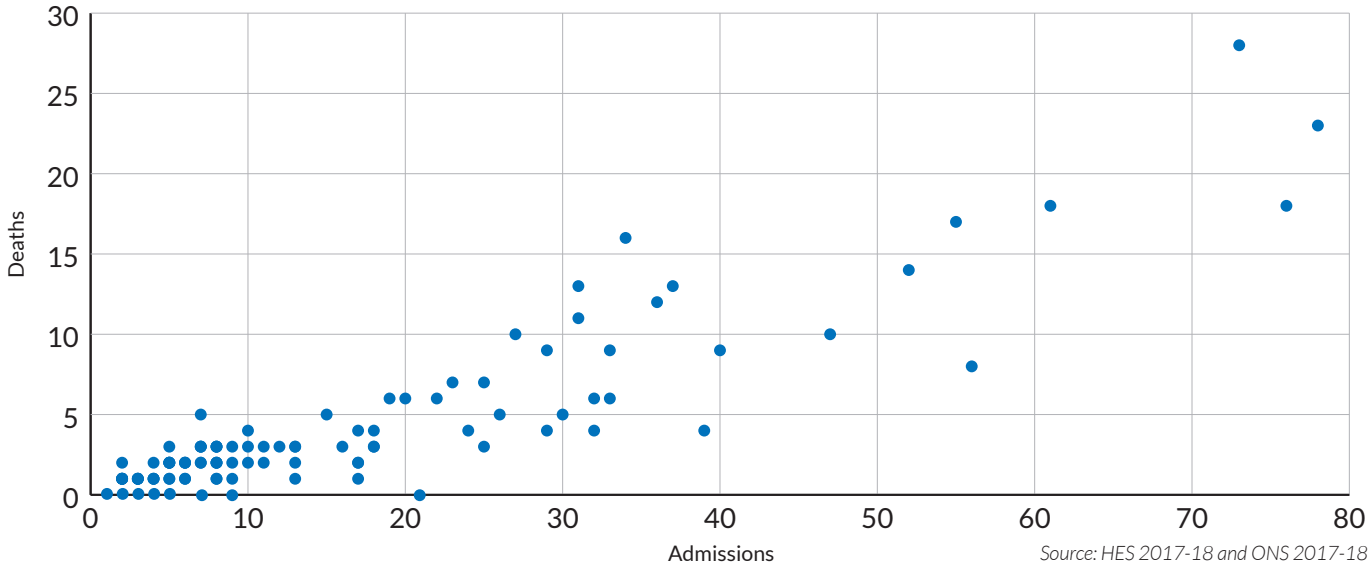
Source: HES 2017-18 and ONS 2017-18

Figure 34b: COPD – Scatterplot showing mortality (in and out of hospital) by ITU admission
No ITU stay - 30 day mortality - 40+ years



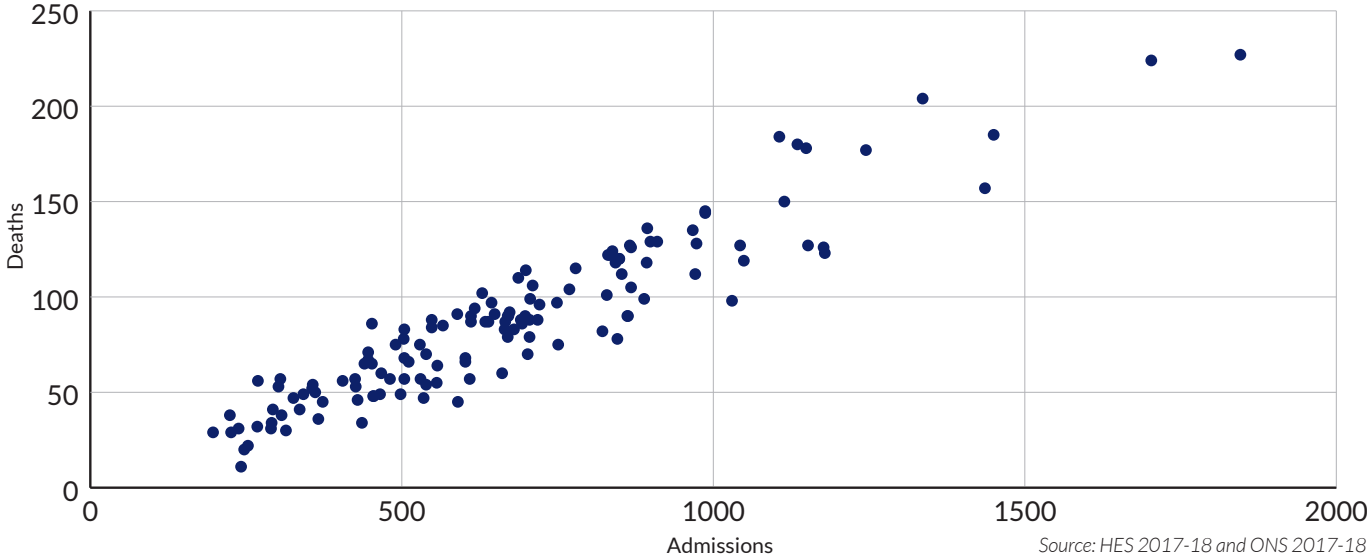
Source: HES 2017-18 and ONS 2017-18

Figure 34c: COPD – Scatterplot showing mortality (in and out of hospital) by ITU admission
ITU stay - 90 day mortality - 40+ years



Source: HES 2017-18 and ONS 2017-18

Figure 34d: COPD – Scatterplot showing mortality (in and out of hospital) by ITU admission
No ITU stay - 90 day mortality - 40+ years



Source: HES 2017-18 and ONS 2017-18

In many deep dives we found excellent working relationships between respiratory and critical care colleagues, with treatment escalated to critical care in a timely fashion. This was supported by patients who are receiving NIV having a clear treatment escalation plan (TEP) in place prior to the initiation of NIV. TEPs are used to encourage patient-clinical team decision-making for patients in whom acute clinical deterioration is a foreseeable risk and includes plans about escalation as well as ceiling of care, recognising that patients who have an initial positive response to NIV but then subsequently deteriorate often do so badly, and may not be candidates for critical care at that stage.

In a few trusts we found a poor relationship between critical care and respiratory medicine, with patients not routinely accessing critical care. This is a surprising finding in light of previous studies that have shown the outcome of ventilating patients with COPD during an exacerbation is difficult to predict.[76] In those trusts we suggested a discussion should take place between respiratory physicians and critical care physicians mediated by senior medical management to resolve disagreements over who should be escalated. This would be alongside sufficient NIV beds, the development of clear protocols so that patients can be identified early as they progress in their journey through hospital, and appropriate ReSPECT and TEP documentation completed. Those deemed suitable for escalation should progress to this with prompt transfer into critical care.

Recommendation: (COPD)

Recommendation	Actions	Owners	Timescale
14. Optimise care for patients with chronic obstructive pulmonary disease (COPD) to reduce length of stay, readmission rates, and overall mortality by using discharge bundles. Where demand exists, consider implementing seven-day services.	**a** Ensure a named respiratory consultant is appointed as a clinical lead for COPD, with this leadership responsibility reflected in their job plan.	Trusts	Within 6 months of publication
	b Consider implementing seven-day services and extending working days (e.g. to 8am-8pm) where possible/indicated to increase the potential for patients to receive facilitated discharge, reducing the likelihood of readmission.	Trusts	Within 18 months of publication
	c Appoint sufficient dedicated competency-based teams to consistently deliver discharge bundles designed to reduce likelihood of readmission –working toward a target of 1 nurse for every 300 COPD admissions.	Trusts	Within 12 months of publication
	d Model the number of patient discharges to track whether implementing the actions above has sufficiently reduced COPD LoS, readmission rates and overall mortality.	Trusts, GIRFT	On completion of actions above
	e Review the number of patients sent home under a supportive early discharge scheme against readmission rates to establish whether there is scope to increase zero LoS patients working toward a target of 20% zero LoS without increasing readmission rates beyond 15%.	Trusts	Within 12 months of publication

[76] *Wildman Martin J, Sanderson Colin, Groves Jayne et al. (2007) Implications of prognostic pessimism in patients with COPD or asthma admitted to intensive care in the UK within the COPD and asthma outcome study (CAOS): multicentre observational cohort study, BMJ; 335 :1132.*

Provision and access to non-invasive ventilation (NIV)

NIV is a technique of supporting ventilation by a non-invasive interface, usually a mask held on by appropriate straps to produce a seal that allows a machine (the ventilator) to deliver a positive pressure to the airways. There are a variety of ventilators with different modes that can allow pressure or volume variations in both the inspiratory and expiratory part of the breathing cycle that are triggered by the patient initiating a breath that is augmented by the ventilator. Depending on the machine, some have a default mode where the machine will deliver a breath after a set time period in case the patient is not making any effort.

With the advent of smaller machines and better interfaces, several studies confirmed that NIV could treat ventilatory failure effectively during exacerbations of COPD without the need for intubation and mechanical (ITU) ventilation. Moreover, the treatment was effective at relieving symptoms and could easily be withdrawn and then reintroduced, so gradually providing less support as the patient's condition improved.[77] Further studies confirmed the ideal time to start support is when the pH is 7.35 or below, which leads to marked improved survival.[78]

This widespread benefit led to the development of acute NIV services, with dedicated units becoming the norm throughout Europe, with clear guidelines for use.[79] In England, there is some variability of provision, as we discovered in our deep dives, with occasional agreements that services will be provided in either a higher dependency area of the acute medical unit or within the HDU part of critical care. Both models have the theoretical disadvantage that the chest physician is not always available so some of the holistic care of COPD may not be provided. Consequently, most NIV units are placed, or should be placed, within the respiratory medicine bed base.

Unfortunately, outcomes from some units were not universally good, with variations in care noted from BTS self-reported NIV audits.[80] As a result, the National Confidential Enquiry into Patient Outcome and Death (NCEPOD) undertook a structured review of NIV services, publishing its report[81] on NIV in 2017. The NCEPOD report found wide variation in both the organisation of acute NIV services and the clinical care provided. The report highlighted that NIV treatment was often delayed due to poor recognition of which patients would most benefit. Inadequate monitoring of vital signs and blood gases was also observed, together with the key role for dedicated specialist staff. NCEPOD also illustrated significant variation in nursing infrastructure to deliver NIV. Based on NCEPOD, the BTS produced quality standards for effective NIV services in 2018[82] which specified in detail the infrastructure that is required, together with the process of care that should be adhered to.

While there are many facets to the BTS quality standard, we asked in our questionnaire about the number of beds for NIV in acute provider units and explored the equipment and staffing during deep dives. The results for number of beds is shown in **Figure 35**.

[77] *Bott, J et al. (1993) Randomised controlled trial of nasal ventilation in acute ventilatory failure due to chronic obstructive airways disease, The Lancet, https://www.sciencedirect.com/science/journal/01406736/341/8860" \o "Go to table of contents for this volume/issue*

[78] *Plant PK, Owen JL, Elliott MW (2001) Non-invasive ventilation in acute exacerbations of chronic obstructive pulmonary disease: long term survival and predictors of in-hospital outcome, Thorax; 56:708-712.*

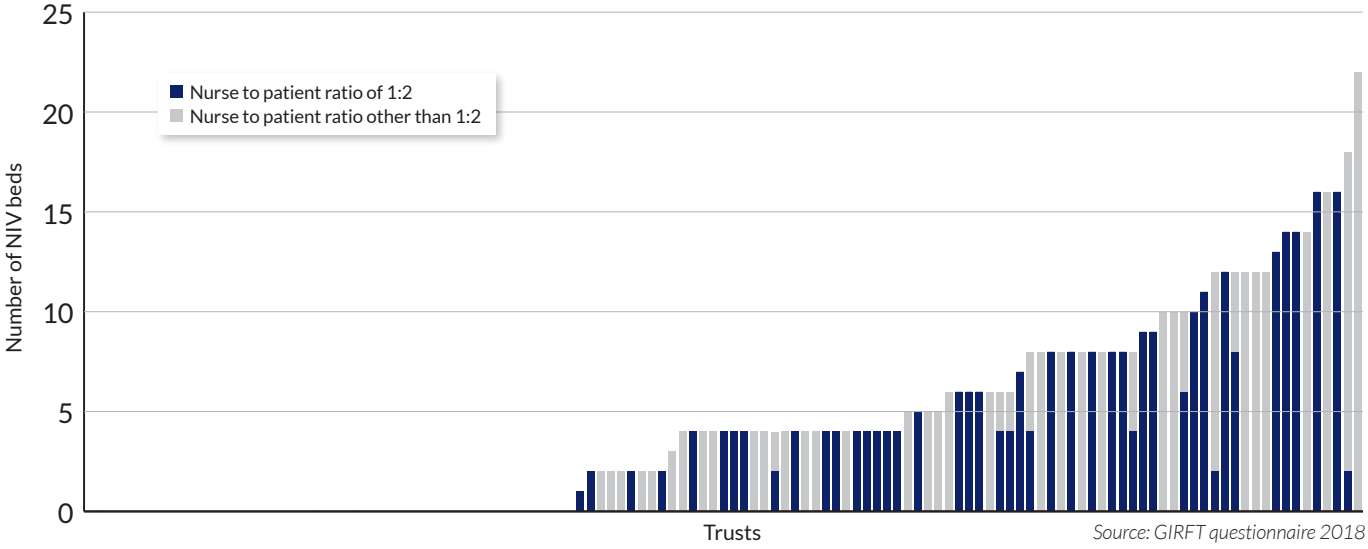
[79] *Rochwerg, B, et al. (2017) Official ERS/ATS clinical practice guidelines: noninvasive ventilation for acute respiratory failure, European Respiratory Journal, 50 (2) 1602426.*

[80] *BTS (2019) National Adult Non-Invasive Ventilation Audit 2019, https://www.brit-thoracic.org.uk/quality-improvement/clinical-audit/national-adult-non-invasive-ventilation-audit-2019/*

[81] *NCEPOD (2017) Inspiring change: a review of the quality of care provided to patients receiving acute non-invasive ventilation, https://www.ncepod.org.uk/2017report2/downloads/InspiringChange_FullReport.pdf*

[82] *Davies M, Allen M, Bentley A, et al. (2018) BTS Quality Standards for acute non-invasive ventilation in adults, BMJ Open Respiratory Research 5:e000283.*

Figure 35: Non-invasive ventilation bed numbers



Source: GIRFT questionnaire 2018

This showed, confirmed during deep dives, an alarming gap in provision of what has been shown to be a lifesaving treatment. We found 77 acute providers had dedicated NIV beds, of which only 43 had five or more beds. We found 29 trusts had increased their nursing staff ratios, but only 20 had sufficient numbers of nurses for the beds to fulfil the BTS standard (navy blue histogram bars). Furthermore, other prerequisites for the service such as a number of ventilators, clear documentation (as above), training and education plans, and close proximity to a blood gas machine with staff trained to undertake capillary gases, were often limited or absent.

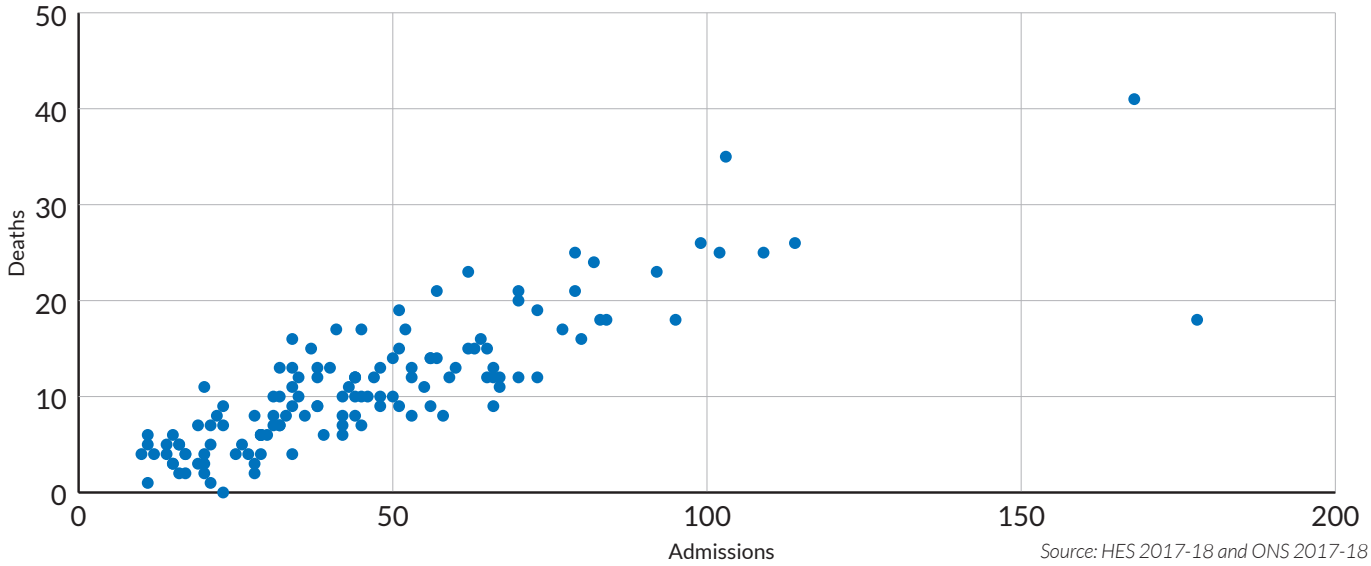
Given the clear standards and the documented effectiveness of NIV treatment this was concerning. While the most recent national BTS audit report has shown some improvement[83] the infrastructure issues remain. During deep dives we found several trusts had developed a less than ideal work-around to fulfil the gap, regularly hearing stories where respiratory consultants had submitted business cases highlighting the NCEPOD and BTS reports but had not been funded to develop such units. Given the marked variation in standard practice, the issue is being discussed with the Care Quality Commission (CQC) as a potential area for review.

This lack of infrastructure may be one explanation why so few patients appear to receive NIV as shown in **Figure 27** (see *Improving care for patients with COPD*, page 82), despite the estimated 13% to18% of patients in ventilatory failure.

Mortality for those patients who do and do not receive NIV is shown in the scatter plots of **Figure 36**. Perhaps more surprising from these plots is the low numbers of patients receiving NIV. We explored whether this relates to the number of beds, and the findings shown in **Figure 37** highlight the marked variability with 2% to 15% of patients across England receiving NIV.

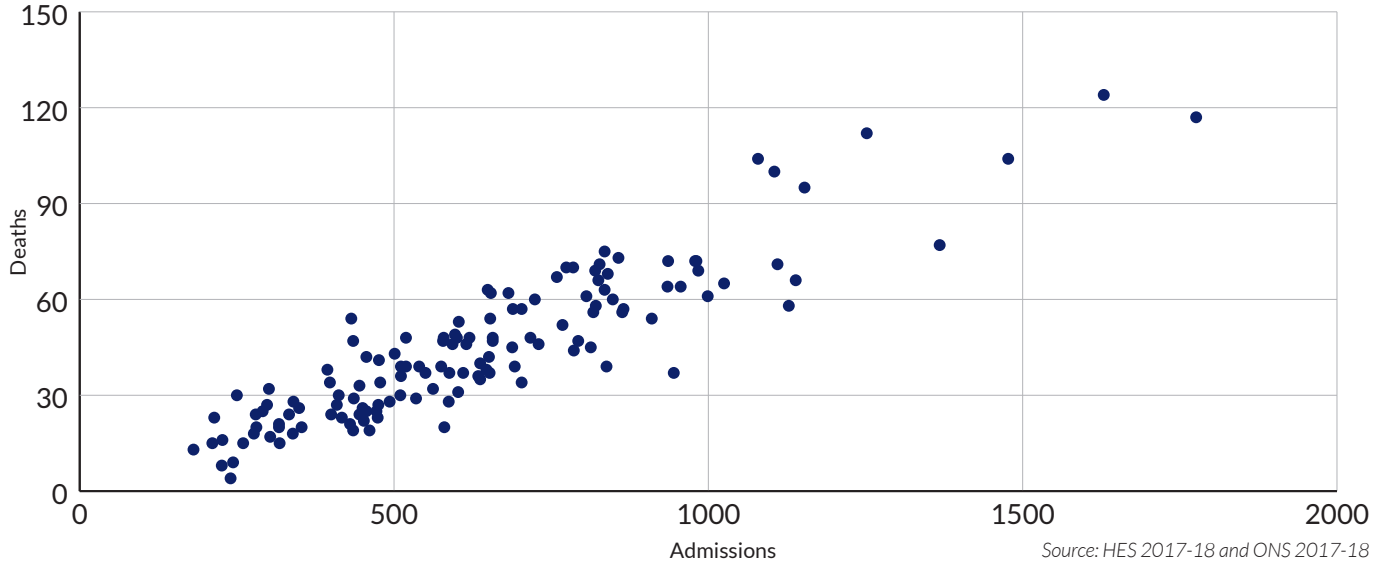
[83] *BTS (2019) National Adult Non-Invasive Ventilation Audit 2019, https://www.brit-thoracic.org.uk/quality-improvement/clinical-audit/national-adult-non-invasive-ventilation-audit-2019/*

Figure 36a: Scatterplot showing mortality (in and out of hospital) With NIV - 30 day mortality - 40+ years



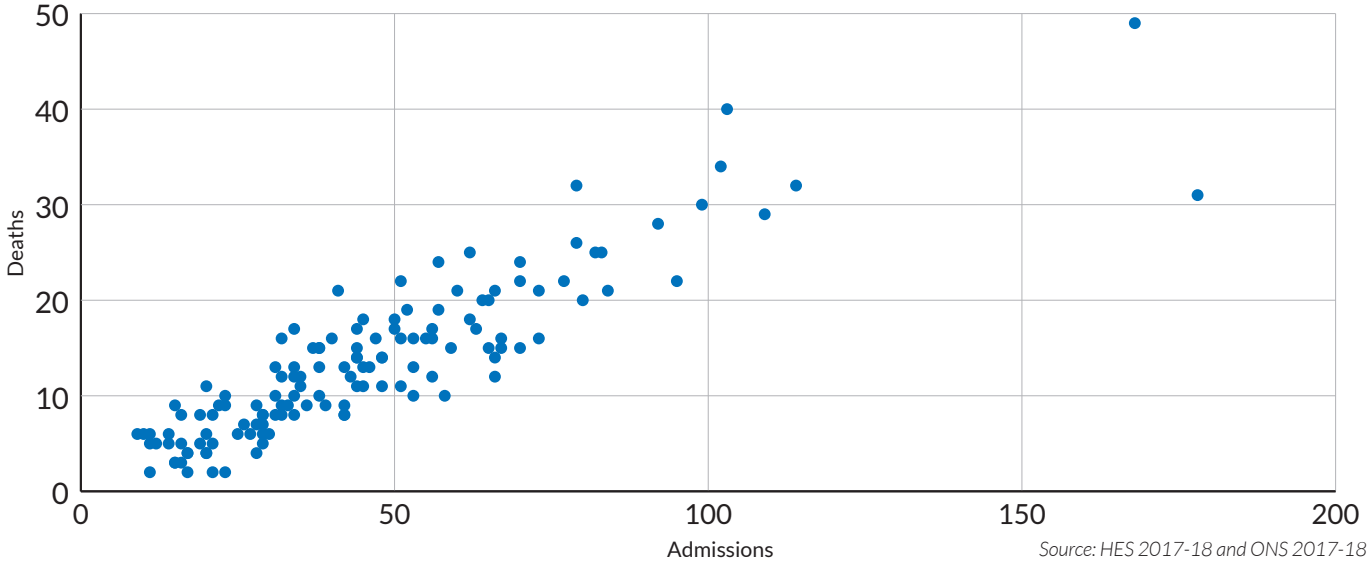
Source: HES 2017-18 and ONS 2017-18

Figure 36b: Scatterplot showing mortality (in and out of hospital) Without NIV - 30 day mortality - 40+ years



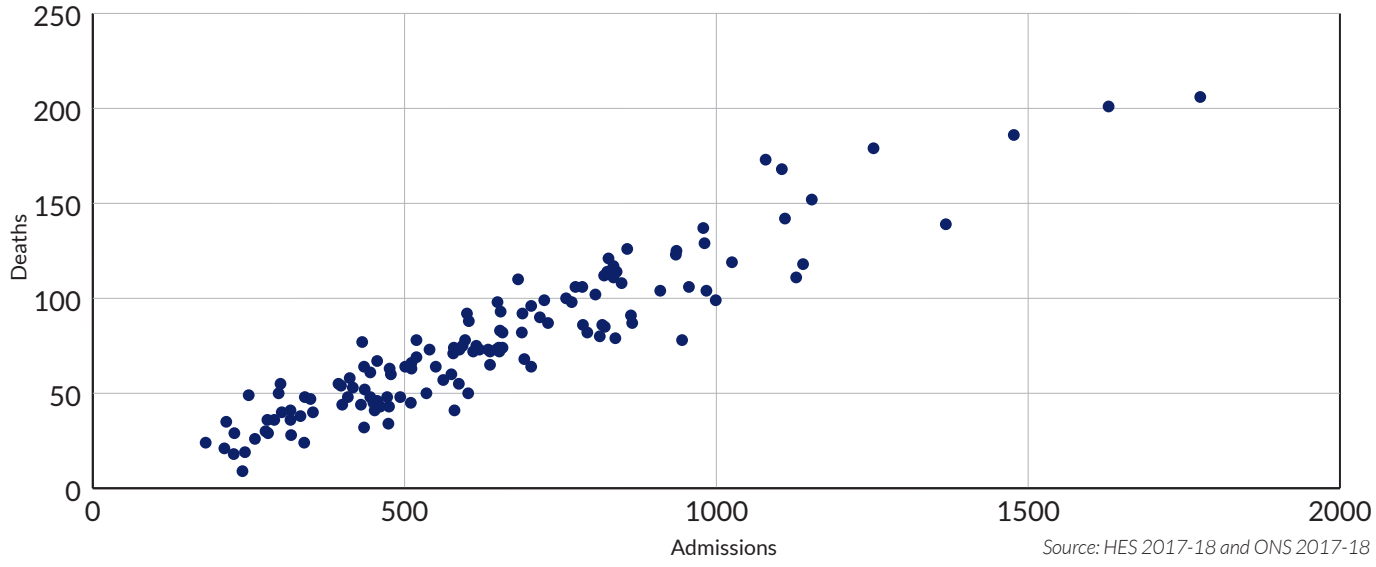
Source: HES 2017-18 and ONS 2017-18

Figure 36c: Scatterplot showing mortality (in and out of hospital) With NIV - 90 day mortality - 40+ years



Source: HES 2017-18 and ONS 2017-18

Figure 36d: Scatterplot showing mortality (in and out of hospital) Without NIV - 90 day mortality - 40+ years

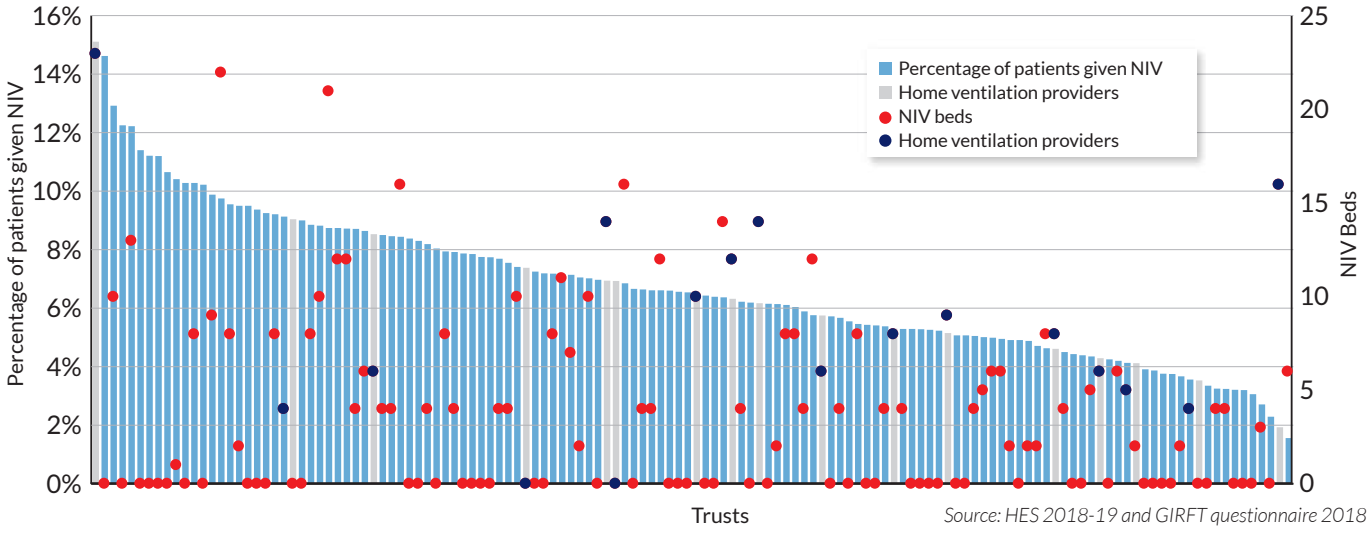


Source: HES 2017-18 and ONS 2017-18

The relationship with NIV bed availability and NIV use from coding was even more unusual. Some units declared they had several NIV beds, as shown in the red dots on **Figure 37**, but little activity. One large NIV unit that was recognised as providing specialised services (navy blue dots) had only 40 episodes of acute NIV per year but, in reality, was undertaking approximately 40 per month.

This suggests that the activity of acute NIV is not always being clearly documented on discharge letters, so coders are not capturing the appropriate code of E85.2. This is an important issue given the national tariff has been designed such that, with this code, there is an uplift to a different HRG and subsequent tariff to recognise the additional cost of delivering NIV care and thus appropriate reimbursement. Even under block contracts, knowing the extent of the activity allows discussion with commissioners to ensure appropriate resources are available.

Figure 37: Percentage of patients with COPD given non-invasive ventilation and number of NIV beds*



Source: HES 2018-19 and GIRFT questionnaire 2018

*It should be noted that the analysis above uses percentage figures and therefore small patient numbers could be skewing this data

Managing patients who readmit with recurrent ventilatory failure led initially to case series and then more structured studies confirming the benefits, both patient-focused and financial, of offering NIV to patients with recurrent admissions.[84] The HOT-HMV study has confirmed that those patients with COPD who have persistent hypercapnia 2-4 weeks post-discharge have reduced hospitalisation if subsequently established on domiciliary NIV.[85] Excellent examples of how the HOT-HMV care pathway has been built into standard practice were seen at Guy's and St Thomas' NHS Foundation Trust and Lancashire Teaching Hospitals NHS Foundation Trust.

This has been a significant change in practice by home mechanical ventilator services (see *Specialised Services*, page 114). Whether these patients should be initiated on home NIV at their local hospital, or at a specialised commissioning service is not established in the specification for Complex Home Ventilation (CHV), but if local services cannot instigate this important step change in care, patients, if willing to travel, should be referred to gain benefit from this intervention.

One key aspect of delivering NIV is its early use.[86] Delay in initiating NIV allows the acidosis to increase with a potentially worse outcome for the patient. The NACAP audit has reviewed the percentage of patients who get NIV within a generous two-hour window and found very low percentages of under 24%, reflecting the poor infrastructure described. A major issue is out-of-hours provision and we found considerable variation in how this was managed, including training medical SPRs to initiate. The best examples, however, were having a peripatetic nurse from the ventilation unit to be able to go and start

[84] *Tuggey, JM, Plant PK and Elliott MW (2003) Domiciliary non-invasive ventilation for recurrent acidotic exacerbations of COPD: an economic analysis, Thorax,58(10):867-71.*

[85] *Murphy PB, Rehal S, Arbane G, et al. (2017) Effect of Home Noninvasive Ventilation With Oxygen Therapy vs Oxygen Therapy Alone on Hospital Readmission or Death After an Acute COPD Exacerbation: A Randomized Clinical Trial. JAMA. 317(21):2177-2186.*

[86] *Rochwerg, B, et al. (2017) Official ERS/ATS clinical practice guidelines: noninvasive ventilation for acute respiratory failure, European Respiratory Journal, 50 (2) 1602426.*

ventilation immediately, usually in the ED or AMU, and stabilise the patient prior to transfer into the NIV unit, thus ensuring prompt treatment, as occurs in University Hospitals of North Midlands NHS Trust.

If we are to make significant inroads into the high mortality associated with COPD exacerbations, we must use proven treatments effectively. The lack of NIV beds, insufficient nursing numbers, lack of basic equipment, poor infrastructure, lack of good documentation and care plans and good access out-of-hours need to be addressed, potentially by an acute NIV CQUIN or other incentive. Ideally all patients who die of hypercapnic ventilatory failure should be reviewed in M&M meetings as part of a learning exercise to determine what factors could have been changed to improve their outcomes.

CASE STUDY

Improving NIV delivery and outcomes through policy, pathways and technology

Sherwood Forest Hospitals NHS Foundation Trust

In response to the 2017 National Confidential Enquiry into Patient Outcome and Death (NCEPOD) report on non-invasive ventilation (NIV), Sherwood Forest Hospitals NHS Foundation Trust reorganised its NIV pathway. This included:

- Processes: the development of a new multidisciplinary Acute NIV Prescription chart[87] including guidance on patient selection, treatment, and reference figures from guidelines.
- Technological changes: the adoption of a real time Service Quality Dashboard using nine quality metrics to record individual patient outcomes and a Patient Quality Dashboard to monitor individual care with personalised feedback for trainees and consultants.
- Policy changes: development of an Acute NIV Service Escalation Policy, linked with the Service Dashboard.
- Staffing and staff training: increased specialist outreach to provide 24/7 cover, quarterly acute NIV Morbidity and Mortality meetings to monitor service and patient outcomes and new multi-professional training programmes, including regular updates for specialists to maintain knowledge, an e-learning package for all doctors, with 'In-situ simulation' training for junior doctors.

Consequently, the trust has seen improvements in outcomes:

- In the year from March 2017 to March 2018, time from admission to NIV fell from a median of 317 to 129 minutes; sustained over a two-year period.
- Improvements over a three-month period in bed availability from 39.5% to 80.9% and nurse availability from 35.5% to 88.7% following use of the dashboard.
- The trust has directly trained 16 specialist nurses, 105 nurses, over 50 junior and senior respiratory doctors and over 120 doctors in Acute/General/Emergency medicine in acute NIV. The E-learning package has reached 581 doctors.

[87] *Available to download from BTS quality improvement resources: https://www.brit-thoracic.org.uk/document-library/quality-improvement/niv/appendix-5-example-niv-prescription-sherwood-forest-hospitals/*

Recommendation: Non-invasive ventilation

Recommendation	Actions	Owners	Timescale
15. Ensure a dedicated non-invasive ventilation (NIV) service is in place, with the recommended infrastructure to improve outcomes and reduce mortality.	**a** Review consultant and nursing infrastructure against BTS standards to deliver NIV services in line with existing NCEPOD 2017 and BTS recommendations.	Trusts	On publication
	b Ensure infrastructure is sufficient to enable timely initiation of NIV, using BTS quality statement and NACAP timeline for guidance	Trusts	Within 12 months of publication
	c Enable close liaison between respiratory and critical care units to ensure that escalation plans are in place for all patients on NIV, and that these plans are implementable.	Trusts	On publication
	d Ensure processes are in place to enable early follow-up post-acute NIV for consideration of home ventilation as per HOT-HMV.	Trusts	Within 3 months of publication
	e Consider development of an acute NIV CQUIN or other incentive that will facilitate data collection.	NHSE/I, GIRFT	Within 6 months of publication

Integrated care

The NHS Long Term Plan (LTP) published in 2019[88] promises an additional £4.5 billion and outlines the government's ambition to prioritise integrated care to improve outcomes. This will form a key part of the evolution of Sustainability and Transformation Partnerships (STPs) into integrated care systems (ICSs) which will cover all of England in 2021.[89] This renewed focus on integration is an important step in addressing the expanding health needs of an ageing population who often have multimorbidity[90] by joining up different services and placing patients at the centre of care, with the ambition of delivering high-quality services in settings that are accessible and convenient for patients, in a timely way. There are many useful reviews of the NHS LTP and integrated care that highlight the issues,[91, 92, 93] and possible ways to address them.

It is clearly important that respiratory teams, including those from acute providers who have extensive experience of such acute care demands, are involved in shaping the care for respiratory patients in STPs and ICSs. During our deep dives we found many consultants and their teams were not aware of the agenda, were not involved in system-level changes and had not been invited to express ideas of delivering integrated care by senior managers within the acute trusts. However, we saw good examples of acute providers working in partnership with the community in shaping care pathways too, notably at Sherwood Forest Hospitals NHS Foundation Trust, Derbyshire Healthcare NHS Foundation Trust, King's College Hospital NHS Foundation Trust and Whittington Health NHS Trust.

Within the respiratory LTP, many workstreams are community focused and, through working with primary care networks, aim to improve early and accurate diagnosis of respiratory conditions. This includes by using quality assured spirometry; supporting patient's self-management through digital offers; optimising medicines with a focus on inhaled therapy, enabling patients to function as well as possible by pulmonary rehabilitation and ensuring breathlessness is managed effectively. Acute care is recognised with a need to improve pneumonia outcomes. To facilitate these workstreams and their delivery there has been considerable investment in respiratory networks at regional/ICS level to act as a focus for change.[94]

Additionally, there are several other areas of the LTP that will affect respiratory medicine. The appointment of a National Specialty Advisor for Tobacco Addiction is an important step in reducing the burden of smoking-related lung disease while a respiratory outpatient transformation group is being established to support outpatient and pathway changes. A major change to facilitate improved timely diagnosis is the appointment of a National Specialty Advisor for physiological measurement, with a focus on cardiorespiratory diagnostics and a remit to improve workforce and pathways, facilitated by clear guidelines found in the Richards review of diagnostic services which contains many important areas such as community diagnostic hubs.[95]

The BTS has had a focus on integrated care for many years. It has disseminated knowledge through educational courses on the benefit of community services and supportive discharge teams in 2000, and several subsequent study days addressing integration of care and personalised medicine. Working with the Primary Care Respiratory Society, there were joint publications under the IMPRESS banner between 2006 and 2014 that highlighted how care could be improved for respiratory patients with chronic disease/long-term conditions by joint working. This is important information that remains available on the BTS Respiratory Futures website.

Over time, the BTS has refined its definition of integrated care, building on the first statement in 2007 to the most recent in 2019 as being *"…the best possible care for the patient, delivered by the most suitable health professional, at the optimal time, in the most suitable setting.*[96]" This statement recognises that current integrated care requires a move away from responsive, fragmented care given to patients by separate individuals in separate organisations to co-ordinated, proactive continuous care in which healthcare professionals in different organisations work across boundaries, forming a single team, which

[88] *NHS (2019) NHS Long Term Plan, https://www.longtermplan.nhs.uk/wp-content/uploads/2019/08/nhs-long-term-plan-version-1.2.pdf*

[89] *NHS England (2020) Integrating care: Next steps to building strong and effective integrated care systems across England, https://www.england.nhs.uk/wp-content/uploads/2020/11/261120-item-5-integrating-care-next-steps-for-integrated-care-systems.pdf*

[90] *Aiden, H (2018) Understanding the challenge: A report for the Richmond Group of Charities, https://richmondgroupofcharities.org.uk/sites/default/files/multimorbidity_-_understanding_the_challenge.pdf*

[91] *Timmins, N (2019) Leading for integrated care: 'If you think competition is hard, you should try collaboration', Kings Fund, https://www.kingsfund.org.uk/publications/leading-integrated-care*

[92] *Social Care Institute for Excellence, https://www.scie.org.uk/integrated-care*

[93] *Kings Fund, (2014) Whittington respiratory service, https://www.kingsfund.org.uk/sites/default/files/media/whittington-respiratory-service-kingsfund-oct14.pdf*

[94] *NHS England and NHS Improvement (2020) Respiratory Clinical Networks Specification https://arns.co.uk/wp-content/uploads/2020/10/Resp-Network_Sepc_V1.7-FINAL.pdf*

[95] *NHS England (2020) Diagnostics: recovery and renewal, https://www.england.nhs.uk/publication/diagnostics-recovery-and-renewal-report-of-the-independent-review-of-diagnostic-services-for-nhs-england/*

[96] *BTS (2019) Position Statement Integrated Respiratory Care, https://www.brit-thoracic.org.uk/about-us/position-statements/*

includes the patient.[97] This will produce benefits to patients and other service-users, who will receive continuity of care, better communication between their healthcare teams, smoother transition between care settings and responsive services.

Within this position statement the rationale for the importance of integrated care for respiratory patients is highlighted, together with timelines, recognising that respiratory medicine has been at the forefront of the integrated care agenda for many years. The reasons for that are clear in this GIRFT report, with a huge burden of chronic disease that can be better managed seamlessly rather than the episodic acute care that is evident and clearly needs to move for both the patient and systems.[98]

To deliver this integrated care, the key components from the BTS perspective are:

- **Education** – including patient self-management through written and digital information along with pulmonary rehabilitation and group-based education.
- **Decision support systems** – including discharge and care bundles, treatment guidelines, care pathways and integrated digital systems.
- **System design** – including early supported discharge services, urgent community based rapid response services and commissioning to incentivise integrated working between organisations. Sharing information. Providing services that effectively reach the most vulnerable.
- **Clinical information** – including ways of using disease registers to 'risk profile' populations. Use of data to measure outcomes, produce audit, measure variation.

The LTP has added to these areas with the need to work in the ICS environment with PCNs at a locality/'place' level and to consider a system approach together with population health issues. A major aspect is dealing with the inequalities that have come into focus as a result of COVID-19 and we have observed during deep dives, that generally populations with the greatest deprivation on a variety of measures are those with the greatest burden of chronic respiratory disease, especially COPD. Locality working to improve diagnosis and management for such patients is an important aspect within the new integrated care agenda. To facilitate better diagnosis in a timely fashion, a key aspect of the LTP, community diagnostic hubs (as highlighted in the Richards review), will aid the drive to more local diagnostics for disadvantaged patients by hopefully improving ease of access.

One of the major factors that has limited progress is the 'system' culture. Many respiratory teams have attempted to work in an integrated way across primary/community/secondary care but have been frustrated at the lack of progress due to organisational, governance and financial barriers between organisations. The new ICS structures, together with the potential change in payment mechanisms, moving from an activity-based tariff under the payment by results (PbR) system to one of blended payments and risk-share, will help to deliver the integrated care that clinicians and patients desire.

One of the key aspects to enable development of integrated care at pace will be the availability of a joined up information strategy. Sharing of records and results between primary care, community services and secondary care is essential to deliver appropriate and timely care, reducing the need for repeat investigations or onward referral. It is not only data sharing agreements between sectors which is needed but the technology to enable it to happen. Where such processes exist, as at Salford Royal NHS Foundation Trust, care can be transformative.

This was evidenced during our deep dives where there was a lack of system engagement with respiratory teams and frustration at the barriers highlighted being present. Only four trusts had seven or more consultant sessions in the community, with 23 (18%) having an insufficient two or more community sessions. Distressingly, 71 trusts (67%) had no sessions outside the acute provider service. Clearly there are few, if any, true integrated respiratory physicians in practice. In discussions with colleagues, most consultants favour a model whereby time is spent in the acute providers and in the community, with sessions shared between several respiratory physicians to provide continuity of the integrated service during periods of annual leave, as occurs, for example, in Derby.

While it is difficult to specify the number of consultant sessions required within a system/health economy, as this will depend upon other infrastructure, staff and resources already present, a formal review of requirements should take place with an estimate of approximately five consultant sessions per 250,000 population.

[97] *BTS (2019) Position Statement Integrated Respiratory Care, https://www.brit-thoracic.org.uk/about-us/position-statements/*

[98] *NHS England (2020) Integrating care: Next steps to building strong and effective integrated care systems across England, https://www.england.nhs.uk/wp-content/uploads/2020/11/261120-item-5-next-steps-integrated-care-systems.pdf*

We found many examples during deep dives of the huge benefit of integrated care to respiratory patients. While it cannot be correlated, it was apparent that those systems with established integrated care services running for several years had some of the lowest admissions for COPD. This was even more apparent when there was a high index of deprivation, where pneumonia admissions were high but those for COPD, the target of integrated care interventions, were low. It thus appears that the integrated care approach to managing COPD has benefits on admission rates. Additional system financial benefits also occur by better use of expensive inhaled drugs that can have an impact on the net carbon zero agenda, and of course the greatest benefit for patients and carers.

While few integrated care systems visited had all the components required, there were excellent examples at Royal Sussex County Hospital (part of the Brighton and Sussex University Hospitals NHS Trust), Royal Free London NHS Foundation Trust, Whittington Health NHS Trust and Salford Royal NHS Foundation Trust, with further examples in the case studies below.

Key service aspects, which are not an exhaustive list, include:

- integration between primary, community and acute providers;
- staff rotations between providers to maintain skill mix;
- education across health care providers, including primary care where a variety of models exist from lectures through to reviewing problem patients in a practice MDT;
- joined up and comprehensive oxygen services;
- integrated and responsive pulmonary rehabilitation;
- regular team communications;
- MDTs across all providers;
- locality/place-based clinics;
- provision and integration of palliative care with access to psychological therapies;
- close linking with smoking cessation services in the local authority;
- integration of health records;
- access to timely diagnostic tests such as quality assured spirometry.

Development of services takes time and it is often two or more years before any significant changes are realised. To deliver such integrated care needs enthusiastic and committed individuals, clear leadership and vision, with supportive management and investment.

An area of disappointment was the variation of services within STPs/ICSs. While respiratory transformation appears to sit in many STP/ICS plans, we found little engagement of respiratory physicians as noted above. Moreover, there was marked variation within systems based upon the CCG footprint with variable access within that system, suggesting that commissioning and organisation within the new systems needs considerable work to ensure equity of provision.

We found examples of excellent integrated services at Royal Sussex County Hospital but adjacent CCGs did not commission a service and there was no integrated care provision within the sister hospital at the same acute provider trust, the Princess Royal Hospital in Haywards Heath. Issues like this were also stark at the Royal Free Hospital, where Camden CCG provided excellent care with consultant sessions in the community and a comprehensive range of interventions to help their patients, while the adjacent CCGs made no provision for such care. This inequality of provision of care needs to be reformed as a priority as CCGs move into ICSs. Regrettably, we found many examples of this in other CCGs, especially in London where some patients were denied routine NICE-mandated interventions such as pulmonary rehabilitation for pulmonary fibrosis, while other patients, cared for by the same acute provider, could access rehabilitation if they lived in an adjacent CCG.

Training in all aspects of integrated care is essential if we are to produce a workforce that can deliver these changes. To date, most consultants delivering community/integrated care are 'self-taught', with few registrars having the opportunity to gain experience. A more structured approach should be considered given the multimorbidities, with experience in managing chronic cardiac problems, frailty and diabetes, but much of this ongoing care is in the remit of the general practitioner. We are delighted to note that training in integrated care is likely to feature in the new registrar curriculum. However, training in integrated care needs to be considered not only for specialist registrars, but also for all healthcare professionals dealing with respiratory patients across systems to ensure the holistic care required is delivered by all professionals in a seamless

way. Such care in the community often makes it easier to access other services, such as palliative care for symptom relief and mental health services such as IAPT to help with the psychological aspects of care that are so important in chronic respiratory disease.[99, 100]

The outcomes are not always easy to determine as there are no specific data sets, with local spot audits being the main source. A comprehensive data set that flows across systems is essential to confirm the system-level and patient-level benefits from integrated services that have embedded consultants. The NHS England and NHS Improvement recommendations[101] on the need for data are a welcome step but need to be prioritised for respiratory care.

As stated previously, it needs to be accepted at the outset that integration of care is not a 'quick win' but one that produces long term and sustained benefits that accrue over the years. The BTS position paper embraces that concept of change.[102]

> *"This is not about specialists just carrying out clinics in the community, but leading and working within teams, using well defined components of care to deliver high quality respiratory care across populations as well as to individuals."*
>
> **BTS position paper**

CASE STUDY

Bringing existing services together enables joined up care

Liverpool University Hospitals NHS Foundation Trust and Merseycare

Liverpool University Hospitals NHS Foundation Trust and Merseycare aimed to bring together a number of separate community services providing cardio-respiratory care. Existing resources were reorganised to improve co-ordination, and enhance existing services which led to:

- Integrated working
  - All teams were moved from different sites across the community to one central hub.
- Community clinics
  - A twice weekly 'one-stop' community respiratory consultant clinic was established and, later, a monthly MDT.
- Access to admission prevention
  - Direct referrals from paramedics were allowed.
- Pulmonary rehabilitation
  - The referral form was simplified, and there was enhanced pre-rehabilitation communication with patients with improved links to local exercise facilities for post-PR training.
- Winter pressures
  - A seasonal reduction in nurse-led clinics over winter was introduced with a 'catch up' over summer.

Despite very high levels of deprivation, the number of COPD admissions has continued to reduce over the last three years and readmissions are lower than national average.

[99] *Karen Heslop-Marshall et al. (2018) Randomised controlled trial of cognitive behavioural therapy in COPD, ERJ Open Research, 4: 00094-2018.*

[100] *Newham JJ. (2017) Features of self-management interventions for people with chronic obstructive pulmonary disease associated with improved health-related quality of life and reduced emergency department visits: a systematic review of reviews with meta-analysis .International Journal of Chronic Obstructive Pulmonary Disease,12, 1705-1720.*

[101] *NHS England (2020) Integrating care: Next steps to building strong and effective integrated care systems across England, https://www.england.nhs.uk/wp-content/uploads/2020/11/261120-item-5-integrating-care-next-steps-for-integrated-care-systems.pdf*

[102] *BTS (2019) Position Statement Integrated Respiratory Care, https://www.brit-horacic.org.uk/about-us/position-statements/*

CASE STUDY

An integrated respiratory service reduces hospital admissions

University Hospitals of Leicester NHS Trust, Leicestershire Partnership Trust and the Leicester, Leicestershire and Rutland CCGs

University Hospitals of Leicester NHS Trust set up the integrated respiratory service in early 2019 to bring together several providers (University Hospitals of Leicester NHS Trust, Leicestershire Partnership Trust and the Leicester, Leicestershire and Rutland CCGs) with the aim of bringing specialist respiratory care closer to home for patients in Leicester, Leicestershire, and Rutland.

The service includes:

- COPD virtual clinics in which GPs, practice nurses and other team members join a consultant to discuss cases and management.
- An Enhanced Respiratory Assessment Service (ERAS) launched to provide specialist care closer to home in two situations:
  - Acute COPD exacerbations in the community, for hospital admission avoidance.
  - Supported hospital discharge for patients who are at risk of readmission.
- Integrated respiratory MDT meeting set with the aim of providing physician and pharmacist support for the patients.

The COPD virtual clinics were piloted with 23 practices of 40 invited practices participating with excellent feedback. ERAS has managed 147 patients to date, and this new integrated way of working has already reduced hospital readmissions in complex cases, improved patient experience and has also furthered integration of both hospital and community teams into one COPD team.

CASE STUDY

Place-based care reduces non-elective admissions

University Hospitals of Derby and Burton NHS Foundation Trust

University Hospitals of Derby and Burton NHS Foundation Trust aimed to reduce variation in non-elective admissions across South Derbyshire. This led to the redesign of respiratory care to be more proactive rather than reactive, with a focus on prevention and the hard to reach.

The ImpACT+ has been commissioned since April 2018, providing place-based integrated respiratory services across southern Derbyshire. The service is delivered by a multi-disciplinary team that is closely aligned to GP practices and has co-located clinics with both smoking cessation and psychological therapy services.

Since introduction, non-elective admissions for all respiratory conditions have declined by 6%. COPD non-elective admissions fell 4%, asthma non-elective admissions dropped 16%. Emergency department attendances for asthma dropped 9 % during this period confirming the efficacy of the service.

CASE STUDY

Integrated services across multiple trust sites to improve patient and staff experience

Imperial College Healthcare NHS Trust

Imperial College Healthcare NHS Trust sought to improve staff retention, build clinical and non-clinical skills, and support service development through integration of services across trust sites and in the community. This was done by moving away from fragmented services, with different providers, that did not work for the patient population. The local primary care network (PCN) and community services were brought together for the benefit of patients and staff alike.

A system was introduced for clinical staff to undertake rotations within two of the trust's main sites, Charing Cross and St Mary's. Extended placements for nurses and physiotherapists offer cross-discipline experience, where staff are able to lead specific patient pathways and participate in system-wide MDTs across the PCN.

These pathways include acute units and respiratory wards, dyspnoea clinics, pulmonary rehabilitation, COPD optimisation and a support hotline support for exacerbation of symptoms and hospital avoidance.

These rotations have helped to strengthen teams spread out across the trust and community settings. Since implementation, COPD targets for the Best Practice Tariff have been consistently met and 30- and 90-day readmission rates are well below the national average. Alongside this, staff retention and wellbeing have improved, and the regular collaboration and communication has improved flow and care of patients.

Recommendation: Integrated care

Recommendation	Actions	Owners	Timescale
16. Review aspects of respiratory care integration and supporting infrastructure at system level to reduce variation in service provision, enable better care delivery and facilitate information flow between providers.	**a** Review service provision across the STP to ensure services are uniform and equitable for respiratory patients, regardless of where they live.	ICSs, CCGs, Trusts	Within 12 months of publication
	b Consider how respiratory departments interface with diagnostic hubs and community services to deliver truly integrated care.	Trusts, ICSs, GIRFT, Respiratory Networks	Within 6-12 months of publication
	c Ensure there are sufficient staff with the appropriate skill mix to deliver integrated care. This should include respiratory consultant sessions in the community.	Trusts	Within 12 months of publication
	d Integrate electronic systems to allow for data access and sharing across providers and commissioners. This data should be used to review and evaluate progress in improving outcomes at system level.	ICSs, Trusts	Within 18 months of publication

Improving treatment for tobacco dependency

Smoking remains the single biggest cause of preventable morbidity, mortality and health inequalities in the UK. Smoking accounts for 474,000 hospital admissions per year and a range of respiratory illness including COPD, asthma exacerbations, lung cancer, pneumonia and influenza, in addition to approximately 100 other non-respiratory conditions. The RCP *Hiding in plain sight* report [103] details in an accessible way a range information on this topic.

NICE, the RCP and the BTS recommend that every patient admitted to hospital has their smoking status ascertained and treatment provided for their addiction to tobacco. Treatment of tobacco dependency saves lives, money and reduces demand on NHS services. The Taskforce for Lung Health highlights the importance of very brief advice (VBA) for smoking cessation in supporting smokers to quit and calls for all clinicians to receive training in the intervention, [104] although as shown below in the audit returns this is not occurring.

Despite these guidelines, sequential audits from BTS (2016 &2019) [105] and national CQUIN results (**Table 2**) have shown that the ascertainment of smoking status and provision of treatment for tobacco dependency is poor across English acute hospitals and there are gaps in care.

Table 5: Provider DNA rates, 2018/19

Question	Yes	No	Not answered
Is your trust participating in the smoking cessation CQUIN for 2018?	80	40	7
Is your trust meeting the screening target of 90%?	18	109	0
Is your trust meeting the very brief advice target of 90%?	17	110	0
Is your trust meeting the NRT offer target of 30%?	25	102	0
Is your hospital a fully enforced smoke free site?	62	64	1

Source: GIRFT questionnaire 2018

Approximately one third of trusts did not participate in the inital launch of the addiction CQUIN, and data from this highlights how poor smoking cesation infrastructures are. Although some trusts stated their sites were smoke free during deep dives, we found little evidence of enforcement, with individuals smoking in hospital grounds.

The latest BTS National Smoking Cessation Audit included data from 125 hospitals and 13,647 admitted patients. It found that only 1 in 8 smokers were referred to a smoking cessation service.

One exemplar that we know of but have not yet seen during our deep-dive visits is the Manchester CURE programme that is based on NICE PH48 and the Ottawa model of smoking cessation.

CURE stands for:
Conversation - have the right one each time;
Understand the level of addiction;
Replace NRT to prevent withdrawal;
Expert & evidenced based treatments.

The programme's launch in 2018 introduced a pathway for the systematic treatment of tobacco dependency as shown below (**Figure 38**). As demonstrated by the CURE project, support for patients who are quitting smoking must continue after the patient has been discharged. This requires comprehensive support to be available in the community, which is well joined up with provision in-house. This is highlighted in the Taskforce for Lung Health's five-year plan. [106]

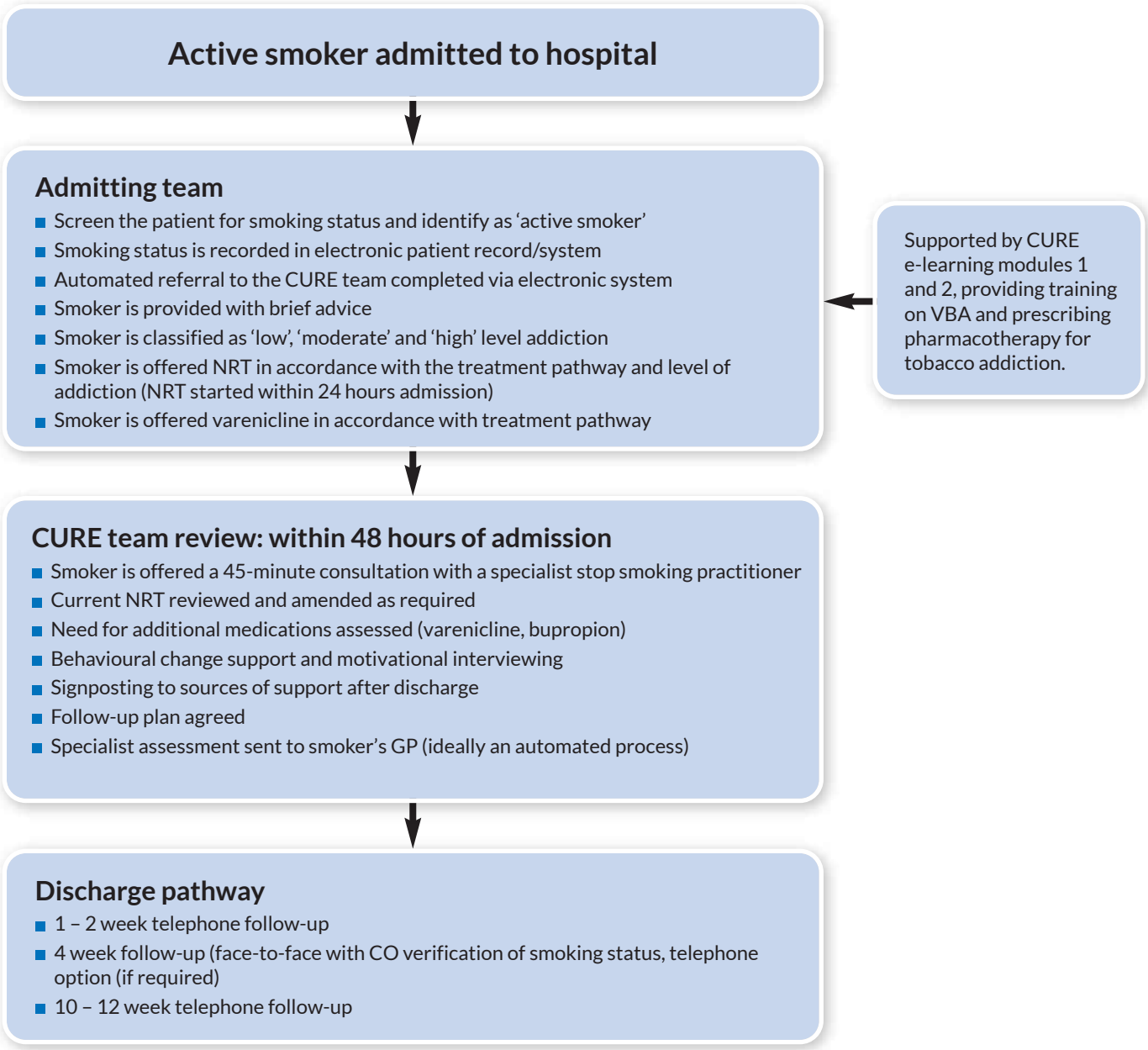
[103] *RCP (2018) Hiding in plain sight: Treating tobacco dependency in the NHS, https://www.rcplondon.ac.uk/projects/outputs/hiding-plain-sight-treating-tobacco-dependency-nhs*

[104] *BLF (2018) Taskforce for Lung Health, https://www.blf.org.uk/taskforce/plan*

[105] *BTS (2019) National Smoking Cessation Audit 2019, https://www.brit-thoracic.org.uk/quality-improvement/clinical-audit/national-smoking-cessation-audit-2019/*

[106] *BLF (2018) Taskforce for Lung Health, https://www.blf.org.uk/taskforce/plan*

Figure 38: Active smoker pathway with CURE programme at Manchester



Source: https://thecureproject.co.uk/

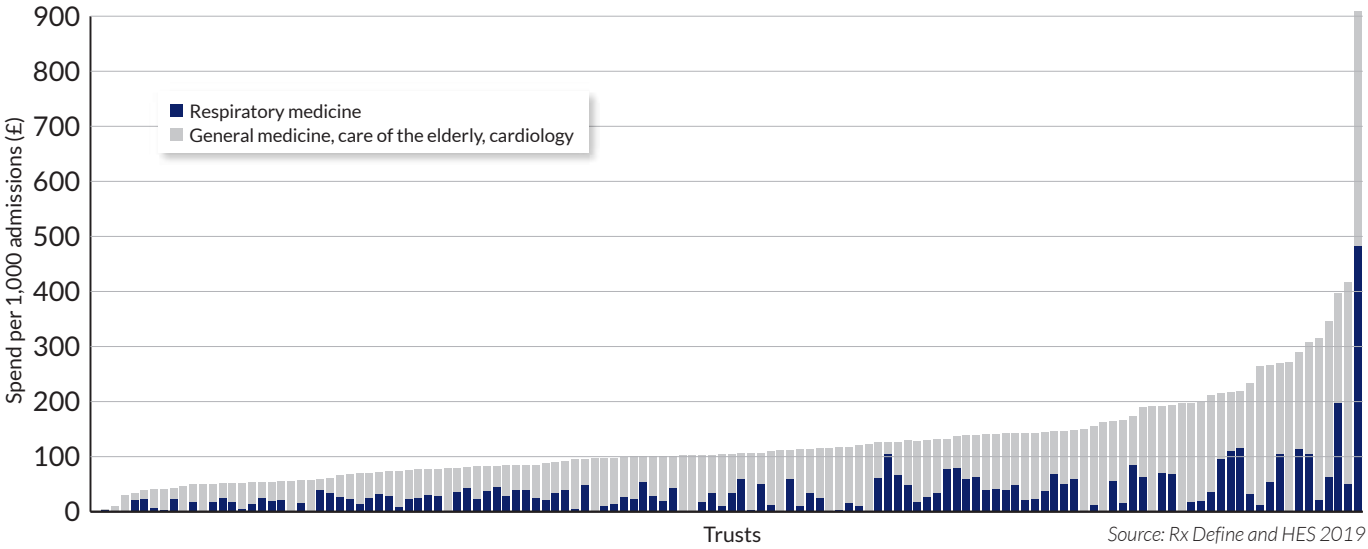
Use of nicotine replacement therapy (NRT)

NRT refers to medication that provides a low level of nicotine to replace that found during use of tobacco. This can help reduce unpleasant nicotine withdrawal effects such as bad moods and cravings, which may occur when a patient gives up smoking. It can come in a range of forms, including as an inhaler, patches and gum.

There is evidence that all forms of NRT increase the likelihood that a person attempting to quit smoking will succeed. The chances of stopping smoking are increased by 50% to 60%. We found wide variation in spend on NRT per 1,000 admissions as shown in **Figure 39**, which are much lower than expected. In a few trusts the NRT was prescribed by respiratory medicine, such as The Newcastle Upon Tyne Hospitals NHS Foundation Trust and in Nottingham University Hospitals NHS Trust, where over half the smoking cessation is provided by the respiratory team due to a dedicated cessation service. A high amount (43%) of COPD patients are prescribed smoking cessation pharmacotherapy and 75-100% are offered smoking cessation. The role of a smoking cessation co-ordinator seems important, as found in Kettering General Hospital NHS Foundation Trust and in Sherwood Forest Hospitals NHS Foundation Trust, where patients are identified upon arrival and assessed, the smoking cessation prescription is agreed and stickers are used to highlight this. Consequently, the Sherwood Forest trust is in the top five of NRT prescription volumes.

Other ways to increase NRT included ward pharmacists prescribing as in Guy's and St Thomas' NHS Foundation Trust and Leeds Teaching Hospitals NHS Trust, while Chesterfield Royal Hospital NHS Foundation Trust, The Royal Wolverhampton NHS Trust and University Hospitals of Leicester NHS Trust have a patient group directive (PGD) to facilitate smoking cessation prescriptions. Supporting patients from discharge is also a key aspect and this was available post-discharge at Warrington and Halton Teaching Hospitals NHS Foundation Trust, where the smoking cessation service to the acute trust was a community in-reach service.

Figure 39: NRT expenditure per 1,000 admissions



Source: Rx Define and HES 2019

CASE STUDY

Changing language and clinician approach to support smoking cessation

Whittington Health NHS Trust

Smoking cessation is an important aspect of respiratory care and the Whittington Health NHS Trust has delivered such services over many years by:

- changing language use, with smoking described as a long-term condition;
- use of the term tobacco/nicotine dependence and clear documentation in clinical notes;
- changing clinician approach by considering behavioural issues, supported by motivational interviewing principles and embedding a psychologist in the team;
- regular training of the respiratory team in management of tobacco/nicotine dependence;
- simple e-prescribing for NRT and varenicline as part of ward stock.

This has resulted in improvements across the trust, including:

- 41% of patients admitted to a respiratory ward who were tobacco dependent and treated with varenicline quit within six months (quit rate);
- after five years, 29% of patients remained non-smokers;
- established relationships with PCT/CCG/Local Authority colleagues;
- improved outcomes for individual patients and populations;
- increased job satisfaction for clinicians.

NRT needs a supporting smoking cessation infrastructure but we found this present in only 36% of trusts. During our deep-dive visits we heard that since completing the questionnaire some services had been withdrawn.

The NHS Long Term Plan has made the treatment of tobacco dependency a priority and has funded a comprehensive treatment programme that requires every trust to provide bedside treatment for tobacco dependency for every patient that smokes by 2023-24. The key components of this programme are that every patient has smoking status ascertained on admission to hospital, 'very brief advice' is provided, treatment for nicotine withdrawal is prescribed and the patient is seen by a stop smoking advisor to discuss treatment options for smoking cessation, with the follow-up arrangements for ongoing treatment made prior to the patients discharge from hospital.

Simple measures that every hospital and respiratory department can put in place whilst they plan for their tobacco dependency treatment service can be found in the RCP Hiding in Plain Sight report[107] and the latest BTS Smoking Cessation Audit Report 2019[108] - we have also highlighted some of these in our own recommendations.

[107] *RCP (2018) Hiding in plain sight: Treating tobacco dependency in the NHS, https://www.rcplondon.ac.uk/projects/outputs/hiding-plain-sight-treating-tobacco-dependency-nhs*

[108] *BTS (2020) Smoking Cessation Audit Report 2019, https://www.brit-thoracic.org.uk/quality-improvement/clinical-resources/smoking-cessation/*

Recommendation: Improving treatment for tobacco dependency

Recommendation	Actions	Owners	Timescale
17. Improve access to smoking cessation therapies and reduce tobacco dependence in patient populations through a comprehensive suite of interventions	**a** Use ward-based non-medical prescribers to prescribe nicotine replacement therapy (NRT) within 12 hours of admission.	Trusts	Within 3 months of publication
	b Identify a clinical lead for tobacco dependency treatment services with adequate protected time.	Trusts	Within 6 months of publication
	c Ensure an electronic method of recording smoking status is in place.	Trusts	Within 6 months of publication
	d Use free online training on treating tobacco dependency for staff through the 'e-learning for health' platform available for all NHS staff.	Trusts	Within 18 months of publication
	e Monitor the success using the BTS online audit platform and applying QI practice to improve results until they reach the standards set out by NICE and the NHS Long Term Plan.	Trusts	Within 18 months of publication

Specialised services

Respiratory medicine has several services that are funded through NHS England as specialised commissioning[109] rather than through Clinical Commissioning Groups, with the aim of improving care for a select group of patients. These services are delivered to set specifications written by Clinical Reference Groups (CRGs).

Not all hospitals offer all of the respiratory specialised services. Based on questionnaire data, 24 trusts are providing services for people with ILD, 22 trusts are providing services for people with severe and difficult-to-control asthma, and 20 trusts are providing services for people who need complex home ventilation. While both pulmonary hypertension and cystic fibrosis are also part of specialised commissioning, we did not review these two areas.

We assessed services against service specifications using questionnaires that we validated during our deep dives. A major problem we encountered was the inability to objectively validate the results as there is little national data. The reason for this is both specialised services and standard services being delivered in the same hospital, with no way of differentiating the activity. This is especially so for respiratory medicine where the majority of the specialised activity is in outpatients. The lack of clear identification rules or specific clinic types is a key issue as hospitals may not get paid for the specialised activity they undertake, making requests for internal investment difficult as there is often no clear income stream.

While use of the multi-professional outpatient attendance as TFC 340 may allow some of the work to be identified, this needs to be agreed and the lack of clarity between what CCGs and specialised commissioners purchase adds to the confusion. One solution is to link activity and payment through registries, as occurs in cystic fibrosis, and the year of care. This would allow a clear identification of activity and would also allow performance management together with the income to support delivery of specialised care. We discuss registries in more detail where relevant to specific specialised services below.

Variations in infrastructure and location planning lead to variations in care

We found that in a number of trusts, the infrastructure required to deliver the specialised service is limited or overstretched. For some centres the referral base is too small to be viable so amalgamation with other centres or development of larger hubs with spokes may be a solution. In other centres formal investment is required to fulfil the service specifications. Negative impacts of the current situation include delays in being seen in clinic, delays in initiating treatment and potential adverse outcomes.

The distance patients travel, and the waiting times for patients to be seen, also shows some variability. Most specialised services are located in urban areas. While the distance patients travel to get to a specialised centre seems to be particularly long in Cornwall and the North West, there are also problems in Norfolk, East of England and in South West England.

In areas where patients are required to travel long distances, processes need to be developed that establish clear hubs and spokes for services, recognising that they may have low volume activity. A hub and spoke network is where one centre of expertise acts as the hub, with regional hospitals being spokes that either send patients to the hub, or receive visiting healthcare teams from the hub. This hub and spoke development should be further supported by using virtual techniques, e.g. virtual referral process and virtual MDTs. Developing clear spokes would improve ease of access for patients, especially given that many are physically limited due to reduced exercise capacity or have underlying neuromuscular disorders.

To further minimise disruption for patients and to reduce the amount of travel, a 'one stop' service should also be in place where possible, so that if repeat pulmonary function tests and CT scans, for example, are required, these can be completed in one attendance along with other investigations such as nasendoscopy. While not always possible to schedule, this should be in place for patients travelling long distances. Such 'one stop' services are not recognised in specialised commissioning and therefore funding them is difficult. While they could be considered as day case interventions, this may not reimburse the costs of all of the interventions unless these are clearly delineated under different treatment function codes.

[109] *NHS England, Specialised Services, https://www.england.nhs.uk/commissioning/spec-services/*

Severe and/or difficult-to-control asthma

While most people living with asthma (see *Improving care for patients with asthma*, page 65) have mild or moderate disease and can be managed in primary or secondary care, there are a group of patients that are harder to manage. Some of these patients may have severe asthma that may, depending on their phenotype, be amenable to treatment with drugs that modify the asthma process: biological therapies.

However, some patients may behave as if they have asthma but do not, or have only mild coexistent asthma and have issues with breathing pattern disorder or upper airway problems. Identifying these severe and 'difficult' asthma patients is important to ensure the correct modalities of treatment are offered and to avoid the side effects of inappropriate treatment, such as long term high-dose oral steroids.

With these uncertainties of diagnosis, such patients should be referred for specialised assessment and treatment under specialised commissioning. Not all patients are being referred for these assessments, as shown by a recent National Asthma Campaign report: *Do no harm: safer and better treatment options for people with asthma*. In this report it is estimated that 46,000 patients are missing out on biological therapies which in a significant proportion of patients is truly life-changing.[110]

Initially specialised asthma services were available in 21 hospitals, but over time they have consolidated, with several working together as network hubs and smaller spokes. For all but one centre, the networks are made up of several larger hubs with their own supporting spokes to deliver services. There remains some confusion, with some services fulfilling the specialised commissioning specification while not being regionally commissioned, and other, smaller hubs not fulfilling the criteria while being commissioned, reflecting the variation between regions.

One role of the hubs is to support the spokes in undertaking assessments to ensure the correct diagnosis, and that other conditions such as laryngeal problems and breathing pattern disorders are excluded, although there seems a variable infrastructure for this to happen. This is an important area to ensure patients are appropriately selected for biological therapies following multidisciplinary team (MDT) discussion, followed by prescription via Blueteq (a decision support tool used to enable high cost drugs approval).[111]

There is significant variation, for example, in the amount of time patients who could benefit from biologics are waiting to initiate this treatment. Some centres had significant delay in initiating treatment, although with the recent COVID-19 pandemic practice has changed, with home care delivery infrastructures and remote management reducing waiting times for treatment.

To support these severe asthma services, an incentive is in place (currently a CQUIN), although the funding from this does not seem to be equitably distributed across all hubs. The NHS England and NHS Improvement Improving Value Programme (IV) recommendations, (not published at the time of writing this report), will inform the incentive.[112]

Workforce

On our deep-dive visits we saw variation in staffing to support severe asthma services and this contributed to the finding that only eight trusts had sufficient resources to deliver what is required in the specification.[113]

The specification outlines the requirement that each specialised asthma service has *"…a minimum of two service-dedicated respiratory physicians with appropriate expertise and training in severe asthma"*. All but one of the 21 providers had a minimum of two consultants with a major interest in asthma but there was considerable variation.

MDT meeting attendance is a key measure. In 20 of the centres, the MDT is in the consultant's job plan, and there was greater than 75% attendance by the consultants in all but one of the services. Unfortunately, participation in the MDT is not recognised in any form of data capture that can lead to payment for general respiratory and specialised services, apart from lung cancer.

Eight units had two or more nurses working within the service, but two had less than one nurse (**Figure 40**).

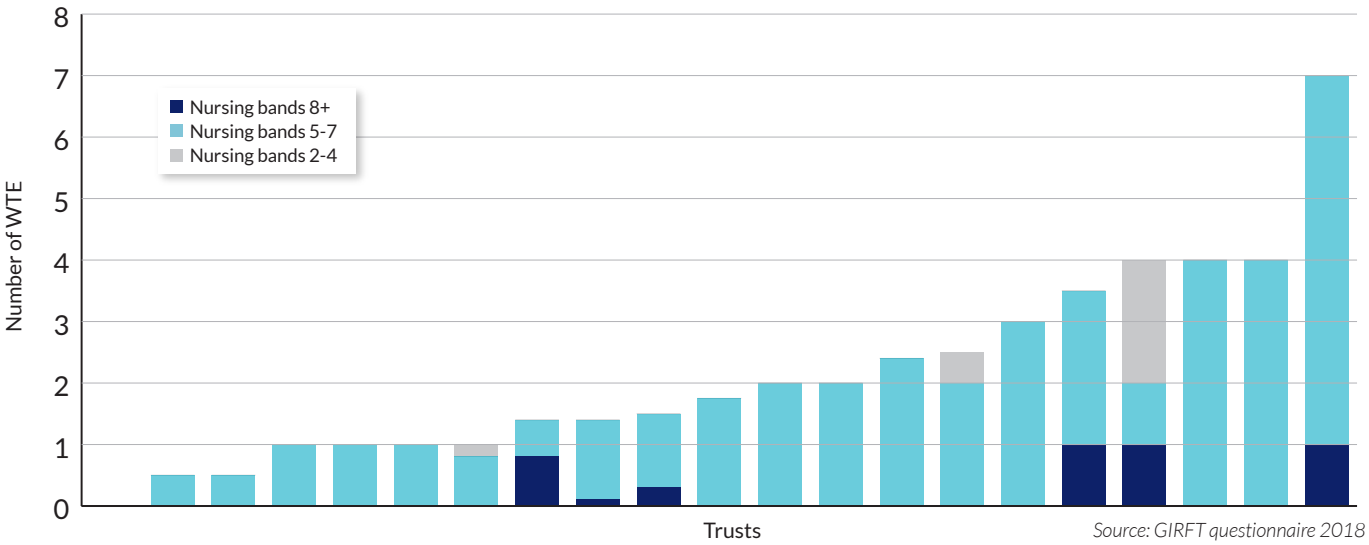
[110] *Asthma UK (2020) Do no harm: safer and better treatment options for people with asthma, https://www.asthma.org.uk/support-us/campaigns/publications/do-no-harm/*

[111] *Blueteq, https://www.blueteq.com/*

[112] *NHS England, Improving Value, https://www.england.nhs.uk/commissioning/spec-services/improving-value/*

[113] *NHS England (2017) Service specification: Specialised Respiratory Services (adult) –Severe Asthma, https://www.england.nhs.uk/wp-content/uploads/2017/04/specialised-respiratory-services-adult-severe-asthma.pdf*

Figure 40: Nursing levels for severe asthma per specialised service



Source: GIRFT questionnaire 2018

Respiratory physiotherapy services were available in most units and are key to improving the identification and management of breathing pattern disorder. But in five services, there was less than one whole time equivalent (WTE) physiotherapist.

Likewise, psychological support is important, but nine of the specialised commissioning centres had less than 0.2 WTE staff to support the service in this area. Only three had one WTE, highlighting that psychological input into severe asthma services is limited. Just seven services had sufficient whole-time administrative support.

Process of care

Ten services are relatively low volume, having fewer than 100 referrals per year, of which five trusts see fewer than two new patients per week. Some of these were in the ten centres that had only 500 patients with severe asthma in their services. The staffing noted above, and DNA rates of over 15% for new patients in seven centres and for follow-up in ten centres, are contributing to the nine centres reporting patient wait times of over ten weeks from referral to assessment.

Asthma UK's qualitative research (*Falling into Isolation* [114]) also found that travel times to severe asthma services create a major burden on patients who must take days off work to attend each appointment. Shared care or outreach arrangements, home administration of biologics, and remote appointments are all potential solutions to significantly reduce the burden on patients. Developments in integrated care (see *Integrated care* page 103) would enable processes that support patient need and improve health outcomes.

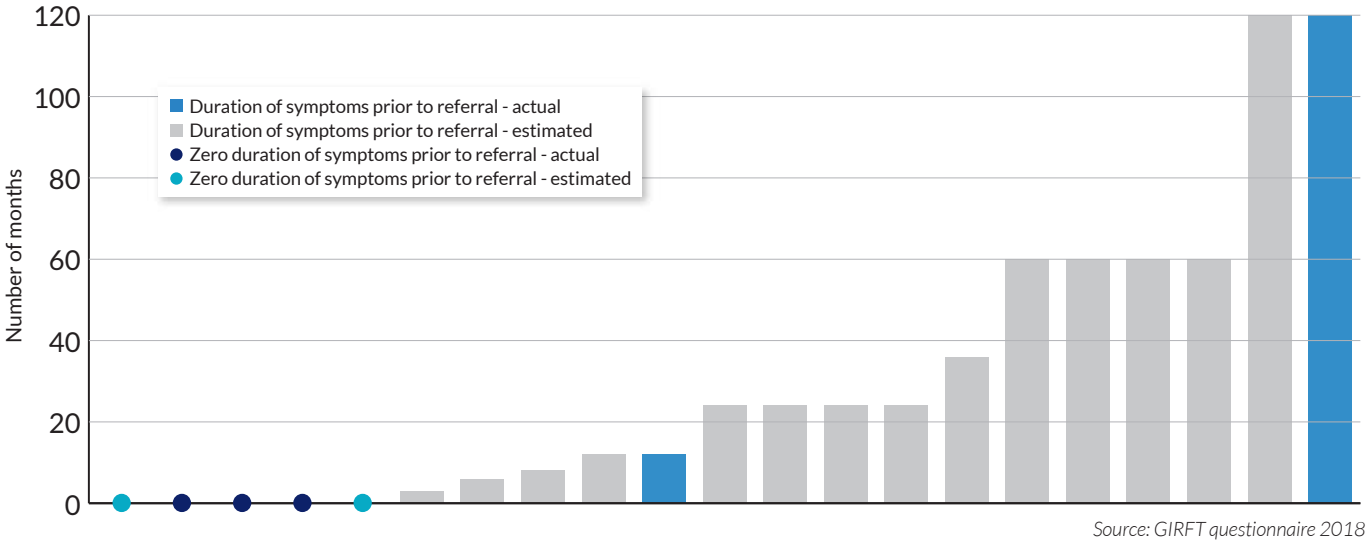
As can be seen in **Figure 41**, many patients had symptoms for many months before being referred, suggesting that the referral processes from primary and more commonly secondary care need to be reviewed and compliance with standards for referral encouraged. Duration of symptoms, including where these are zero, are reported directly from the questionnaires returned by trusts. Asthma UK's report *Living in Limbo* [115] found that only 18% of those who should be referred for specialist review according to BTS guidelines are referred, and its report *Slipping through the net* showed there was variation in when clinicians were willing to refer. [116]

[114] *Asthma UK (2020) Falling into Isolation: Lived experience of people withs severe asthma, https://www.asthma.org.uk/support-us/campaigns/publications/falling-into-isolation/*

[115] *Asthma UK (2020) Living in limbo: the scale of unmet need in difficult and severe asthma, https://www.asthma.org.uk/support-us/campaigns/publications/living-in-limbo/*

[116] *Asthma UK (2019) Slipping through the net: The reality facing patients with difficult and severe asthma, https://www.asthma.org.uk/support-us/campaigns/publications/difficult-and-severe-asthma-report/*

Figure 41: Duration of symptoms (in months) for most patients prior to the referral being reviewed



Source: GIRFT questionnaire 2018

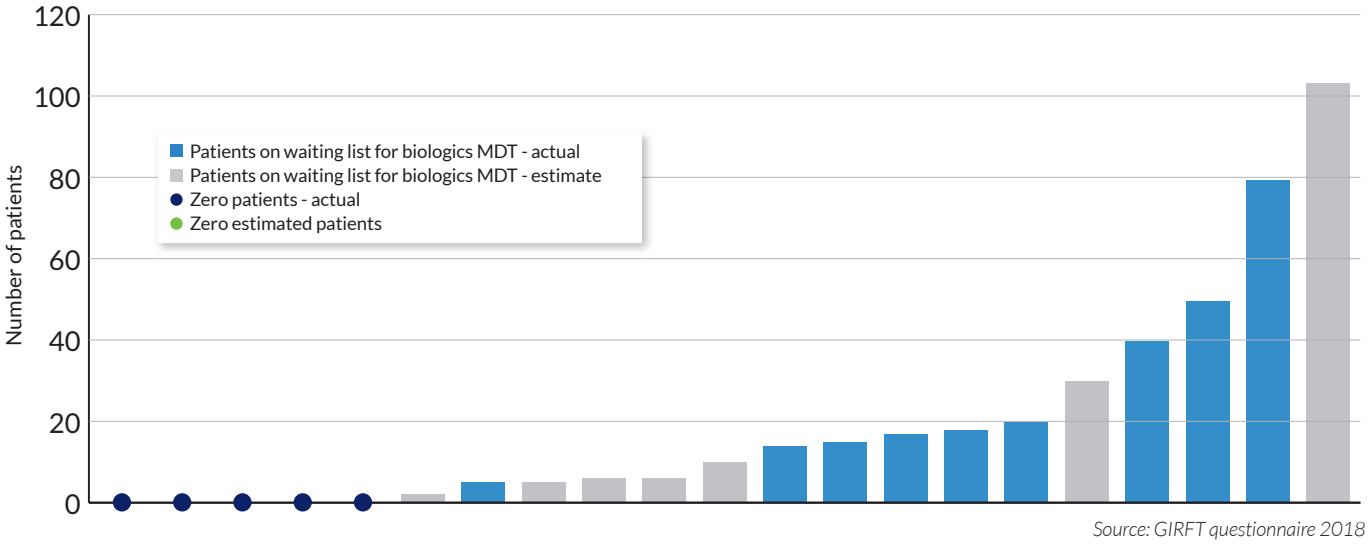
A clear area in the specification is the entry of data onto the national severe asthma register, although this is being returned in only five of the 21 centres. Some of this will relate to the individual trust's cost to subscribe to the registry and the lack of dedicated staff for data entry. Tariffs should reflect the time and cost for this key area that has greater opportunity to be used as a payment mechanism given the problems outlined above in identifying severe asthma patients.

Treatment for severe and difficult asthma

For some patients, ensuring they have a definitive diagnosis of severe asthma is an important step. Patients may have difficulties with laryngeal dysfunction, and exercise-induced laryngeal obstruction masquerading as asthma that does not improve with steroids. Identifying this problem is important as it is treatable by speech and language therapy and can be done by nasendoscopy at rest and on exercise. However, three centres did not offer a comprehensive service for managing vocal cord dysfunction and we are unsure how many spokes are performing this assessment. It is not possible to get accurate data, as the procedure may be done routinely in the clinic and not captured as a day case procedure or potentially miscoded as a bronchoscopy.

For patients with proven severe asthma that has an immunological background, NICE has produced guidelines on the use of disease modifying biological therapies. However, there is a long delay in initiating therapy in some centres as shown in **Figure 42**. As a consequence the Accelerated Access Collaborative has launched a workstream to assess the issues and possible interventions to increase the number of patients who can derive benefits from such biological therapies earlier in the course of their illness. Of interest, as briefly highlighted above, the COVID-19 pandemic has changed the timescale within which centres are now initiating these therapies (see *COVID-19 impact on respiratory medicine*, page 146).

Figure 42: Number of patients on the waiting list for discussion at biologics MDT



Source: GIRFT questionnaire 2018

For a small, selected group of individuals, bronchial thermoplasty (a process of scarring the airways with heat treatment) can be used. The process is usually three treatments over a period of several weeks, though its uptake appears low. The number of coded thermoplasty interventions was just 33 in the UK in the year January to December 2018, with 26 potentially being miscoded. We asked, through our questionnaire, about thermoplasty and only 23 patients had 62 treatments over a 12-month period across the country. This probably represents the true, relatively low use of bronchial thermoplasty, but does raise the concern that some patients may be having this intervention and it is not being accurately recorded.

Mental health support for patients should not be overlooked when planning and delivering treatment. Asthma UK's report *Falling into Isolation*[118] highlighted the serious impact severe asthma can have on someone's mental health and showed how not everyone under specialist care is able to access psychological support.

Interstitial lung disease

Interstitial lung disease (ILD) comprises a broad spectrum of conditions, all of which cause inflammation and scarring in the lungs.[119] Between 3,000 and 15,000 new patients are diagnosed with ILD in England each year with the majority having either sarcoidosis or idiopathic pulmonary fibrosis (IPF).[120, 121] The poor prognosis of IPF is well recognised, having an outcome that is often worse than many cancers.

While many respiratory consultants will undertake the investigation of patients with suspected ILD at a district general hospital, usually involving a high resolution CT scan of the thorax, detailed pulmonary function tests and blood tests, there are a subset of patients that merit discussion with a specialised commissioning ILD service.[122] These include where there is doubt about the diagnosis, for determining a management plan, and consideration of starting the NICE-recommended disease-modifying antifibrotic agents.[123] Such consultations may be face-to-face but several centres now encourage use of a proforma for data capture and a remote MDT to allow case discussion, with patients being seen in virtual clinics.

As many patients with other ILDs are managed within local hospitals we did not specifically review these services. However, as part of the discussions on staffing, we noted during our deep dives that there were rarely ILD nurses, except in specialist centres. Such nurses play a key role in supporting patients and carers; organising rehabilitation, oxygen therapy and supporting in palliation of breathlessness.

[118] *Asthma UK (2020) Falling into Isolation: Lived experience of people withs severe asthma, https://www.asthma.org.uk/support-us/campaigns/publications/falling-into-isolation/*

[119] *BLF, What is pulmonary fibrosis? https://www.blf.org.uk/support-for-you/pulmonary-fibrosis/what-is-pulmonary-fibrosis*

[120] *NHS England (2018) Service specification: ILD, https://www.england.nhs.uk/wp-content/uploads/2018/08/Interstitial-lung-disease-service-adult.pdf*

[121] *BLF, Idiopathic Pulmonary Fibrosis, https://www.blf.org.uk/support-for-you/idiopathic-pulmonary-fibrosis-ipf*

[122] *Sylvester KP, Clayton N, Cliff I, et al. (2020) ARTP statement on pulmonary function testing 2020., BMJ Open Respiratory Research, 2020;7:e0005755.*

[123] *NICE (2017) Idiopathic pulmonary fibrosis in adults: diagnosis and management, Clinical guideline [CG163], https://www.nice.org.uk/guidance/cg163*

A specific problem appeared in the delivery of pulmonary rehabilitation for patients attending specialised services. As this was delivered locally to the patient, some CCGs did not commission rehabilitation for ILD patients, while it was available for patients at an adjacent postcode, despite being a clear NICE recommendation. Local communities delivering rehabilitation and the commissioners of such services need to ensure the NICE recommendations are followed for ILD patients.

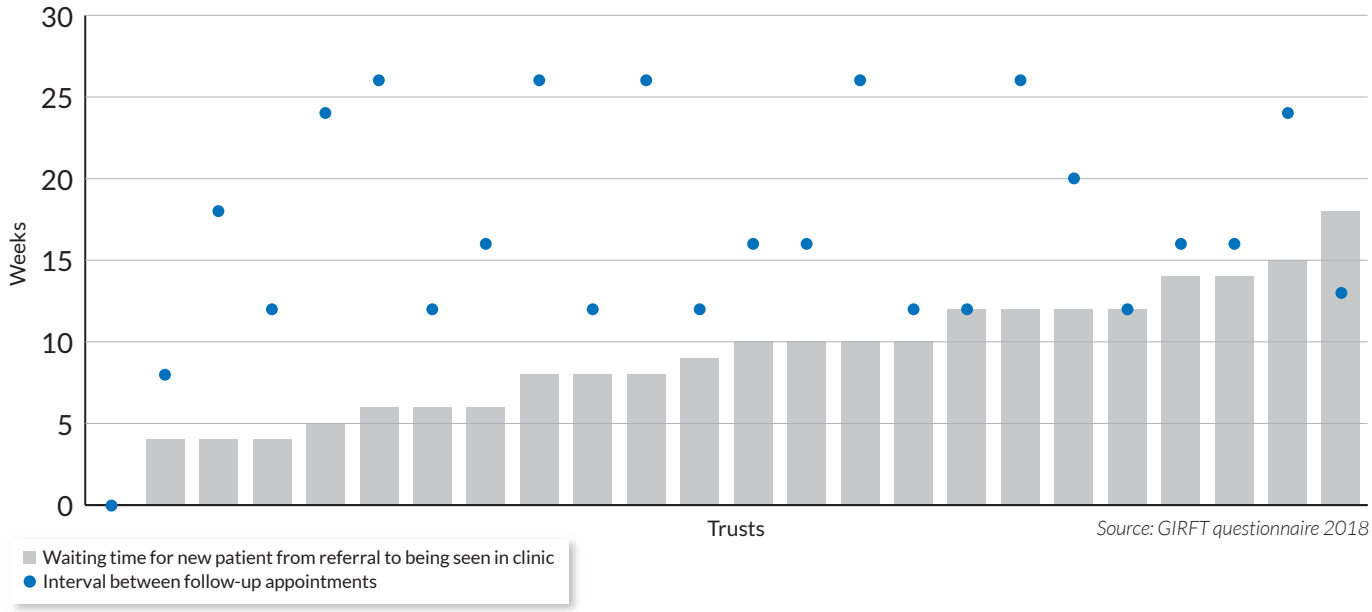
Recognising the need for better information, the BTS established a national registry, producing an annual report [124] with over 2,470 IPF entries and a small number of 490 sarcoid records. The information held allows year on year comparisons. Areas addressed include meeting the BTS quality standards for care. Regrettably, only 54 trusts, including the specialised commissioning centres, entered their patients into the registry, usually due to workforce and time available for data entry. For the specialised commissioning centres this was confirmed through our questionnaire and deep-dive visits, with only four trusts indicating they enter over 50% of patients onto the BTS registry.

Apart from this general registry data, there is no specific information around specialised commissioning services due to the absence of any clear identification rules noted at the outset of this specialised commissioning section. Consequently, the service activity at specialised commissioning level, given it is predominantly at outpatient level, is not identified and thus is not reimbursed appropriately. While using the registry as a vehicle for recognising and reimbursing activity is a potential solution, this has not occurred.

Workforce

In our visits we observed unwarranted variation in waiting times for new patients with ILD to be seen in clinic, from below five weeks in some trusts, to above 15 in the trust with the longest wait times (**Figure 43**). Where trusts do not have enough staff with the appropriate skills, there are not enough appointment slots to meet demand.

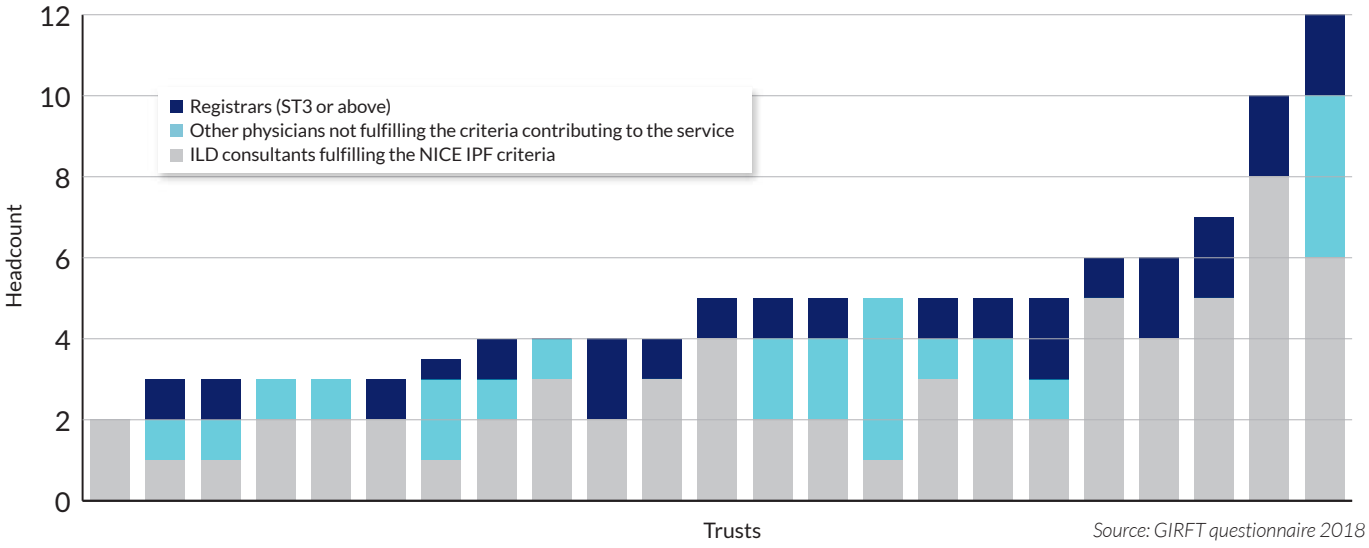
Figure 43: Patient waiting time for new and follow-up in ILD per specialised centre



Trusts have varying numbers of clinicians able to contribute to their ILD service, ranging from just one consultant fulfilling all NICE IPF criteria, to six. To varying degrees, these consultants are supported by registrars at ST3 level (junior doctors training in respiratory) or above, and/or other physicians who do not fully meet the criteria recommended for service contribution (**Figure 44**).

[124] *BTS (2019) ILD Registry Annual Report, British Thoracic Society Reports, Vol 10, Issue 3, ISSN 2040-2023.*

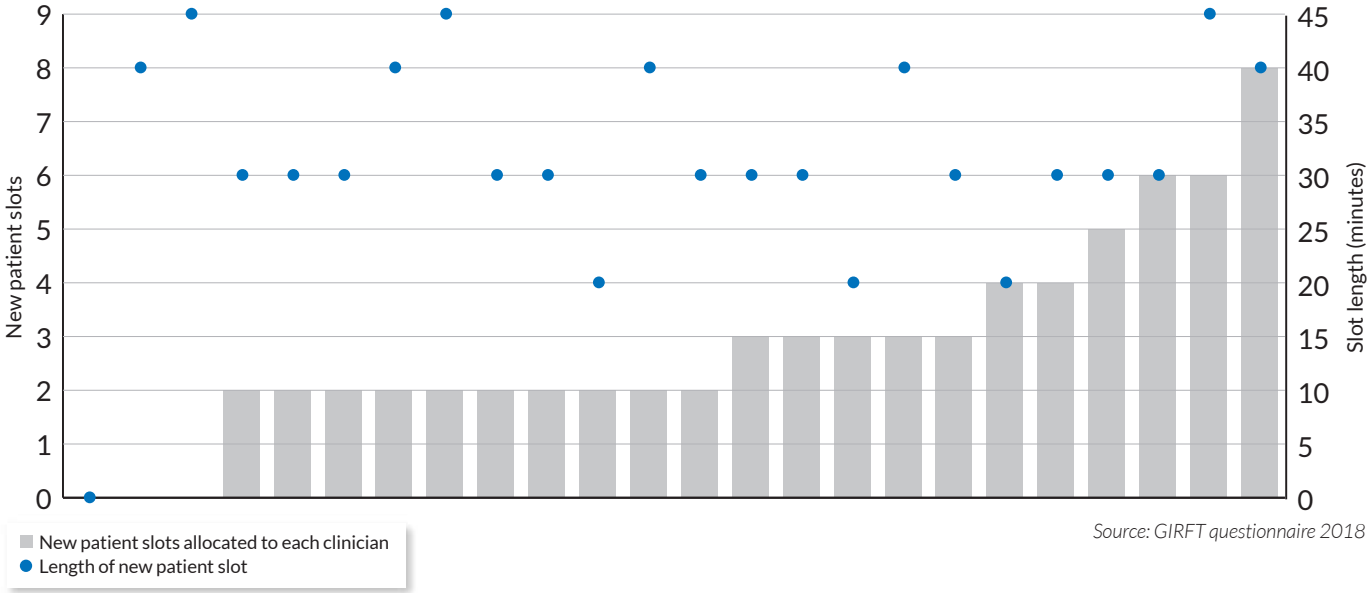
Figure 44: Medical workforce in place for ILD per specialised trust



Source: GIRFT questionnaire 2018

There is also wide variation in the number of appointments allocated per clinician across specialised centres, though most appointment times followed RCP recommendations of 30 minutes in length (**Figure 45**).

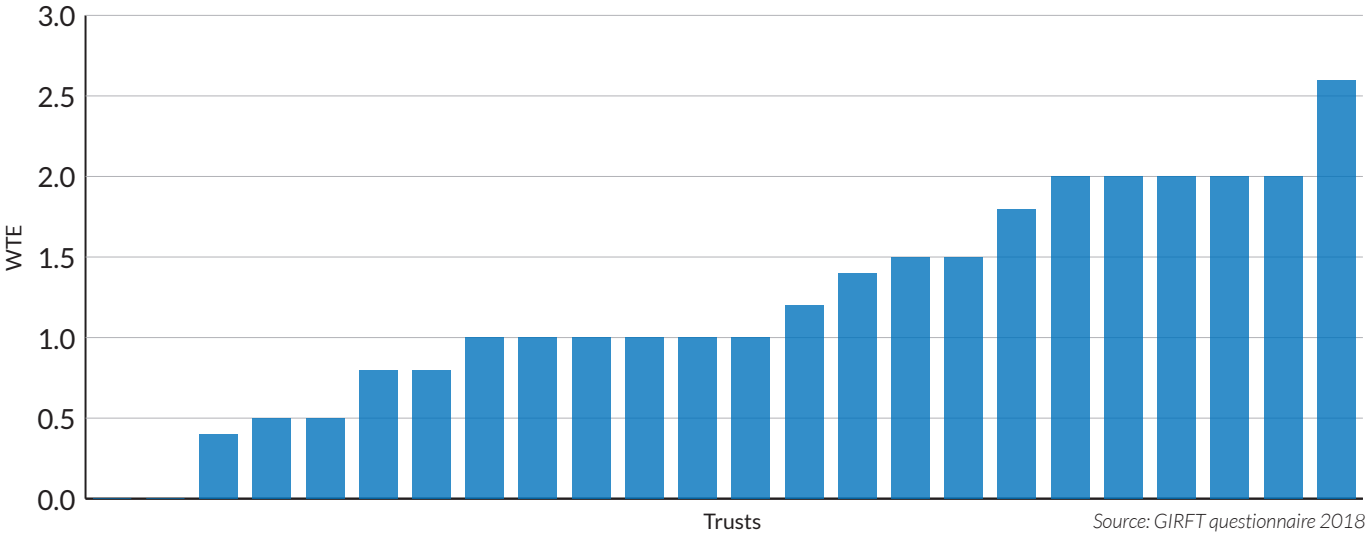
Figure 45: New patient slots by number and length in minutes per trust



Source: GIRFT questionnaire 2018

Similarly, we saw wide variation in ILD specialist nurse availability, with fewer than 0.5 whole time equivalent nurses in one trust, and up to 2.5 in the highest staffed trust (**Figure 46**). ILD specialist nurses play a vital role in care for patients, as outlined above, and so there should be a minimum of one Band 6 nurse per 300 ILD patients and their role should be disease-specific, seeing patients who are occasionally admitted but acting as a care co-ordinator. Together with pharmacists, who play an important role in the management of the antifibrotic agents, nurses are key to the efficient delivery of care. As such the team should be supported by administrative and clerical staff including an MDT co-ordinator role to ensure nurses do not undertake nonclinical tasks.

Figure 46: Number of ILD specialist nurses per specialised trust



Source: GIRFT questionnaire 2018

Complex Home Ventilation

Home ventilation, also known as assisted mechanical ventilation, is when assisted breathing methods normally provided in an acute care setting of ITU or HDU are provided in the community – usually in the home, but sometimes in other settings like hospices or care homes. The treatment is usually delivered through a mask, non-invasive ventilation (NIV), but in some cases a patient may have a tracheostomy, as the access route to provide ventilatory support (Invasive Ventilation).

NHS England and NHS Improvement's complex home ventilation (CHV) national service specification outlines both the activity and population to be served. This includes:

- patients with rapidly progressing neuromuscular disease such as motor neurone disease (MND) or Duchenne Muscular Dystrophy who should be under review either pending or starting ventilatory support;
- patients transitioning to adult care;
- patients ventilated by the tracheostomy route or those non-invasively ventilated using a hood, mask or mouthpiece (or a combination) for greater than 14 hours per day;
- weaning centres.

However, many centres who provide specialised services also deliver general acute and home ventilation services, making it difficult to differentiate patients receiving general ventilation care from those who fulfil the above criteria for the specialised service.

Once again, challenges with the identification rules, exacerbated by the code E85.2 not having a time dependent measure, means that although we know from this OPCS code that ventilation has been used on patients, we cannot determine specialised activity and thus specialised top up tariff. Consequently, activity for this report was obtained by self-completed questionnaire and validated during deep-dive visits. While some centres have a registry for tracking equipment, few centres have an accurate record of activity from a registry. It is essential such data is captured for patient care and as a payment mechanism given the inability to capture this activity.

Weaning centres

The current service specification which dates from 2013 includes not only CHV but also weaning centres. These are almost always associated with CHV centres but occasionally exist alone. However, not all CHV centres have dedicated weaning units.

The role of weaning units is to facilitate step down from ITU. When patients in a critical care environment are receiving ventilatory support, but have no other organ failure, they may have difficulty getting off ventilation. Once this is identified,

patients should be transferred, ideally within one week, to a weaning centre. This facilitates patients in being weaned off tracheostomy ventilation to mask non-invasive ventilation, allowing the tracheostomy to close (decannulation) or where weaning does not occur, patients can be discharged with ongoing ventilator use.

Current financial incentives may, however, be impeding the transfer of patients, as funding is allocated to each patient staying in ITU. A holistic approach to patient management is needed that incentivises transfer of patients to the departments best placed to manage their condition.

Workforce

Of the 19 units recognised by specialised commissioning only four fulfil the specification in having four consultants, and only six had units with greater than two physicians to support the service. As expected from the above, there was marked variation in the amount of direct clinical care (DCC) attributable to ventilation services. Most services worked closely with neurology and cardiology colleagues, either having a dedicated consultant to support the service or doing joint clinics.

It is not possible to determine the nursing workforce, as some trusts returned data for specialist nurses delivering clinics, while others also included the ward bed base. However, it was clear there was limited specialist nurse provision for some centres. No standard for the number of specialist nurses per patient exists and given the demand for home visits for the population of patients who cannot travel, such as those with advanced MND, or invasively ventilated patients, a ratio should be established as a marker for service development. Moreover, there is no funding mechanism as there is no national domiciliary tariff for such essential home visits, which also needs to be addressed.

Most units had dedicated physiotherapy time for the service but only 11 admitted to doing joint clinics with physiotherapy. Given the importance in sputum clearance techniques in many patients requiring assisted ventilation, including instruction on cough assist devices, presence of an appropriate physiotherapy infrastructure is essential and should be provided. This relatively low physiotherapy presence may explain why only nine trusts reported issuing more than 40 cough assists per year, again far from ideal practice in this complex group of patients.

There was little dedicated dietetic, occupational therapy, speech, and language support, but much of this may be delivered in the acute ward setting and therefore was not captured by our questionnaire.

Administrative staff are key to allowing efficient running of the service and a point of contact for dependent patients to seek advice. Nine centres had greater than one wholetime equivalent, but five reported having no administrative staff for home ventilation services, which leads to nursing or other staff undertaking such administrative duties.

Bed capacity, initiating ventilation and home visits

Twelve centres had dedicated beds for CHV and weaning. A prerequisite for running a service is to allow access for weaning and only two centres reported having a sufficient number of beds, a reflection of the increasing demand that needs to be addressed. While many centres continue to initiate ventilation as an elective inpatient admission, several centres have adapted to a low or absent bed base by initiating ventilation as an outpatient, with one centre performing over 210 ventilator initiation procedures. Unfortunately, the tariff for this is low at approximately £200.

Initiating ventilation does fulfil the definition of day case activity, and one centre is undertaking over 90% of its initiation this way, an important source of income at approximately £700 per attendance. It would seem a sensible approach for trusts to ensure their initiations are counted as a day case attendance. This wide variation in process of initiating ventilation reflects bed availability, centre experience and, potentially, patient choice. There is only one study that has looked at the clinical outcomes and financial aspects of either day case or inpatient initiation and showed little difference.[125]

Supporting patients who cannot travel with home visits is a key, but unfunded, aspect of the service. Eight centres see more than five patients per week and seven do more than 40 home visits per week, but there were also centres that did few visits, with seven undertaking less than 20 home visits per month. This is surprising and either reflects an insufficient number of staff to deliver the service or that the patients on ventilation in that service are not the ones outlined in the specification, an area that requires review.

[125] *Patrick B. et al. (2019) Late Breaking Abstract - Cost-effectiveness of outpatient (OP) vs. inpatient (IP) setup of home non-invasive ventilation (NIV) in obesity hypoventilation syndrome (OHS): A Randomised Clinical Trial, European Respiratory Journal, 54 (suppl 63) RCT5099.*

Service activity

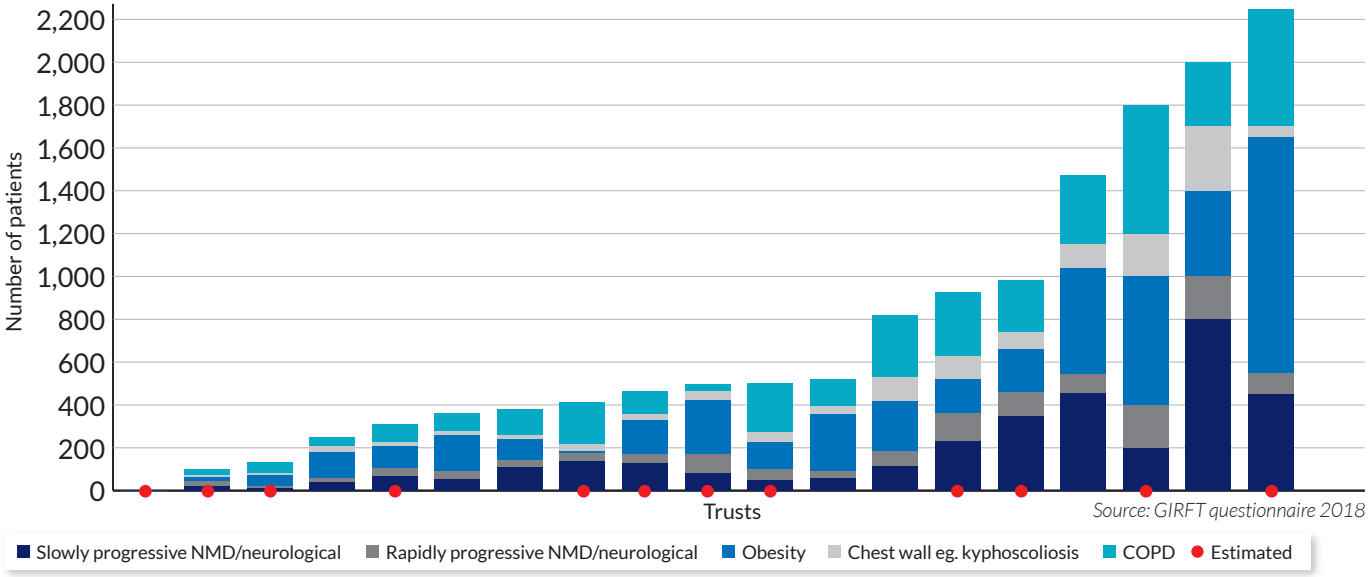
The number of patients on ventilatory support and the nature of the underlying disease shows considerable variation (**Figure 47**). This low number of patients on ventilation is probably a reflection of a low referral rate, with ten trusts having fewer than 300 referrals per year and some having far less. For such low volume providers, it may be difficult to retain and train staff with the right skillset for this difficult group of complicated patients.

There is also variation in the numbers of patients under surveillance. These are patients who have not yet reached the threshold of needing ventilation support, such as progressive neuromuscular patients, but should be followed up in line with the national specification. Some centres had few surveillance patients, 15 had greater than 500 patients, and 11 greater than 1,000 under surveillance. This is a large volume of work which, again, is not captured due to the inadequate coding and identification rules, and is therefore not associated with income beyond the normal respiratory outpatient follow-up tariff at approximately £100. This needs to be addressed.

Additionally, there are variations in the use of a bacterial/viral filter placed within the ventilator circuit, not those used where the machine entrains air. Filters have a theoretical role in limiting the infective content of expired air returning to the ventilator and potentially prevent contamination of the machine. An audit undertaken by the Specialists in Long term Ventilation at Home (SiLVaH) group has shown that approximately half of the providers did not use a filter in the room air circuit.

The evidence base for such filters is limited, with the theoretical risk of passing infection between patients if the ventilator is given to another patient without any process for decontamination of the airflow pathway within the machine. However, given that most patients have their own ventilator(s) at home with little swapping of machines unless they break down, the use of regular filter changes may appear clinically unnecessary and have significant financial implications. In one institution, over £300,000 per annum is spent upon such filters. Further research is ongoing to address if filters are needed, but in the interim trusts should assess the need for such expensive but unproven actions.

Figure 47: Breakdown of patient numbers by clinical condition requiring specialised ventilation services



Patients may be transferred to CHV and weaning units from critical care or other centres for expert care and decannulation. We found the weaning centre concept is not universally working as only nine centres had more than 20 referrals. Furthermore, only seven hospitals achieved more than five decannulations per year.

This referral pattern may explain the wide variation in the number of patients supported by tracheostomy ventilation, with nine units having only single figure patients on such support. For patients receiving more than 14 hours NIV per day (the threshold for recognition in specialised commissioning), once again there is marked variation in patient numbers.

Some centres have 50 or fewer patients. Recognising that some centres may be very efficient in closing tracheostomies and moving to mask ventilation over 14 hours, we combined both types of ventilation and found that only ten trusts have more than 100 patients on either type of ventilation.

Over the years, an increasing number of children have been started on home ventilation, many of whom have survived into adolescence and will be needing to move into adult CHV care. This is a difficult time for many, so the transition needs to be gradual via joint clinics, a time-consuming process but an important one to gain the trust of patient and family alike.[126, 127] This is an area of some concern, as noted in the NCEPOD review of long term ventilation.[128] If we explore the number of patients being transitioned from paediatric to adult care there is variation in the numbers, with only 11 centres transitioning ten or more patients, a figure that will increase. However, we again have some low volume providers that are unlikely to have sufficient activity to maintain the required skill set.

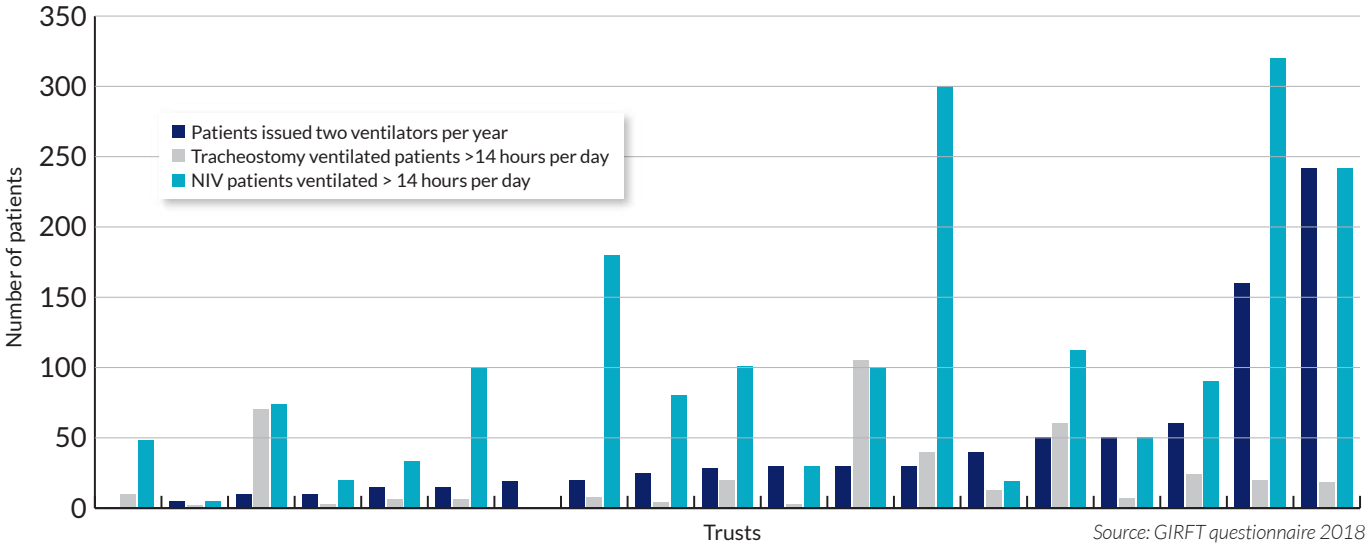
In light of these low volume providers for weaning and decannulation, tracheostomy ventilation and over 14 hours mask ventilation, a review of whether these centres should be managing such individuals should be undertaken to confirm whether they should be designated as a specialised centre. With respect to potential weaning centres these too should be reviewed to ensure an appropriate geographical spread, recognising need for carers to travel. There should be no low volume providers and centres should be appropriately commissioned and resourced to deliver the complex care.

Infrastructure

An important patient-facing marker of a service is what happens when advice is needed urgently, or a ventilator breaks down out-of-hours. We found 13 centres provided technical support, and 15 provided 24/7 helplines. Three said they provided neither technical support nor a 24/7 helpline, which is a cause for concern considering the risk upon equipment breakdown.

A lack of such support is sometimes overcome by providing patients with two ventilators (**Figure 48**). The variation in number of patients who are ventilated by tracheostomy (as above) confirms the low volume providers, few of which have a second ventilator. While a battery supply may overcome the potential power failure, this does not prevent ventilator breakdown and is a cause for concern.

Figure 48: Number of patients issued two ventilators per year



Source: GIRFT questionnaire 2018

[126] *Children and young person's health outcomes strategy (2013) Report of the Children and Young People's Health Outcomes Forum, https://www.gov.uk/government/publications/independent-experts-set-out-recommendations-to-improve-children-and-young-people-s-health-results*

[127] *Kennedy, I, (2010) Getting it right for children and young people: Overcoming cultural barriers in the NHS so as to meet their needs, https://www.gov.uk/government/publications/getting-it-right-for-children-and-young-people-overcoming-cultural-barriers-in-the-nhs-so-as-to-meet-their-needs*

[128] *NCEPOD (2020) Balancing the Pressures: A review of the quality of care provided to children and young people aged 0-24 years who were receiving long-term ventilation, https://www.ncepod.org.uk/2020ltv/LTV_Full_Report.pdf*

Recommendations: Specialised services

Recommendation	Actions	Owners	Timescale
18. Review service infrastructure to ensure delivery against national specialised service specifications, reducing the likelihood of delays in treatment or discharge.	**a** Review infrastructure against national specifications and identify areas where additional support or resource is needed to ensure optimum service delivery.	Trusts	Within 12 months of publication
	b Consider how to support trusts in addressing gaps or inequities in service provision which arise as a result of services not meeting all requirements of national specifications.	GIRFT, NHSE Spec Comm	Within 12 months of publication
19. Consider hub and spoke models to amalgamate low volume specialised services.	**a** Review specialised activity levels across regions and consider consolidating services or moving to hub and spoke models where possible to improve shared decision-making and reduce the likelihood of low volume services.	Trusts, ICSs	Within 2 years of publication
20. Review how trusts achieve and maintain specialised status; updating service specifications. Where service demands have changed over time, specifications and subsequent resources need to be aligned to deliver appropriate care.	**a** Update national specification for complex home ventilation to: i) formalise guidance around developing weaning centres; ii) review tariffs to ensure appropriate remuneration, notably for services delivering significant volumes of tracheostomies and >14h NIV together with home visits; iii) consider additional remuneration for transitional services.	NHSE Spec Comm, Clinical regional networks	Within 12 months of publication
21. Establish formal registries to capture patient-level information which can support monitoring and inform commissioning decisions.	**a** Determine key metrics to be collected that include outcome and process measures that reflect costs and benefits of delivering specialised services. Consider how such registries can be used to sensibly support payment.	NHSE Spec Comm, Specialised respiratory CRG	Within 18 months of publication

Medicines optimisation

Medicines optimisation is the process of finding the most safe and effective use of medicines to enable the best possible outcomes. On our visits, we found variation in uptake/use of medicines and have structured this section around three key themes:

- flu vaccination;
- antibiotic stewardship;
- environmental impact of inhalers.

Flu vaccination

Flu vaccination needs to be considered for both the 'at risk' population of patients, which for respiratory medicine is a significant number, and staff caring for patients, both in the acute and community sector, for example nursing home staff. It is vital that staff, and particularly frontline staff, receive a flu vaccine. Being protected against flu stops vulnerable patients from being exposed to the virus and means that staff do not fall ill and need to take time away from work, threatening staffing levels. Details of flu uptake by different staff, together with other useful metrics, can be found on the data tracker page on the taskforce for lung health.[129] About one in ten cases of flu caught in hospital is fatal. The Taskforce for Lung Health recommends an increase in the uptake of frontline staff vaccination to 100%, and accurate monitoring of staff uptake across the health and social care sector.[130]

We did not look at CCG-level data for local flu vaccination uptake but clearly this, together with pneumococcal vaccination, is of huge importance and there needs to be robust plans for this to occur. There is an opportunity to vaccinate patients either attending outpatients or inpatients following recovery from an acute episode. However, we have found few examples where this is routinely occurring in respiratory medicine.

There is wide variation in vaccination of staff across trusts as shown in **Figure 49**. Percentage uptake ranged from just below 50% to above 90%, with a mean uptake across all trusts of 73.6%. The national target set by NHS England for 2019 was 75% uptake among frontline staff.[131]

As can be seen in **Figure 49**, of the 137 trusts we had data for, only 40 trusts increased their flu vaccination rate by more than 5% in 2018-19 from the previous year. The median increase for those trusts who increased their vaccination rate by more than 5% was 8%. **Figure 49** also illustrates that at 20 trusts, the flu vaccination rate decreased by more than 5% in 2018-19 from the previous year. The median drop in rates for the 20 trusts who decreased by more than 5% was 9%.

Different trusts have explored ways of improving their staff vaccination rates, and NICE has published guidelines on how to increase uptake.[132] It became clear through deep-dive discussions that often cultural change and leadership around flu vaccination had a more significant impact on driving rates up than incentives, as found at St Helens and Knowsley Teaching Hospitals Trust which has the best vaccination rates. Raising the profile of vaccination using patient experience has been effective at Kettering General Hospital NHS Foundation Trust where the trust has worked with the parents of twins (one who died of flu) and helped create 'Ned's story' to try and ensure a high uptake of flu vaccination, and prevent tragedies happening to others.

Calderdale and Huddersfield NHS Foundation Trust makes a donation to UNICEF for every vaccination undertaken while Chelsea and Westminster Hospital NHS Foundation Trust has included the flu vaccination as mandatory in the employee contract from July 2019, to further improve uptake. There are many reasons why colleagues do not have flu vaccination - Guys and St Thomas' NHS Foundation Trust has systematically surveyed its staff to better understand barriers to vaccination uptake. Addressing those issues is an important step to increasing vaccination uptake.

[129] *BLF, Flu vaccinations, https://www.blf.org.uk/taskforce/data-tracker/flu-vaccinations/flu-vaccination-health-care-workers-0*

[130] *BLF (2018) Taskforce for Lung Health, https://www.blf.org.uk/taskforce/plan*

[131] *Ford, M. (2019) This year's NHS staff flu vaccination campaign to take 'new approach', https://www.nursingtimes.net/news/public-health/years-nhs-staff-flu-vaccination-campaign-take-new-approach-20-09-2019/*

[132] *NICE (2018) Guideline NG103: Flu vaccination: increasing uptake, https://www.nice.org.uk/guidance/ng103*

CASE STUDY

Innovative engagement approaches improve flu vaccination uptake

St Helens and Knowsley Teaching Hospitals NHS Trust

St Helens and Knowsley Teaching Hospitals NHS Trust has consistently achieved above the national target for vaccination of staff. In 2018-19 the trust achieved 95.4% staff vaccination rate, an improvement on 87% achieved in 2017-18.

These high rates are achieved by a number of initiatives:

- a 24 hour 'jabathon', with feedback from staff indicating this was very popular as staff found it difficult to leave their work area;
- 21 consultant infection prevention champions and over 70 link nurses who attend education and training and complete local audits to monitor compliance;
- a robust communications campaign including global briefings, a flu button on the trust intranet, certificates for wards that achieved 100% and a flu campaign video featuring a local celebrity called the 'flus at ten';
- a strong culture led by the executive team.

CASE STUDY

Embedding flu vaccination programs in wards improves patient coverage

Whittington Health NHS Trust

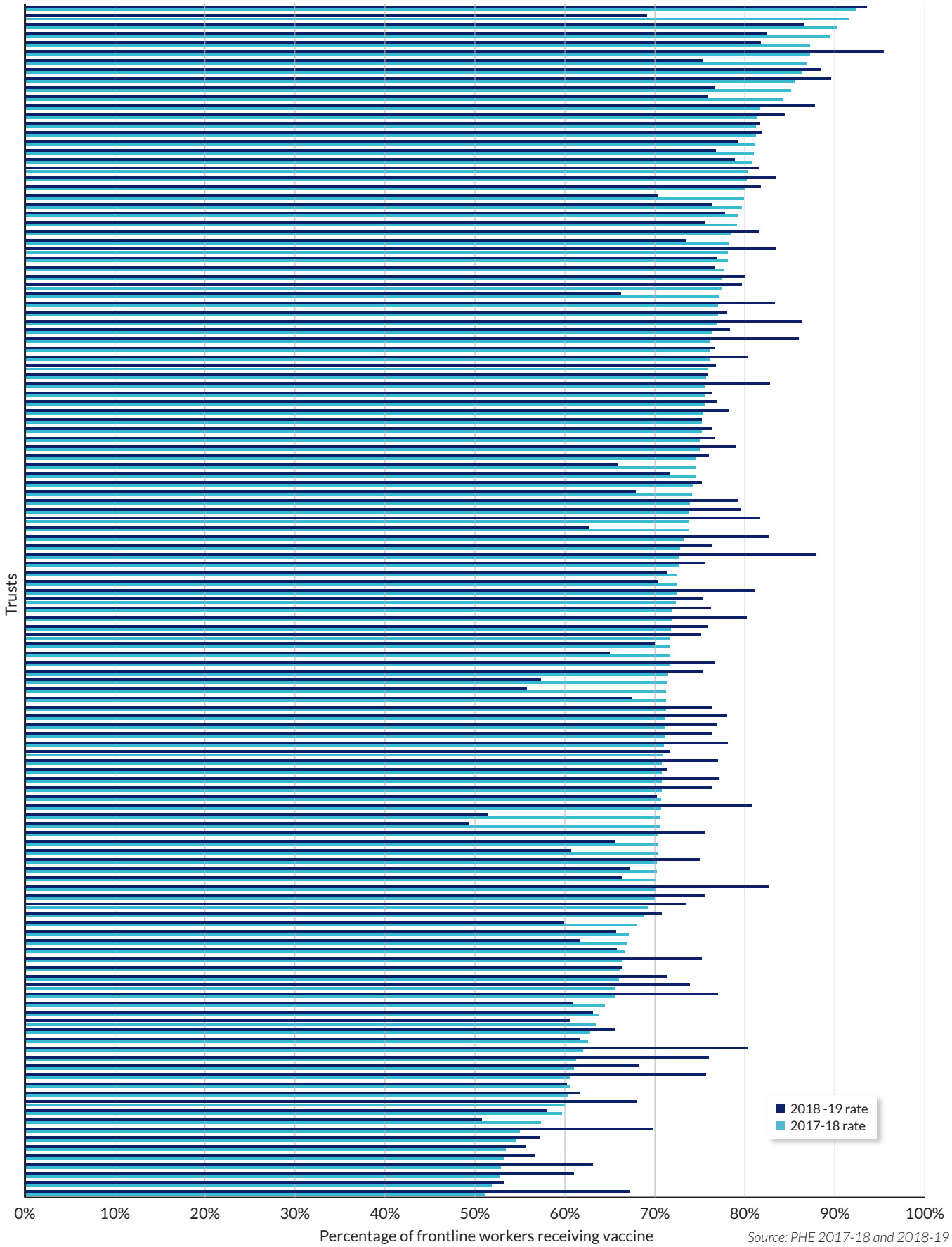
Whittington Health NHS Trust treats many patients with respiratory diseases who have not received a flu jab despite meeting the criteria for receiving one. Hospital admission (and other attendances) provide an opportunity to ensure patients receive their influenza vaccination without an additional visit. This is especially relevant during the COVID-19 pandemic, where frail and high-risk/shielded patients may be apprehensive about attending their GP practice or community pharmacy.

In 2017 the Whittington Health NHS Trust introduced flu vaccination on respiratory wards as a 'preventing future illness' intervention. This involved better information sharing to highlight patients who had not received a vaccine, easier prescribing via dropdown menus, improved information sharing with GPs to ensure records are updated.

An inpatient offer of influenza vaccination is now an embedded part of the respiratory ward care. It is also increasingly offered on other wards in the hospital. This reflects both that clinicians want to be able to offer flu vaccination and that patients want to take up the offer of inpatient vaccination.

With the ability of the pharmacy team to review primary care notes, a current initiative is to deliver pneumococcal vaccination in patients who have not had this in the past.

Figure 49: seasonal flu vaccine healthcare worker uptake rate by trust



Source: PHE 2017-18 and 2018-19

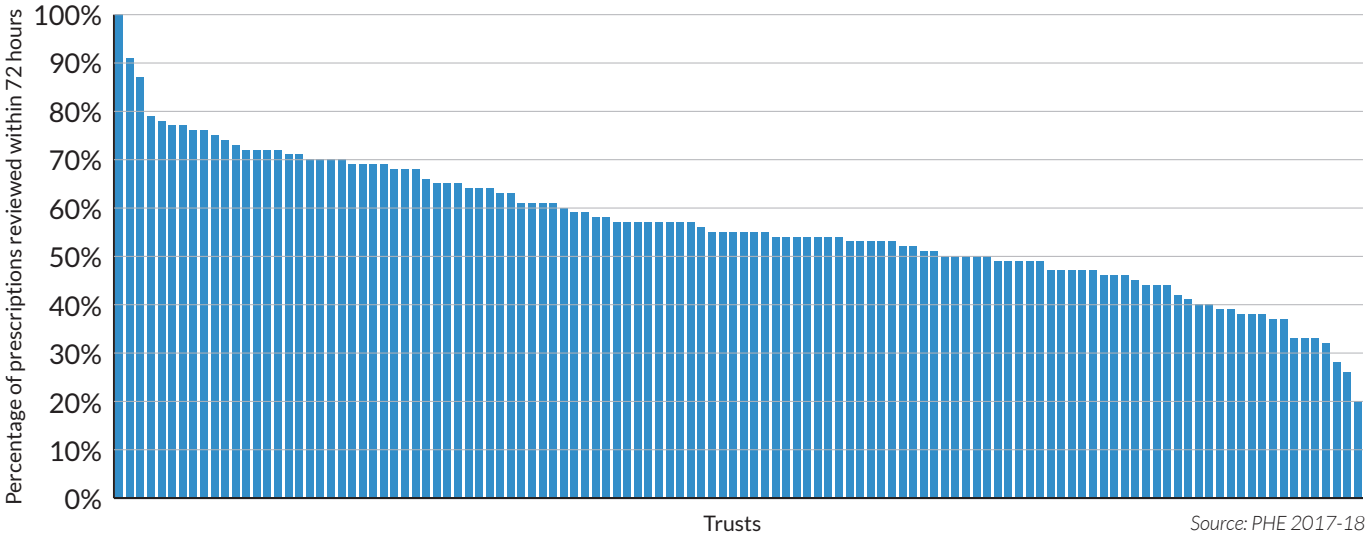
Antimicrobial stewardship

Antimicrobial resistance (AMR) remains a serious threat to the health of people in England, with 178 AMR infections diagnosed each day.[133] Antimicrobial stewardship is a term used to describe an organisational or healthcare system wide approach to promoting and monitoring the correct and appropriate use of antimicrobials to preserve their future effectiveness. The correct and appropriate use of antimicrobials is vital as we face the rise of antimicrobial resistance. NICE antimicrobial resistance guidelines states that: *"Commissioners should ensure that antimicrobial stewardship operates across all care settings as part of an antimicrobial stewardship programme.*[134]*"*

Given the high volumes of antibiotic prescribing for acute respiratory infections, stewardship is an important area for respiratory medicine, however we found that many respiratory departments do not have an antimicrobial steward appointed. To improve stewardship, NHS England and NHS Improvement has made this a recommendation in assurance reporting at trust level and a supportive process is in place to deliver improved stewardship, although results of this are awaited.[135]

As can be seen in **Figure 50**, there is wide variation in the number of prescriptions reviewed within 72 hours at trust level, with a view to moving to oral antibiotics and/or a narrower spectrum drug when microbiological evidence is available. We did find during our deep-dive visits that some organisations performed poorly, however a systematic approach has since significantly improved these findings. Unfortunately, follow-up data is not available to see shifts over time, as subsequent information was collected as a CQUIN around sepsis and is not truly comparable. To try to improve choice of antibiotics and raise the profile of this important area, a community acquired pneumonia CQUIN that includes aspects of antibiotic use has been developed, but this has been delayed due to the COVID-19 pandemic.

Figure 50: Percentage of antibiotic prescriptions reviewed within 72 hours by acute providers



Source: PHE 2017-18

[133] *Public Health England (2020) English Surveillance Programme for Antimicrobial Utilisation and Resistance (ESPAUR), https://www.gov.uk/government/publications/english-surveillance-programme-antimicrobial-utilisation-and-resistance-espaur-report*

[134] *NICE (2015) Antimicrobial stewardship: systems and processes for effective antimicrobial medicine use, https://www.nice.org.uk/guidance/NG15/chapter/1-Recommendations#all-antimicrobials*

[135] *M Santillo, et al, ARK-Hospital (2019) Intervention planning for Antibiotic Review Kit (ARK): a digital and behavioural intervention to safely review and reduce antibiotic prescriptions in acute and general medicine, Journal of Antimicrobial Chemotherapy, Volume 74, Issue 11.*

CASE STUDY

Reducing the use of broad-spectrum antibiotics in community-acquired pneumonia using point-of-care testing

University Hospitals of Derby and Burton NHS Foundation Trust

Antimicrobial resistance (AMR) is a matter of international importance. Royal Derby Hospital developed and tested front-door comprehensive microbiological testing to enable more patients to get a microbiocidal diagnosis and enable better streamlining of antibiotic regimens.

Patients admitted with CAP at Royal Derby Hospital underwent comprehensive microbiological testing where possible within the first 24 hours of admission, with influenza PCR performed during influenza season. All antibiotics prescribed during the admission (including discharge) were recorded.

The hospital found that, of 1,336 patients admitted with CAP, 28.0% received a positive microbiological diagnosis, compared with 11.4% in a pre-intervention cohort. Prior to comprehensive screening, patients with CAP received a median of 9.5 days of broad spectrum antibiotics compared with 7.8 days after intervention. Within the intervention group, patients with a positive pneumococcal diagnosis received a median of 4.0 days of a broad spectrum antibiotic and 5.5 days of a narrow spectrum antibiotic, compared with 8.8 and 0.0 days respectively for those with no positive microbiology.

Comprehensive microbiological testing results in a higher proportion of patients with a positive microbiological diagnosis and is associated with lower prescribing of broad spectrum antibiotics.

Environmental impact of inhaler medication

Inhaled therapy has been a major advance in delivering drugs to the airways and is now the standard form of therapy for both bronchodilators and inhaled steroids. Inhalers can be broadly considered as breath actuated dry powder or soft mist, where an inspiratory effort generated by the patient through the device produces an aerosol that has particles of sufficient size to be deposited in the airways. There are over 20 different inhaler types with differing characteristics which, together with patient effort and technique, affect drug deposition.

Proper inhaler technique is essential in order that patients can effectively self-manage their asthma and fully benefit from treatment. Education for patents is one aspect of ensuring correct inhaler technique, but this is only possible if relevant healthcare team members receive adequate training in inhaler technique and in how to demonstrate that technique. NHS RightCare has built inhaler technique into national initiatives. When patients are equipped with the right inhaler technique this enables them to make an informed decision with their healthcare teams, and supported by decision aids, about the most appropriate inhaler type for them.

In contrast to these dry powder inhalers (DPIs) are the metered dose inhalers (MDIs), which contain a propellant and the drug as particles or in solution which is aerosolised on actuation of the device. For many years, the propellants were fluorocarbons (CFCs) that had a damaging effect on the ozone layer. CFCs were gradually withdrawn in favour of hydrofluorocarbons (HFCs). However, over recent years HFCs have been identified as potent powerful greenhouse gases. While there is an issue of single-use plastics within the devices entering the environment, the impact of which may be reduced by reuse, recycling or incineration, the largest contributor to the carbon footprint for an MDI are the propellants. The carbon impact is estimated at 500g CO2eq per dose for MDIs, compared to 20g in DPIs.[136] Five doses from an MDI would be equivalent to driving nine miles in an average car.[137] The size of this problem is important for England where some 35 million prescriptions for MDIs were issued in 2018. Compared with other European countries the use of MDIs is much greater (up to seven times) adding to the potential footprint.

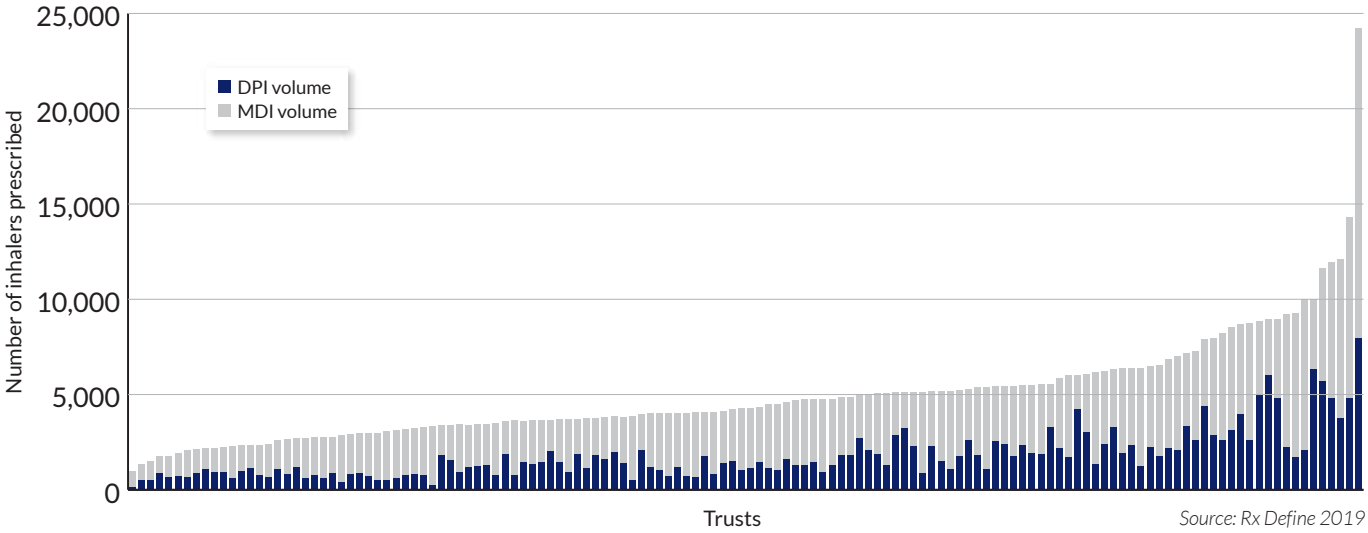
[136] *NICE (2019) NICE encourages use of greener asthma inhalers, https://www.nice.org.uk/news/article/nice-encourages-use-of-greener-asthma-inhalers*

[137] *GP Online (2019) How switching asthma inhalers can help the NHS cut carbon emissions, https://www.gponline.com/switching-asthma-inhalers-help-nhs-cut-carbon-emissions/article/1588958*

Nationally, the contribution of MDIs to global warming has been recognised as an aspect of the government's Net Zero commitments and in specific NHS Long Term Plan commitments.[138] There is a move towards DPIs being encouraged in the new primary care networks contract, and for secondary care the encouragement in both the forthcoming asthma incentive scheme and the established COPD incentive scheme, both of which have been delayed as a consequence of COVID-19. It should be noted that ensuring the right inhaler is given to the right patient must remain the priority, alongside proper inhaler technique guidance, and NICE has developed a patient decision aid to assess the best inhaler for individual patients.[139] Several manufacturers of MDIs have also announced investments in low carbon propellants, to start entering the market from 2025.

To explore this area further, we have looked at the number of MDIs and DPIs prescribed in acute providers and have information on the estimated tonnes of carbon dioxide produced per trust and the reductions that can occur by changing prescribing practices. At a more basic level we have found variation in the number of inhalers prescribed per bed, from eight to over 20, for reasons which were not apparent, and there was marked variation in the number which originated from respiratory medicine, ranging from over 35% to nil. It is not easy to explain this finding beyond acknowledging the differences in care pathways. Recognising the national differences in prescribing we looked at the ratio of MDI and DPI and found wide differences as shown in **Figure 51**. From our deep dives it was clear that where there were enthusiasts who recognised the impact of HFC propellants on the environment, there was greater DPI use.

Figure 51: Number of dry powder inhalers prescribed compared to metered dose inhalers



Source: Rx Define 2019

There have been a variety of publications concerning the science of this[140, 141] that have led to position statements from both the BTS and the Primary Care Respiratory Society.[142, 143] All of these highlight the potential impact of HFCs on the environment and the potential environmental benefit from a move to prescribing DPIs.

It is important to recognise the change from CFC propellants to HFCs was planned over many months, was done in a gradual and co-ordinated way and did not involve a change in device type, as both were MDIs. This change was associated with additional resources that gave clinicians the opportunity to discuss the changes with patients and optimise care. As new low

[138] *The Committee on Climate Change (2019) Net Zero Technical, https://www.theccc.org.uk/publication/net-zero-technical-report/*

[139] *NICE (2020) Patient decision aid: Inhalers for asthma, https://www.nice.org.uk/guidance/ng80/resources/inhalers-for-asthma-patient-decision-aid-pdf-6727144573*

[140] *Bloom CI, Douglas I, Olney J, et al. (2019) Cost saving of switching to equivalent inhalers and its effect on health outcomes, Thorax.*

[141] *Wilkinson AJK, Braggins R, Steinbach I, et al. (2019) Costs of switching to low global warming potential inhalers. An economic and carbon footprint analysis of NHS prescription data in England, BMJ Open.*

[142] *BTS (2020) Position Statement: The Environment And Lung Health, https://www.brit-thoracic.org.uk/about-us/position-statements/*

[143] *PCRS (2020) Position statement: Environmental issues in respiratory disease, https://www.pcrs-uk.org/sites/pcrs-uk.org/files/PositionStatementOnEnvironmentalIssues.pdf*

carbon propellants become available from 2025, this same type of shift will be possible. In the short-term, carbon reduction can be achieved in a modest shift away from MDIs to DPIs and, where available, other lower carbon devices. **Figure 51** suggests that a considerable shift may be possible within the range of existing national variation in prescribing practice.

Favouring lower carbon DPI from first prescription, where clinically appropriate, should be straight-forward and is supported by BTS guidelines. However, caution is required in undertaking a change in device type from MDI to DPI. This should be done with clinicians working in partnerships with patients on the basis of clinical need and patient preference, to find what the best inhaler is for them, ensuring they can use the inhaler correctly, and encouraging adherence to inhaler therapy. The environmental impact of all suitable devices should be an aspect of informed choice in shared decision-making for patients and clinicians. Clear local guidance, with pharmacists heavily involved in designing and supporting changes, ideally across STPs, is an opportunity to develop standardised formularies.

We have data on the estimated impact on carbon dioxide equivalent reduction with a move to DPIs, including the cost of prescribing at acute provider, STP, and regional level for both inhaled steroids and salbutamol reliever therapy. For simplicity, if we consider salbutamol as Ventolin, there were 18.5 million MDIs prescribed in 2018 that produce 462,000 tonnes of carbon dioxide. Further information is available from a community interest company: ***https://www.prescqipp.info/***

If we are to tackle these environmental issues, we need to be realistic about the pace of change and see this as an opportunity, with appropriate investment, to optimise management and especially inhaler technique. Very sensible advice is contained in the statements by both the BTS and PCRS. Recycling old devices at a pharmacy is a simple step, together with considering the lowest environmentally harmful product when prescribing an inhaler for the first time. For patients established on MDI relievers, a significant reduction in CO2 footprint could be achieved moving to a product with less propellant.

Recommendation: Medicines optimisation

Recommendation	Actions	Owners	Timescale
22. Improve patient outcomes by reviewing infrastructure to support appropriate medicines use.	**a** Improve uptake of staff flu vaccination using NICE QS190.	Trusts	Within 12 months of publication
	b Ensure patients are offered flu and pneumococcal vaccination.	Trusts	Within 12 months of publication
	c Appoint an antibiotic steward at department level.	Trusts	Within 6 months of publication
	d Improve adherence to inhaler therapy, especially for inhaled steroids to reduce the reliance on reliever therapy. This will improve outcomes and reduce the carbon footprint of inhalers	Trusts, PCNs	Within 6 months of publication
	e Develop guidance at ICS level to standardise formularies. This should include patient education on inhaler therapy, ensuring patients use their inhaler correctly and shared decision-making in choice of inhaler.	ICSs, PCNs, Trusts	Within 12 months of publication

Workforce

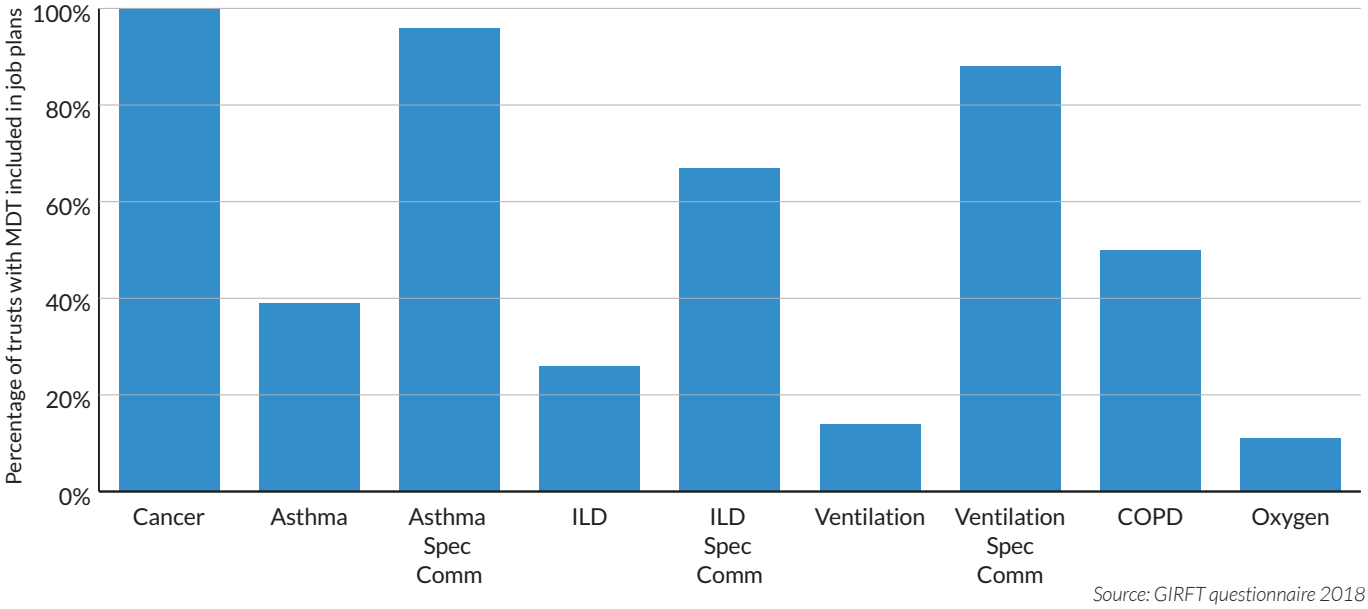
The workforce who contribute to the management of respiratory patients and form the teams that deliver care comprises a wide range of professionals. To run an effective and efficient system, staff with the right skillset in sufficient numbers need to be present, although this was often not found during deep dives, across all professions.

Medical staff

The respiratory medical workforce is not only involved in delivering specialty and subspecialty respiratory care but also has a major role in acute care, in-reaching into ED and AMU, as well being on call for the hospital take. However, sometimes this is to the detriment of respiratory patients, as we often heard during deep dives that respiratory wards had lots of general medical patients, while patients with respiratory problems needing expert care were placed on general wards.

This is shown in the marked variation in the number of hospitals that achieve 65% of their respiratory patients managed by respiratory physicians (see *Activity and information flows*, page 47 and *Acute and inpatient care*, page 38), but it is important to take note of the evolving role of MDTs in delivering care. These have been encouraged over the years, especially in cancer and in specialised commissioning, but as their activity is not always captured in a formal process, they do not attract payment. This is particularly the case for specialised commissioning, as noted in that section. **Figure 52** shows some examples of MDTs, but not all are included in job plans and inclusions varied greatly depending on consultant specialties.

Figure 52: Inclusion of MDT meetings in consultant job plans

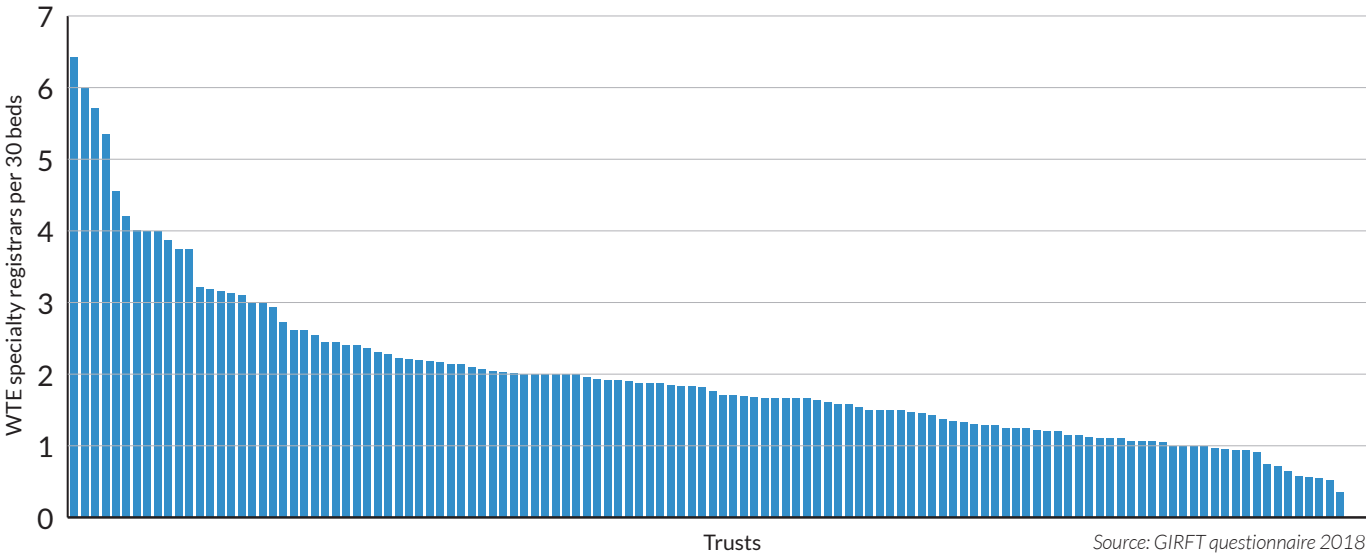


Source: GIRFT questionnaire 2018

Specialty trainees

There is a wide variation in number of specialist registrars (SpRs) per respiratory bed, as shown in **Figure 53**. With some units having very few SpRs, especially in district general hospitals. We found some large trusts we visited had a disproportionate number of SpRs at the central site, with few associated in peripheral sites, where there are excellent learning opportunities. We also found in some trusts that respiratory registrars are contributing a disproportionate amount to the acute take, impacting on the amount of their training spent on respiratory medicine. This is something that has previously been highlighted by trainees in their responses to the GMC survey and an issue trusts need to address.

Figure 53: Number of whole time equivalent respiratory medicine specialty registrars per 30 beds



Source: GIRFT questionnaire 2018

The BTS regularly monitors specialty trainee numbers. In 2019, the BTS reported that there were 772 trainees holding training numbers, of whom 148 were 'out of programme' (e.g. to carry out research). There were also 21 vacant posts.

The number of CCTs awarded in respiratory medicine can be used as a proxy measure for the number of trainee doctors moving into consultant specialty, and these have been reducing annually. In 2017 the number was 94, it was 80 in 2018, and 69 for Q1-3 in 2019. These reducing numbers indicate that there are not enough new trainees coming in to fill vacant posts and replace proposed retirements, let alone to support any expansion that is occurring, and needs to accelerate to fulfil the NHS Long Term Plan ambitions. During deep dives we found many trusts had vacant consultant posts and for some it was up to three, severely impacting on both the quality of care and placing additional burden on the consultant staff present. An estimated additional 100 training posts in respiratory medicine have been called for but this is insufficient to fulfil the expansion of the respiratory integrated care that needs to occur, and which is being promoted during GIRFT community reviews.

Recognising the changing landscape of respiratory care, which will increasingly be delivered in an integrated way closer to patients' homes, a more realistic increase is likely to be in the region of an extra 200 respiratory trainee numbers. This is something GIRFT, alongside BTS, would be keen to discuss further with Health Education England to ensure the specialty evolves in line with the ambitions set out for respiratory care in the NHS Long Term Plan.

Physician Associates

Physician Associates support doctors in the diagnosis and management of patients, performing a variety of roles including taking medical histories from patients, performing physical examinations, diagnosing illnesses, and analysing test results. Physician Associates can free up the time for doctors to concentrate on work necessitating their higher level of training, in line with the NHS People Plan's 'Releasing Time to Care' ambitions as well as adding much needed continuity to the medical team.[144]

The number of Physician Associates continues to grow, with 37 universities now offering postgraduate entry. To qualify, they must undertake a two-year full time postgraduate course, followed by a national examination. They usually have a background in biomedical science or similar, although some have previous healthcare experience. To date, there are almost 2,000 Physician Associates in the UK with a further 1,600 in training.[145] The profession is not yet regulated, but the Faculty of Physician Associates holds a Managed Voluntary Register pending statutory GMC regulation to come into place in late 2021.

Physician Associates provide an opportunity to improve delivery of respiratory care through an increased workforce capacity, but the numbers employed within respiratory care, as seen during GIRFT visits, is low: we observed three Physicians Associates across our first 50+ visits, all functioning as basic ward support with no advanced practice. To fulfil potential,

[144] *RCP, Who are physician associates?, https://www.fparcp.co.uk/about-fpa/Who-are-physician-associates*

[145] *RCP, Faculty of Physician Associates, https://www.rcplondon.ac.uk/news/faculty-physician-associates*

they should be allowed to prescribe and request ionising radiation investigations. An additional period of in-depth training in their chosen specialty is likely to be needed and it may be that an advanced respiratory curriculum needs to be considered. Such an example of the expanded role is being delivered in Cheshire and Merseyside Strategic Clinical Network.

Nursing

The nursing roles in respiratory medicine can be considered as ward based, including general outpatient nursing and more specialty nursing (advanced and enhanced). Ward staffing numbers and skill mix are determined locally, but it is essential that staff have a basic understanding of respiratory medicine and can support on-going ward care. This may involve a variety of areas, including smoking cessation and where possible prescribing against Patient Group Directives (PGDs), and especially advising and assessing patients with regards to inhaler technique. Peak flow (PF) recordings are an important way of assessing control of acute asthma and could help determine safety around discharge, as noted in the asthma section, by ensuring PF recordings are accurate and supervised by nursing staff. In the absence of disease-specific nursing staff, ward nurses and pharmacists play a key role in assessing and optimising inhaler technique.

Nursing ratios are discussed in the report with recommendations in the appropriate sections. Decisions regarding nursing ratios should consider NQB guidance on safe sustainable and productive staffing (see https://www.england.nhs.uk/ourwork/part-rel/nqb/). Local planning will be needed to determine the true number of nurses required, recognising the tools based around acuity do not always factor in the many important aspects of care.

In more specialised areas, such as NIV, criteria on the number of staff and their training exist and should be adhered to to ensure good patient outcomes, an area of on-going discussion with CQC.[146] The BTS Professional Development Framework outlines a pathway for ongoing progression for respiratory nurses.[147]

Specialist nursing (enhanced and advanced level)

Specialist nurses have been instrumental in delivering respiratory care over many years, starting with tuberculosis nurses. Depending on the hospital size, specialist nurses may follow a more generic path or become disease-specific, such as asthma, or oxygen therapy. Such enhanced level practitioners are essential in producing quality care not only on the respiratory wards but across the whole of the hospital, given that respiratory medicine patients are cared for beyond respiratory wards as highlighted in previous sections. Specialist nurses also have an important role in managing follow-up, and the adaptations made during the COVID-19 pandemic have shown that remote follow-up, monitoring and support can be managed safely and efficiently by specialist nurses.

With respect to senior decision makers – advanced level practitioners – there are only 34 nurse consultants and many senior nursing staff are approaching retirement, with few new posts being advertised or frozen due to financial implications. The BTS has attempted to address this by running a 'learning track' for many years in the Summer Meeting and publishing a workforce document that highlights many of these issues.[148] During our deep dives we noted many occasions where there were insufficient levels of specialist nursing staff to deliver optimal care, as highlighted in the appropriate sections. Recruiting to such posts would lead to major efficiency improvements to facilitate discharge and reduce readmissions.

Physiologists

Physiology services are a key area in respiratory medicine, with many patients having a physiological measurement at some stage of their journey. Such measurements are mandated by NICE, specialised commissioning, BTS and other organisations in either making a diagnosis, confirming the eligibility for treatment, or on-going monitoring.

Physiology training was redrafted in the modernising scientific careers review[149] that looked at the scientist grade (STP) through the practitioner (PTP) and scientific training programmes. Competency is achieved through both academic (university) and work-based training over three years, with STP student graduates being able to undertake a variety of advanced investigations and lead services.

The PTP grade has unfortunately had relatively few applicants over recent years, leaving a gap in the workforce such that this has now been converted to an apprenticeship programme. As part of modernising scientific careers, individuals can progress to higher specialist scientific training (HSST), which effectively produces consultant grade scientists at the end of

[146] *BTS (2019) National Adult Non-Invasive Ventilation Audit, https://www.brit-thoracic.org.uk/quality-improvement/clinical-audit/national-adult-non-invasive-ventilation-audit-2019/*

[147] *BTS (2020) A professional development framework for respiratory nursing, https://www.brit-thoracic.org.uk/workforce/respiratory-nurse-specialists/*

[148] *BTS (2018) Respiratory Medicine Workforce Review, https://www.brit-thoracic.org.uk/media/70309/bts-workforce-review-2018-final-7-dec-2018.pdf*

[149] *National School of Healthcare Science, Programmes, https://nshcs.hee.nhs.uk/programmes*

a five-year programme via a professional doctoral training programme. Again, there is a relatively low but increasing uptake of students into the HSST grade, with only seven enrolled since 2014, with the first two due to graduate in the next 12 months. The role of these individuals is to provide scientific advice to organisations, such as ICSs, physiology networks as well as leading scientific and clinical services, such as breathlessness assessment, ILD, and procuring new technology.

Like many areas, recruitment into respiratory physiology has been slow and has not kept pace with either physician appointments or mandated interventions, for example, prescribing antifibrotic treatment for ILD is based upon physiological measures. The whole process of recruitment and retention of staff needs invigorating.

During our deep dives, in virtually every hospital we found insufficient physiologist staff numbers to deliver the services for both general respiratory function tests (spirometry, gas transfer, lung volumes) and delivery of sleep medicine. Many physiologists/clinical scientists had adopted the idea of an extended working day to maximise the use of the equipment [150] as found in both the physiology and sleep departments at University Hospitals of North Midlands NHS Trust. Staff shortages are the rate limiting factor in respiratory diagnostics for most trusts who adopt this action. The spread of staff is highlighted in **Figure 54**; we estimate there is a shortfall of 375 qualified senior staff (Band 5 and above) across England.

Out of 110 trusts that responded to the ARTP questionnaire, we found that 56 of these trusts had no Band 2 – 4 physiology staff.

Figure 54: Skill mix of physiology teams

Source: GIRFT questionnaire 2018

From our observation notes to trusts we have made universal recommendations that they consider appointing Band 2 staff to undertake basic investigations under supervision while gaining the ARTP spirometry certificate to progress to Band 3 and then after an additional year of consolidating experience, progressing to Band 4 via the ARTP Associate Practitioner examination. Similar pathways exist for sleep medicine with oximetry and CPAP qualifications. Appointment to the basic physiology workforce would enable more senior staff to be deployed to undertake complex investigations of which there are significant waiting lists.

While appointment of Band 4 staff may produce some short-term benefit, a systematic review of recruitment, training and retention is recommended to fill the gap for the expanding need for respiratory physiological services.

Consultant Clinical Scientists play a key role and work in partnership with their medical colleagues and within multi-professional clinical teams to support clinical scientific practice aimed at quality improvement, innovation and world-class outcomes for patients.[151] They may manage or lead respiratory and/or sleep services, undertake specialist clinics and undertake scientific research.

Administrative staff

Administrative staff are essential to supporting all professional staff with essential paperwork, and with enabling prompt communication that is necessary for good care. We found many examples during deep dives where senior medical, nursing and physiological staff were undertaking routine Band 2-3 clerical work: an inappropriate use of clinical expertise and resource. This is also highlighted in the appropriate sections of this report. Where there is insufficient administrative resource available, we found key areas such as the NACAP and other audits that form part of the trust's quality accounts were not being submitted, leading to a lack of quality data, poor performance and loss of income.

[150] *Department of Health (2009) Transforming Respiratory and Sleep Diagnostic Services A Good Practice Guide, http://data.parliament.uk/DepositedPapers/Files/DEP2011-0742/DEP2011-0742.pdf*

[151] *RCP (2020) Recognising the vital role of healthcare scientists, clinical physiologists and technologists, https://www.rcplondon.ac.uk/news/recognising-vital-role-healthcare-scientists-clinical-physiologists-and-technologists*

Allied Health Professions (AHPs) and pharmacists

AHPs are the third largest workforce in the NHS. They provide system-wide care to assess, treat, diagnose and discharge patients across social care, housing, education, and independent and voluntary sectors.[152] There are 14 allied professions, including occupational therapists, physiotherapists, and speech and language therapists.

Through our visits we found many respiratory departments have very variable access, in particular, to physiotherapy, psychology, dietetics or speech and language therapists, especially in the specialised commissioning areas, but applicable to most aspects of respiratory care.

We attempted to look in detail at the role of physiotherapy in respiratory care, given their key role not only in maintaining physical activity and pulmonary rehabilitation, but in specific aspects of respiratory care in breathing pattern disorders and sputum clearance. From the latest electronic staff record returns, there are 21,381 qualified physiotherapists and 1,879 vacancies, but we have little further information within respiratory services and would recommend detailed workforce planning including the extended scope of practice.

We also hoped to get information on the role of pharmacists beyond the areas outlined in specialised commissioning but were unsuccessful in doing so beyond the anecdotes from deep dives where we noted some pharmacists have an extended role in respiratory care.

Recommendation: Workforce

Recommendation	Actions	Owners	Timescale
23. Address variations in service delivery and meet the needs of the local population by staffing respiratory departments with the appropriate numbers and skill mix of doctors, specialist nurses, physiologists and allied health professionals.	**a** Review the trainee numbers for respiratory medicine to ensure the specialty evolves in line with ambitions set out for respiratory care in the NHS Long Term Plan.	GIRFT, BTS, HEE	Within 12 months of publication
	b Consider optimising skill mix by appointing specialist/enhanced roles for Physician Associates, nurses and Allied Health Professionals within the respiratory team.	Trusts	Within 18 months of publication
	c Consider how to address recruitment and retention challenges in the respiratory workforce.	HEE / NHSEI, GIRFT	Ongoing
	d Consider appointing more band 2 physiologists to conduct spirometry and support sleep diagnostics, with view to these staff developing into band 4 roles with experience. Where advanced diagnostics are required, ensure there is sufficient numbers / skill mix to deliver results in a timely way to achieve the 6-week RTT target.	Trusts	Within 12 months of publication
	e Appoint enough administrative staff to address clerical workload and reduce clinical time spent on administrative tasks in line with NHS People Plan ambitions.	Trusts	Within 18 months of publication
	f Carry out detailed workforce planning including scoping extended practice for nurses, AHPs and pharmacists.	Trusts, ICSs	Within 18 months of publication

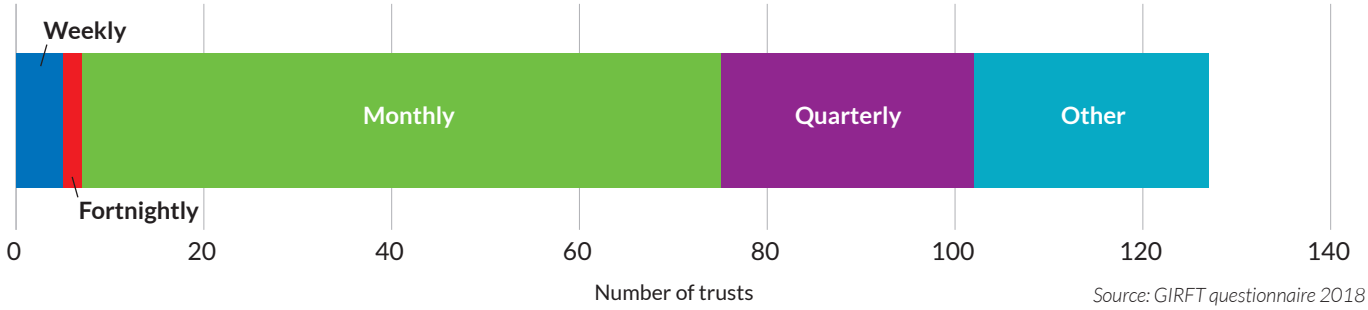
[152] *NHS England, About Allied Health Professionals, https://www.england.nhs.uk/ahp/about/*

Patient safety and litigation

Learning from complaints, adverse events, coroner inquests, an effective Mortality and Morbidity meeting (M&M) and litigation are all markers of good governance that are important for delivering quality care.

We asked about M&M meetings in our questionnaire and discussed the findings in deep-dive visits. Frequency of M&M meetings ranged from fortnightly in a few hospitals to quarterly in 31% of surveyed trusts (**Figure 55**). We found that morbidity was not often discussed in detail and where there were two sites in one trust, they failed to have joint meetings, which can result in missed learning opportunities. We noted that 90 respondents were following the RCP process of structured judgement reviews (SJRs), a validated methodology that allows a judgement to be made that is reproducible.[153] 24 trusts did not follow this process and 12 did not respond to the question. From the deep dives, we found that most respiratory departments had an M&M lead but access to notes for review was not always easy. We noted that the concept of the medical examiner was understood and in two of the 58 visits to date, respiratory physicians were taking up the role.

Figure 55: Frequency of M&M meetings by number of trusts



Source: GIRFT questionnaire 2018

Reducing the impact of litigation

Each of the GIRFT programmes has examined the impact and causes of litigation with a view to reducing the frequency and cost of litigation and more importantly reducing the incidents that lead to them. It was clear during GIRFT visits that most consultants had little knowledge of the claims against them. We explored the reasons for this and found that the legal department informed the respiratory department of claims in only a few trusts. Discussion of claims occurred at trust board or divisional level, but unless a respiratory physician attended these meetings, the respiratory department was usually unaware of the claim. However this close link between respiratory clinicians and litigation departments can occur effectively, as seen at both the Countess of Chester Hospital NHS Foundation Trust and Doncaster and Bassetlaw Hospitals NHS Foundation Trust. Perhaps the best example was at Portsmouth Hospitals NHS Trust, where the trust has a set litigation protocol where information on any claims made are sent to the relevant department for discussion within the M&M meetings.

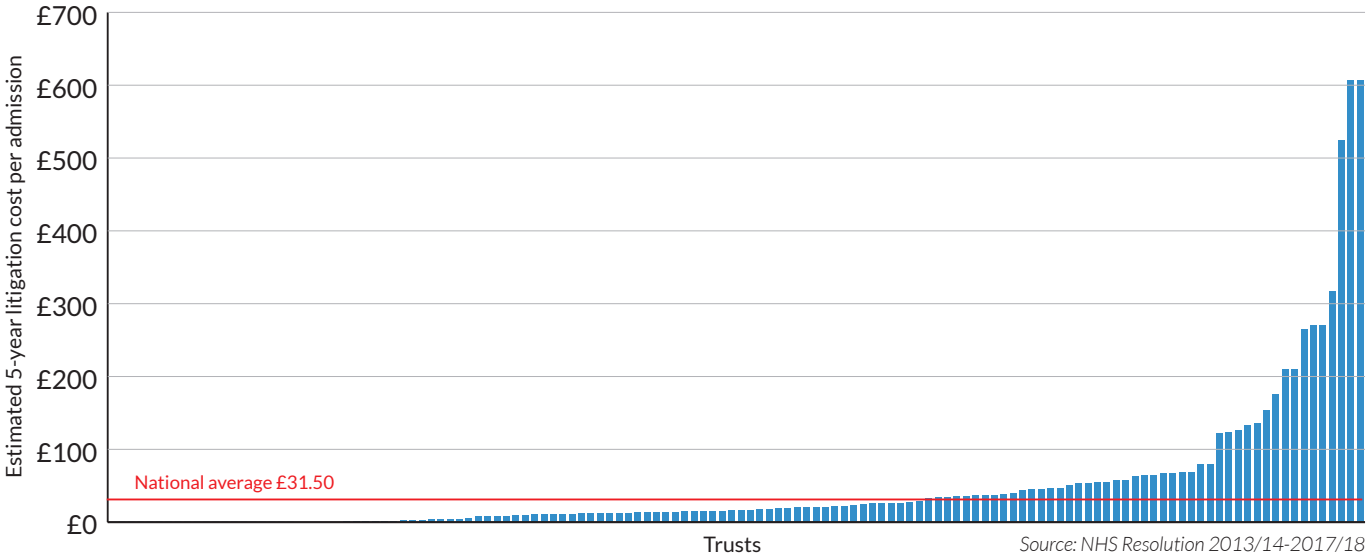
We made general recommendations, even though there was often a delay of several years from the event to the claim, that these claims should be formally reviewed at the M&M meetings to ensure the learning was embedded. Such a process should be considered for complaints and patient safety incidents which may be handled by directorate management but are not often formally discussed in M&M meetings, including those that had gone to the coroner as inquests. Again, a missed learning opportunity to improve patient care.

[153] *RCP (2016) Using the structured judgement review method: A clinical governance guide to mortality case record reviews, https://www.rcplondon.ac.uk/sites/default/files/media/Documents/NMCRR%20clinical%20governance%20guide_1.pdf*

Clinical negligence claims volume and costs

Data obtained from NHS Resolution shows that potential estimated clinical negligence claim costs in respiratory medicine were estimated to have risen from £12.3 million per year to £16.5 million per year over the five years (**Table 3**). We found the national average estimated cost of litigation per respiratory medicine admission was £31. There are noticeable differences between providers: the best performing provider is estimated to cost £0 per admission, while at the other end of the scale, one provider is expected to generate an average of £607 of litigation costs per admission (**Figure 56**). A confounding factor in this is that some of the thoracic surgery litigation claims are included in respiratory medicine so this may distort some of the above figures.

Figure 56: Variation in England between trusts in estimated litigation costs for respiratory medicine per admission notified to NHS Resolution 2013/14 to 2017/18



Source: NHS Resolution 2013/14-2017/18

Table 3: Volume and potential estimated cost of medical negligence claims against respiratory medicine notified to NHS Resolution 2013/14 to 2017/18

Year of notification	No. of claims	% change in claims	Sum of Total Claim (£)	% change in cost
2013/14	91	-	12.3 million	-
2014/15	104	14%	11.7 million	-5%
2015/16	118	13%	14.0 million	20%
2016/17	100	-15%	13.2 million	-6%
2017/18	136	36%	16.5 million	25%
Grand Total	**549**	**-**	**67.7 million**	**-**

Claims trends and causes

Respiratory medicine is the 26th highest clinical specialty for claim numbers and is the 28th highest for total claim costs during the financial years 2013/14 – 2017/18. The crude apportionment of the reasons for the claims are attributed in **Table 4**.

Table 4: Top 5 most frequent causes for litigation in respiratory medicine 2013/14 to 2017/18

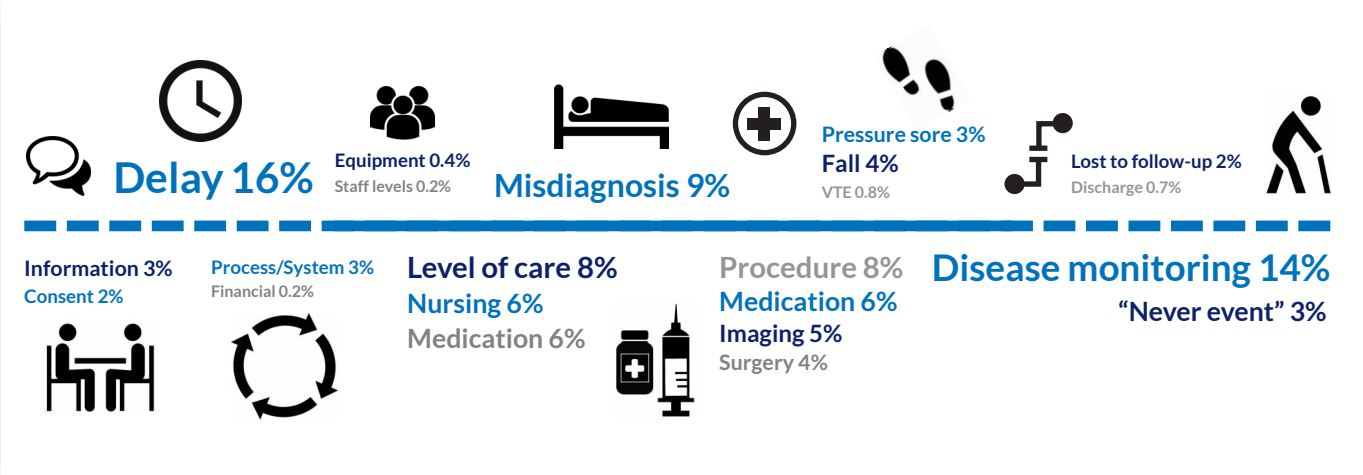
Causes	No. of claims
Treatment	247
Diagnosis	199
Nursing	67
Medication Errors	32
Consent	26

Nature of claims

We undertook a systematic review of the 549 claims over the five-year period. Six were not against acute providers and eight were in under 18-year olds, and so were excluded. Others were either difficult to classify or were not considered to be truly respiratory medicine in origin. Thus, of the remaining 356, 117 (33%) were either presumed, or actually were, cancer related. The second, and surprising, area was 42 cases (12%) related to tuberculosis management, with 38 (11%) being respiratory infection related. For thoracic surgery alone we found 18 cases (5%) but there was a disproportionate amount claimed - an average cost of £285,000, in contrast to the average cost for respiratory medicine (excluding thoracic surgery) of £118,000 (ie; the average cost for thoracic surgery is 242% that of respiratory medicine). It is therefore important when trusts review their litigation claims that note is taken of any that may be attributable to thoracic surgery.

To get a clear picture of the timings of the claims, **Figure 57** highlights a process map outlining when we could attribute claims.

Figure 57: Timeline of when claims are made



Recommendation: Litigation

Recommendation	Actions	Owners	Timescale
24. Reduce litigation costs by application of the GIRFT five-point plan. Share learning by ensuring claims, inquests and complaints are reviewed in regular M&M meetings.	**a** Assess benchmarked position compared to the national average when reviewing the estimated litigation cost per activity. Trusts would have received this information in the GIRFT 'Litigation data pack'.	Trusts	On publication
	b Discuss with the legal department or claims handler the claims submitted to NHS Resolution included in the data set to confirm correct coding to that department. Inform NHS Resolution of any claims which are not coded correctly to the appropriate specialty via CNST.Helpline@resolution.nhs.uk – notably any claims which should have been classified to thoracic surgery.	Trusts	On completion of 24a
	c Once claims have been verified, further review claims in detail including expert witness statements, panel firm reports and counsel advice as well as medical records to determine where patient care or documentation could be improved. If the legal department or claims handler needs additional assistance with this, each trusts panel firm should be able to provide support.	Trusts	On completion of 24b
	d Triangulate claims with learning themes from complaints, inquests and serious incidents (SI) / Patient Safety Incidents (PSI) and where a claim has not already been reviewed as SI/PSI we would recommend that this is carried out to ensure no opportunity for learning is missed. The findings from this learning should be shared with all front-line clinical staff in a structured format at departmental/directorate meetings (including Multidisciplinary Team meetings, Morbidity and Mortality meetings where appropriate. Sustainable and effective interventions that measurably reduce risks to patients should be implemented and where these are successful, should be shared through multiple routes, including discussion at meetings.	Trusts	On completion of 24c
	e Where trusts are outside the top quartile of trusts for litigation costs per activity GIRFT we will be asking national clinical leads and regional teams to follow-up and support trusts in the steps taken to learn from claims. They will also be able to share with trusts examples of good practice where it would be of benefit.	Trusts	On completion of 24d
	f Review categorisation of medical negligence claims to separate thoracic surgery claims from respiratory medicine / cardiac surgery.	GIRFT, NHS Resolution	On publication

Procurement

In 2016, NHS Improvement mandated all trusts to submit their monthly purchase order data to a central database: the NHS Spend Comparison Service (SCS). This is the first time a single national dataset of procurement information has been established for the NHS. Since that time the GIRFT programme has been analysing this data to better understand the variation in products and brands used, and prices paid across NHS trusts. This analysis has been a feature of previous GIRFT reports with examples of variation in the number of brands used by clinicians.

It has been noted that the variation can lead to compromises in patient safety and can add significant costs to the NHS Supply Chain. Addressing variation therefore would have the potential to improve safety and efficacy and provide a potential opportunity to secure better deals and improved value for money for trusts.

Unwarranted variation in respiratory medicine

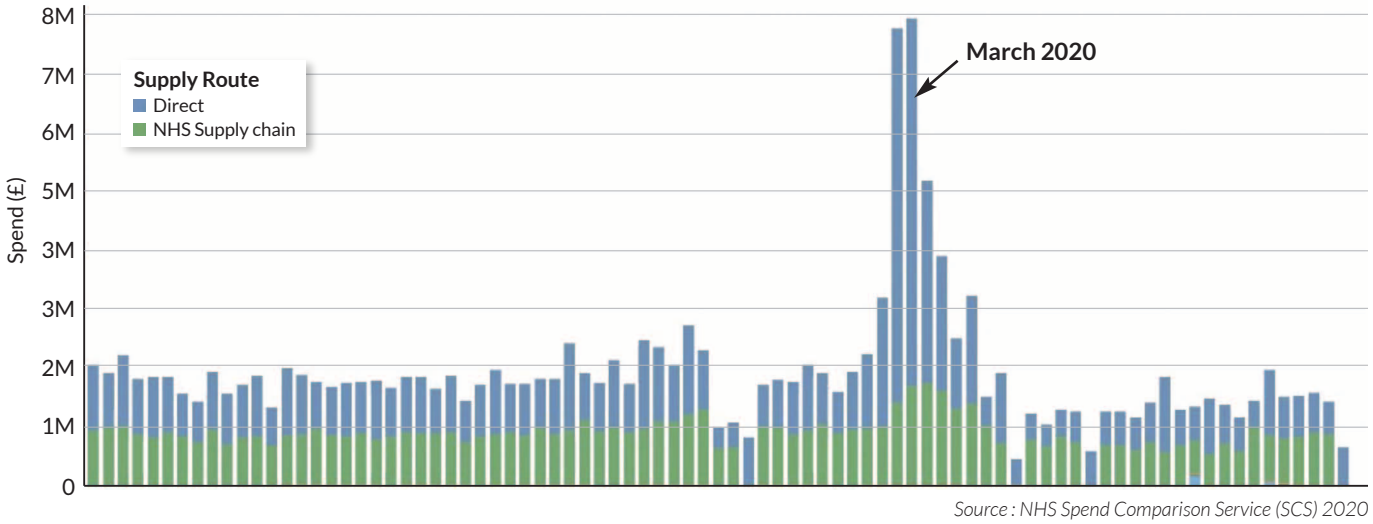
We looked at a selection of products used by respiratory departments across the NHS. While the data available at the time of writing was incomplete and requires further cleansing, SCS analysis indicates that NHS spend on key products for respiratory medicine amounts to over £164.7 million per year, one of the top ten highest specialty spends. Underlying price variation across respiratory medicine is estimated to total £13.6m (8.2% of total spend).

Key product categories include small portable ventilators used for acute and chronic home ventilation, Continuous Positive Airway Pressure (CPAP) devices, masks/interfaces for both the above, indwelling pleural catheters (pleural drains) and Cough Assist devices. This amounts to over 570 suppliers and over 8,000 products.

Respiratory procurement amid COVID-19

As shown below, demand for respiratory products increased significantly in March-April 2020 mainly for CPAP, ventilators and masks due to the use of these devices in treating COVID-19 patients. Given the data on respiratory spend is still evolving as a result of the COVID-19 pandemic, GIRFT will carry out further analysis to delve deeper into these peaks to understand variation in prices paid in more detail. We plan to publish a separate piece of analysis on this in 2021. Additionally, we will use this further analysis to refresh the information we presented during deep dives on the variety of respiratory products.

Figure 58: Overview of spend associated with Respiratory Medicine - March 2019-October 2020 (by week)



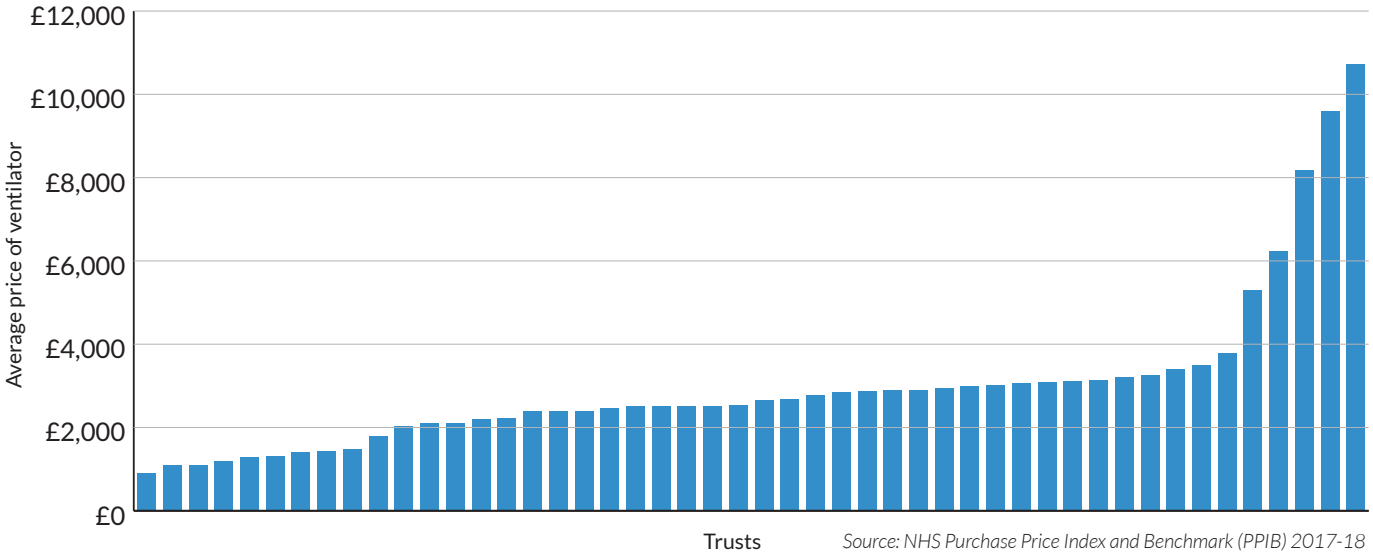
Source : NHS Spend Comparison Service (SCS) 2020

Ventilators

Our initial analysis of spend data from 2017-18 across 66 providers identified a wide variation in average price of low-specification ventilators, from £367 to £3,463. For the same product from the same supplier, some trusts were paying as little as £43 while others were paying £2,875.

The average price of high-specification ventilators, used in lower volumes mostly by specialised centres, ranged from £1,130 to £11,053. For the same product from the same supplier, some trusts were paying £3,752 per device while others were paying £11,962.

Figure 59: Variation in average price of high-specification ventilators



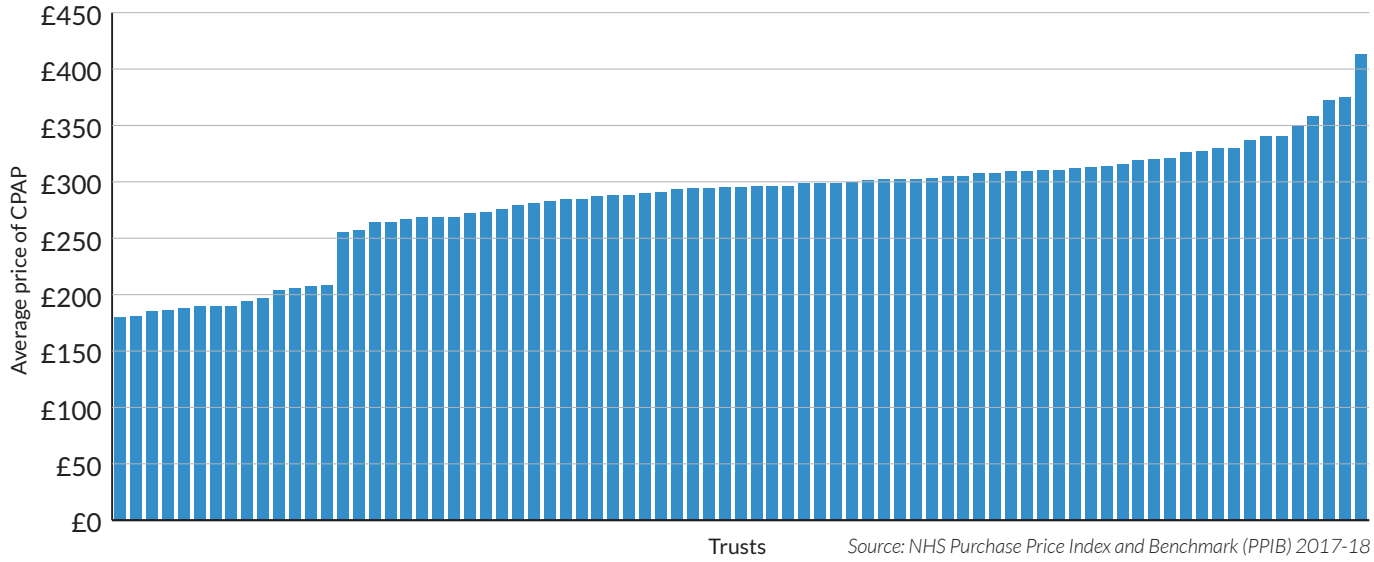
Source: NHS Purchase Price Index and Benchmark (PPIB) 2017-18

CPAP devices

There are 107 of 127 trusts that run sleep services, with most offering a CPAP treatment service for obstructive sleep apnoea. Most services have many hundreds to thousands of patients on CPAP, with some of the older and larger services having over 10,000 patients on CPAP. With increasing recognition of sleep problems, there are increasing numbers of patients going onto CPAP. On deep-dive visits we found that some trusts with sleep services did not have accurate spend data on CPAP devices recorded.

There are relatively few manufacturers of CPAP devices. Based on analysis of 2017-18 data from 87 trusts, we identified a variation in average price paid for auto-adjusting CPAP machines from £179 to £3,358. For the same product from the same supplier, some trusts were paying as little as £43 while others were paying £2,250. Total spend on CPAP machines across the NHS in 2017-18 was over £7.95 million.

Figure 60: Variation in average price per auto-adjusting CPAP device



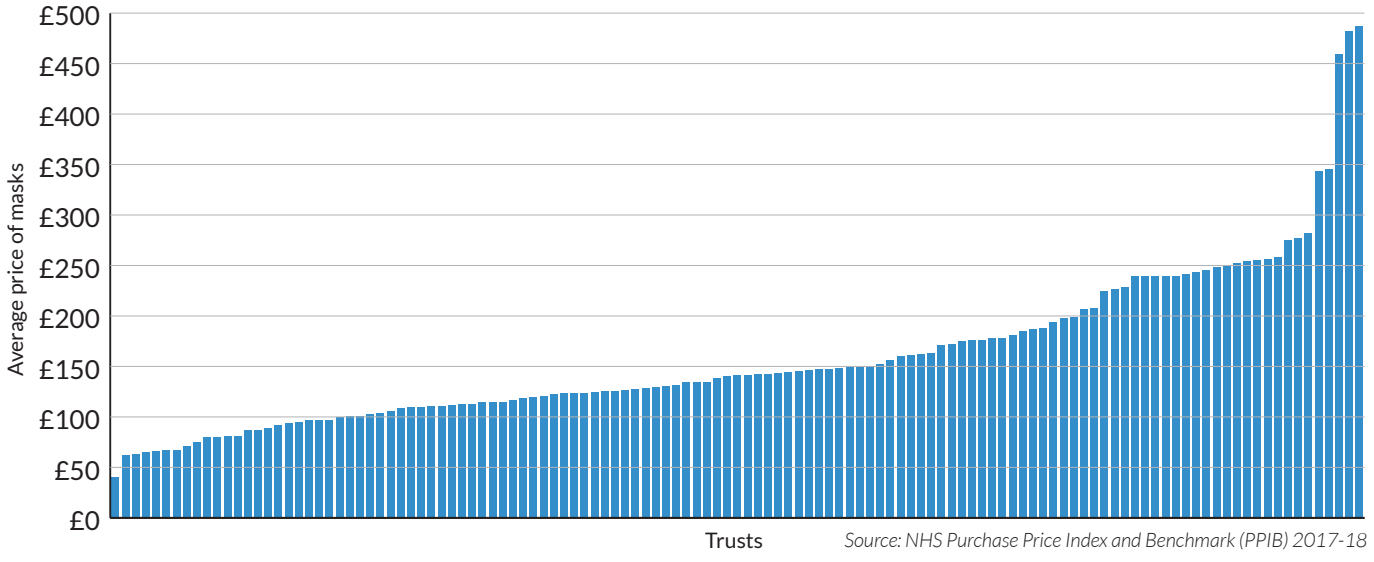
Source: NHS Purchase Price Index and Benchmark (PPIB) 2017-18

For fixed-pressure CPAP machines, less data was available. However, some variation in spend could be observed. For example, for the same brand one trust was paying £230 per device while another was paying £425.

Masks

Masks, commonly referred to as interfaces, are used with CPAP devices and the ventilators described above and are thus the commonest high cost spend in respiratory medicine; total spend on masks across the NHS in 2017-18 was over £11 million. Again, there was significant variation for the same product from the same supplier - some trusts were paying £55 per mask while others were paying £1,025.

Figure 61: Variation in average price of masks per trust



Source: NHS Purchase Price Index and Benchmark (PPIB) 2017-18

Other key products

Accurate data on variation in spend on pleural drains and Cough Assist devices was particularly limited at the time of writing, but this is an area where more information would be valuable for providers to support benchmarking. To support trusts in achieving best value, GIRFT will review and refine the data available within SCS to ensure a more accurate picture of procurement practices.

Reducing unwarranted variation and improving value for money

GIRFT has established a programme to reduce unwarranted variation, improve the evidence-base to enable better decision-making, accelerate adoption of new proven technologies, and improve overall value for money by reducing supply chain costs. The GIRFT Clinical Technology Optimisation programme has been working with GIRFT clinical leads to examine the data and evidence that support products and, in some cases, national Clinical Technology Advisory Panels (CTAPs) have been established with leading clinicians from the specialty to address safety, efficacy, innovation and value – with the objective of providing better information to clinicians and procurement professionals across the NHS. We intend to establish a CTAP for respiratory medicine in the near future.

GIRFT has also been working with the new NHS operating model for NHS procurement, including the new Category Towers, to develop plans for helping trusts and clinicians to address variation and improve value for money.

Furthermore, an issue is knowing whether different brands have clinical impacts, and to assess that NHS England and NHS Improvement has launched 'Scan4Safety[154]' (2020) in which individual products can be traced to individual clinicians. We are looking at the feasibility of creating links between NCIP and Scan4Safety to assist in identifying the efficacy of different brands and, perhaps most importantly, to allow tracking of new implants or procedures across the NHS.

We recommend that providers adopt the GIRFT three-point strategy to improve procurement of devices and consumables.

Recommendation: Procurement

Recommendation	Actions	Owners	Timescale
25. Enable improved procurement of devices and consumables through cost and pricing transparency, aggregation and consolidation, and by sharing best practice.	**a** Use sources of procurement data, such as SCS and relevant clinical data, to identify optimum value for money procurement choices, considering both outcomes and cost/price.	Trusts, GIRFT	Within 6 months of publication
	b Identify opportunities for improved value for money, including the development of benchmarks and specifications. Locate sources of best practice and procurement excellence, identifying factors that lead to the most favourable procurement outcomes.	GIRFT	Ongoing
	c Use Category Towers to benchmark and evaluate products and seek to rationalise and aggregate demand with other trusts to secure lower prices and supply chain costs.	Trusts, STPs, GIRFT	Within 12 months of publication

[154] *Scan4Safety, https://www.scan4safety.nhs.uk/*

COVID-19 impact on respiratory medicine

The COVID-19 pandemic has strained hospital systems with large volume of admissions, often prolonged length of stay, the need for advanced respiratory support, infection control measures such as PPE and social distancing and the impact of staff absences due to sickness or isolation measures. In England, the rate of COVID-19 infections in the population has been variable both temporally and spatially with London, the Midlands and the North West regions experiencing a higher overall burden earlier in the pandemic.[155, 156] This has resulted in an asymmetric impact on NHS hospitals in England.[157]

The SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2) infection which causes the COVID-19 disease typically causes respiratory symptoms and patients with severe illness are likely to develop respiratory failure.[158] While some 17% of hospitalised patients need advanced ventilatory support,[159] over 40% of patients in hospital will require oxygen therapy[160] with or without non-invasive respiratory support. As many of these patients are managed by respiratory physicians, COVID-19 has placed significant pressure on respiratory departments across England.

Much of the care for COVID-19 pneumonia during the first wave of the pandemic occurred in primary care at a time when testing was limited and diagnosis and treatment were by virtual assessment based upon a variety of guidelines.[161, 162] These actions also included difficult decisions around palliation of symptoms with GMC advice.[163, 164]

How COVID-19 impacted GIRFT workstreams

The COVID-19 pandemic gathered pace during our deep-dive visits, resulting in cancelling face-to-face deep dives when we had completed 51 of our planned visits. After a pause of over three months, we then completed a further seven deep dives as virtual visits using video conferencing.

To gain a better understanding of the impact the first wave of COVID-19 had on trusts, we also took part in dedicated cross-specialty deep-dive visits throughout September and October 2020 – the findings from which can be found in GIRFT's *Clinical practice guide for improving the management of adult COVID-19 patients in secondary care.* We reiterate some of the key recommendations from this report in subsequent sections.

In general, it was notable that the recommendations made earlier in this national report did not need to change substantially in a post-COVID-19 landscape. Instead, many of them simply gained further relevance and urgency.

In this section of the report, we look at how trusts and notably how respiratory departments have adapted to the challenges of COVID-19. Rapid changes in hospital and community care have been effective in combatting some of these system-wide challenges faced by respiratory patients and respiratory teams, and have had outcomes that may be beneficial beyond the pandemic.

Acute hospital care

Wave one of the COVID-19 pandemic necessitated the redeployment of NHS staff across departments and specialties. This included respiratory physicians, nurses, physiologists and AHPs which had a huge impact on normal care delivery, with most services effectively being closed down. This was especially so for many aspects of physiological measurement and sleep services, whose activities were deemed aerosol generating procedures (AGPs). A similar consideration exists for bronchoscopy where full PPE is needed.

[155] *Gov.uk, Coronavirus cases, https://coronavirus.data.gov.uk/cases*

[156] *PHE (2020) Disparities in the risk and outcomes of COVID-19, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/908434/Disparities_in_the_risk_and_outcomes_of_COVID_August_2020_update.pdf*

[157] *NHS England, COVID-19 Hospital Activity, https://www.england.nhs.uk/statistics/statistical-work-areas/covid-19-hospital-activity/*

[158] *Guan W, Ni Z, Hu Y et al. (2020) Clinical characteristics of coronavirus disease 2019 in China, New England Journal of Medicine.*

[159] *Karagiannidis C, Mostert C, Hentschker C et al. (2020) Case characteristics, resource use, and outcomes of 10 021 patients with COVID-19 admitted to 920 German hospitals: an observational study, Lancet Respiratory Medicine.*

[160] *Huang C, Wang Y, Li X, et al. (2020) Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. Lancet.*

[161] *NICE (2020) COVID-19 rapid guideline: arranging planned care in hospitals and diagnostic services, https://www.nice.org.uk/guidance/NG179*

[162] *Greenhalgh Trisha, Koh Gerald Choon Huat, Car Josip (2020) COVID-19: a remote assessment in primary care, BMJ*

[163] *GMC (2020) Joint statement: Community-based prescribing for COVID-19 symptoms, https://www.gmc-uk.org/news/news-archive/joint-statement--community-based-prescribing-for-covid-19-symptoms*

[164] *GMC (2020) Treatment and care towards the end of life: good practice in decision making, https://www.gmc-uk.org/ethical-guidance/ethical-guidance-for-doctors/treatment-and-care-towards-the-end-of-life*

Ward management

Identification of patients with definite or possible COVID-19 via appropriate and timely testing allowed patients to be appropriately cohorted to minimise cross infection of patients and staff. Recognition of mental health aspects of isolation from carers and relatives is important. To deliver this enhanced ward care to a population of unwell patients with the processes of 'donning and doffing' PPE, which reduces efficiency and increases time to see each patient, consultants changed their normal work patterns. With the requirement for more time on wards, many consultants had to cancel outpatient work, often moving to 12 hour days to meet the inpatient demand. Many clinicians adopted the Royal College of Physicians advice for performing ward rounds, namely:

COVID-19 ward rounds

- ward rounds including only necessary MDT members, socially distanced and in appropriate PPE;
- bedside review should be undertaken at a safe distance from the beside;
- non-key decisions makers should not be at the bedside but may be socially distanced or outside the room;
- provision for the patent to communicate with family members should be made, such as phones or tablets at the bedside;
- board rounds.

Beyond managing an enhanced bed base of patients requiring oxygen, many respiratory teams also developed a respiratory support unit (see below). Additionally, in wave one and continued in wave two, respiratory consultants play an important role in the triage of suspected COVID-19 patients and provide advice on the management of patients for consideration of respiratory support and on restricted drug therapies such as remdesivir and tocilizumab.

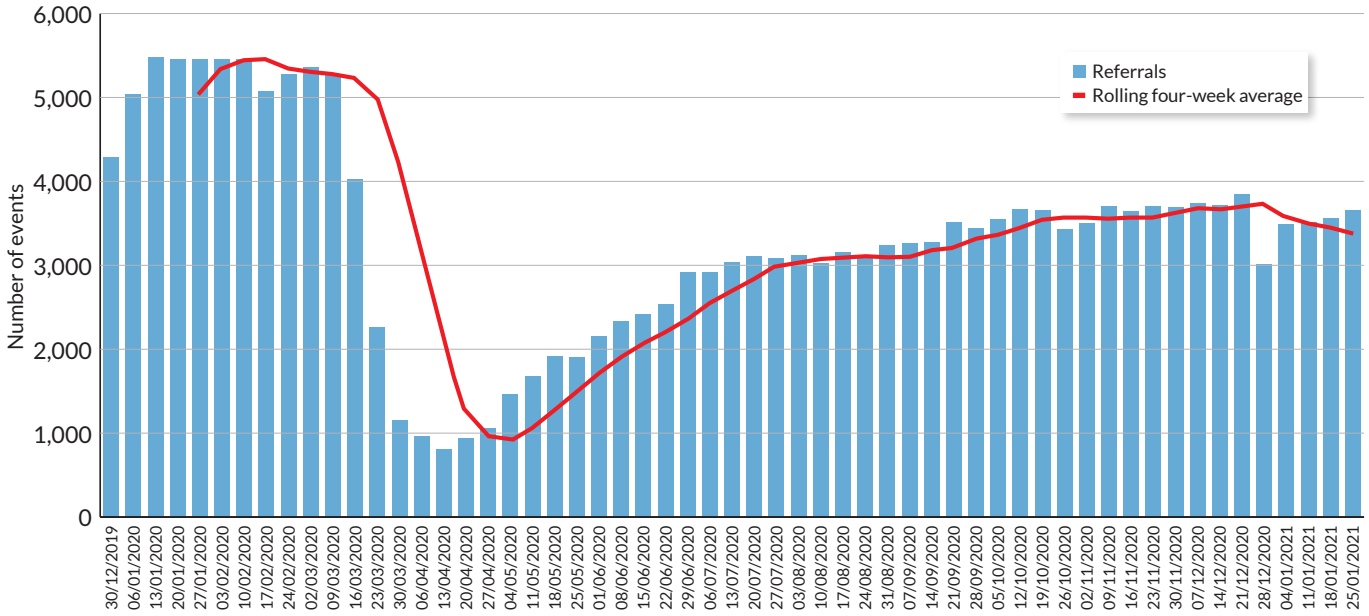
Communication is key and we heard of the importance of respiratory teams joining the daily or twice daily 'huddle' which build and maintain the close links between critical care, acute and emergency medicine which are necessary to coordinate care. Establishing clear clinical pathways for each hospital is important, with clear documentation of ceiling of care, and use of the ReSPECT form to ensure management for patients meets clinicians and patient needs and expectations. These simple but important facets are highlighted in those organisations that had better outcomes from wave one as noted in GIRFT's *Clinical practice guide for improving the management of adult COVID-19 patients in secondary care.*[184]

Outpatients

Respiratory team support of acute care outpatient activity effectively stopped, apart from a few organisations who had staff who could not participate in acute care and used their time to provide virtual follow-up. The overall impact on outpatient activity has been huge, as shown in **Figure 62a** and **b**. This fall in outpatient activity, from a baseline of approximately 5,500 referrals per week to around 1,000, is an 83% reduction. While there has been some restoration of activity following the first wave this is only around 75% of the pre-COVID-19 referral activity. This delay not only creates a backlog of potential referrals who need to be seen, but adds to the risk of harm by delayed diagnosis and failure to start treatment. This also increases the risk of subsequent hospitalisation where the usual maintenance care in clinic has not occurred, for example, in those patients with ILD as noted below.

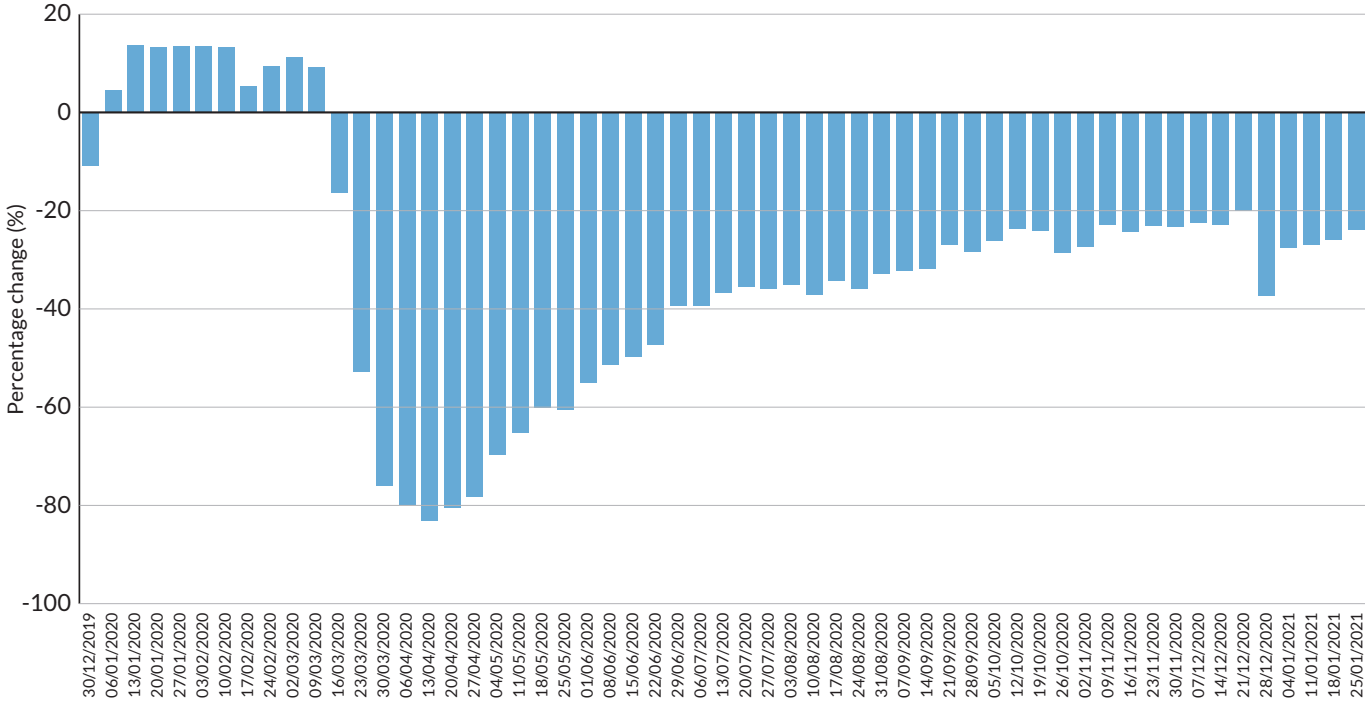
While most respiratory departments managed to maintain access for patients with lung cancer, the cessation of lung screening services, the closure of GP open access chest x-ray services and the fear by the patient themselves of attending led to a significant reduction in the early presentation and detection of lung cancer. This has not yet reached the normal referral patterns. This delay in early diagnosis is likely to lead to patients presenting acutely in hospital with advanced disease with very limited treatment options.

Figure 62a: Weekly number of referrals, with a four-week rolling average



Source: NHS e-Referral Service (e-RS) open data dashboard, report 31/01/2021

Figure 62b: Percentage change of number of referrals from baseline



Source: NHS e-Referral Service (e-RS) open data dashboard, report 31/01/2021

COVID-19 impacts on physiology and sleep services

Due to the AGP risk and the redeployment of staff to support acute COVID-19 care, activity in physiology and sleep medicine also ceased during the first wave of the pandemic. Guidelines produced from the BTS[165] and ARTP[166, 167] highlight mitigations for some of the AGP issues, including not performing tests unless clinically indicated to change therapy and using full PPE, given that patient and staff safety is paramount. 'Routine' respiratory function testing should no longer occur in primary care practices unless as part of a co-ordinated plan with all the appropriate precautions. This oversight of respiratory physiology departments in reprioritising both the choice and timing of the correct test is an autonomy to be welcomed, but does require the appropriate IT and communications between patient, requesting clinician and physiology department.

The longer-term impact on physiology and sleep testing with respect to infection control lessons remains uncertain. However, some CCGs have altered the recommendations for spirometry to avoid unnecessary testing/duplication, which has somewhat reduced the backlog of tests. Considerable research is ongoing in this area, supported by research networks. There are substantial gaps in our knowledge on aerosols and viral transmission but early evidence confirms the clinical view that filters are effective at reducing droplets but the issue of cough in producing aerosols is significant. This is of great importance to respiratory physiology departments given that many patients cough after respiratory function tests.

Community services: pulmonary rehabilitation

In the community, most rehabilitation services closed during the pandemic, leading to a huge backlog of patients - an estimated 8,000 people and increasing, who normally complete rehabilitation in a six-month period. As they will have become deconditioned from lack of activity as part of shielding and the failure to participate in rehabilitation, there are a large number of patients who will deteriorate and have an increased risk of hospitalisation if they exacerbate, adding to the already significant in-hospital burden of COVID-19. In addition, the level of deconditioning seen amongst people who would not traditionally access pulmonary rehabilitation further increases the need for places on programmes.

Service recovery and restoration

In July 2020, providers were advised by NHS England and NHS Improvement[168] that focus needed to shift to accelerate the return of non-COVID-19 health services. This prompted a drive to recover maximum elective activity and restore all cancer services. First and follow-up outpatient attendances were expected to be restored to 100% (either face-to-face or virtually).

Outpatient service: Virtual clinics

As stated above, outpatient services for respiratory medicine were significantly impacted by the pandemic. For face-to-face outpatients, lack of administrative staff to co-ordinate timing of appointments, sufficient waiting room space for social distancing and the difficulties imposed by the AGP risk of respiratory function tests have severely reduced productivity.

Virtual clinics have been employed in respiratory medicine from the outset and build upon what was already happening in many departments where clinicians would phone patients with their results or discuss management via the phone when travel was an issue. The widespread use of either telephone or video conferencing has led to an element of restoration of clinic activity. The face-to-face consultation with clinical examination that is important for many areas of respiratory medicine has not been restored. However, such virtual clinics enable vulnerable patients to stay away from hospital and public transport, where infection risk is higher. They can also be set up to enable clinicians to work from home in some cases, further reducing risk of infection spread. Additionally, virtual clinics reduce footfall across the hospital, in turn alleviating crowding and slowing infection spread. There are benefits to virtual clinics beyond COVID-19, especially for patients who must travel long distances for a consultation or those with reduced mobility or breathlessness, for whom travel may be more difficult. Virtual clinics can, however, present a risk of introducing inequity in access, especially when video techniques are used and individuals may not have access to a computer or wi-fi, or cannot use such devices. Further to this an absence of the standard clinical examination could lead to a missed or inaccurate diagnosis potentially resulting in harm to the patient. For respiratory medicine face-to-face consultations, including examination, need to be retained.

[165] *BTS (2020) Guidance for the resumption and continuation of urgent and elective outpatient respiratory services, https://www.brit-thoracic.org.uk/covid-19/covid-19-resumption-and-continuation-of-respiratory-services/*

[166] *ARTP, BTS (2020) Respiratory Function Testing During Endemic COVID-19, https://www.artp.org.uk/News/artp-guidance-respiratory-function-testing-and-sleep-services-during-endemic-covid-19*

[167] *ARTP, BTS (2020) Sleep Services During Endemic COVID-19, https://www.artp.org.uk/News/artp-guidance-respiratory-function-testing-and-sleep-services-during-endemic-covid-19*

[168] *NHS England and NHS Improvement (2020) Third phase of NHS response to COVID-19 https://www.england.nhs.uk/coronavirus/wp-content/uploads/sites/52/2020/07/20200731-Phase-3-letter-final-1.pdf*

Sleep services

Sleep services have been severely affected, with waiting times increasing rapidly as most services were stopped due to redeployment of staff and the AGP issue of CPAP treatment. There has been considerable innovation, with clinics moving to virtual consultations, and patients collecting equipment from departments in a social distanced way to minimise infection risk, or using disposable equipment for making the diagnosis. As far as treatment is concerned, patients will attend for their usual explanation and mask fit but will turn on their CPAP device at home.[169] Initial anecdotal evidence from several centres suggests that this is as effective as the normal method of in-hospital titrations, although data on long-term adherence is pending.

A major advance, as a consequence of COVID-19, is the move to remote monitoring for CPAP adherence which began during the first lockdown when there were no routine outpatient attendances. By utilising a separate modem, and in the more modern machines an inbuilt modem, the information on adherence to CPAP, variation in time of use, leak and efficacy can be remotely determined. Using this information during a virtual clinic attendance allows for a frank discussion on management of sleep apnoea and allows changes to the machine settings if required. This has dramatically reduced the footfall in sleep departments and is safer and more convenient for patients, although takes more time for the physiologist who has to prepare for the virtual consultation. Many trusts allowed access to such remote platforms, but many patients do not have such modern machines.

While they may be more costly in either initial outlay or continued access to the platform, such remote monitoring should become the norm once clinical evaluation has confirmed that CPAP is the treatment of choice. This is not a 'cheaper' option given the need to purchase the equipment, the time needed to download the results and then the virtual attendance, but is of clinical advantage and safer. Tariffs and incentive payments need to be developed to reflect this new way of working which has considerable benefits for organisations, patients and staff as outlined.

Asthma services

Access to standard diagnostic tests including spirometry have been limited due to the AGP risk,[170] but use of a fractional exhaled nitric oxide (FeNO) test can be a helpful measurement[171] and is deemed by the ARTP as a low risk procedure.[172]

One interesting observation is the marked reduction in the number of asthma admissions during wave one of the pandemic when compared with the previous year (**Figure 63**), with admissions effectively halving. Whether this relates to a reduction in infections due to isolation, a reluctance to attend hospital due to the perceived risk of catching COVID-19, or change in medication adherence is difficult to know. It may be that the marked increase in the number of prescriptions for inhaled corticosteroids at the start of the pandemic may have led to better control of asthma with the associated reduction in admissions.

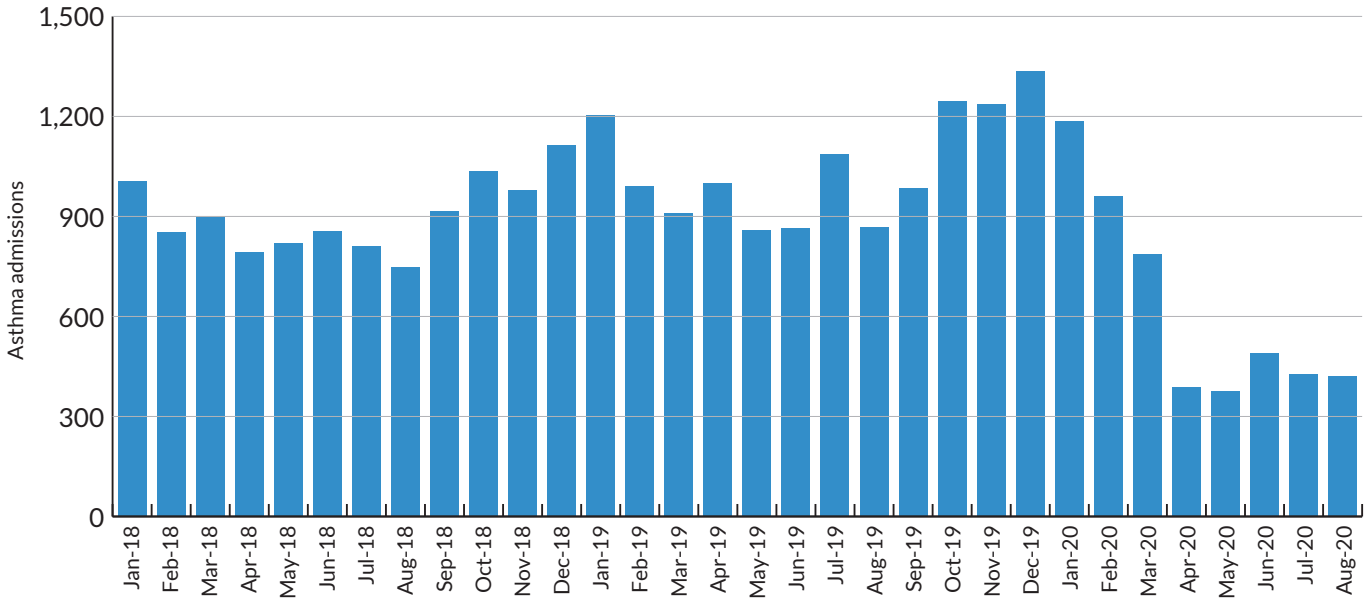
[169] *ARTP, BTS, (2020) Sleep Services During Endemic COVID-19, https://www.artp.org.uk/News/artp-guidance-respiratory-function-testing-and-sleep-services-during-endemic-covid-19*

[170] *ARTP, BTS (2020) Sleep Services During Endemic COVID-19, https://www.artp.org.uk/News/artp-guidance-respiratory-function-testing-and-sleep-services-during-endemic-covid-19*

[171] *NICE (2017) Asthma: diagnosis, monitoring and chronic asthma management, https://www.nice.org.uk/guidance/ng80*

[172] *ARTP (2020) – Guidelines for recommencing physiological services during the COVID-19 endemic phase, https://www.artp.org.uk/write/MediaUploads/Standards/COVID19/ARTP_COVID-19_endemic__guidance_Vers_5.6_final.pdf*

Figure 63: Admissions for asthma, Jan 2018 – July 2020



Source: HES 2018-2020

For patients with severe disease who are receiving biological therapies there was a dramatic shift to receiving home treatment via either self or supported administration. This was so effective that, for many organisations where there was a waiting list to start such therapies, these have effectively been cleared with many providers reporting minimal waits for the initiation of biological drug treatments.

Interstitial lung disease services

Unfortunately, in contrast to early work on asthma, evidence suggests that patients with ILD do not fare well with COVID-19 infections,[173] and so shielding advice is an important step, although this is not always clear on national websites.[174]

While there may be some delays in patients attending hospitals for the first outpatient appointment for a suspected diagnosis of ILD, there are clear instructions about restoration of specialised commissioned services. These include clear advice about continuing antifibrotic drugs, together with advice about accessing respiratory function tests to determine NICE-mandated eligibility criteria for the disease modifying antifibrotic agents. Unfortunately the impact of the COVID-19 led to the closure of many such specialised services with delay in restoration.

COPD services

As with other respiratory conditions, patients with COPD should be encouraged to maintain their existing treatment regimens to prevent exacerbations and avoidable trips to hospital which could increase the risk of COVID-19 infection.[175] In a trend similar to that shown above for asthma, albeit not as stark, our analysis shows that admissions for COPD were significantly lower in April-June 2020 when compared to April-June 2019 (see **Figure 6**).

[173] *Drake, T et al. (2020) Outcome of Hospitalization for COVID-19 in Patients with Interstitial Lung Disease: An International Multicenter Study, American Journal of Respiratory and Critical Care Medicine.*

[174] *Department of Health and Social Care, Public Health England (2020) Guidance on shielding and protecting people who are clinically extremely vulnerable from COVID-19, https://www.gov.uk/government/publications/guidance-on-shielding-and-protecting-extremely-vulnerable-persons-from-covid-19/guidance-on-shielding-and-protecting-extremely-vulnerable-persons-from-covid-19*

[175] *NICE (2020) Nice Guideline NG168: COVID-19 rapid guideline: community-based care of patients with chronic obstructive pulmonary disease (COPD), https://www.nice.org.uk/guidance/ng168*

Respiratory support units (RSUs)

Delivery of respiratory support (defined here as continuous positive airway pressure therapy (CPAP), or high flow nasal oxygen (HFNO)) to patients with COVID-19 was a key advance in the first wave of the pandemic. This was shown by the use of the newly authored OPCS code for CPAP - E85.6. In the month of its launch in April 2020, the code was recorded 5,500 times in that month, reflecting the widespread uptake of CPAP, with its use being documented some 5,000 times in the following month. While this may be an overstatement as some patients may have been initiated on CPAP and not tolerated it, we have reviewed the list of hospitals in England and identified hospitals that did use CPAP at this time but failed to capture the activity.

The delivery of these treatment modalities in respiratory support units corresponded to better outcomes in the September 2020 GIRFT COVID-19 deep dives, reducing the burden on critical care. In one hospital, a 60-bed RSU ensured that only patients needing invasive ventilation were admitted to critical care. In wave two of the COVID-19 pandemic, RSUs played a major role in maintaining critical care capacity to allow an element of 'business as usual' while managing patients who needed advanced support.

RSUs are usually based on respiratory wards to allow enhanced respiratory support to be delivered outside the critical care environment. The bed numbers required will vary depending on the local circumstances: consultant respiratory staff, oxygen flow capabilities, ability to effectively cohort patients into such units, Infection Prevention and Control (IPC) issues and local critical care capacity. Such units are separate from NIV units or adjacent, but are for the delivery of predominantly CPAP and HFNO therapy.

The needs of these patients are greater than those requiring ordinary oxygen administration and they require enhanced nursing, medical, and AHP support, together with close and ideally remote monitoring. There is a need to respond to rapid deterioration and to escalate to critical care where agreed as part of the advanced care planning.

The staffing for such units is at a lower level than the mandated 1:2 for NIV, as most patients on CPAP/HFNO will not need regular blood gases or changes to ventilator settings so a qualified nurse to patient ratio of 1:4 is the minimum, provided the staff are trained and competent in managing such support. In addition to the increased nursing provision, all of these RSUs require increased staffing from other healthcare workers including medical, AHP (such as physiotherapy) and pharmacy, to support and manage these complex, vulnerable and very sick patients. To support such care there should be a minimum of two respiratory consultant ward rounds daily, including weekends. To facilitate this, respiratory consultants will need to come off the acute take or reduce their contribution to it.

The National Reporting and Learning System (NRLS) has noted an increase in alerts over the pandemic period due to the incorrect use of equipment and setting, something that would be addressed by appropriately trained staff. To support the RSU in delivering CPAP, a peripatetic team who can make assessments has been shown to be beneficial and should be part of a COVID-19 service. While the information is somewhat crude, it would seem the peak activity of an RSU during the first pandemic wave was 20 beds per 250,000 population.

Follow-up after COVID-19

Follow-up of patients who have been admitted with COVID-19 is a major pressure for respiratory medicine. Respiratory physicians and their teams have played a key role in delivering the acute care through the pandemic, with the widespread adoption of RSUs, but have been delivering COVID-19 follow-up. In some trusts, those admitted to critical care have been followed up by critical care, although in smaller hospitals with fewer intensivists this work has also fallen to respiratory medicine.

The scale of this is almost beyond comprehension, with thousands of patients from larger trusts needing assessment post-discharge. This activity has been at a time when departments are also trying to restore services for the backlog of both new and follow-up patients from the first wave, with limited access to diagnostics.

From the deep dives, we know that most providers are following the BTS guideline[176] with a chest x-ray (CXR) after six weeks with either a face-to-face or virtual clinic appointment. At some stage, an MDT approach may be needed to ensure the wide-ranging needs of these patients are addressed.

Some organisations have showed great innovation such as at United Lincolnshire Hospitals NHS Trust where senior respiratory nurses and physiotherapists have been reviewing patients and discussing with consultant staff in an MDT.

[176] *BTS (2020) British Thoracic Society Guidance on Respiratory Follow Up of Patients with a Clinico-Radiological Diagnosis of COVID-19 Pneumonia*

At Newcastle Hospitals NHS Foundation Trust a multi-professional MDT is functioning as a 'one stop service' and at Barts Health NHS Trust a computerised proforma aids targeting reviews.

The majority of work reviewing the post hospital admission CXR and follow-up review is falling to respiratory consultants. Given their commitments to acute care and inpatient care during the pandemic, COVID-19 follow-up activity is being done over and above normal duties in a way that is not sustainable, even before the additional inpatient demands are placed upon respiratory teams by the usual winter pressures. This is producing a huge strain on the system, irrespective of staff sickness and isolation and reflects the long-standing lack of capacity within respiratory services that we have highlighted in the *Workforce* section on page 133.

Post-COVID-19 syndrome

There are large numbers of patients who have had COVID-19 infection who have a delayed recovery and manifest a variety of symptoms. While the cough and anorexia appear to resolve relatively early, breathlessness, malaise and especially fatigue appear to persist in some individuals. To define these features further NICE, the Scottish Intercollegiate Guidelines Network (SIGN) and the Royal College of General Practitioners (RCGP) have jointly developed a guideline on post-COVID-19 syndrome, *COVID-19 rapid guideline: managing the long-term effects of COVID-19*.

In defining the scope for this guideline, the clinical definition of post-COVID-19 syndrome has been agreed as:

> ***Acute COVID-19:** signs and symptoms of COVID-19 for up to 4 weeks.*
>
> ***Ongoing symptomatic COVID-19:** signs and symptoms of COVID-19 from 4 to 12 weeks.*
>
> ***Post-COVID-19 syndrome:** signs and symptoms that develop during or after an infection consistent with COVID-19, continue for more than 12 weeks and are not explained by an alternative diagnosis.*[177]

To assess such patients, a sum of £10m has been announced[178] to establish initial assessment services to allow patients to be directed to the most relevant therapy, such as 'Your COVID-19 Recovery', following an MDT discussion. There is considerable ongoing work to establish such services, with data metrics being developed to ensure the outcomes of these services can be evaluated.

To further support COVID-19 patients in primary care, to help prevent admission at acute portals, and to facilitate discharge, a virtual ward concept has been established with oximetry monitoring, with further release of funds to support this innovation.[179]

While for most places this is sitting in primary care,[180] we found an excellent example in Dorchester where this has been integrated across the acute provider, primary care, and in the community. The virtual ward concept is not limited to the above, and Brighton and Sussex University Hospitals NHS Trust and Sussex Community NHS Foundation Trust have together come up with an innovative use of the hospital at home services to facilitate early discharge of those COVID-19 patients who are still oxygen dependent to be discharged but regularly followed up with a 'safety net'.

Lessons learned

At the outset of COVID-19 there was little experience of dealing with such a pandemic and many lessons were learned during the course of wave one that were later applied during wave two. These include better fluid management, recognition of the thrombotic issues, and effective treatments with the use of dexamethasone[181] and approval of antiviral remdesivier,[182] although the utility of the latter has been questioned.[183] While there remain many unanswered questions about risk factors, clear improvements in management of COVID-19 were made, recognising the complex methods for attributing death making it difficult to determine accurate mortality rates.

[177] *https://https://www.nice.org.uk/guidance/ng188/*

[178] *NHS (2020) NHS to offer 'long covid' sufferers help at specialist centres, https://www.england.nhs.uk/2020/10/nhs-to-offer-long-covid-help/*

[179] *NHS England (2020) Novel coronavirus (COVID-19) standard operating procedure COVID Oximetry @home, https://www.england.nhs.uk/coronavirus/publication/novel-coronavirus-covid-19-standard-operating-procedure-covid-oximetry-home/*

[180] *Greenhalgh Trisha, Knight Matthew, A'Court Christine, Buxton Maria, Husain Laiba. (2020) Management of post-acute covid-19 in primary care, BMJ.*

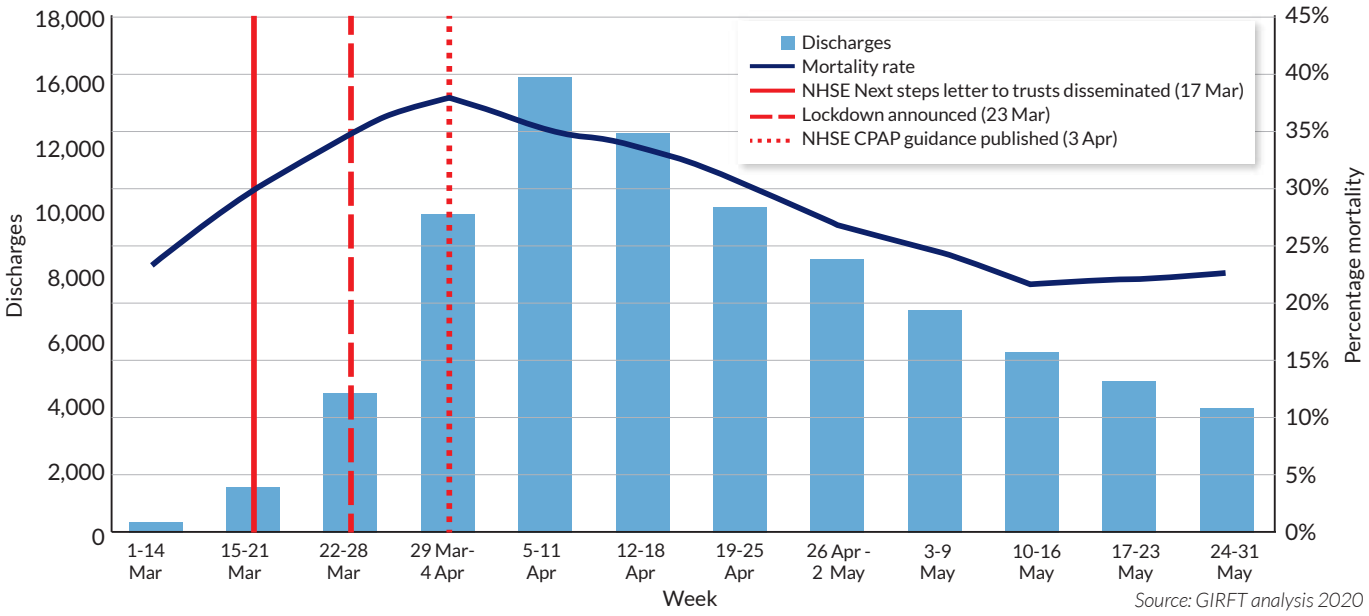
[181] *NICE (2020) COVID-19 prescribing briefing: corticosteroids, https://www.nice.org.uk/guidance/ng159/resources/covid19-prescribing-briefing-corticosteroids-pdf-8839913581*

[182] *MHRA (2020) Early access to medicines scheme (EAMS) scientific opinion: Remdesivir in the treatment of patients hospitalised with suspected or laboratory-confirmed SARS-CoV-2 infection who meet the clinical criteria, https://www.gov.uk/government/publications/early-access-to-medicines-scheme-eams-scientific-opinion-remdesivir-in-the-treatment-of-patients-hospitalised-with-suspected-or-laboratory-confirmed*

[183] *WHO (2020) Therapeutics and COVID-19: Living Guideline, https://www.who.int/publications/i/item/therapeutics-and-covid-19-living-guideline*

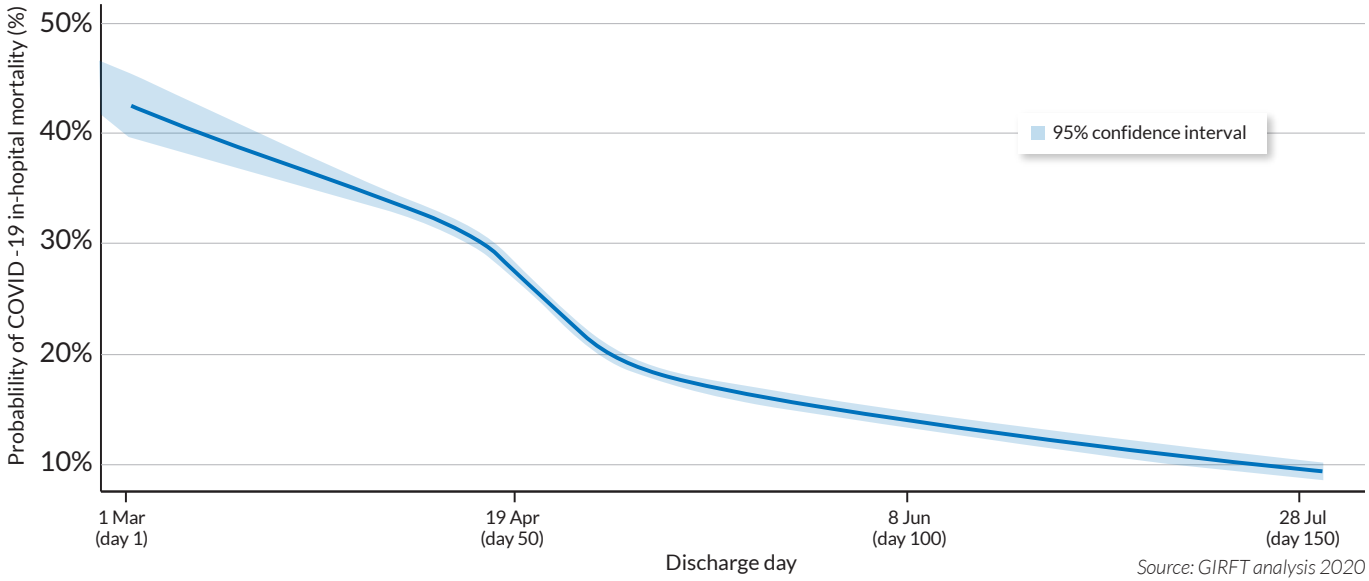
GIRFT analysis of HES data from wave one showed some of these improved outcomes (**Figure 64**) where the intervention is noted and the changes in mortality over time highlighted in the sinusoidal decrease in mortality (**Figure 65**). Several trusts demonstrated excellent outcomes for COVID-19 patients, including four trusts with adjusted in-hospital mortality probabilities of greater than two standard deviations below the mean for the analysed time period. The GIRFT programme engaged with these trusts for a series of cross-specialty deep dives – recommendations and findings from which are reported in the GIRFT *Clinical practice guide for improving the management of adult COVID-19 patients in secondary care.*[184]

Figure 64: COVID-19 discharges and mortality (%) rate per week



Source: GIRFT analysis 2020

Figure 65: Estimated probability of COVID-19 related in-hospital mortality March - July 2020



Source: GIRFT analysis 2020

[184] *GIRFT (2020) Clinical practice guide for improving the management of adult COVID-19 patients in secondary care https://www.gettingitrightfirsttime.co.uk/wp-content/uploads/2020/12/Covid19-Clinical-Practice-Guidance-S-FINAL.pdf*

Recommendation: COVID-19

Recommendation	Actions	Owners	Timescale
26. Ensure respiratory services are able to provide optimal care for patients with COVID-19 and post-COVID-19 syndrome by establishing respiratory support units, enabling remote treatment monitoring and optimising multidisciplinary expertise.	**a** Establish staffed respiratory support units in line with national recommendations, including a multi-professional outreach service. Aim for a minimum nurse to patient ratio of 1:4, with nurses trained in administering CPAP and HFNO.	Trusts, ICSs/CCGs	Within 3 months of publication
	b Review job plans to allow introduction of twice daily respiratory consultant-led ward rounds for COVID-19 patients, by reducing respiratory consultant commitments to the acute take where feasible.	Trusts	Within 3 months of publication
	c Procure CPAP devices with capability for remote monitoring where possible through co-ordinated discussions between respiratory and IT departments.	Trusts	Within 12 months of publication
	d Review tariff arrangements to support providers in offering CPAP treatments with remote monitoring to reduce departmental footfall.	CCGs / NHSE/I	Within 6 months of publication
	e Prioritise restoration of bronchoscopy and Endobronchial Ultrasound, recognising the pressures on GI endoscopy.	Trusts	Within 3 months of publication
	f Develop COVID-19 follow-up services in line with national recommendations.	ICSs, Trusts	Within 6 months of publication
	g Ensure adequate multidisciplinary resourcing is in place to review patients with post-COVID-19 syndrome through MDTs.	Trusts, ICSs	Within 6 months of publication

Notional financial opportunities

This report sets out a series of recommendations to improve the delivery of respiratory medicine services. Taken together, the recommendations are designed to improve patient outcomes while optimising capacity, enabling more patients to be seen and treated in a timely way and to reduce the amount of time patients spend in hospital where clinically appropriate. In this busy specialty, where demand for both outpatient and inpatient services is high, progress in these areas would be invaluable to patients and providers alike.

The specific impact of our recommendations is hard to measure in some areas, but in others, there is a clear tangible benefit that could be realised. We have sought to quantify this. GIRFT analysis has calculated there is a notional financial opportunity of between £28.9m and £63.9m a year.

These notional financial opportunities put an estimated value on the resource associated with variation based on providers achieving average or best quartile performance. The figures are gross sums, based on activity levels. As they rely on process change and productivity improvements, they are not necessarily cash-releasing and do not represent a comprehensive set of all opportunities discussed in the report, many of which may be found at a local trust level. Nonetheless, they provide an indication of what may be possible.

Each opportunity would also bring with it benefits to patients. For example, reducing unnecessary follow-up, reducing length of stay and reducing emergency readmissions.

There are further savings that could be realised through streamlining procurement and reducing costs resulting from litigation. This report has identified a total spend of £67.8m on litigation against respiratory medicine over a five-year period. While we already know this figure is slightly distorted as some of the claims relate to thoracic surgery, we expect implementation of the GIRFT programme's five-point plan should improve patient safety and reduce litigation costs trust-wide.

Further opportunities

The opportunity values shown in **Table 5** are for illustration only. Individual providers and clinicians should assess their own services to determine the unwarranted variation that exists and associated opportunities. This assessment will help departments and trusts prioritise service changes. Individual providers may also have other opportunities that are not included here, such as those recommended on deep-dive visits.

Reducing follow-up activity will vary with internal processes but within earlier sections of this report we have described possible methodologies to achieve better return.

In some cases, many trusts are already achieving performance within the best quartile, but this should not limit further improvement. For example, in reducing DNAs, 40 trusts already report DNA rates at or below 9%, but the top ten trusts have average DNA rates at or below 7%.

Pneumonia is a complex condition of acute episodes with associated frailty, and we have therefore sought to adjust the financial estimates to take this into account. Due to the coding issues highlighted earlier in this report, it is difficult to classify and exclude the most complex clinical scenarios which inherently skew these figures. However, we have sought to adjust targets to take these into account.

When it comes to reducing length of stay for patients with COPD, as shown in the table below, efforts can be directed to increasing the proportion of patients with a zero length of stay if sufficient infrastructure is established within the community, as noted in the *Integrated care* section on page 103, to enable supportive early discharge allowing people to get home more promptly.

NB: It is important to note that some of the notional financial opportunities for increasing the percentage of patients with zero LoS have not been included in the totals of Table 5 to avoid double-counting, as indicated by a single asterisk*.

Table 5: Gross notional financial opportunities

Improvement	Standard			Target		
	Target	Activity opportunity	Gross notional financial opportunity	Target	Activity opportunity	Gross notional financial opportunity
Optimise outpatients by reducing DNAs *(recommendation 1a)* Reduce Outpatient Did Not Attends *Base data: Jan-Dec 2018* *Cost estimated based on respiratory medicine first outpatient attendance (18/19 ref costs uplifted to 20/21 prices)*	*National median* 12% DNA rate	40,000 appointments	£6.8m	*Best quartile* 9% DNA rate	79,000 appointments	£13.4m
Optimise outpatients by limiting unnecessary follow-up *(recommendation 1b)* Reduce Outpatient Follow-up Attendances *Base data: Jan-Dec 2018* *Cost estimated based on respiratory medicine follow-up outpatient attendance (18/19 ref costs uplifted to 20/21 prices)*	*National median* 25% of patients to be discharged at first appointment	19,000 follow-up appointments	£2.9m	*Best quartile* 33% of patients to be discharged at first appointment	42,000 follow-up appointments	£6.5m
Improve acute care for respiratory patients by embedding respiratory teams in acute settings to help facilitate discharge *(recommendation 2e)* Reduce length of stay - Respiratory Medicine* *Base data: Jan-Dec 2018* *Cost estimated based on average excess bed day cost (18/19 ref costs uplifted to 20/21 prices)*	*National median* Increase percentage of patients with zero length of stay to 19%	17,000 bed days	£6.4m*	*Best quartile* Increase percentage of patients with zero length of stay to 24%	39,000 bed days	£14.8m*

Table 5: Gross notional financial opportunities

Improvement	Standard			Target		
	Target	Activity opportunity	Gross notional financial opportunity	Target	Activity opportunity	Gross notional financial opportunity
Reduce acute admissions, length of stay, and deliver a high quality pleural service *(recommendation 10)* Reduce length of stay - Pleural Disease *Base data: Jan-Dec 2018* *Cost estimated based on average excess bed day cost (18/19 ref costs uplifted to 20/21 prices)*	*National median* Increase percentage of patients with zero length of stay to 33%	1,700 bed days	£0.6m	*Clinical view* Increase percentage of patients with zero length of stay to 75%	14,700 bed days	£5.5m
Review departmental resourcing to improve outcomes, reduce length of stay and reduce the likelihood of readmissions for patients with asthma *(recommendation 12)* Reduce 30-day emergency readmissions - asthma *Base data: Jan-Dec 2018* *Cost estimated based on average emergency admission cost (18/19 ref costs uplifted to 20/21 prices)*	*National median* Reduce readmission rate to 14%	600 emergency admissions	£0.6m	*Best quartile* Reduce readmission rate to 12%	1,300 emergency admissions	£1.2m
Optimise care for pneumonia patients by ensuring the correct diagnosis, as well as reviewing patient pathways and infrastructure to reduce length of stay *(recommendation 13)* Reduce length of stay - Pneumonia** *Base data: Jan-Dec 2018* *Cost estimated based on average excess bed day cost (18/19 ref costs uplifted to 20/21 prices)*	*National median* Reduce average length of stay to 3.65 days	15,000 bed days	£5.6m	*Best quartile* Reduce average length of stay to 3.41 days	34,000 bed days	£12.9m

Table 5: Gross notional financial opportunities

Improvement	Standard			Target		
	Target	Activity opportunity	Gross notional financial opportunity	Target	Activity opportunity	Gross notional financial opportunity
Optimise care for pneumonia patients by ensuring the correct diagnosis, as well as reviewing patient pathways and infrastructure to reduce readmissions *(recommendation 13)* Reduce 30-day emergency readmissions - Pneumonia *Base data: Jan-Dec 2018* *Cost estimated based on average emergency admission cost (18/19 ref costs uplifted to 20/21 prices)*	*National median* Reduce readmission rate to 17%	1,800 emergency admissions	£1.7m	*Best quartile* Reduce readmission rate to 15%	4,200 emergency admissions	£3.8m
Optimise care for patients with chronic obstructive pulmonary disease (COPD) to reduce length of stay *(recommendation 14)* Reduce length of stay - COPD* *Base data: Jan-Dec 2018* *Cost estimated based on average excess bed day cost (18/19 ref costs uplifted to 20/21 prices)*	*National median* Increase percentage of patients with zero length of stay to 16%	1,650 bed days	£0.6m*	*Best quartile* Increase percentage of patients with zero length of stay to 21%	5,150 bed days	£1.9m*
Optimise care for patients with chronic obstructive pulmonary disease (COPD) to reduce length of stay *(recommendation 14)* Reduce length of stay - COPD*** *Base data: Jan-Dec 2018* *Cost estimated based on average excess bed day cost (18/19 ref costs uplifted to 20/21 prices)*	*National median* Reduce average length of stay to 5.4 days	24,000 bed days	£9.1m	*Best quartile* Reduce average length of stay to 5.11 days	40,000 bed days	£15.1m

Table 5: Gross notional financial opportunities

Improvement	Standard			Target		
	Target	Activity opportunity	Gross notional financial opportunity	Target	Activity opportunity	Gross notional financial opportunity
Optimise care for patients with chronic obstructive pulmonary disease (COPD) to reduce readmission rates *(recommendation 14)*	*National median*			*Clinical view*		
Reduce 30-day emergency readmissions - COPD *Base data: Jan-Dec 2018* *Cost estimated based on average emergency admission cost (18/19 ref costs uplifted to 20/21 prices)*	Reduce readmission rate to 25%	1,700 emergency admissions	£1.6m	Reduce readmission rate to 20%	6,000 emergency admissions	£5.5m
Total			**£28.9m**			**£63.9m**

Notes to table:

* Not included in the total to avoid double-counting
** Calculation excludes long stay patients over 9 days
*** Calculation excludes zero length of stay patients

It should also be noted that the above calculations are based on trust recording and coding via HES. Issues related to quality of respiratory coding are highlighted in several sections of this national report, see *Activity and information flows* page 47.

About the GIRFT programme

Getting It Right First Time (GIRFT) is a national programme designed to improve medical care within the NHS.

Funded by the Department of Health and Social Care and jointly overseen by NHS England and NHS Improvement and the Royal National Orthopaedic Hospital NHS Trust, it combines wide-ranging data analysis with the input and professional knowledge of senior clinicians to examine how things are currently being done and how they could be improved.

Working to the principle that a patient should expect to receive equally timely and effective investigations, treatment and outcomes wherever care is delivered, irrespective of who delivers that care, GIRFT aims to identify approaches from across the NHS that improve outcomes and patient experience, without the need for radical change or additional investment. While the gains for each patient or procedure may appear marginal they can, when multiplied across an entire trust – and even more so across the NHS as a whole – deliver substantial cumulative benefits.

The programme was first conceived and developed by Professor Tim Briggs to review elective orthopaedic surgery to address a range of observed and undesirable variations in orthopaedics. In the 12 months after that pilot programme, it delivered an estimated £30m–£50m savings in orthopaedic care – predominantly through changes that reduced average length of stay and improved procurement.

The same model is now being applied to over 40 different areas of clinical practice. It consists of four key strands:

1. A broad data gathering and analysis exercise, performed by health data analysts, which generates a detailed picture of current national practice, outcomes and other related factors.
2. A series of discussions between clinical specialists and individual hospital trusts, which are based on the data –providing an unprecedented opportunity to examine individual trust behaviour and performance in the relevant area of practice, in the context of the national picture. This then enables the trust to understand where it is performing well and what it could do better – drawing on the input of senior clinicians.
3. A national report, that draws on both the data analysis and the discussions with the hospital trusts to identify opportunities for NHS-wide improvement.
4. An implementation phase where the GIRFT team supports providers to deliver the improvements recommended.

Implementation

GIRFT works in partnership with NHSE/I regional teams to help trusts and their local partners to implement improvements and address the issues raised in both the trust data packs and the national specialty reports. The GIRFT team provides support at a local level, advising on how to reflect the national recommendations into local practice and supporting efforts to deliver any trust specific recommendations emerging from the GIRFT visits. GIRFT also helps to disseminate best practice across the country, matching up trusts who might benefit from collaborating in selected areas of clinical practice. Through all its efforts, local or national, the GIRFT programme strives to embody the 'shoulder to shoulder' ethos that has become GIRFT's hallmark, supporting clinicians nationwide to deliver continuous quality improvement for the benefit of their patients.

Glossary

Acute Medical Unit (AMU)
A dedicated facility within a hospital that acts as the focus for acute medical care for patients that have presented as medical emergencies to hospitals or who have developed an acute medical illness while in hospital.

Banding
A system of job salary and grading where NHS posts are allocated to set pay bands, giving consideration to aspects of the job, such as the skills involved, under an NHS Job Evaluation Scheme. There are nine numbered pay bands subdivided into points. A set of national job profiles has been agreed to assist in the process of matching posts to pay bands.

Blueteq
A web-based prior approval system that notifies the NHS that a person is going to be put onto a given medicine, usually for high cost drugs under the responsibility of specialised commissioning.

Board round
A summary discussion of the patient journey and what is required on that day for it to progress. They identify and resolve any waits or delays in the patient's hospital stay.

Bronchial thermoplasty
A heat treatment given to some people with severe asthma that reduces the amount of thickened smooth muscle on the inside walls of the airways.

Casemix
The type or mix of patients, categorised by a variety of measures including demographics, disease type and severity, and the diagnostic or therapeutic procedures performed.

Clinical Commissioning Group (CCG)
Clinically-led statutory NHS bodies responsible for planning and commissioning health care services for their local area.

Clinical Reference Groups (CRGs)
A group including clinicians, commissioners and patient representatives with responsibility to ensure that specialised commissioning service specifications are delivered to a high standard.

Co-morbidities
The simultaneous presence of two or more chronic diseases or conditions in a patient.

Day case
When a patient is admitted electively for care that day, without the use of a hospital bed or overnight stay. The patient must require a bed for recovery purposes, or require a minor surgical procedure.

Empyema
A condition in which pus-filled pockets develop in the pleural space.

FeNO (fraction of expired nitric oxide) test
A test to see how much nitric oxide is in the breath, which can indicate an inflammatory process and is used in management of asthma.

Full polysomnography
A comprehensive recording of the changes that occur in sleep. It monitors many body functions including brain activity, eye movements, and muscle tone to allow the staging of sleep needed in some aspects of sleep medicine. This is usually simultaneous with other cardiorespiratory recordings and video observation throughout the sleeping period

Global Burden of Disease
A global study led by the Institute for Health Metrics and Evaluation (IHME), tracking progress within and between countries on deaths and causes of death.

Healthcare Quality Improvement Partnership (HQIP)
An independent organisation led by the Academy of Medical Royal Colleges, the Royal College of Nursing and National Voices. It aims to improve health outcomes by enabling those who commission, deliver and receive healthcare to measure and improve healthcare services.

Healthcare Resource Group (HRG)
Standard groupings of clinically similar treatments that use common levels of healthcare resource. HRGs help organisations to understand their activity in terms of the types of patients they care for and the treatments they undertake.

Hospital Episode Statistics (HES)
Data collected by NHS Digital for each episode of admitted patient care in England.

Hub and spoke networks
A network arrangement between service providers. Hub and spoke networks can be either formal, with a contractual agreement in place, or informal, where there is a shared understanding of how the network will operate, but no contractual agreement.

ICD-10
The International Classification of Disease is a system of medical coding created by the World Health Organisation (WHO) for documenting diagnoses, diseases, signs and symptoms and social circumstances. It is a statistical classification that is used by health care providers and national and regional organisations to report/summarise an episode of care. It is mandated nationally for use across the NHS and the UK government has a commitment to report UK diagnostic statistics to WHO using ICD-10.

Improving Access to Psychological Therapies programme (IAPT)
IAPT services offer NICE recommended therapies, such as cognitive behavioural therapy (CBT), for common problems involving stress, anxiety and depression.

Length of stay (LoS)
The number of days that a patient is in hospital as an inpatient. Can be pre-operative, post-operative, or the sum of both.

Local Safety Standards for Invasive Procedures (LocSSIPs)
A process through which organisations review their current local processes for invasive procedures and ensure that they are compliant with the new national standards.

Multidisciplinary team (MDT)
A group of healthcare workers who are members of different disciplines (e.g. psychiatrists, social workers, etc.), each providing specific services to the patient. In this document, it typically refers to multidisciplinary teams for cancer care.

Morbidity and Mortality meetings
Meetings for the review of deaths and potential harms as part of professional learning

Mortality rate
A measure of the number of deaths in a particular population, in a defined unit of time. The mortality rate is often measured using:

National Confidential Enquiry into Patient Outcome and Death (NCEPOD)
The National Confidential Enquiry into Patient Outcome and Death is a national charity that carries out studies into perioperative mortality and outcomes from surgery and the reasons behind them

National Reporting and Learning System
An NHS central database of patient safety incident reports.

NHS RightCare
A programme developed to reduce unwarranted variation in order to improve people's health. www.england.nhs.uk/rightcare

Parapneumonic effusion
Accumulation of exudative pleural fluid associated with a lung infection that may progress to an empyema.

Patient Level Information and Costing Systems (PLICS)
A system of collecting and deriving costs at the patient level.

Personalised Asthma Action Plan (PAAP)
A written plan devised with a GP for asthma patients, detailing which medicines to take, what actions to take if symptoms worse, and emergency action to take in the event of an asthma attack.

Physician Associate
Medically trained, generalist healthcare professionals, who work alongside doctors and provide medical care as an integral part of the multidisciplinary team.

Programmed Activity (PA)
Blocks of time, usually equivalent to four hours, in which contractual duties are performed. In consultant job plans there are four basic categories of contractual work: direct clinical care (DCC), supporting professional activities (SPAs), additional responsibilities and external duties.

Pleural effusion
A condition affecting the lining of the lung (pleura). Fluid fills the space between the pleura and the chest wall.

Pneumothorax
When air enters the space between the outside of the lung and the inside of the chest wall. A small pneumothorax may cause few or no symptoms. A large pneumothorax can cause the lung to collapse.

Pulmonary embolism rule-out criteria (PERC)
A tool, used by clinicians to identify and 'rule out' patients who do not need further testing for pulmonary embolism because they are low risk.

Pulmonary rehabilitation (PR)
A treatment programme for people with lung conditions made up of a physical exercise programme together with a tailored educational programme.

Re-expansion pulmonary oedema (RPO)
A rare complication that can occur after rapid re-inflation of the lung following drainage of a pleural effusion or pneumothorax.

Spirometry
A test used to help diagnose and monitor certain lung conditions by measuring how much air a patient can breathe out in one forced breath and also the underlying capacity of the lung.

Standardised Mortality Ratio (SMR)
Statistically calculated mortality ratios established by dividing the number of actual deaths within the trust by the 'expected' number of deaths based on the characteristics of the patients treated.

Summary Hospital-level Mortality Indicator (SHMI)
An indicator of mortality at trust level across the NHS in England using a standard and transparent methodology.

Technology-enabled care
The use of telehealth, telecare, telemedicine, telecoaching and self-care in providing care for patients with long term conditions that is convenient, accessible and cost-effective.

Acknowledgements

I would like to acknowledge the key support I have had in developing this national report. Project managers Jenny Littlewood and Peter Stewart-Sandeman have kept me on track throughout my deep dives across the country. Analyst Matt Colmer has from the very start made the art of the improbable possible when it came to data analysis and interpretation. Policy managers Kate Livesey and Kathleen Reinoga have helped me define the scope of this report and develop implementable recommendations, while Angela Wipperman has aided in translating findings into a clear and impactful narrative.

Several sections have also had particular input from colleagues. I am grateful to Jaidev Mehta and Natasha Callender for support in developing our medicines metrics, as well as Nicola Read, Annakan Navaratnam and John Machin for their authorship of the litigation section.

Members and staff of the British Thoracic Society, Association for Respiratory Technology and Physiology and key charities such as Asthma UK and the British Lung Foundation have all provided useful guidance and sense-checking throughout the GIRFT respiratory workstream.

Finally, I am grateful to my respiratory colleagues across the country for their welcoming approach to our deep-dive visits and commitment to the GIRFT approach of continual quality improvement. I am especially thankful to those who have shared examples of best practice for this report.

Martin Allen

Data and copyright acknowledgements

The GIRFT programme would like to thank the following organisations for making their data available:

- NHS Digital;
- NHS England and NHS Improvement;
- NHS Resolution;
- Royal College of Physicians;
- Diagnostic Imaging Dataset (DID);
- ARTP toolkits.

GIRFT report team

Dr Martin Allen – Clinical Lead
Jenny Littlewood – Project Manager
Peter Stewart-Sandeman – Project Manager
Matt Colmer – Analyst
Kate Livesey – Policy Manager
Kathleen Reinoga – Policy Manager
Angela Wipperman – Editor
John Machin – Clinical Lead for Litigation
Annakan Navaratnam and Nicola Read – Litigation
Maddy Connolly – Senior Manager, Finance and Analytics
Matthew Barker – Senior Policy Lead
Anna Woodford – Series Editor
Melanie Proudfoot – Head of Communications
Michelle Carter – Communications Manager

For more information about GIRFT,
visit our website: www.GettingItRightFirstTime.co.uk
or email us on info@GettingItRightFirstTime.co.uk

You can also follow us on Twitter @NHSGIRFT and
LinkedIn: www.linkedin.com/company/getting-it-right-first-time-girft

The full report and executive summary are also available to download as
PDFs from: www.GettingItRightFirstTime.co.uk