British Thoracic Society
Respiratory Support Audit
Protocol and Instructions
February 2023

Aims and Objectives
The aim of the BTS audit programme is to drive improvements in the quality of care and services provided for patients with respiratory conditions across the UK. This audit aims to capture data on patients outside critical care that have required respiratory monitoring or intervention (i.e. either admitted to an acute respiratory support unit or treated in another ward setting with NIV/CPAP/HFNO), with a view to better understanding variations in clinical practice and outcome.

The aim is to include all patients who **ARE** admitted to a Respiratory Support Unit and, where possible, also those who **SHOULD** have been admitted (e.g. treated with NIV in a ward area that is not designated as an RSU). The organisational part of this audit aims to gather data on the services that provide support to these patients.

Audit Period and Scope
Audit period: 01 Feb 2023 – 31 Mar 2023
Data entry period: 01 Feb 2023 – 31 May 2023

The **Respiratory Support Audit** has two parts:

Part 1: Patient Questionnaire – one record per patient
Part 2: Organisational Questionnaire – one record to be submitted by each participating site to provide information on available resources for your institution

The audit should be led by a Consultant Physician and the screening process/diagnosis review should be undertaken by a member of the direct care team.

Any UK hospital that has had adult inpatients admitted for acute respiratory support in the above designated audit period can take part in the audit. Please aim for at least 25 records for part 1.

Definitions:

Acute respiratory support:
Patients receiving the following methods of respiratory support:

1) Any patient requiring monitoring above and beyond what is given on the ward/advanced monitoring for an acute respiratory problem

And/or

2) Patients being seen in a Respiratory Support Unit, defined as an area of enhanced care that enables a higher level of monitoring and respiratory intervention than would be expected for a routine ward environment

Instructions for Case Identification

All adult inpatient cases (≥18 years) **admitted** to a hospital who have been treated with respiratory support (NIV/CPAP/HFNO) in any setting other than critical care AND/OR admitted to Respiratory Support Units.

Inclusion Criteria

Any patient admitted to a designated RSU. This includes patients admitted to an RSU purely for bed capacity reasons.

If not admitted to RSU, then any patient with a primary respiratory condition who SHOULD ideally have been admitted to an RSU. This will typically be identified by a need for monitoring and/or clinical intervention that is above and beyond what is normally provided in a standard ward setting. Examples include:

- Patients receiving acute NIV for acute hypercapnic respiratory failure
- Patients receiving acute non-invasive CPAP for hypoxaemia of respiratory cause
- Patients receiving acute HFNO for hypoxaemia
- Patients receiving Long Term Ventilation who are admitted acutely
- ICU step down patients with ongoing single organ respiratory failure including continued requirement for tracheostomy/laryngectomy management and patients receiving Mechanical Insufflation-Exsufflation (MI-E) therapy
- Acute Pulmonary Embolism and requiring a higher level of monitoring than for standard ward care (e.g. requiring continuous oximetry)
- Acute Asthma and requiring a higher level of monitoring than for standard ward care (e.g. requiring continuous oximetry)
- Other Respiratory conditions characterised by an acute need for continuous oxygen monitoring

Exclusions

- Patients that do not meet any of the inclusion criteria

PART 2: Organisational Audit

This part of the audit is best completed under the supervision of the lead Consultant Physician, responsible for the acute NIV / RSU service. One form should be completed per hospital for services available at the time of the audit period.

There is no requirement for participating hospitals to have a Respiratory Support Unit. The audit also seeks to record where these services are not available.

Accessing the BTS Audit Tools:

Data can be entered onto the online data collection tool via the BTS audit system (user registration required – log in details should not be shared): https://audits.brit-thoracic.org.uk/

Each site will require a signed registration form from a chosen audit lead before audit access can be granted. Blank registration forms can be found alongside the protocol and other documents online at the audit website under each audit or the main BTS website.

The Respiratory Support Audit appears under the list of adult audit tools. To access the audit, click on the Period name "01 Feb 2023- 31 Mar 2023" and then click "Add record" to access the data entry screens.

You can save the record you are working on and return to it at any point. When you have completed data entry you will need to click "Commit" to submit your data to the database. At this point you can see the record but will not be able to edit the contents further.

Analysis and Reporting

Audit participants can generate local reports from the audit system which present that institution's data as a comparison to the national dataset, and reports comparing data from different audit periods. Click the 'Reports' link on the audit system home page, then select the type of report and the relevant audit period(s) from the links at the bottom of the reports page.

Data submitted for BTS national audits may be reviewed for outliers under the BTS outlier policy. More information can be found here: https://www.brit-thoracic.org.uk/quality-improvement/clinical-audit/audit-outlier-process/

Contacts

Any queries should be referred to audittools@brit-thoracic.org.uk

Appendix 1: Applicable Standards

The audit questions are based on key recommendations from the BTS/ICS guidance document, 'Respiratory Support Units: Guidance on development and implementation' (June 2021), the British Thoracic Society Quality Standards for Acute Non-Invasive Ventilation in Adults (April 2018), and the Respiratory GIRFT report (2021).

Applicable recommendations from 'Respiratory Support Units: Guidance on development and implementation:'

- There should be designated operational management, medical, nursing and allied health professional (AHP) leads for the RSU.
- Complex respiratory care should be co-located and delivered in an RSU environment.
- Consultants should all have experience and competence in the management of complex respiratory conditions.
- There should be 24/7 cover available from the same pool of consultants who deliver daytime work.
- The nursing staff requirement of an RSU will be dependent on the number of beds within the unit and the complexity of each patient. Staffing ratios should reflect existing guidance where available.
- Nursing staff should be experienced and have demonstrable competence in the management of complex respiratory conditions.
- Monitoring (saturations, blood pressure, ECG) should be available at each bedspace and displayed centrally on the RSU.
- All RSUs should have immediate access to co-located blood gas monitoring.

The British Thoracic Society's Quality Standards for Acute Non-Invasive Ventilation in Adults:

- Quality statement 1- Acute non-invasive ventilation (NIV) should be offered to all patients who meet evidence-based criteria. Hospitals must ensure there is adequate capacity to provide NIV to all eligible patients.
- Quality statement 2 - All staff who prescribe, initiate, or make changes to acute NIV treatment should have evidence of training and maintenance of competencies appropriate for their role.
- Quality statement 3 - Acute NIV should only be carried out in specified clinical areas designated for the delivery of acute NIV.
- Quality statement 4 - Patients who meet evidence-based criteria for acute NIV should start NIV within 120 minutes of the first blood gas measurement that defines the physiological indication for acute NIV.
- Quality statement 5 -All patients should have a documented escalation plan before starting treatment with acute NIV. Clinical progress should be reviewed by a healthcare professional with appropriate training and competence within four hours, and by a consultant with training and competence in acute NIV within 14 hours of starting acute NIV.

- Quality statement 6 -All patients treated with acute NIV should have blood gas analysis performed within two hours of starting acute NIV; failure of these blood gas measurements to improve should trigger specialist healthcare professional review within 30 minutes.

Recommendations from NCEPOD's 'Inspiring Change' report (June 2017):

- All hospitals should have a clinical lead for their acute non-invasive ventilation (NIV) service. The clinical lead should have time allocated in their job plan with clear objectives, including audit and governance for this service. (Medical Directors and Nursing Directors)

- Continuous positive airways pressure (CPAP) and non-invasive ventilation (NIV) should be coded separately. They are two distinct treatments given for different conditions and separate coding will reduce clinical confusion and improve reporting of outcomes. (NHS Digital and the Association of Clinical Coders)

- Acute non-invasive ventilation treatment should only be provided in clinical areas equipped with: a. Continuous pulse oximetry; b. Continuous ECG monitoring; and c. Rapid access to the results of blood gas analysis. (Medical Directors and Nursing Directors)

- In line with current British Thoracic Society guidelines, patients with known chronic obstructive pulmonary disease, or other known risk factors for hypercapnic respiratory failure, should have an oxygen saturation of 88-92% maintained, both prior to admission and on admission to hospital. The device used for oxygen delivery, the concentration of oxygen administered and the target saturation should be documented in the relevant patient record. (Ambulance Trusts and Emergency Medicine Physicians)

- Treatment with acute non-invasive ventilation (NIV) must be started within a maximum of one hour of the blood gas measurement that identified the need for it, regardless of the patient's location. A service model whereby the NIV machine is taken to the patient to start treatment prior to transfer for ongoing ventilation will improve access to acute NIV. (All Clinical Staff Providing Acute Non-Invasive Ventilation and Acute Non-Invasive Ventilation Service Leads)

- In all areas providing acute non-invasive ventilation (NIV), a minimum staffing ratio of one nurse to two acute NIV patients must be in place, as recommended in the British Thoracic Society guideline. The duration for which this should continue will be determined by each individual patient's response to ventilation. (Nursing Directors and Medical Directors)

- All hospitals where acute non-invasive ventilation (NIV) is provided must have an operational policy that includes, but is not limited to: a. Appropriate clinical areas where acute NIV can be provided, and in those areas the minimum safe level of staff competencies; b. Staff to acute NIV patient ratios; c. Escalation of treatment and step down care procedures; d. Standardised documentation; and e. Minimum frequency of clinical review, and seniority of reviewing clinician. Compliance with this policy should be part of the annual audit process.

- All staff who prescribe/make changes to acute non-invasive ventilation treatment must have the required level of competency as stated in their hospital operational policy. A list of competent staff should be maintained.

- All patients treated with acute non-invasive ventilation (NIV) must have a treatment escalation plan in place prior to starting treatment. This should be considered part of the prescription for acute NIV and include plans in relation to: a. Escalation to critical care; b. Appropriateness of invasive ventilation; and c. Ceilings of treatment. This should take into account: d. The underlying diagnosis; e. The risk of acute NIV failure; and f. The overall management plan. (All Clinical Staff Responsible for Starting Acute NIV)

- All patients treated with acute non-invasive ventilation (NIV) must be discussed with a specialist competent in the management of acute NIV at the time treatment is started or at the earliest opportunity afterwards. Consultant specialist review to plan ongoing treatment should take place within a maximum of 14 hours. (Acute Non-Invasive Ventilation Service Leads)

- All patients receiving acute non-invasive ventilation (NIV) should receive, as a minimum, daily consultant review while they remain on ventilation. This consultant must be competent in acute NIV management. (Clinical Directors and Consultants Responsible for Acute NIV)

- All patients treated with acute non-invasive ventilation must have their vital signs recorded at least hourly until the respiratory acidosis has resolved. A standardised approach such as the National Early Warning Score is recommended. (Nurses and Acute Non-Invasive Ventilation Service Leads)

- Documentation of all changes to ventilator settings is essential and the use of a standardised proforma is recommended. (Acute Non-Invasive Ventilation Service Leads)

- The use of acute non-invasive ventilation could act as a flag to consider referral to palliative care services, as this may be valuable for both active symptom control and end of life care. (Clinical Staff)
- Following an acute non-invasive ventilation episode, a structured plan for future treatment should be discussed with the patient and/or carer either at the point of discharge from hospital or at subsequent follow-up. This must be documented and a copy of the plan given to the patient and to the patient's general practitioner. (Clinical Staff)

- In the absence of a recognised indication for acute non-invasive ventilation (e.g. chronic obstructive pulmonary disease) patients with acute ventilatory failure and evidence of pneumonia have a high risk of death and acute NIV should not be considered standard treatment. Escalation of treatment should be actively considered. There should be close liaison between senior members of the medical and critical care teams to agree the most appropriate approach to management. (Consultants)

- Governance arrangements for acute non-invasive ventilation (NIV) services should be in place in all organisations that provide acute NIV treatment. These should include all disciplines and specialities involved in the delivery of NIV. Depending on the local service model, those involved in the governance of acute NIV services are likely to include medical, nursing and physiotherapy staff from Emergency Medicine, Acute Medicine, Respiratory Medicine and Critical Care.

- (Medical Directors, Nursing Directors and Acute Non-Invasive Ventilation Service Leads)

- All acute non-invasive ventilation services should have a record kept of the number of patients treated, to aid service planning. (Acute Non-Invasive Ventilation Service Leads)

- All acute non-invasive ventilation services should be audited annually. The audit results should be reported to the Hospital Board. (Acute Non-Invasive Ventilation Service Leads and Medical Directors)

- All hospitals should monitor their acute non-invasive ventilation mortality rate and quality of acute NIV care. This should be reported at Board level. (Chief Executives, Medical Directors, Nurse Directors and Acute Non-Invasive Ventilation Service Leads)

- A quality standard for acute non-invasive ventilation is required to facilitate quality improvement in acute non-invasive ventilation services. (British Thoracic Society and Local Quality Improvement Leads)

The 2021 Respiratory GIRFT states:

Ensure a dedicated non-invasive ventilation (NIV) service is in place, with the recommended infrastructure to improve outcomes and reduce mortality.