Enhanced Emergency Assessment Pathways in Asthma and COPD: a new multidisciplinary pathway to support rapid assessment and treatment of patients presenting to hospital with an exacerbation of asthma or COPD

Introduction

Acute exacerbations of asthma and chronic obstructive pulmonary disease (COPD) remain among the most common reasons for unscheduled hospital attendance and emergency admission, and the first hours of care are critical to patient outcomes. The clinical trajectory of an exacerbation can change rapidly, and early, guideline-based assessment and treatment—delivered reliably and without delay—can prevent deterioration, reduce avoidable admissions, and improve patient experience.

The National Respiratory Audit Programme (NRAP) State of the Nation report, *Catching our breath: Time for change in respiratory care* (1), provided a timely and compelling rationale for national action. The report focused on care delivered to people admitted with asthma and COPD exacerbations across England and Wales, using data collected between 1 April 2023 and 31 March 2024 and drawing on more than 126,000 submitted case records across the programme. Importantly, the NRAP report highlighted persistent deficiencies in the implementation of key, evidence-based interventions during the early phase of emergency care**,** with variation across regions and several areas unable to return to pre-pandemic levels.

For adults presenting with acute asthma, a documented peak expiratory flow (PEF) measurement within one hour of arrival was recorded in 10% of cases. Early recognition and assessment of asthma severity is essential to guide appropriate treatment and escalation, with PEF providing invaluable additional information alongside clinical assessment and physiological observations, where clinically appropriate and feasible. Improving the use of PEF, where appropriate, combined with clinical assessment, offers an opportunity to strengthen early severity assessment and steer timely treatment.

For people with COPD who received non-invasive ventilation (NIV), NRAP reports that only 18% received NIV within two hours of arrival—despite NIV being a time-critical intervention for appropriately selected patients with acute hypercapnic respiratory failure. These findings, together with the observed variation between services and regions, point to a system challenge: while national guidance is clear, frontline delivery in the pressured emergency setting remains inconsistent.

In light of these conclusions, the NRAP State of the Nation report made the following recommendation:

The British Thoracic Society, as the expert body, should lead the development of a standardised acute care bundle for patients with asthma and COPD on arrival to hospital, working towards May 2026. This should involve consultation with other bodies such as the Royal College of Emergency Medicine, Society for Acute Medicine, and NRAP. NRAP will measure the implementation of the acute care bundle by tracking the percentage of patients receiving timely and optimal care.

In response to this, the British Thoracic Society (BTS) has led the development of a standardised acute assessment pathway for patients with asthma or COPD on arrival to hospital. This has been developed in partnership with the Royal College of Emergency Medicine (RCEM)**,** the Society for Acute Medicine (SAM**)**, NRAP clinical leads and a multi-disciplinary group of respiratory specialists. This resource recognises that improving early emergency care requires alignment across the extended acute team (emergency medicine, acute medicine, respiratory services, and critical care), supported by practical tools that work in real-world clinical flow.

Purpose and aims of the assessment pathways

This report and accompanying Emergency Assessment Pathways in Asthma and COPD are intended to support multidisciplinary teams to deliver rapid, standardised assessment and time-critical treatments for people presenting acutely with exacerbations of asthma or COPD; this is regardless of hospital setting or geography. Rather than creating lengthy admission bundles that risk poor usability at the front door, the project has focused on producing concise, one-page "enhanced emergency assessment pathways" for asthma and COPD, with a shared design philosophy and a common purpose: to improve the measurable care processes in the first hours that NRAP audits and reports on nationally.

The assessment pathways aim to:

- **Improve timeliness and reliability** of key actions in first hours of asthma and COPD emergency care that are repeatedly highlighted by NRAP as requiring improvement
- **Reduce unwarranted variation** between services and regions by promoting a shared standardised approach that can be adopted locally and embedded into routine pathways
- **Support clinical decision-making under pressure** through clear severity stratification and prioritised "high-impact actions", enabling rapid escalation where needed and avoiding delays to definitive therapy
- **Enable measurement and improvement** by incorporating prompts that can be recorded (paper or electronically), facilitating audit readiness and supporting NRAP's intention to track implementation over time.

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Methodology

A working group was esatablished in the Spring of 2025 made up of specialists from the fields of asthma and COPD care and experts in quality improvement. Members of the working group were drawn from a range of stakeholder organisations, including the British Thoracic Society (BTS), NRAP, the Royal College of Emergency Medicine (RCEM) and the Society of Acute Medicine (SAM). The members of the group are listed at the end of this document.

Review process

The enclosed resources were reviewed by the BTS Quality Improvement Committee and by the relevant committees of the stakeholder organisations mentioned above. The documents were also subject to public consultation between 29 July and 2 September. Comments received during that consultation have been reflected in these resources. The documents were also piloted within some of the hospitals associated with members of the working group. This took place for a period of a few weeks prior to public consultation.

Scoping process

The working group used the existing admission care bundles for asthma and COPD as the starting point for this project. On review, however, there was consensus that a different approach was needed to support patients with acute exacerbations. First, the focus was shifted to management from the point of arrival at hospital, rather than only from the point of admission, reflecting NRAP's finding that early, pre-admission care is where the greatest variation occurs. Second, the group agreed that a pathway approach was more appropriate than a care bundle: care bundles typically describe a fixed set of actions to be completed at a single point in time, whereas the first hours of an asthma or COPD exacerbation require severity-stratified decision-making across several time points, from triage through reassessment to discharge or admission. Finally, the group agreed to produce two separate assessment pathway documents — one for asthma, one for COPD — sharing a common visual format and clinical structure, so that users would recognise and navigate both easily, while allowing each to reflect the distinct severity criteria and treatment steps of the respective condition.

The agreed remit of the working group was not to develop new quality standards or clinical guidelines, but instead to provide tools that support front-line teams to reliably deliver existing BTS, SIGN and NICE guidance on the acute assessment and management of asthma and COPD, within the practical constraints of the emergency care setting. This was achieved by bringing together multi-professional expertise from a range of stakeholders, drawn from respiratory medicine, emergency medicine and acute medicine.

Where guidance detail was lacking or silent on operational specifics (for example, exact reassessment intervals or discharge timeframes), decisions were reached by expert consensus, informed by the perspectives of the stakeholder organisations represented and by BTS specialist advisory groups. The pathways underwent multiple iterations and were tested in 4 acute hospital settings, with revisions made in response to feedback at each stage. Impact of implementation will be tracked through existing NRAP clinical audit key performance indicators, so that delivery of the high-impact actions can be monitored over time, without creating a parallel audit burden.

Audience

In drafting the pathways, the working group wanted to ensure that the resources were accessible to meet the needs of a range of generalist healthcare professionals providing acute care for patients with exacerbations of COPD and asthma. Each pathway therefore provides enough high-level information for the treating clinician to determine clinical severity and risk, and to action appropriately.

How to use the assessment pathways

The pathways described below set out the immediate actions to be taken for patients presenting to hospital with either an acute exacerbation of asthma or COPD. The pathway for asthma patients is outlined in Section A and for COPD patients in Section B. These sections describe the actions that attending clinicians should take, with a rationale as to why these constitute the optimal approach for managing these patients.

Appendices 1 and 2 provide one-page template versions of the two pathways, which can be adapted for local use, or integrated into electronic patient record systems. These are quick reference visual guides, which are designed to allow services to implement the required steps and track the progress of their patients.

Implementation of the pathways will be supported through existing NRAP audit measures, enabling services to monitor improvements in the timeliness and delivery of key interventions, without introducing additional reporting requirements.

Abbreviations

ABG	Arterial blood gas
ACVPU	Alert, Confusion, Voice, Pain, Unresponsive (consciousness level)
AECOPD	Acute Exacerbation of Chronic Obstructive Pulmonary Disease
AHRF	Acute hypercapnic respiratory failure
CBG	Capillary Blood Gas
COPD	Chronic Obstructive Pulmonary Disease
CXR	Chest X Ray
ECG	Electrocardiogram
HR	Heart Rate
ICS	Inhaled Corticosteroid
LABA	Long-acting beta-2 agonist
MART	Maintenance and Reliever Therapy
mcg	Microgram
mg	Milligram
NEWS2	National Early Warning Score 2
NIV	Non-Invasive Ventilation
PaCO2	Partial Pressure of Carbon Dioxide in Arterial Blood
PaO2	Partial Pressure of Oxygen in Arterial Blood
PEF	Peak Expiratory Flow
pH	Potential of Hydrogen (acidity level)
RR	Respiratory rate
SpO2	Peripheral Capillary Oxygen Saturation (blood oxygen level)
VBG	Venous blood gas

A. Asthma Emergency Assessment Pathway

Introduction

This assessment pathway describes 4 high impact actions to ensure the best clinical outcome for patients presenting to hospital with an exacerbation of asthma. The pathway is designed to be used for patients on arrival to hospital (not just the Emergency Department), and through their care to respiratory review. The aim for this pathway is to improve the quality and timeliness of care.

These four impact actions are:

- severity assessment through triage review,
- initial management
- reassessment to review severity, and
- decision to admit or discharge.

Each impact action has been stratified depending on the severity of the exacerbation and has been colour coded accordingly: Moderate (green), Severe Acute (orange), Life Threatening (bright red), and Near Fatal (dark red).

Inclusion criteria

Adults (16+) presenting to emergency care with an acute exacerbation of asthma.

Time frame

From start to finish, actions 1-4 should take around 120 minutes from arrival at hospital.

Action 1: Severity Assessment (Triage Review)

Severity is stratified into Moderate, Severe Acute, Life-Threatening and Near-Fatal using the criteria long established in SIGN 158 (2) and carried forward into the current BTS/NICE/SIGN acute asthma pathway (3). These thresholds were retained unchanged because they are already familiar to UK emergency and acute teams and map directly onto NRAP's own severity fields, so the same tick-box doubles as the audit data-capture point rather than creating a second, parallel classification.

Early assessment of asthma severity is fundamental to guiding appropriate treatment and escalation. The flowchart therefore begins with clinical assessment and physiological observations, including PEF measurement where appropriate and feasible. NRAP's State of the Nation report identified that PEF was documented within one hour in 10% of cases, highlighting an opportunity to improve its use as part of a comprehensive severity assessment. Arterial blood gas is triggered only by SpO2 <92%, consistent with guideline thresholds, to avoid over-testing in moderate presentations.

ACTION 1: SEVERITY ASSESSMENT (Triage review)

- RR, HR, SpO_2*
- Perform ABG if SpO_2 <92%, or if features of life threatening asthma are present.

*Pulse oximetry may overestimate oxygen saturations in people with darker skin tones.

Near Fatal	Life Threatening	Severe Acute	Moderate
Raised $PaCO_2$ and/or requiring mechanical ventilation with raised inflation pressures **Manage in resus or equivalent**	SpO_2 <92% and one of the following: Altered consciousness, Exhaustion, Arrhythmia, Hypotension, Cyanosis, Silent Chest, Poor respiratory effort, PEF < 33% best/predicted, PaO_2 < 8 kPA, "Normal" $PaCO_2$ of 4.6-6.0 kPa **Manage in resus or equivalent**	Inability to complete sentences in one breath RR≥ 25/min, HR ≥ 110/min, PEF 33-50% best/predicted **Manage in resus or equivalent**	PEF >50-75% best/predicted

Action 2: Initial Management

Treatment steps (oral prednisolone 40mg or IV hydrocortisone 100mg if oral route unavailable; nebulised salbutamol; nebulised ipratropium for life-threatening/near-fatal disease) follow the standard first-line bronchodilator and steroid bundle in the SIGN 158 acute asthma algorithm. No deviation from guideline dosing was intended.

Expert consensus: *The salbutamol nebuliser dose in the pathway boxes was amended to 2.5mg. SIGN 158's acute adult algorithm specifies 5mg (repeated as clinically indicated). It was felt that the clinical side effects/efficacy threshold and widespread clinical practice favoured this change.*

ACTION 2: INITIAL MANAGEMENT

Near Fatal or Life Threatening	Severe Acute	Moderate
Aim oxygen saturations 94-98%. • Give prednisolone 40 mg, or IV hydrocortisone 100 mg (if unable to take orally). • Give salbutamol 2.5mg and ipratropium 500 microgram / 0.5 mg	• Give prednisolone 40mg. • Give salbutamol Nebuliser 2.5mg.	• Give prednisolone 40 mg. • Up to 10 puffs of salbutamol inhaler via spacer.

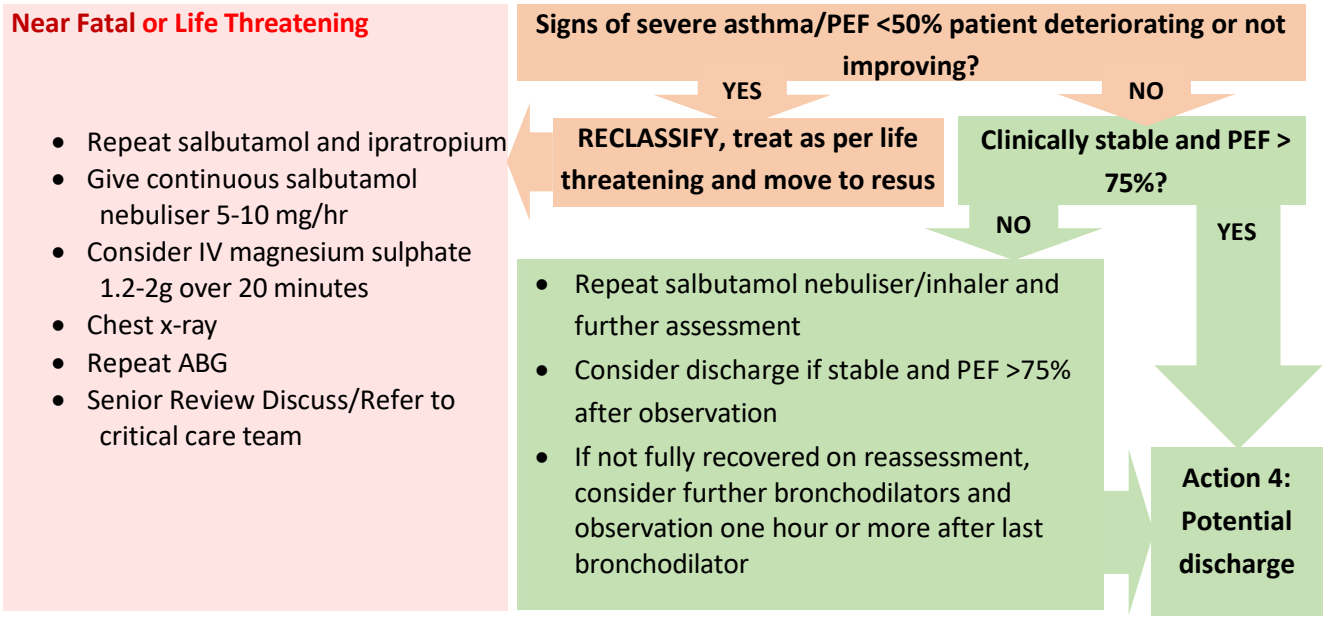
Action 3: Reassessment (Review Severity)

Reassessment at 15–20 minutes reflects the expected onset of effect of nebulised bronchodilator therapy. Patients not fully recovered are escalated using the same severity criteria as Action 1, so reassessment does not introduce a second decision framework. Repeat nebulised salbutamol/ipratropium, continuous nebulisation, IV magnesium, chest X-ray and repeat ABG for life-threatening/near-fatal disease, mirror SIGN 158's escalation steps for patients failing initial therapy; IV magnesium is deliberately framed as "consider" rather than mandatory, reflecting its use in patients with poor or no response to initial nebulisers and not as a routine step.

The requirement for a further period of observation and reassessment (one hour or more after the last bronchodilator, before discharge is confirmed) was included to encourage structured reassessment rather than a single-point decision. This was to address variation seen in practice where early improvement is not consistently rechecked before discharge.

ACTION 3: REASSESSMENT (REVIEW SEVERITY)

If not fully recovered, consider further treatment/escalation



Action 4: Decision to Discharge or Admit

Admission and respiratory review timeframes (24 hours) and the BTS asthma attack care bundle (4) (minimum 5-day prednisolone course, ICS/LABA MART inhaler as per formulary with technique check, GP letter, local asthma service notification) reproduce the discharge care bundle. This is so that pathway completion at Action 4 integrates directly into existing discharge quality improvement processes, rather than creating a new one. The 120-minute overall target for Actions 1–4 aligns with the timeframe NRAP already uses to describe timely first-hours care.

ACTION 4: DECISION TO DISCHARGE OR ADMIT		
Near Fatal **Admit to Critical Care:** **Hospital medical team will need to ensure respiratory review within 24 hours**	**Life Threatening** **Admit to Hospital:** **Hospital medical team will need to ensure respiratory review within 24 hours**	**Potential Discharge -** If patient is ready for discharge, they will need the following: • Prednisolone 40mg until recovery (min 5 days) • ICS/LABA inhaler MART at least, with technique checked • Send discharge letter to GP • Local asthma services reviewed/informed per local pathways Consider also: • Review BTS asthma attack care bundle for more information

B. COPD Emergency Assessment Pathway

Introduction

The COPD pathway is anchored in NICE NG115 COPD in over 16s: diagnosis and management (5), which includes recommendations for managing exacerbations of COPD in hospital, together with BTS guidance and quality standards on management of non-invasive ventilation (NIV) in acute hypercapnic respiratory failure (AHRF) (6).

This assessment pathway describes 4 high impact actions to ensure the best clinical outcome for patients presenting to hospital with an acute exacerbation of COPD (AECOPD), based upon the risk associated with their exacerbation. The pathway is designed to be used for patients on arrival to hospital (not just the Emergency Department), and through their care to respiratory review. The aim for this pathway is to improve the quality and timeliness of care.

These four impact actions are:

- risk assessment through triage review,
- initial management and investigations
- reassessment to review risk, and
- decision to admit or discharge.

Each impact action has been stratified according to the clinical risk associated with the exacerbation presentation and has been colour coded accordingly: Life Threatening Risk (bright red), High Risk (orange) and Moderate Risk (green).

Inclusion criteria

Adults (18+) presenting to emergency care with an acute exacerbation of COPD

Time frame

From start to finish, actions 1-4 should take around 120 minutes from arrival at hospital.

For patients presenting with features of a Life-Threatening Risk COPD exacerbation, time to commencement of treatment with NIV should be within 1 hour of diagnosis of persistent acute hypercapnic respiratory failure (which has not responded to initial treatment) OR within 2 hours of arrival at hospital.

Action 1 – Risk assessment on arrival and triage review

Rationale for risk-based stratification (Action 1)

Early drafts stratified COPD exacerbations using discrete physiological thresholds for respiratory rate (RR), oxygen saturation (SpO_2), pH and consciousness level. Feedback from the BTS COPD Specialist Advisory Group identified that comparable severity thresholds for COPD exacerbations are not well evidenced and vary between existing sources (GOLD, NICE and other national guidelines, trial definitions), so fixed "severity" cut-offs risked implying a certainty not supported by the evidence.

In response, the group replaced "severity" with "risk" and broadened the defining criteria for each tier. This better reflects how exacerbations are recognised in clinical practice, avoids anchoring on any single unevidenced number, and aligns with emerging evidence linking early risk stratification to inpatient mortality. To ensure broader criteria did not dilute urgency, "consider admission" was added explicitly to the High Risk tier.

The 25% inpatient mortality figure reflects findings from the NCEPOD review of acute non-invasive ventilation (7), which reported in-hospital mortality of 25.1% in patients with COPD receiving acute NIV. This underlines the significant mortality associated with COPD exacerbations complicated by acute hypercapnic respiratory failure and the importance of early recognition and timely escalation.

One threshold was deliberately kept fixed: PCO_2 >6.5kPa, used consistently in Action 1 and Action 3. Feedback from RCEM and SAM highlighted that many patients with advanced COPD present with chronic, stable hypercapnic respiratory failure rather than acute decompensation with respiratory acidosis, and that the real triage challenge is distinguishing these two groups. As the pathway's core purpose is timely recognition of the need for acute NIV, this threshold was retained as a key physiological measure, even as the surrounding risk categories were broadened.

RR, HR, SpO_2, VBG and ACVPU were chosen as the mandatory triage data set because together they identify the two features that most reliably separate a moderate exacerbation from one needing urgent escalation: hypoxaemia (SpO_2 <88% on air) and acute hypercapnic respiratory failure (pH <7.35 on VBG), both drawn from NG115's exacerbation criteria. ACVPU was added, in preference to a fuller consciousness scale, to keep triage assessment fast while still flagging new confusion or drowsiness, a recognised feature of life-threatening decompensation.

ACTION 1: RISK ASSESSMENT (TRIAGE REVIEW)

RR, HR, SpO_2*, VBG, ACVPU

- Pulse oximetry may overestimate oxygen saturations in people with darker skin tones.

Life Threatening Risk (25% inpatient mortality)

- If VBG pH <7.35 and PCO_2 >6.5 kPa: Decompensated type 2 respiratory failure

May require urgent ventilatory support
(typically NIV but also consider invasive ventilation)

Manage in resus or respiratory support unit

High Risk

- evidence of systemic stress e.g. acute confusion, NEWS2 scale 2 score ≥5 (or ≥3 in any single parameter)
- new or worsening respiratory failure sats <88%
- VBG pH ≥7.35
- unable to ambulate or manage at home

Manage in majors or medical admission bed

Moderate Risk

- No evidence of systemic stress, NEWS2 scale 2 score <5
- No evidence of new respiratory failure - sats ≥88%
- Able to perform daily activities

Potentially manage in ambulatory care setting

Action 2 – Initial Management and Investigations

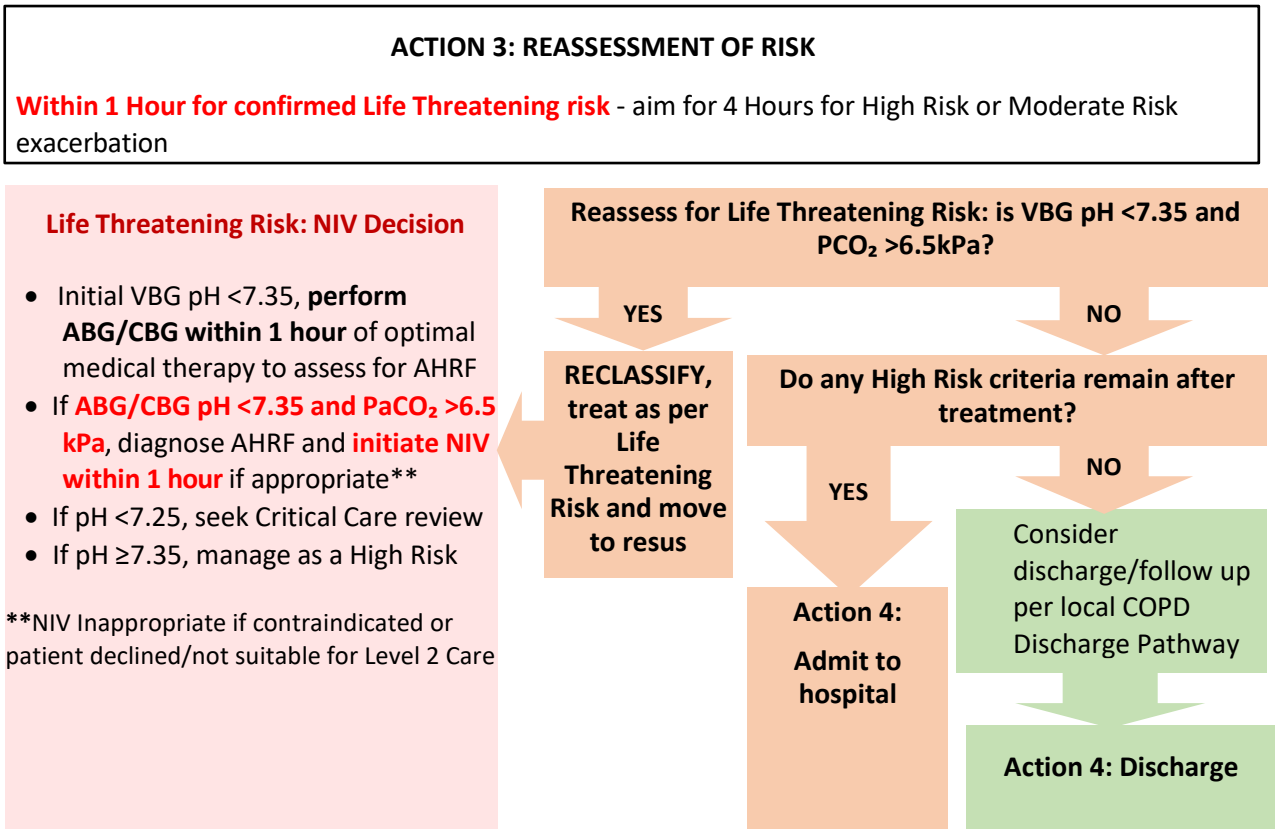
In line with NG115 exacerbation management bundle guidance, the pathway sets out initial management of all patients with COPD exacerbation to include 30mg oral Prednisolone, administration of nebulised salbutamol 2.5mg plus ipratropium 500mcg as needed, provision of antibiotics where bacterial infection is suspected, and controlled oxygen therapy titrated to target saturations of 88–92%. In patients presenting with Life Threatening Risk, these should be performed immediately. Investigations such as bloods, CXR and ECG are recommended specifically to exclude alternative or complicating diagnoses (e.g. pneumonia, pneumothorax, cardiac cause), consistent with NG115's recommendation to confirm the working diagnosis rather than assume COPD from history alone. Documentation of escalation status and review of any existing advance care plan was recommended by the working group as a patient-safety step; these are not specified by NG115 however they directly inform decisions around appropriateness of NIV and critical care escalation later in the pathway.

ACTION 2: INITIAL MANAGEMENT AND INVESTIGATIONS
Immediate in cases of Life Threatening risk

Life Threatening Risk	High Risk	Moderate Risk
• Give Prednisolone 30mg + Salbutamol 2.5mg nebulised +/- Ipratroprium 500mcg nebulised. • Give antibiotics if bacterial infection suspected. • Prescribe and administer controlled oxygen therapy to **target saturation** 88-92%. • Determine and document escalation status; ascertain if there is an existing advance care plan.		
Investigations to exclude alternative diagnosis: Perform: Bloods, CXR, and ECG. Review available spirometry to confirm COPD.		

Action 3 – Reassessment of risk

For life-threatening AECOPD, the NIV decision tree (arterial blood gas if VBG pH <7.35; start NIV within 1 hour if ABG confirms pH <7.35 and $PaCO_2$ >6.5kPa; seek critical care opinion if pH <7.25) aims to support early identification of acute hypercapnic respiratory failure and timely treatment with NIV after initiation of other medical therapy, in line with BTS guidance. This section also prompts consideration of appropriateness of NIV on the basis of a treatment escalation or advance care plan in selected patients. The recommendation to reassess within 1 hour for Life Threatening Risk and within 4 hours for High and Moderate Risk exacerbations was set by expert consensus, since NG115 does not specify these intervals. The times were chosen to be achievable in a typical acute setting while still being soon enough to identify early deterioration and were tested across the 4 pilot sites without requiring adjustment.



Action 4 – Decision to discharge or admit, confirmation of diagnosis

Discharge criteria and recommendations (30mg prednisolone for 5 days, antibiotics if indicated, GP letter, follow-up per local pathway) and the 24-hour respiratory review requirement for admitted and life-threatening risk/NIV patients, reflect NG115 exacerbation management and discharge guidance and acknowledge delivery of established COPD discharge bundles (8). Follow up after an acute exacerbation should be in line with local pathways, which could include support through a hospital at home or virtual ward. It should be noted that "Confirmation of diagnosis" was retained as an explicit step at Action 4, rather than assumed at triage. This is because NG115 requires spirometry-supported diagnosis and a proportion of patients labelled COPD at triage will either not have this confirmed at the point of an acute presentation or may not have a record of existing quality-assured spirometry, in which case this should be arranged as part of their follow up care.

ACTION 4: DECISION TO DISCHARGE OR ADMIT AND CONFIRMATION OF DIAGNOSIS

Life Threatening Risk/NIV

- Refer to medical team and/or Respiratory Support Unit
- Critical Care/Resp/Outreach informed for ongoing care
- Admitting team request respiratory review within 24 hours

Admit to hospital

- Admitting team refer for respiratory review within 24 hours

Discharge

- Prednisolone 30 mg 5 days +/- antibiotics
- Discharge letter to GP
- Follow up as per local respiratory pathway
- Consider BTS COPD Discharge Bundle

Resources

1. Template patient record sheet for the asthma and COPD emergency assessment pathways can be found at Appendix 1 and 2 respectively. These can be reformatted or revised for local use.
2. Links – BTS - Asthma resources
   COPD resources
   NICE - Asthma Health Topic Resources
   COPD Health Topic Resources
   NRAP - Adult Asthma Secondary Care Workstream
   Adult COPD Secondary Care Workstream

Appendices

1. Appendix 1 - Asthma Emergency Assessment Pathway – patient record sheet
2. Appendix 2 - COPD Emergency Assessment Pathway – patient record sheet

References

1. State of the Nation, National Respiratory Audit Programme [NRAP] (2025)
2. BTS/SIGN 158 - Guideline on the Management of Asthma (2019)
3. BTS/NICE/SIGN NG244 Asthma Pathway (2024)
4. BTS Asthma Attack Care Bundle (2023)
5. NICE Guideline 115: Chronic obstructive pulmonary disease in over 16s: diagnosis and management (2018)
6. BTS/ICS Guideline for the Ventilatory Management of Acute Hypercapnic Respiratory Failure in Adults (2016)
7. NCEPOD. Inspiring Change: A review of the quality of care provided to patients receiving acute non-invasive ventilation (2017)
8. BTS COPD Discharge Bundle (2016)

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