NHS
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Clinical Commissioning Group

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COPD and ACO

(Asthma-COPD Overlap)

Guidelines

(Diagnosis and management of diseases of chronic airflow limitation in Bedfordshire and Luton)

Updated December 2019

These guidelines are designed for use across all healthcare settings in Bedfordshire and Luton by any suitably trained healthcare professional.

Contents

Introduction and acknowledgements

These guidelines are intended to assist healthcare professionals diagnose and manage patients with diseases of chronic airflow limitation - Chronic Obstructive Pulmonary Disease (COPD) and Asthma-COPD overlap (ACO) in Bedfordshire. They are intended to support the local implementation of the:

- NICE Clinical Guideline: Chronic obstructive pulmonary disease in Over 16s: diagnosis and management (NG115), issued December 2018 (replaces NICE CG 101), updated July 2019
- NICE Clinical Guideline: Chronic obstructive pulmonary disease (acute exacerbation): antimicrobial prescribing (NG114), issued December 2018
- Diagnosis of Diseases of Chronic Airflow Limitation: Asthma, COPD and ACO. A joint project of GINA and GOLD. Updated 2018
- Global Strategy for Asthma Management and Prevention (GINA) Updated 2018.
- Global Initiative for Chronic Obstructive Lung Disease (GOLD). Global Strategy for Diagnosis, Management and Prevention of COPD. Updated 2019.

The Bedfordshire guidelines on COPD management in adults were first published in June 2013 as a joint initiative between the Bedfordshire and Luton Respiratory Implementation Networks and were ratified by the Bedfordshire and Luton Joint Prescribing Committee (JPC). This 2018 final version was approved by the JPC in February 2016 with amended versions approved in April 2017, March 2018, February 2019 and September 2019.

Since the publication of these Guidelines, there has been new and emerging evidence, the GINA report and several new inhaler therapies introduced for the management of people with COPD. The need for a comprehensive new guideline was discussed and agreed with the Bedfordshire Respiratory Implementation group.

Many thanks to all those who have supported the development of these updated guidelines. We would particularly like to acknowledge comments received during the consultation process through the working group teleconference and Bedfordshire and Luton Joint Prescribing Committee.

We hope you find these helpful in your health care setting. We welcome any comments on the guidelines, please contact us at:

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These guidelines are based on the best available evidence but their application can always be modified by professional judgement.

Preface

COPD is a common preventable and treatable disease that is characterised by persistent respiratory symptoms and airflow limitation that is due to airway and/or alveolar abnormalities usually caused by significant exposure to noxious particles or gases.[9] It is a multi-component disease with systemic consequences and effects on quality of life. Effective management should therefore be based on individualised patient assessment of the severity of disease and co-morbidities, current symptoms, impact on patient's quality of life, risk of exacerbations, hospital admissions and increased risk of death.

A significant proportion of patients who present with symptoms of chronic airways disease have features of both Asthma and COPD, recognition of this overlap of clinical features has been called the Asthma–COPD overlap (ACO) described in the GINA report (2018). Faced with a patient presenting with equal symptoms of Asthma and COPD (essentially ACO) the default management should be Asthma treatment recognising the pivotal role of inhaled corticosteroids (ICS) in preventing mortality and even death in patients with uncontrolled Asthma (GINA 2018). It is important that patients with features of COPD alone should not receive ICS monotherapy.

This comprehensive guideline has been updated to reflect the limitations of FEV in influencing some therapeutic decisions for individualised patient care and highlights the importance of symptoms and exacerbation risk in patients with COPD.[9] Using the breathlessness symptom (MRC score) and history of exacerbations to determine the treatment pathway is in line with GOLD 2019 which uses FEV_1/FVC ratio at the point of diagnosis.

We hope you will find these updated guidelines a useful resource and tool adopting a multi-dimensional assessment and holistic approach to improve the care of people with COPD and ACO.

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How to use the Bedfordshire and Luton COPD and ACO guidelines updated 2019

These guidelines are designed for use across all healthcare settings in Bedfordshire and Luton, by any suitably trained healthcare professional to support the optimal delivery of care and utilisation of services locally. There are three sections to the guidelines:

1. **Diagnosis** of COPD and ACO
2. **Management** of COPD and ACO
3. **Inhaler choices and treatments** for COPD and ACO

A COPD checklist, which may be used as a SystmOne® template, is included in Appendix 1 and the NICE COPD Quality Standards (February 2016) are included in Appendix 2.

Algorithms used in the guidelines

The disease management algorithms are colour coded in line with a traffic light system:

Green	Actions to be undertaken within **primary care**.
Amber	**Consider referral to the Respiratory Team (RT) in Secondary Care w**here GPs are competent in care of exacerbations and appropriate community services, including Respiratory Nurse Specialists, are available these patients may be cared for in primary care.
Red	**Referral to RT** is strongly recommended.
Blue	**Notes**.

These guidelines are available electronically via the BCCG extranet and the GP Ref websites.

Current definition of COPD and clinical description of Asthma-COPD overlap (ACO)

COPD - COPD, a common preventable and treatable disease, that is characterised by persistent respiratory symptoms and airflow limitation that is due to airway and/or alveolar abnormalities usually caused by significant exposure to noxious particles or gases. Exacerbations and comorbidities contribute to the overall severity in individual patients. [GOLD 2019]

Asthma-COPD overlap (ACO*) - ACO is characterised by persistent airflow limitation with several features usually associated with both asthma and COPD. ACO is therefore identified in clinical practice by the features that it shares with both asthma and COPD. This is not a definition, but a description for clinical use as ACO includes several different clinical phonotypes and there are likely to be several different underlying mechanisms. (GINA 2018)

Step 1: Does the patient have chronic airways disease?

Features:

- History of chronic or recurrent cough, sputum production, dyspnoea, or wheezing; repeated acute lower respiratory tract infections or frequent winter bronchitis
- Review and confirm evidence of a previous diagnosis of asthma or COPD.
- History of prior treatment with inhaled medications.
- History of smoking tobacco and/or other substances.
- Exposure to environmental hazards, e.g. occupational or domestic exposures to airborne pollutants.
- Family history of COPD.

Physical examination:

- May be normal. Ask if the patient has experienced any weight loss, reduced exercise tolerance, waking at night with breathlessness, ankle swelling, fatigue, chest pain or haemoptysis. N.B. chest pain and/or haemoptysis is uncommon in COPD and raise the possibility of alternate diagnoses.
- Evidence of hyperinflation and other features of chronic lung disease or respiratory insufficiency.
- Abnormal auscultation (wheeze and/or crackles).
- Document BMI, MRC score and pulse oximetry, CAT score and exacerbation history.

Investigations:

Radiology

- May be normal, particularly in early stages.
- Abnormalities on chest X-ray or CT scan (performed for other reasons such as screening for lung cancer), including hyperinflation, airway wall thickening, air trapping, hyperlucency, bullae or other features of emphysema. N.B. the presence of emphysema on CT scan is an independent risk factor for lung cancer.
- May identify an alternative diagnosis, including bronchiectasis, evidence of lung infections such as tuberculosis, interstitial lung diseases or cardiac failure.

Blood tests

- Full Blood Count (FBC) to identify anaemia or polycythaemia

Further investigations

- See appendix 3b for information on NICE recommendations for additional investigations

Step 2a: Do symptoms suggest chronic airways disease?

YES ← → NO → Consider alternative diagnosis, e.g. bronchiectasis (See Appendix 3)

Use table to distinguish between COPD, Asthma and ACO

1. Assemble the features for asthma and for COPD that best describe the patient.
2. Compare number of features in favour of each diagnosis and select a diagnosis.

Note: These features best distinguish between asthma and COPD. Count the number of check boxes in each column. If 3 or more boxes are checked for either asthma or COPD suggest that diagnosis. If there are a similar number of boxes checked in each column for both asthma and COPD, consider a diagnosis of ACO*. *Refer to 'Think – is this ACO?' section of the guideline.

Feature if present suggests:	Asthma	COPD
Age of onset	☐ Before age 20 years	☐ After age 35 years
Pattern of symptoms	☐ Variation over minutes, hours or days ☐ Worse during the night or early morning ☐ Triggers e.g. exercise, emotions including laughter, dust or exposure to allergens ☐ Variable breathlessness commonly with night time waking	☐ Persistent despite treatment ☐ Good and bad days but always daily symptoms and exertional dyspnoea ☐ Chronic cough & sputum preceded onset of dyspnoea, unrelated to triggers ☐ Persistent and progressive breathlessness not commonly with night time waking
Lung function	☐ Record of variable airflow limitation (spirometry or peak flow)	☐ Record of persistent airflow limitation ($FEV_1/FVC<0.7$ (70%) or below LLN if value available post-bronchodilator spirometry)
Lung function between symptoms	☐ Normal	☐ Abnormal
Past history or family history	☐ Previous doctor diagnosis of asthma ☐ Family history of asthma and other allergic conditions (allergic rhinitis or eczema)	☐ Previous diagnosis of COPD, chronic bronchitis or emphysema ☐ Heavy exposure to risk factor: tobacco smoke, biomass fuels.
Time course	☐ Variation in symptoms either seasonally, or from year to year. ☐ May improve spontaneously or have an immediate response to bronchodilators or to ICS over weeks.	☐ Symptoms slowly worsening over time (progressive course over years) ☐ Rapid-acting bronchodilator treatment provides only limited relief
Chest X-ray (If ≥ 3 weeks history of cough and / or increasing breathlessness.)	☐ Normal	☐ Severe hyperinflation
Total number of features		

Step 2b: Differential diagnosis – Incidental findings on Chest X-rays or CT scans (NICE NG 115)

Consider respiratory review and spirometry (see Step 3b) for people with emphysema or signs of chronic airways disease on a chest X-ray or CT scan.

If the person is a current smoker, their spirometry results are normal and they have no symptoms or signs of respiratory disease:

- offer smoking cessation advice and treatment, and referral to specialist stop smoking services https://www.thestopsmokingservice.co.uk/ (see the NICE guideline on stop smoking interventions and services)
- warn them that they are at higher risk of lung disease
- advise them to return if they develop respiratory symptoms
- be aware that the presence of emphysema on a CT scan is an independent risk factor for lung cancer

If the person is **not** a current smoker, their spirometry is normal and they have no symptoms or signs of respiratory disease:

- ask them if they have a personal or family history of lung or liver disease and consider alternative diagnoses, such as alpha-1 antitrypsin deficiency
- reassure them that their emphysema or chronic airways disease is unlikely to get worse
- advise them to return if they develop respiratory symptoms
- be aware that the presence of emphysema on a CT scan is an independent risk factor for lung cancer

Step 3a: Perform quality assured spirometry to confirm initial diagnosis and disease severity

(Refer to Spirometry Appendix 4a)

For COPD, post bronchodilator spirometry demonstrates

- FEV_1 / FVC <70% or below the lower limit of normal (LLN) if value available
- FEV_1 + FEV_1 / FVC ratio fails to return to normal with drug therapy

Assess severity of airflow obstruction using the table below.

Severity of airflow obstruction

Chronic obstructive pulmonary disease in over 16s: diagnosis and management available at www.nice.org.uk last accessed January 2019

		NICE NG 115 (2018) / GOLD 2019
Post-bronchodilator FEV1/FVC	FEV_1 % predicted	Post-bronchodilator
< 0.7	≥ 80%	Stage 1 / Mild*
< 0.7	50–79%	Stage 2 / Moderate
< 0.7	30–49%	Stage 3 / Severe
< 0.7	< 30%	Stage 4 / Very severe

*Symptoms should be present to diagnose COPD in people with mild airflow obstruction.

Step 3b: Spirometric measures in asthma, COPD and ACO (GINA 2018)

Spirometric variable	Asthma	COPD	ACO
Normal FEV1/FVC pre- or post BD	Compatible with diagnosis	Not compatible with diagnosis	Not compatible with diagnosis
Post-BD FEV1/FVC <0.7	Indicates airflow limitation but may improve spontaneously or on treatment	Required for diagnosis	Usually present
Post-BD FEV1 ≥80% predicted	Compatible with diagnosis (good asthma control or interval between symptoms)	Compatible with GOLD classification of mild airflow limitation if post-BD FEV1/FVC <0.7(70%) or below LLN if value available	Compatible with diagnosis of mild ACO
Post-BD FEV1 <80% predicted	Compatible with diagnosis. Risk factor for asthma exacerbations	An indicator of severity of airflow limitation and risk of future events (e.g. mortality and COPD exacerbations)	An indicator of severity of airflow limitation and risk of future events (e.g. mortality and exacerbations)
Post-BD increase in FEV1 >12% and 200 ml from baseline (reversible airflow limitation)	Usual at some time in course of asthma, but may not be present when well-controlled or on controllers	Common and more likely when FEV1 is low	Common and more likely when FEV1 is low
Post-BD increase in FEV1 >12% and 400ml from baseline (marked reversibility)	High probability of asthma	Unusual in COPD. Consider ACO	Compatible with diagnosis of ACO

Step 3c Think- Is this ACO?

Asthma-COP overlap (ACO*) – a description for clinical use

ACO is characterised by persistent airflow limitation with several features usually associated with asthma and several features usually associated with COPD. ACO is therefore identified in clinical practice by the features that it shares with both asthma and COPD*.

Asthma and COPD may overlap. While a larger bronchodilator response may point to concurrent asthma or asthma-COPD overlap (ACO), a thorough history and further investigations may be needed to confirm this. An FEV_1 increase ≥ 12% and ≥ 200 mL constitutes a positive bronchodilator response. An FEV_1 increase > 400 mL strongly suggests underlying asthma or ACO.

Initial treatment of ACO compared to COPD or Asthma

Features * (Refer to Step 2a)	If 3 or more features of COPD	If 3 or more features of asthma	Features of both asthma and COPD
	Treat as COPD	**Treat as ASTHMA**	**Treat as ACO**
Treatment	COPD drugs. (Refer to Managing COPD- Step 4b)	Asthma drugs. (Refer to Asthma Guidelines)	Treat with ICS and LABA.

Step 4a: Non-pharmacological management of COPD

All COPD Patients:

- Smoking cessation is the single most effective intervention to reduce the risk of developing COPD and slow its progression. Consider this as a treatment and not an option. Refer patient to in-house smoking cessation service, community pharmacy or specialist stop smoking service: Click here to access the local service
- Assess symptoms
- Review degree of airflow limitation using spirometry
- Review quality of life using CAT score (www.catestonline.org)
- Assess risk of exacerbations
- Assess co-morbidities (optimise treatment, refer to NICE NG56 guidance for multimorbidity)
- Refer to Pulmonary Rehabilitation Service:
  - ●For self-reported exercise limitation
  - ●Recent COPD Hospital admission for an acute exacerbation (course to start within 4 weeks of admission)
  - ●Prior COPD Hospital admission
  - ●If MRC Score >2
  - ●Still symptomatic
- Check inhaler technique- At start of treatment and regularly during treatment. Can they use it? Do they use it?
- Check that the patient is able to use and does use current inhaled medications appropriately. Can they use it? Do they use it?
- Refer to community pharmacist for annual Medicines Use Review (MUR) and / or New Medicine Service (NMS) for inhaler technique check and demonstration – *refer to Appendices 7 and 8.
- COPD Self-Management Plan and advice leaflet refer to Appendix 5 and 6
- Supported Self-Care:

-Maintain weight in healthy range (Refer to Nutrition in COPD section-page 34)
-Encourage regular activity (5x30 minutes walking at breathless pace per week)
-Signpost to Support networks, e.g. Local Breathe Easy Groups, BLF website www.blf.org.uk

Step 4b: Initial Pharmacological Management of COPD

Please refer to appendix 2b for locally modified GOLD 2019 management template

Always remember to rule out ACO/Asthma at all stages.

REFER TO SPIROMETRY RESULTS AT POINT OF DIAGNOSIS – confirmation of COPD

For breathlessness or exercise limitation- Offer SABA Salbutamol +/- spacer (Use as required at each stage)

Persistent symptoms - Remains breathless and exacerbates despite optimal non-pharmacological intervention, relevant vaccinations and after being offered smoking cessation (if applicable).Inhaler: can they use it? Do they use it? Provide patient education (see page 25), offer pulmonary rehabilitation referral.

MRC 2 or below, CAT 9 or below

Offer LAMA inhaler*

Braltus® Zonda® (Tiotropium) or
Spiriva Respimat® (Tiotropium)

See page 19 for subsequent treatment choices

Persistent breathlessness or exacerbations

Inhaler: can they use it? Do they use it?

MRC 3 and above, CAT 10 or above

Offer LAMA/LABA combination inhaler

- Spiolto® Respimat® (tiotropium/olodaterol) (1st line)

See page 19 for subsequent treatment choices

If findings suggestive of asthma/steroid responsiveness, variability, blood eosinophil count ≥300 alone or ≥100 with ≥ 2 exacerbations/ 1 hospital admission:

Offer LABA/ICS combination inhaler

- Fostair® 100/6 (MDI +/- spacer or Nexthaler®) or
- DuoResp®Spiromax® or
- Symbicort® Turbohaler or Symbicort® MDI or
- Relvar® Ellipta® (92/22)

Repeated episodes of breathlessness or exacerbations: clinical review required

Inhaler: can they use it? Do they use it?

Does the patient have a rescue pack?

See 'managing and preventing COPD exacerbation' section

Offer triple therapy to patients on ICS+LABA inhaler: if day to day symptoms continue to adversely impact on quality of life or ≥ 2 exacerbations or ≥1 exacerbation requiring hospitalisation within a year. **Consider triple therapy in patients on LABA+LAMA inhaler**: if ≥ 2 exacerbations or ≥1 exacerbation requiring hospitalisation within a year. **Consider a 3 month trial to patients on LABA+LAMA inhaler** if day to day symptoms continue to adversely impact on quality of life. **Triple therapy inhalers: Trimbow®▼ (**87 mcg beclometasone dipropionate/5 mcg formoterol fumarate dehydrate/9 mcg glycopyrronium) **or Trelegy®▼** (92 mcg fluticasone furoate/ 65 mcg umeclidinium bromide/22 mcg vilanterol)
Prophylactic azithromycin is specialist team initiation only.

MRC Dyspnoea scale (NICE NG115)	
1	Not troubled by breathless except on strenuous exercise
2	Short of breath when hurrying on a level or when walking up a slight hill
3	Walks slower than most people on the level, stops after a mile or so, or stops after 15 minutes walking at own pace
4	Stops for breath after walking 100 yards, or after a few minutes on level ground
5	Too breathless to leave the house, or breathless when dressing/undressing

*Consider LABA: Formoterol easyhaler® +/- spacer if allergic to LAMA (GOLD 2019 recommendation)

Choice of inhaler is dependent on optimal device for patient and cost effectiveness - advice via scriptswitch/optimise – see 'second line and third

COPD Assessment Test (CAT) can be accessed via http://www.catestonline.org

Step 4c: Follow up Pharmacological Management of COPD (modified GOLD 2019)

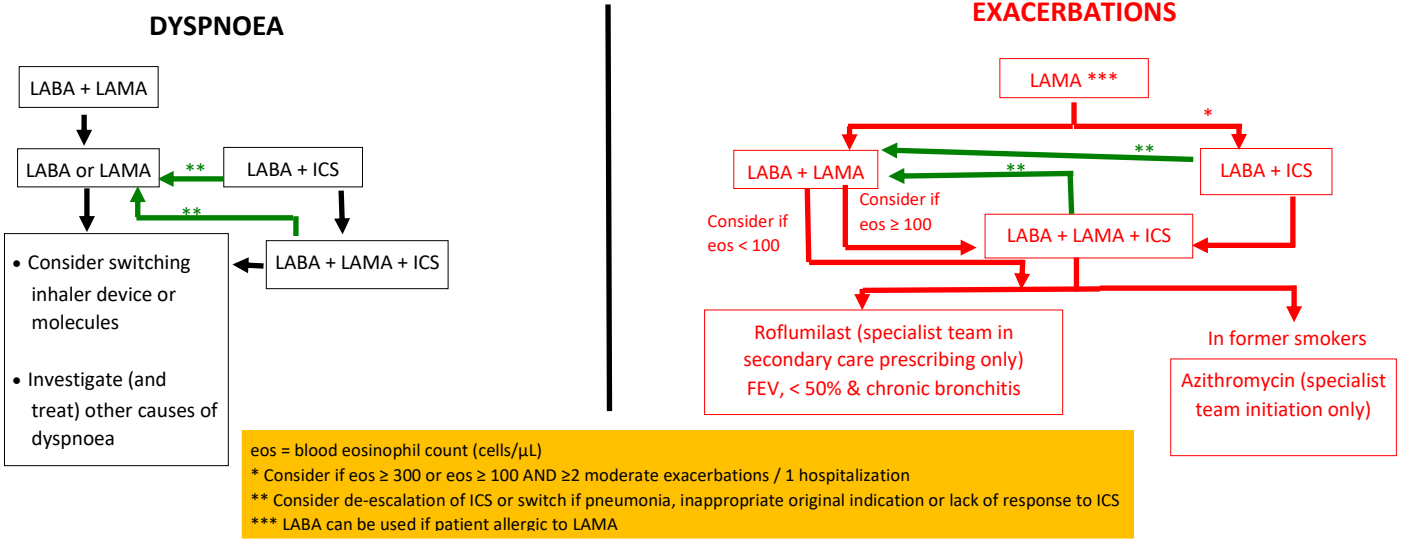
1. **IF RESPONSE TO INTITIAL TREATMENT IS APPROPRIATE, MAINTAIN IT.**

2. **IF NOT:**

√ Consider the predominant treatable trait to target (dyspnoea or exacerbations)
- Use exacerbation pathway if both exacerbations and dyspnoea need to be targeted

√ Place patient in box corresponding to current treatment & follow indications

√ Assess response, adjust and review



eos = blood eosinophil count (cells/µL)
* Consider if eos ≥ 300 or eos ≥ 100 AND ≥2 moderate exacerbations / 1 hospitalization
** Consider de-escalation of ICS or switch if pneumonia, inappropriate original indication or lack of response to ICS
*** LABA can be used if patient allergic to LAMA

Bedfordshire Clinical Commissioning Group and Luton Clinical Commissioning Group

Protocol for the review of Inhaled Corticosteroid (ICS) use in Adults with COPD (updated December 2019)

A prescribing decision aid for use by primary care clinicians and specialist nurses to manage people ≥ 18 years old, currently prescribed a ICS + LABA or LAMA+LABA inhaler (dual therapy) or ICS + LABA inhaler AND a LAMA inhaler (triple therapy)

Step 1: Confirm diagnosis

Does the patient have obstructive spirometry?

NO → Consider if inhaled therapy is clinically required

YES

Step 2: Optimise COPD management

Referral for smoking cessation &/or treatment required? Referral for pulmonary rehabilitation? Physical &/or mental health condition(s) impacting COPD symptoms?

YES

Step 3: Assess for ICS requirement – does the patient fall into the following criteria(s)?

- History or features of asthma/ACO or steroid responsiveness and/or variability — YES
- A large degree of reversibility of airflow limitation (>12% or 400 mL in post-bronchodilator FEV1)* — YES
- Blood eosinophil count ≥ 100 cells/mm³ (0.1 x 10⁹/L) with ≥ 2 exacerbations or ≥1 exacerbation requiring hospitalisation per year — YES
- Blood eosinophil count consistently ≥ 300 cells/mm³ (0.3 x 10⁹/L) — YES

CONTINUE ICS THERAPY

For patients on dual therapy inhaler: check inhaler technique and optimise. If clinically stable, remain on dual therapy and review within 12 months

For patients currently on triple therapy: a (ICS+LABA) inhaler AND a LAMA inhaler who are clinically stable, **provided the steroid dose is equivalent**, switch to a single fixed dose triple therapy inhaler (ICS+LABA+LAMA) trial as per BCCG & LCCG COPD Primary Care Guideline. For ICS dose equivalence refer to SIGN 158 and NICE inhaled corticosteroid doses. Follow up in 2-3 months to check compliance.

If NO to all criteria listed above

Step 4: Step down ICS - switch to a LABA + LAMA inhaler and taper or stop ICS immediately according to dose potency (consider patient preference and clinical need). Options include:

- Spiolto Respimat® (1st Line) 2 puffs once daily
- Duaklir Genuair® (2nd line) 1 puff twice daily
- Anoro Ellipta® (2nd line) 1 puff once daily

Counsel patient and follow up (at least twice a year)

Triple therapy inhaler options:

- Trimbow® 2 puffs twice daily
- OR Trelegy® Ellipta® 1 puff daily

If the patient is clinically unstable on dual therapy, a full clinical review is required.

OFFER triple therapy to patients on ICS+LABA inhaler if day to day symptoms continue to adversely impact on quality of life or ≥ 2 exacerbations or ≥1 exacerbation requiring hospitalisation within a year, To trial effectiveness, consider dual therapy (ICS+LABA) with LAMA inhaler for 3 months prior to single triple therapy inhaler. **Consider triple therapy to patients on LAMA+LABA inhaler** if day to day symptoms continue to adversely impact on quality of life ≥ 2 exacerbations or ≥1 exacerbation requiring hospitalisation within a year. Stop and switch back to LAMA+LABA if no improvement after 3 months.

Patient on low/medium dose ICS + LABA**

ICS can be stopped **immediately**, see **step 5** for monitoring & follow up

Patients on High dose ICS + LABA***

ICS dose must be **tapered/ reduced slowly**, see **step 5** for protocol, monitoring & follow up

Step 5: Remove ICS or switch Patient to lower dose ICS (continue to assess compliance)

Patient on Low/Medium Dose ICS → STOP ICS**

Switch to LABA + LAMA (optimise bronchodilation)

Spiolto Respimat® 2 puffs twice daily (1st Line)

Duaklir Genuair® 1 puff twice daily (2nd line)

Anoro Ellipta® 1 puff daily (2nd line)

High-dose ICS* → TAPER ICS, switch to lower dose ICS in separate inhaler#**

Clenil modulite 100 pMDI, 2 puffs twice daily (unlicensed)

In combination with LABA+LAMA (optimise bronchodilation)

4 weeks

4 weeks

Symptom improvement/ clinically stable?

YES ⇩

Reduce ICS to: Clenil modulite 100 pMDI, 1 puff twice daily

Continue with LABA+LAMA

NO

4 weeks

Patient should be encouraged to contact their monitoring clinician if any worsening of symptoms or condition.

Interim call with patient (approx. 2 weeks) to check compliance and ensure stability.

If symptoms or condition worsen:

- **Consider assessment of pulmonary function using spirometry**
- **Review blood eosinophil count**
- **Review need for additional therapy- including non-pharmacological therapies**
- **Consider referral to respiratory team for review**

Step 6: Consultation with monitoring clinician (continue to assess compliance)

Symptom improvement/ clinically Stable? YES ⇩

Continue with LABA + LAMA

Continue with LABA+LAMA, STOP Clenil Modulite inhaler

NO

6 months

6 months

Reassess for alternate treatment:

- **Acute onset of moderate to severe exacerbations**
- **Worsening of symptoms**
- **Air flow limitation worsening (FEV1 ≥ 100ml loss per year) (NICE NG 115)**
- **Blood eosinophil count > 300 cells/mm^3 (0.3 x 10^9/L)**
- **Full clinical review required**
- **Consider use of a fixed ICS dose combination or consider triple therapy if clinically indicated**

Step 7: Follow-up with monitoring clinician/ community team for full clinical review

- **Review patient at least twice a year during the first year of ICS withdrawal followed by annual reviews if patient's COPD is stable and the patient is 'exacerbation free'.**
- **If patient has ≥2 moderate exacerbations, hospital admission or experiences a deterioration in symptoms, full clinical review required**
- **If ≥ 2 moderate exacerbations or ≥1 exacerbation requiring hospitalisation within a year (ICS+LABA+LAMA therapy may be considered) OR if day-to-day symptoms continue to adversely impact on quality of life, a 3 month trial may be considered. Following clinical review, if symptoms improve continue with ICS+LABA+LAMA. If no symptomatic improvement, and switch back to ICS/LABA for 3 months. If symptoms continue to persist, refer to specialist team.**

*Consider reversibility testing for confirmation of asthma features, FEV1 improves by >12% or 400mL following bronchodilator

Low/medium dose ICS: Fostair® 100/6, 2 puffs BD or 200/6 1 puff BD; DuoResp® Spiromax®160/4.5, 2 puffs BD or 320/9 1 puff BD; Symbicort® 200/6, 2 puffs BD or 400/12 1 puff bd; or Relvar® Ellipta® 92/22, one puff OD * High dose ICS: Fostair® 200/6, 2 puffs BD; DuoResp® Spiromax® 320/9 2 puffs BD; Symbicort® 400/12, 2 puffs BD

For patients whereby compliance is an issue, stepping down ICS dose using dual therapy inhaler therapy (ICS + LABA) e.g. Fostair® 200/6 for 4 weeks tapered to Fostair® 100/6 for 4 weeks then switched LABA + LAMA inhaler can be considered. Adapted from: Primary Care Respiratory Society. Evaluation of appropriateness of ICS Therapy in COPD and Guidance on ICS withdrawal. https://www.pcrs-uk.org/sites/pcrs-uk.org/files/SteppingDownICS_FINAL4.pdf

Bedfordshire and Luton Quick Reference Guide to Stepwise Management of Stable COPD

	Mild	Moderate	Severe	Very Severe
Assess degree of airflow limitation using Spirometry (FEV1 Predicted)	>80%* * must have symptoms	50-79%	30-49%	<30%
Non Pharmacological Interventions				
Assess symptoms	MRC score to assess degree of breathlessness, pulse Oximetry, CAT score to review quality of life.			
Optimise function	Encourage physical activity, review BMI and nutritional state* refer Page, provide education, record history of exacerbations in the last 12 months, self-management plan, and initiate appropriate and regular review, offer NHS health check to eligible patients aged 40-74 years.			
Assess Co-morbidities and treat	Especially cardiovascular diseases, osteoporosis, anxiety and depression, bronchiectasis, lung cancer, skeletal muscle dysfunction, metabolic syndrome.			
	Offer pulmonary rehabilitation to all patients: with MRC score 2 and above, who consider themselves functionally disabled by their condition or breathlessness, recent hospitalisation for exacerbation or significant functional deterioration* Refer page			
Pharmacological Interventions				
Risk Reduction	Check smoking status and offer help to stop at every opportunity, combine pharmacotherapy with appropriate support as part of smoking cessation programme. https://www.thestopsmokingservice.co.uk/			
Inhaler technique and Adherence	At each visit check device usage and technique- Can they use it? Do they use it?			
Short acting reliever Medication	Offer SABA, use as required and may continue at all stages.			
Symptom relief and Exacerbation Prevention and Management	Please refer to Bedfordshire Quick Reference Guide – First line Drug Choices on page 19-22 1) Agree a written self-management plan 2) Prescribe rescue medication *Refer to page 3) Be aware of anxiety and depression, particularly if they have severe breathlessness, hypoxia and/or have been admitted to hospital with an exacerbation. Screen and treat as appropriate as per NICE guidance. 4) Consider trial of mucolytic therapy if chronic productive cough			
Follow-up	12monthly	12monthly	6-12monthly	At least 6 monthly -Consider referral to RT for Oxygen therapy assessment -Involve MDT palliative teams and advanced care planning

Safety Information

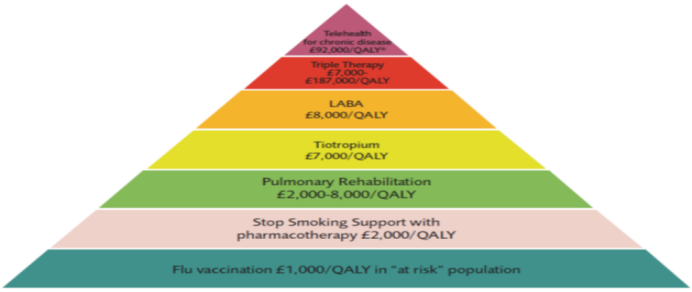
When using tiotropium delivered via Respimat® or HandiHaler® to treat COPD take the risk of cardiovascular side effects into account for patients with conditions that may be affected by the anticholinergic action of tiotropium including: myocardial infarction in the last 6 months; unstable or life threatening cardiac arrhythmia; cardiac arrhythmia requiring intervention or a change in drug therapy in the past year; hospitalisation for heart failure (NYHA Class III or IV) with the past year. https://www.gov.uk/drug-safety-update/tiotropium-delivered-via-respimat-compared-with-handihaler-no-significant-difference-in-mortality-in-tiospir-trial
Monitor patients for diabetes and osteoporosis if on long term high dose steroids. NICE guidance (TA160 and 161) on primary and secondary prevention of osteoporotic fragility fractures may be of relevance. www.nice.org.uk

[3]Referral to the RT is an option if the patient is unresponsive to treatment at any stage in the pathway or uncertain diagnosis, suspected severe COPD, patient requests second opinion, assessment / review for pulmonary rehab, oxygen therapy, nebuliser therapy or oral corticosteroid therapy.

Important inhaled steroid safety information is available in the product patient information leaflet. Refer to www.medicines.org.uk for individual preparations. Discuss the risk of side effects (including pneumonia) and issue a steroid treatment card for:

- People using prolonged high doses (more than 1000 micrograms beclometasone or equivalent of inhaled corticosteroids (including off-label high doses and maximum inhaled doses in conjunction with oral corticosteroids). NHS England Guidance on ICS in Adults
- People taking inhaled corticosteroids plus drugs that inhibit their metabolism (for example cytochrome P450 inhibitors such as HIV protease inhibitors).
- The steroid treatment card provides clear guidance on the precautions to minimise the risks of adverse effects, and provides details of the prescriber, drug, dosage, and the duration of treatment. GP practices and community pharmacists can order supplies of steroid treatment cards using the Primary Care Support England (PCSE) online portal www.pcse.england.nhs.uk

Figure 1 London Respiratory Team COPD Value Pyramid



Triple therapy not normally recommended if LAMA ineffective in previous step as it is associated with a high cost/QALY (£35,000 - £187,000) and therefore should only be used in exceptional cases.

Second and subsequent treatment line COPD drug choices

SABA inhaler
Second Choice:
Terbutaline Turbohaler

LAMA inhaler
Second Choice:
Umeclidinium bromide (Incruse®Ellipta®)▼ OR
Aclidinium bromide (Eklira® Genuair®) ▼

LABA inhaler (if allergic to LAMA)
Second Choice:
Formoterol 12 microgram / dose MDI +/- spacer
Third Choice:
Salmeterol MDI (+/- spacer)

LAMA + LABA combination inhaler
Second choice:
Umeclidinium/vilanterol (Anora®Ellipta®)▼ OR
Aclidinium / formoterol (Duaklir® Genuair®) ▼

LABA + ICS combination inhaler
Consider using alternative first line choice as second/third line option (all four inhaler brands are first line):
Formoterol + Budesonide (Symbicort® Turbohaler 400/12 or MDI 200/6)
Formoterol + Budesonide (DuoResp® Spiromax®)
Formoterol + Beclomethasone + (Fostair® cfc-free inhaler MDI +/- spacer)
Fluticasone + Vilaterol (Relvar® Ellipta®92 /22)

Choice of inhaler is dependent on optimal device for patient and cost effectiveness - advice via scriptswitch/optimise. In addition, NICE NG 115 recommends choice based on drug's potential to reduce exacerbations, their side effects and to minimise the number of inhalers and different types of inhalers used by each person as far as possible.

COPD Inhaler choices and treatments **Can they use it? Do they use it?** = CCG preferred, lower carbon footprint inhaler choice		
SABA inhaler		
1. Salbutamol 100mcg/dose inhaler CFC-free +/- spacer		One or two puffs up to four times daily.
2. Terbutaline dry powder inhaler 500 microgram per inhalation		One inhalation up to four times a day.
2. Salbutamol 100micrograms/dose dry powder inhaler (Easyhaler Salbutamol)		One or two puffs up to four times daily.
LAMA inhaler		
1. Spiriva Respimat® (Tiotropium) 2.5 micrograms per inhalation		Two inhalations once daily.
1. Braltus® Zonda® inhaler (Tiotropium bromide) 16 micrograms inhalation powder, hard capsule		One capsule inhaled once daily.
2. Aclidinium bromide (Eklira Genuair®) 375 micrograms per inhalation▼		One inhalation twice daily.

2.Umeclidinium bromide (Incruse® Ellipta®) 55 micrograms inhalation powder▼		One inhalation once daily
LABA inhaler		
1. Easyhaler formoterol 12 micrograms per puff		One puff inhaled twice daily.
2. Formoterol 12 microgram / dose MDI +/- spacer		One puff inhaled twice daily.
3. Salmeterol 25 micrograms per puff MDI +/- spacer		Two puffs inhaled twice daily.
LAMA+LABA combination inhaler		
1. Tiotropium / olodaterol (Spiolto® Respimat®) 2.5 microgram/2.5 microgram inhalation solution▼		Two puffs inhaled once daily at the same time each day.
2. Umeclidinium/vilanterol (Anoro® Ellipta®) 55 micrograms/ 22 micrograms▼		One inhalation once daily.
2. Aclidinium / formoterol (Duaklir Genuair®) 340 micrograms /12 micrograms inhalation powder▼		One inhalation twice daily.

LABA + ICS combination inhaler		
1. Fostair® 100/6 MDI +/- spacer		Two puffs twice daily.
1. Fostair® NEXThaler® 100/6		Two inhalations twice daily.
1. DuoResp Spiromax® 160/4.5 micrograms and 320/9 micrograms inhalation powder		160 / 4.5 strength - Two inhalations twice daily 320 / 9 strength-One inhalation twice daily.
1. Symbicort® Turbohaler® 400/12 micrograms inhalation powder		One inhalation twice daily.
1. Symbicort® MDI 200/6 micrograms per actuation		Two inhalations twice daily
1. Fluticasone furoate/ vilanterol (Relvar®Ellipta®) 92 micrograms/22 micrograms		One inhalation once a day
LABA+LAMA+ICS combination inhaler		

1. Trimbow® 87 micrograms/5 micrograms/9 micrograms pressurised inhalation, solution (beclomethasone/formoterol/ glycopyrronium)		Two inhalations twice daily
1.Trelegy Ellipta® ▼ 92 micrograms fluticasone furoate, 65 micrograms umeclidinium bromide equivalent to 55 micrograms umeclidinium and 22 micrograms vilanterol (as trifenatate)		One inhalation once a day
Spacers – ***Spacers should be hand washed using warm water and washing up liquid and air dried, not more than monthly interval (NICE NG115)***		
1. Volumatic® spacer	Solid adaptor, only fits specific MDIs, including all Chiesi (Clenil®, Fostair®, Atimos®) and GSK (Ventolin®, Flixotide®, Seretide®, Serevent®)	-Removable mask -Perceivable valve movement
2. A2A spacer®	Universal adaptor (all MDIs)	-Low-static -Anti-microbial -Removable mask -Perceivable valve movement
3. Space Chamber Plus®	Universal adaptor (all MDIs)	-Removable mask -Perceivable valve movement

Managing & Preventing COPD Exacerbations

Check patient has an exacerbation
An exacerbation is 2 of the following 3 criteria:

1. Increased breathlessness
2. Increased sputum volume
3. Increased sputum purulence

Check whether patient has any RED FLAG symptoms
Red Flag Symptoms – suggest same day referral to RT or Emergency Department for symptoms suggestive of type 2 respiratory failure.

RED FLAG Symptoms

- Profound shortness of breath, with increased respiratory rate
- Inability to complete sentence
- Peripheral or central cyanosis
- Drowsy
- Confusion
- Rapid onset of symptoms, Haemoptysis

If patient is having ≥3 exacerbations with increased sputum and chest infections send for HRCT to exclude bronchiectasis

YES

ACUTE SELF MANAGEMENT- Patient to commence home rescue pack; counsel and give patient advice leaflet. Refer to Appendix 6.

PREVENTION OF FUTURE EXACERBATIONS

Steroids
Prednisolone 30mg each morning for 5 days.*

1st Line Antibiotic
Oral amoxicillin 500mg three times daily for 5 -7 days

Optimise treatment
Increase short-acting beta$_2$-agonist for duration of exacerbation e.g. 2-8 puffs up to 4 hourly.

Refer to pulmonary rehabilitation

No improvement after 2-3 days

2nd line antibiotic if sputum still purulent
oral doxycycline 200mg stat and 100mg daily for further 4-6 days or oral clarithromycin 500mg twice daily for 5-7 days
3rd line antibiotic: alternate 2nd line choice or if 2nd choice not susceptible: oral co-amoxiclav 625mg three times daily for 5 to 7 days

Continue Prednisolone 30mg* for up to 7 days

*Based on NICE NG 115 – BTS recommends 40mg dose of prednisolone

- 2 exacerbations in next 12 months after starting above, consider adding mucolytic, especially if chronic productive cough with sputum
- Ensure benefit-review ongoing need / STOP if ineffective.

No improvement / deterioration - Suggest same day referral to secondary care via RT Luton and Dunstable Tel: 07535977268; Bedford Hospital Tel: 01234 730343 Consider admission if outside of RT hours. NB specialist may recommend or initiate prophylactic antibiotics- refer to appendix 5

Education

At diagnosis and at each review appointment, offer people with COPD and their family members or carers (as appropriate):

- written information about their condition
- The British Lung Foundation has a series of patient information leaflets in relation to COPD that can be accessed via https://shop.blf.org.uk/collections/lung-health-information
- opportunities for discussion with a healthcare professional who has experience in caring for people with COPD
- NICE inhaler for asthma Patient Decision Aid can be used to support shared decision making on inhaler therapy

Ensure the information provided is:

- available on an ongoing basis
- relevant to the stage of the person's condition
- tailored to the person's needs.

At minimum, the information should cover:

- an explanation of COPD and its symptoms
- advice on quitting smoking (if relevant) and how this will help with the person's COPD https://www.thestopsmokingservice.co.uk/
- advice on avoiding passive smoke exposure
- managing breathlessness
- physical activity and pulmonary rehabilitation
- medicines, including inhaler technique and the importance of adherence
- vaccinations
- identifying and managing exacerbations
- details of local and national organisations and online resources that can provide more information and support
- how COPD will affect other long-term conditions that are common in people with COPD (for example, hypertension, heart disease, anxiety, depression and musculoskeletal problems)

Be aware of the obligation to provide accessible information as detailed in the NHS Accessible Information Standard. For more guidance on providing information to people and discussing their preferences with them, please refer to the NICE guideline on patient experience in adult services

COPD Self-Management Plan

Please refer to Managing & Preventing COPD Exacerbations within this guideline for further information.

Develop an individualised self-management plan in collaboration with each person with COPD and their family members or carers (as appropriate), and:

- Include education as listed in the education section of this guideline
- Review the plan at future appointments
- Develop an individualised exacerbation action plan in collaboration with each person with COPD who is at risk of exacerbations.

Offer people a short course of oral corticosteroids and a short course of oral antibiotics to keep at home as part of their exacerbation action plan if:

- they have had an exacerbation within the last year, and remain at risk of exacerbations
- they understand and are confident about when and how to take these medicines, and the associated benefits and harms
- they know to tell their healthcare professional when they have used the medicines, and to ask for replacements.

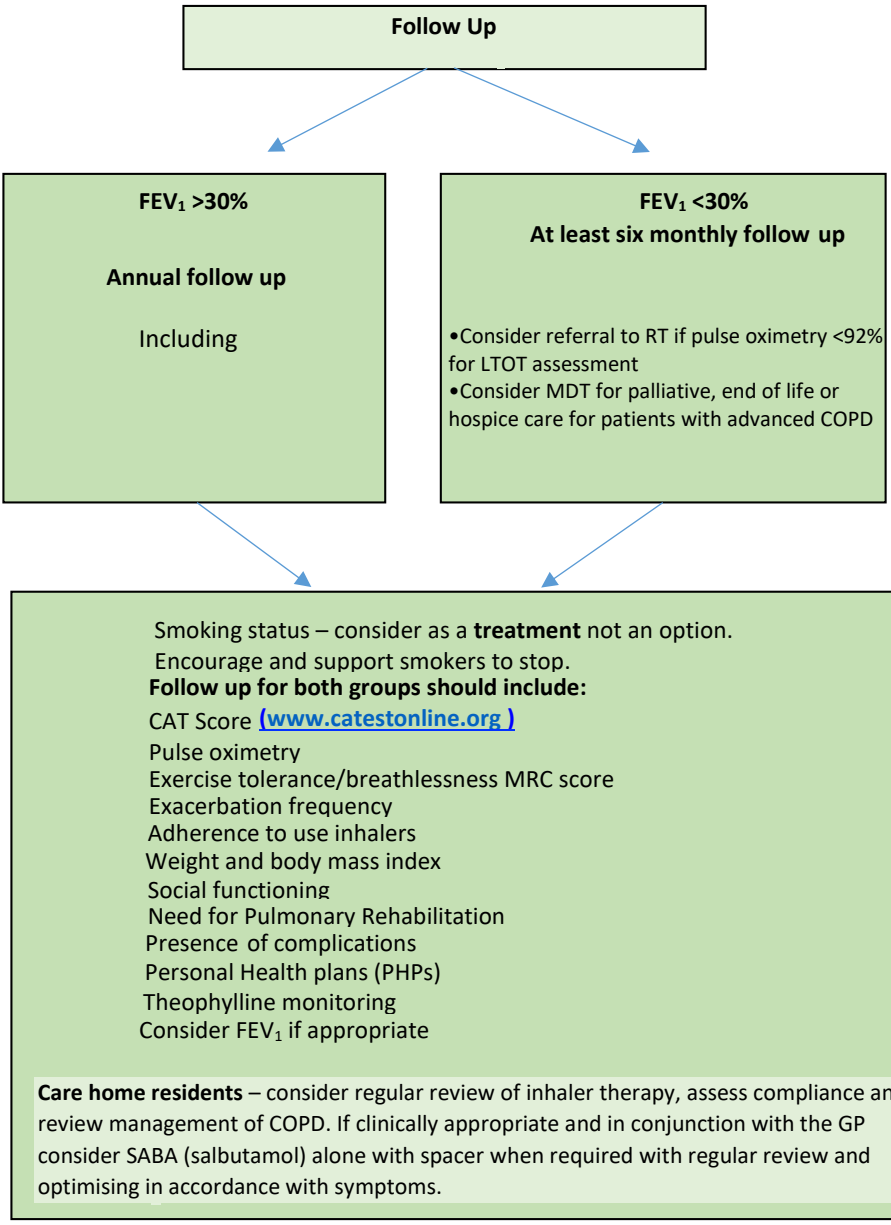
Encourage people with COPD to respond promptly to exacerbation symptoms by following their action plan, which may include:

- adjusting their short-acting bronchodilator therapy to treat their symptoms
- taking a short course of oral corticosteroids if their increased breathlessness interferes with activities of daily living
- adding oral antibiotics if their sputum changes colour and increases in volume or thickness beyond their normal day-to-day variation

Ask people with COPD if they experience breathlessness they find frightening. If they do, consider including a cognitive behavioural component in their self-management plan to help them manage anxiety and cope with breathlessness.

For people at risk of hospitalisation, explain to them and their family members or carers (as appropriate) what to expect if this happens (including non-invasive ventilation and discussions on future treatment preferences, ceilings of care and resuscitation).

Review of COPD Patients



Managing COPD contd.

Offer:

- Annual flu vaccination
- Pneumococcal vaccination-generally required only once in a lifetime

If symptoms still troublesome check compliance, inhaler technique and consider appropriate spacer devices prior to changing current medication:

Trial of **Slow Release Theophylline** (next box)

Consider if inhaled therapy cannot be used or this can be added if the patient is still symptomatic after trials of short acting and long acting bronchodilators. Remember to check adherence before initiating any new/add-on therapy.

If there is no response to the new intervention within 4 weeks **STOP and refer to RT.**

Spacers should be hand washed using warm water and washing up liquid and air dried, not more than monthly interval.

Trial of Slow Release Theophylline (Consider referral to RT)

- Check BNF for drug interactions and monitoring, www.bnf.org.
- Prescribe by brand name, e.g. Uniphyllin®, Phyllocontin Continus®
- In the first week prescribe half standard dose e.g. Uniphyllin 200mg od, stepping to full dose in week 2, e.g. 200mg twice daily.
- Check levels at 2 weeks (take samples ideally at trough level before next dose is due – check with laboratory for best timing of blood samples) and then 4 weekly until in therapeutic range and if:
  - Symptoms of toxicity (see BNF for signs)
  - No improvement (if considering increasing dose)
  - Interactions

Check theophylline levels routinely every 6-12 months or more regularly in elderly people, those with heart failure or liver impairment. Repeat theophylline levels if:

- Person stops smoking
- An enzyme inducing or inhibiting drug is prescribed
- 3 days after a dose adjustment

- Nebulised Therapy
- SBOT/ Ambulatory Oxygen/LTOT

- Second Opinion
- Surgery

Consider anxiolytics

E.g. Diazepam 2mg / Oramorph® 2.5mg PRN

Consider if appropriate referral for Psychological intervention

Consider GSF Palliative Care or discuss at Palliative MDT

Refer to Appendix 1

High Risk indicators for COPD

The following indicators serve as prompts to include patients on the COPD High Risk register/ GSF/Palliative register:

- Very Severe disease-FEV_1 <30%
- Hospitalisation in last 12months for severeexacerbations
- One episode of Non Invasive Ventilati on (NIV)
- ≥ 2 moderate exacerbations in last 12months
- CAT score >10
- >6 weeks of systemic steroids for COPD in preceding 6 months
- MRC score 4 or 5
- DOSE Score >6
- Presence of Co-morbidities
- Signs of right sided heart failure /Cor Pulmonale
- On Long-Term Oxygen Therapy(LTOT)

Non disease specific trigger points

- Frailty and co-morbidities that mean they are expected to die within 12 months or from a sudden acute crisis in their condition.
- Advanced progressive long term incurable conditions.

NICE quality standard on end of life care for adults and guidance on care for people in the last days of life are available via www.nice.org.uk

Multi-component assessment and prognostic tools

The prognosis of patients with COPD is difficult to predict with a 3 year survival still being as high as 50%. Tools have been developed to help assess the respiratory and systemic expressions of COPD, allowing for improved knowledge on categorisation and prognosis in COPD patients. Their use as trigger tool can help identify patients with advanced disease. These include:

- **DOSE Index** - (Dyspnoea, Obstruction, Smoking Exacerbation) (Refer to Appendix 9)

It reflects health status, exercise tolerance, healthcare consumption and respiratory failure through four clinical measures. It provides a more accurate prediction of patient at risk of current and future exacerbations and has a more practical use in primary care.

- **BODE Index** - (Body mass index, airflow Obstruction, Dyspnea and Exercise capacity) (Refer to Appendix 10)

It predicts all-cause mortality and respiratory –related mortality with better accuracy than FEV_1 alone. It more accurately predicts three-year survival. It correlates well with prognosis and health status but its' use in primary care is limited by the requirement for a 6 minute walk test. It is not recommended to assess prognosis in people with stable COPD.

Assessing severity and using prognostic factors (NICE NG115)

From diagnosis onwards, when discussing prognosis and treatment decisions with people with stable COPD, the following factors are individually associated with prognosis:

- Rapid decline in FEV1
- smoking status
- breathlessness (MRC scale)
- chronic hypoxia and/or cor pulmonale
- low BMI
- severity and frequency of exacerbations
- hospital admissions
- symptom burden (for example, COPD Assessment Test [CAT] score)
- exercise capacity (for example, 6-minute walk test)
- TLCO
- whether the person meets the criteria for long-term oxygen therapy and/or home non- invasive ventilation
- multimorbidity
- frailty

Indications for Hospital admission vs management of exacerbations at home (NICE guideline 101)

Factors to consider when deciding where to manage exacerbations

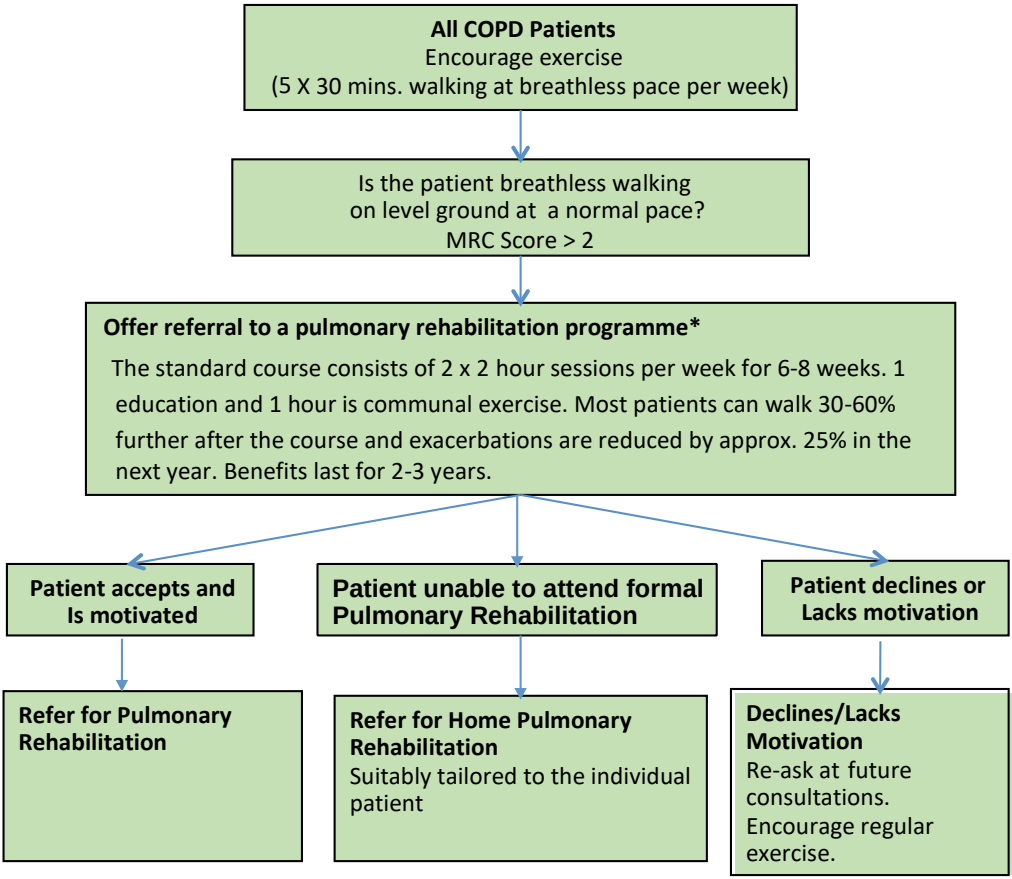
	Treat at home?	Treat in hospital?
Able to cope at home	Yes	No
Breathlessness	Mild	Severe
General condition	Good	Poor / deteriorating
Level of activity	Good	Poor / confined to bed
Cyanosis	No	Yes
Worsening peripheral oedema	No	Yes
Level of consciousness	Normal	Impaired
Already receiving LTOT	No	Yes
Social circumstances	Good	Living alone / not coping
Acute confusion	No	Yes
Rapid rate of onset	No	Yes
Significant comorbidity (particularly cardiac disease and insulin-dependent diabetes)	No	Yes
SaO_2 < 90%	No	Yes
Changes on chest X-ray	No	Present
Arterial pH level	≥ 7.35	< 7.35
Arterial PaO_2	≥ 7 kPa	< 7 kPa

When to Refer to Respiratory Team (RT) for specialist review and investigation

Reason	Purpose of referral
Persistent symptoms and / or exacerbations despite treatment (suspected severe COPD)	Confirm diagnosis and optimise therapy
Symptoms out of proportion to spirometry or inconclusive spirometry (symptoms disproportionate to lung function deficit)	Look for other explanations including cardiac impairment, pulmonary hypertension, depression and hyperventilation
Diagnostic uncertainty (e.g. suspected pulmonary hypertension, bronchiectasis, interstitial pulmonary fibrosis and other causes of respiratory symptoms).	Confirm diagnosis and optimise therapy
Assessment for pulmonary rehabilitation	Identify candidates for pulmonary intervention
Assessment / review for oxygen therapy	Optimise therapy and measure blood gases
Assessment for long term nebuliser therapy	Optimise therapy and exclude inappropriate prescriptions
Assessment for oral corticosteroid therapy	Justify need for continued treatment or supervise withdrawal
Patient with COPD requests second opinion.	Confirm diagnosis and optimise therapy
Patients with co-morbidities that may interfere with assessment and management of their airways disease.	Confirm diagnosis and optimise therapy
A rapid decline in FEV1 (>100ml / year)	Encourage early intervention
Suspected asthma or COPD with less than 3 boxes checked in Step 2 Syndromic Diagnosis or additional symptoms or signs (e.g. haemoptysis, weight loss, night sweats, fever, frequent infection, signs of bronchiectasis or other structural lung disease, dysfunctional breathing).	Confirm diagnosis, optimise pharmacotherapy and access other therapists Frequent infections – exclude bronchiectasis Haemoptysis – exclude Lung carcinoma

Age under 35, or family history of alpha1-antitrypsin deficiency	Identify alpha-1 antitrypsin deficiency, consider therapy and screen family
Suspected respiratory failure- symptoms such as profound shortness of breath, inability to complete sentences, peripheral or central cyanosis, increasing drowsiness, confusion, worsening peripheral oedema	Confirm diagnosis and optimise therapy
Bullous lung disease – refer to NICE NG115 for more information	Identify candidates for lung volume reduction procedures
Onset of Cor Pulmonale (ankle oedema, left parasternal heave, tricuspid regurgitation)	Confirm diagnosis and optimise therapy
Assessment for lung transplant / lung volume reduction/ TLCO – refer to NICE NG115 for more information	Identify candidates for surgical or bronchoscopic lung volume reduction or lung transplantation
Hyperinflation, assessed by lung function testing and emphysema on unenhanced CT chest scan and optimised treatment for other comorbidities	Confirm diagnosis and optimise therapy

Pulmonary Rehabilitation



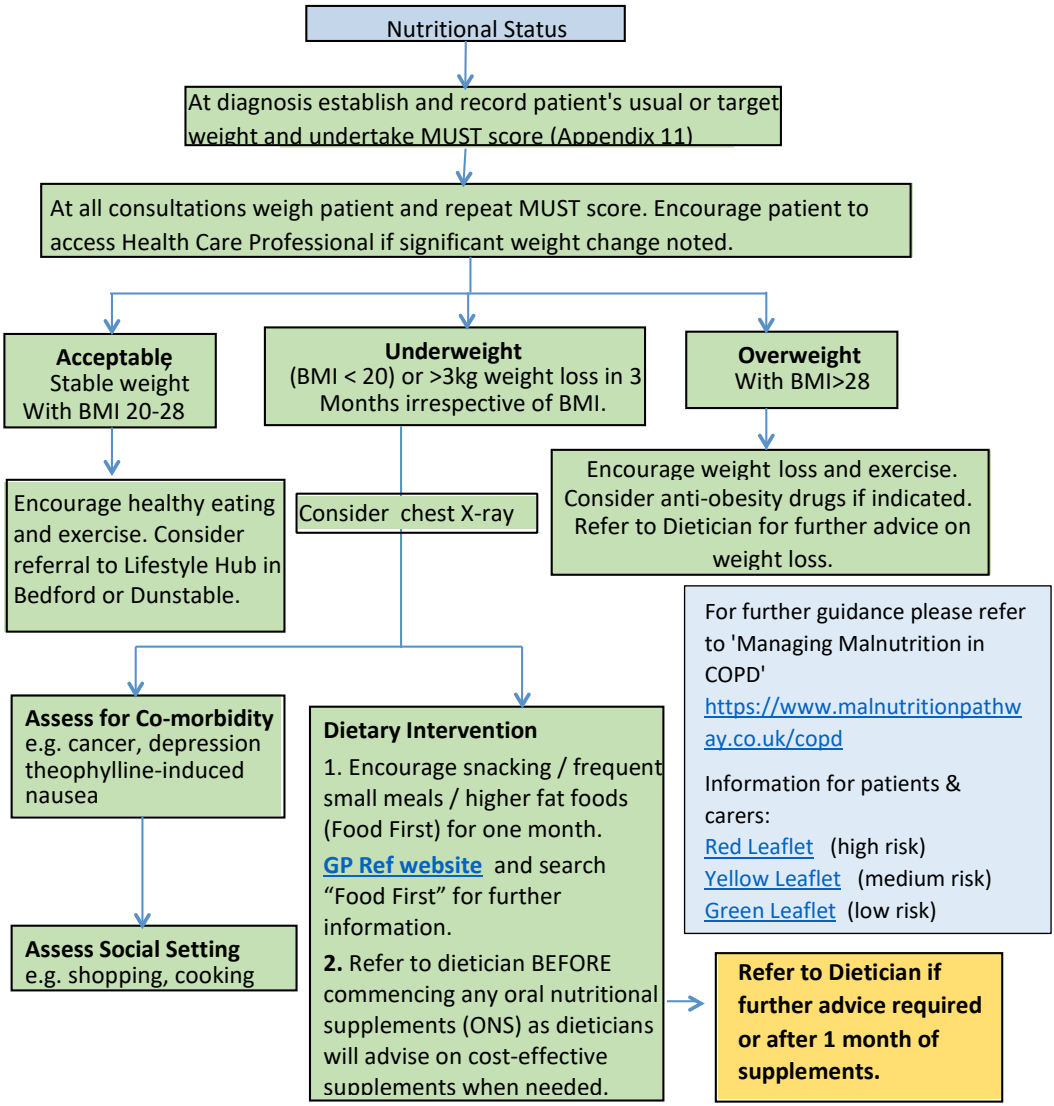
Wheelchairs and stair-lifts should be recommended with caution as they decrease exercise. An Occupational Therapy referral could be considered to assess patient needs.

If people have excess sputum they should be taught by the physiotherapist how to use positive expiratory devices and active cycle of breathing techniques.

Prn oxygen should generally not be prescribed and should only be issued with secondary care advice. Co habitants of people on oxygen therapy who smoke should be offered smoking cessation and referral to specialist stop smoking services

*Complete local referral proforma.

Nutrition in COPD



Oxygen Therapy

SpO_2<92% at rest
SpO_2<90% on exertion

↓

Optimise inhaler/respiratory medication. Ensure clinically stable.

↓

If SpO_2 remains <92% at rest or <90% on exertion

↓

Refer to RT (Home Oxygen Service) for LTOT or Ambulatory Oxygen Assessment

LTOT criteria: PaO_2 **<7.3kPa** when stable **or <7.3kPa** or **<8kPa** with signs of Cor Pulmonale, peripheral oedema, pulmonary hypotension or Polycythaemia on 2 occasions when clinically stable for minimum of 4 weeks. Ambulatory Oxygen Criteria: SpO_2 <90% on exertion.

↓

Requires Long-Term Oxygen Therapy

- LTOT assessment (including structured risk assessment) will be undertaken within 4 weeks of referral.
- The RNS will perform capillary blood gas sampling, interpret blood gas results and initiate oxygen therapy in line with above criteria/BTS guidelines.
- Duration of LTOT is a minimum 15hrs in a 24hr period including night time use.
- The flow rate of oxygen will be determined during the LTOT assessment and appropriate delivery system/ modality of oxygen discussed with the patient and prescribed by the RNS. All oxygen therapy will be provided by the approved oxygen provider e.g. British Oxygen Company (BOC) or Dolby Vivisol.
- All LTOT patients will be assessed for the provision of portable/ambulatory oxygen therapy and prescribed where appropriate.
- Patients not meeting the criteria for LTOT but who are active and desaturate (drop their $Sp0_2$) <90% on exertion will be assessed for ambulatory oxygen therapy.
- All patients prescribed LTOT and ambulatory oxygen therapy will be routinely reviewed at 4 week home visit followed by 3 months, 6 months than annually by the RNS with monitoring of $Sp0_2$ and annual blood gas analysis but more frequent reviews will be arranged if clinically indicated.

Oxygen Therapy Assessment For flying

$SpO_2$92-94%

Wants to fly this year
Refer to secondary care for flight assessment.

Does not want to fly this year.
No action required

SpO_2> 95%

Fit to fly in next year
No action required

Oxygen therapy (continued)

The structured risk assessment for people being assessed for long-term oxygen therapy who meet the criteria should take the following factors into consideration:

- the risks of falls from tripping over the equipment
- the risks of burns and fires, and the increased risk of these for people who live in homes where someone smokes (including e-cigarettes).Base the decision on whether long-term oxygen therapy is suitable on the results of the structured risk assessment.

For people who smoke or live with people who smoke, but who meet the other criteria for long-term oxygen therapy, ensure the person who smokes is offered smoking cessation advice and treatment, and referral to specialist stop smoking services https://www.thestopsmokingservice.co.uk/ (see the NICE guidelines on stop smoking interventions and services and medicines optimisation).

NICE NG 115 states 'Do not offer long-term oxygen therapy to people who continue to smoke despite being offered smoking cessation advice and treatment, and referral to specialist stop smoking services' Although on all BOC literature it is advised for patients NOT to smoke whilst prescribed oxygen therapy, the 20 minute rule is recognised. Patient must remove and turn off the oxygen 20 minutes before going outside to smoke. This allows the clothing to be less oxygen rich and lessens the risk of burns / fire. Provide BOC safety leaflet Dangers of smoking whilst on oxygen therapy. Notify BOC to ensure they are placed on the register 0800 136603

Advise people who are having long-term oxygen therapy that they should breathe supplemental oxygen for a minimum of 15 hours per day.

Do not offer long-term oxygen therapy to treat isolated nocturnal hypoxaemia caused by COPD

Ambulatory oxygen therapy

- Do not offer ambulatory oxygen to manage breathlessness in people with COPD who have mild or no hypoxaemia at rest.
- Consider ambulatory oxygen in people with COPD who have exercise desaturation and are shown to have an improvement in exercise capacity with oxygen and have the motivation to use oxygen

Short burst oxygen therapy

- Do not offer short burst oxygen therapy to manage breathlessness in people with COPD who have mild or no hypoxaemia at rest

Wellbeing Services for patients with COPD

For patients whom may require psychological support with the management of their long term conditions, the following local services are available through self-referral, carer referral or GP referral:

For any queries or referrals for COPD clients registered with a Bedfordshire GP. Please contact Bedfordshire Wellbeing Service:

Sarah Massey
Team Leader & LTC Therapies Coordinator | East London NHS Foundation Trust
Bedfordshire Wellbeing Service
Whichellos Warf | The Elms | Stoke Road
Leighton Buzzard | LU7 2TD
Tel: 01525 638300 | Mobile: 07584 886939
| Email: sarah.massey10@nhs.net
Tuesday-Friday

For Luton clients, please refer to the Total Wellbeing service:

Wikas Nortje
Long Term Conditions Lead
Total Wellbeing: Phone: 0300 555 4152
Email: info@totalwellbeingluton.org

Glossary

ACO	Asthma-COPD overlap
ARAS	Acute Respiratory Assessment Service
BLF	British Lung Foundation
BMI	Body Mass Index
BNF	British National Formulary
BODE	Body-mass index, airflow Obstruction, Dyspnoea, and Exercise
BTS/SIGN	British Thoracic Society / Scottish Intercollegiate Guidelines Network
CAT Score	COPD Assessment Test
CCG	Clinical Commissioning Group
CFC	Chlorofluorocarbon
CG	Clinical Guideline
COPD	Chronic Obstructive Pulmonary Disease
Cor Pulmonale	Failure of the right ventricle due to disease of the lungs
DOSE Index	Dyspnoea, Obstruction, Smoking, Exacerbation
FEV_1	Forced expiratory volume in 1 second
FVC	Forced Vital Capacity
GINA	Global Initiative for Asthma
GOLD	Global Initiative for Chronic Obstructive Lung Disease (GOLD)
GSF	GOLD Standard Framework
Haemoptysis	Coughing blood
ICS	Inhaled corticosteroid
JPC	Bedfordshire and Luton Joint Prescribing Committee
LABA	Long-acting $beta_2$ agonist
LAMA	Long-acting muscarinic antagonist
LLN	Lower limit of normal
MDI	Metered dose inhaler
MDT	Multi-Disciplinary Team
MRC	Medical Research Council
NICE	National Institute for Health and Care Excellence
NIV	Non-invasive ventilation
OCS	Oral Corticosteroids
PEF	Peak Expiratory Flow
PRN	Medication to be taken as required
QALY	Quality Adjusted Life Year
QS	Quality Standards
RNS	Respiratory Nurse Specialist
RT	Respiratory Team
SABA	Short-acting $beta_2$ agonist
SAMA	Short-acting muscarinic agent
$Sp0_2$	Blood oxygen saturation level

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6. Global Initiative for Chronic Obstructive Lung Disease (GOLD). Global Strategy for Diagnosis, Management and Prevention of COPD 2019 Report. Available at: http://goldcopd.org/gold-reports/
7. Global Strategy for Asthma Management and Prevention (2018 Update). Available at: http://ginasthma.org/2018-gina-report-global-strategy-for-asthma-management-and-prevention/

Appendix 1: COPD Checklist[8]

At initial review to confirm the diagnosis:

- ☐ Take a full history particularly focusing on respiratory aspects:
  - Shortness of breath
  - Cough
  - Sputum
  - Reduced exercise tolerance
- ☐ Document smoking status and willingness to quit if still smoking, offer pharmacotherapy and behavioural support. https://www.thestopsmokingservice.co.uk/
- ☐ Check all medication
- ☐ Confirm patient has proof of diagnostic quality assured spirometry in medical records otherwise perform spirometry according to protocol and interpret results.
- ☐ Relevant examination including:
  - Finger clubbing
  - Chest examination
  - Pulse
  - Respiratory rate

If the diagnosis is confirmed include the following:

- ☐ MRC dyspnoea score and offer referral to pulmonary rehabilitation if >2
- ☐ COPD Assessment Test (CAT) http://www.catestonline.org/
- ☐ Screen for Depression/Anxiety
- ☐ Chest X-ray as a baseline for all newly diagnosed patients
- ☐ Full blood count (FBC)
- ☐ BMI
- ☐ Pulse oximetry. If this is 92% or more at rest oxygen is not required but you might want to advise on techniques for coping with breathlessness.

Management of COPD

- ☐ Check smoking history and offer appropriate pharmacotherapy and behavioural support.

- ☐ Management of COPD according to BCCG guidelines (discuss with patient as appropriate).
- ☐ If prescribing inhalers ensure the person has been trained on how to use the device, check technique and understanding.
- ☐ Offer referral for Pulmonary Rehabilitation if appropriate, encourage regular activity to all COPD patients.
- ☐ Check for high risk indicators and add to high risk register if appropriate.
- ☐ Discuss Personal Health Plan
- ☐ A written self-management plan – to include:
    - Recognition and management of exacerbations
    - An action plan (Patient advice leaflet – Refer Appendix 6 (BCCG COPD guidelines)
    - Self-care including signposting to self-help groups such as Breathe Easy and support networks such as BLF website
- ☐ Advice about influenza and pneumococcal vaccination.
- ☐ Offer the patient an opportunity to ask any questions.
- ☐ All patients should be offered an annual review but patients with more severe disease follow up should be offered six monthly or more frequently if they have worsening symptoms.
- ☐ Consider Palliative or End of life care and MDT support if appropriate.

At each Review-document the following:

- ☐ Smoking history and offer appropriate support
- ☐ Breathlessness and exercise tolerance:
    - How far can they walk?
    - Can they walk on an incline?
    - Can they climb stairs?
    - MRC 2 and above or considering themselves disabled refer for pulmonary rehabilitation
- ☐ Repeat CAT score to quantify the impact of COPD on the patient's health (www.catestonline.org).
- ☐ Sputum production
    - Colour
    - Thick or easy to expectorate

- Volume or excessive quantity

- Frequency of exacerbations. Consider issue of rescue medication on if appropraite (2 or more previous exarcebation or previous hospital admission)
- Ask about courses of antibiotics and/or oral steroids since last assessment.
- Document any hospital admissions and discuss
- Check for complications – e.g. Cor Pulmonale. Is there any ankle swelling?
- Look for signs of anxiety and depression and ask the depression questions.
- Ask about and document the presence of other co-morbidities i.e. diabetes, heart failure, osteoporosis.
- Check concordance, discuss the effects of drug treatment, and discontinue treatments with no objective benefit.
- Check Inhaler technique at every review and provide education where appropriate.
- Do pulse oximetry. If saturations are below 92% at rest refer for long-term oxygen therapy (LTOT).
- If on frequent steroids think about the need for osteoporosis prevention.
- Assess nutritional status and check BMI.
- Spirometry if there is rapid deterioration requiring more frequent monitoring.

Consider as appropriate referral to:

- Smoking cessation services
- Pulmonary rehabilitation
- Respiratory physiotherapy
- Occupational therapy
- Respiratory Team (RT)
- Social services (help at home, benefits etc.)
- Dietician for weight management advice to those with BMI<20kg/m^2 and not responding to “Food First” and >28kg/m^2.

Appendix 2a: NICE COPD Quality Standards (QS10) Feb 2016

List of quality statements

Statement 1. People aged over 35 years who present with a risk factor and one or more symptoms of chronic obstructive pulmonary disease (COPD) have post-bronchodilator spirometry. [2011, updated 2016]

Statement 2. People with COPD who are prescribed an inhaler have their inhaler technique assessed when starting treatment and then regularly during treatment. [2011, updated 2016]

Statement 3. People with stable COPD and a persistent resting stable oxygen saturation level of 92% or less have their arterial blood gases measured to assess whether they need long-term oxygen therapy. [2011, updated 2016]

Statement 4. People with stable COPD and exercise limitation due to breathlessness are referred to a pulmonary rehabilitation programme. [2011, updated 2016]

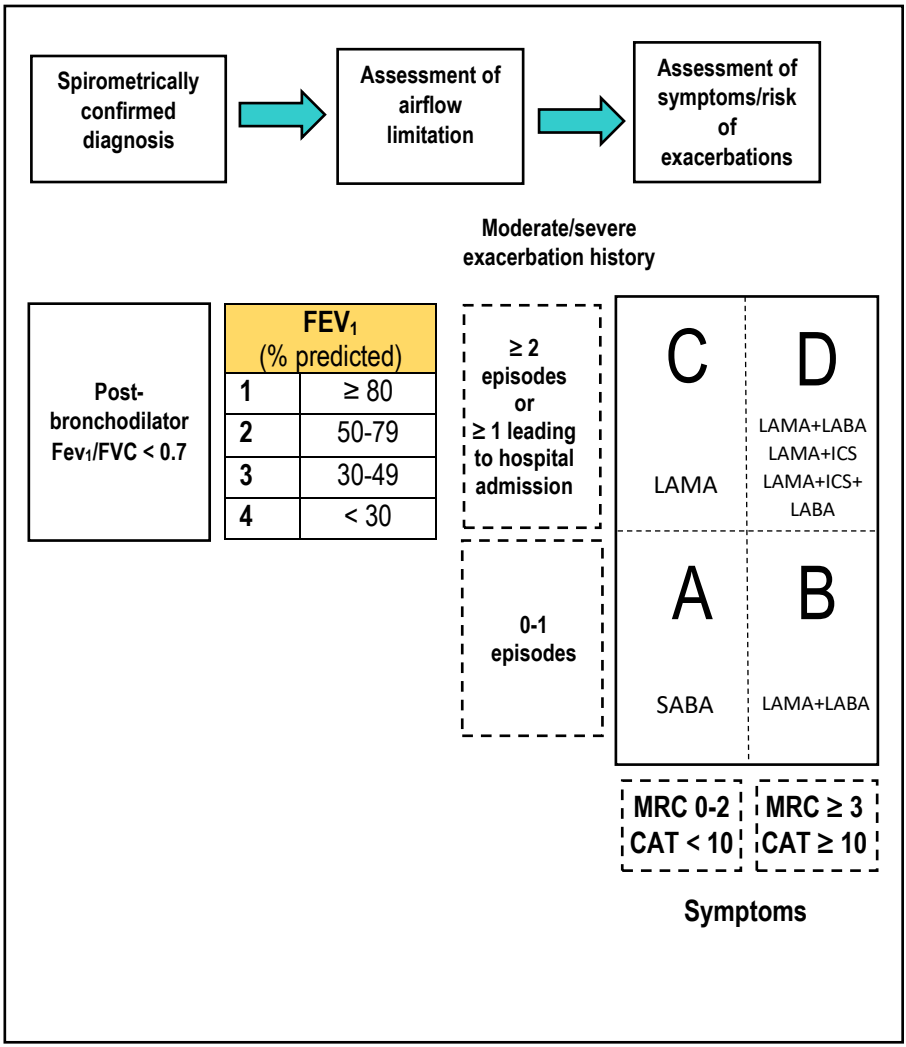
Statement 5. People admitted to hospital for an acute exacerbation of COPD start a pulmonary rehabilitation programme within 4 weeks of discharge. [2011, updated 2016]

Statement 6. People receiving emergency oxygen for an acute exacerbation of COPD have oxygen saturation levels maintained between 88% and 92%. [updated 2016]

Statement 7. People with an acute exacerbation of COPD and persistent acidotic hypercapnic ventilatory failure that is not improving after 1 hour of optimal medical therapy have non-invasive ventilation. [2011, updated 2016]

Statement 8. (Placeholder – Guidance still needs to be produced) Hospital discharge care bundle. [updated2016]

Appendix 2b: Locally modified GOLD 2019 pharmacological management template



Appendix 3a: COPD and its Differential Diagnosis (GOLD 2019)

Diagnosis	Suggestive Features
COPD	• Onset in mid-life. • Symptoms slowly progressive. • History of tobacco smoking or exposure to other types of smoke.
Asthma	• Onset early in life (often childhood). • Symptoms vary widely from day to day. • Symptoms worse at night / early morning. • Allergy, rhinitis, and/or eczema also present. • Family history of asthma. • Obesity coexistence
Congestive Heart Failure	• Chest x-ray shows dilated heart, pulmonary oedema. • Pulmonary function tests indicate volume restriction, not airflow limitation.
Bronchiectasis	• Large volumes of purulent sputum. • Commonly associated with bacterial infection. • Chest x-ray / CT shows bronchial dilation, bronchial wall thickening.
Tuberculosis	• Onset all ages. • Chest X-ray shows lung infiltrate. • Microbiological confirmation. • High local prevalence of tuberculosis.
Obliterative Bronchiolitis	• Onset at younger age, non-smokers. • May have history of rheumatoid arthritis or acute fume exposure. • Seen after lung or bone marrow transplantation. • CT on expiration shows hypodense areas.
Diffuse panbronchiolitis	• Predominantly seen in patients of Asian descent. • Most patients are male and non-smokers. • Almost all have chronic sinusitis • Chest X-ray and HRCT show diffuse small centrilobular nodular opacities and hyperinflation.
These features tend to be characteristic of the respective disease, but are not mandatory. For example, a person who has never smoked may develop COPD (especially in the developing world where other risk factors may be more important than cigarette smoking); asthma may develop in adult and even in elderly patients. Consider primary care respiratory review and spirometry for people with emphysema or signs of chronic airway disease on a chest X-ray or CT scan.	

Appendix 3b: Additional Investigations (NICE NG115)

Investigation	Role
Sputum culture	To identify organisms if sputum is persistently present and purulent
Serial home peak flow measurements	To exclude asthma if diagnostic doubt remains
Electrocardiogram (ECG) and serum natriuretic peptides	To assess cardiac status if cardiac disease or pulmonary hypertension are suspected because of: • A history of cardiovascular disease, hypertension or hypoxia or • Clinical signs such as tachycardia, oedema, cyanosis or features or cor pulmonale Please refer to the NICE guideline NG106 on chronic heart failure in adults for recommendations on using serum natriuretic peptides to diagnose heart failure
Echocardiogram	To assess cardiac status if cardiac disease or pulmonary hypertension are suspected
CT scan of the thorax	To investigate symptoms that seem disproportionate to the spirometric impairment To investigate signs that may suggest another lung diagnosis (such as fibrosis or bronchiectasis) To investigate abnormalities seen on a chest X-ray To assess suitability for lung volume reduction procedures - secondary care role – refer to NICE NG115
Serum alpha-1-antitrypsin	To assess for alpha-1 antitrypsin deficiency if early onset, minimal smoking history or family history. Offer people with alpha-1 antitrypsin deficiency a referral to a specialist centre to discuss how to manage their condition.
Transfer factor for carbon monoxide (TLCO)	To investigate symptoms that seem disproportionate to the spirometric impairment To assess suitability for lung volume reduction procedures

Appendix 4a: Spirometry (GOLD 2018)

Spirometry is essential for the assessment of patients with suspected chronic disease of the airways. It must be performed at either the initial or a subsequent visit. Spirometry confirms chronic airflow limitation but is of more limited value in distinguishing between asthma with fixed airflow obstruction, COPD and ACOS. Whereas spirometry was previously used to support a diagnosis of COPD, full diagnostic quality assured spirometry is now required to make a confident diagnosis of COPD. Spirometry is the most reproducible and objective measurement of airflow limitation available. A spirometer with real time read out volume is crucial in determining true from spurious values. Hand held micro spirometry is recommended for follow-up and monitoring, case finding but not for diagnostic purposes. Peak expiratory flow measurement alone cannot be reliably used as the only diagnostic test, despite its good sensitivity, because of its weak specificity.

Considerations in Performing Spirometry (GOLD 2018)

Preparation

- Spirometers need calibration on a regular basis.
- Spirometers should produce hard copy or have a digital display of the expiratory curve to permit detection of technical errors or have an automatic prompt to identify an unsatisfactory test and the reason for it.
- The supervisor of the test needs training in its effective performance.
- Maximal patient effort in performing the test is required to avoid underestimation of values and hence errors in diagnosis and management.

Bronchodilation

- Possible dosage protocols are 400 mcg beta$_2$-agonist, 160 mcg anticholinergic, or the two combined. FEV_1 should be measured at least 10-15 minutes after a short-acting beta$_2$-agonist is given
- Spirometry should be performed using techniques that meet published standards[1,2,3].
- The expiratory volume/time traces should be smooth and free from irregularities.
- The recording should go on long enough for a volume plateau to be reached, which may take more than 15 seconds in severe disease.

- Both FVC and FEV_1 should be the largest value obtained from any of 3 technically satisfactory curves and the FVC and FEV_1 values in these three curves should vary by no more than 5% or 150 ml, whichever is greater.
- The FEV_1/FVC ratio should be taken from the technically acceptable curve with the largest sum of FVC and FEV_1.

Evaluation

- Spirometry measurements are evaluated by comparison of the results with appropriate reference values based on age, height, sex, and race.
- The presence of a post bronchodilator $FEV_1/FVC < 0.70$ confirms the presence of airflow limitation.

Appendix 4b: Reversibility testing (NICE NG 115)

For most people, routine spirometric reversibility testing is not necessary as part of the diagnostic process or to plan initial therapy with bronchodilators or corticosteroids. It may be unhelpful or misleading because:

- repeated FEV1 measurements can show small spontaneous fluctuations
- the results of a reversibility test performed on different occasions can be inconsistent and not reproducible
- over-reliance on a single reversibility test may be misleading unless the change in FEV1 is greater than 400 ml
- the definition of the magnitude of a significant change is purely arbitrary
- response to long-term therapy is not predicted by acute reversibility testing

Untreated COPD and asthma are frequently distinguishable on the basis of history (and examination) in people presenting for the first time. Whenever possible, use features from the history and examination (such as those listed in table 3) to differentiate COPD from asthma. For more information on diagnosing asthma, refer to the local BCCG and LCCG guideline for the management of asthma in primary care.

Appendix 5: Oral prophylactic antibiotic therapy

Specialist initiation only

Consider azithromycin (usually 250 mg orally 3 times a week, *off label*) for people with COPD if they:

- Do not smoke **and**
- Have optimised non-pharmacological management and inhaled therapies, relevant vaccinations and (if appropriate) have been referred for pulmonary rehabilitation **and**
- Continue to have **one or more of the following**, particularly if they have significant daily sputum production:
  - Frequent (typically 4 or more per year) exacerbations with sputum production
  - Prolonged exacerbations with sputum production
  - Exacerbations resulting in hospitalisation

Before offering prophylactic antibiotics, ensure that the person has had:

- Sputum culture and sensitivity (including tuberculosis culture), to identify other possible causes of persistent or recurrent infection that may need specific treatment (for example, antibiotic-resistant organisms, atypical mycobacteria or *Pseudomonas aeruginosa*)

  Training in airway clearance techniques to optimise sputum clearance & a CT scan of the thorax to rule out bronchiectasis and other lung pathologies

Before starting azithromycin, ensure the person has had:

- An electrocardiogram (ECG) to rule out prolonged QT interval
- Baseline liver function tests

When prescribing azithromycin:

- Advise people about the small risk of hearing loss and tinnitus, and tell them to contact a healthcare professional if this occurs.
- Review prophylactic azithromycin after the first 3 months, then at least every 6 months. Only continue treatment if the continued benefits outweigh the risks.
- There are no long-term studies on the use of prophylactic antibiotics in people with COPD
- For people who are taking prophylactic azithromycin and are still at risk of exacerbations, provide a non-macrolide antibiotic to keep at home as part of their exacerbation action plan

  It is not necessary to stop prophylactic azithromycin during an acute exacerbation of COPD.

Appendix 6: PATIENT ADVICE LEAFLET

What to do if you have a flare up (exacerbation) of your COPD

You are having a flare if you have **two** of the following three signs:

1. Are much more breathless than usual
2. Have an increase in the amount of sputum
3. Have a change in colour of sputum

Contact your GP or your practice nurse or community matron.

Start taking your standby supply of steroids and / or antibiotics.

•**Steroids (prednisolone)** if you are much more breathless than normal, and your daily living activities are affected, continue with increased reliever medication and start taking **prednisolone**.

Dose of prednisolone- Six tablets (30mg) once a day (taken in the morning) for _____ days.

•**Antibiotics** If the colour of your sputum changes from your normal colour start your antibiotics.

Preparation: _____

Dose: _____

If you experience a flare up of COPD, and start prednisolone and / or antibiotics, ALWAYS advise your GP or practice nurse or community matron within 3 days of starting your standby medication.

For further support, you can contact your local Breathe Easy group for support www.blf.org.uk/BreatheEasy/Detail/Bedford

British Lung Foundation Direct Helpline 03000 030 555 or www.blf.org.uk

Appendix 7: How to get extra help with inhaler training and assessment- The Community Pharmacy New Medicine Service (NMS) and Medicine Use Reviews (MURs)

Healthcare professionals in primary and secondary care can refer patients to their local community pharmacist when they prescribe a new inhaler or where they consider a patient would benefit from further support in using their existing inhalers. Community pharmacists provide patients prescribed inhalers either a New Medicine Service (NMS) or Medicines Use Review (MUR).

The New Medicine Service is a free to use NHS service provided by community pharmacists and aims to help patients get the most out of their medicines when they are first prescribed. The community pharmacist asks the patient if they would consent to use the service and then provides an explanation of what the medicine is for and how the inhaler is used correctly. Patients can also ask any questions about their new inhaler. The NMS also includes patients commenced on a new inhaler whilst in hospital. Community pharmacists can provide NMS post discharge from hospital.

The Medicine Use Review (MUR) service is for patients who are already prescribed inhalers. The MUR service is also a free to use NHS service and patients are asked to consent to have the service. The MUR aims to improve patient knowledge, adherence and use of their medicines by:

- Establishing the patient's actual use, understanding and experience of taking their medicines
- Identifying, discussing and resolving poor or ineffective use of their medicines
- Identifying side effects and drug interactions that may affect adherence
- Improving the clinical and cost effectiveness of prescribed medicines and reducing medicine wastage.

Data from Bedfordshire community pharmacies indicate that the NMS and MUR services are currently underutilised. In particular, referral post discharge from hospital NMS is particularly low.

A patient information leaflet on the NMS is provided in Appendix 7. A booklet for patients explaining the MUR service is available at: http://psnc.org.uk/wp-content/uploads/2013/07/mur_booklet.pdf

Appendix 8: New Medicine Service: Helping you with your new medicine Patient Information Leaflet

What this leaflet is for?
If you have been invited to use the New Medicine Service (NMS) or want to know more about it then this leaflet will give you the information you need.

What is the New Medicine Service?
The New Medicine Service is a free NHS service, offered through your pharmacy (chemist), to help you understand your condition and get the most out of your new medicine.

Who is it for?
The service is for people who have received their first prescription for a medicine to treat any of the following conditions:

- asthma
- lung conditions such as chronic bronchitis and emphysema
- type 2 diabetes
- high blood pressure
- conditions where you take a medicine to control the way your blood clots.

How will it help me?
Between 30% and 50% of prescribed medicines are not taken as recommended. This means that a lot of medicines are wasted or are not as effective as they could be. The service will:
- help you to find out more about the new medicine you are taking
- help to sort out any problems you are having with your new medicine
- give you a chance to ask questions about your medicine and discuss any concerns
- help to improve the effectiveness of your new medicine, for example, there may be an easier or better way to take it
- help you to make your own decisions about managing your condition
- help you to improve your health, which could lead to fewer GP and hospital visits.

The New Medicine Service will help provide better value for you and the NHS by making sure that your medicines are right for you.

How does the service work?
When you are given your new medicine you will be asked if you want to sign up to the service, which will be provided in three parts. If you agree, you will need to sign a consent form to allow your pharmacist to share your information with other parts of the NHS (see overleaf).

Step 1	Your pharmacist will give you information about your new medicine.
Step 2	You will be invited to a meeting with your pharmacist between 7 and 14 days after you first receive your medicine. You will be able to choose a time that suits you. This is a confidential conversation and will be provided in a private area within the pharmacy or if you prefer, you could choose to have the discussion over the telephone. Your pharmacist will ask you questions about how you are getting on with your new medicine, find out if you are having any problems and give you any information and support you need. You may have concerns or questions that you want to ask. You can ask anything at all about your new medicine.
Step 3	Your pharmacist will arrange a follow-up discussion with you 14 to 21 days after step 2. You will be able to talk about how things are going with your medicine and ask for more advice if you need it.

Why do I need to sign a consent form?

In order to receive this service, you will be asked to give your consent for your pharmacist to share information from your New Medicine Service discussions with:

- your GP, if necessary (for example if they need to change your medicine because you are having a problem with it)
- your local NHS England area team to make sure that the service is being provided properly by your pharmacist
- your local NHS England area team, the NHS Business Services Authority and the Secretary of State for Health, to make sure your pharmacy is being paid the correct amount by the NHS for the service they have provided you.

If you do not give your consent you will not be able to use the service. However, when you first receive your medicines your pharmacist will still give you advice about them.

How can you prepare for your discussions with the pharmacist?

- Read the leaflet that comes with your new medicine.
- Make a note of questions you want to ask about your new medicine.
- Make a note of any concerns about your new medicine that you may want to discuss with your pharmacist.
- Bring your new medicine to the meeting with your pharmacist.

What happens after the two discussions?

- Everything may be okay with your new medicine and nothing else will need to happen.
- If you have had problems with the medicine, you may agree with your pharmacist to change the way you use it.

- Your pharmacist may recommend that your doctor reviews your new medicine. If this is needed your pharmacist will send a note to your doctor explaining the issues raised. You can have a copy of this note.

Appendix 9: The DOSE Index

The Dyspnoea, Obstruction, Smoking Exacerbation (DOSE) Index

Components	DOSE index points			
	0	**1**	**2**	**3**
MRC Scale	0-1	2	3	4
FEV1 % predicted	> 50	30-49	<30	-
Smoking status	Non-smoker	Smoker	-	-
Exacerbations in previous year	0-1	2-3	>3	-
FEV1 % predicted = forced expiratory volume in 1 second percentage predicted. Score 0-1 mild , 2-3 moderate , 4 or above-Severe COPD				

Available at: https://www.pcrs-uk.org/dose-index

Appendix 10: The BODE Index

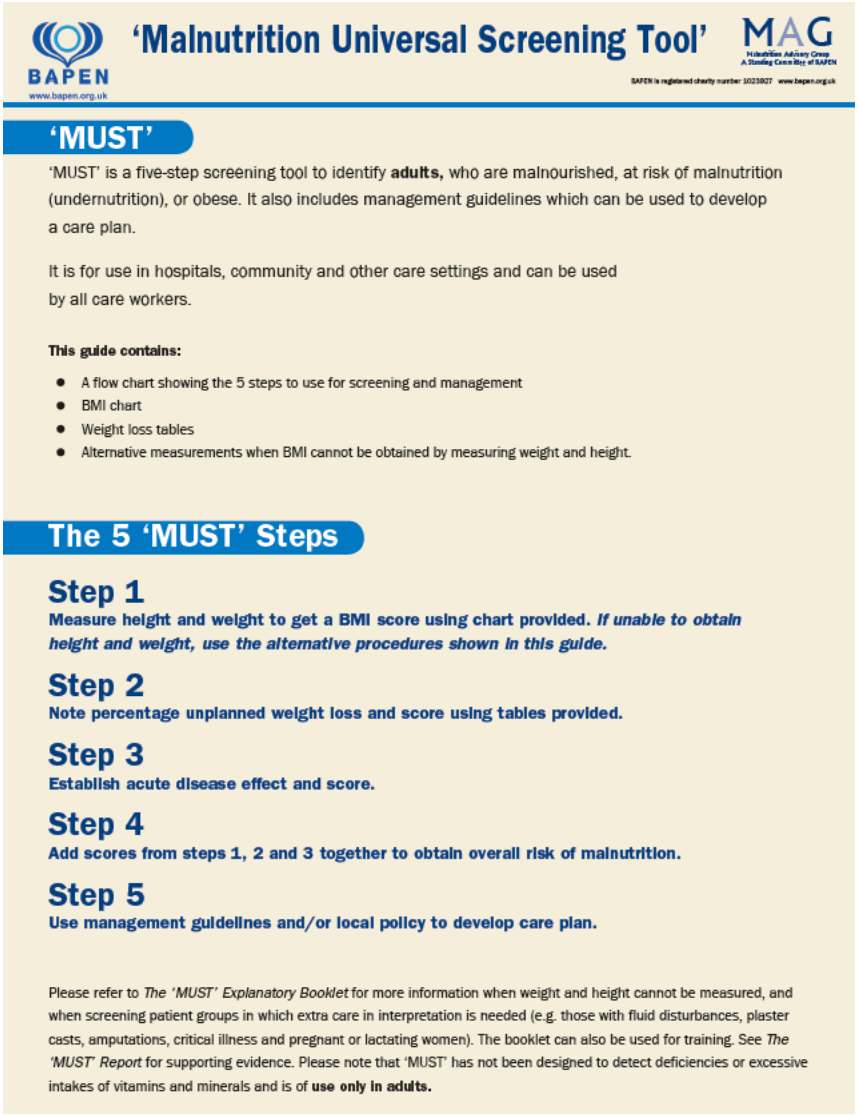
(Body mass index, airflow Obstruction, Dyspnea and Exercise capacity)

Variable	Points of BODE Index			
	0	1	2	3
FEV1 (% predicted)	≥65	50-64	36-49	≤35
6-Minute Walk Test (meters)	≥350	250-349	150-249	≤149
MMRC Dyspnoea Scale	0-1	2	3	4
Body Mass Index	>21	≤21		

Available at: https://www.pcrs-uk.org/dose-index

Appendix 11: MUST Score

MUST score calculator is available at: www.bapen.org.uk/screening-and-must/must-calculator . For further information on 'MUST' see www.bapen.org.uk .



BAPEN
www.bapen.org.uk

'Malnutrition Universal Screening Tool'

MAG
Malnutrition Advisory Group
A Standing Committee of BAPEN

BAPEN is registered charity number 1023927 www.bapen.org.uk

'MUST'

'MUST' is a five-step screening tool to identify **adults,** who are malnourished, at risk of malnutrition (undernutrition), or obese. It also includes management guidelines which can be used to develop a care plan.

It is for use in hospitals, community and other care settings and can be used by all care workers.

This guide contains:

- A flow chart showing the 5 steps to use for screening and management
- BMI chart
- Weight loss tables
- Alternative measurements when BMI cannot be obtained by measuring weight and height.

The 5 'MUST' Steps

Step 1
Measure height and weight to get a BMI score using chart provided. *If unable to obtain height and weight, use the alternative procedures shown in this guide.*

Step 2
Note percentage unplanned weight loss and score using tables provided.

Step 3
Establish acute disease effect and score.

Step 4
Add scores from steps 1, 2 and 3 together to obtain overall risk of malnutrition.

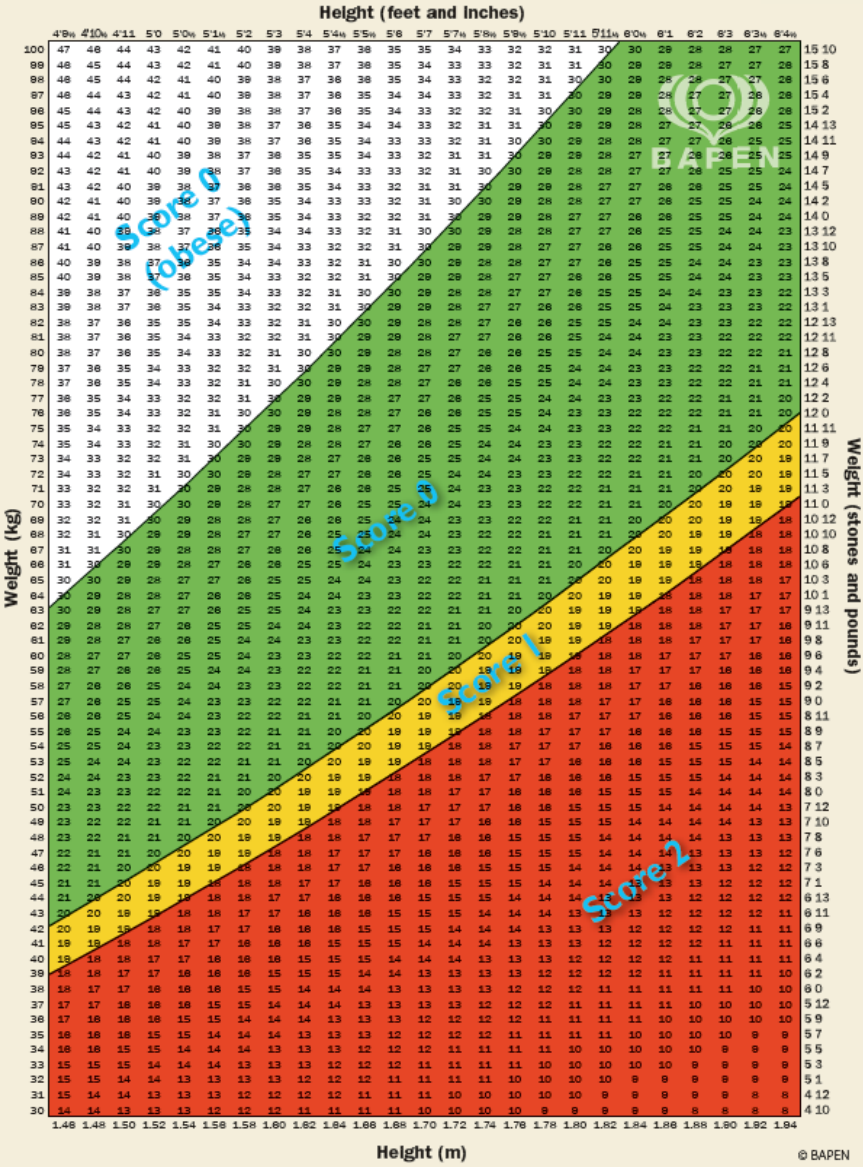
Step 5
Use management guidelines and/or local policy to develop care plan.

Please refer to *The 'MUST' Explanatory Booklet* for more information when weight and height cannot be measured, and when screening patient groups in which extra care in interpretation is needed (e.g. those with fluid disturbances, plaster casts, amputations, critical illness and pregnant or lactating women). The booklet can also be used for training. See *The 'MUST' Report* for supporting evidence. Please note that 'MUST' has not been designed to detect deficiencies or excessive intakes of vitamins and minerals and is of **use only in adults.**

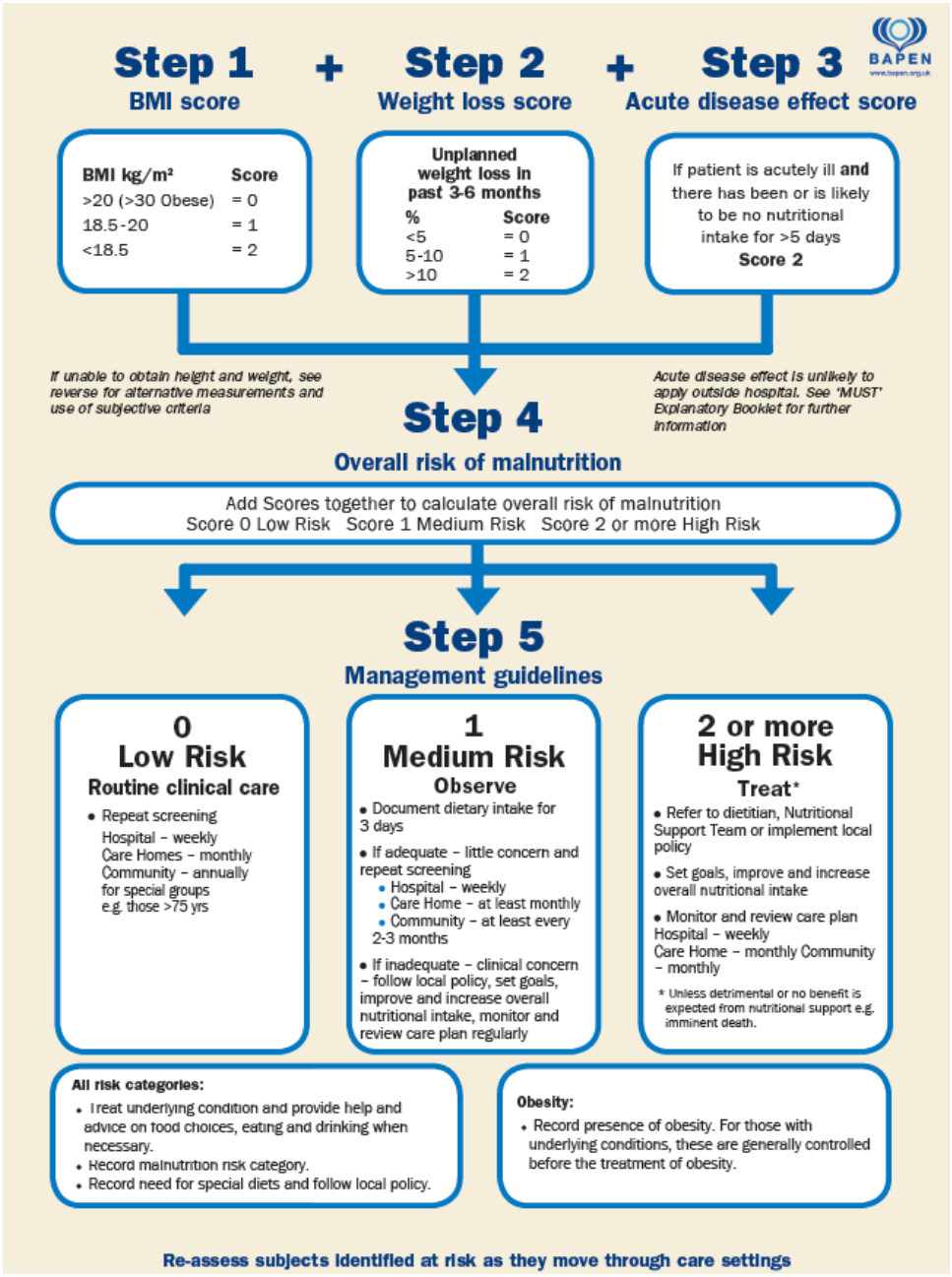
The 'Malnutrition Universal Screening Tool' ('MUST') is reproduced here with the kind permission of BAPEN (British Association for Parenteral and Enteral Nutrition).

Step 1 – BMI score (& BMI)

BAPEN
www.bapen.org.uk



Note : The black lines denote the exact cut off points (30,20 and 18.5 kg/m²), figures on the chart have been rounded to the nearest whole number.


Step 1
BMI score
+
Step 2
Weight loss score
+
Step 3
Acute disease effect score
BAPEN
BMI kg/m²
Score
>20 (>30 Obese)
= 0
18.5-20
= 1
<18.5
= 2
Unplanned weight loss in past 3-6 months
%
Score
<5
= 0
5-10
= 1
>10
= 2
If patient is acutely ill and there has been or is likely to be no nutritional intake for >5 days
Score 2
If unable to obtain height and weight, see reverse for alternative measurements and use of subjective criteria
Acute disease effect is unlikely to apply outside hospital. See 'MUST' Explanatory Booklet for further information
Step 4
Overall risk of malnutrition
Add Scores together to calculate overall risk of malnutrition
Score 0 Low Risk Score 1 Medium Risk Score 2 or more High Risk
Step 5
Management guidelines
0
Low Risk
Routine clinical care
• Repeat screening
Hospital – weekly
Care Homes – monthly
Community – annually
for special groups
e.g. those >75 yrs
1
Medium Risk
Observe
• Document dietary intake for 3 days
• If adequate – little concern and repeat screening
• Hospital – weekly
• Care Home – at least monthly
• Community – at least every 2-3 months
• If inadequate – clinical concern – follow local policy, set goals, improve and increase overall nutritional intake, monitor and review care plan regularly
2 or more
High Risk
Treat*
• Refer to dietitian, Nutritional Support Team or implement local policy
• Set goals, improve and increase overall nutritional intake
• Monitor and review care plan
Hospital – weekly
Care Home – monthly Community – monthly
* Unless detrimental or no benefit is expected from nutritional support e.g. imminent death.
All risk categories:
• Treat underlying condition and provide help and advice on food choices, eating and drinking when necessary.
• Record malnutrition risk category.
• Record need for special diets and follow local policy.
Obesity:
• Record presence of obesity. For those with underlying conditions, these are generally controlled before the treatment of obesity.
Re-assess subjects identified at risk as they move through care settings

Weight before weight loss (kg)	SCORE 0 Wt Loss < 5%	SCORE 1 Wt Loss 5–10%	SCORE 2 Wt Loss > 10%
34 kg	<1.70	1.70 – 3.40	>3.40
36 kg	<1.80	1.80 – 3.60	>3.60
38 kg	<1.90	1.90 – 3.80	>3.80
40 kg	<2.00	2.00 – 4.00	>4.00
42 kg	<2.10	2.10 – 4.20	>4.20
44 kg	<2.20	2.20 – 4.40	>4.40
46 kg	<2.30	2.30 – 4.60	>4.60
48 kg	<2.40	2.40 – 4.80	>4.80
50 kg	<2.50	2.50 – 5.00	>5.00
52 kg	<2.60	2.60 – 5.20	>5.20
54 kg	<2.70	2.70 – 5.40	>5.40
56 kg	<2.80	2.80 – 5.60	>5.60
58 kg	<2.90	2.90 – 5.80	>5.80
60 kg	<3.00	3.00 – 6.00	>6.00
62 kg	<3.10	3.10 – 6.20	>6.20
64 kg	<3.20	3.20 – 6.40	>6.40
66 kg	<3.30	3.30 – 6.60	>6.60
68 kg	<3.40	3.40 – 6.80	>6.80
70 kg	<3.50	3.50 – 7.00	>7.00
72 kg	<3.60	3.60 – 7.20	>7.20
74 kg	<3.70	3.70 – 7.40	>7.40
76 kg	<3.80	3.80 – 7.60	>7.60
78 kg	<3.90	3.90 – 7.80	>7.80
80 kg	<4.00	4.00 – 8.00	>8.00
82 kg	<4.10	4.10 – 8.20	>8.20
84 kg	<4.20	4.20 – 8.40	>8.40
86 kg	<4.30	4.30 – 8.60	>8.60
88 kg	<4.40	4.40 – 8.80	>8.80
90 kg	<4.50	4.50 – 9.00	>9.00
92 kg	<4.60	4.60 – 9.20	>9.20
94 kg	<4.70	4.70 – 9.40	>9.40
96 kg	<4.80	4.80 – 9.60	>9.60
98 kg	<4.90	4.90 – 9.80	>9.80
100 kg	<5.00	5.00 – 10.00	>10.00
102 kg	<5.10	5.10 – 10.20	>10.20
104 kg	<5.20	5.20 – 10.40	>10.40
106 kg	<5.30	5.30 – 10.60	>10.60
108 kg	<5.40	5.40 – 10.80	>10.80
110 kg	<5.50	5.50 – 11.00	>11.00
112 kg	<5.60	5.60 – 11.20	>11.20
114 kg	<5.70	5.70 – 11.40	>11.40
116 kg	<5.80	5.80 – 11.60	>11.60
118 kg	<5.90	5.90 – 11.80	>11.80
120 kg	<6.00	6.00 – 12.00	>12.00
122 kg	<6.10	6.10 – 12.20	>12.20
124 kg	<6.20	6.20 – 12.40	>12.40
126 kg	<6.30	6.30 – 12.60	>12.60

Weight before weight loss (st lb)	SCORE 0 Wt Loss <5%	SCORE 1 Wt Loss 5–10%	SCORE 2 Wt Loss >10%
5st 4lb	<4lb	4lb – 7lb	>7lb
5st 7lb	<4lb	4lb – 8lb	>8lb
5st 11lb	<4lb	4lb – 8lb	>8lb
6st	<4lb	4lb – 8lb	>8lb
6st 4lb	<4lb	4lb – 9lb	>9lb
6st 7lb	<5lb	5lb – 9lb	>9lb
6st 11lb	<5lb	5lb – 10lb	>10lb
7st	<5lb	5lb – 10lb	>10lb
7st 4lb	<5lb	5lb – 10lb	>10lb
7st 7lb	<5lb	5lb – 11lb	>11lb
7st 11lb	<5lb	5lb – 11lb	>11lb
8st	<6lb	6lb – 11lb	>11lb
8st 4lb	<6lb	6lb – 12lb	>12lb
8st 7lb	<6lb	6lb – 12lb	>12lb
8st 11lb	<6lb	6lb – 12lb	>12lb
9st	<6lb	6lb – 13lb	>13lb
9st 4lb	<7lb	7lb – 13lb	>13lb
9st 7lb	<7lb	7lb – 13lb	>13lb
9st 11lb	<7lb	7lb – 1st 0lb	>1st 0lb
10st	<7lb	7lb – 1st 0lb	>1st 0lb
10st 4lb	<7lb	7lb – 1st 0lb	>1st 0lb
10st 7lb	<7lb	7lb – 1st 1lb	>1st 1lb
10st 11lb	<8lb	8lb – 1st 1lb	>1st 1lb
11st	<8lb	8lb – 1st 1lb	>1st 1lb
11st 4lb	<8lb	8lb – 1st 2lb	>1st 2lb
11st 7lb	<8lb	8lb – 1st 2lb	>1st 2lb
11st 11lb	<8lb	8lb – 1st 3lb	>1st 3lb
12st	<8lb	8lb – 1st 3lb	>1st 3lb
12st 4lb	<9lb	9lb – 1st 3lb	>1st 3lb
12st 7lb	<9lb	9lb – 1st 4lb	>1st 4lb
12st 11lb	<9lb	9lb – 1st 4lb	>1st 4lb
13st	<9lb	9lb – 1st 4lb	>1st 4lb
13st 4lb	<9lb	9lb – 1st 5lb	>1st 5lb
13st 7lb	<9lb	9lb – 1st 5lb	>1st 5lb
13st 11lb	<10lb	10lb – 1st 5lb	>1st 5lb
14st	<10lb	10lb – 1st 6lb	>1st 6lb
14st 4lb	<10lb	10lb – 1st 6lb	>1st 6lb
14st 7lb	<10lb	10lb – 1st 6lb	>1st 6lb
14st 11lb	<10lb	10lb – 1st 7lb	>1st 7lb
15st	<11lb	11lb – 1st 7lb	>1st 7lb
15st 4lb	<11lb	11lb – 1st 7lb	>1st 7lb
15st 7lb	<11lb	11lb – 1st 8lb	>1st 8lb
15st 11lb	<11lb	11lb – 1st 8lb	>1st 8lb
16st	<11lb	11lb – 1st 8lb	>1st 8lb
16st 4lb	<11lb	11lb – 1st 9lb	>1st 9lb
16st 7lb	<12lb	12lb – 1st 9lb	>1st 9lb

Alternative measurements and considerations

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Step 1: BMI (body mass index)

If height cannot be measured

- Use recently documented or self-reported height (if reliable and realistic).
- If the subject does not know or is unable to report their height, use one of the alternative measurements to estimate height (ulna, knee height or demispan).

Step 2: Recent unplanned weight loss

If recent weight loss cannot be calculated, use self-reported weight loss (if reliable and realistic).

Subjective criteria

If height, weight or BMI cannot be obtained, the following criteria which relate to them can assist your professional judgement of the subject's nutritional risk category. Please note, these criteria should be used collectively not separately as alternatives to steps 1 and 2 of 'MUST' and are not designed to assign a score. Mid upper arm circumference (MUAC) may be used to estimate BMI category in order to support your overall impression of the subject's nutritional risk.

1. BMI

- Clinical impression – thin, acceptable weight, overweight. Obvious wasting (very thin) and obesity (very overweight) can also be noted.

2. Unplanned weight loss

- Clothes and/or jewellery have become loose fitting (weight loss).
- History of decreased food intake, reduced appetite or swallowing problems over 3-6 months and underlying disease or psycho-social/physical disabilities likely to cause weight loss.

3. Acute disease effect

- Acutely ill and no nutritional intake or likelihood of no intake for more than 5 days.

Further details on taking alternative measurements, special circumstances and subjective criteria can be found in *The 'MUST' Explanatory Booklet*. A copy can be downloaded at www.bapen.org.uk or purchased from the BAPEN office. The full evidence-base for 'MUST' is contained in *The 'MUST' Report* and is also available for purchase from the BAPEN office.

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Alternative measurements: instructions and tables

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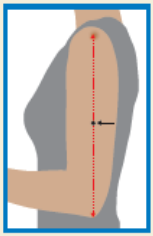
If height cannot be obtained, use length of forearm (ulna) to calculate height using tables below.
(See The 'MUST' Explanatory Booklet for details of other alternative measurements (knee height and demispan) that can also be used to estimate height).

Estimating height from ulna length

Measure between the point of the elbow (olecranon process) and the midpoint of the prominent bone of the wrist (styloid process) (left side if possible).

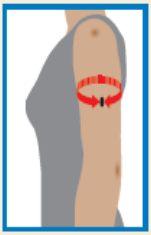
Height (m)	men (<65 years)	1.94	1.93	1.91	1.89	1.87	1.85	1.84	1.82	1.80	1.78	1.76	1.75	1.73	1.71
	men (≥65 years)	1.87	1.86	1.84	1.82	1.81	1.79	1.78	1.76	1.75	1.73	1.71	1.70	1.68	1.67
	Ulna length (cm)	32.0	31.5	31.0	30.5	30.0	29.5	29.0	28.5	28.0	27.5	27.0	26.5	26.0	25.5
Height (m)	Women (<65 years)	1.84	1.83	1.81	1.80	1.79	1.77	1.76	1.75	1.73	1.72	1.70	1.69	1.68	1.66
	Women (≥65 years)	1.84	1.83	1.81	1.79	1.78	1.76	1.75	1.73	1.71	1.70	1.68	1.66	1.65	1.63
Height (m)	men (<65 years)	1.69	1.67	1.66	1.64	1.62	1.60	1.58	1.57	1.55	1.53	1.51	1.49	1.48	1.46
	men (≥65 years)	1.65	1.63	1.62	1.60	1.59	1.57	1.56	1.54	1.52	1.51	1.49	1.48	1.46	1.45
	Ulna length (cm)	25.0	24.5	24.0	23.5	23.0	22.5	22.0	21.5	21.0	20.5	20.0	19.5	19.0	18.5
Height (m)	Women (<65 years)	1.65	1.63	1.62	1.61	1.59	1.58	1.56	1.55	1.54	1.52	1.51	1.50	1.48	1.47
	Women (≥65 years)	1.61	1.60	1.58	1.56	1.55	1.53	1.52	1.50	1.48	1.47	1.45	1.44	1.42	1.40

Estimating BMI category from mid upper arm circumference (MUAC)



The subject's left arm should be bent at the elbow at a 90 degree angle, with the upper arm held parallel to the side of the body. Measure the distance between the bony protrusion on the shoulder (acromion) and the point of the elbow (olecranon process). Mark the mid-point.

Ask the subject to let arm hang loose and measure around the upper arm at the mid-point, making sure that the tape measure is snug but not tight.



If MUAC is <23.5 cm, BMI is likely to be <20 kg/m².
If MUAC is >32.0 cm, BMI is likely to be >30 kg/m².

The use of MUAC provides a general indication of BMI and is not designed to generate an actual score for use with 'MUST'. For further information on use of MUAC please refer to *The 'MUST' Explanatory Booklet*.

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