IMSANZ 2023: ASTHMA AND COPD UPDATE

JAMES FINGLETON
WHO AM I

• Respiratory SMO at Wellington Hospital,
  Specialist interest in asthma and COPD
• Medical Director, Asthma and Respiratory Foundation NZ
  Co-author NZ asthma and COPD guidelines
• NZ President, Thoracic Society of Australia New Zealand
• Senior Clinical Lecturer, University of Otago Wellington
CONFLICTS OF INTEREST

I have received fees for speaking and/or advisory board fees from GSK, Boehringer-Ingelheim and AstraZeneca. I have received support to attend educational meetings from AstraZeneca, Boehringer-Ingelheim and GSK

Research funders:
Health Research Council
Wellington Medical Research Foundation
Asthma Foundation New Zealand
AstraZeneca
GSK
Fisher & Paykel
Genentech / Roche
OUTLINE

• Asthma
  • Current NZ Guidelines
  • Acute care
  • Quality improvement

• COPD
  • Current NZ guidelines
  • Recent changes to GOLD guidelines
  • Acute care
Main changes 2020

• Combining adolescents and adults

• Avoid SABA-only treatment

• Budesonide/formoterol rather than a SABA as the preferred reliever inhaler across the spectrum of asthma severity

• Introduction of the terminology ‘anti-inflammatory reliever (AIR)’ therapy

• Discussion of add-on therapies in severe asthma
SABA monotherapy is no longer recommended.

ICS/fast-onset beta$_2$-agonist reliever therapy is superior to SABA reliever therapy, across the range of asthma severity.

In NZ the only ICS/fast-onset beta$_2$-agonist combination products registered and approved for use as a reliever contain budesonide/ formoterol (Symbicort Turbuhaler or Duoresp Spiromax).

Symbicort or Duoresp are the preferred relievers for asthma in NZ.

One actuation of budesonide/formoterol 200/6µg or 100/6µg via turbuhaler as needed vs 2 puffs of SABA.
Combination fixed-dose beta agonist and steroid inhaler as required for adults or children with mild asthma
Crossingham et al. Cochrane Database of Systematic Reviews

https://doi.org/10.1002/14651858.CD013518.pub2
**AS-NEEDED BUD/FORM VERSUS REGULAR ICS**

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>PRN FABA/ICS Events</th>
<th>Total</th>
<th>Regular ICS Events</th>
<th>Total</th>
<th>Weight</th>
<th>Odds Ratio M-H, Random, 95% CI</th>
<th>Odds Ratio M-H, Random, 95% CI</th>
<th>Risk of Bias</th>
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<tbody>
<tr>
<td>Novel START</td>
<td>9</td>
<td>220</td>
<td>21</td>
<td>225</td>
<td>10.8%</td>
<td>0.41 [0.19, 0.93]</td>
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<tr>
<td>PRACTICAL</td>
<td>37</td>
<td>437</td>
<td>59</td>
<td>448</td>
<td>23.5%</td>
<td>0.61 [0.40, 0.94]</td>
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<tr>
<td>SYGMA 1</td>
<td>70</td>
<td>1277</td>
<td>74</td>
<td>1282</td>
<td>29.1%</td>
<td>0.95 [0.68, 1.33]</td>
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<tr>
<td>SYGMA 2</td>
<td>171</td>
<td>2089</td>
<td>173</td>
<td>2087</td>
<td>36.7%</td>
<td>0.99 [0.79, 1.23]</td>
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<tr>
<td>Total (95% CI)</td>
<td>4023</td>
<td>4042</td>
<td>100.0%</td>
<td>327</td>
<td></td>
<td>0.79 [0.59, 1.07]</td>
<td></td>
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<tr>
<td>Total events</td>
<td>287</td>
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</table>

Heterogeneity: Tau² = 0.05; Chi² = 7.32, df = 3 (P = 0.06); I² = 59%
Test for overall effect: Z = 1.51 (P = 0.13)
Test for subgroup differences: Not applicable

**Risk of bias legend**
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Blinding (performance bias and detection bias)
(D) Blinding of participants and personnel (performance bias)
(E) Blinding of outcome assessment (detection bias)
(F) Incomplete outcome data (attrition bias)
(G) Selective reporting (reporting bias)
(H) Other bias

Combination fixed-dose beta agonist and steroid inhaler as required for adults or children with mild asthma
Crossingham et al. Cochrane Database of Systematic Reviews
[https://doi.org/10.1002/14651858.CD013518.pub2](https://doi.org/10.1002/14651858.CD013518.pub2)
Combination formoterol and budesonide as maintenance and reliever therapy versus combination inhaler maintenance for chronic asthma in adults and children

Kew et al. Cochrane Database of Systematic reviews

https://doi.org/10.1002/14651858.CD009019.pub2
Anti-Inflammatory Reliever therapy based algorithm using Budesonide/ Formoterol 200µg/6µg

**STEP UP** to achieve control and reduce risk of exacerbations

**STEP DOWN** after a period of prolonged control to find and maintain lowest required step

**Maintenance**

- **Step 1**
  - None

**Symptom relief**

- **Step 1**
  - One actuation twice daily
- **Step 2**
  - Two actuations once daily
- **Step 3**
  - One actuation as required

Before stepping up:
- Review inhaler technique, use, and treatable traits.
- If a severe exacerbation of asthma occurs:
  - Review and consider stepping up.
- If asthma remains uncontrolled at Step 3:
  - Health professional to consider add-on treatment.
  - May require referral for specialist review.

Traditional SABA reliever therapy based algorithm for asthma management

**STEP UP** to achieve control and reduce risk of exacerbations

**STEP DOWN** after a period of prolonged control to find and maintain lowest required step

**Maintenance**

- **Step 1**
  - Standard dose ICS
- **Step 2**
  - Standard dose ICS/LABA
- **Step 3**
  - High dose ICS/LABA

**Symptom relief**

- SABA 1-2 actuations as required

Before stepping up:
- Review inhaler technique, use, and treatable traits.
- If a severe exacerbation of asthma occurs:
  - Review and consider stepping up, or switching to the Anti-Inflammatory Reliever (AIR) therapy based algorithm.
- If asthma remains uncontrolled at Step 3:
  - Health professional to consider add-on treatment.
  - May require referral for specialist review.
Add on treatments: LAMA’s

• LAMAs have efficacy in severe asthma, when added to ICS/LABA treatment.

• Tiotropium as add-on treatment to maintenance ICS/LABA is MEDSAFE approved, but not funded in NZ.

• There is evidence supporting single-inhaler triple therapy (ICS/LABA/LAMA) but none of these devices are approved or funded currently.

• LAMA therapy is funded for those patients with co-existent COPD.

• LAMA is a therapeutic option in asthma patients with features of COPD, not controlled at Step 3.
Add on treatments: Biological

- Monoclonal antibody treatments target specific inflammatory pathways in severe asthma.

- Omalizumab (anti-IgE), mepolizumab and benralizumab (anti-IL-5) are currently licensed in NZ but funded only in a subset of patients:
  - 4 exacerbations in 12 months or on maintenance steroids
  - Blood eosinophils >0.5 within last 12 months (anti-IL5) OR
  - IgE between 70 and 1300 with evidence of atopy (anti-IgE)

- They are specialist-only but highly effective in patients with the appropriate pattern of inflammation (based on blood eosinophils and IgE).
Non-pharmacological measures

- Smoking cessation
- Influenza vaccination
- Weight loss
- Exercise
- Breathing exercises
- Avoid triggers (including aspirin/NSAIDs)
- Avoidance workplace exposures
Self-management

- Action plans should be offered to all people with asthma.
- Asthma action plans may be based on symptoms ± peak flow and comprise 3 or 4 stages.
YOUR AIR* ASTRHMA ACTION PLAN

Anti-Inflammatory Reliever Therapy

Know your asthma symptoms

Feeling good
- Your asthma is under control when you don’t have asthma symptoms most days (wheeze, tight chest, a cough or feeling breathless)
- You have no cough or wheeze at night
- You can do all your usual activities and exercise freely
- Most days you do not need extra Symbicort actuations

Your peak flow reading is above:

Know when and how to take your medicine

Regularly scheduled Symbicort:
- Actuation(s) every morning

As needed Symbicort to relieve symptoms:
- 1 actuation when you need it to relieve your asthma symptoms

Symbicort is a 2-in-1 treatment used for both prevention and relief of symptoms. Carry this at all times. You do not need an extra inhaler as a reliever.

Other Medication

Let's take action...

Your asthma is getting severe when
- Your asthma symptoms are getting severe (wheeze, tight chest, a cough or feeling breathless)
- OR your Symbicort is only helping for 2-3 hours
- OR you are using more than 8 actuations a day in total (regular + reliever use)
- OR you feel you need to see your doctor

Your peak flow reading is below:

Let’s keep calm...

It is an emergency when
- Your symptoms are getting more severe quickly
- OR you are finding it hard to speak or breathe
- OR your Symbicort is not helping much
- OR you are using your Symbicort every 1-2 hours

Your peak flow reading is below:

Prednisone mg for days
and then mg for days

Best peak flow:

Plan prepared by:

Next review date:

Signature:
Acute asthma management

**Algorithm for the Management of Acute Severe Asthma**

**Evaluate Severity**
- **Mild/Moderate:** FEV₁ or PEF >50%
  - Give 6x100μg salbutamol via MDI and spacer
- **Severe:** FEV₁ or PEF 30-50%
  - Give 6x100μg salbutamol via MDI and spacer or salbutamol 2.5mg via nebulisation, prednisone 40mg, oxygen if required to keep sats >92%
- **Life-Threatening:** FEV₁ or PEF <30%
  - Give continuous salbutamol via nebulisation, ipratropium bromide 500μg via nebulisation, IV hydrocortisone 100mg or prednisone 40mg, oxygen if required to keep sats >92%. If anaphylaxis is present give IM adrenaline.

**Reassess**
- FEV₁ or PEF >70%
  - Consider oral prednisone 40mg, if not given above.
- FEV₁ or PEF 50-70%
  - Give prednisone 40mg if not given above.
  - Repeat salbutamol 6x100μg via MDI and spacer.
- FEV₁ or PEF <50%
  - Give salbutamol via MDI and spacer, or salbutamol 2.5mg via nebulisation, up to 3 times over 1st hour, ipratropium bromide 6x20μg via MDI and spacer or 500μg via nebulisation, oxygen if required to keep sats 92-96%.

**Arrange Urgent Transfer to Hospital by Ambulance**
- All patients will require hospital admission.

**Refer to ICU/HDU**
- Give salbutamol 2.5mg via nebulisation, frequency determined by response, up to continuously, IV hydrocortisone 100mg 6 hourly or prednisone 40mg daily, ipratropium bromide 500μg via nebulisation up to hourly, consider IV magnesium sulphate 1.2-2.0g over 20 min, oxygen if required to keep sats 92-96%.

**Investigations**
- Include: ABG, CXR, U&E.

**Stable**
- No signs of severe asthma and FEV₁ or PEF >70%
  - Discharge once pre-discharge conditions are met (Table 8).

**Unstable**
- Signs of severe asthma or FEV₁ or PEF <50-70%
  - Admit.

For practical purposes, the FEV₁ and PEF are considered interchangeable when expressed as % predicted for the purpose of assessment of acute asthma severity.
Acute severe Asthma: Practice Points

• For most patients initial treatment with β-2 agonist via a spacer and oral steroids is likely to be sufficient.

• Reserve nebulised β-2 agonists for those with severe asthma who do not respond to initial inhaled therapy.

• Magnesium sulphate is the preferred IV bronchodilator in life-threatening asthma.

• No role for IV β-2 agonists or IV aminophylline.

• No role for adrenaline unless asthma accompanied by anaphylaxis.
Asthma mimics / co-morbidities

• Vocal cord dysfunction / inducible laryngeal obstruction

• Dysfunction breathing / breathing pattern disorder

• Cardiac disease

• Eosinophilic granulomatosis with polyangiitis (EGPA)
At time of exacerbation, review:

- Is it asthma?
- Adherence
- Technique
- Start an ICS if not already on one (typically budesonide-formoterol)
- Consider switch to budesonide-formoterol based regimen if currently using SABA as reliever
- Low threshold for respiratory review if available
- Provide an asthma plan pre-discharge
Quality Improvement

• NZ Severe Asthma Network

• NZ National Asthma Audit
NZ National Asthma Audit

Aim: To assess care against nationally agreed standards, recognise variations in practice, identify the proportion of inpatients who meet the definition of severe asthma, and advocate for improved respiratory care in New Zealand.

Retrospective notes based audit

Included patients were adults admitted to public hospitals with a primary diagnosis of Asthma between the dates of 1st July 2019 and 31st October 2019, inclusive.

Care assessed against 10 standards
Sponsor, Funding and Ethics

TSANZ is the audit Sponsor

Endorsed by Asthma and Respiratory Foundation

Funded by unrestricted educational grants from

AstraZeneca
GlaxoSmithKline

Funders had no role in the conception, design, or conduct of the audit
Funders have no access to audit data
HDEC have confirmed that ethical review is not required (ref. 19/NTA/80)
Results

Data available for 760 admissions

There were 1103 admissions for asthma nationally, 1st July to 31st October 2019

Therefore data available for around 70% of all adult asthma admissions during the audit period
Standards

1. Patients should have a peak flow or FEV1 measured at the time of presentation to hospital.

2. Patients presenting with acute asthma should receive oral or IV steroids within 1 hour of triage if not given pre-hospital.

3. Patients should receive systemic steroids for at least 5 days.

4. People admitted to hospital with asthma should be commenced on an inhaled corticosteroid if they were not on this previously.

5. Adherence to prescribed long-term asthma treatment should be assessed in all patients.

6. Inhaler technique should be reviewed in all patients.

7. Patients who have more than one hospital admission for asthma exacerbation within 12 months should be assessed by a specialist respiratory physician, respiratory nurse, or respiratory nurse specialist.

8. Patients should have peak flow measured in the 24 hours prior to discharge.

9. Prior to discharge patients should receive a written personalised asthma management plan.

10. Patients who are admitted for an asthma exacerbation should be recommended to have a planned review by a healthcare professional within 2 weeks of discharge.
Variation by site

Overall standards attainment rate was 43%

Lowest site 33%

Highest site 63%
## How do we compare?

<table>
<thead>
<tr>
<th></th>
<th>NZ</th>
<th>UK 2019/20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median Age, yrs</td>
<td>47</td>
<td>48</td>
</tr>
<tr>
<td>Sex (Female), %</td>
<td>71</td>
<td>72</td>
</tr>
<tr>
<td>Current smoker, %</td>
<td>28</td>
<td>23</td>
</tr>
<tr>
<td>Standards</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥ 5 days oral steroids, %</td>
<td>86</td>
<td>91</td>
</tr>
<tr>
<td>Inhaled steroids at discharge, %</td>
<td>79</td>
<td>90</td>
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<tr>
<td>Inhaler technique checked, %</td>
<td>34</td>
<td>65</td>
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<tr>
<td>Asthma plan issued, %</td>
<td>23</td>
<td>47</td>
</tr>
<tr>
<td>Respiratory specialist review, %</td>
<td>33</td>
<td>81</td>
</tr>
</tbody>
</table>
Take-home messages from the audit

Proved that a national audit is achievable
Suggests wide variation in quality of care nationally
2 out of 3 patients don’t meet a respiratory clinician
1 in 5 are not on any form of ICS at discharge

Single best predictor of good care is being seen by a respiratory nurse / nurse practitioner / nurse specialist
Acknowledgements:

Steering Committee: Betty Poot, Jack Dummer, Jill West, Roland Meyer, Sandra Hotu, Stuart Jones, Mark Weatherall

MRINZ team: Allie Eathorne, Nick Shortt, John Martindale, Ciléin Kearns

TSANZ support: Nicole Hatten

DHB contributors: Adele Omahony, Alex Chapman, Angela Moran, Atiqah Abdul Latiff, Bonnie Anderson, Christine Tuffery, Elisabeth King, Elisabeth Taylor, Gayatri Surwade, Grace Bird, Ha Na Ahn, James Wethasinghe, Karalyn Hicks, Logitha Sritharan, Lydia Vujcich, Maya Wernick, Melinda McGinty, Moayid Sherif, Nikola Ncube, Peter Brown, Robbie Fyfe, Roland Meyer, Samantha Lovelock, Sandra Hopping, Sue Jones, Susan Xian, Suzanne Poole, Vicki Cho, Wendy McRae

... And anyone I have missed out!

Chris Lewis – Information analyst, Ministry of Health
Key Messages for Asthma

• Avoid SABA-only treatment
• Budesonide/formoterol rather than a SABA as the preferred reliever
• At review:
  • Is it asthma?
  • Adherence
  • Technique
  • Start an ICS if not already on one (typically budesonide-formoterol)
  • Consider switch to budesonide-formoterol based regimen if currently using SABA as reliever
  • Low threshold for respiratory review if available
  • Provide an asthma plan pre-discharge
Acknowledgement

We thank Leanne Te Karu and Teresa Demetriou for their valued contribution towards these guidelines.
Key Messages

1. Culturally appropriate education.
2. Good quality Spirometry is key.
3. Smoking cessation remains number one.
4. Pulmonary Rehabilitation should be offered to all COPD patients and particularly post-exacerbation.
5. LAMAs are first step, then LAMA/LABA.
6. ICS/LABA – ongoing exacerbations, particularly if eosinophils (≥0.3)
**COPD in Māori**

The burden of COPD among Māori is one of the most significant health disparities in NZ

Greater exposure to smoking & poor housing

Worse lung function for any given level of exposure, and onset 15-20 years younger

Hospitalisation: 3.5 times higher

Mortality: 2.2 times higher

Large inequities in lost years of healthy life
Non-Pharmacological

Smoking Cessation
Exercise
Pulmonary Rehabilitation
Breathing Control
Sputum Control
Nutrition
Assisted Ventilation
Interventional
E-cigarettes

Probably less harmful than smoking; but are not risk free.

Useful aid in the setting of a supportive smoking cessation program.

Long term safety unknown.

People using e-cigarettes should be advised to stop them as soon as possible.

No e-cigarette or vape is currently approved as a smoking cessation tool.
Using a spacer

If you use a metered dose inhaler (MDI), a spacer will help get the correct dose of medication into your lungs.

Ask your healthcare professional about a spacer, they can provide them free of charge. If you don’t already have one, you need one. Spacers increase your medications effectiveness.

1. Shake the inhaler well (holding it upright)

2. Fit the inhaler into the opening at the end of the spacer

3. Seal lips firmly around the mouthpiece, press the inhaler once only

4. Take 4-6 slow breaths in and out through your mouth. Do not remove the spacer from your mouth between breaths

5. Repeat steps 1-4 for further doses

Washing your spacer

Wash your spacer once a week with warm water and dishwashing liquid.

Do not rinse, drip dry to ensure that your medicine gets into your lungs and doesn’t stick to the sides of the spacer.

This COPD Action Plan belongs to:

Better Breathing, Better Living

Produced by Asthma and Respiratory Foundation NZ
info@asthmaandrespiratory.org.nz
asthmaandrespiratory.org.nz

1. Stop what you are doing
2. Find a resting position
3. Use your fan, or the breeze
4. Begin your preferred breathing technique for 2-3 minutes

My Breathlessness Plan

If you are still feeling breathless, follow your Action Plan on the next page

Remember
- Keep your action plan up to date
- Make sure your inhalers aren’t empty or expired
- Take your medications as prescribed
- Ensure you always carry your reliever
- Regularly check your inhaler technique with your healthcare professional

Long term home oxygen and flow rate L/min

I am happy for this plan to be shared with other healthcare providers
I have an Advance Care Plan
I am a known CO₂ retainer

About Me
(tick all that apply)
# Know your COPD symptoms

**When I am well my ‘normal’ is:**
- I have a usual amount of cough/phlegm.
- I can do my usual activities.

**Exercise/activity**
- % breathing room air

**Oxygen Satuations**

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## Know when and how to take your medicine

**Reliever:**
- **[name]**
- puffs every morning
- puffs every night
- puffs every morning
- puffs every night
- puffs when you need it to relieve your symptoms

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## These signs suggest my COPD is worse:

- I am more breathless
- I need my reliever medicine more often
- I am more tired / lethargic
- I am losing my appetite
- I may have signs of a fever (hot/cold flushes, temperature)

**What should I do?**
- Breathing control techniques
- Energy conservation techniques
- Chest clearance
- Take reliever inhaler regularly (for example every 4 hours)
- Make an appointment to see my Primary Health Care team within 3 days

**Start prednisone:**

<table>
<thead>
<tr>
<th>[name]</th>
<th>mg</th>
<th>for</th>
<th>days</th>
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</table>

**If I have all of the following symptoms it is a sign of a chest infection:**
- There is an increase in the amount of phlegm
- My phlegm has changed to a darker colour
- I am more breathless than usual

**Start antibiotics for signs of a chest infection:**

**Important:** You need to see a doctor today

**Other instructions:**

---

## I’m extremely unwell

**What should I do?**
- Dial 111 for an ambulance or press your medical alarm button
- Take extra reliever as needed until the ambulance arrives
- Breathing control techniques

**Plan prepared by:**

**Next review date:**

**Signature:**

---

nzrespiratoryguidelines.co.nz
BREATHLESSNESS QUICK REFERENCE

CONSERVE YOUR ENERGY & PACE YOURSELF
- Plan your day: Will I have time for a break?
- Prioritise tasks: What’s most important?
- Adapt tasks: Can it be done easier?
- Delegate: Can someone else help?

USE A FAN
- Use a handheld fan, freestanding fan, a desktop fan, or the breeze through an open door or window. Hold the fan about 15 centimetres from your face so you can feel the air on your top lip.

CHANGE YOUR POSITION
- Lean forward with arms resting on your knees or the sides of a chair and position knees slightly apart.
- Lean forward over a table or surface resting on your arms up on some pillows or similar.
- Lean forward with arms resting on a surface near supermarket trolley, or back of a chair. Alternately rest standing with your back against a wall.

BREATHING TECHNIQUES
- Breathing Into/Out of a Tummy: Place hands on tummy, breathe in (tummy goes out), breathe out (tummy goes in).
- Pursed-Lip Breathing: Breathe in through your nose, breathe out like you are making a whistle sound.
- How to do it: Breathe in before exerting effort, breathe out while making the effort.
- Paced Breathing: Breathe in for a few counts, breathe out for a few counts.
- Breathe around the rectangle.

DISTRACTION & MEDITATION
- Focus on things that bring you pleasure or calmness, such as mindfulness or meditation.

EXERCISE
- Regular activity should be done in moderation.
- Ask to be referred to your local pulmonary rehabilitation program.

TAKE YOUR MEDICATION
- Use your prescribed medication as directed. If you have difficulty managing your breathlessness, talk to your healthcare professional as there may be other medications that may help.

WHEN FEELING BREATHLESS...
- Stop what you’re doing.
- Rest your position.
- Use your fan.
- Start your breathing technique.
Pharmacological Management

Key Points:

- Review inhaler technique, device suitability, and adherence regularly and before any medication changes.
- Prescribe on class, find the device that is best for the patient.
- SABA and/or SAMA can be used for symptom relief.
- Start with LAMA.
- Escalate to LABA/LAMA if LAMA does not control breathlessness/exacerbations.
Pharmacological Management

The main role for ICS is to prevent exacerbations in patients with frequent exacerbations.

Higher blood eosinophils are associated with a greater response to ICS and may identify patients who should receive ICS/LABA in preference to LABA/LAMA.

Patients with Asthma/COPD overlap should always receive ICS.

Withdraw ICS: carefully, with 4-6 week review and usually only if blood eosinophils <0.3.
Figure S5. Rate of moderate or severe COPD exacerbations by blood eosinophil count (modified intent-to-treat population).

Banded areas indicate 95% confidence intervals. BFF MDI denotes budesonide/formoterol fumarate metered dose inhaler; BGF MDI budesonide/glycopyrrlate/formoterol fumarate metered dose inhaler; COPD chronic obstructive pulmonary disease; GFF MDI glycopyrrolate/formoterol fumarate metered dose inhaler.

Lancet Respir Med 2019
Published Online
July 4, 2019
http://dx.doi.org/10.1016/S2213-2600(19)30190-0
# Simplified maintenance inhaler management of COPD

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<th>When Treating</th>
<th>Start with</th>
<th>If needed, move on to</th>
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<tbody>
<tr>
<td>COPD without Frequent exacerbations</td>
<td>LAMA</td>
<td>LABA/LAMA</td>
</tr>
<tr>
<td>COPD with Frequent exacerbations</td>
<td>LAMA</td>
<td>LABA/LAMA (consider ICS/LABA if eosinophilia) then LABA/LAMA/ICS</td>
</tr>
<tr>
<td>Asthma/COPD Overlap</td>
<td>ICS/LABA</td>
<td>ICS/LABA plus LAMA</td>
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Consider

Prophylactic macrolide if recurrent infective exacerbations (evidence for azithromycin and erythromycin) – refer to secondary care provider
Do Not*

Do not routinely prescribe a SAMA to patients on a LAMA
Do not prescribe long-term oral corticosteroids as maintenance therapy for COPD
Do not routinely prescribe theophylline
Do not use short-term response to bronchodilator (eg, reversibility testing) to predict benefit from long-term bronchodilator therapy
Do not routinely prescribe nebulised therapy in patients with stable COPD
Do not withdraw ICS in patients with asthma/COPD overlap or raised blood eosinophils

* Do not recommendations are intended as guidance to highlight prescribing practices that are rarely appropriate. Clinicians must consider the circumstances of individual patients to decide whether they apply in a specific case.
Acute Management

Bronchodilators:
Use after breath-control techniques
SABA/SAMA – MDI + spacer (recommended), dry powder, or neb
One actuation followed by 4-6 tidal breaths
Bronchodilator effect: 8-10 puffs = 5mg neb
We recommend 5 puffs MDI (or 2.5mg neb)
If neb – make it air driven
HOSPITAL MANAGEMENT OF ACUTE EXACERBATION OF COPD

Assess severity

Moderate OR Severe
- More short of breath than usual
- Able to speak in sentences
- Usually have wheeze
- Some chest/neck indrawing
- SpO2 near usual level
- Normal level of consciousness
- Very short of breath
- Only a few words per breath
- Severe chest/neck indrawing
- Tripod positioning
- SpO2 well below their usual level
- May be agitated

Life-threatening OR Imminent respiratory arrest
- Extremely short of breath
- Unable to speak
- May not have a wheeze
- May be no chest/neck indrawing
- SpO2 rapidly falling
- Severe agitation and/or falling level of consciousness

Initial Management
- Salbutamol via inhaler & spacer, up to 5 individual puffs
- Controlled oxygen, if needed, aiming for SpO2 88-92%
- Oral prednisone 40mg
- Oral antibiotics if change in sputum or evidence of infection
- Air-driven nebuliser: Salbutamol 2.5mg AND Ipratropium 500mcg
- Controlled oxygen, aiming for SpO2 88-92%
- Oral prednisone 40mg
- Oral antibiotics if change in sputum or evidence of infection
- Air-driven nebuliser: Salbutamol 2.5mg AND Ipratropium 500mcg

Reassess after 15 - 30 minutes
- Good response to initial management?

Responding?

NO

General Considerations
In patients not responding to treatment, consider alternative diagnoses (heart failure, acute coronary disease, pneumonia, pneumothorax, pulmonary embolus). Suggested investigations:
- Chest X Ray and ECG
- Biomarkers (troponin, BNP, +/- d-dimer where appropriate)
**Responding?**

NO

Continue treatment and reassess after 2 hours
- Good response to initial management?
- Not breathless or tachycardic at rest?
- Able to manage/adequate support at home?

is admission required

NO: Patient responding and discharge appropriate
YES: Patient responding, but discharge not currently appropriate

At Discharge
- Provide education and updated COPD action plan
- Ensure clear follow-up plans are in place
- Primary care follow-up within 2 weeks
- Ensure that there is sufficient support at home
- Refer to pulmonary rehabilitation unless completed recently or contra-indicated
- Prescribe prednisone and antibiotics if indicated, to complete course.

Discharge Patient

YES: Patient deteriorating

Consider NIV
In all patients with life-threatening exacerbation or who are requiring supplementary oxygen:
- Obtain arterial blood gas and assess for hypercapnic respiratory failure
- Consider any advance care plan, and patient/whānau preferences

Is NIV indicated?

NO

At Discharge
- Provide education and updated COPD action plan
- Ensure clear follow-up plans are in place
- Primary care follow-up within 2 weeks
- Ensure that there is sufficient support at home
- Refer to pulmonary rehabilitation unless completed recently or contra-indicated
- Prescribe prednisone and antibiotics if indicated, to complete course.

Discharge Patient

YES

Continue treatment
- Repeat Salbutamol 2.5mg nebuliser as needed
- Step down to SABA via inhaler & spacer once stabilised

Document resuscitation status and consider ceiling of care for all patients

Ongoing management:
- Complete 5 days of prednisone
- Complete 5 to 7 days of antibiotics, if indicated
- Salbutamol as-needed via inhaler & spacer
- Continue regular inhalers unless contraindicated

Consider:
- Sputum clearance
- Early Mobilisation

Admit Patient
After an exacerbation

Review:
Inhaler technique
Action Plan
Breathlessness Plan
Pulmonary rehabilitation
Identify and Manage Comorbidities
Is Advanced Care Planning appropriate?
GOLD changes 2023

- Slightly changed definition- no change to clinical practice
- Simplified ABCD groups to ABE, which matches NZ guidelines
- Suggested naming ‘etiotypes’:

![Initial Pharmacological Treatment Diagram](image)
<table>
<thead>
<tr>
<th>Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Genetically determined COPD (COPD-G)</td>
<td>Alpha-1 antitrypsin deficiency (AATD)</td>
</tr>
<tr>
<td></td>
<td>Other genetic variants with smaller effects acting in combination</td>
</tr>
<tr>
<td>COPD due to abnormal lung development (COPD-D)</td>
<td>Early life events, including premature birth and low birthweight, among others</td>
</tr>
<tr>
<td>Environmental COPD</td>
<td></td>
</tr>
<tr>
<td>Cigarette smoking COPD (COPD-C)</td>
<td>- Exposure to tobacco smoke, including in utero or via passive smoking</td>
</tr>
<tr>
<td></td>
<td>- Vaping or e-cigarette use</td>
</tr>
<tr>
<td></td>
<td>- Cannabis</td>
</tr>
<tr>
<td>Biomass and pollution exposure COPD (COPD-P)</td>
<td>Exposure to household pollution, ambient air pollution, wildfire smoke, occupational hazards</td>
</tr>
<tr>
<td>COPD due to infections (COPD-I)</td>
<td>Childhood infections, tuberculosis-associated COPD, WHIV-associated COPD</td>
</tr>
<tr>
<td>COPD &amp; asthma (COPD-A)</td>
<td>Particularly childhood asthma</td>
</tr>
<tr>
<td>COPD of unknown cause (COPD-U)</td>
<td></td>
</tr>
</tbody>
</table>

*Adapted from Colli et al. (2022) and Stols et al. (2022)*
Key Messages for COPD

1. Culturally appropriate education
2. Good quality Spirometry is key
3. Smoking cessation remains number one
4. Pulmonary Rehabilitation should be offered to all COPD patients and particularly post-exacerbation
5. LAMAs are first step, then LAMA/LABA
6. Add ICS if ongoing exacerbations, particularly if eosinophils (≥0.3)
ANY QUESTIONS?
RESERVE SLIDES AFTER THIS POINT
Specific allergy issues

• Allergy requires a history of reaction to an allergen plus detection of specific IgE antibodies, either on serum or by skin prick testing (SPT).

• SPT has a high negative predictive value and a low risk of systemic allergic reactions, but serum specific IgE may be more appropriate in certain settings.

• Aeroallergens such as house dust mite, pollens or pet danders are most likely to be allergic triggers for asthma.
• Consider testing for allergen-specific IgE to aeroallergens in patients with allergic asthma.

• Allergen immunotherapy (AIT) can be considered in patients with allergic asthma and allergic rhinitis who have evidence of allergy to HDM and/or pollens.

• All patients with asthma and food-related anaphylaxis should be referred to an immunologist/allergist.
### Acute asthma management

**Table 6: Levels of severity of acute asthma exacerbation.**

| Mild/moderate asthma exacerbation: | • Increasing symptoms  
• FEV1 or PEF >50% best or predicted  
• No features of acute severe asthma |
|-----------------------------------|-------------------------------------------------------------------------------------|
| Acute severe asthma:              | Any one of:  
• FEV1 or PEF 30-50% best or predicted  
• Respiratory rate ≥25/min  
• Heart rate ≥110/min  
• Inability to complete sentences in one breath |
| Life-threatening asthma:          | Any one of the following in a patient with severe asthma:  
• FEV1 or PEF <30% best or predicted  
• SpO₂ <92% or PaO₂ <60mmHg  
• PaCO₂ ≥45mmHg  
• Inability to talk#  
• Silent chest#  
• Cyanosis#  
• Feeble respiratory effort, exhaustion#  
• Hypotension or bradycardia# |

#These are very late manifestations and reflect a patient at risk of imminent respiratory arrest.
Box 1: Key messages for non-pharmacological management of COPD.

A four-step consultation plan for COPD is shown in Appendix 1.

Recommendations:
• Smoking cessation is the most important component of management, and every patient who is still smoking should be offered help to quit.
• Offer pulmonary rehabilitation to all patients with COPD.
• Promote regular exercise (20–30 minutes per day).
• Address obesity and under-nutrition.
• Some patients will benefit from review by a respiratory physiotherapist and breathing exercises.
• Individual breathlessness plans, including handheld fan therapy, can help manage symptoms.
• A subset of carefully selected patients may benefit from thoracic surgery, endobronchial valve therapy or referral for transplantation. These options should be considered as part of respiratory specialist review in secondary care.
**Box 2: Key messages for pharmacological management of COPD.**

A suggested four-step consultation plan for COPD is shown in Appendix 1.

Recommendations:
- Inhaler technique, device suitability, and adherence to treatment should be reviewed regularly and before any medication changes.
- SABAs and SAMA can be used for symptom relief.
- We suggest a LAMA as the first-line long-acting bronchodilator, both for breathlessness and reduction of exacerbation risk.
- Escalate to LABA/LAMA if LAMA does not control breathlessness/exacerbations.
- The main role for ICS is to prevent exacerbations in patients with frequent exacerbations.
- Higher blood eosinophils are associated with a greater response to ICS and may identify patients who should receive ICS/LABA in preference to LABA/LAMA.
- Patients with Asthma/COPD overlap should receive ICS irrespective of blood eosinophils, lung function, and exacerbation frequency: preferably as combination ICS/LABA.
- Within each drug class, choice of treatment should be guided by a patient’s preference for inhaler device.
- Treatment may be escalated more quickly for patients with severe COPD or frequent exacerbations.
- Provide all patients with a written/electronic personalised COPD action plan (see appendix)
Do not*:

- Do not routinely prescribe a SAMA to patients on a LAMA.
- Do not prescribe long-term oral corticosteroids as maintenance therapy for COPD.
- Do not routinely prescribe theophylline.
- Do not use short-term response to bronchodilator (eg, reversibility testing) to predict benefit from long-term bronchodilator therapy.
- Do not routinely prescribe nebulised therapy in patients with stable COPD.
- Do not withdraw ICS in patients with asthma/COPD overlap or raised blood eosinophils.

*Do not recommendations are intended as guidance to highlight prescribing practices that are rarely appropriate. Clinicians must consider the circumstances of individual patients to decide whether they apply in a specific case.
**Box 3: Criteria for oxygen.**

Criteria for supply of long-term oxygen therapy (LTOT):

- Assess when the patient’s respiratory condition is stable—at least six weeks after hospital discharge or an acute respiratory illness.
- Arterial oxygen tension ($\text{PaO}_2$) (measured by arterial blood gas) less than 7.3kPa (55mmHg) indicates the need for long-term oxygen (oxygen saturation usually <88%).
- $\text{PaO}_2$<8.0kPa (60mmHg) (oxygen saturation up to 91%) may also be an indication for long-term oxygen if there is evidence of polycythaemia (haematocrit > 0.55) and/or cor pulmonale/right heart failure.

Criteria for oxygen in palliative care:

- Terminal illness with a life expectancy less than 3 months
- Oxygen saturation $\text{SpO}_2$ <90%
- Dyspnoea not adequately controlled by optimal treatment for dyspnoea and pain (physiotherapy, narcotics, anxiolytics)

*There is a fire risk associated with oxygen use and smoking or other flammable sources such as gas appliances, open flames and vaping devices. Current smoking, use of heated tobacco, e-cigarettes, or vaping devices are absolute contra-indications to $O_2$ supply.*
**Box 4:** Key messages for exacerbation management in COPD.

Recommendations:

- Early diagnosis and prompt management of exacerbations of COPD may prevent functional deterioration and reduce hospital admissions.
- Most mild to moderate exacerbations can be managed at home.
- Short-acting inhaled beta$_2$ agonists with or without short-acting anti-muscarinics are the initial bronchodilators of choice to treat an acute exacerbation.
- Give short course oral corticosteroids (eg, prednisone 40mg once daily for five days).
- Give short-course antibiotics for purulent sputum and/or other evidence of infection.
- Titrate oxygen to target saturations of 88–92%
- Non-invasive ventilation (NIV) reduces mortality in patients with hypercapnic respiratory failure due to an acute exacerbation of COPD.
- Careful discharge planning and referral to pulmonary rehabilitation may reduce the risk of future exacerbations and admissions.
Box 5: Principles of management of asthma–COPD overlap.

- There are no data to support the use of ICS alone in asthma–COPD overlap.
- Data from asthma trials suggest that LABA monotherapy may be harmful.
- Observational evidence suggests that ICS combined with long-acting bronchodilators should be the mainstay of therapy in ACO.
- Non-pharmacological approaches to the management of COPD are also recommended in people with ACO (eg, smoking cessation, vaccinations, exercise, pulmonary rehabilitation and treatment of comorbidities).
- ICS withdrawal is not recommended in patients with ACO, due to possible increases in exacerbations and mortality.
WHEN FEELING BREATHLESS...

Stop what you are doing

Find a resting position

Use your fan or the breeze

Choose your preferred breathing technique, & continue for 2-3 minutes

AFTER 2-3 MINUTES EVALUATE YOUR BREATHLESSNESS

Are you feeling less breathless and more in control?

Yes: Continue with your activity

OR

No: Take reliever medication through a spacer, then resume breathing technique for another 2-3 minutes

If you still feel no better, then assess whether you need to seek medical help
## Results: Demographics

<table>
<thead>
<tr>
<th></th>
<th>Mean (SD)</th>
<th>Median (IQR)</th>
<th>Min to Max</th>
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<tbody>
<tr>
<td>Age (years) N=760</td>
<td>47.19 (18.92)</td>
<td>47 (32 to 61)</td>
<td>16 to 94</td>
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<tr>
<td>Number of previous admissions, N=167(^1)</td>
<td>3.37 (2.54)</td>
<td>2 (2 to 4)</td>
<td>1 to 15</td>
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</table>

<table>
<thead>
<tr>
<th></th>
<th>N/760^2</th>
<th>%</th>
</tr>
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<tbody>
<tr>
<td>Sex (Female)</td>
<td>541</td>
<td>71</td>
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<td>Ethnicity</td>
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<tr>
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<td>5</td>
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<tr>
<td>Other</td>
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<tr>
<td>≥3 courses prednisone in the last 12 months</td>
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<td>28</td>
</tr>
<tr>
<td>Admitted in previous 12 months</td>
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<td>32</td>
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<tr>
<td>Current smoker</td>
<td>213</td>
<td>28</td>
</tr>
<tr>
<td>Severe asthma treatment (Yes)</td>
<td>112/534</td>
<td>21</td>
</tr>
</tbody>
</table>

\(^1\)In those with a previous admission \(^2\) Unless otherwise specified
Standard 3

Patients should receive systemic steroids for at least 5 days.

86% (80 to 93)
Standard 4

People admitted to hospital with asthma should be commenced on an inhaled corticosteroid if they were not on this previously.

48% (40 to 58)
Standard 5

Adherence to prescribed long-term asthma treatment should be assessed in all patients.

44% (39 to 49)
Standard 6

Inhaler technique should be reviewed in all patients.

34% (30 to 39)
Standard 7

Patients who have more than one hospital admission for asthma exacerbation within 12 months should be assessed by a specialist respiratory physician, respiratory nurse, or respiratory nurse specialist.

42% (34 to 52)
Standard 9

Prior to discharge patients should receive a written personalised asthma management plan.

23% (19 to 26)
Standard 10

Patients who are admitted for an asthma exacerbation should be recommended to have a planned review by a healthcare professional within 2 weeks of discharge.

27% (24 to 31)
Comorbidities/Treatable Traits

Identify and Manage Comorbidities:
Lung Cancer
Cardiac Disease
Mental Health – anxiety and depression
Bronchiectasis
ILD
Others: GORD, Allergic Rhinitis, OSA/OHS