Assessing Shortness of Breath

Cameron White

Common Questions after hours

- “Oh Hi, so and so has desaturations can you come see them”
- “Hi, this patient’s respiratory rate is in the yellow zone, can you please come review”
- “Oh this patient is in BTF, but is working hard to breath”

Dyspnea

- Subjective Experience
- Breathing discomfort
- Interactions among multiple physiological, psychological, social and environmental factors

Causes

- Lungs
  - Central
  - Pump causes
  - Gas exchange causes
- Heart
  - Ischemia
  - Systolic dysfunction
  - Valve disorders
  - Pericardial disease
  - Anemia
- Could be both!

Look, see and feel

- Look at the patient (ABCD)
  - A – is the patient talking ? Sentences? Phrases? Words – if not stridor?
    - Get help if stridor
  - B
    - Respiratory rate
    - Saturations (on how much oxygen?)
    - Crackles (pneumonia / oedema)
    - Wheeze (Cardiac and Pulmonary wheeze)
    - Percussion
    - The type of breathing (purse lip?)
  - C
    - JVP , peripheral edema, tachycardia, BP (low+high)
  - D
    - Work of breathing , obesity, temperature, GCS, Cyanosis

History (if able to get)

- Symptoms
  - Decreases exercise tolerance (walking to the bathroom, ?SOB)
  - PND
  - How many pillows do you sleep on
  - ?recent infections ?sputum changes ?Cough ?fever
  - Pleuritic chest pain / chest pain / chest tightness (asthma)
- Dyspnea duration important
  - Acute minute to hours
    - Lungs
      - PE
      - Pneumothorax
      - Infections
      - Aspiration
    - Heart
      - MI
      - Heart Failure
      - Tamponade

History

- Hx of COPD
  - Can look at puffers (usually a LABA/ICS and LAMA)
- Hx of Asthma
- Hx of Bronchiectasis
- Hx of heart failure
  - ?LVEF
- Hx of fluid intake
  - Patient with sepsis, litre and litre of fluid and no output
  - Goes somewhere else
- Medication Hx!!!!!

Investigations

- Blood Gas (ideally ABG)
  - Tells you so much!
  - A-a gradient (the bigger the gap the more diffusion problem there is)
  - Acidosis / Alkalosis ?Resp or metabolic
  - Hypoxia, hypercarbia
  - Call for help if patient pH <7.30 – 7.25
- Chest X-Ray
  - Pneumothorax
  - Pulmonary edema
  - Pneumonia
  - Aspiration
  - Massive pleural effusion

Investigations

- Bloods
  - FBC - Anemia
  - BNP
    - If it's negative highly unlikely to be heart failure (90%)
  - CRP can direct you whether it's sepsis
  - D-dimer (wells scores, PERC scores)
- ECG
  - Ischemia, ST changes
  - Sinus Tachycardia (not s1q3t3)
- Gold stars (best consult gifts)
  - Previous spirometry
  - Ward spirometry (probably never going to happen)
  - Peak flow meters

Lungs – “Air goes in and out”

- Controller problems
  - “Air Hunger”
  - Hypoxia
  - Hypercapnia (due to ventilation / perfusion mismatch)
  - Sepsis / other drugs (drive to expel waste and compensate) / DKA compensation
- Pump problems
  - COPD (purse lip breathing to open up airway secondary to increase airway resistance)
  - Chest wall problems
    - Broken ribs
    - Kyphoscoliosis
    - Muscle problems
  - Asthma

Lung

- Gas exchanger
  - Alveoli where oxygen and Co2 diffuses
    - Pulmonary Fibrosis
    - PE
    - Pneumonia
    - APO
    - Atelectasis
    - Sputum Plugging

Heart - Blood goes round and round

- Heart failure
  - Pulmonary edema from poor ejection fraction and fluid +++
  - Heart failure from tamponade
  - Valve disease
  - Patient is in rapid AF and poor ejection fraction
  - Hypertensive heart failure
  - HFpEF
  - MI causing heart failure

You can only say it’s anxiety when you have ruled out all other organic cause!

Treatment

- COPD
  - Steroids (know whether pt been on steroids, may need more)
  - Bronchodilators (Ventolin q2 – 3 hourly, can use q15min if exac + Atrovent)
  - Please if use Atrovent, cease Spiriva + Vice Versa
  - Wean if patient is better
  - O2 is important even CO2 retainer
  - Call for help if unable to manage
- Asthma
  - Similar recipe
  - However if you can't "stretch" patients, call for help

Others

- Heart Failure
  - LMNOP
  - Call for help

Common Questions after hours

- “Oh Hi, so and so has desaturations can you come see them”
  - Pulmonary edema
  - Pneumonia
  - PE
  - COPD, Asthma
  - Hypoventilation
  - Hypo-perfusion
  - Or… bad trace (get an ABG)

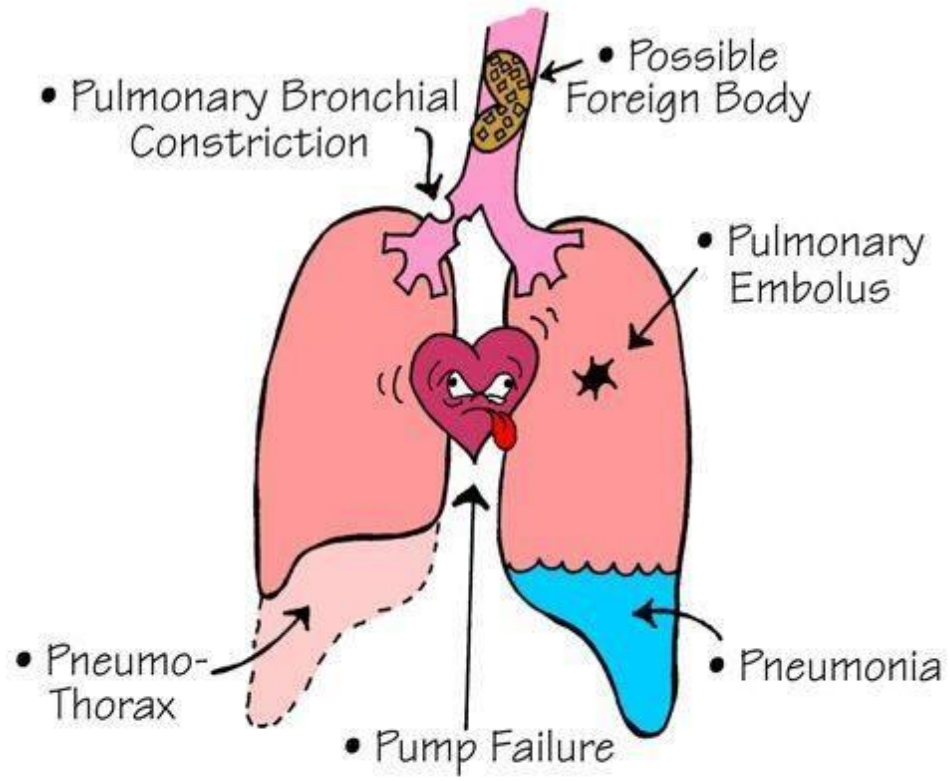
Question 2

- “Hi, this patient’s respiratory rate is in the yellow zone”
  - Look at the patient ?respiratory distress or comfortable
  - Call help if distress
  - Increase RR usually sign of patient is sick
    - Pneumonia
    - Pulmonary Edema
    - PE
    - Pneumothorax
    - ?underlying sepsis / metabolic compensation
    - COPD /Asthma
    - Or maybe just very anxious from being sick getting stuck in hospital….

Question 3

- Oh this patient is in BTF, but is working hard to breath”
  - Call for help
  - Again, the above differentials

6-Ps OF DYSPNEA



CXR

- ?Approach

CXR

- Initial review – who, when, why, where, when
- Lines and tubes
- A – airway
- B – breathing (lungs and pleural spaces)
- C – circulation
- D – disability (bones)
- E – everything else

- APO - ABCDE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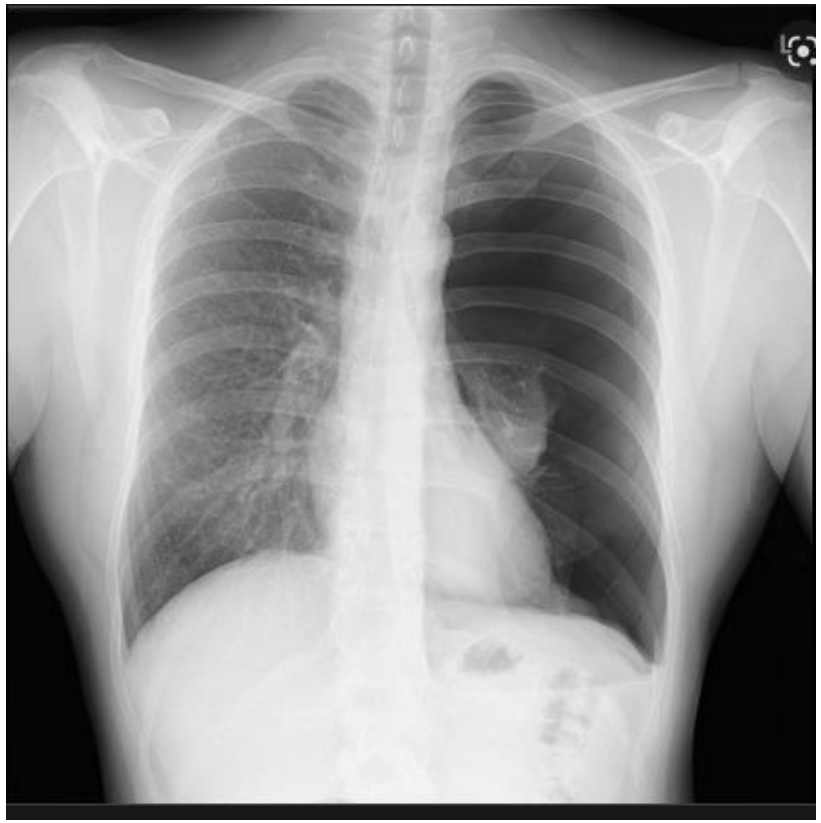
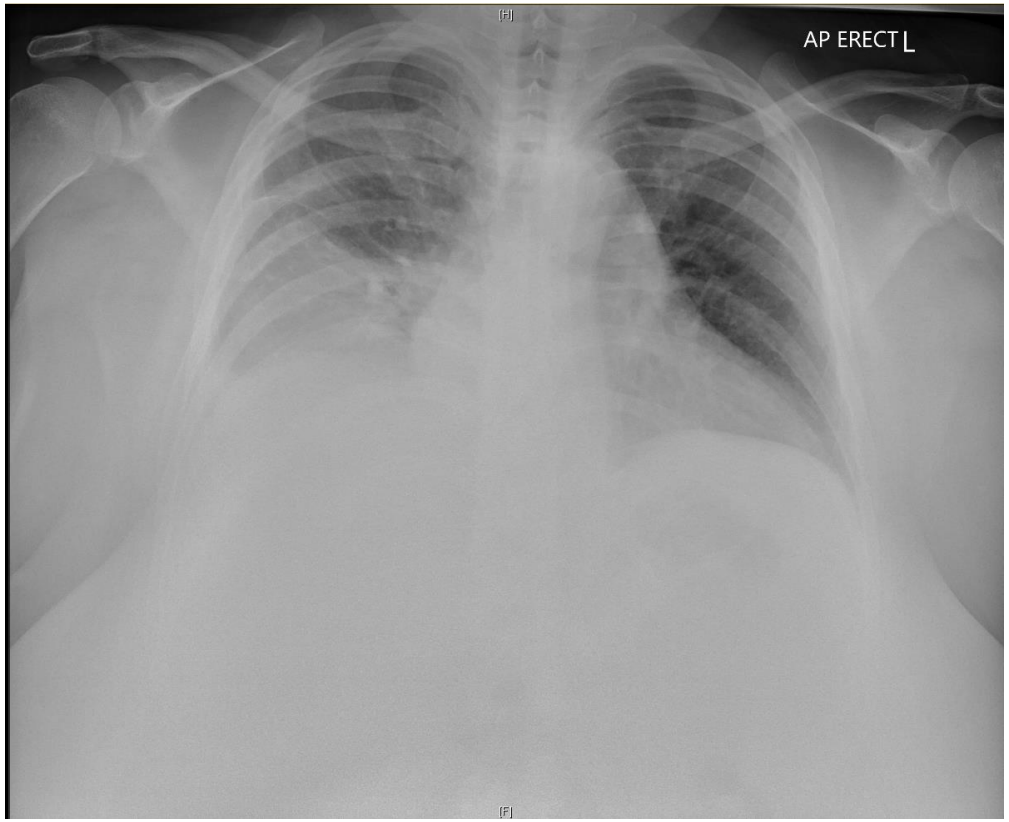
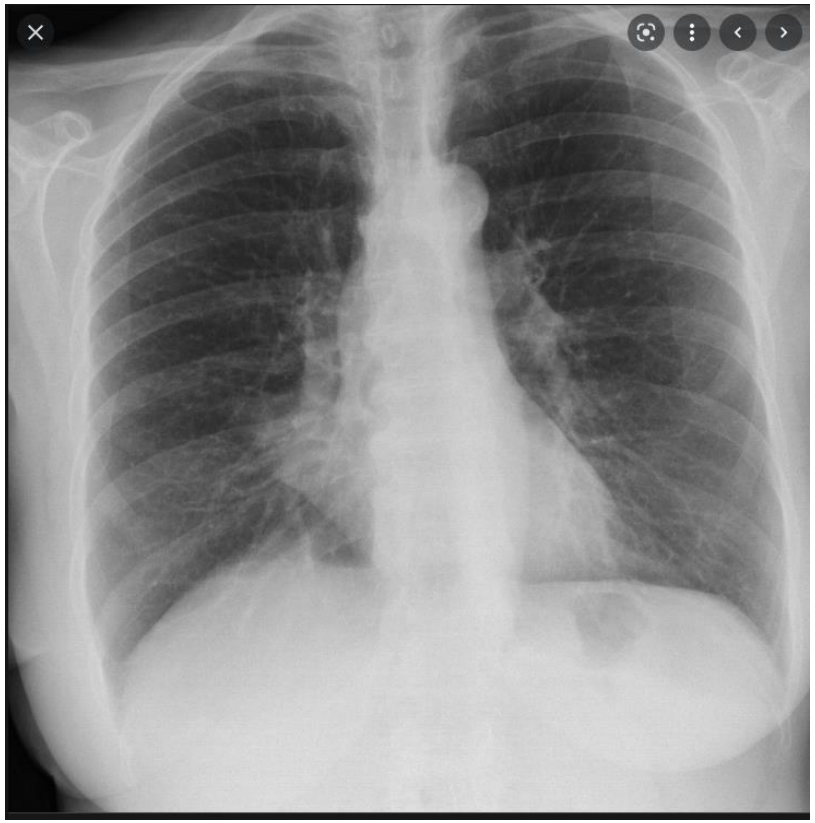



AP ERECT L

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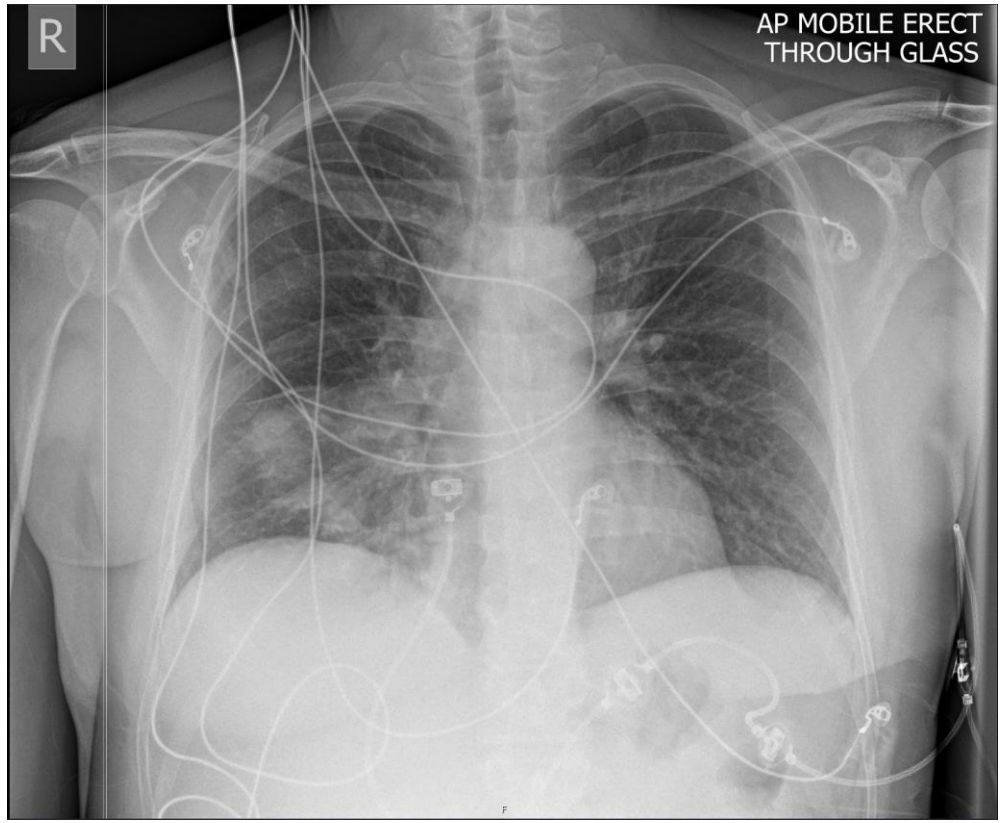
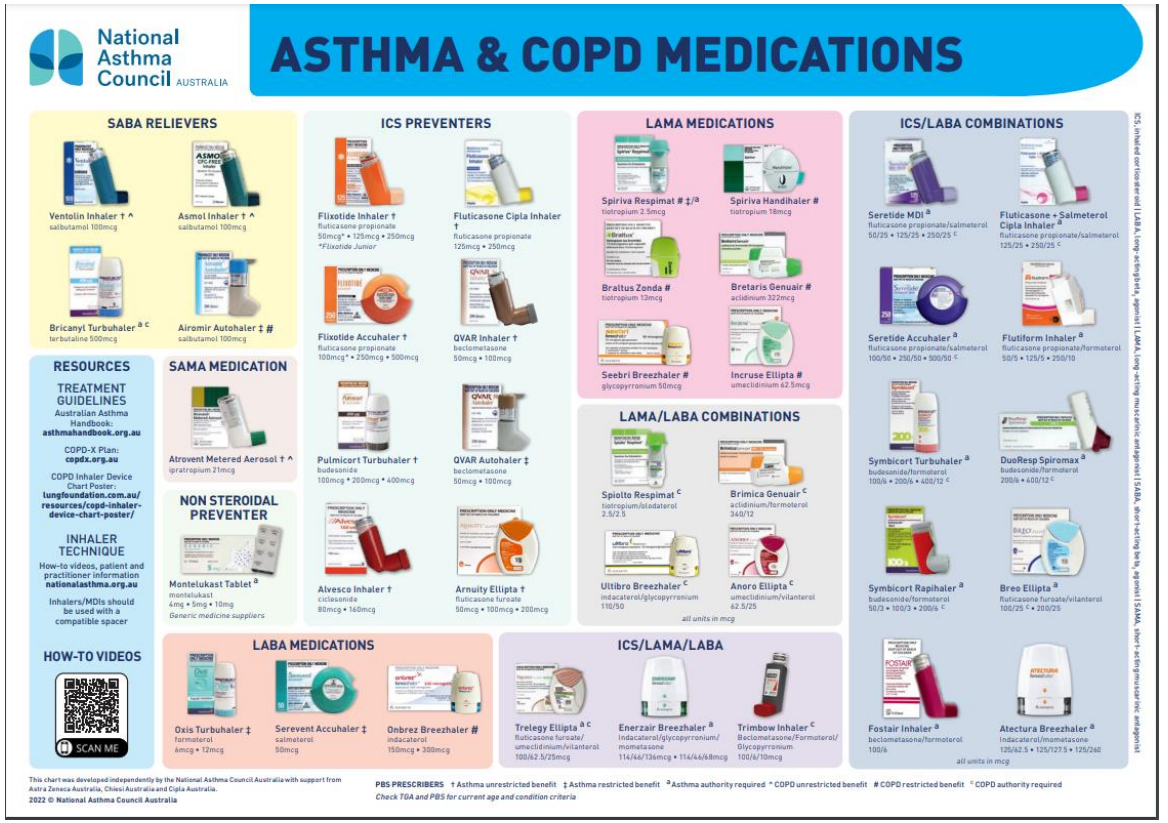

R
AP MOBILE ERECT
THROUGH GLASS

Acute management

- Oxygen
  - How much?
  - Too much?
  - What device should I use?
  - It’s not getting any better?

Acute management

- Bronchodilators
  - What are all these random names?
  - How much should I use/how often?
  - Too much of a good things?
  - SMART therapy
  - COPD – who needs inhaled steroids?


National Asthma Council AUSTRALIA
ASTHMA & COPD MEDICATIONS
SABA RELIEVERS
Ventolin Inhaler † ^
salbutamol 100mcg
Asmol Inhaler † ^
salbutamol 100mcg
Bricanyl Turbuhaler a c
terbutaline 500mcg
Airomir Autohaler ‡ #
salbutamol 100mcg
ICS PREVENTERS
Flixotide Inhaler †
fluticasone propionate
50mcg* • 125mcg • 250mcg
*Flixotide Junior
Fluticasone Cipla Inhaler †
fluticasone propionate
125mcg • 250mcg
Flixotide Accuhaler †
fluticasone propionate
100mcg* • 250mcg • 500mcg
QVAR Inhaler †
beclometasone
50mcg • 100mcg
Pulmicort Turbuhaler †
budesonide
100mcg • 200mcg • 400mcg
QVAR Autohaler ‡
beclometasone
50mcg • 100mcg
Alvesco Inhaler †
ciclesonide
80mcg • 160mcg
Arnuity Ellipta †
fluticasone furoate
50mcg • 100mcg • 200mcg
LAMA MEDICATIONS
Spiriva Respimat # ‡ a
tiotropium 2.5mcg
Spiriva Handihaler #
tiotropium 18mcg
Braltus Zonda #
tiotropium 13mcg
Bretaris Genuair #
aclidinium 322mcg
Seebri Breezhaler #
glycopyrronium 50mcg
Incruse Ellipta #
umeclidinium 62.5mcg
LAMA/LABA COMBINATIONS
Spiolto Respimat c
tiotropium/olodaterol
2.5/2.5
Brimica Genuair c
aclidinium/formoterol
340/12
Ultibro Breezhaler c
indacaterol/glycopyrronium
110/50
Anoro Ellipta c
umeclidinium/vilanterol
62.5/25
all units in mcg
ICS/LABA COMBINATIONS
Seretide MDI a
fluticasone propionate/salmeterol
50/25 • 125/25 • 250/25 c
Fluticasone + Salmeterol Cipla Inhaler a
fluticasone propionate/salmeterol
125/25 • 250/25 c
Seretide Accuhaler a
fluticasone propionate/salmeterol
100/50 • 250/50 • 500/50 c
Flutiform Inhaler a
fluticasone propionate/formoterol
50/5 • 125/5 • 250/10
Symbicort Turbuhaler a
budesonide/formoterol
100/6 • 200/6 • 400/12 c
DuoResp Spiromax a
budesonide/formoterol
200/6 • 400/12 c
Symbicort Rapihaler a
budesonide/formoterol
50/3 • 100/3 • 200/6 c
Breo Ellipta a
fluticasone furoate/vilanterol
100/25 c • 200/25
Fostair Inhaler a
beclometasone/formoterol
100/6
Atectura Breezhaler a
indacaterol/mometasone
125/62.5 • 125/127.5 • 125/260
all units in mcg
RESOURCES
TREATMENT GUIDELINES
Australian Asthma Handbook:
asthmahandbook.org.au
COPD-X Plan:
copdx.org.au
COPD Inhaler Device Chart Poster:
lungfoundation.com.au/resources/copd-inhaler-device-chart-poster/
INHALER TECHNIQUE
How-to videos, patient and practitioner information
nationalasthma.org.au
Inhalers/MDIs should be used with a compatible spacer
HOW-TO VIDEOS
SCAN ME
SAMA MEDICATION
Atrovent Metered Aerosol † ^
ipratropium 21mcg
NON STEROIDAL PREVENTER
Montelukast Tablet a
montelukast
4mg • 5mg • 10mg
Generic medicine suppliers
LABA MEDICATIONS
Oxis Turbuhaler ‡
formoterol
6mcg • 12mcg
Serevent Accuhaler ‡
salmeterol
50mcg
Onbrez Breezhaler #
indacaterol
150mcg • 300mcg
ICS/LAMA/LABA
Trelegy Ellipta a c
fluticasone furoate/umeclidinium/vilanterol
100/62.5/25mcg
Enerzair Breezhaler a
indacaterol/glycopyrronium/mometasone
114/44/136mcg • 114/44/68mcg
Trimbow Inhaler c
Beclometasone/Formoterol/Glycopyrronium
100/6/10mcg
ICS: inhaled corticosteroid | LABA: long-acting beta2 agonist | LAMA: long-acting muscarinic antagonist | SABA: short-acting beta2 agonist | SAMA: short-acting muscarinic antagonist
This chart was developed independently by the National Asthma Council Australia with support from Astra Zeneca Australia, Chiesi Australia and Cipla Australia.
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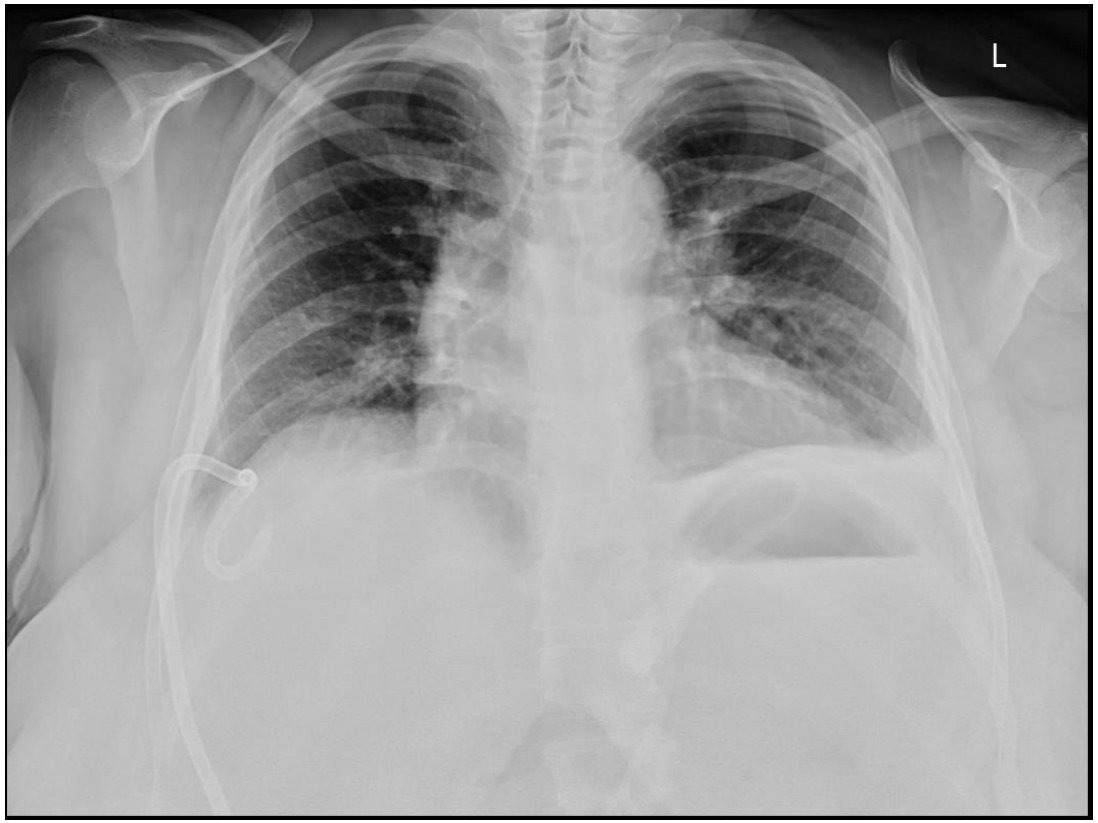
PBS PRESCRIBERS † Asthma unrestricted benefit ‡ Asthma restricted benefit a Asthma authority required ^ COPD unrestricted benefit # COPD restricted benefit c COPD authority required
Check TGA and PBS for current age and condition criteria

Acute management

- Diuretics
- Antibiotics
- Steroids
  - How much?

Acute management

- Pleural taps and chest drains
  - Clarify pleural effusions? Causes?
  - Extra tests?
  - How much fluid actually is there?
    - What's better CXR or CT?
  - Management – drains
  - ? Recurrence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- Differential cell count
  - Neuts – pneumonia, empyema, pancreatitis
  - Lymphocytes – TB, cancer
  - Eosinophils – EGPA, asbestosis
- Gram stain and culture
- Cytology
- Glucose
  - Low (<2) common in infection/malignancy (rarely TB, EGPA)
- pH
  - <7.20 with pneumonia
  - Malignancy (poor prognostic marker)
- amylase

Case example

- Called to see a patient on the ward for desaturation
- 75M admitted under respiratory and being managed for IECOPD
- Saturations have been sitting 90-92% on 2L since admission, desaturated to 86% on 2L, now 90% on 4L and theyre more short of breath than usual

Case example

- Called to see a patient on P4E
- 73F with metastatic breast cancer with ICC inserted 3 days ago for large left sided effusion
- “Can you come review the drain? I’m not very comfortable with drains and I just want someone to come have a lock, I don’t think its swinging anymore”

Case example

- Phone call from DB4
- “Bob, hes a 84M D8 COVID currently on dexamethasone and baricitinib. He’d been doing really well on just 1-2L of nasal prongs but he desaturated to 86% so I’ve bumped him up to 4L and now hes ok with sats around 93%, but he just doesn’t look quite right”