

The Doctors' Handbook

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> Shortness of breath & hypoxia

#### Most **common** differentials?

#### Most **important** differentials?







**NB** This is by no means an exhaustive list, simply the most common/most important causes of acute SOB

This presentation won't cover COVID-19, as this has already been covered extensively

#### You've been **bleeped:** Scenario 1



68F admitted with cough, SOB and hypoxia Referred from A&E to the medical take. You go to review them in resus







**General appearance**: patient appears breathless, distressed and tired. Coughing up green sputum into a tissue

RLL crackles, on 15L NRB

HS normal, JVP normal, CRT 2-3s, warm peripheries Calves SNT, no pedal oedema

GCS 15

Patent

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Abdomen SNT

## Which immediate **bedside investigations** would you want?

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#### Investigations

A&E have done these investigations prior referral, so the results are already available





#### Shows diffuse consolidation is RLZ

ABG

On 15L NRB

pН

 $PO_2$ 

BE

7.4  $SO_2$ PCO<sub>2</sub> 3.8 Lac 6.5

85% 2.4

HCO<sub>3-</sub> 24 +1

## Impression?

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#### Impression



## Community acquired pneumonia

Sepsis

## Management?



#### Management

Sepsis 6 including high flow O<sub>2</sub>

CURB65 score? IV vs PO

Saline nebulisers

Suctioning of secretions

Chest physio

Review resus status/DNAR

2222 call

Med SpR will consider/make ICU referral



#### Oxygen therapy in cases of CAP

Titrate oxygen as high as they need to **meet** their **target saturations** 

If their work of breathing remains high (i.e. high RR and use of accessory muscles) OR they are not meeting their target sats with 15L NRB – what **else** can we consider? Consider starting on **Optiflow**. This would need to be discussed with a senior

Optiflow is similar to nasal cannula, but can deliver up to **60L per min** (max 4L for NC) This is an **Aerosol Generating Procedure** (AGP) - during the pandemic, hospitals have very strict rules on which wards can have it running and which can't



#### Why optiflow? Two reasons:

It provides some **PEEP** 

It's **humidified** so won't dry out their airway if they're going to be on  $O_2$  for a long time

#### You've been **bleeped:** Scenario 2

CCF

EF - 35-40%

**PMHx** 



68M admitted with subacute onset SOB over the last few days, with orthopnea, PND, ankle oedema +++







**General appearance**: patient appears breathless, distressed and tired

A Patent

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Bibasal inspiratory creps, on 15L NRB

HS normal, raised JVP, CRT 2-3s, cool peripheries Calves SNT, pitting oedema up to mid-thigh

GCS 15

Abdomen SNT

## Investigations?



#### Investigations



**NB** This ABG is very similar to the first, but the management will be very different. The context of the patient is important

## Management?

#### Management (in order)



 $O_2$  – In all patients – increase  $O_2$ % as high as necessary to meet target saturations If not meeting their targets on 15L NRB, then needs **discussion with ITU. Put out a 2222 call.** 

Diuretics – type/dose/route?

Senior decision **only** – GTN infusion +/- CPAP if not meeting target saturations using steps 1+2. CPAP needs discussion with ITU/CCOT

#### Furosemide

40-80mg IV stat monitor response and titrate repeated doses accordingly

CPAP is an AGP. GTN infusion – usually only given if SBP >130. Often preferred over furosemide.



Think about precipitating factors (new/stopped meds, ?ACS, arrhythmia, infection, slow build up etc)





Input/output fluid monitoring and fluid restriction

Daily weights

Review resus status/DNAR



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Get an urgent cardiology review – will usually happen within 24 hours



Order inpatient echo if not done recently



#### You've been **bleeped:** Scenario 3



72M admitted with SOB and productive cough





 HR
 109
 0
 RR
 30

 103
 61
 0
 30

**General appearance**: patient appears breathless, distressed and tired. Coughing up green sputum

86%

on

28%

Venturi

**T°** 38

RLZ crackles and diffuse wheeze, on Venturi mask

HS normal, CRT <2s, calves SNT, no pedal oedema

GCS 15

Patent

Α

B

С

D

Ε

Abdomen SNT



#### Investigations





Shows diffuse consolidation RLZ

| ן | $\left( \right)$ | ABG |  |
|---|------------------|-----|--|
|   |                  |     |  |

On 28% Venturi on arrival to A&E

| рН                | 7.31 |
|-------------------|------|
| pCO <sub>2</sub>  | 8    |
| pO <sub>2</sub>   | 8    |
| sO <sub>2</sub>   | 86%  |
| HCO <sub>3-</sub> | 31   |

## Impression?

## Management plan?



#### Impression



#### T2RF/respiratory acidosis

Infective exacerbation of COPD

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#### Management





Venturi mask – carefully titrate O<sub>2</sub> to maintain sats 88-92%

2222 call

Med SpR will consider/make ICU referral

Back to back salbutamol nebs – 2.5mg **NB** this can cause a raised lactate and tachycardia, sometimes also a tachyarrythmia

Ipratropium bromide (Atrovent) 500mcg 6 hourly/QDS Prednisolone 30mg OD for 5 days



IV Abx (usually co-amoxiclav but go according to Microguide/trust guidance

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#### Investigations - ABG

| On arrival        | 28% Venturi | 1 hr later       | 35% Venturi |
|-------------------|-------------|------------------|-------------|
| рН                | 7.31        | рН               | 7.28        |
| PCO <sub>2</sub>  | 8           | PCO <sub>2</sub> | 9           |
| PO <sub>2</sub>   | 8           | PO <sub>2</sub>  | 8.1         |
| SO <sub>2</sub>   | 86%         | SO <sub>2</sub>  | 88%         |
| HCO <sub>3-</sub> | 31          | HCO <sub>3</sub> | 3- 31       |
| BE                | -2          | BE               | -2          |



#### Management (in light of repeat ABG)

Patient needs BiPAP (NIV)



Escalate to senior – must be specially trained to initiate it (Med SpR/ ITU SpR /CCOT/respiratory nurse)



Get a CXR to rule out pneumothorax or rib # recommended but shouldn't delay initiation of BiPAP

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#### Management (in light of repeat ABG)



Start BiPAP

Repeat ABG again in 1 hour. If improved then keep current settings

If no improvement/minor improvement then BiPAP settings can be changed



#### Patient wellbeing on BiPAP

If anxious can use Oramorph 2.5mg PRN after discussion with senior – use cautiously

Give **breaks** for eating and sleeping wherever possible. Important for helping with recovery. Have nebs during breaks too

Use **fan therapy** to ease breathlessness (not used as much during the pandemic)



#### You've been **bleeped:** Scenario 4



77M on orthopaedic ward post hip replacement for a #NOF





No PMHx of COPD/respiratory disease



General appearance: drowsy

Patent, no snoring

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Chest clear, on 15L NRB

HS normal, CRT <2s, pulse regular, no pedal oedema

Unresponsive to voice, grunts + pushes you away in response to sternal rub, pinpoint pupils, downgoing plantars

Abdomen SNT, BM 6

### Differentials?

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A look at the drug chart shows coprescription of **tramadol** and **oramorph**, patient also has **fentanyl patch** 

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#### Investigations



**NB** Again, note that whilst this ABG is very similar to the one in the previous scenario, there will be a very different management plan

## Impression?



#### Impression



#### T2RF/respiratory acidosis

**Opiate toxicity** 

#### How would you **manage** this patient?



#### Management

2222 call – Med SpR will consider/make ICU referral

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Naloxone – 200-400mcg stat. Can give repeat boluses



Oxygen – aim sats >94%

Consider BiPAP if insufficient response to naloxone

#### Why is it particularly important to consider the **half-life** of naloxone in this instance?

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## Because the half-life of naloxone is **shorter** than that of morphine

This means that after an initial dose of naloxone, they can **slip back** into opiate overdose once the naloxone has worn off

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They need **continued monitoring** and potentially further doses of naloxone. Some patients will require a naloxone infusion (this would be a senior decision)



#### You've been **bleeped:** Scenario 5



ATSP – 45F who is acutely SOB, hypoxic and anxious





General appearance: looks flushed, sweaty, breathless and very distressed

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Stridor, lips + tongue appear swollen



Diffuse bilateral wheeze. finds it much easier to breath sitting up. She slips down the bed and when you lie her flat briefly to slide her up she really struggles to breathe



HS normal, CRT <2s, warm peripheries, calves SNT, no pedal oedema



You look through the drug chart and see they've been given a dose of co-amoxiclav recently. It was their first dose

No recorded allergies

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## Impression?

## Management plan?



#### Management

High flow O<sub>2</sub> via non-rebreathe mask

**NB:** Someone else should put out the 2222 call whilst you stay with the patient. Tell them to let you know once it's been done.

Remove trigger e.g. stop IV Abx infusion

Positioning: Sitting patient up may make breathing easier in presence of stridor. <u>If no stridor</u> then can lie patient flat with legs raised to improve hypotension.

Airway compromise = 2222 peri-arrest <u>with the assistance of anaesthetics</u>

IM Adrenaline 0.5mg to anterolateral aspect of thigh

Give IV fluid bolus

If poor response after 5 min, give 2<sup>nd</sup> dose of adrenaline

NB: Beta-blockers can make adrenaline less effective. Patients taking beta-blockers may need glucagon.

If there is insufficient response after 2 doses of adrenaline, then this is termed 'refractory anaphylaxis' requiring an adrenaline infusion. The Med SpR/Anaesthetic SpR should be on scene by this point.

Salbutamol/adrenaline nebs – driven by high flow  $O_2$ 

#### Change of anaphylaxis guidelines

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In 2021, the use of hydrocortisone and chlorphenamine was **removed** from the acute management of anaphylaxis.

This was because their **speed of onset takes hours**, so in the immediate situation of a 2222 peri-arrest call they are not helpful.

There was concern that they were **causing distraction** from/delay in the administration of acutely life-saving interventions such as adrenaline and IV fluids

#### Aftercare

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Take serial mast-cell tryptase blood samples **First** – at the time of onset of symptoms (or ASAP) **Second** – approx. 1 hour after onset of symptoms **Third** – 24hrs later

Patient should be carefully monitored afterwards in case of **rebound symptoms (biphasic reaction)**. Monitoring should be for between 2-12 hours depending on presence of red flags (see Resus Council Anaphylaxis Guidelines 2021 pp. 43). If there is any concern about worsening symptoms then give more adrenaline.



#### Aftercare

Ensure you educate the patient carefully. Tell them the **name** of the drug and **drug group** that they are allergic to and write it down for them. **Document** that you have done this.



Ensure that the patient receives an Epipen on discharge and has an appointment booked with the **OP Allergy clinic** 

#### You've been **bleeped:** Scenario 6



24M admitted via A&E to CDU 2 days ago with exacerbation of asthma. Initially settled with salbutamol nebs and oral steroids

#### ATSP urgently due to increased RR and wheeze



### **Differentials?**

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#### Differentials



HAP leading to repeat asthma exacerbation

Pneumothorax

Non-infective reexacerbation

#### RR, Sats

Observation: use of accessory muscles (intercostal/subcostal recession, use of neck muscles)

Chest auscultation – wheeze/reduced breaths sounds/silent chest (checking for severity of wheeze, pneumonia, pneumothorax or silent chest from reduced respiratory effort)

#### Peak flow

In the words of one consultant 'Not doing a peak flow for a patient with an asthma exacerbation is like not taking a BM of a patient with DKA'. It is essential for monitoring response to treatment.

However, there is the caveat that if they are too short of breath to do a PEAK flow then don't force them.

Compare their current peak flow against their best result within the last 1 year. eg. 300 (400) means 75% of expected.

## Management?

#### Management



Back to back salbutamol nebs **driven by O<sub>2</sub>** 

Ipratropium bromide nebs – single stat dose

Steroids: IV hydrocortisone or PO prednisolone 40mg



Order a **bedside** CXR (exclude pneumothorax/pneumonia)



**D** 

D/w senior re: magnesium sulphate infusion/aminophylline

Involve ITU **early** for cases of hypoxia or if patient is not rapidly improving



## Feedback