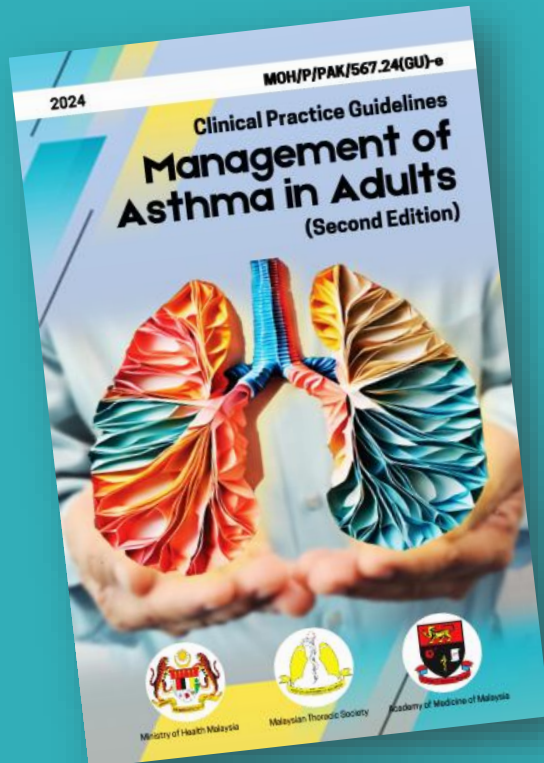


TRAINING OF CORE TRAINERS ON CPG MANAGEMENT OF ASTHMA IN ADULTS (SECOND EDITION)



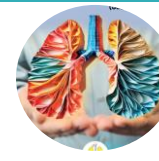
CASE DISCUSSION 1



Clinical vignette

Mr. Ahmad, a 45-year-old man presents to clinic with a 12-month history of intermittent cough, wheezing, and shortness of breath.

Question 1



What further questions would you like to ask Encik Ahmad?

Answer 1

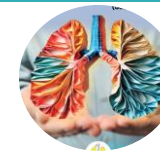


Table 2. Clinical Features Suggestive of Asthma

Clinical History and Symptoms	
Common symptoms	Wheeze Cough Chest tightness Shortness of breath
Symptoms variability	Episodic symptoms Diurnal symptoms Symptoms after/during exercise
Triggers	Common colds (viral infection) Allergen e.g house dust mites, pets Cold weather Irritants: <ul style="list-style-type: none">• smoke• haze• strong smell i.e. perfumes, cleaning solutions• exhaust fumes
History of atopy	Allergic rhinitis Eczema
Family history of atopy	Asthma Allergic rhinitis Eczema
Physical Examination	
Respiratory examination	Use of accessory muscles Audible wheeze Rhonchi on auscultation



On further questioning..

- What are his other common symptoms?
 - His symptoms are particularly **bothersome at night**, with frequent awakenings due to breathlessness, occurring 2–3 times a week.
- What are his triggers?
 - He has a long-standing history of feeling “tight-chested” after **physical exertion** and **exposure to dust** at his workplace.
 - He works in a dusty environment.
- Any family history of asthma/ atopy?
 - He has a **family history of asthma** (mother and sister)
 - He himself has not atopy/ allergy to food
- Is he a smoker?
 - He is a **social smoker** 5 cigarettes per day for the last 10 years.

Question 2



What do we look for in the physical examination?

Answer 2



Vital Signs

- Respiratory rate — look for tachypnoea

Auscultation Findings

- Wheeze/rhonchi
- Prolonged expiratory phase
- Reduced breath sounds

Important Notes

Physical exam may be normal between asthma exacerbations

Helps to exclude other differential diagnoses (e.g., heart failure, COPD, upper airway obstruction)



Physical examination

- On physical examination: BMI is 32 kg/m².
- **No use** of accessory muscles
- On auscultation, he has **expiratory wheezing** and prolonged expiration



Question 3

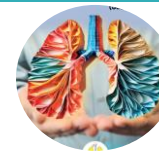


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What are the key factors that point towards asthma?

Answer 3



Smoking history

smoking is a known risk factor that can worsen asthma and lead to persistent airflow limitation

Environmental exposure

The patient works in a dusty environment which could trigger his respiratory symptoms

Family history of asthma

the presence of asthma in immediate family members suggests a genetic predisposition

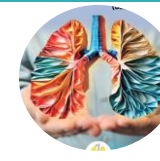
Obesity

Overweight people often experience more severe asthma

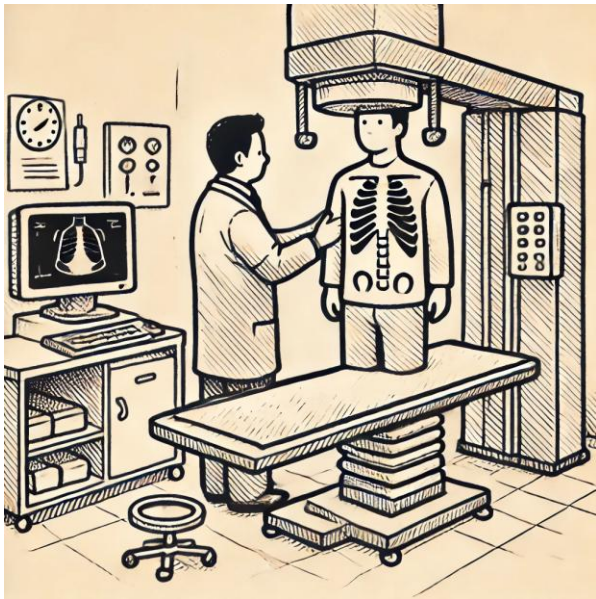
Intermittent symptoms and awakening

these are key indicators of asthma

Question 4



How would you diagnose him?



Answer 4

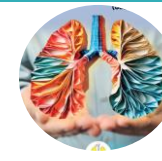
Table 3: Investigations for Asthma

Investigation	Description
Demonstration of airway obstruction	
Spirometry	A $FEV_1/FVC < 0.7$ or $<$ lower limit normal (LLN)
Demonstration of airway obstruction variability or reversibility	
Spirometry	An improvement in FEV_1 or FVC $\geq 12\%$ AND ≥ 200 ml following bronchodilator treatment
	An improvement in FEV_1 or FVC $\geq 12\%$ AND ≥ 200 ml from baseline after four weeks on ICS
Peak Expiratory Flow Rate (PEFR)	A $\geq 20\%$ improvement in PEFR following bronchodilator treatment
	A $\geq 20\%$ improvement in PEFR from baseline after four weeks on ICS
	Diurnal Variation <ul style="list-style-type: none"> • PEFR measured and recorded at least twice daily (morning and evening) over two weeks. • PEFR variability of $\geq 20\%$ is suggestive of asthma. Refer to Appendix 3 on Peak Expiratory Flow Rate Variability and Appendix 4 on Peak Expiratory Flow Normogram.
Bronchoprovocation Test*	Methacholine challenge test <ul style="list-style-type: none"> • A PC20 value of ≤ 8 mg/ml is a positive test
	Mannitol challenge test <ul style="list-style-type: none"> • Decrease in FEV_1 of $\geq 15\%$ from baseline at cumulative dose of ≤ 635 mg is a positive test
	Exercise challenge test <ul style="list-style-type: none"> • Decrease in FEV_1 of $\geq 10\%$ from baseline
Detection of T2-high inflammation	
Blood eosinophils	Threshold for blood eosinophils is ≥ 150 cells/ μ L or $> 4\%$
IgE**	Total serum IgE > 100 kU/L
	Any allergen-specific IgE > 0.35 kU/L
FeNO**	Elevated FeNO level (≥ 50 ppb)

*Not routinely performed in clinical practice|

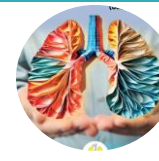
**To be performed when resources are available

Answer 4



- **Detailed symptom history:**
 - Confirm pattern, frequency and duration of symptoms cough, wheezing, breathlessness and nocturnal awakenings)
- **Physical Examination:**
 - Wheezing, prolonged expiration or other signs of airway obstruction
- **Spirometry:**
 - Perform spirometry to assess lung function. The presence of a reduced FEV1 (forced expiratory volume in 1 second) that improves with bronchodilators (a $\geq 12\%$ increase) would confirm reversibility, which is characteristic of asthma.
- **PEFR monitoring:**
 - Mr. Ahmad could be asked to track his PEFR over several weeks to identify diurnal variability (which is typical for asthma).
- **Identifying triggers:**
 - Investigate potential triggers, including allergens (e.g., dust) and exercise.

Question 5



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What are your differential diagnosis?

Answer 5



- **COPD**

- COPD generally affects older adults with a history of chronic smoking and is characterized by persistent airflow limitation that does not significantly improve with bronchodilators

- **Heart failure**

- SOB at night but is associated with orthopnea and pedal oedema

- **GERD**

- GERD can cause wheezing and cough but is usually accompanied by heartburn or regurgitation symptoms.

- **Infections**

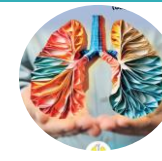
- A history of persistent symptoms after an infection may suggest post-infectious wheezing rather than chronic asthma.

Question 6



What are your key diagnostic tests and how would you interpret the results?

Answer 6



- **Spirometry:**
 - A reduction in FEV1 that improves significantly ($\geq 12\%$ and 200mL) after inhaling a bronchodilator suggests reversible airway obstruction, which is consistent with asthma.
- **PEFR Monitoring:**
 - If Mr. Ahmad shows significant diurnal variation (typically $>20\%$), this further supports the diagnosis of asthma. Daily PEFR monitoring can help identify variability and predict asthma exacerbations.
- **Exhaled Nitric Oxide (FeNO):**
 - Elevated levels of FeNO suggest eosinophilic inflammation, commonly seen in asthma.
- **Allergen testing:**
 - If an allergic trigger is suspected, skin testing or specific IgE testing may help identify potential allergens.



Recommendation 1

- Diagnosis of asthma should be made based on typical clinical history, physical examination and evidence of airway obstruction variability.
 - Spirometry is the preferred tool to demonstrate airway obstruction variability or reversibility.

Question 7



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Once diagnosed with asthma, what would be the goals of treatment?

Answer 7



Treatment Goals

- The asthma treatment goals include:
 - achieving optimal symptom control
 - minimising risk of future exacerbations
 - reducing treatment side effects
 - preventing persistent airflow limitation
 - lowering asthma-related mortality

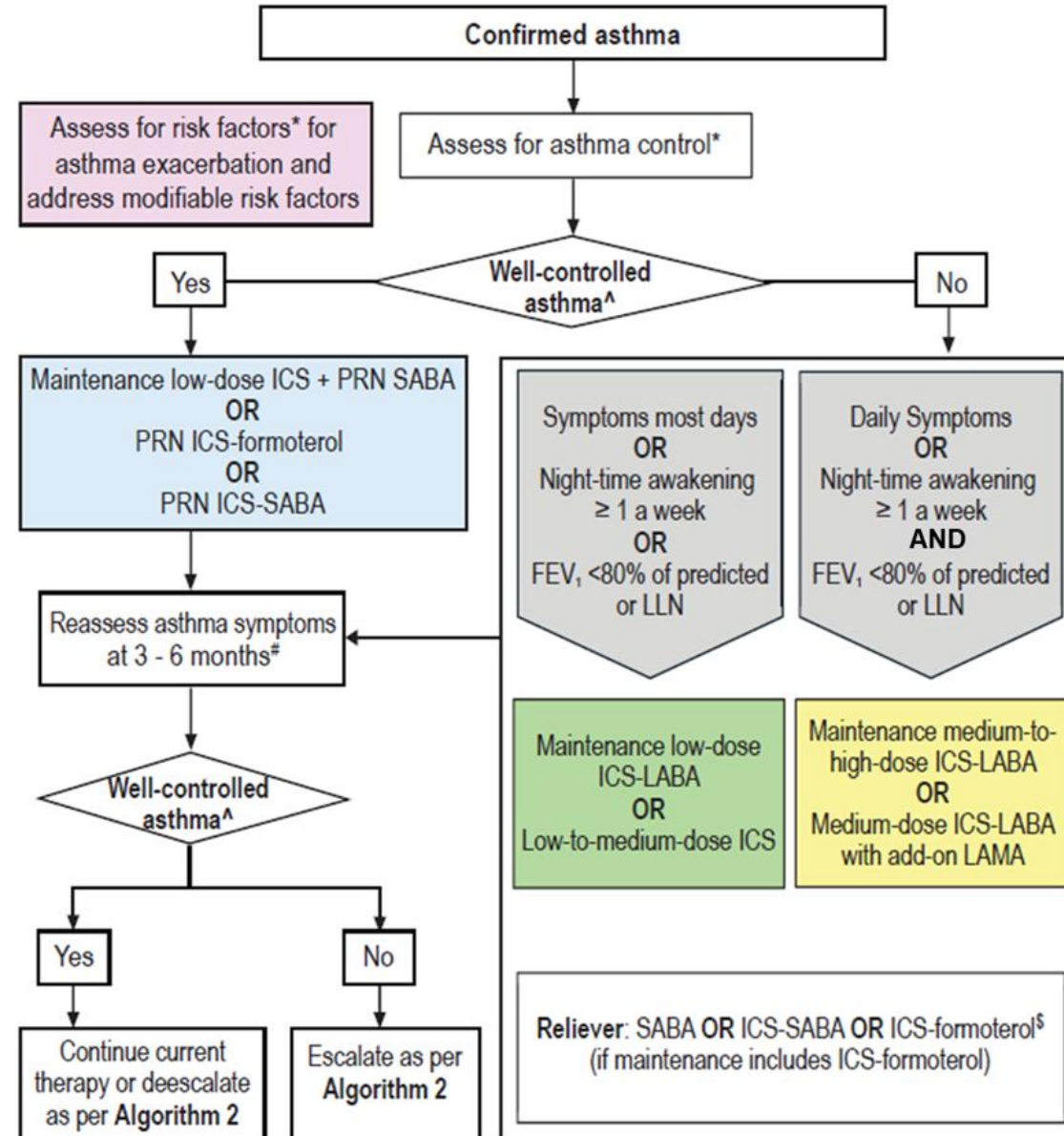
It is also essential to identify and incorporate patient's personal goals for asthma management into the care plan.

Question 8

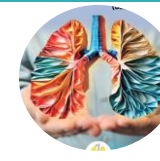


How would you treat Encik Ahmad?

Answer 8



Answer 8



- **Inhaled corticosteroids (ICS):**
 - Start with low-dose ICS to reduce inflammation in the airways. If symptoms are severe or not controlled with ICS, consider adding a long-acting beta-agonist (LABA) or increasing the ICS dose.
- **Smoking cessation:**
 - Strongly recommend quitting smoking to prevent further airway damage and improve asthma control.
- **Avoid triggers:**
 - Advise on strategies to minimize exposure to dust at his workplace and consider using a face mask or relocating to a less dusty environment if possible.
- **Weight management:**
 - Encourage lifestyle modifications to reduce his BMI, as weight loss may improve asthma symptoms
- **Follow-up:**
 - Regular follow-up to assess symptom control (ACT score), lung function (spirometry), and inhaler technique. If asthma control remains poor, consider alternative treatments such as biologics (e.g., mepolizumab) or escalating therapy.

Progress



- Encik Ahmad was diagnosed with asthma. He was advised to stop smoking and referred to the nearest smoking cessation clinic for initiation of NRT.
- He was initiated on a combination of inhaled corticosteroids and long-acting bronchodilator in a single inhaler and asked to use it regularly twice a day and as needed.

- Monotherapy with SABA is not recommended as its excessive use is associated with risk of asthma exacerbation and mortality.
 - Thus, it is vital to use ICS together with SABA or regimen without SABA [ICS-formoterol anti-inflammatory reliever (AIR)]



You asked Encik Ahmad to demonstrate his inhaler technique. Upon observation, several errors were identified: he did not shake the inhaler before use, did not hold his breath after inhalation, and was unaware that he needed to gargle with water after using his inhaled corticosteroid (ICS).

He also appears unaware of his asthma diagnosis and attributes his symptoms to a heart condition

Question 9



How would you advise him on his inhaler technique?

Answer 9



- Correct inhaler technique errors
- Suggest TTG approach

Question 10



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What should we include in our discussion?



Answer 10



Basic information about asthma

- Pathophysiology and symptoms
- Recognising early signs of exacerbation
- Treatment goal
- Identifying and avoidance of asthma triggers
- Impact of co-morbidities on asthma control

Pharmacotherapy

- The difference between reliever and maintenance
- Dosages of medication
- Information of inhalation devices and importance of correct inhaler technique
- Possible drug adverse reactions

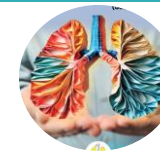
Non-pharmacotherapy

- Smoking cessation
- Allergen exposure
- Vaccination
- Weight reduction
- Pulmonary rehabilitation
- Physical activity
- Yoga
- Breathing exercise
- Dietary modifications
- Vitamin D

Importance of adherence behaviours

- Medication adherence
- Regular follow-up appointments

Question 11

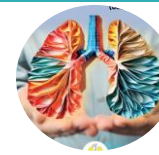


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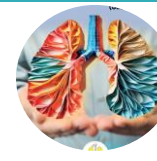
Doctor...what do I do if I get worse?

Answer 11



- It is essential for patients to understand their asthma, actively engage in shared decision-making and take charge of managing their condition.
- The components of guided asthma self-management include:
 - self-monitoring of symptoms and/or PEFR
 - AAP
 - regular medical review by healthcare providers

Self-guided treatment



Self-guided treatment

Self-monitoring of symptoms and/or PEF

- Self-monitoring by either symptoms or PEF with regular medical review and an AAP has been shown to reduce both ED visits and hospitalization rates compared to usual care






Asthma action plan

- Help guide patients in making short-term adjustments to their treatment based on their symptoms and/or PEF
- AAP should be completed and explained to the patient

A. SUGGESTED ASTHMA ACTION PLAN TEMPLATE

Name:	Doctor:
IC. No.:	Hospital/Clinic:
Best PEF:	Date:

This asthma action plan helps you to recognise and respond to worsening asthma

ASTHMA CONTROL	RELIEVER	CONTROLLER
 WELL <ul style="list-style-type: none"> No cough, wheeze, chest tightness or shortness of breath AND Sleep well at night AND Able to perform usual activities OR <ul style="list-style-type: none"> PEFR: ____ to ____ l/min (80% to 100% of personal best) 	 Your reliever colour: _____	 Your controller colour: _____
	No need to use reliever except before exercise (if needed)	Dose: ____ inhalations ____ times a day
 GETTING WORSE <p>If you have ANY of these:</p> <ul style="list-style-type: none"> Cough, wheeze, chest tightness or shortness of breath Waking up at night due to asthma symptoms Able to perform some, but not all usual activities OR <ul style="list-style-type: none"> PEFR: ____ to ____ l/min (50% to 79% of personal best) 	<p>Take 2 to 4 inhalations every 20 minutes for a total 3 times and assess symptoms</p> <p>↓</p> <div style="display: flex; justify-content: space-between;"> <div> <p>If symptoms or PEF improve</p> <ul style="list-style-type: none"> lengthen interval to every 3 – 4 hours as needed duration may be further lengthened based on continued good response </div> <div> <p>If symptoms worsen or persist</p> <p>Proceed to ALERT management</p> </div> </div>	<p>Dose:</p> <p>____ inhalations ____ times a day</p>
 ALERT <p>If you have ANY of these:</p> <ul style="list-style-type: none"> Worsening cough, wheeze, chest tightness or shortness of breath Difficulty walking or talking Need to use reliever more frequently than every 4 hours OR <ul style="list-style-type: none"> PEFR: Below ____ l/min (less than 50% of personal best) 	<p>Proceed to nearest hospital or clinic or dial 999 IMMEDIATELY AND DURING TRANSFER</p> <p><input type="checkbox"/> With spacer — increase dose up to 10 inhalations every 20 minutes</p> <p><input type="checkbox"/> Without spacer — take 2 inhalations every 5 minutes</p>	<p>Dose:</p> <p>____ inhalations ____ times a day</p>

Note: The use of pMDI with spacer is encouraged

Asthma Action Plan (Appendix 5)



Recommendation 3

- Regular medical reviews in asthma patients are preferred over self-adjustment of medications aided by asthma action plan.
- Behavioural change techniques should be considered in self-management strategy of asthma.

Thank You!!



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