A very warm IPCRG welcome to the 5th Hot Topic Webinar

Breathing and feeling well through universal access to right care
## Today’s Agenda

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<tr>
<th>Time</th>
<th>Session</th>
<th>Presenter(s)</th>
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<tr>
<td>1500hrs BST</td>
<td>Welcome and Introductions</td>
<td>Janwillem Kocks, President Elect IPCRG</td>
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<tr>
<td>1505hrs</td>
<td>COVID-19 &amp; the Challenges of Diagnosing Asthma in adults &amp; children</td>
<td><strong>Presenters:</strong> Luke Daines, UK &amp; Jim Stout, USA</td>
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<tr>
<td>1535hrs</td>
<td>Discussion with your questions</td>
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<td>1550hrs</td>
<td>Video, Tai Chi &amp; Comfort Break</td>
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<td>1600hrs</td>
<td>Oral Abstract Presentations</td>
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<td>1715hrs</td>
<td>Closing Remarks</td>
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*Breathing and feeling well through universal access to right care*
1. Effectiveness and acceptability of a smart inhaler asthma self-management programme: A cluster RCT study protocol  
   Susanne van de Hei, Netherlands

2. The sensitivity and specificity of specific IgE in diagnosing asthma  
   Janwillem Kocks, Netherlands

3. Informing the development of asthma review templates: A mixed-studies systematic review of long-term condition review templates in clinical consultations  
   Kirstie McClatchey, UK

4. Efficacy and Safety of Indacaterol/Glycopyrronium/ Mometasone Furoate in Patients with Uncontrolled Asthma: The Phase III IRIDIUM Study  
   Huib Kerstjens, Netherlands

5. Lung function Improvement and Asthma Exacerbation Reduction with Indacaterol/ Glycopyrronium/ Mometasone Furoate in Uncontrolled Asthma: IRIDIUM Study  
   Alberto Papi, Italy

6. Indacaterol/Mometasone Furoate Fixed-dose Combination vs Salmeterol/Fluticasone in Uncontrolled Asthma: Results of PALLADIUM and IRIDIUM Studies  
   Kenneth Chapman, Canada

7. Efficacy And Safety Of Indacaterol/Glycopyrronium/ Mometasone Furoate Versus Salmeterol/Fluticasone Plus Tiotropium In Uncontrolled Asthma: The ARGON Study  
   Richard van Zyl-Smit, South Africa
Presentation 1

Luke Daines, UK

Breathing and feeling well through universal access to right care
COVID-19 & the challenges of diagnosing asthma in adults in primary care

Dr Luke Daines
CSO Academic Clinical Fellow, University of Edinburgh, UK
GP, Covid Telephone Triage Hub, NHS Lothian, Scotland

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Breathing and feeling well through universal access to right care
Conflicts of interest

- Member of the BTS/SIGN asthma guideline development group (2019)
Mis-diagnosis of asthma

Why is making an accurate diagnosis of asthma challenging?

Achieving a diagnosis of asthma

Trial of treatment and follow up

Challenges in assessment due to Covid-19

Providing good patient experience
Outline

Mis-diagnosis of asthma

Why is making an accurate diagnosis of asthma challenging?

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Providing good patient experience
Misdiagnosis

Underdiagnosis

Overdiagnosis
Retrospective study of routinely collected health data* (Netherlands)
53.5% of the 652 children were over diagnosed:
  – 5 children had no asthma
  – 344 children unlikely to have asthma.

Prospective multicentre cohort study** (Canada) of adults recruited from
the community who had been diagnosed with asthma within 5 years
33.1% of the 613 had no evidence of current asthma.
  – After a further 12 months 181 continued to have no features of asthma

*Loojmans van den Akker, BJGP, 2016; **Aaron et al., JAMA 2017
Consequences of misdiagnosis

**Under-diagnosis**
- Lack of treatment
- Untreated symptoms, reduced quality of life
- Avoidable mortality

**Over-diagnosis**
- Wrong / unnecessary treatment
- Side effects / untreated symptoms
- Cost of medication
Outline

Mis-diagnosis of asthma

Why is making an accurate diagnosis of asthma challenging?

Achieving a diagnosis of asthma

Trial of treatment and follow up

Challenges in assessment due to Covid-19

Providing good patient experience
1. Asthma is not a single disease
2. There is no ‘gold’ standard test
3. No ‘best’ approach for diagnosing asthma
Asthma is not a single disease

“Asthma is a heterogeneous disease, with different underlying disease processes. Recognizable clusters of demographic, clinical and/or pathophysiological characteristics are often called ‘asthma phenotypes’…”

GINA 2020
Recommend a “shift away from using the umbrella term asthma towards the diagnosis of asthma phenotypes that respond to specific treatments”

The Lancet Asthma Commission

Monoclonal antibodies
- Anti-IgE: Omalizumab
- Anti-IL5: Mepolizumab, Benralizumab & Reslizumab
- Anti-IL4 & IL13: Dupilimab
There is no ‘gold standard’ test

"The absence of a ‘gold standard’ test makes it difficult to confirm or refute the diagnosis of asthma.

Investigations can determine key features of asthma, but all have limitations.

Consequently, the diagnosis of asthma is often made clinically.
No definitive evidence for the ‘best’ way to diagnose asthma

On the one hand…

**Test before treatment**
“move away from the current no-test culture in clinical practice”

Diagnosing asthma without testing for airflow obstruction is like diagnosing diabetes without testing a patient’s blood sugar

The Lancet Asthma Commission 2017

Professor Shawn Aaron
ERS Congress 2017
No definitive evidence for the ‘best’ way to diagnose asthma

On the other hand…

Asthma status and the outcome of diagnostic tests can vary over time

- A key feature of an episodic disease
- Explains the often negative tests (especially in primary care)
- ‘Active’ and ‘inactive’ asthma

Individual tests influence the probability of asthma but do not prove a diagnosis
No definitive evidence for the ‘best’ way to diagnose asthma

The situation is complicated by different availability of tests!

“I have a spirometer in my office and [...] I love to depict the patients at once”

“We can get a full spirometry in a week where I work. But if we would have to wait for 2 weeks then [the patient] would probably be better by then. So, it depends on when they get the test.”

“We don’t have access to spirometry, and we have very limited peak flow at the clinics, so if I have a patient at the clinic presenting with wheezing and some degree of asthma history, the aim is to provide a treatment so that they can go home better rather than really getting the diagnosis.”

Each professional had developed strategies for diagnostic investigation in the context that they worked.

Daines et al., 2020 BMJ Open
Poll Question: Spirometry availability

Q: How soon would you be able to gain spirometry for a patient presenting with symptoms of asthma? (prior to covid-19)

1. On the day of presentation
2. Within a week of presentation
3. Within 2 weeks of presentation
4. Within a month of presentation
5. More than a month
6. Unable to access spirometry
Outline

Mis-diagnosis of asthma

Why is making an accurate diagnosis of asthma challenging?

Achieving a diagnosis of asthma

Trial of treatment and follow up

Challenges in assessment due to Covid-19

Providing good patient experience
Clinical assessment

Confirmation
Structured clinical assessment

- Symptoms of wheeze, cough, breathlessness and chest tightness that vary over time and in intensity
- Recurrent episodes (attacks) of symptoms
- Symptoms triggered by exercise, allergen exposure, viral infections
- Personal/family history of other atopic conditions

Not just about the history

- All available information including previous clinical records
- Recorded observation of wheeze heard by a professional?
- Past lung function measurements or allergy testing?
Probability of asthma diagnosis:

- 0%: Low probability
- 100%: High probability

- Consider alternative diagnoses
- Further diagnostic testing
- Confirm diagnosis / Trial of treatment

Test-treatment threshold
Test threshold
Annette
Age: 61 years
Cough and sputum
Progressively worsening breathlessness
Lifelong smoker

Alternative diagnosis more likely
Patient with respiratory symptoms
Are symptoms typical of asthma?

Yes

Detailed history/exam for asthma
History/exam supports asthma diagnosis?

Yes

Further history/tests for alternative diagnoses

Alternative diagnosis confirmed?

Yes

Treat for alternative diagnosis

No

No
Sarah
Age: 22 years
Wheeze, breathless, cough, tight chest
Episodic symptoms, triggered by pollen
Asymptomatic between episodes
Never smoked

Asthma is probable
Khalil

Age: 39 years
Persistent cough - no clear pattern
Not breathless. No wheeze.
Eczema as a child
Smoked cigarettes rarely as a student
Otherwise healthy

Asthma is possible
Clinical assessment

Confirmation
Patient with respiratory symptoms
Are symptoms typical of asthma?

Yes

Detailed history/exam for asthma
History/exam supports asthma diagnosis?

Yes

Perform spirometry / PEF with reversibility
Results support asthma diagnosis?

Empiric treatment with ICS and prn SABA
Review response
Diagnostic testing 1-3 months

Yes

Treat for ASTHMA
Patient with respiratory symptoms

Are symptoms typical of asthma?

Yes

Detailed history/exam for asthma

History/exam supports asthma diagnosis?

Yes

Perform spirometry / PEF with reversibility

Results support asthma diagnosis?

Yes

Repeat on other occasion or
arrange other tests

Result: Confirms asthma diagnosis?

Yes

Consider trial of treatment
for most likely diagnosis, or
refer for further tests

No

Treat for ASTHMA
Outline

Mis-diagnosis of asthma

Why is making an accurate diagnosis of asthma challenging?

Achieving a diagnosis of asthma

**Trial of treatment and follow up**

Challenges in assessment due to Covid-19

Providing good patient experience
The concept of a ‘trial of treatment’ has been criticised as potentially leading to commencement of lifelong treatment without a clear diagnosis.

✓ Use an inhaled corticosteroid

✓ Review after 6-8 weeks. Use a clinical questionnaire to assess asthma symptoms (e.g. ACT or ACQ)

✓ Was the improvement a coincidence? Stop the treatment and re-assess. If symptoms re-occur the diagnosis is likely.
Follow up

Being able to review a patient felt to be crucial in confirming (or changing) a diagnosis…

…but, ensuring the review of individuals can be challenging

✓ Use a suspected asthma code to identify that the diagnosis is unconfirmed

✓ Once confirmed, record the basis for the diagnosis in the medical record

Daines et al., 2020 BMJ Open
Outline

Mis-diagnosis of asthma

Why is making an accurate diagnosis of asthma challenging?

Achieving a diagnosis of asthma

Trial of treatment and follow up

Challenges in assessment due to Covid-19

Providing good patient experience
Challenges in assessment due to Covid-19

(Greater reliance on remote consulting)

Clinical assessment

Confirmation
Challenges in assessment due to Covid-19

Largely achievable

✓ Medical record available
✓ Structured history
✗ Examination

✓ Clinical assessment

Confirmation

? Spirometry
? FeNO

✓ Peak expiratory flow
✓ Clinical Questionnaires
✓ Trial of treatment

Alterations likely
Asthma is probable

Asthma is possible

Asthma unlikely
Mis-diagnosis of asthma

Why is making an accurate diagnosis of asthma challenging?

Achieving a diagnosis of asthma

Trial of treatment and follow up

Challenges in assessment due to Covid-19

Providing good patient experience
Diagnosis uncertainty shapes patient experience

Why Is It Difficult to Diagnose My COPD?
A Patient Physician Perspective of Airflow Management

Kerri Jones · Prasad Nagakumar · Satish Rao
"We also said that receiving information should always start sooner, you know that the valuable time is probably the first 3 months after you’ve been diagnosed.” Participant 23

Daines et al., BJGP, 2020
Conclusions

- Build up evidence for an asthma diagnosis using a structured clinical assessment.

- A diagnosis of asthma often takes time to confirm.

- Objective evidence to support an asthma diagnosis should ideally be sought however likely the diagnosis appears to be.

- Considering a trial of treatment? Have a clear structure and use a suspected code.

- Diagnosis provides a ‘window of opportunity’ for patient learning.
COVID-19 & the challenges of diagnosing asthma in adults in primary care

Any questions?

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Breathing and feeling well through universal access to right care
Breathing and feeling well through universal access to right care
COVID-19 and the Challenges of Diagnosing Asthma in Children in Primary Care

James W. Stout MD MPH
Professor of Pediatrics
University of Washington, Seattle WA
Pediatrician
Odessa Brown Children’s Clinic
What we’ll cover

• The challenges of diagnosing asthma in children
• COVID issues specific to pediatric asthma
• Increasing disparities as a result of the pandemic
Diagnostic Challenges in High-Income Countries

• A one year-old girl presents in respiratory distress.

• In our toolbelt:

• Structured illness history, stethoscopes, thermometers, X-ray, ultrasound, reliable electricity, bloodwork, readily available medications (bronchodilators oral corticosteroids) point-of-care and laboratory diagnostic tests (respiratory viral panel)
Recurrent Wheeze Phenotypes
The questions about these little children: 
(beyond a history of recurrent wheezing)

- Does the child respond to a bronchodilator? 
  (albuterol/salbutamol)
- Does a biologic parent or full sibling have asthma?
- Does the child have eczema?
- Does the child have a chronic runny nose?
Diagnostic Challenges in Low- and Middle-Income Countries:

- A one year-old girl presents in respiratory distress.
- In our toolbelt:
  - Structured illness history
  - Stethoscopes? Thermometers? Reliable electricity? Readily available medications?

AND:
- The enormous public health problem and distraction…
Global Burden of Disease for Pediatric Pneumonia

PNEUMONIA IS THE SINGLE BIGGEST INFECTIOUS KILLER OF CHILDREN: CHILD MORTALITY BY MAJOR CHILDHOOD INFECTIOUS ILLNESSES

<table>
<thead>
<tr>
<th>Disease</th>
<th>Deaths of children under five by leading infectious diseases, 2015</th>
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<tbody>
<tr>
<td>PNEUMONIA</td>
<td>920,000</td>
</tr>
<tr>
<td>DIARRHEA</td>
<td>525,000</td>
</tr>
<tr>
<td>PERTUSSIS, TETANUS, MENINGITIS</td>
<td>404,000</td>
</tr>
<tr>
<td>SEPSIS</td>
<td>306,000</td>
</tr>
<tr>
<td>MALARIA</td>
<td>206,000</td>
</tr>
<tr>
<td>MEASLES</td>
<td>74,000</td>
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</tbody>
</table>

- **2** children under five die from pneumonia every minute
- **99%** the share of child deaths from pneumonia in developing countries
- **735,000** the number of projected deaths in 2030 on current trends
- **1 MILLION** the lives that could be saved in the next five years from pneumonia prevention and treatment
- **5.3 MILLION** the lives that could be saved by 2030
- **4 IN EVERY 5** the share of pneumonia deaths that occur in children under two years
- **$0.40** the cost of effective antibiotic treatment for pneumonia
- **43%** increased risk of mortality to South Asian girls with pneumonia, compared with boys
- **170 MILLION** the number of children not vaccinated against pneumonia
- **250 MILLION DOSES** the expected vaccine demand from countries eligible for Gavi support in 2026
Bacterial

Viral

Bronchospasm or Wheezing
Bronchospasm masquerading as pneumonia

<table>
<thead>
<tr>
<th>Year</th>
<th>Authors</th>
<th># WHO-defined pneumonia</th>
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<tbody>
<tr>
<td>2001</td>
<td>Sachdev</td>
<td>100</td>
</tr>
<tr>
<td>2004</td>
<td>Hazir</td>
<td>800</td>
</tr>
<tr>
<td>2004</td>
<td>Addo-Yobo</td>
<td>800</td>
</tr>
<tr>
<td>2011</td>
<td>Cardosa</td>
<td>100</td>
</tr>
<tr>
<td>2013</td>
<td>Gowraiah</td>
<td>200</td>
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- Pneumonia
- Re-diagnosed Asthma
Among 614 children under 5y presenting with severe respiratory distress at Mulago Hospital in Uganda, 41% had “asthma syndrome” (asthma; bronchiolitis; bacterial pneumonia and asthma).
Symptom-based screening tool for asthma syndrome among young children in Uganda. R. Nantanda et al.

- Best performing questions
  (sensitivity 81%, specificity 85%):
  - Does your child have a *history* of breathing difficulties?
  - Does your child *currently* have breathing difficulties, cough, or wheezing?
  - This combination performed only slightly better than:
  - “Is the child currently wheezing?” (sens. 77%, spec. 88%)
Cough or difficulty breathing?

Look, Listen, Feel

RED

Antibiotics

Urgent referral
May trial bronchodilator in transport but do not delay care

YELLOW

Wheezing?

yes

 Bronchodilator trial

Responder?

yes

Continue bronchodilator
Consider antibiotics
Follow up indicated

no

no

GREEN

Supportive care
Follow up as needed

YELLOW

no

GREEN

Antibiotics
Ongoing evaluation
Acute Lower Respiratory Illness Treatment Evaluation (ALRITE)
History

- Cough or difficulty breathing?
- For how long?
- Risk of HIV exposure?
- History of wheezing or difficulty breathing before present illness?
Examination

- Temperature or Fever
- Oxygen saturations
- Respiratory rate counter
Bronchodilator trial
(for Under 5’s presenting acutely)

- Dose and how to administer
- Recommend reassessment in at least 10 minutes (up to 4 hours)
- Stores patient and timer for reassessment
- Rescore patient with respiratory assessment
  - Oxygen saturation
  - Respiratory rate
  - Chest indrawing
  - Wheezing
- Based on reassessment, final diagnosis and treatment recommendations provided
Diagnosis and Treatment

**Diagnosis: Pneumonia, wheezing illness**

**Instructions**
- Bronchodilator recommended. Administer two puffs inhaled Salbutamol with spacer
- Give 1 tablet oral Amoxicillin twice daily for 5 days
- Follow-up in 3 days
- History of breathing difficulty, refer for possible chronic asthma

**Diagnosis: Mild Upper-Respiratory Illness**

**Instructions**
- Bronchodilator not necessary. Recommend dose of antibiotics and refer for possible infection.
- Bronchodilator not necessary. Recommend dose of antibiotics and refer for possible infection.
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- Bronchodilator not necessary. Recommend dose of antibiotics and refer for possible infection.
- Bronchodilator not necessary. Recommend dose of antibiotics and refer for possible infection.

**Diagnosis: Severe pneumonia or very severe disease**

**Instructions**
- Refer URGENTLY to hospital
- Give first dose of appropriate antibiotic. Intramuscular injection Ampicillin/Gentamicin recommended, oral Amoxicillin otherwise
- Dilute 500mg vial Ampicillin or 2ml vial Gentamicin with 2.1 ml sterile water
- Inject 2ml Ampicillin or 1.1 ml Gentamicin into upper arm, thigh, or bottom with sterile needle
- If convulsing, treat with anticonvulsant like Diazepam
Children with Asthma and COVID

- Dry cough, shortness of breath, fatigue, sore throat, diarrhea
- Unclear whether asthma is an independent risk factor in children, but let common sense prevail
- Remain on current asthma medications
- Albuterol/salbutamol shortage driven by its use for COVID—first generic albuterol approved in US April 8th 2020
Pediatric Asthma and COVID

- Coronaviruses → 20% of pediatric colds
- Oral corticosteroids → prolonged viral replication
- Virtual visits for all mild/moderate asthma patients
Avoid nebulizers during the pandemic, if possible

- Nebulizers:
  - Increase the risk of lower lung viral deposition
  - Could transmit viable coronavirus to bystanders
Three important things to remember about COVID

1. Soap is very effective at helping to remove and deactivate the virus

2. Hand washing preferred to hand Sanitizer

3. Clean surfaces before disinfecting (disinfect with discretion)
COVID amplifies health disparities

- Pre-existing chronic illnesses
- Many low income jobs require physical presence
- Indoor air quality
- School closures
- Transportation issues
- Health literacy
- Access to and comfort with technology
School closures
Sheltering in place, Seattle area
Worldwide, almost 40% of people use solid fuel for heating and cooking
Sheltering in place, Uganda
In summary:

- Diagnosing asthma in children under 5y is challenging, and presents different issues in different countries
- Keep your distance, wear a mask
- Wash hands with soap and water
- Find ways to help those less fortunate