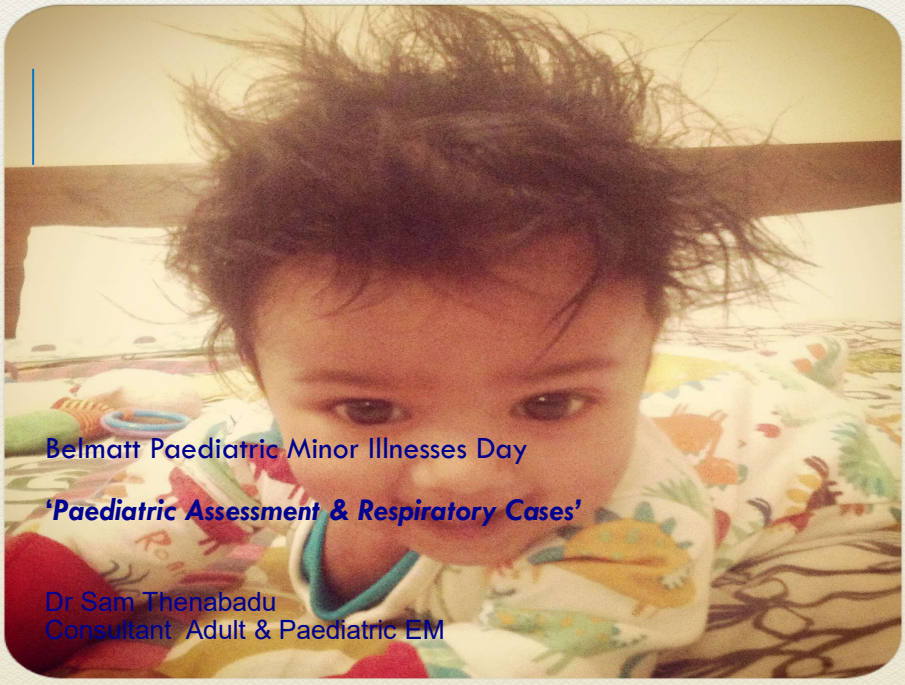


Belmatt Paediatric Minor Illnesses Day

'Paediatric Assessment & Respiratory Cases'

Dr Sam Thenabadu
Consultant Adult & Paediatric EM

INTRODUCTION

- Paediatrics makes up 25-30% of ED case load
- Patients tend to bring along worried parent(s)

- Approach is the same – History, Exam, Ix, DDs & Rx
- Nuances are different – eg language, order of exam, priorities for each party

- Most children are well…

- BUT paediatric resources are limited so beware the quiet

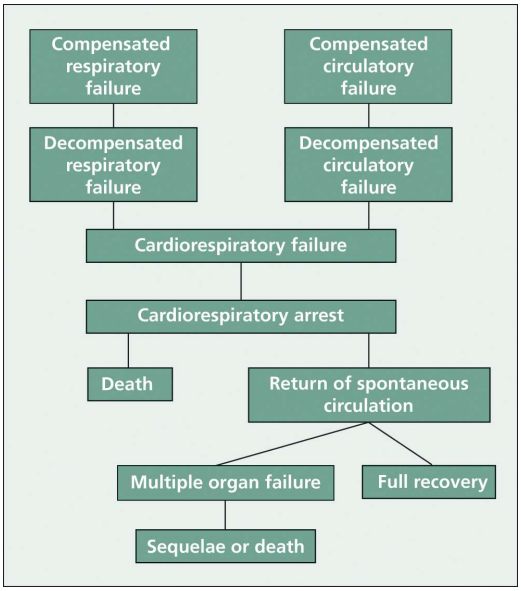
MAIN CHALLENGE IS TO CONFIRM NO LIFE THREATENING ILLNESS PRESENT

SOMETIMES THEY CHANGE….

RECOGNITION AND INITIAL MANAGEMENT OF THE SERIOUSLY ILL CHILD

To understand:

- **the importance of using the structured ABCDE approach to rapidly identify seriously ill children**
- **that there is often some respiratory compensation for circulatory failure and vice versa**



RECOGNITION OF THE SERIOUSLY ILL CHILD IS BASED ON ASSESSMENT OF

- **A**irway (with c-spine consideration in trauma)
- **B**reathing
- **C**irculation
- **D**isability (mental status)
- **E**xposure

SPECIFIC ABCDE ASSESSMENTS AND INTERVENTIONS A - AIRWAY

Assessment	Information sought	Possible resultant actions
A **Airway patency**	Is the airway: • patent (conscious, vocalising) • at risk • obstructed	• suction if indicated • head positioning • oropharyngeal airway • reassess • summon expert help

RECOGNITION OF AIRWAY OBSTRUCTION

Is the airway:

- Patent?
- At risk?
- Obstructed?

SPECIFIC ABCDE ASSESSMENTS AND INTERVENTIONS
B - BREATHING

Assessment	Information sought	Possible resultant actions
B **Breathing adequacy**	• respiratory rate • chest expansion • use of accessory muscles / retractions • palpation • percussion • auscultation • SpO_2 and FiO_2	• administer high-flow oxygen appropriately • support breathing with BMV as necessary • reassess • summon expert help

WORK OF BREATHING

- Respiratory rate
- Chest expansion
- Accessory muscle use / retractions
- Palpation, percussion, auscultation
- Additional sounds
- SpO_2 and FiO_2

SPECIFIC ABCDE ASSESSMENTS AND INTERVENTIONS
C - CIRCULATION

Assessment	Information sought	Possible resultant actions
C **Circulation adequacy**	• conscious level • heart rate • capillary refill time • presence of distal pulses • skin temperature and colour • blood pressure • urine output	• attach monitoring (as appropriate to setting) • obtain circulatory access (IV or IO) • estimate weight • request blood samples for laboratory testing and bedside glucose estimation • reassess • summon expert help

ASSESSING CAPILLARY REFILL TIME

Capillary refill time
> 2 seconds is abnormal

ASSESSING PULSE VOLUME

Comparison of central and peripheral pulses

- Pulse decreases more rapidly in peripheral than in central pulses

ASSESSING SKIN PERFUSION

Skin colour
- Mottling
- Pallor
- Peripheral cyanosis
- Rashes

Feel skin temperature
- Warm / cold line

SPECIFIC ABCDE ASSESSMENTS AND INTERVENTIONS
D - DISABILITY

Assessment	Information sought	Possible resultant actions
D **Disability (conscious level)**	• AVPU • interaction with parent and surroundings • posture and muscle tone • pupil size and reactivity	• reconsider A and B management as conscious level dictates • establish bedside glucose • reassess • summon expert help

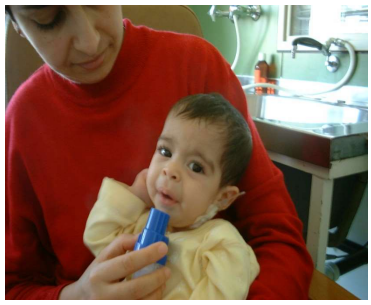
CONSCIOUS LEVEL

AVPU

Interaction with parents / carers

Posture and muscle tone

Pupil size and reactivity



SPECIFIC ABCDE ASSESSMENTS AND INTERVENTIONS
E - EXPOSURE

Assessment	Information sought	Possible resultant actions
E **Exposure**	• evidence of blood loss / skin lesions / wounds / drains / rashes • core temperature	• control any external bleeding • reconsider specific management as dictated by any observed fluid loss / lesions etc • consider appropriate measures to control temperature • reassess • summon expert help

EXPOSURE

- Evidence of blood loss / skin lesions / wounds / drains / rashes
- Core temperature

PAEDIATRIC RESPIRATORY EMERGENCIES

INTRODUCTION TO PAEDIATRIC RESPIRATORY COMPLAINTS

- Very common – 35% of Paediatric admissions
- 5th most common cause of death 1-14 yr olds
- Seasonal varieties
- Pandemics – H1N1
- Difficult patients to predict trajectories / frequent reviews needed

CHILD VS ADULT RESPIRATORY DISEASE

Different anatomy...
- Smaller airways (radius of small airways)
- Large tongue
- Obligate nasal breathers

Different physiology
- Much greater O2 requirement/kg
- Breathing and feeding so intertwined in infants

Different presentations of same bug...
- RSV – bronchiolitis in <2y but simple URTI in 5y old

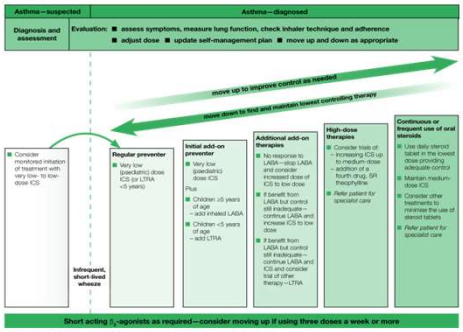
Different pathogens...
- Neonates – gram negatives, GBS, chlamydia
- Infants – not yet fully immunised
- Older children – massive exposure at nursery / school age

CASE 'A'

- 8 year old boy at 11pm after playing in a football tournament all day.
- He is SOBAR and now unable to talk in full sentences.
- Coughing ++ and Vomit x1
- Multiple previous episodes – hospitalised x6
- HR 155
- BP 115/87
- RR 32
- O2 91% (poor trace)
- T 37.2

ASTHMA

- Commonest respiratory disorder in childhood
- 30 000 Asthma admissions per year and rising
- 40 UK deaths in 1-14 yr age group
- Chronic inflammation of mucosa
- Bronchoconstriction and reversible airway narrowing
- Transient wheezers secondary to URTIs



ASTHMA

Classify:

mild /moderate / severe / life threatening

Salbutamol first line

Atrovent for severe episodes

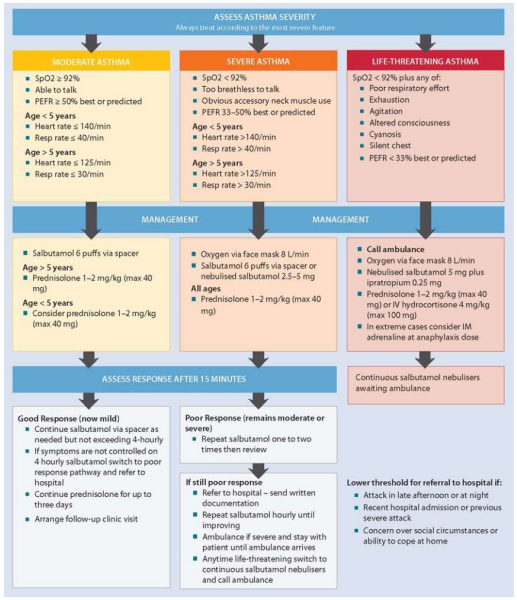
Early steroids

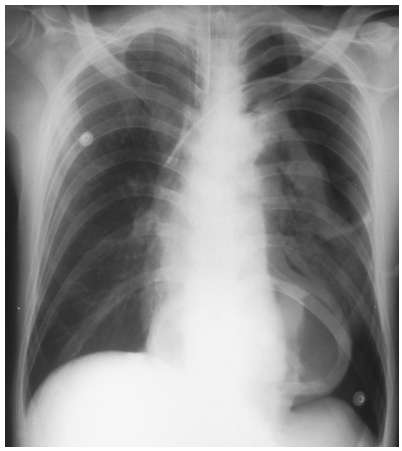
IV salbutamol

IV aminophylline

IV magnesium

Ventilatory Support?





CASE B

- 6 month old boy 2/7 increasing SOB and cough
- No obvious fevers
- Only had 200ml of milk in the last 24 hours
- Sleepy but rousable
- At triage he has a respiratory rate of 60 and saturations of 93%

BRONCHIOLITIS

- Lower respiratory tract infection
- Ages 2 months to 2 years
- Respiratory Synctial Virus (RSV) most common
- Peak incidence in winter months

- 60% affected by age 1 & 80% by age 2
- Symptoms inc wheeze, cyanosis, vomiting, irritability & poor feeding

BRONCHIOLITIS

- Early symptoms include a mild rhinorrhoea, cough, and fever
- Other common symptoms include wheeze, cyanosis, vomiting, irritability and poor feeding.
- Apnoea may occur in young infants
- General signs:
- tachypnoea, tachycardia, fever, cyanosis.
- Diffuse expiratory wheezing, nasal flaring, intercostal recession, inspiratory crepitations.

NICE ADMISSION CRITERIA (2015)

Apnoea (observed or reported)

Persistent oxygen saturation of less than 92% when breathing air

Inadequate oral uid intake (50–75% of usual volume, taking account of risk factors

persisting severe respiratory distress, for example grunting, marked chest recession, or a respiratory rate of over 70 breaths/minute

BRONCHIOLITIS – INVESTIGATIONS

Which Tests?

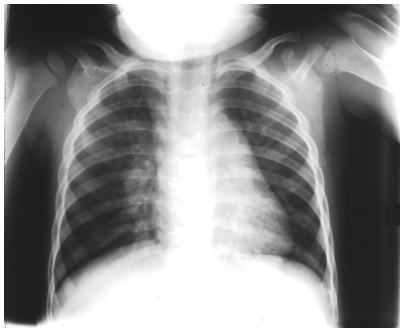
Oximetry

NPA

Chest X Ray

Bloods & Blood Gas

Useful or Not?



BRONCHIOLITIS - MANAGEMENT

- Supportive measures are the mainstay
- Oxygen
- NG Feeding

Do not use any of the following to treat bronchiolitis in children:

antibiotics
hypertonic saline
adrenaline (nebulised)
salbutamol
montelukast
ipratropium bromide
systemic or inhaled corticosteroids

a combination of systemic corticosteroids and nebulised

CASE C

- Winter
- a 3 yr old boy presents @ 3am with barking cough and stridor
- Mum holding child in arms walking around outside house
- 2/7 hx of runny nose and mild fevers

- HR 145
- RR 30
- O2 93 (poor trace)
- T 37.8

CROUP

Viral upper respiratory tract infection causing nasopharyngeal inflammation that spreads to the larynx and trachea

Sub glottal inflammation causes the movement of the vocal cords to be impaired leading to the characteristic cough

Parainfluenza virus causes 80% of episodes

Seasonal – Autumn & Spring

Commonest in ages 6 months to 3 years

Rare above 6 years

CROUP - INVESTIGATIONS

WHICH TESTS?

FBC, CRP

NPA

CXR

Differentials?

Epiglottitis

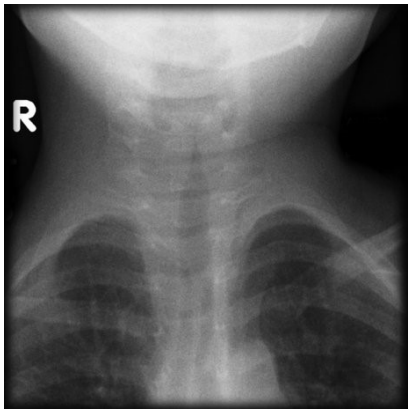
Foreign body

Anaphylaxis

Laryngomalacia

Peritonsillar abscess

USEFUL OR NOT?

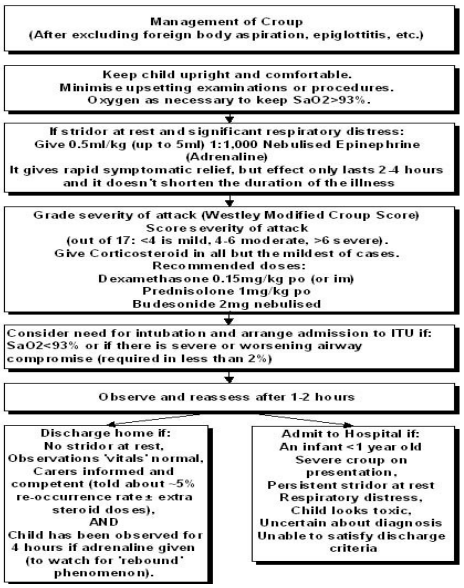


CROUP – WESTLEY SCORING SYSTEM

Parameter	Grade	Score
Stridor	None When Agitated At Rest	O 1 2
Intercostal Recession	Mild Moderate Severe	1 2 3
Air Entry	Normal Mildly Decreased Severely Decreased	0 1 2
Cyanosis	None With Agitiation At Rest	0 4 5
Conscious Level	Normal Altered	0 5

CROUP - MANAGEMENT

- Westley score on arrival and 2 hrs later
- Dexamethasone – 0.15mg/kg Stat dose only OR
- Prednisolone 1mg/kg stat dose only OR
- Budesonide 2mg Nebuliser
- Dropping GCS: Adrenaline Nebuliser 5m1 1:1000 at 5 minute intervals
- No improvement – Early intubation considered
- No role for Abx in isolated croup
- If improves home w symptomatic Rx only



CASE 'D'

- 6 year old girl complaining of SOB along with a widespread urticarial rash having been prescribed antibiotics for a suspected chest infection earlier today.
- The symptoms began 30 minutes after taking the first does of penicillin tonight.
- Cough ++ and Vomit x3
- HR 155
- RR 32
- O2 98%
- T 39.8

DRUG ALLERGY / ANAPHYLAXIS

- Multiple allergens possible
- SOB and Rash two most common presenting features
- Time of presentation variable
- Early ABC essential
- Oxygen
- Bronchodilators
- Anti histamines
- Adrenaline if compromised – IM vs IV routes to give?
- Mast Cell Tryptase – immediately then 1-2hrs later

Stings	**47**	29 wasp, 4 bee, 14 unknown
Nuts	**32**	10 peanut, 6 walnut, 2 almond, 2 brazil, 1 hazel, 11 mixed or unknown
Food	**13**	5 milk, 2 fish, 2 chickpea, 2 crustacean, 1 banana, 1 snail
Food possible cause	**17**	5 during meal, 3 milk, 3 nut, 1 each - fish, yeast, sherbet, nectarine, grape, strawberry
Antibiotics	**27**	11 penicillin, 12 cephalosporin, 2 amphotericin, 1 ciprofloxacin, 1 vancomycin
Anaesthetic drugs	**39**	19 suxamethonium, 7 vecuronium, 6 atracurium, 7 at induction
Other drugs	**24**	6 NSAID, 3 ACEI, 5 gelatins, 2 protamine, 2 vitamin K, 1 each - etoposide, acetazolamide, pethidine, local anaesthetic, diamorphine, streptokinase
Contrast media	**11**	9 iodinated, 1 technetium, 1 fluorescein
Other	**3**	1 latex, 1 hair dye, 1 hydatid

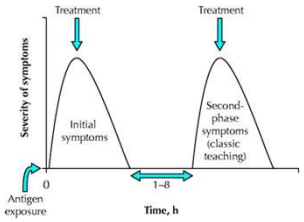
Table 1. Suspected triggers for fatal anaphylactic reactions in the UK between 1992-2001[15]

Drugs in anaphylaxis	Dosage by age			
	Less than 6 months	6 months to 6 years	6 - 12 years	More than 12 years
Adrenaline IM - pre-hospital practitioners	150 micrograms (0.15ml of 1:1,000)		300 micrograms (0.3ml of 1:1,000)	500 micrograms (0.5ml of 1:1,000)
Adrenaline IM - in-hospital practitioners	0.1ml/kg of 1:10,000 10 micrograms/kg			
Adrenaline IV	Titrate 1 microgram/kg*			
Crystalloid	20ml/kg			
Chlorphenamine (IM or slow IV)	250 micrograms/kg	2.5mg	5mg	10mg
Hydrocortisone (IM or slow IV)	25mg	50mg	100mg	200mg

* 1 microgram/kg given over 1 minute (range 30 seconds to 10 minutes), e.g. 0.5ml/kg of 1:10,000 adrenaline made up to 50ml saline 0.9% and run at 1ml/min is 1 microgram/kg/minute

ALS6: APLS Anaphylaxis Algorithm: Updated November 2009

ADMIT OR HOME – THE BIPHASIC RESPONSE?



Grunau et al (2014)

430,000 case notes with biphasic reactions

Incredibly rare (0.17%!)

Could occur far longer than any reasonable period of observation in the ED (anything up to 6 days afterwards)

There were NO 28/7 fatalities

FOLLOW UP

Auto injector training

Advice leaflets

GP to refer to allergy clinic if Anaphylaxis

CASE 'E'

- A 2 year old boy who has recently immigrated from Ecuador presents to the ED with profound SOB and looking pale, lethargic and drooling profusely.
- He has not had any previous illnesses.
- He is now becoming increasingly drowsy.

- HR 165
- RR 30
- O2 93 (poor trace)
- T 39.8
-

EPIGLOTTITIS

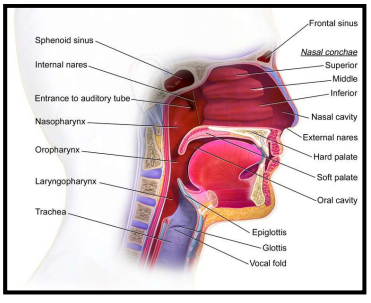
- Rare, Acute life threatening inflammation
- Hib Vaccination reduced rates significantly
- Most commonly age 2 to 8 years
- Haemophilus Influenzae type B
- Streptococcus
- Rapidly evolving over a few hours
- The 'tripod sign'

EPIGLOTTITIS - INVESTIGATIONS

- Keep child on parent's lap
- DON'T do any investigations until the appropriate help have arrived.
- Lateral soft tissue XR
- Throat swabs

EPIGLOTTITIS - MANAGEMENT

- Intubation in 30% of cases
- Surgical Tracheostomy
- Broad spectrum Abx – Cefotaxime
- Consider Steroids



CASE 'F'

Priority Call to a 3 year old boy Jacob who is at a friend's birthday party presenting with a sudden onset sob and drooling.

He is having difficulty breathing and has stridor when agitated.

Known 'seasonal asthma'

HR 145

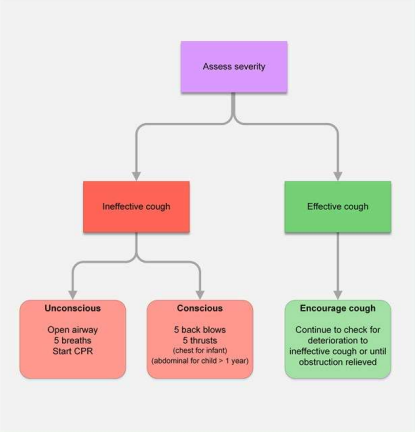
RR 30

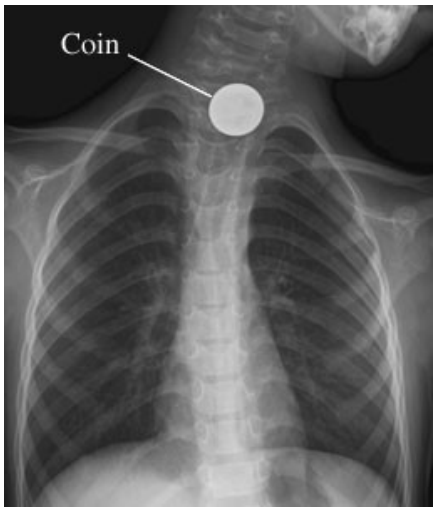
O2 93 (poor trace)

T 37.8

FOREIGN BODIES

- Children can ingest anything!
- Careful history essential
- May present with obvious SOB and DIB
- Drooling
- Stridor
- Wheeze





ANY QUESTIONS…