



AGENCY FOR
CLINICAL
INNOVATION

Emergency - Quality, Education and Safety Teleconference

E-QUEST

16th May 2018

Dr Mathew O'Meara, Chief Paediatrician NSW

Dr Mayro Dos Santos, Improvement Lead, Paediatrics, CEC

Dr Nicholas Lelos | Advanced Trainee | Emergency Care Institute

Thanks for joining



House rules

Confidentiality

Respect

OUTLINE

- Case reviews
- Underlying causes
- Pause for comments and discussion
- Clinical context
- NSW Health guidance (Resources)

Participation encouraged throughout

(But please turn off camera & mute mic when not talking)

Procrustes, in Greek legend, was a robber dwelling somewhere around Athens. Procrustes had an iron bed on which he compelled his victims to lie. Here, if a victim was shorter than the bed, he stretched him by hammering or racking the body to fit. Alternatively, if the victim was longer than the bed, he cut off the legs to make the body fit the bed's length. In either event the victim died.

The “bed of Procrustes,” or “Procrustean bed,” has become proverbial for arbitrarily—and perhaps ruthlessly—forcing someone or something to fit into an unnatural scheme or pattern



Case 1 – Tom

- 2 years old presents in rural ED
- Lethargy, nausea, vomiting, poor intake, poor urine output
- Pale and irritable
- RR 34, Sats 95%, HR 134, T 37
- Triage 2
- Weight 12.5 kg

Tom - Continued

Seen in 10 minutes

Chest clear, throat mildly congested

UA Trace blood

Impression gastroenteritis

Plan: Trial of fluids

Tom - Management

Reviewed 3 hours later

90 ml of fluid in

Observations stable

Review if worse

Case 1.1 - Tom

Next day: Represents

Vomiting, fever diarrhoea

RR 40 Sats 98% HR 160 T 38.2

Triage 3

THOUGHTS ON THE CASE?

Confidentiality
Respect

Tom- continued

VBG: pH 7.4, CO2 33, Bicarb 21, BE -4

Fluid bolus iv

Admitted to rural site

Dry cough treated with ventolin

5 hrs later RR 50, mild effort, sats 93%, HR 160, T 38.2

Tom- continued

3 Yellow zone obs. Clinical review called, not attended. Second call for clinical review

Paediatrician review overnight. Decreased breath sounds right side

Diagnosis: Pneumonia +/- effusion

Consult tertiary hospital. IV ceftriaxone, flucloxacillin, vancomycin

Tom - Transfer

- NETS nurse transfer by road to tertiary hospital
- On arrival RR 60, sats 89%, HR 170, T 38.6
- Severe pneumonia
- Humidified high flow oxygen
- ICU transfer for resp distress and shock

Investigations and Management

Bix - WCC 0.4, Neut 0.2

US - pleural effusion

Theatre for bone marrow and thorascopy

200mL dark fluid drained - strep pneumoniae

Arrested intraoperatively. No ROSC

DISCUSS

- How can this help local management?
- Would you have done anything differently?

Pediatric ED Presentations – key points



Respiratory problems can look non-specific

Respond to early signs of deterioration

If escalation get blocked go harder

Antibiotics are just the beginning

Cardio respiratory support

Bree

6 year old girl

Diarrhoea 1 week

Noted by others to appear lethargic and pale

Respiratory Rate 28

Respiratory distress Mild with slight intercostal recession

Oxygen Saturations 88% in room air

Heart Rate 115

Blood Pressure 89/41

Temperature 36.5 degrees

AVPU responds to voice

ED triage 2

Bree - Cont

Background:

Developmental delay
prematurity (ex-34/40 weeks)
chronic lung disease
atrial septal defect

Bree - Cont

Concerns?



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Bree - Cont

Assessed by Dr

Chest clear, no added sounds

Plan: ECG, AXR, CXR

Working diagnosis – asthma/bronchiolitis

Mgx: Treated with salbutamol

Oxygen then weaned



Bree - Cont

CXR interpreted: signs of bronchiolitis and evidence of airspace opacification in the right upper lobe suggestive of atelectasis.

Observations

HR in blue zone

sats not recorded after oxygen removed

Alertness not recorded

Other vital signs normal

Discharged 2 hours after arrival

Salbutamol 2-4 puffs, 2-4 hourly

Bree - aftermath

Arrested 3 hours after discharge

Unable to be resuscitated

Coronial case

Post mortem results are not yet available to determine the cause of death

Comments?



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Key points

Risk factors

unaware

co-morbidity

Severity

Bronchiolitis

Illness of infants

Cognitive errors



Grace

4 month old girl in rural hospital

Unwell 3 days, vomiting, decr wet nappies

Triage

RR 60

Respiratory distress

Sats 90-94% in air

Grace

Assessed by GP VMO promptly

Cyanotic episode

Oxygen via nasal prongs– sats to 96%

Mgx:

IV access 20mls/kg of 0.9% Sodium Chloride + 2.5% Glucose

CXR RUL consolidation

Ampicillin



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Grace

Planned transfer to Base Hospital.

Paramedics queried need for NETS

In transit

RR 44

Sats 86%

HR 160

Oxygen via Hudson mask

Grace

Assessment at Base Hospital

Severe resp distress, wheezy

HR 194

T 38.4

Triage 2

Salbutamol – RR better, “pinker”

Second iv line

Cefotaxime

NGT coiled – replaced

NETS contacted

Grace

Continuing deterioration

Attempted intubation – bradycardic arrest with ROSC

Second intubation attempt – ETT confirmed, second arrest

Inotropes

NETS retrieval

Grace

Diagnosed with coarctation of the aorta and cardiogenic shock.

Stent was inserted in theatre

Child died from hypoxic brain injury

Cardiac failure can look like respiratory failure

Feel for pulses

Reconsider when not improving/deteriorating

Fresh eyes may see things more clearly

Airway skills in infants

James

4 month old with lethargy, decreased oral intake and barking cough.

Triage

Respiratory Rate	32
Oxygen Saturations	99%
Heart Rate	147
Temperature	36.9
Weight	3.9kg

Siblings at home were also unwell with flu-like symptoms

Triage cat 3.

James

Assessed by ED Registrar.

No respiratory distress, no stridor no cough.

Obs between the flags.

James

Diagnosis mild croup

Treated 4mg prednisolone plus second dose in 12 hours-time.

Discharged

Advised to re-present if there were ongoing concerns, or GP in 2 days' time

James

12 hours later found unresponsive, not breathing and cold.

Drove to ED

In resus cool, mottled, apnoea, no pulse.

Pupils were fixed.

CPR attempted without response

Coronial case

Sudden Unexpected Death of an Infant

James

The post-mortem determined the cause of death as sepsis due to viral and superimposed bacterial pneumonia. Mild chronic tracheitis noted

Key Points

- “Croup” in a young infant

Uncommon < 6 months, rare < 3 months

More likely structural problem

- Admission criteria

Age, severity, uncertain diagnosis, comorbidity

- Failure to thrive

Paediatric Watch. Lessons from the frontline.

Paediatric Clinical Guidelines

- NSW
- RCH
- SCHN

paediatric WATCH

Lessons from the frontline

A publication of the Clinical Excellence Commission
Edition 3/17

Sepsis in a heartbeat: Never ignore persistent tachycardia

A two and a half year old child presented to the Emergency Department (ED) at a rural hospital with fever, vomiting, and flu like symptoms. Observations on arrival included respiratory rate 58 (Yellow Zone); SpO2 100% on room air; heart rate 178 (Red Zone); and temp 37.3°C.

The child was assessed by a medical officer (MO) who noted the child to have a "flat" affect, and, following examination, thought the child had a viral infection. The MO presented the case to a senior consultant, however, the consultant did not review the patient.

The child's respiratory rate and heart rate remained in the Yellow and Red Zones respectively for the next 4 hours at which point the child was discharged home, with advice to return if there were further concerns.

Sepsis is one of the leading causes of death in children, with mortality rates as high as 8% -10%. The majority of these deaths are considered to be preventable. Recent literature has highlighted that early sepsis identification with targeted sepsis management may in fact reduce mortality to as low as 1-3%.

There were a number of similarities in each of these seven NSW RCAs. They included diagnostic error, loss of situational awareness, and failure to activate the [Clinical Excellence Commission's paediatric sepsis pathway](#) despite the child fitting the criteria on the pathway.

One consistent theme was clearly evident in all seven cases. All seven patients had **persistent tachycardia**.

In each of these cases, staff did not react to this vital clue which could have led them to recognise a sick child and investigate further.

Persistent tachycardia remains one of our most valuable tools in identifying sepsis in

All seven patients involved in the missed sepsis cases had risk factors, signs and symptoms to activate the paediatric sepsis pathway either on arrival or early in their presentation. However, the sepsis pathway was not activated in any of the cases.

Once a patient is placed on the sepsis pathway and reviewed by a senior clinician, diagnostic tools including a lactate, base excess or procalcitonin level are useful to assist clinicians in the ongoing management of the patient.

The aim for patients with presumed sepsis is administration of appropriate antibiotics and IV fluids within an hour of activating the paediatric sepsis pathway.

Lessons learnt:

- Do not ignore, or dismiss an unexplained persistent tachycardia.
- For any undifferentiated patient with persistent tachycardia, always consider "could this be sepsis?"

Bronchiolitis Algorithm

Bronchiolitis Algorithm

Initial Assessment

This table is meant to provide guidance in order to stratify severity. The more symptoms the infant has in the moderate-severe categories, the more likely they are to develop severe disease.

Symptoms	Mild	Moderate	Severe
Behaviour	Normal	Some/intermittent irritability	Increasing irritability and/or lethargy /fatigue
Respiratory Rate	Normal – mildly increased respiratory rate	Increased respiratory rate	Marked increase or decrease in respiratory rate
Use of accessory muscles	Nil to mild chest wall retraction	Moderate chest wall retractions Tracheal tug Nasal flaring	Marked chest wall retractions Marked tracheal tug Marked nasal flaring
Oxygen Saturation Oxygen Requirement	O ₂ saturations >92% (in room air)	O ₂ saturations 90 - 92% (in room air)	O ₂ saturations < 90% (in room air) Hypoxemia, may not be corrected by O ₂
Apnoeic Episodes	None	May have brief self-limiting apnoea	Increasingly frequent or prolonged apnoea
Feeding	Normal or slightly decreased	Difficulty feeding but able to take > 50% of normal feeds	Significant difficulty feeding with intake < 50% of normal feeds

4.3 Differential Diagnosis

A number of other conditions may share some presenting features with viral bronchiolitis. These conditions can usually be excluded via an accurate history, a thorough physical examination and, where clinically indicated, a chest X-ray. Such conditions include:

- Pneumonia
- Congestive heart failure
- Pertussis
- Pneumothorax
- Bronchial foreign body

7 INVESTIGATIONS

In most infants and children presenting to hospital and/or hospitalised with bronchiolitis, **NO** investigations are required.

Chest x-ray (CXR)

- Is not routinely indicated in infants presenting with bronchiolitis and may lead to unnecessary treatment with antibiotics and subsequent risk of adverse events.

Blood tests (including full blood count (FBC), blood cultures)

- Have no role in management.

Virological testing (nasopharyngeal swab or aspirate)

- Has no role in management of individual patients.

Urine microscopy and culture

- May be considered to identify urinary tract infection if a temperature over 38 degrees in an infant less than two months of age with bronchiolitis.

Management

Likelihood of Admission	Suitable for discharge Consider risk factors	Likely admission, may be able to be discharged after a period of observation Management should be discussed with a paediatrician	Requires admission and consider need for transfer to an appropriate children's facility/PICU Referral is determined by: -Senior review -Local CERS response
Observations Vital signs (respiratory rate, heart rate, O2 saturations, temperature)	Assessment in ED prior to discharge (minimum two sets of observations on SPOC)	Hourly Referring to SPOC	Continuous cardiorespiratory and oximetry monitoring and assessment
Hydration/Nutrition	Small frequent feeds	Not feeding adequately (< 50% over 12 hours), Administer NG or IV hydration	Not feeding adequately (< 50% over 12 hours) or unable to feed, Administer NG or IV hydration
Oxygen	Nil requirement	Administer O ₂ to maintain saturations ≥ 92%	Administer O ₂ to maintain saturations ≥ 92%
Respiratory Support		If a trial of NPO ₂ is ineffective consider HFNC after paediatrician review	Consider HFNC or CPAP after paediatrician review
Disposition/Escalation	Consider further medical review if early in the illness and any risk factors are present or if child develops increasing severity after discharge	Decision to admit should be supported by clinical assessment, social and geographical factors and phase of illness	Requires admission or transfer, escalate as per local CERS if: -Severity does not improve -Persistent desaturations -Significant or recurrent apnoeas with desaturation

If no improvement consult NETS 1300 36 2500

Investigations have no usual role in the management of bronchiolitis (see page 7)

Provide advice on the expected course of illness & when to return - Parent Fact sheets should be given to parent/ carer

DISCUSSION



Questions?

CLINICAL TOOLS AND GUIDELINES

The screenshot shows the website <https://www.aci.health.nsw.gov.au/networks/eci>. The page features the Emergency Care Institute (ECI) logo on the left and the ACI (Agency for Clinical Innovation) logo on the right. A navigation bar includes links for NEWSLETTERS, NEWS & EVENTS, CONTACT US, and LOG IN. Below the logos is a secondary navigation menu with categories: About Us, Clinical, ED Administration, Professional & Consumers, Research, and Education & Training. A search bar is positioned below the navigation menu. The main content area features a large red banner with the word "Emergency" and a white arrow pointing left. To the right of the banner is a vertical menu with categories: Administration & Clinical Support, Allied Health, Consumers, Doctors, and Nurses. Below the banner, there are sections for "Upcoming Events" (with a calendar for September 2017) and "What's New" (highlighting ECI Events and research symposiums). A "Clinical tools" section is also visible, with a "CLICK HERE" button.

Emergency Care Institute
NEW SOUTH WALES

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Search the ECI website... Search

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Doctors
Nurses

Upcoming Events

Sun	Mon	Tue	Wed	Thu	Fri	Sat
27	28	29	30	31	1	2

September 2017

What's New

ECI Events

Videos and presentations are now available from the 2017 Research Symposium, Nursing Leadership Forum and the first ED Leadership Forum on 9 June

Clinical tools
Latest evidence based
CLICK HERE »

E-QuESTs so far

- Atypical Chest Pain - ACS
- Sepsis in the elderly
- Abdominal pain in the elderly - AAA & Ischaemic gut
- Scrotal emergencies
- Deadly headaches
- Paediatric deterioration
- Head injuries
- Ophthalmological emergencies
- Mental Health presentations
- Pediatric Emergencies and bronchiolitis

Looking to next month, please...

- Share your cases
- Share your patient safety actions
- Spread the word with your colleagues

(or send me their email: Nicholas.lelos@health.nsw.gov.au)

What would you like to see / hear about?



Level 4, 67 Albert Avenue
Chatswood NSW 2067

PO Box 699
Chatswood NSW 2057

T + 61 2 9464 4666
F + 61 2 9464 4728

aci-info@health.nsw.gov.au
www.aci.health.nsw.gov.au

Many thanks!

Next E-QuEST

Wednesday 13th June 08:00 am

Look out for our email survey
We need your responses to guide future
work

