Paediatric Best Care Bundles: Streamlining Care in the Emergency Department

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Paediatric Clinical Nurse Specialist

Dr Stefan Van Der Walt
Paediatric Emergency Specialist
Before we start...
The CNS in ED – What do we do?

Patients with minor injuries and illnesses
- Take history, examine, order investigations (whiteboard clinician)
- Diagnose and treat injuries and illness
- Disposition – discharge or referral

Clinical oversight by ED Specialist
- Discuss ALL patients to endorse/validate/consult on decisions
- Prescribing
The Adult CNS in ED

Patients with minor injuries and illnesses

Treatments/interventions
- Manipulation of fractures/dislocations
- Local and nerve infiltration for analgesia
- Suturing/wound management/burns
- I & D abscess
- Removal of foreign bodies (ears/eyes/nose/soft tissue)
- Epistaxis management
- Dental emergencies
- Joint aspirations (diagnostic)
- Minor medical presentations
- WDHB – some Best Care Bundle presentations
Patients with minor injuries and *illnesses*

Treatments/interventions

- **Medical Presentations:**
  - Respiratory illness (cough/wheeze/SOB/croup/pharyngitis)
  - Gastrointestinal illness (gastro/constipation)
  - GUI complaints (UTI etc)
  - Skin complaints (eczema, abscess, cellulitis, rashes)
  - Undifferentiated presentations (e.g. febrile)

- **Injury presentations:**
  - Head injuries
  - Wounds, burns and fractures
  - Foreign bodies (ears/eyes/nose/soft tissue)
Best Care Bundle (BCB)s

- What they are
- How they work
- How they make a difference
KEEP CALM
6 HOURS TO GO
Patient Journey through the ED

Arrive

Triaged

Move to appropriate area

Disparity

DELAY

Clinician Consultation
- Investigations
- Treatment Plan
- Disposition

Assessed by a Nurse
- Vital signs
- Urgent needs addressed
A Best Care Bundle (BCB) is...

A collection of resources aimed at improving patient care and reducing process delays for suitable clinical presentations.
Paediatric Best Care Bundles

Wheeze >1 year

Croup

Bronchiolitis

Rehydration
Components of a BCB?
Croup BCB
How it works
## CROUP

### Inclusion Criteria

<table>
<thead>
<tr>
<th>Date:</th>
<th>Time:</th>
<th>Name:</th>
<th>Sign:</th>
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- □ Age < 6 months → STOP - NOT SUITABLE FOR THIS CARE BUNDLE
  - 1. **ED Senior Medical or Paediatric Registrar review without delay**
- □ Age > 6 months with stridor, barking cough and/or hoarse voice → CONTINUE
  - (Include patients who have received treatment on route who are currently asymptomatic)
- □ Initiate Best Care Bundle "Group" on Whiteboard

### Initial Nursing assessment - Aim to complete by 30 minutes

- History, examination and vital signs recorded on the Nursing Assessment Sheet.
- Croup Assessment Tool applied and appropriate pathway started. (see page 2)

<table>
<thead>
<tr>
<th>Initial Pathway:</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
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### Red Flags

- □ CAT "Severe" or Hypoxia (Sats < 94%)
  - 1. Move to Resusc for urgent medical review and inform Paediatric Team

<table>
<thead>
<tr>
<th>Any other below:</th>
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- □ Sudden onset, no prodromal illness; history of choking (? Foreign body)
- □ Urticarial rash (? Anaphylaxis)
- □ Allergies associated with Anaphylaxis in the past
- □ Not immunised (? Epiglottitis)
- □ High fever and toxic appearance (? Bacterial Tracheitis / Epiglottitis)
- □ Known syndromes (e.g. Down Syndrome) or airway issues (Larynge-tractoe malacia, Haemangiomas)

- □ **ED Senior Medical or Paediatric Registrar review without delay**

### Clinician review - Aim to complete within 90 minutes

<table>
<thead>
<tr>
<th>Name:</th>
<th>Designation:</th>
<th>Time:</th>
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If no clinician sign on at 2 hours - discuss with CNS or Lead Specialist (NGH 3005, WTH 7789)

### Sample Signatures

<table>
<thead>
<tr>
<th>Name</th>
<th>Signature</th>
<th>Initials</th>
<th>Name</th>
<th>Signature</th>
<th>Initials</th>
</tr>
</thead>
<tbody>
<tr>
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Issue Date: November 2013
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- **Age < 6 months** → **STOP - NOT SUITABLE FOR THIS CARE BUNDLE**
  - **ED Senior Medical or Paediatric Registrar review without delay**

- **Age > 6 months with stridor, barking cough and/or hoarse voice** → **CONTINUE**
  - *(Include patients who have received treatment en route who are currently asymptomatic)*
  - **Initiate Best Care Bundle “Croup” on Whiteboard**
# Red Flags

<table>
<thead>
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<tbody>
<tr>
<td>☐ CAT “Severe” or Hypoxia (Sats &lt; 94%)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Any other below</td>
</tr>
<tr>
<td>☐ Sudden onset, no prodromal illness, history of choking ( ? Foreign body )</td>
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<td>☐ Not immunised ( ? Epiglottitis )</td>
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</table>
### Croup Assessment Tool (CAT)

If features from more than one category “mild”, “moderate” or “severe” are present, score the highest category.

<table>
<thead>
<tr>
<th></th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Behaviour:</strong></td>
<td>Normal</td>
<td>Some or intermittent irritability</td>
<td>Increasing irritability or lethargy</td>
</tr>
<tr>
<td><strong>Stridor:</strong></td>
<td>Barking cough</td>
<td>Some stridor at rest</td>
<td>Stridor present at rest</td>
</tr>
<tr>
<td></td>
<td>Stridor only when active or upset</td>
<td></td>
<td>Marked increase or decrease</td>
</tr>
<tr>
<td><strong>Respiratory rate:</strong></td>
<td>Normal</td>
<td>Increased</td>
<td>Tracheal tug</td>
</tr>
<tr>
<td><strong>Accessory muscle use:</strong></td>
<td>None or Minimal</td>
<td>Tracheal tug</td>
<td>Nasal flaring</td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>Moderate chest wall retraction</td>
<td>Marked chest wall retraction</td>
</tr>
<tr>
<td><strong>Hypoxia or oxygen requirement:</strong></td>
<td>None</td>
<td>None or Minimal</td>
<td>Saturations &lt; 94%</td>
</tr>
</tbody>
</table>
Moderate Pathway \( \rightarrow \) review every 30 minutes

At each review: Record vital signs and then select management option.

### START

<table>
<thead>
<tr>
<th>Nursing review</th>
<th>Time:</th>
<th>Sign:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calming and comforting measures, <strong>avoid distressing interventions if possible.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ Oral Dexamethasone 0.15 mg/kg (max 12 mg) if not already given.</td>
<td></td>
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</tbody>
</table>

### 30 min

<table>
<thead>
<tr>
<th>Nursing review</th>
<th>Time:</th>
<th>Sign:</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Severe ( \rightarrow ) Move to Resus, start severe pathway</td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ Moderate ( \rightarrow ) Continue nursing cares</td>
<td></td>
<td></td>
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</tbody>
</table>
| □ Mild \( \rightarrow \) Continue nursing cares
  \[⇐ \text{If discharge seems likely initiate clinician review now} \]

### 60 min

<table>
<thead>
<tr>
<th>Nursing review</th>
<th>Time:</th>
<th>Sign:</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Severe ( \rightarrow ) Move to Resus, start severe pathway</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| □ Moderate \( \rightarrow \) Alert Clinician to lack of response to treatment
  \[⇐ \text{Refer for Paediatric assessment} \]
| □ Mild \( \rightarrow \) Discharge if discharge guidelines on page 8 are met. |
**Focused History**

- Clinical Notes - completed by Dr or PCNS

### History

*See nursing assessment sheet for additional information*

<table>
<thead>
<tr>
<th></th>
<th>Stridor <em>(inspiratory)</em></th>
<th>Number of days with stridor:</th>
<th>Cough <em>(barking)</em></th>
</tr>
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<tbody>
<tr>
<td>□</td>
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<td>□</td>
<td>□</td>
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<table>
<thead>
<tr>
<th></th>
<th>Wheeze</th>
<th>Fever</th>
<th>Hoarse voice</th>
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<tr>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
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<table>
<thead>
<tr>
<th></th>
<th>Immunised <em>(Not being immunised increases the risk for Diphtheria and H. influenzae infection)</em></th>
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<table>
<thead>
<tr>
<th></th>
<th>Atypical presentation <em>(? other pathology: haemangiomas - look for birth marks, congenital malformations)</em></th>
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<table>
<thead>
<tr>
<th></th>
<th>Exposure to known allergen <em>(Consider Anaphylaxis!)</em></th>
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<tr>
<td>□</td>
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</table>
### Focused Examination

#### Ear Nose and Throat

Avoid distressing the child with throat examination - *may worsen obstruction!*

#### Respiratory

- Visible indrawing
- Accessory muscle use
- Grunting
- Stridor
- Crackles
- Unequal air entry
- Silent chest
Discharge Guidelines

If history of poor compliance with treatment after discharge in the past or suspicion that compliance is likely to be poor after discharge, consider admission or discuss with Paediatric Team.

Discharge patient if the following criteria have been met.

- Patient reviewed by Senior Dr. or Paediatric Team if not ED patient.
- Mild disease not requiring treatment.
- Mild symptoms 1 hr after treatment if only received steroid treatment.
- Mild symptoms 4 hrs after receiving a single dose of Adrenaline.
- Ongoing treatment explained and appropriate medications prescribed.
- No transport or other issues which might interfere with coming back to ED for review if required.
- Parent / Caregiver feel confident in being able to manage at home know who to contact if they are concerned.
- Discharge letter and other relevant documentation given to Parent / Caregiver.

Patient information handouts.

- Croup
Discharge Information – Croup

What is Croup?

Your child has croup. This is a viral illness which affects young children and causes swelling and narrowing of the upper airways (voice box and windpipe).

What are the signs and symptoms of croup?

- A dry ‘barking’ cough which may be worse at night.
- Stridor, which is a harsh noise that is heard as your child breathes in.

How long will my child be sick?

- Your child may have stridor for a few days and the cough may last for up to a week.

What is the treatment?

- Croup is caused by viruses, so antibiotics do not help.
- Mild cases of croup can be managed at home and no medication is needed.
- In moderate to severe croup your doctor may prescribe a single dose of a steroid medicine which will reduce swelling in your child’s airway and help them to breathe more easily. Steroids improve the stridor component of the illness but have little effect on the cough.

If you are concerned about the use of steroids, be reassured that a single dose is safe and will have no harmful effects on your child. They work for about 48 hours.

How can I care for my child at home?

- If your child becomes upset, remain calm and comfort your child—distress can make their breathing and stridor worse.
- Sips of cool fluid or ice blocks may be soothing if your child’s throat is sore.
- You can give Paracetamol if your child is miserable with a fever or has a sore throat. (Follow the dosage instructions on the bottle carefully.)
- Although adding steam to the air used to be recommended, there is no evidence it actually helps. (There have been several cases where children have been badly burned from the hot water.) We do not recommend using steam for croup.
- DO NOT let anyone smoke near your child.
Patient Journey through the ED

Arrive

Triaged

Move to appropriate area

Prompts Disposition

Clinician Consultation
  - Investigations
  - Treatment Plan
  - Disposition

Treatment

Assessed by a Nurse
  - Vital signs
  - Urgent needs addressed
How They Make a Difference

Purpose of BCBs:
- Reduce process delays in ED
- Reduce treatment disparities for certain conditions
- Reduce admission rates
- No increase in returns to ED (representations)
- Increase consistency of data (for audit)
Pre BCB Group: 1 Mar – 30 Sep 2013
Post BCB Group: 1 Mar – 30 Sep 2014

Sample includes:
- ED patients
- Paediatric medical

31% increase in croup/stridor identification (pop increase in same period = 3%)

- WTH only
- Croup
- Age 6m -15yrs
Mean Length of Stay (LOS)

<table>
<thead>
<tr>
<th></th>
<th>Pre-bundle</th>
<th>Post-bundle</th>
<th>Difference</th>
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<tbody>
<tr>
<td>EM</td>
<td></td>
<td>12 minutes</td>
<td></td>
</tr>
<tr>
<td>Paed</td>
<td>282 minutes</td>
<td></td>
<td></td>
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<tr>
<td>Med</td>
<td></td>
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<tr>
<td>Overall</td>
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Shorter
Mean Hours to Discharge (from ED or ward)

Overall LOS:
- Post BCB: 00:50
- Shorter

Day:
- Post BCB: 00:18
- Shorter

Night:
- Post BCB: 01:24
- Shorter

Legend:
- PreBCB
- Post BCB
Time to Treat with Dexamethasone (TTT)

Improved by 118%

Pre BCB: 27% (0-29 minutes) and 73% (30+ minutes)
Post BCB: 59% (0-29 minutes) and 41% (30+ minutes)
Electronic Dispensing Data

- Corresponding Pyxis entries identified:
  - Pre BCB Data 44%
  - Post BCB Data 56% - Awaiting re-audit.

Percentage increase 27%
Percentage Admitted to Ward

<table>
<thead>
<tr>
<th>Group</th>
<th>Pre-bundle</th>
<th>Post-bundle</th>
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</thead>
<tbody>
<tr>
<td>EM</td>
<td>6%</td>
<td>6%</td>
</tr>
<tr>
<td>Paed</td>
<td>6%</td>
<td>38%</td>
</tr>
<tr>
<td>Med</td>
<td>19%</td>
<td>8%</td>
</tr>
<tr>
<td>Overall</td>
<td>11%</td>
<td>8%</td>
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24% reduction in ward admissions post bundle
...and there is no down side

Representations

Pre bundle – 2.4%
Post bundle – 1.9%
How do BCBs make a difference?

- Reduced process delays in ED
  - ↓ LOS ↓ TTT
- Reduced treatment disparity
  - EM vs Paed Medical
- Reduced admission rates
- No increase in representations
- Improved data capture
  - “Croup” in presenting symptom field
  - Electronic dispensing data (Pyxis)
A Best Care Bundle (BCB) is...

How they work...

They DO make a difference
Acknowledgments

Bundle Development:
- Stefan Van Der Walt Paed EMS
- Olwen Gilbert Paed EMS
- Carmen Haines Paed NE ED
- Jenny Crawford Paed Pharmacist
- Jane Key PCNS ED
- Jan Boyd PCNS ED
- Jaye Fuller PCNS ED
- Jenny Bindon Project Manager

Audit:
- Jane Key PCNS
- Delwyn Armstrong Health Intelligence Manager
- Emma Batistich ED SMO
- Stefan Van Der Walt Paed EMS
- Olwen Gilbert Paed EMS
- Jenny Bindon Project Manager
Any Questions?


Chub-Uppakarn, S., & Sangsupawanich, P. (2007). A randomized comparison of dexamethasone 0.15 mg/kg versus 0.6 mg/kg for the treatment of moderate to severe croup. *International Journal Of Pediatric Otorhinolaryngology, 71*(3), 473-477.


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