Recognising a sick child

Allan Wardhaugh
Paediatric Intensivist
UHW
Tales of a country doctor
What is he going to talk about?

- Importance of the airway
- Structured approach to assessing illness
  - A
  - B
  - C
  - D
- Cases
Traditional assessment

- History of presenting complaint
- Past history
- Family History
- Examination
- Differential diagnosis
- Management plan
Intensivist’s assessment

- **Airway**
  - Identify problem, treat, move on

- **Breathing**
  - Identify problem, treat, move on

- **Circulation**
  - Identify problem, treat, move on

- **Disability (Conscious level)**
  - Identify problem, treat, move on
ABCD stabilised

- Then start worrying about diagnosis
Cardiac arrest

- Adults
  - Often primary cardiac event

- Children
  - Usually secondary to hypoxia
  - Very poor outcome
  - Usually warning period before it happens
Airway

- Large head, short neck – flexes head and narrows airway
- Tongue relatively large
- Obligate nasal breathers first 6 months
- Adeno-tonsillar hypertrophy 3 – 8yrs
- Everything narrow
  - Flow proportional $R^4$
Adult vs Paediatric arrests

- Adults
  - Ischaemic heart disease $\rightarrow$ VF $\rightarrow$ asystole/PEA
- Children
  - Hypoxia $\rightarrow$ asystole/PEA/VF
Arrest

- 101 children with cardio-pulmonary arrest
  - 21 respiratory only
  - 80 cardiac

- Respiratory arrest alone 43% survive
- Cardiac Arrest 8% survive
Airway

Patent?

- Yes: Go to B
- No:
  - Chin lift
  - Jaw thrust
  - Gentle finger sweep or suction

Give Oxygen
Breathing

- Effort
- Effectiveness
Breathing

- Effort
  - Rate
  - Recession and indrawing
  - Nasal flaring
  - Grunting
  - Wheeze
  - Stridor

- Effectiveness
## Resp rate

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Resp rate (per minute)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1</td>
<td>30 – 40</td>
</tr>
<tr>
<td>1 – 2</td>
<td>25 – 35</td>
</tr>
<tr>
<td>2 – 5</td>
<td>25 – 30</td>
</tr>
<tr>
<td>5 – 12</td>
<td>20 – 25</td>
</tr>
<tr>
<td>&gt;12</td>
<td>15 – 20</td>
</tr>
</tbody>
</table>
Breathing

- Effort
- Effectiveness
  - Chest movement
  - Air entry
  - Colour
  - Oxygen saturation
  - Heart rate
  - Conscious level
Beware exhaustion

- Apparent respiratory effort reduced
- Pre-terminal
Circulation

- Heart rate
- CRT
- Urine output
- ‘Filling’
  - liver
- Blood pressure
  - Hypotension is a late sign
# Heart rate

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Heart rate (per minute)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1</td>
<td>110 - 160</td>
</tr>
<tr>
<td>1 – 2</td>
<td>100 - 150</td>
</tr>
<tr>
<td>2 – 5</td>
<td>95 - 140</td>
</tr>
<tr>
<td>5 – 12</td>
<td>80 - 120</td>
</tr>
<tr>
<td>&gt;12</td>
<td>60 - 100</td>
</tr>
</tbody>
</table>
# Blood pressure

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Systolic BP (mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1</td>
<td>70 - 90</td>
</tr>
<tr>
<td>1 – 2</td>
<td>80 - 95</td>
</tr>
<tr>
<td>2 – 5</td>
<td>80 - 100</td>
</tr>
<tr>
<td>5 – 12</td>
<td>90 - 110</td>
</tr>
<tr>
<td>&gt;12</td>
<td>100 - 120</td>
</tr>
</tbody>
</table>
Disability

- Conscious level
- Pupils
- Posture
AVPU

- A  alert
- V  voice
- P  pain
- U  unresponsive
AVPU

- A alert
- V voice
- P pain
- U unresponsive

GCS < 8
Pupils

- Blown pupil
- Blown pupils
Posture

- Abnormal flexion
  - Decorticate
- Abnormal extension
  - Decerebrate
Who’s on the critical list?
Emma - 2 year old

- RR
- HR
- Urine

ml/kg/hr
Mel B – 14 year old

[Graph showing melib kinase activity over time]
Mel C - 6 month old
Geri - 4 year old

ml/kg/hr

RR

HR

Urine
Posh - 18 month old

Graph showing the relationship between time (0, 20, 40, 60, 80, 100, 120, 140, 160, 180) and measurements in ml/kg/hr.
Gavin - 2 year old

ml/kg/hr

RR
HR
Urine
Results

- Critical
  - Gavin
  - Posh
  - Geri
  - Mel B

- No cause for concern
  - Mel C
  - Emma
  - Charlotte
Mel B – 14 year old

ml/kg/hr

RR

HR

Urine
Geri - 4 year old
Posh - 18 month old
Summary
- Heart rate
- Respiratory rate
- Urine output