IMPROVING CARE FOR PEOPLE IN SCOTLAND, A FOCUS ON DETERIORATION: PREVENTION, RECOGNITION AND RESPONSE

Paediatric Care
Chaired by Professor George Youngson
<table>
<thead>
<tr>
<th>Topic</th>
<th>Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jamie’s Story</td>
<td>Jennifer Rodgers</td>
</tr>
<tr>
<td>Overview of Sepsis 6</td>
<td>Neil Spenceley</td>
</tr>
<tr>
<td>Sepsis Experience, NHS Grampian</td>
<td>Drew McDonald</td>
</tr>
<tr>
<td>Q&amp;A</td>
<td></td>
</tr>
<tr>
<td>Rapid Admissions of Critical Care</td>
<td>Neil Spenceley</td>
</tr>
<tr>
<td>Update on national PEWS</td>
<td>Linda Clerihew</td>
</tr>
<tr>
<td>Q&amp;A</td>
<td></td>
</tr>
<tr>
<td>Paediatric Care: Early recognition.......Then what?</td>
<td>Professor George Youngson</td>
</tr>
</tbody>
</table>
Join the conversation on Twitter, follow #SPSPConf16 and remember to include it in your tweets.

Free wi-fi available
Wi-fi network: delegate
Password: haymarket
Jamie’s Story
Jennifer Rodgers
“Patients don’t suddenly deteriorate, healthcare professionals suddenly notice.”

Neil Spenceley
National Paediatric Lead
Pediatric Intensive Care Outcomes: Development of New Morbidities During Pediatric Critical Care*

**Conclusions:** The prevalence of new morbidity was 4.8%, twice the mortality rate, and occurred in essentially all types of patients, in relatively equal proportions, and involved all aspects of function. Compared with historical data, it is possible that pediatric critical care has exchanged improved mortality rates for increased morbidity rates. (*Pediatr Crit Care Med* 2014; 15:821–827)
17 year old male (68 kg) referred for PICU review at 16:00 (Friday)

Diagnosis of presumed UTI
SBAR

- Presented to A+E > 24 hours previously; 2-3 day history of fever
- Medical history:
  - Spina Bifida
  - Hydrocephalus
  - Recurrent UTIs/renal impairment
- Cloudy urine on catheterisation
• PEWS 1 in A+E. Presumed UTI, IV access, blood and urine cultures obtained
• PEWS 3 on transfer from A+E to ward
• Commenced on IV Tazocin on ward (5 hours following admission)
• Overnight - spiking temperatures with associated rigors. CRP >250
• Medical reviews ++ - tachycardic, tachypnoeic and hypotensive, PEWS 5 - 8. Given total 1500ml (20ml/kg) in fluid boluses over 12 hours
S BAR

- PEWS 1 in A+E. Presumed UTI, IV access, blood and urine cultures obtained
- PEWS 3 on transfer from A+E to ward
- Commenced on IV Tazocin on ward (5 hours following admission)
- Overnight - spiking temperatures with associated rigors. CRP >250
- Medical reviews ++ - tachycardic, tachypnoeic and hypotensive, PEWS 5 - 8. Given total 1500ml (20ml/kg) in fluid boluses over 12 hours
SBAR

- HR 160 bpm (60-110), CRT 3-4 seconds, Temp 39 degrees, BP- 80/68 (PEWS - 8)
- Rigoring, GCS 15/15; alert and appropriate; no meningism. Parents concerned
- Lactate 5
- Impression - Septic shock
HR 160 bpm (60-110), CRT 3-4 seconds, Temp 39 degrees, BP- 80/68 (PEWS - 8)
Rigoring, GCS 15/15; alert and appropriate; no meningism. Parents concerned
Lactate 5
Impression - Septic shock
SBAR

- Given 1 litre fluid bolus rapidly
- Facemask oxygen 5l/min
- Transfer to PICU
- Central lines sited on admission and commenced on Adrenaline 0.05mcg/kg/min and Noradrenaline 0.05mcg/kg/min within 30 minutes
• Given 1 litre fluid bolus rapidly
• Facemask oxygen 5l/min
• Transfer to PICU
• Central lines sited on admission and commenced on Adrenaline 0.05mcg/kg/min and Noradrenaline 0.05mcg/kg/min within 30 minutes

Do outcomes vary according to the source of admission to the pediatric intensive care unit?

Odetola FO¹, Rosenberg AL, Davis MM, Clark SJ, Dechert RE, Shanley TP.
Improving Situation Awareness to Reduce Unrecognized Clinical Deterioration and Serious Safety Events

AUTHORS: Patrick W. Brady, MD, MSc,a,b Stephen Muething,
UNSAFE Transfers

- Intubated
- Inotropes
- 3 Fluid boluses

Within 60 minutes of ICU review
Two investigators (Dr Brady and Ms Goodfriend) reviewed 20 consecutive SSEs and 80 consecutive ICU transfers to identify potential predictors of deterioration. The presence of at least 1 of the following 5 risk factors was found in each case: (1) family concern about patient safety, (2) high-risk therapies including unfamiliar therapies on the unit (eg, insulin use outside of the diabetes unit), (3) elevated PEWS of \( \geq 5 \), (4) watcher or a patient where a clinician had a “gut feeling” that the patient was at risk for deterioration or “close to the edge,” and (5) communication concern that may impact patient safety.
Conceptual Model
“If the bedside nurse does not know the plan then there is no plan.”
Nae weel
Nae awfy wee
Awfy nae wee

Plan

Persons Notified: □ RT
□ NP □ Intern □ Senior
□ Fellow □ Attending

Notify MPS (Required)

Unit

Date

High PEWS
Comm. Concern
Watcher
Family Concern

High PEWS
Comm. Concern
Watcher
Family Concern

High PEWS
Comm. Concern
Watcher
Family Concern

Notify MPS (Required)

Notify MPS (Required)

Notify MPS (Required)
PICU
Problem addressed
Intervention plan
Call back
Follow Up plan
Cultural Change
Improving sepsis recognition and management in the paediatric ED

Drew McDonald, Senior Staff Nurse ED
Catharina Hartman, Specialty Doctor in EM
Royal Aberdeen Children’s Hospital
November 2016
We all know sepsis 6
Overview of RACH sepsis 6

• Attended SPSP national event in March 2014

• Sepsis 6 discussions took place in RACH in May 2014

• Integrated into A+E practice in October 2014

• Our video should explain our sepsis process, enjoy😊
Why did we need to change?

- We had no idea of how we performed in managing sepsis
- Resuscitation algorithms for everything, apart from sepsis
- Treatment varied between clinicians
- Nobody ever mentioned “sepsis”, knowledge was poor
- It is well known that children die because of delayed recognition, delayed antibiotics and not supporting circulation, and we can reduce mortality rates due to sepsis by improving pre-PICU care
# Why design a recognition tool?

<table>
<thead>
<tr>
<th><strong>Before</strong></th>
<th><strong>After</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Adapted Manchester triage tool vague and sepsis not mentioned</td>
<td>• Fast, safe and comprehensive triage for all children with illness presentation</td>
</tr>
<tr>
<td>• PEWS, great tool, but not always accurate, completed routinely and not acted upon</td>
<td>• The tool makes you think about the child in greater detail than before</td>
</tr>
<tr>
<td>• Varying standard of triage depending on experience level of triage nurse</td>
<td>• Our triage skill has increased to a higher level</td>
</tr>
<tr>
<td>• Perfusion and mental state not always checked or documented</td>
<td>• We have an agreed set pathway with doctors to have a potentially ill child reviewed immediately</td>
</tr>
<tr>
<td>• Doctors less responsive to less experienced nurses concerns</td>
<td></td>
</tr>
</tbody>
</table>
PAEDIATRIC SEPSIS 6

RECOGNITION TOOL

<table>
<thead>
<tr>
<th>Date</th>
<th>CHI Number</th>
<th>Area</th>
<th>Time Of Arrival</th>
<th>Time of 1st assessment</th>
</tr>
</thead>
</table>

STOP

PEWS SCORE | Temp | HR | RR

- CAPILLARY REFILL TIME >2 seconds: YES / NO
- POOR PERIPHERAL PERFUSION: YES / NO
- BLOOD SUGAR ABNORMAL: YES / NO
- MOTTLED: YES / NO
- ALTERED MENTAL STATE (e.g. irritability, lethargy): YES / NO

SEPSIS INDICATED (Inform Medical Staff or Senior Nurse): YES / NO

Time of senior review: _______

THINK

(REDUCE THRESHOLD)

START SEPSIS 6: YES / NO

(IF NO, treat with suitable interventions (e.g. antipyretics, oral fluids) and re-check 90 minutes; escalate to sepsis 6 if conditions worsen and meets sepsis 6 criteria)

Time SEPSIS 6 protocol commenced: _______

NHS Grampian

#SPSCONF16
PAEDIATRIC SEPSIS 6
RECOGNITION TOOL

Please attach end of bed label

<table>
<thead>
<tr>
<th>PEWS Score</th>
<th>TISSUE SODGE</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>CHILD LOOKS UNWELL</th>
</tr>
</thead>
</table>

Please start to recognise sepsis whenever child presents in ward with any illness symptoms. Please complete form in full.

STOP - RECOGNISE SEPSIS

TEMPERATURE <38° OR >38°
INAPPROPRIATE TACHYCARDIA (REFER TO PEWS)
POOR PERIPHERAL PERfusion / CAPILLARY REFILL >3 SECS / MOTTLED
ALTERED MENTAL STATE (sleepiness, irritability, lethargy, irritability)
INAPPROPRIATE TACHYPNOEA (REFER TO PEWS)
HYPOTENSION (REFER TO PEWS)

THINK
Reduce threshold: consider sepsis 6 treatment with fewer signs than above

CHECK SCORE AND FOLLOW LINK FOR SENIOR DOCTOR REVIEW

YES=0
DOES NOT MEET ANY CRITERIA FOR SEPSIS 6

YES=1
CHECK THRESHOLD CRITERIA: MET CONTACT SENIOR DOCTOR
CRITERIA MET: YES NO

YES=2
REFER TO SENIOR DOCTOR, TO CONSIDER SEPSIS 6 TREATMENT

YES=3
IMMEDIATE SENIOR DOCTOR REVIEW
THINK SEPSIS 6

IF YOU FEEL THIS CHILD IS SEVERE START SEPSIS 6 BUNDLE IF NOT FOLLOW REVIEW PROCESS

Time of Senior Doctor Review: START SEPSIS 6 Y/N REVIEW

Reason SEPSIS 6 not commenced:

Doctor’s Signature Review Time mins

If no to SEPSIS 6 please give suitable interventions (ie. antipyretics, oral fluids) and re-check child in 30 minutes, repeating PEWS score. Escalate to senior doctor if child’s condition deteriorates/concerning.

30 minute PEWS score: re-escalate No

Time SEPSIS 6 Protocol Commenced: ________
Did the recognition tool work?

- Over 4000 children screened with recognition tool since October 2014
- Nursing staff feel that it has increased their knowledge of sepsis and triage skills
- Has helped the nurses communicate with doctors if the child requires a sepsis assessment
- All patients treated with sepsis 6 so far have been identified for senior doctor review by the recognition tool
- To date no patient has been treated with sepsis 6 after scoring 0 on sepsis recognition
<table>
<thead>
<tr>
<th><strong>Before</strong></th>
<th><strong>After</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• No treatment plan available</td>
<td>• Easy to follow sepsis 6 management</td>
</tr>
<tr>
<td>• Variation in type and dose of antibiotic</td>
<td>• 1 antibiotic in 1 dose for all patients + 1 other for special circumstances</td>
</tr>
<tr>
<td>• Inconsistent fluid management</td>
<td>• Standard fluid bolus and re-assessment, further boluses if required</td>
</tr>
<tr>
<td>• “Inotropes?! That’s a PICU thing”</td>
<td>• “Will I get the adrenaline ready?”</td>
</tr>
<tr>
<td></td>
<td>High Flow o2</td>
</tr>
<tr>
<td>---</td>
<td>--------------</td>
</tr>
<tr>
<td>2</td>
<td>Blood Taken</td>
</tr>
<tr>
<td></td>
<td>Blood Culture, Blood Sugar/Lactate</td>
</tr>
<tr>
<td>3</td>
<td>Antibiotics Given</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Fluids</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Inotropic Support</td>
</tr>
<tr>
<td>6</td>
<td>Senior/Specialist Help</td>
</tr>
</tbody>
</table>
PAEDIATRIC SEPSIS 6

DO

MANAGEMENT AND MEASUREMENT TOOL

1. Give High Flow O₂

   Time  Signature

2. Obtain IV/IO access and obtain Bloods

   Blood Culture, Blood Sugar, 
   Urine

   Time  Signature

3. Give IV/IO Antibiotics

   Antibiotic  Dose

   (Cefotaxime 50mg/kg)

   ADD

   (Nesiritide 22)

   (Amoxicillin 50mg/kg)

   Add Cimetidine if toxic shock indicated

   Time  Signature

4. Consider fluid Resuscitation

   Bolus  Amount  Time  Signature

   20ml/kg Crystalloid

   Aim to reverse shock – trend to normal HR /
   BP / Capillary Fill

   Check for fluid overload after 2nd bolus

   If no signs of overdosed and still shocked

   Give further 20ml/kg fluid

5. Consider Early Inotropic Support

   Dose of Adrenaline

   Time  Signature

   (Dobutamine 0.2 μg/kg 50ml 5% contrast
   in 500ml 5% dextrose)

6. Involve Senior/Specialist Help Early

   Person Contacted  Time  Signature

   (Contact PICU if intensivist commenced)
Did the management protocol work?

Overall antibiotic administration times
Paediatric ED sepsis 6 RACH
Did the management protocol work?

- Quicker recognition combined with standardised efficient management has lead to a time improvement for administration of life saving interventions
- We treat 73% of our sepsis 6 patients within 1 hour
- 2.3% of patients screened are treated with sepsis 6 (89 total)
- 4 patients have been transferred to PICU with severe sepsis after sepsis 6 treatment, all have returned safely
- 1 patient died after sepsis 6 treatment
- Teamwork and communication have improved since sepsis 6 integration
• 30% of the patients we treat for sepsis have a bacterial illness or high clinical suspicion

BUT

• We still have work to do! Sepsis management can be difficult

• Applying oxygen, and occasionally no fluids given

• We learn, train and adapt at every opportunity
Was it easy?

NO!
Why?

Helpful attitudes

• Acknowledgement that we could do better

• Willingness to accept change and make improvements required

• Doctors willing to be involved

• Teamwork and equality between doctors and nurses

• “If it makes it safer for patients lets do it”

Challenges

• If its not broken don’t fix it attitude

• Not understanding the importance of the recognition tool: this is the starting point

• A system that is slow to respond to change and lacking teamwork

• Lack of clinical leadership, not interested in SPSP

• Failure to understand that sepsis is a killer disease but one that we can (and should) treat
Was it worthwhile?

YES!
Why?

• Our knowledge of sepsis has passed expectations

• Our triage as a whole is robust easy and accurate

• Has made sepsis treatment more efficient effective and safe
What next?

- Triage
- G-Med (OOH)
- SAS/primary care
- Working with other health boards
- Ward sepsis/Deteriorating patient tool
Triage tool and ward tool
Thank you for listening!
Paediatric Care:
Early recognition....... 
Then what?

Prof George Youngson CBE
Patients don’t suddenly deteriorate
We just suddenly notice
\[ b \pm \sqrt{b^2 - 4ac} \quad \frac{\sin^{-1}}{2a} \quad \frac{\partial y}{\partial x} \]

The care equation

Recognition + Reaction + Response + Rescue = + ve Outcome
Can we measure “failure to rescue”? 
What’s in the human factors box?

- Behaviours and attitudes
- Codes of conduct
- Organisational reliability
- Patient safety
- Ergonomics
- Non-technical skills
- Human performance limitation
- Team performance
- Compliance with SOP’s

Making it easy ... to do the right thing and difficult to do the wrong thing
“I could not believe outcomes can be so much better without any change to the skill set of the individuals involved”

Checklist Manifesto
Dr Atul Gawande
Patient safety lead
WHO
# Surgical Safety Checklist (First Edition)

**Before induction of anaesthesia**

**Sign In**
- **Patient has confirmed**
  - Identity
  - Site
  - Procedure
  - Consent
- Site marked/not applicable
- Anaesthesia safety check completed
- Pulse oximeter on patient and functioning

**Time Out**
- Confirm all team members have introduced themselves by name and role
- Surgeon, anaesthesia professional and nurse verbally confirm
  - Patient
  - Site
  - Procedure
- Anticipated critical events:
  - Surgeon reviews: what are the critical or unexpected steps, operative duration, anticipated blood loss?
  - Anaesthesia team reviews: are there any patient-specific concerns?
  - Nursing team reviews: has sterility (including indicator results) been confirmed? Are there equipment issues or any concerns?
- Has antibiotic prophylaxis been given within the last 60 minutes?
  - Yes
  - Not applicable
- Is essential imaging displayed?
  - Yes
  - Not applicable

**Sign Out**
- Nurse verbally confirms with the team:
  - The name of the procedure recorded
  - That instrument, sponge and needle counts are correct or not applicable
  - How the specimen is labelled (including patient name)
  - Whether there are any equipment problems to be addressed
- Surgeon, anaesthesia professional and nurse review the key concerns for recovery and management of this patient

This checklist is not intended to be comprehensive. Additions and modifications to fit local practice are encouraged.
# Surgical Safety Checklist (First Edition)

**Teamwork**

**Shared mental model (Communication)**

**Situation awareness**

**Leadership and decision-making**

---

**Sign In**
- Patient has confirmed:
  - Identity
  - Site
  - Procedure
  - Consent
- Site marked/not applicable
- Anaesthesia safety check completed
- Pulse oximeter on patient and functioning
  - Does patient have a:
    - Known allergy?
      - No
      - Yes
    - Difficult airway/aspiration risk?
      - No
      - Yes, and equipment/assistance available
  - Risk of ≥500mL blood loss (2mL/kg in children)?
    - No
  - No other patient information available

**Time Out**
- Confirm all team members have introduced themselves by name and role
- Surgeon, anaesthesia professional and nurse verbally confirm:
  - Patient
  - Site
  - Procedure
- Anticipated critical events:
  - Surgeon reviews: what are the critical or unexpected steps, operative duration, anticipated blood loss?
  - Anaesthesia team reviews: are there any patient-specific concerns?
  - Nursing team reviews: has sterility (including indicator results) been confirmed? Are there equipment issues or any concerns?
- Has antibiotic prophylaxis been given within the last 60 minutes?
  - Yes
  - Not applicable
- Is essential imaging displayed?
  - Yes
  - Not applicable

**Sign Out**
- Nurse verbally confirms with the team:
  - The name of the procedure recorded
  - That instrument, sponge and needle count are correct (or not applicable)
- How the specimen is labelled (including patient name)
- Whether there are any equipment problems to be addressed
- Surgeon, anaesthesia professional and nurse review the key concerns for recovery and management of this patient

---

This checklist is not intended to be comprehensive; additions and modifications to fit local practice are encouraged.
\[ \int \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \sin^{-1} \frac{\partial y}{\partial x} \]

The care equation

Recognition + Reaction + Response + Rescue = +ve Outcome
Group Task

What makes it difficult to implement each step of the “care equation” and why?

What would make it easier?

Discuss
Add linda Q&A
Coming next

Panel debate – Safety is sorted; it’s time to move on to another dimension of quality

Pentland Suite – Level 3