Early Recognition of the Deteriorating baby - NEWS
Objectives

- Develop knowledge of risk factors for maladaptation to life ex utero
- Recognise the deteriorating neonate
Fetal Circulation vs newborn circulation

- Fetal heart:
  - Deoxygenated blood from placenta to lower body
  - Oxygenated blood from lungs to lower body

- Heart after birth:
  - Closed foramen ovale
  - Deoxygenated blood from upper body to lower body
  - Oxygenated blood from lower body to lungs
  - All deoxygenated blood now flows to lungs
  - Closed ductus arteriosus
Adaptation to extra uterine Life

- Fetal lung fluid is reabsorbed during labour
- With the first breaths air replaces the fluid in the alveoli
- This results in decreased pulmonary artery pressure
- Blood can now flow from the pulmonary artery through the lungs for oxygenation and return to the left side of the heart
- The ductus arteriosus closes within a few hours of birth and the neonate will have the same circulation an adult does
Neonatal Response to an Event

What happens when something goes wrong in the transition to life ex utero?

It's important to understand that a neonate can only respond like a fetus to an adverse event - the diving reflex.
The diving reflex

- In order to preserve energy the fetus/neonate will shunt blood to the vital organs (brain and heart) and rely on the placenta for perfusion

- Body movements and heart rate decrease (bradycardia)

- Breathing movements cease (apnoea)

This is called the diving reflex
The diving reflex

• A neonate can be resuscitated with basic measures in this situation
  – Stimulation
  – Chin positioning
  – Ventilation

• Which results in:
  → Heart rate increase
  → Oxygenation
  → Respiration and increase in body movements
What events effect the fetus or neonate?

**Intra partum**
- Abnormal presentation
- Precipitous delivery
- Prolonged labour
- Difficult forceps birth
- Intrauterine growth restriction
- Prolonged pregnancy

**Maternal**
- Eclampsia
- Isoimmunisation
- Infection
- Drug addiction
- Cardiovascular disease

**Obstetric**
- Abruption
- Cord prolapse
- Placenta Previa
- Oligohydramnios
What events effect the fetus or neonate?

Fetal/Postnatal

- Prematurity
- Respiratory distress
- Cardiopulmonary anomalies
- Sepsis
- Haemolytic disease
- Gastro-oesophageal reflux
- Milk in retro pharynx
- Abnormal head positioning
- Suffocation in bed
Remember, whatever the cause, the fetus or neonate can only react with apnoea and bradycardia to an event.

Neonates can be affected by in utero events many hours after birth, it is therefore important to know which neonates should be observed closely so that early signs of deterioration are responded to.
What are the main risks?

- Respiratory distress
- Infection
- Hypoglycaemia
- Subgaleal haemorrhage

Completion of the Risk assessment will help you determine which babies are at increased risk of developing these.
Risk factors for respiratory distress

- Maternal opiates
- Meconium stained liquor
- Preterm infants (born before 37 weeks)
- Retained lung fluid
- Pneumothorax
- Infection
Risk factors for infection

• GBS positive mother
• Sibling had GBS infection
• Prolonged rupture of membranes (>18 hours)
• Premature rupture of membranes (<37 weeks)
• Premature birth (<37 weeks)
• Maternal fever (>38°C)

Common neonatal infection are Group B streptococcus (GBS), E Coli, Klebsiella, non-typable Haemophilus and Listeria
Risk factors for hypoglycaemia

- Large for Gestational age (LGA) weight > 90\textsuperscript{th} percentile
- Small for Gestational Age (SGA) – weight < 10\textsuperscript{th} percentile
- Prematurity – born at < 37 weeks gestation
- Weight < 2.5kg
- Infant of a diabetic mother with either pre-existing Insulin Requiring Diabetes Mellitus (type 1) or Insulin Requiring Gestational Diabetes (IRGDM)
Risk factors for hypoglycaemia

- Perinatal stress/hypoxia – apgar score < 7 at any times or umbilical cord pH < 7.1 or umbilical cord BGL < 2.6mmol/L
- Cold stress – temperature of < 36.0°C which does not improve after 30 minutes of warming
- Symptomatic neonates – ie: jittery, apnoea, hypotonia, lethargy, irritability, seizures
- Poor feeding and more than 10% weight loss
Risk factors for subgaleal haemorrhage

• Instrumental birth/ vacuum delivery

• Higher risk if both vacuum and forceps have been used or multiple attempts
What is **respiratory distress**?

- Diagnosed when neonates are tachypnoeic (respiratory rate > 60/minute for at least 15 minutes)
- Show signs of increased effort of breathing such as expiratory grunt, nasal flaring and use of intercostal muscles

**NOTE**: Some respiratory distress may be evident in the first 10-15 minutes of life
Assessment of effort of breathing

**Normal**
- nil of the above

**Abnormal**
- the presence of any of the above

*Effort of Breathing*

**Abnormal** effort of breathing is the presence of any criterion below:
- Grunting
- Gasping
- Nasal flaring
- Stridor
- Intercostal recession
- Suprasternal recession
- Tachypnoea

![Effort of Breathing Score](chart)
Common sites of recession in respiratory distress
Examples of increased effort of breathing
What are the signs of infection?

- Pale or mottled skin
- Problems with temperature control (\(< 36 \, ^\circ C \text{ or } > 37.5 \, ^\circ C\)) unexplained by environmental factors
- Signs of respiratory distress – grunting, tachypnoea or oxygen saturations \(< 95\%
- Poor feeding, high pitched cry, inconsolable screaming
- Blank staring expression
- Bradycardia (\(< 100 \, \text{bpm}\)) or tachycardia (\(> 160 \, \text{bpm}\))
What are the signs of hypoglycaemia?

- Lethargy, poor feeding
- Apnoea
- Cyanosis
- High pitched cry, irritability
- Jitteriness
- Seizures
- Hypotonia

If in doubt check BGL – if < 2.6 mmol/L baby needs medical review
What is a **Subgaleal Haemorrhage (SGH)**

- Subgaleal haemorrhage is caused by rupture of the emissary veins, which are connections between the dural sinuses and the scalp veins.
- Blood accumulates between the epicranial aponeurosis of the scalp and the periosteum.
- Rare but potentially lethal condition.
- Most likely to follow vacuum extraction or forceps delivery.
- Babies who require intensive care for SGH have a 25% mortality rate.
Localised Signs

• Generalised scalp swelling
• Laxity of the scalp at the site of cup application
• The lesion is fluctuant and will vary depending on the position of the head
• The lesion crosses suture lines
• Pitting oedema over the head extending over the head and in front of the ears
• **Caput Succedaneum** - A serosanguinous collection that may extend across the midline and over suture lines.

• **Cephalhaematoma** - Occurs when friction generated during delivery results in bleeding between the periosteum and the underlying skull. The swelling does not cross the suture line.
Escalate immediately to TL and RMO for:

- Poor tone (floppy)
- Poor colour (cyanosed, mottled, pale)
- Temperature instability
- BGL < 1.5
- Any scalp check abnormality or change
Neonatal Early Warning Score and risk assessment

• All newborns have a NEWS chart
• Risk assessment and first set of observations within 1 hour of birth
• Observation frequency dependent on risk factor(s)
### Neonatal Risk Assessment

1. Within 1 hour of birth ALL neonates require a risk assessment and complete set of vital signs.
2. Complete the following for ALL neonates prior to transfer between wards:
   - a. Check heart rate, respiratory rate, temperature, oxygen saturation on foot (≥ 95%) and record on Neonatal Early Warning Score (NEWS) Chart.
   - b. Review cord blood gas results in the chart and document on Clinical form: 6500 Newborn Feeding Record.
3. When recording vital signs: Observations in coloured zone are scored. The scores are added to give a total NEWS.

**NOTE:** Frequency of observation intervals outlined below does not dictate timing of discharge.

<table>
<thead>
<tr>
<th>Risk factor</th>
<th>Reason for risk factor (tick as applicable ✓)</th>
<th>Observation frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory Distress/ Depression</td>
<td>• Malignant in liquor</td>
<td>Hourly for 4 hours</td>
</tr>
<tr>
<td></td>
<td>• Maternal opioid or maternal anaesthetic within 4 hours of birth (e.g. morphine, codeine, pethidine, methadone, heroin)</td>
<td>4 hours for 24 hours</td>
</tr>
<tr>
<td></td>
<td>• APgar ≤ 7 at 5 minutes</td>
<td>than 8 hourly</td>
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<tr>
<td></td>
<td>• Birth cord blood pH ≤ 7.1</td>
<td></td>
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<tr>
<td></td>
<td>• Elevated cord blood lactate ≥ 4</td>
<td></td>
</tr>
<tr>
<td>Subgaleal haemorrhage&lt;br&gt;PLUS scalp observations</td>
<td>• Vacuum / haemorrhage at or an unsuccessful instrumental birth</td>
<td></td>
</tr>
<tr>
<td>Sepsis</td>
<td>• GBS + or mother OR Prolonged ROM ≥ 18 hours NO antibiotic or inadequate antibiotic administered before birth</td>
<td>4 hours for 48 hours</td>
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<tr>
<td></td>
<td>• Maternal fever ≥ 38°C</td>
<td>than 8 hourly</td>
</tr>
<tr>
<td></td>
<td>• GBS + or mother OR Prolonged ROM ≥ 18 hours with adequate antibiotic cover</td>
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<tr>
<td>Premature</td>
<td>• Born before 37 weeks</td>
<td>4 hours for 24 hours</td>
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<tr>
<td>Jaundice</td>
<td>• Birth trauma (traumatising)</td>
<td>than 8 hourly</td>
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<tr>
<td></td>
<td>• ABO incompatibility and/or maternal antibody positive</td>
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<td></td>
<td>• DCT positive</td>
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<td></td>
<td>• Inadequate oral intake/day or mode of meconium &gt; 24 hours</td>
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<td></td>
<td>• Jaundice &lt; 2 cm at less than 24 hours age</td>
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<tr>
<td>PLUS neonatal review</td>
<td>• Refer to Clinical Procedure Jaundice in the Newborn</td>
<td></td>
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<tr>
<td></td>
<td>• More frequently if undergoing phototherapy</td>
<td></td>
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<tr>
<td>Hypoglycaemia</td>
<td>• Maternal diabetes</td>
<td>4 hourly</td>
</tr>
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<td></td>
<td>• Birth weight ≤ 2.5 kg</td>
<td>24 – 48 hours</td>
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<td>than 8 hourly</td>
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<tr>
<td>Hypoglycaemia PLUS BGL</td>
<td>• Maternal drug use - refer to pathway - Commence on Finnegan's chart</td>
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### Observation frequency

- Risk assessment ticked
- Observation frequency
Observation frequency as per risk assessment.

Graphical representation of observations.
<table>
<thead>
<tr>
<th>NEWS</th>
<th>Notify</th>
<th>Escalate</th>
<th>Observations</th>
<th>Intra hospital escort</th>
</tr>
</thead>
</table>
| NEWS 4 - 5 | Team Leader/ CMC  
NICU Outreach Senior RMO/ Registrar to review within 30 minutes | After 60 minutes if no review and/or no improvement escalate per NEWS 6 - 7 | ➞ ½ hourly for 1 hour  
➢ Commence fluid balance chart | RM |
| NEWS 6 - 7 | Team Leader/ CMC  
NICU Outreach Senior RMO/ Registrar to review within 30 minutes | After 30 minutes if no review and/or no improvement escalate per NEWS ≥ 8 | If patient improves decrease frequency of vital signs to | RM and NICU Outreach Senior RMO/ Registrar |
| NEWS ≥ 8 | Team Leader/ CMC  
Contact NICU Registrar to review immediately  
Contact Consultant | Consider MET if no review and/or no improvement | ➞ Hourly for 4 hours  
➢ 4 hourly for 24 hours | RM and NICU Registrar |
MET CRITERIA

• If a baby meets Neonatal MET criteria a Neonatal Code Blue/MET should be called as per Medical Emergency/Code Blue policy

• NEWS does NOT replace calling the Neonatal Medical Emergency Team (Neonatal MET)

Dial 2222 state Neonatal Code Blue and location (CHS)

NOTE: No Neonatal Code at Calvary

Dial 2222 for Neonatal Code Blue
• Health Professional worried about Clinical state
• Cardiac or Respiratory arrest
• Airway threat
• Severe or worsening respiratory distress, exhaustion or apnoea
• Central cyanosis
• Seizure(s)
• Any observation in the 4/MET zone
Responsibilities if NEWS ≥ 4 or you are concerned about the baby

- Notify the team leader or CMC

- Frequency of observations is escalated to:
  - ½ hourly for the first hour (more frequently if the patient’s condition dictates)

If the patient’s condition improves they may then progress to:

- Hourly for the next four hours
- 4/24 for the next 24 hours
Please note

- The NEWS chart is a tool and should be used in conjunction with sound clinical judgement.

- There will be babies who will not score a NEWS ≥4; however, review by medical officer will be in their best interest.
Your patient is deteriorating

what do you do next??
What is the best way to communicate deterioration?

ISBAR
ISBAR method of Communication

- **IDENTIFY**
  - Yourself, the Doctor, and the Patient.
- **SITUATION**
  - What are you calling about? State this!
- **BACKGROUND**
  - Further detail about the patient; may include
    - Procedures; medical history; current therapy etc.
- **ASSESSMENT**
  - What do YOU think the problem is!
- **RECOMMENDATION**
  - What would you like the Doctor to do.
Communication Exercise

If your DOG does a POO
Please put it in a litter bin.

Please help keep our open spaces clean.
Management plans

- Who does what? When? How?
- Who do I inform of changes?

You need a Management Plan...
Documenting

• Document any decisions/actions taken as a result of the observations
• Helps the flow of information,
• Medico legal requirement
• Remember if you don’t write, down it didn’t happen!
Recognition of the Deteriorating Patient

+   =

Prevent further deterioration
COFFEE BREAK

CASE STUDIES