SICK KIDS: ASSESSMENT AND EARLY MANAGEMENT OF THE UNWELL CHILD UNDER 5 YEARS

CONTEXT

- Aboriginal children in northern and central Australia experience disproportionately high rates of disease from serious infection, particularly invasive pneumococcal disease.
- An audit of mortality in children under the age of 5 years in the Kimberley from 2005 to 2013 documented a neonatal mortality rate of 7 times greater than the WA state average.
- This protocol aims to assist the early identification of children in the Kimberley with a serious bacterial infection and/or illness and expedite the implementation of essential and appropriate treatment. This is in line with international movement for early treatment of sepsis.
- For a list of common serious diagnoses to consider in the Kimberley, see the separate document *The Common Serious Diseases and Local Illnesses: Children under Five in the Kimberley Region.*

ANTIBIOTICS

Ceftriaxone has been chosen for use in this protocol because:

a) It is readily available at most health care sites
b) It can be administered intramuscularly when intravenous access is not possible/practical
c) It is effective for many (***but not all***) of the bacteria that have been implicated in recent sepsis-related deaths of children in the Kimberley

Gentamicin is used in addition to ceftriaxone as it has broader coverage of gram negative bacteria and some activity against *Staph aureus*.

Early use of broad spectrum antibiotics has been shown to reduce mortality in paediatric sepsis. However, children with early sepsis may deteriorate rapidly despite of appropriate antibiotics, and may need escalation of therapy (e.g. airway support or inotropes) within hours of initial presentation. *Any child who is sick enough to receive ceftriaxone is sick enough to be in hospital and to have their care discussed with a paediatrician.*

Application of this Protocol

Within the Kimberley region there is an excessively high rate of sepsis-related mortality in young children, and most unwell children present to health care sites that are remote from specialist paediatric care. This Kimberley Unwell Child Protocol has been specifically designed to address these regional issues. Direct application of this procedure at sites outside the Kimberley region may result in the inappropriate overuse of broad-spectrum antibiotics.

SOME NOTES ON FEVER

- In most cases a febrile illness (temperature >37.5^{o}C) is due to a self-limiting viral infection; however, it may be an early feature in the course of a serious bacterial infection such as meningitis or pneumonia.
- Children without apparent source of infection are of particular concern because it is difficult to distinguish between a simple vs. life threatening infection.
- Temperature alone is not a good predictor of serious bacterial infection. The degree of temperature, its rapidity of onset, response to anti-pyretics (e.g. paracetamol) and febrile convulsions do **not** correlate with severity of illness.
- The behaviour and appearance of the child and localising symptoms are the best indication of the degree of illness and the potential for serious infection. Children without a fever can still have a serious infection or illness.

RETURNING HOME AND FOLLOW UP

- SAFETY NET - Parent education & review is an important part of care. Advice must include:
  - How to contact the local health service if concerned
  - When to return for planned review/assessment
  - Signs and symptoms to look out for to prompt earlier review
- Keep in mind social and environmental safety factors (see “Caution” box on flowchart) when making decisions about whether a child can be sent home from a clinic or ED.
- The parent or carer must be able to check on the child during the night and for the duration of the illness.
- If unable to satisfy any of these requirements then **admit the child to hospital.**

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The decision to deviate from this protocol must first be discussed with the Kimberley Paediatrician.

CAUTION

- Less than 3 months of age (< 1 month: doctor to **phone on-call** paediatrician)
- Second presentation to hospital or clinic with same illness or within 72 hours
- Underlying medical condition Unimmunised child
- Remote location
- History of prematurity and age less than 2 years

Low threshold for admission
AND
Early consult with doctor and paediatrician.

1 →

ALL children presenting with acute illness to any health site reported by the carer or identified by the clinician MUST have:

1. HR, RR, BP, Temperature, oximetry, capillary refill time (CRT), hydration status and weight.

2. Examination for focal signs of infection / serious illness.

2 → **USE TRAFFIC LIGHT TOOL**

	GREEN – LOW RISK No symptoms/signs in amber or red columns	AMBER – INTERMEDIATE RISK Any symptom/sign in amber column, none in red	RED – HIGH RISK Any symptom/sign in red column
Colour (skin & lips)	Normal colour	Paleness of skin reported by parent/ carer	Pale/ mottled/ ashen/ blue
Activity	Responding normally to social cues Content / smiles Stays awake or awakens quickly Strong normal cry / not crying	Not responding normally to social cues No smile Difficult to wake / harder to wake than usual Decreased activity	No response to social cues Appears ill to a health care professional Does not wake, or if roused does not stay awake Weak, high pitched or continuous cry
Respiratory	Normal respiratory rate: Age < 3 months: 25-65 breaths/min 3-12 months: 25-55 breaths/min 1 -4 years: 20-50 breaths/min	Tachypnoea: Age < 3 months: 65-75 breaths/min 3-12 months: 55-65 breaths/min 1 -4 years: 50-60 breaths/min Nasal Flaring Crackles in chest Oxygen saturation ≤95% in air	Tachypnoea: Age < 3 months: > 75 breaths/min 3-12 months: > 65 breaths/min 1 -4 years: > 60 breaths/ min Moderate to severe chest in-drawing Grunting Oxygen saturation ≤90% in air
Circulation	Normal heart rate: Age < 3 months: 100-170 beats/min 3-12 months: 90-170 beats/min 1 -4 years: 80-150 beats/min Normal skin and eyes Moist mucous membranes	Tachycardia: Age < 3 months: 170-190 beats/min 3-12 months: 170-180 beats/min 1 -4 years: > 150-170 beats/min CRT ≥ 3 seconds	Tachycardia: Age < 3 months: > 190 beats/min 3-12 months: > 180 beats/min 1 -4 years: > 170 beats/ min Decreased peripheral perfusion - cool, mottled, pale peripheries; capillary refill time >3 sec) Hypotension Circulatory collapse
Hydration	No or mild dehydration (< 3% weight loss) No physical signs	Moderate dehydration (4 – 6% weight loss) Circulatory signs as above Oliguria Dry mucous membranes Poor feeding in infants	Severe dehydration (>7% weight loss) Circulatory signs as above Anuria Reduced skin turgor
Other	None of the amber or red symptoms	Age 3 -12 months: temperature ≥39°C Fever for ≥ 5 days Rigors Swelling of limb or joint Non-weight bearing limb/ not using extremity Limb pain	Age < 3 months: temperature ≥38°C Non-blanching rash Bulging fontanelle Neck Stiffness Status epilepticus Focal neurological signs Focal seizures

CRT = capillary refill time: Apply pressure over sternum for 5 seconds then measure refill time. RR = respiratory rate: Breaths / minute

Adapted from: Feverish Illness in Children Clinical Guideline National Institute for Health and Care Excellence (May 2013), Observation parameters as per WACHS Paediatric Observation & Response Chart.

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MANAGEMENT PLAN 3

Low Risk

NON-URGENT MANAGEMENT PLAN

No sign/symptom in amber or red columns

Respond to parental / carer concerns

1. **Investigation**
*If **fever** with **no** focus identified*, must have urinalysis +/- urine MC&S (clean/sterile specimen). Other investigations as clinically indicated.

2. **Medication**
Antibiotics or other medication as clinically indicated.

3. **Observation**
Repeat vital signs, CRT and oximetry at least once prior to discharge.

4. **Plan**
If not admitted then parent education & consider review within 12-24 hours.
NB: if <6 months of age with evidence of UTI: admit, observe and commence IV antibiotics.

5. **Consultation**
Discuss with local doctor +/- paediatrician as required.

Beware of the Kimberley child with febrile illness who appears well on initial assessment

!! Intermediate Risk !!

INTERMEDIATE RISK MANAGEMENT PLAN

Any sign/symptom amber column, none in red

Commence within 1 hour. Must be discussed with the doctor responsible for your service

Identified **FOCUS** of infection or serious illness?

YES

1. **Investigation**
As clinically indicated by diagnosis *(may include urine MC&S, throat swab, faecal MC&S).*

2. **Medication**
Antibiotics or other medication as clinically indicated.

3. **Observation**
Repeat vital signs, CRT and oximetry at least once prior to discharge.

4. **Plan**
Low threshold for admission, especially if remote.
If not admitted then parent education & GP/ clinic review within 12-24 hours.

5. **Consultation**
Local doctor +/- Paediatric consult as required.

NO

1. **Investigation**
Must have partial septic workup: Blood cultures, FBP, CRP, U&E, BSL, MC&S of throat and urine.
Consider: CXR, LP, blood gas.

2. **Medication**
≤ 3 months: Local doctor to call paediatrician to discuss required antibiotics

≥ 3 months: Ceftriaxone IV/IO/IM 50mg/kg ***and*** Gentamicin IV/IM 7.5mg/kg

DO NOT DELAY ANTIBIOTICS

3. **Observation**
Continue to monitor vital signs, oximetry, CRT and observe for signs of deterioration.

4. **Plan**
Must be admitted to hospital. Transfer from remote communities.

5. **Consultation**
Initially with local doctor, as these children need evacuation. Local doctor to discuss with on-call paediatrician **(9194 2222)**

!!!! High Risk !!!!

HIGH RISK MANAGEMENT PLAN

Any sign/symptom in the red column

Local doctor to consult on-call Kimberley Regional Paediatrician urgently on **9194 2222**

Prepare/Plan for emergency evacuation
Call RFDS **1800 625 800**

DO NOT DELAY INTERVENTION

THESE CHILDREN NEED EARLY ACCESS WITH BLOOD CULTURE TAKEN, ANTIBIOTICS GIVEN & FLUID RESUSCITATION. THIS MAY MEAN EARLY IO ACCESS.

Give IV/IO fluid bolus N/Saline 20mL/kg

1. **Investigation**
Must have BSL & partial septic workup: Blood cultures, FBP, CRP, U&E, urine MC&S (clean/sterile).
Consider: CXR, LP, blood gas, coagulations studies, throat swab MC&S.
Specifically label IO samples

2. **Medication**
≤ 3 months: Local doctor to call paediatrician to discuss required antibiotics.

≥ 3 months: Ceftriaxone IV/IO/IM 50mg/kg ***and*** Gentamicin IV/IM 7.5mg/kg

3. **Observation**
Continuous monitoring and respond to changes in vital signs, FNO & CRT. Record accurate fluid balance.

4. **Plan**
Evacuation per local policy.

5. **Consultation (ASAP)**
Discuss with local doctor & paediatrician **(9194 2222)**.