FEVER - ED MANAGEMENT - SCH

PRACTICE GUIDELINE ©

DOCUMENT SUMMARY/KEY POINTS

- This document is intended as a facility specific document for Sydney Children's Hospital Randwick. The NSW Health "Children and Infants with Fever – Acute Management" (INTERnet link) CPG is currently under review and has been rescinded.
- For Oncology / Transplant patients see Oncology / Transplant Patients – Fever or Suspected Sepsis – Initial Management (**INTRA**net link)
- Please read this guideline in conjunction with the Clinical Excellence Commission Paediatric Sepsis Pathway and Resources (INT**ER**net link)
- For local empiric antibiotic recommendations see Empiric Antibiotic Guidelines - SCH (**INTRA**net link)

- ***Fever is one of the most common acute presentations in childhood.***
- ***Many children will be only mildly unwell and will have a focus of infection identified on clinical examination. Investigations may not be required.***
- ***Key factors are:***
  - ***the child's age (see Febrile Infant 0-3 months)***
  - ***immunisation status***
  - ***associated risk factors such as immunosuppression.***
  - ***presence of signs of toxicity.***
  - ***presence of a focus of infection.***

CHANGE SUMMARY

- SCH Document due for mandatory review.
- Rescinds SCH Document C.16.F.1
- Updates management of fever in 0-3mth age group incorporating new evidence

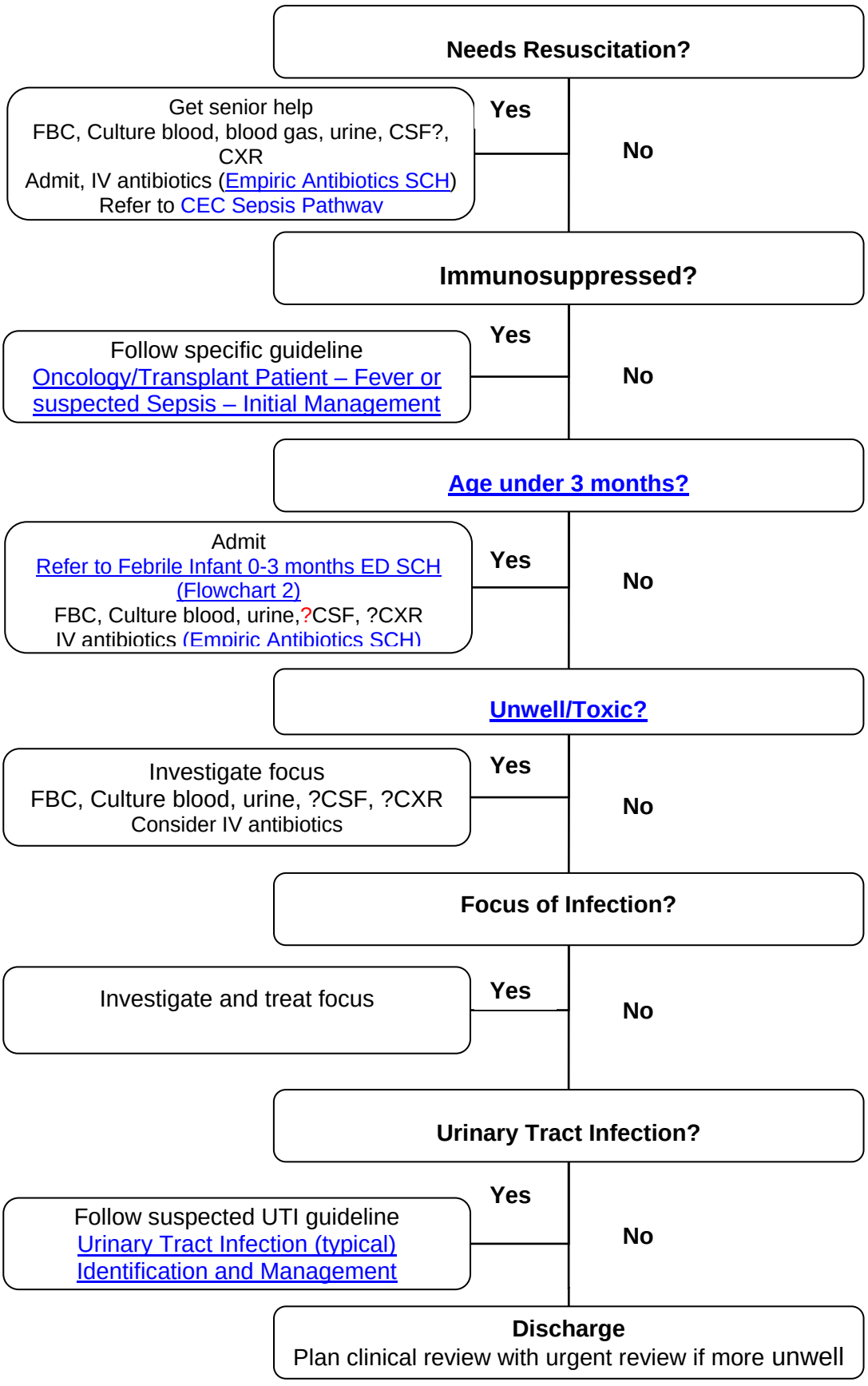
This document reflects what is currently regarded as safe practice. However, as in any clinical situation, there may be factors which cannot be covered by a single set of guidelines. This document does not replace the need for the application of clinical judgement to each individual presentation.

Approved by:	SCHN Policy, Procedure and Guideline Committee	
Date Effective:	1st May 2019	**Review Period**: 3 years
Team Leader:	Head of Department	**Area/Dept**: ED SCH

READ ACKNOWLEDGEMENT

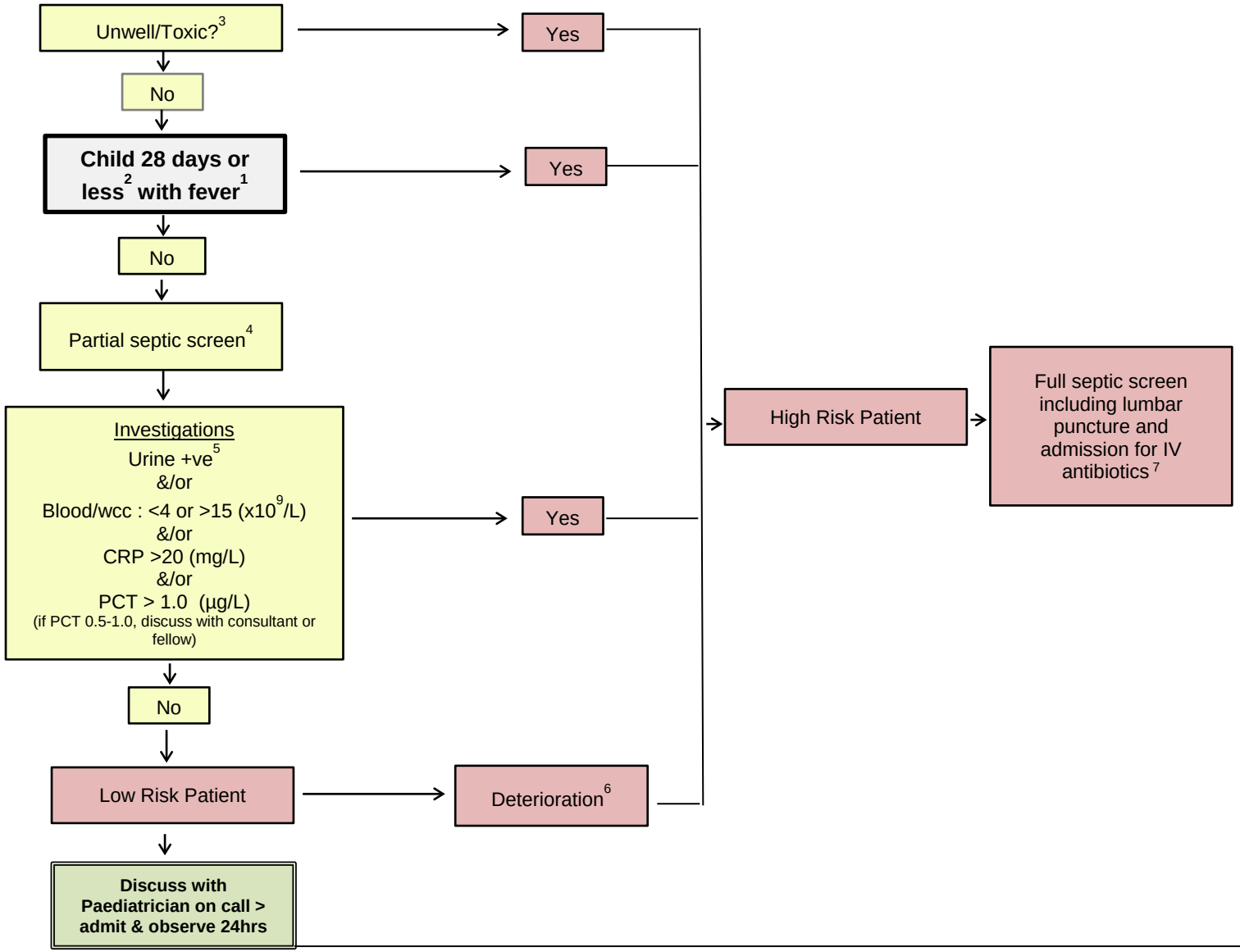
- All SCH Emergency Department clinical staff should read and acknowledge this document.

Flowchart 1: Febrile child under 5 years of age with fever (>38°C axillary)



SYDNEY CHILDREN'S HOSPITAL

Flowchart 2: Fever under 3 months



Historically infants <3months with a fever have by default been managed with full septic screen including lumbar puncture and admitted for iv AB.
There is sound evidence that not all of these patients are at risk of invasive bacterial infection and hence LP and iv AB may not be required.
Patients that fall into the High Risk group should be managed with full septic screen.
Patients that fall into the Low Risk group may be safely managed without LP/iv AB and admitted for observation on the ward after discussion with the admitting Paediatrician.

1: Fever
>38 in ED or GP practice or at home in last 24hrs
Infants who "felt hot" to parents but are afebrile in ED should be discussed with a senior clinician

2. Age
Corrected gestational age for infants born <37 weeks

3. Unwell/Toxic (at any assessment)
A: **A**ctivity abnormal (lethargic, irritable)
B: **B**reathing difficulties
C: abnormal **C**olour, **C**irculation or **C**ry
D: **D**ecreased feeding (<half normal) or **D**ecreased urine output (<4 wet nappies in 24hrs)

4. Partial septic screen
Blood culture, FBC, CRP, procalcitonin, electrolytes, urea, creatinine
Urine dipstick & culture (SPA/catheter/clean–catch)
Chest xray if strong suspicion of pneumonia
Full septic screen:
Partial screen plus
Lumbar puncture (if not contraindicated)

5. Positive urine
Dipstick +ve for leucocytes & nitrites **or**
Urine microscopy wcc (send all urine for culture)

6. New signs of toxicity or observations in red zone on paediatric observation chart

7. Urinary tract infections
Isolated UTI in 1-3 month old infants may be managed without LP (unless unwell/septic) –
DISCUSS WITH THE ON CALL PAEDIATRICIAN
UTI in unwell infants of any age may still require completion of septic screen, including lumbar puncture

Fever

Fever is one of the most common acute presentations in childhood. Many children will be only mildly unwell and will have a focus of infection identified on clinical examination.

Our aim is to identify those children with serious causes of fever such as septicaemia, meningitis, pneumonia and pyelonephritis without subjecting children to too many procedures or tests. This requires a combination of clinical judgement, specific investigations and serial observation.

Key factors are:

- the child's age and immunisation status
- associated risk factors such as immunosuppression.
- presence of signs of toxicity
- presence of a focus of infection. Investigations may not be required

Rationale for clinical approach

Age

Neonates and young infants:

- May not have the characteristic signs of serious infection (temperature can be high or low)
- May not have localising features.
- Can deteriorate rapidly.
- May be infected with organisms from the birth canal.

Young infants with fever, especially those under three months of age (see flowchart 2), need rapid assessment and investigation, and admission to hospital. Consult a senior colleague about the extent of investigations (full blood count, cultures of blood, blood gas, urine and CSF, chest x-ray) and the administration of antibiotics.

Older infants/toddlers:

- Localise infection better than neonates, but may still be pre-verbal.
- Are frequently exposed to infectious diseases in group childcare.
- Get viral infections as well as the 'typical' bacterial infections of pneumococcus, meningococcus and Hib (although the incidence of these infections has been significantly lessened by immunisation).

Following the introduction of pneumococcal vaccination, the rates of occult bacteraemia have markedly decreased. Accordingly, non-toxic febrile children older than 3 months of age who have no obvious source of infection are no longer routinely screened for occult bacteraemia.

Older Children:

- Usually verbalise and localise symptoms well.
- Are more tolerant to fluid loss – less likely to need IV rehydration.
- Can get 'typical' childhood organisms plus others such as mycoplasma and infectious mononucleosis.

Risk Factors

Immunosuppressed

Children who have central venous access devices, are immune deficient (congenital, HIV, neoplasms, asplenia) or have multiple congenital abnormalities are at risk of developing severe infections. Immunosuppressed children may rapidly develop septic shock. These children need rapid assessment, treatment and consultation with their specialist team.

Unwellness/Signs of Toxicity

Use this simple system to work out how sick a child appears – in conjunction with the Paediatric CEC Sepsis Kills Pathway

'**A'** is for arousal, alertness or activity decreased

'**B'** is for breathing difficulties (tachypnoea, dyspnoea, grunting)

'**C'** is for poor colour (pale or mottled), poor circulation (cold peripheries, increased capillary refill time) or cry (weak, high pitched)

'**D**' is for decreased fluid intake (less than half normal) and/or decreased urine output (fewer than four wet nappies a day)

The presence of any of these signs places the child at higher risk of serious illness.

The presence of more than one sign increases the risk.

An unwell child can appear drowsy, lethargic or irritable, pale, mottled or tachycardic.

Children with any of these signs must be seen urgently, investigated and treated as a priority.

Unexplained, persistent tachycardia should always raise concerns.

- **Discuss with Consultant/Fellow or senior doctor**.

Focus of infection

Children with a definite focus of infection should only have investigations specific to that focus unless they are very young and/or toxic. For example, a mildly unwell child with definite acute otitis media does not need a urine culture, but a very unwell child who has acute otitis media needs a more thorough work-up as the child may have secondary bacteraemia, meningitis or an abscess.

Subjective features such as mild reddening of the throat or tympanic membranes should be interpreted with great caution especially in young children. Ask a more senior doctor to review the patient if the signs are mild or subjective.

Clinical features of some infectious diseases may be subtle. Careful examination, including bones and joints will help identify a focus.

Not all rashes associated with fever are viral or 'non-specific'. Meningococcal disease and Kawasaki disease are two important causes of rash which require timely diagnosis and therapy. If in any doubt ask a senior colleague for advice.

Meningococcal disease

Although the classical features of meningococcal disease are well known, children may present early with non-specific symptoms (half of all children with meningococcal disease are sent home at first presentation).

Children with meningococcal disease may:

- have pre-existing coryzal illness,
- present with gastrointestinal symptoms but no rash.
- present with a blanching, non-purpuric rash.
- present with leg pain, cold extremities or abnormal skin colour.

Serial observations for signs of unwellness/toxicity either in the Emergency Department or by the parents at home are important aids to early diagnosis. Refer to the Meningococcal Disease: Management – SCH practice guideline for more information.

Kawasaki disease

The clinical features of Kawasaki disease include:

- high fever for more than five days,
- conjunctival injection,
- polymorphous rash,
- changes in mucous membranes,
- changes in the extremities and
- cervical lymphadenopathy.

Many children will not have all the diagnostic features, however a high index of suspicion needs to be maintained, particularly for children with high persistent fever, unresponsive to antibiotic therapy.

Abnormal laboratory investigations often include neutrophilia with toxic changes, thrombocytosis, raised acute phase reactants, elevated transaminases and low serum albumin.

Investigations

Perform an investigation only if the result is likely to alter management. **In urgent cases, such as a toxic child, do not wait for local anaesthetic to work. Get senior help immediately and get on with it.**

- **Blood** for **culture** should be taken whenever a blood count is performed on a febrile child.
- **Venous blood gas** should be collected urgently in potentially septic children, in accordance with sepsis guidelines
- **White cell count and acute phase reactants** have limited use in the immunised child, especially when there is a focus of infection.
- **Chest X-ray** is most useful if the child has signs of respiratory illness such as cough, tachypnoea, dullness or crackles. If there are no respiratory signs perform other investigations before the CXR.

- **Lumbar puncture** should be considered in a young infant, toxic child, irritable child or a child with complex febrile convulsions, especially if the child is already on antibiotics. However, if the child is drowsy or is very unwell, resuscitation and antibiotics take precedence – do not delay.
- **Urine culture** should be performed in all febrile children <3 months of age, and all children who are toxic or have fever without focus > 48hrs.

  Bag urine samples are inappropriate because of high contamination ratios. When it is urgent to get a urine specimen, a suprapubic (<1 year) or catheter (any age) urine sample are the recommended invasive techniques. Urine culture is essential prior to the commencement of antibiotics for suspected urinary tract infection. Refer: Urinary Tract Infection (typical) Identification and Management

Antipyretics

The presence of fever does not demand the use of antipyretics. There may be advantages to the child in not treating the fever. A trial of antipyretics, however, may be of help in irritable children with high fever, e.g. over 38.5^{o}C axillary. Paracetamol is indicated as first line therapy.

- Alternating paracetamol and ibuprofen is theoretically unwise and not recommended.
- The response of fever to antipyretics is not of use in assessing the significance of an infection.

Follow-Up

Children who are discharged home from an Emergency Department with fever should generally be followed up the following day, preferably by their family doctor, or in the ARC (Acute Review Clinic) or in the Emergency Department, to assess progression of infection, response to treatment and results of investigations.

Although a child may be non-toxic when seen, no test can exclude the child becoming toxic and unwell later. Parents should be encouraged to look for toxicity every four to six hours, and to seek clinical review if the child becomes toxic or unwell.

Clear communication from a doctor with empathy for the parents may enhance safety and improve the functioning of stressed families.

The discharging Emergency Department doctor should write a note to the family doctor with the clinical diagnosis and a list of investigations performed.

List of links in this document

1. Empiric Antibiotic Guidelines – SCH: http://webapps.schn.health.nsw.gov.au/epolicy/policy/4672
2. Oncology/Transplant Patient – Fever or suspected Sepsis – Initial Management SCH http://webapps.schn.health.nsw.gov.au/epolicy/policy/3705
3. Clinical Excellence Commission Sepsis Pathway Resources - http://www.cec.health.nsw.gov.au/patient-safety-programs/adult-patient-safety/sepsis-kills/sepsis-tools

4. Clinical Excellence Commission Paediatric Sepsis Pathway - http://www.cec.health.nsw.gov.au/__data/assets/pdf_file/0008/343475/Paediatric-Sepsis-Pathway-Sept-2016-with-watermark.pdf
5. Empiric Antibiotic Guidelines - SCH - http://webapps.schn.health.nsw.gov.au/epolicy/policy/4672
6. Urinary Tract Infection (Typical): Identification and Management - http://webapps.schn.health.nsw.gov.au/epolicy/policy/4382
7. Meningococcal Disease Management – SCH - http://webapps.schn.health.nsw.gov.au/epolicy/policy/3651
8. Paracetamol Guidelines on ePolicy - http://webapps.schn.health.nsw.gov.au/epolicy/search?query=paracetamol

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3. Plunkett, Adrian, and Jeremy Tong. "Sepsis in children." *BMJ: British Medical Journal* 350 (2015): h3017.
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6. Craig, Jonathan C., et al. "The accuracy of clinical symptoms and signs for the diagnosis of serious bacterial infection in young febrile children: prospective cohort study of 15 781 febrile illnesses." *Bmj* 340 (2010): c1594.