1. Purpose

This procedure provides clinical practice guidelines to guide clinicians involved in the emergency management of fever in children. It aims to identify those at risk of serious bacterial or other significant illness who need timely treatment, whilst avoiding unnecessary investigations in the majority.

2. Scope

This procedure relates to all Children’s Health Queensland (CHQ) staff involved in the care and management of children who present with fever as their primary complaint.

3. Procedure

3.1 Introduction

Fever is one of the most common reasons for paediatric presentations to emergency services and provides diagnostic and management challenges to clinical staff.

3.2 Fever definition and measurement

The normal mean body temperature is 37°C (range 36.2 - 38.0°C) in healthy children 1. For children under three months of age, 38°C is approximately two (2) standard deviations above the mean.2 The body temperature fluctuates (by up to 1°C) with age, time of day, activity level, feeding, clothing, ambient condition and the site used for the reading 1. Core body temperature measurement (pulmonary artery or distal oesophagus) is the accepted gold standard, but is not practical in the emergency department setting. Estimation by rectal or bladder temperature is also too invasive to be routinely used in the conscious child. Commonly used alternative sites (oral, axillary, tympanic, and skin)3-5 all may underestimate core temperature by up to 1°C.

A parent’s touch has been shown to have high sensitivity but low specificity for discovering a fever.6 A practical definition of fever is any temperature ≥38°C however measured, at home or in hospital.

3.3 “Fever phobia”

Fever often causes significant anxiety for parents and healthcare workers alike. “Fever phobia” is a common phenomenon 8 and may be perpetuated by well-intentioned enquiries regarding height of the fever or repeated measurement by medical personnel. Myths and misinformation about the likely causes of fever (such as teething); what the height of the fever means; response of fever to antipyretics; and side effects such as risk of seizures, brain damage and death are commonly encountered and should be acknowledged, gently corrected where needed, and put into perspective.
3.4 Pathophysiology of fever

Fever is a physiological response most often caused by an infective process when exogenous pyrogens (e.g. bacterial toxins, antibody-antigen complexes) induce endogenous pyrogens (e.g. TNF-α, IL-1β, IL-6 and interferons) resulting in an elevated body temperature. The thermoregulatory centre then raises and maintains the body temperature to the new set point. This may negatively stress some children with pre-existing cardiac, respiratory or neurological diseases, and gives most children a degree of malaise. However fever is thought to be a generally beneficial adaptive response that promotes the immune response and inhibits the invading pathogen, potentially reducing the duration of certain infections.

3.5 Epidemiology of fever

Febrile illnesses comprise approximately 20% of paediatric emergency presentations. Most (80%) have a readily identifiable source of the fever. Of the remaining 20%, most will have a self-limiting viral infection, however a small proportion will have a serious bacterial infection (SBI) or be febrile from conditions such as Kawasaki disease, vaccination reactions, arthritis or connective tissue disorders, malignancies, drug fever, or inflammatory bowel disease. In a large Australian children's hospital study, 7.5% of febrile children <5 years old had a SBI; 3.4% had a urinary tract infection (UTI); 3.4% pneumonia; 0.4% bacteraemia and 0.1% meningitis. Pyrexia of unknown origin (PUO) is any fever lasting 10 - 21 days without cause identified on history, examination and basic investigations.

3.6 Serious bacterial infection (SBI)

SBI includes UTI, pneumonia, meningitis, bacteraemia, osteomyelitis, septic arthritis, skin and soft tissue infection or bacterial enteritis; though only the first four (4) are likely to present in an occult fashion with significant frequency.

**UTI**

This is a relatively common infection in febrile children <5 years. In the 1st year of life, 6.5% girls and 3.3% boys (1.2% of circumcised vs. 8.0% of uncircumcised males) will have a UTI. In the 2nd year, the rates become 8.1% girls & 1.9% boys and decrease thereafter. UTI is also the most common SBI causing fever without focus, at approximately 5%.16

**Pneumonia**

About 3 - 4% all febrile children under 5 years and approximately 5% with fever without a focus have pneumonia, though most will be viral in origin. Increasing pneumococcal immunisation may continue to decrease the incidence of bacterial pneumonia due to the commonest bacterial agent, *Streptococcus pneumoniae*.

**Bacteraemia**

The incidence of occult bacteraemia has fallen from over 10% to <0.5% of febrile children aged three (3) months to three (3) years. This is largely due to effective immunisation against *Haemophilus influenzae type b* (HIB) & *Streptococcus pneumoniae*. Rates are higher (approximately 2 - 10%) in non and pre-vaccinated children depending on age. Meningococcaemia occurs in only 0.02% of young febrile infants <2 - 3 months, but approximately 15% of these may not appear ill-looking. Other common pathogens, particularly in infants <6 months, include Salmonella species (which may be associated with diarrhoea) and E. Coli (which may accompany UTI).16
Meningitis
The incidence of meningitis is generally very low, but more common in younger infants. A recent study found a bacterial meningitis rate of approximately 0.7% in febrile infants < 2 months old.

4. Assessment
A well-taken history and thorough clinical examination should aim to identify:

- a. children who have a focus of infection that may then be investigated and treated, and
- b. children for whom no infective focus may be found and who may require further investigations and/or empirical treatment according to their risk of SBI.

Factors that may assist in risk stratification include:
- child’s age
- immune status - incomplete immunisations, immunocompromise
- signs of toxicity
- current or recent use of antibiotics
- presence of concerning signs and symptoms (eg. petechial rash)

5. Age
Several meta-analyses have shown that febrile young infants <3 months have a high risk of SBI (7-24%). This risk is greatest in the neonatal period and decreases progressively with increasing age. Young infants are more likely to present with non-specific features (they lack the hypothalamic and immune system maturity to localise the infection) and can deteriorate rapidly. In addition to the pathogens seen in older children, Group B Streptococcus, E. Coli, Herpes Simplex virus, Listeria monocytogenes infections are more common in this period. Detecting other viral infections (e.g. RSV) lowers but does not remove the risk of SBI (7% vs. 12.5% for SBI (mainly UTI) in one (1) large study. More recently a study found the incidence for SBI in infants one to three (1 - 3) months decreased significantly if they had bronchiolitis, however the UTI rate was still 4%. A systematic review supported the use of screening for UTI in bronchiolitic children aged one to three (1-3) months as this was the only SBI with significant incidence (3.3%).

Children aged three (3) months to three (3) years have a lower risk of SBI and have their immunity boosted with vaccinations. Occult bacterial infection is most commonly UTI, pneumonia or bacteraemia. In this age group, the presence of a recognisable viral syndrome (including bronchiolitis) predicts a very low incidence of bacteraemia (0.2%).

Older children (>3 years) have mature immune systems, are better able to verbalise and localise symptoms and are at lower risk of SBI.

6. Immunisations & Immune status
The risk of occult bacteraemia (OB) and SBI has fallen in the last 20 years with the advent of several vaccines, in particular the Haemophilus influenzae type b (HIB) and pneumococcal (PC) immunisations. Recent studies suggest that OB rates have fallen to <0.5% in immunised children 3 - 36 months with fever without focus. HIB has all but been eliminated as a cause of bacteraemia and serious invasive infection. Streptococcus pneumoniae remains responsible for the majority of current cases of OB, but is thought to cause invasive disease in less than 5% of these. It is expected that there may be a further decrease in OB incidence as the 7-valent conjugate pneumococcal vaccine is replaced on the National Immunisation Program with a 13-valent one that covers most of the remaining invasive serotypes. After two (2) of the usual three to four (3 - 4) doses of these immunisations (usually achieved by four (4) months of age in Australia), there is >95% protection. In addition the national program has increased herd immunity, which further reduces the risk to all children.

If a child has a congenital immune deficiency syndrome, sickle cell disease, HIV, asplenia, cancer, nephrotic syndrome, intracranial shunt, cochlear implant, immunosuppressive therapy or is indigenous then there is a greater risk for SBI.
7. **Clinical appearance and toxicity**

Well-appearing children over one (1) month of age are less likely to have a SBI than those who appear toxic (92% if toxic, 26% if looking ill, 3% if well-appearing - using Yale Observation Score (YOS) in children under age two (2) years). More recent studies have cast doubt on the utility of the YOS and recognise the difficulties in differentiating toxic and well-appearing infants. A number of SBI risk assessment protocols in young infants (Rochester, Boston, and Philadelphia protocols) include a ‘well appearance’ criterion in addition to laboratory tests.

The National Institute for Health and Clinical Excellence (NICE) guidelines combine features of specific serious disease with general appearance into a ‘traffic light’ based assessment to help determine risk. Clinical features that may help to identify serious infection in children include:

- Drowsiness
- Breathing difficulty or tachypnoea
- Cyanosis or pallor
- Poor peripheral perfusion
- Feeding <50% normal
- Decreased activity
- <4 wet nappies in 24 hours
- Seizures
- Petechial rash
- Parental concern or clinician instinct.

8. **Petechial rash and fever (Figure 1)**

SBI incidence (predominantly meningococcal disease) has been estimated to be 2 - 8% in children with fever and petechiae. If the child is unwell (i.e. abnormal vital signs, poorly perfused, or having altered mental state) or if the rash is purpuric (>2mm lesions) and not consistent with typical Henoch-Schonlein purpura (HSP), then the child should be managed presumptively for meningococcal disease with resuscitation as required and a 3rd generation cephalosporin whilst investigations are carried out. Well-appearing children with petechiae caused by local pressure or only in the distribution of the superior vena cava (eg. following coughing/vomiting) may be discharged with early review. In all other cases blood tests should be performed (full blood count, C reactive protein, blood culture). If the FBC and CRP are within normal limits and the child remains well during a 4-hour period of observation, then discharge with early review is again appropriate, otherwise admission with or without antibiotics should be undertaken.

**Figure 1:**  *Fever and petechial rash flowchart*

Adapted from: Royal Children’s Hospital, Melbourne, 'Fever and petechiae flowchart'
8.1 Fever height, duration and response to antipyretics

The height of the temperature has been used in many management algorithms to risk stratify febrile children. Whilst there is evidence that higher temperatures are associated with increased risk of SBI, the significance and degree of risk may be less clear in today's immunised population. In addition, viruses such as influenza routinely cause fevers >40°C, with SBI's being responsible for only a small proportion of high fevers encountered. Also, SBI's such as sepsis and meningitis may present without significant fever. Thus, it is the presence of a fever that is important to note and the height of fever should not be used as the primary discriminating management decision variable.

The duration of the fever and response to antipyretics have failed to show any ability to differentiate severe from mild illness or bacterial from viral infection.

INVESTIGATIONS

Most tests used to investigate febrile children have only moderately good sensitivities and specificities. Investigations may be used to help make a diagnosis, determine antibiotic use and duration, or risk stratify certain patients when no focus of infection is found. In the case of a PUO, more extensive investigations may be warranted, but will not be discussed further here.

Urinalysis, microscopy and culture

UTI is the most prevalent SBI in febrile young children and testing for one should be performed in symptomatic children or in febrile children <3 years. A recent AAP Clinical Practice Guideline on diagnosis of UTI in young children has recommended screening on the basis of risk. In practice, the majority of children, in particular infants will not fall into their low risk category and will require testing.

Dipstick urinalysis or urine microscopy may be used to screen urine samples for UTI. A diagnosis of UTI is likely (positive likelihood ratios of >20) when:

- both the leucocyte esterase and nitrite tests are positive in children ≥2 years or
- bacteria are seen on a Gram stain.

A presumptive diagnosis of a UTI can then be made and empirical antibiotics commenced while the sample is being cultured and tested for sensitivities.

UTI may be confidently ruled out (negative likelihood ratio of 0.19) when both leucocyte esterase and nitrite are negative on dipstick testing in patients over two (2) years of age. If not, a sample for microscopy and culture should be obtained.

The method of urine collection is also important and different methods vary by potential delays, invasiveness, and contamination rates.

Supra-pubic bladder aspiration (SPA) has the lowest contamination rate, but is invasive and has a success rate of 23 - 90% depending on the operator and use of ultrasound to determine location and the presence of at least 20ml of urine. It should be only generally considered in infants <6 months or if there is phimosis or labial adhesion.

Urethral catheterisation has a sensitivity of 95% and specificity of 99% compared to SPA. It is also invasive but success rates may be higher than with SPA. It should be used first line in children >6 months who are not toilet-trained or if SPA fails.

Clean catch specimen may be used for children who are unable to void on request, are not toxic, and in whom a delay in obtaining the sample is not detrimental. The child’s perineum should be washed prior to collection and the inside of the clean/sterile container used for collection should not contaminated by touching the collector’s or the child’s skin.

Midstream urine is recommended once the child is toilet trained.

Bag specimens although uncomfortable for the child (especially on removal) are often more acceptable to parents and staff because they are less invasive. Unfortunately, up to 85 - 90% samples are contaminated and thus cannot be used for a culture. A bag sample negative on dipstick urinalysis in a young child (<2 years) is not sufficient to rule out a UTI. A negative dipstick urinalysis on a sample obtained from a bag on a non-toxic febrile child >2 years is sufficient to rule out an infection. The high contamination rates plus potential delays in obtaining samples mean that bag samples should generally be discouraged.
Chest X-ray (CXR)
There is limited value in performing a CXR in a febrile child without cough. The likelihood of detecting pneumonia is increased with longer duration of cough and fever or the presence of leucocytosis. Most pneumonia in infants and young children is viral in origin and a CXR cannot reliably distinguish viral from bacterial pneumonia. Even when the CXR suggests a bacterial aetiology, a virus is more often isolated than a bacterial pathogen.

A CXR is recommended in febrile children with:
- increased work of breathing (chest recession, tracheal tug, use of accessory muscles)
- cough, tachypnoea and low oxygen saturation (≤ 93% in room air)
- a temperature >39°C and WBC >20 x 10⁹ (as a screen for occult pneumonia).

Blood Culture
Although blood cultures are the gold standard for diagnosing a bacteraemia, there are limitations with this investigation. Now that the incidence of occult bacteraemia is very low, the contamination rate is often higher than the true positive rate. Negative blood culture may also have a poor NPV due in part to inadequate sampling (minimum blood sample required usually ≥1 ml but confirm with local laboratory). Young infants have higher rates of bacteraemia, and may become bacteraemic with other invasive SBI's, and it is recommended to collect a blood culture in this group.

Full Blood Count
A recent systematic review found that WCC has no value in ruling out SBI and is less valuable than CRP for ruling in SBI. Meningococcal, salmonella & staphylococcal bacteraemias often do not elevate the WCC. When used, the threshold most often used to indicate increased bacteraemia risk is WCC>15 x 10⁹/L, which has only moderate sensitivity and specificity. One large study including the post-PC vaccine era reported 74.0% sensitivity, 54.5% specificity, 1.5% positive predictive value and a 99.5% negative predictive value. Some investigators also include WCC<5 x 10⁹/L, absolute neutrophils count (ANC)>10 x 10⁹/L or <1 x 10⁹/L, or the presence of bands as risk factors.

With the current low risk of bacteraemia and using more appropriate tests for the other occult SBI, there appears little value in the test, except in very young infants or the unimmunised.

C reactive protein (CRP)
CRP is an acute phase reactant and concentrations start to rise at four to six (4 - 6) hours after onset of inflammation and peak around 36 - 50 hours. CRP shows promise and is better than the FBC for detecting SBI, especially if used after 12 hours of fever. A recent systematic review showed that different cut-off values can be used to identify high risk and low risk children. Young children with fever >39.5°C may be divided into three (3) groups according to CRP:
- 5% risk of SBI if CRP <20 mg/L
- 15% risk of SBI if CRP 20-80 mg/L
- 72% risk of SBI if CRP >80mg/L
(Note: likelihood ratios were only moderate and the populations included had intermediate or high prevalence of SBI.)

Lumbar Puncture (LP)
There is limited evidence regarding which children should have an LP performed as part of the septic workup, especially as the incidence of bacterial meningitis has decreased dramatically since the introduction of the HIB and PC vaccines. Although there is good evidence for several useful clinical features which influence the likelihood of meningitis in a child, no one clinical feature is diagnostic and in the very young infant meningitis often presents with non-specific features like poor feeding, lethargy or irritability. The height of the fever and WCC are unhelpful as they do not reflect the risk of bacterial meningitis. In general, as long as the child is well...
enough to tolerate the procedure and there are no contraindications the procedure, an LP should be considered in children with signs or symptoms of meningitis, or in the young febrile infant with non-specific features such as vomiting, lethargy / drowsiness, irritability or poor feeding. [Refer to acute management of meningitis in children clinical procedure – to be hyperlinked]

**Other tests**

Procalcitonin (a prohormone rises with physiological stress) has restricted availability currently, but has shown utility in differentiating bacterial from viral illness. It has been reported to have better specificity and possibly sensitivity than CRP for bacterial meningitis or sepsis especially in first six to eight (6 - 8) hours of fever.

Viral diagnostic studies – limited usefulness in ruling out SBI as noted above.

Stool microscopy and culture – may be indicated in very young infant or if mucoid, bloody or prolonged diarrhoea.

### 9. Management

The recommended emergency management of febrile children is summarised on the Flowchart and comprises:

**Supportive**

The child should have excess layers of clothing removed. Over-enthusiastic physical cooling can be counterproductive by stimulating shivering and other heat-retaining reflexes. Oral fluids if tolerated should be encouraged to maintain hydration.

**Antipyretics**

Antipyretics may be prescribed for an awake child to provide relief from discomfort caused by the fever or the underlying cause of the fever. Parents should be advised that fever is one of the body’s immune system responses to infection and that antipyretics do not treat or shorten the illness, will not prevent febrile convulsions, and if the dosing is excessive can cause adverse events.

Aspirin should be avoided in children as the uncommon possibility of Reye’s syndrome increases with varicella or influenza-like illnesses.

Appropriate choices for symptomatic relief one of:

- **Paracetamol 15mg/kg up to four (4) hourly** with a maximum of four (4) doses per day, or
- **Ibuprofen 10mg/kg up to six (6) hourly** with a maximum of four (4) doses per day (avoid in children <6 months, if significantly dehydrated or history of hypersensitivity. Ibuprofen appears to be safe in asthmatics.

There is some evidence that ibuprofen reduces fever and discomfort more quickly than paracetamol. The popular dual therapy dosing regimes advocated by some reduce the time with fever, however there is no significant difference in resolution of discomfort versus monotherapy. Safety concerns have been raised over recommending two drugs with different dosing regimes for little gain.

**Risk Stratification**

The risk of SBI may be stratified by age, the presence of a focus for infection, and toxicity. See the Flowcharts in [Appendix 1](#) & [Appendix 2](#) for details.

**Antibiotics**

Antibiotics may be indicated depending upon the perceived risk of SBI or the specific infection found. Antibiotics are usually administered via the intravenous route initially for admitted patients
For choices and doses see Children’s Health Queensland Antibiocard
See flowcharts Appendix 1 - Emergency Management of Fever in Children (< 4 months) and Appendix 2 - Emergency Management of Fever in Children (≥ 4 months).

Disposition
As indicated by the Flowchart. All toxic children should be reviewed early by a senior medical officer.
Febrile children fit for discharge should be discussed with a senior doctor and arrangements made for a follow up visit at his / her local General Practitioner to check progress and outstanding test results.
See flowchart Appendix 3 - Admission / discharge criteria for children presenting with fever.
When a decision is made to transfer a child to a Level 6 facility, referral must be made through RSQ.65

Activation of the QLD emergency medical system coordination centre (QCC)
Further information on the preparation of an infant prior to transport can be obtained through RSQ Clinical Guidelines paediatric section (page 31-35).65
Statewide RSQ clinical guidelines - Paediatrics

Abbreviations

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tr>
<td>AAP</td>
<td>American Academy of Pediatrics</td>
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<tr>
<td>ANC</td>
<td>Absolute neutrophil count</td>
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<tr>
<td>BSL</td>
<td>Blood sugar level</td>
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<td>Children</td>
<td>0-14 years of age</td>
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<td>CHS</td>
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<tr>
<td>CRP</td>
<td>C-reactive protein</td>
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<tr>
<td>CXR</td>
<td>Chest x-ray</td>
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<tr>
<td>E.Coli</td>
<td>Escherichia coli</td>
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<td>FBC</td>
<td>Full blood count</td>
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<tr>
<td>HIB</td>
<td>Haemophilus influenzae type B</td>
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<td>HIV</td>
<td>Human immunodeficiency virus</td>
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<td>HSP</td>
<td>Henoch-schonlein purpura</td>
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<tr>
<td>IV</td>
<td>Intravenous</td>
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<tr>
<td>LP</td>
<td>Lumbar puncture</td>
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<tr>
<td>MCS</td>
<td>Microscopy, culture and sensitivity pathology test</td>
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<tr>
<td>NICE</td>
<td>National Institute for Health and Clinical Excellence</td>
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<tr>
<td>NPV</td>
<td>Negative predictive value</td>
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<td>OB</td>
<td>Occult bacteraemia</td>
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<tr>
<td>PC</td>
<td>Pneumococcal</td>
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<td>PUO</td>
<td>Pyrexia of unknown origin</td>
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<td>RSQ</td>
<td>Retrieval Services Queensland</td>
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<td>SBI</td>
<td>Serious bacterial infection</td>
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<td>SPA</td>
<td>Supra-pubic bladder aspiration</td>
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<td>SVC</td>
<td>Superior vena cava</td>
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<td>UTI</td>
<td>Urinary tract infection</td>
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<tr>
<td>UEC</td>
<td>Urea, electrolytes and creatinine</td>
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4. Supporting Documents

- **Appendix 1. Emergency management of children presenting with fever – less than 4 months**
- **Appendix 2: Emergency Management of children with Fever (>4 months)**
- **Appendix 3: Admission / Discharge Criteria for Children with Fever**
- **Fever in children fact sheet**
- **Children’s Health Queensland Antibocard**

5. References and Suggested Reading


6. Consultation

Key stakeholders (position and business area) who reviewed this version are:

- Director of Paediatric Emergency Medicine, Children’s Health Queensland
- Clinicians (medical, nursing, allied health) working within Level 4, Level 5 and Level 6 Children’s Health and Metro Children’s Health Queensland in emergency, inpatient and ambulatory services
- Children’s Health Queensland Hospital and Health Service clinical leaders - medical, nursing and allied health
- District Chief Executive Officers — Children’s Health Queensland, Metro South, Metro North and West-Moreton Health Service Districts
- Queensland Ambulance Services — Manager Clinical Standards.

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- Dr Jason Acworth - Director of Paediatric Emergency Medicine, Children's Health Queensland
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- Dr John Gavranich - Director of Paediatrics, Ipswich Hospital
- Dr Adrian Bonsall - Fellow, Emergency Services, Mater Children's Hospital
- Shahn Horrocks - Nurse Practitioner, Emergency Services, Gold Coast and Logan Hospitals
- Andrea Hetherington - Clinical Nurse Consultant (Paediatrics) Emergency Services, Logan Hospital
- Sharon Bluett - Nurse Educator, Emergency Services, Mater Children's Hospital
7. Procedure Revision and Approval History

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<th>Modified by</th>
<th>Amendments authorised by</th>
<th>Approved by</th>
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<td>Chief Executive, Children’s Health Queensland</td>
<td>General Manager Operations</td>
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8. Audit / Evaluation Strategy

<table>
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| Audit strategy | 1. Staff survey to evaluate awareness of procedure and emergency management practices  
2. Observe practice  
3. Review documentation, i.e. chart audit, to evaluate compliance with procedure |
| Audit tool attached | Nil |
| Audit date | Annual snapshot review (August) |
| Audit responsibility | Individual Greater Brisbane Metropolitan hospitals, i.e. Ipswich, Logan, Redland, MCH, RCH, TPCH, Redcliffe, Caboolture |
| Key Elements / Indicators / Outcomes | KPI 1 — greater than 80% staff awareness of procedure  
KPI 2 — greater than 80% compliance with procedure |

9. Appendices

- Appendix 1: Emergency Management of Children with Fever (<4 months)
- Appendix 2: Emergency Management of children with Fever (>4 months)
- Appendix 3: Admission / Discharge Criteria for Children with Fever
Appendix 1 – Emergency Management of Children with Fever (< 4 months)

Emergency management of children with FEVER (< 4 MONTHS)

Child presents to emergency service with a fever

Assess Severity
- Consider pre-hospital management given
- Treat discomfort with antipyretic
- Remove excess layers of clothing
- Consider offering oral fluids

No toxic features

Toxic features

A. Toxic
- Marked lethargy/decrease in activity
- Altered mental status
- Insoluble irritability
- Tachypnoea, increase work of breathing, grunting
- Cyanosis
- Poor perfusion (mottled skin, pallor)
- Marked/persistent tachycardia
- Moderate to severe dehydration
- Infant feeding <50% normal
- < 4 wet nappies in 24 hours
- Seizures
- Petechial rash
- Parental concern

Emergency Management
- (Resuscitate using ABCD)
  A. Provide highflow oxygen
  B. Support ventilation (BVM)
  C. Obtain IV or IO access
  D. Check BSL & give IV 10% Glucose (2 mL/kg) as needed

B. CXR indications
- Increased work of breathing
- Cough
- Tachypnoea
- SaO2 ≤ 93% in room air
- T > 39°C & WCC > 20 x 10⁹/L

C. LP indications
- Age < 2 months of age
- Bulging fontanelle
- Vomiting
- Lethargy/drowsiness
- Cerebral irritability
- Poor feeding
- Seizures

Any high risk features?

D. High risk criteria
- WCC < 5 or > 15 x 10⁹/L
- ANC < 1 or > 10 x 10⁹/L
- Bands > 1.5 x 10⁹/L
- CRP > 20 or PCT > 0.5ng/mL
- CSF: > 7 WBC
- Urine microscopy: > 10 WBC or bacteria
- CXR: Infiltrate, collapse
- Prematurity
- Immunodeficiency or significant underlying chronic disease

Low risk criteria
- No high risk criteria

Meets discharge criteria?

Y

Antibiotics

N

Admit to children’s inpatient service

Investigations
- Urine MCS
- +/- CXR

Investigations
- Urine MCS
- FBC
- CRP/PCT
- Blood culture
- +/- CXR
- +/- LP

Investigations
- Urine MCS
- FBC
- CRP/PCT
- Blood culture
- +/- CXR
- +/- LP

Investigations
- Urine MCS

Review

Investigation & Treatment

Investigation & Treatment

Investigation & Treatment

Investigation & Treatment

Any high risk features?

Y

N

N

Y

Discharge
Emergency management of children with FEVER (≥ 4 MONTHS)

Child presents to emergency service with a fever

Assessment
- No toxic features

Focus of infection evident?
- Y
  - Focus of infection evident?
  - (including bronchiolitis)
  - Investgate and treat as indicated by specific infection found
- N
  - ≥ 2 doses of immunisations (Hib + PCV)?
  - Y
    - Antiobiotics if presumed UTI
  - N

Investigation & Treatment
- Toxic OR Immunocompromised

Emergency Management (Resuscitate using ABCD)
- A: Provide high flow oxygen
- B: Support ventilation (BVM)
- Consider ETT intubation if not responding
- C: Obtain IV or IO access
  - Give IV fluid boluses 20mL/kg
  - 0.9%NaCl as required
- D: Check BSL and give IV 10% Glucose (2 mL/kg) as needed

Disposition
- Focus of infection evident?
  - Y
    - Investigate and treat as indicated by specific infection
    - Antibiotics
  - N

ChQ Procedure 00707 : Febrile Illness – Emergency Management in Children
Printed copies are uncontrolled

Version No.: 1.0: Effective From: 13/02/2013
Queensland Government

A. Toxic
- Marked lethargy/decrease in activity
- Altered mental status
- Inconsolable irritability
- Tachypnoea, increase work of breathing, grunting
- Cyanosis
- Poor perfusion (mottled skin, pallor)
- Marked/persistent tachycardia
- Moderate to severe dehydration
- Infant feeding < 50% normal
- < 4 wet nappies in 24 hours
- Seizures
- Petechial rash (see text)
- Parental concern

B. CXR indications
- Increased work of breathing
- Tachypnoea
- SaO2 ≤ 93% in room air
- T > 39°C & WCC > 20 x 10⁹/L

C. LP indications
- Age < 2 months of age
- Bulging fontanelle
- Vomiting
- Leathargy/drowsiness
- Cerebral irritability
- Poor feeding
- Seizures

D. High risk criteria
- WCC < 5 or > 15 x 10⁹/L
- ANC < 1 or > 10 x 10⁹/L
- Bands > 1.5 x 10⁹/L
- CRP > 20 or PCT > 0.5 ng/mL
- CSF: > 7 WBC
- Urine microscopy: > 10 WBC
- CXR: Infiltrate, collapse
- Prematurity
- Immunodeficiency or significant underlying chronic disease

Note: This protocol is for children ≥ 4 months of age. For children < 4 months, consult a paediatrician immediately.
11. Appendix 3 – Admission / Discharge Criteria for Children with Fever

Criteria for discharge from the emergency service

Criteria for discharging an infant with febrile illness from the emergency service includes:
- age greater than 2 months
- no toxic features
- no indication for intravenous antibiotics
- no high risk criteria for SBI
- able to maintain adequate oral intake to maintain hydration
- parent information sheet given and discussed
- recommend review by GP within 24 hours

When discharging an infant with a febrile illness, their social circumstances should be considered and appropriately addressed after the initial assessment and observation period:
- time of day
- parents/carers comprehension and compliance
- access to transport should return be required
- distance to local hospital

Criteria for admission to children's inpatient service

Criteria for admission to the children’s inpatient service for an infant with febrile illness includes:
- age less than 2 months
- any toxic features
- need for intravenous antibiotics
- significant high risk criteria for SBI
- inability to maintain adequate oral intake to maintain hydration
- unplanned return within 24 hours of initial assessment
- social factors such as long distance to hospital and family/carers not able to cope with symptom management.