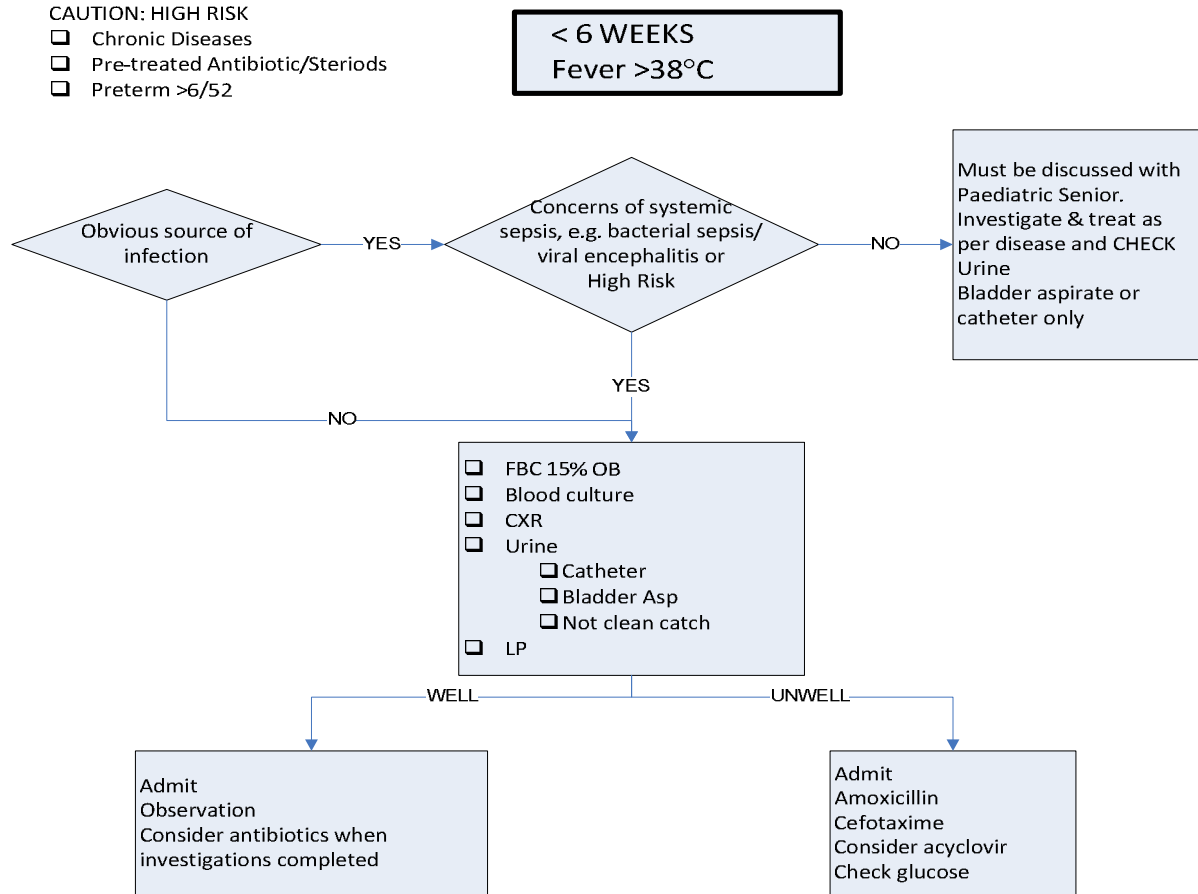


Guideline: Fever in the Child under Two Years of Age

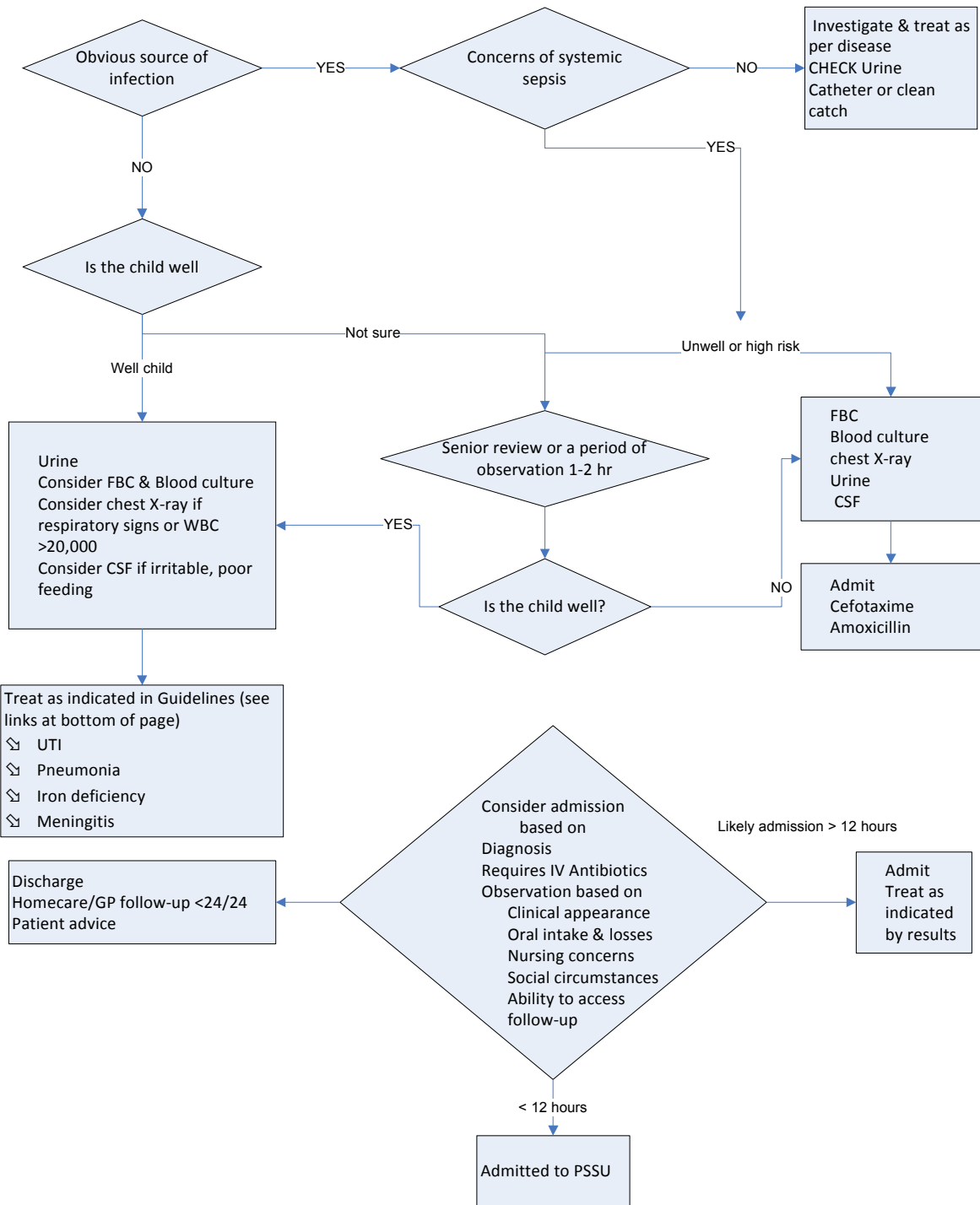


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CAUTION: HIGH RISK

- ⊗ Chronic Diseases
- ⊗ Pre-treated Antibiotic/Steroids
- ⊗ Unimmunised
- ⊗ Preterm >6/52

6/52 to 3/12
Fever >38°C



Hyperlinked Guidelines

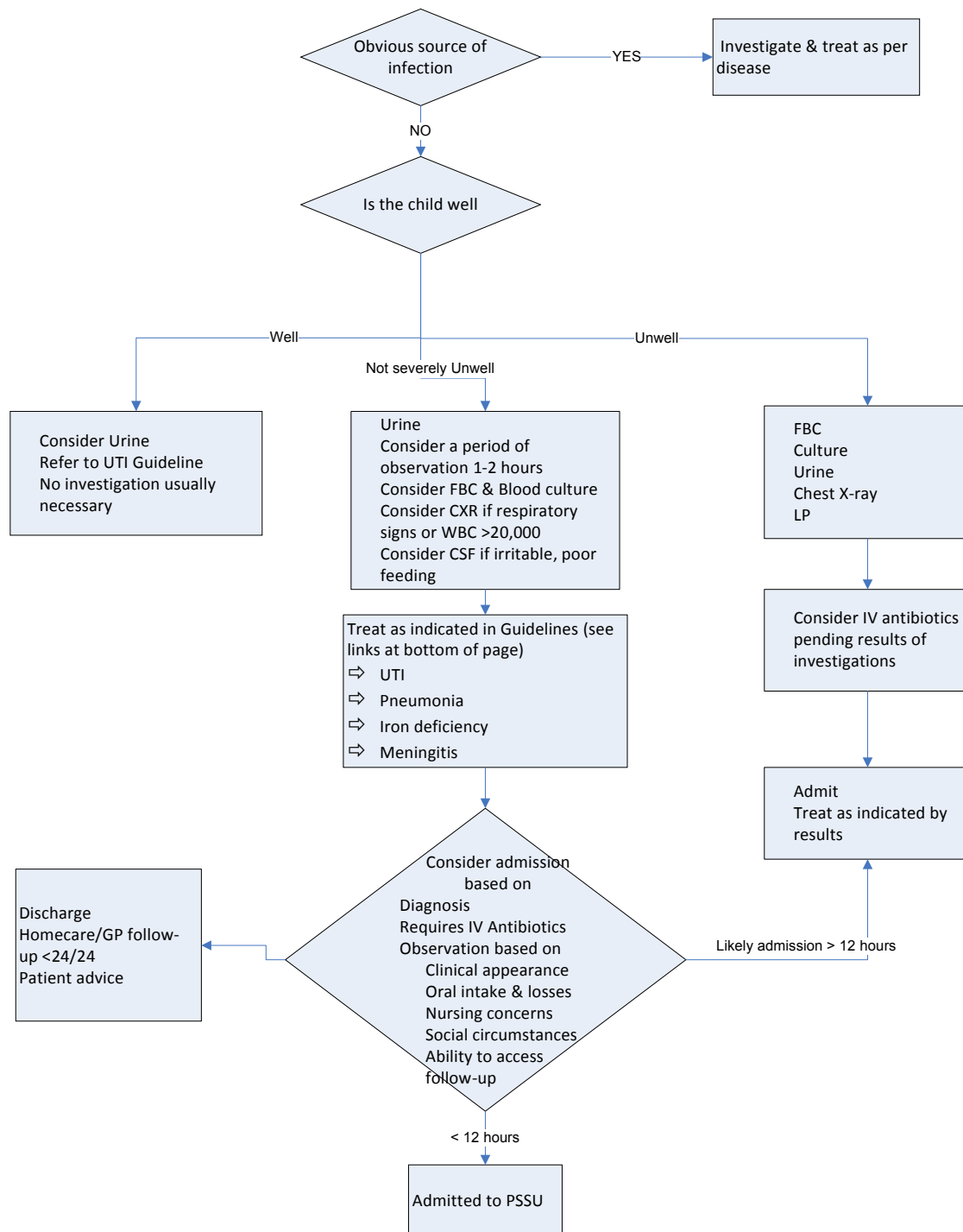
- [UTI](#)
- [Pneumonia](#)
- [Iron deficiency](#)
- [Meningitis](#)

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CAUTION: HIGH RISK

- ⇒ Chronic Diseases
- ⇒ Pre-treated Antibiotic/Steroids
- ⇒ Unimmunised
- ⇒ Preterm >6/52

>3/12 - to <2 years
Fever >39°C



Hyperlinked Guidelines

- [UTI](#)
- [Pneumonia](#)
- [Iron deficiency](#)
- [Meningitis](#)

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Purpose

This guideline applies to all children under two years of age, presenting with a febrile illness.

Responsibility

The clinical team caring for the patient

Guideline

We acknowledge that this Guideline has been adapted for use in Kidz First Emergency Care from the Starship Children's Fever Guideline with their consent. It differs in that if a blood culture is drawn, an FBC is added to screen for Iron Deficiency. Differences to the Starship Guideline are highlighted in **Blue**.

[Hyperlink to Iron Deficiency Guideline](#)

Important changes in the epidemiology of infectious disease in this age group have occurred during the past decade. These include vaccination against Haemophilus influenza B, the meningococcal disease epidemic in New Zealand, and recent vaccination against the epidemic strain of Neisseria meningitidis group B. It is likely it will change further with the introduction of Prevenar (pneumococcal vaccine).

The majority of children under 2 years of age with a high fever have a viral illness. About 3% of children under 2 years with a rectal temperature of >38.9°C have a potentially serious bacterial infection.

Young febrile children often present with non-specific changes in behaviour and appearance. Specific signs, such as meningism, cannot be relied on to diagnose significant illness in this age group. The height of fever, rapidity of onset of illness, and response to antipyretics are not good indicators of the nature of the underlying illness.

Simple febrile convulsions are not associated with increased risk for serious sepsis.

The following strategy is recommended in the Children's Emergency Department at Starship Children's Hospital. This strategy applies to previously well children. Children with co-morbidities are likely to require more investigation and greater use of empiric antibiotic treatment.

Remember that no set of guidelines can give the correct course of action for every clinical circumstance, and senior medical staff are available to assist with clinical decision making.

Temperature in these guidelines refers to rectal or electronic tympanic membrane "rectal equivalent". Tympanic membrane temperature measurement is inaccurate in children <6 months, a rectal temperature should be obtained unless contraindicated (e.g. peritonism or rectal bleeding). Tympanic membrane thermometers can also give falsely low recordings in some older children, if in doubt check by another method.

Caution is necessary with children who are:

- Pre treated with antibiotics or steroids.
- Unimmunised or Partially Immunised.
- Preterm infants (>6 weeks early).
- Have Chronic Diseases.

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For these Children please discuss with a senior as they may need more extensive investigation or observation.

Children under 6 weeks of age, any fever (i.e. >38°C)

This is a high risk group, with bacterial infection in approximately 15% and the possibility of rapidly progressive disease.

Full sepsis work up is necessary including:

- Chest x-ray.
- FBC.
- Blood cultures.
- CSF.
- Urine (bladder aspirate or catheter).

A dip stick screen on a bag urine specimen will miss some UTIs and is not adequate since UTIs are both more common and more serious in this age group. It is preferable to obtain a definitive urine specimen (bladder aspirate or catheter) immediately as part of the general sepsis screen to allow rapid institution of antibiotic therapy in sick infants.

Test for hypoglycaemia in these children as soon as possible.

Antibiotics should be commenced immediately in infants who appear unwell (lethargic or very irritable).

Infants who look well may have IV antibiotics commenced once all investigations are completed, or may be observed closely in hospital without antibiotics if all initial results (FBC, urine and CSF microscopy, CXR) are normal. The decision regarding whether to start antibiotics will generally be made by the admitting team under these circumstances.

Amoxycillin	50 mg/kg/dose	Q8H	1st week of life
		Q6H	>1 week of age
Cefotaxime	Load 100 mg/kg then 50 mg/kg/dose	Q12H	1st week of life
		Q6H	>1 week of age

Children 6 weeks to 3 months of age, any fever (i.e. >38°C)

The risk of bacterial infection in this age group is around 6%.

If the infant looks unwell:

Perform full sepsis screen:

- Chest x-ray.
- FBC.
- Blood culture.
- CSF.
- Urine (CSU or clean catch).

Admit on IV antibiotics (amoxycillin and cefotaxime, dose as described above).

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If the child looks well and feeding is satisfactory:

We realise what a “Well Child” looks like is a grey area and it is difficult to teach without the benefit of clinical experience. Given the high risk local population, we would suggest either ...

- A. Review the patient with a Senior.
- Urine (CSU or clean catch sent to lab).

And consider

- FBC.
- Blood culture.
- Chest x-ray if indicated by respiratory signs (grunting, tachypnoea, recession, oxygen requirement or a high WBC >20000). (10-15% of children with WCC have occult pneumonia even in pneumococcal vaccine era).

OR after a period of observation and you remain unsure, go to B):

- B. Investigate if there is no Senior available.
- Urine (CSU or clean catch sent to lab).
 - FBC.
 - Blood culture.
 - Chest x-ray if indicated by respiratory signs (grunting, tachypnoea, recession, oxygen requirement or a high WBC >20000) [10-15% of children with WCC have occult pneumonia even in pneumococcal vaccine era].
 - CSF if indicated by irritability and poor feeding – i.e. the unwell child.
 - If initial results are normal, the infant may be managed at home.

Clinical review must occur within 24 hours (GP, Homecare Nurse or hospital).

If you have any doubts regarding the infant’s clinical state, laboratory results or social situation admit to hospital.

Children 3 months to two years of age, fever >38.9°C

Decisions regarding investigation and management are based on the child’s history and examination findings, with particular focus on risk factors for serious infection, early signs of cardiovascular or respiratory compromise and the overall appearance and behaviour of the child. Investigations contribute only a small amount of additional information.

Children who present with a fever persisting for more than five days require a different approach and should be discussed with senior staff.

Decision making requires experience and clinical judgement, and you should discuss cases with senior medical staff who can help you develop your skills in this area. There is a spectrum of illness severity, and the sections below provide examples of the approach to children with different severity of illness:

1. There is a clear clinical focus of infection in a child who appears well (alert, responsive and undistressed):

Treat as clinically indicated for the specific infection (usually viral infections requiring symptomatic care). No laboratory investigation is usually necessary.

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2. The child has any of the following: reduced conscious level, poor perfusion, a widespread petechial rash (not just a few petechiae), signs of cerebral irritation, or just “looks very sick”.

Full sepsis work up:

- Chest x-ray.
- FBC.
- Blood culture.
- CSF (note the contra-indications to lumbar puncture below).
- Urine.

These children should be admitted to hospital for observation and IV antibiotics pending culture results:

Cefotaxime - Load 100 mg/kg then
50 mg/kg/dose Q6H

Children with poor perfusion, tachycardia or hypotension will require urgent fluid resuscitation: 20 ml/kg of normal saline as an initial bolus.

Reassess according to response. Children with septicaemia may require multiple fluid boluses to restore adequate circulation. Repeat fluid boluses according to effect, watching for reduction in tachycardia, improved perfusion and urine output, and change in conscious state. Two boluses of 20 ml/kg is equivalent to half the normal circulating blood volume. Children who require this level of fluid resuscitation should be closely monitored.

Lumbar puncture is contra-indicated in children with evidence of raised ICP, a Glasgow Coma Score of less than 9, focal neurological signs, cardiovascular instability, suspected bleeding disorder or if showing signs of rapid deterioration.

If lumbar puncture is contra -indicated, then treatment for bacterial meningitis should be started immediately. Children with focal seizures, focal neurological abnormality, suspected encephalitis or contact with active herpetic disease should also be commenced on IV acyclovir.

3. The child who has a fever without clinical focus, who is not severely unwell.

These children have a rate of bacteraemia of ~2%, mostly Strep. pneumoniae. The majority of these cases resolve spontaneously.

FBC and CRP are not useful in determining the risk of bacterial sepsis in a child presently acutely with fever.

All require screening for a UTI. The prevalence of UTI in this age group with fever and no clinical focus is 2-5%. It is the most commonly missed bacterial diagnosis. Diagnosis is challenging as the clinical presentation tends to be non-specific. A bag specimen screened by dipstick is acceptable in this age group, however a definitive specimen (CSU) is required if the dipstick is positive for either nitrites or leucocytes. Do not send bag urine specimens to the laboratory. A child with unexplained persistent fever or history of UTIs in the past should always have a urine sample obtained (see UTI guideline).

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Consider blood culture in the more unwell child. If a blood culture is drawn then it may be prudent to add a FBC to screen for Iron.

Deficiency, bearing in mind that in the post pneumococcal era, the WBC is not a useful guide in detecting Occult Bacteraemia.

Chest x ray and CSF specimen should be obtained if indicated by history and examination, discuss with a senior doctor if in doubt. Children with a high WBC >20000 have a 10-15% chance of having an occult pneumonia on chest x-ray. Children who have received prior antibiotics are more likely to require a CSF specimen despite lack of specific meningeal signs.

If a child is drowsy (but otherwise looks well) after a simple febrile seizure, a short period of observation in ED may avoid excessive investigation and treatment, since most show dramatic improvement over 1 - 2 hours.

If focal infection is diagnosed on urine, CSF microscopy or CXR: treat as clinically indicated.

Virtually all of these children have viral illnesses, but alternative diagnoses may become apparent with time.

If, following a period of observation, the child remains responsive, interactive and well perfused, discharge home with symptomatic treatment (paracetamol) and arrange for clinical review within 24 hours, or sooner if condition deteriorates.

This review should normally be with the family's GP. Bring the child back to ED if timing or other circumstances prevent GP review.

Consider the following when making decisions regarding disposition:

- Trend in clinical appearance and vital signs over a period of observation.
- Oral intake and losses.
- Any nursing concerns regarding the child.
- Social circumstances.
- Ability of family to access the necessary follow up.

If you have any doubt about the clinical state of the child, or if the social circumstances make care at home more difficult take a blood culture and admit the child.

Antibiotic therapy is generally unnecessary in this group if hospitalised for observation unless clinical deterioration is evident. The decision regarding whether to start antibiotics will generally rest with the admitting team.

Any child with a positive blood culture should be immediately recalled to ED unless the child is reported to be well by parents and the culture is definitively identified by the laboratory as a contaminant organism (coagulase negative staphylococcus or diptheroids).

References

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Definitions

Terms and abbreviations used in this document are described below:

Term/Abbreviation	Description
FBC	Full Blood Count
CSF	Cerebrospinal Fluids
CXR	Chest X-ray
CSU	Catheter Specimen Urine
GP	General Practitioner
WBC	White Blood Count
UTI	Urinary Tract Infection
ED	Emergency Department
ICP	Intracranial Pressure
CRP	C Reactive Protein
IV	Intravenous

Associated Documents

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Other documents relevant to this guideline are listed below:

NZ Legislation	Health Practitioners Competency Assurance Act (2003).
CMDHB Clinical Board Policies	Nil.
NZ Standards	Nil.
Organisational Procedures or Policies	Nil.
Other related documents	Starship Children's Hospital Fever Guideline. UTI Guideline. Pneumonia Guideline. Meningitis Guideline. Iron deficiency Guideline.

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