The Febrile Infant / Child With Acute Illness And Altered Consciousness

saving children's lives

ETAT+

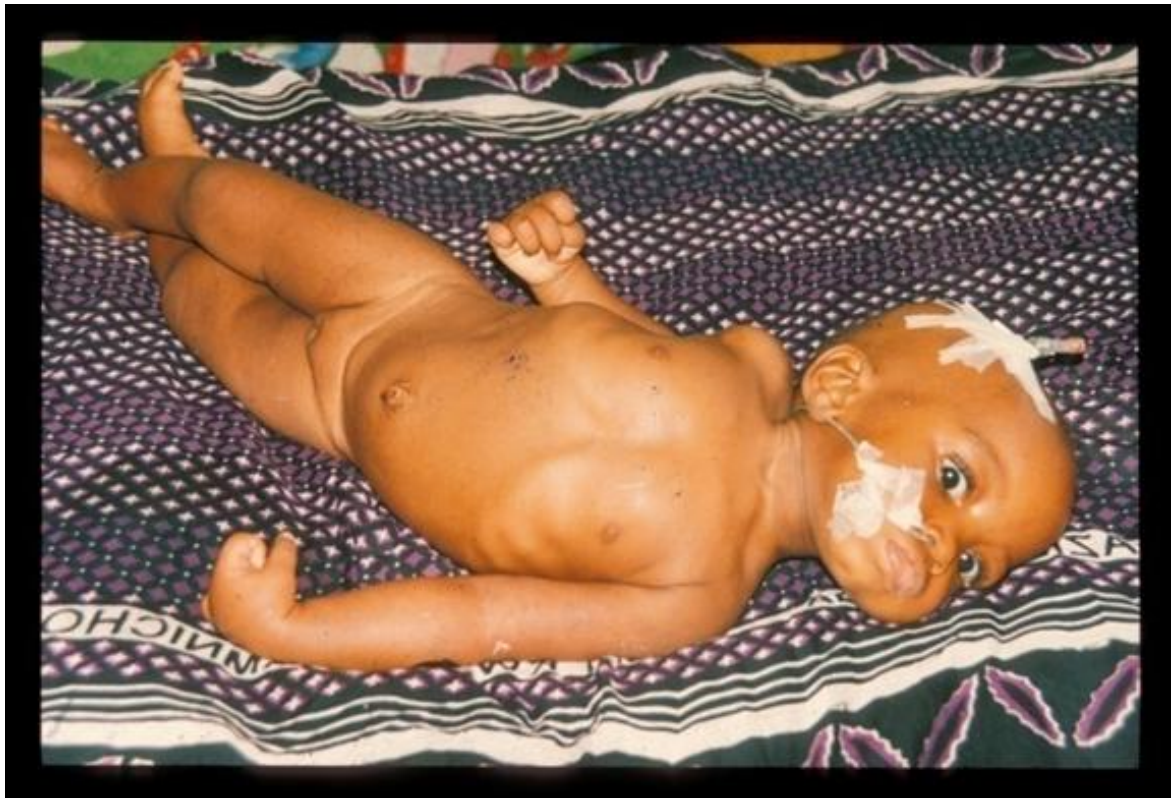
Emergency Triage Assessement and Treatment **plus admission**

KEMRI | Wellcome Trust

Objectives

- Assessment and diagnosis of altered consciousness: meningitis and severe malaria
- Who needs an LP
  - Drugs for ABM ***if aged > 1m***
  - *Tuberculous meningitis not covered*
- What is cerebral malaria / severe malaria
- Use of Artesunate & Quinine

What could be the problem?



Newer vaccines (HiB and Pneumo) and increased use of bednets are changing disease pattern

Cerebral Malaria

Acute Bacterial Meningitis

Abscess / TB

Encephalitis

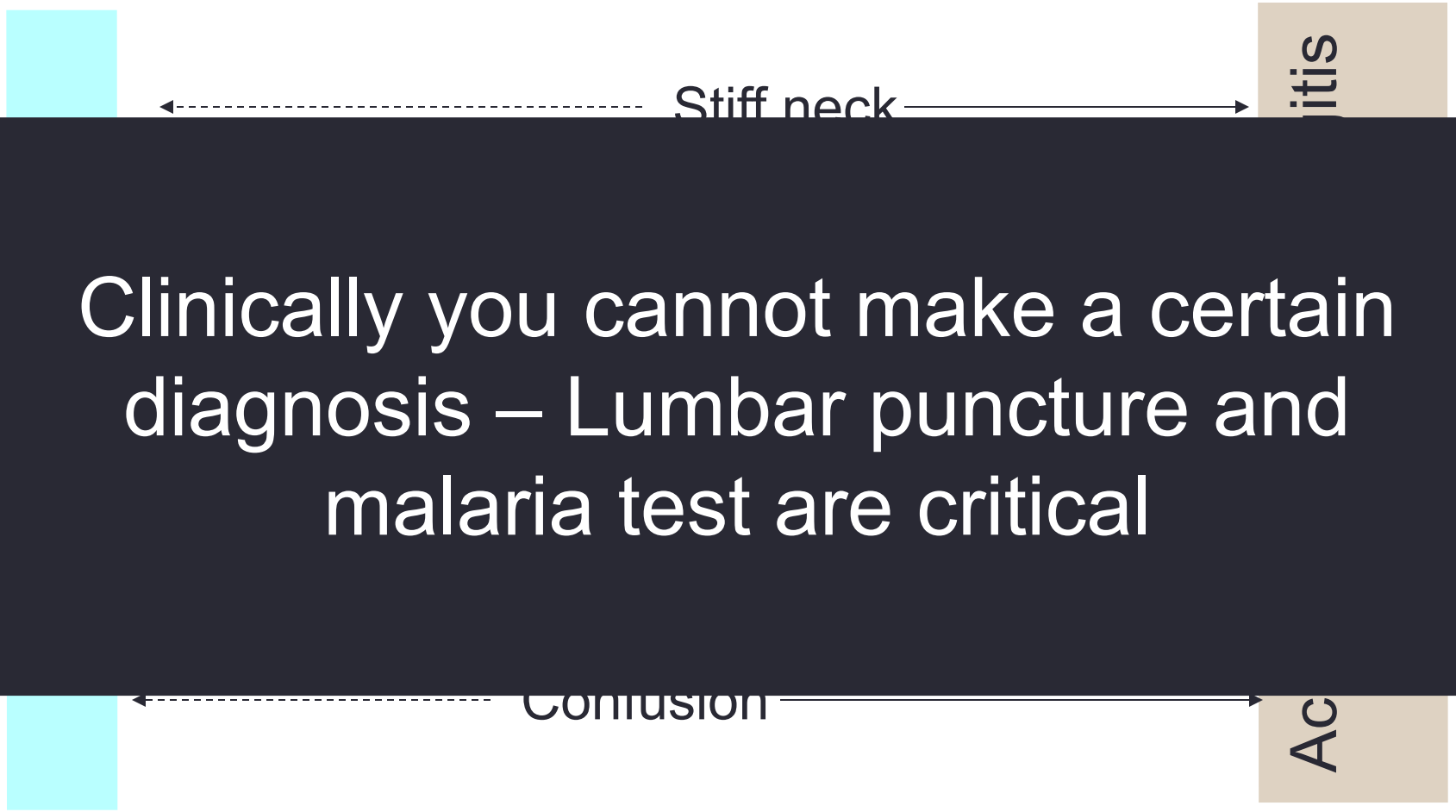
Primary or secondary complication of severe systemic illness or HIV

How severe is the problem?

- Severity and duration of symptoms
- Convulsions (duration, type & frequency)
- Ability to feed?

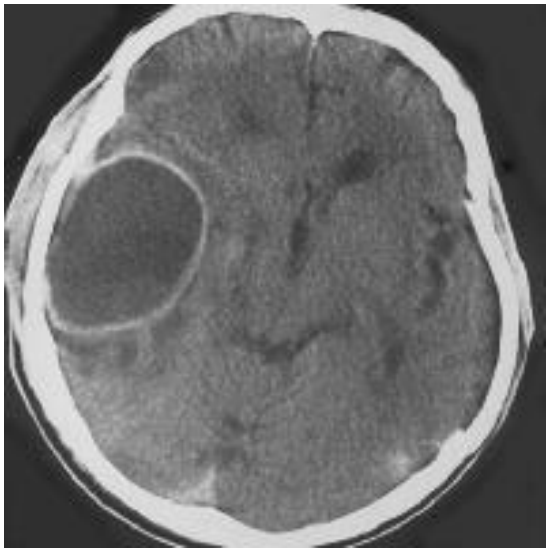
A	Alert	Eye contact
V	Responds to Voice	Carer's call - name
P	Responds to Pain	Over sternum - Localises
U	Unconscious	Inadequate response to pain

CM vs ABM vs Encephalitis

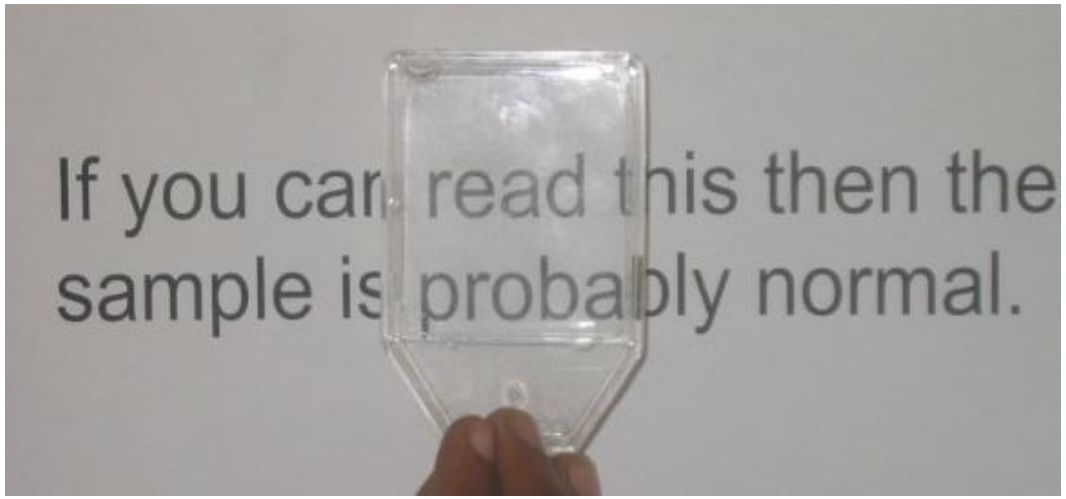


So what is a sensible rule for LP?

- At a minimum, if you want to avoid missing meningitis (and deaths and handicap from it), **and avoid wasting antibiotics**, at least LP those with history of fever and one of:
  - Bulging fontanelle
  - Stiff neck
  - Fits if age <6 months or > 6 yrs
  - Partial or focal fits
  - Reduced consciousness



CSF Cloudiness / Turbidity



CSF should be crystal clear.

Cloudiness usually appears at CSF WBC counts > $200x10^6$ Wbc per L

A well run hospital can....

- Get LPs done on admission before starting treatment
- ***Get CSF to the laboratory immediately*** (do not put CSF in fridge or incubator)
- Do a count of the CSF white cells (and their type) within 1 hour of receiving the sample
- Ideally do a CSF Gram stain, glucose and protein

What do we use for treatment of ABM in children aged > 1m?

- Penicillin + Chloramphenicol – still can be used
- Ceftriaxone is a good drug
- To avoid promoting development of resistance Ceftriaxone should be used ***AFTER confirming diagnosis with LP on admission***

Note double doses of penicillin are used for meningitis if age is > 1m

What is ‘Severe Malaria’?

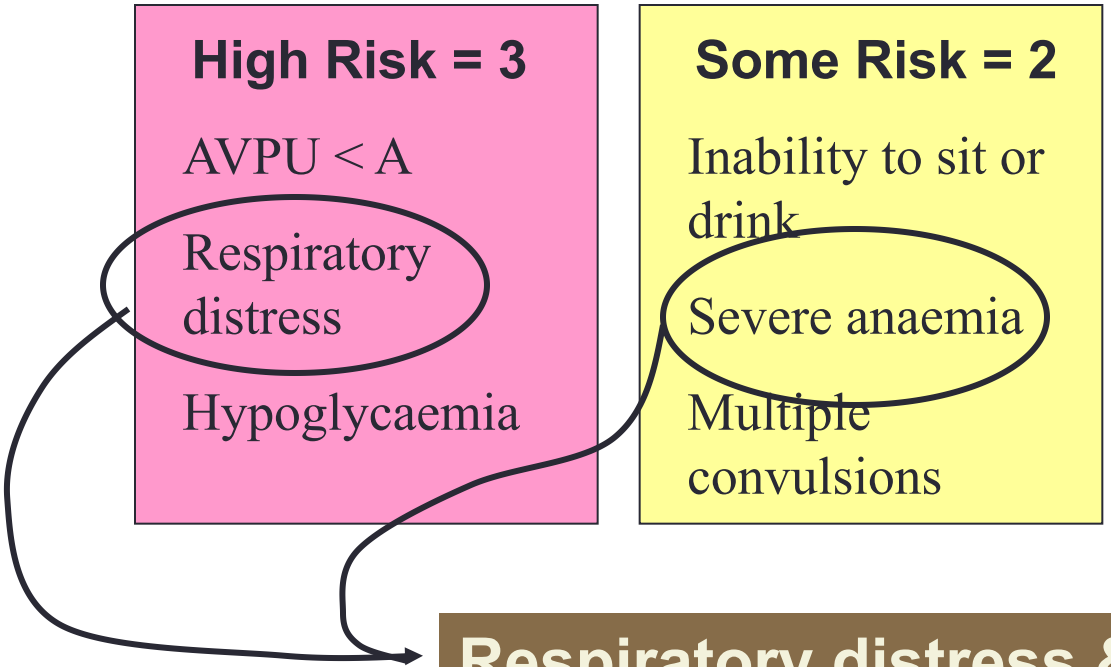
Severe Malaria in **African children in endemic areas**

- 'Cerebral malaria'
  - Strictly Coma = AVPU < P (AVPU = U)
  - In practice if AVPU < A or unable to drink
- Severe Malaria with Respiratory Distress
  - Deep, acidotic breathing & usually indrawing
  - Typically associated with anaemia / severe anaemia.
- Severe Anaemia
  - Hb < 5g/dl (<50g/L) or PCV / Haematocrit < 15%
  - As many as 40-50% of children with severe anaemia will NOT have respiratory distress
- **Plus positive diagnostic test**

Life-threatening malaria

High risk of death	Some risk of death	Very low risk of death
AVPU < A	Inability to sit or drink	1 convulsion
Respiratory distress	Severe anaemia	High temperature
Hypoglycaemia	2 or more convulsions	Alert – can drink
Risk score = 3	**Risk score = 2**	**Risk score = 1**

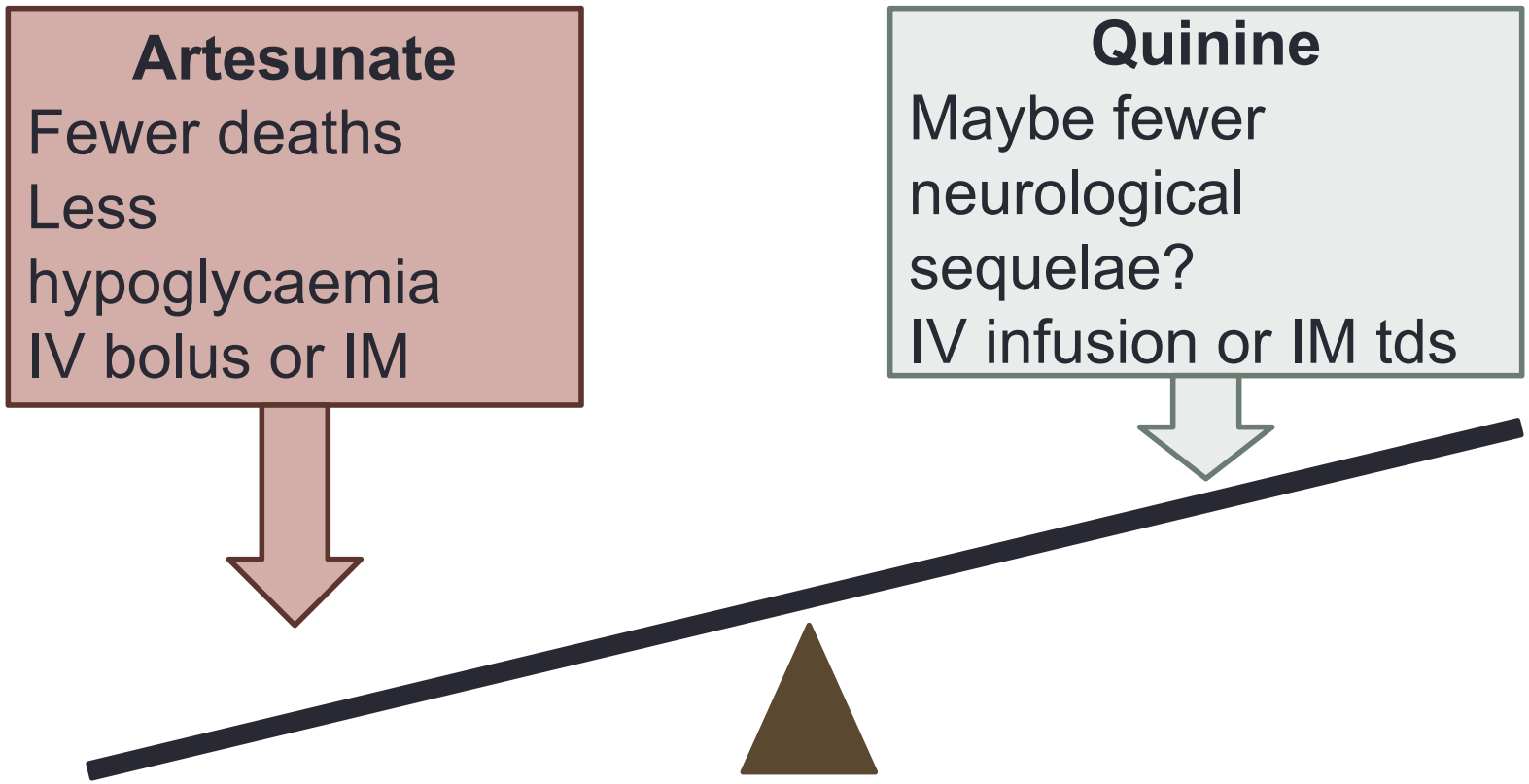
Severe malaria



Respiratory distress & Severe Anaemia,

Risk scores 'multiply' so that child with more than one sign of severe malaria have very high risk of death (3 x 2 = 6!)

Best treatment for severe malaria?



Artesunate benefits outweigh disadvantages

Artesunate now recommended 1st line in Kenya

Treating severe malaria (1)

Artesunate

- Give 3mg/kg on admission and after 12 hours if< 20kg
- Give 3rd dose at 24 hours and then daily doses (max 7 days)
- iv or im routes
- **Change to full course AL as soon as able to drink**

Quinine

- Loading dose 20mg/kg
- 10mg/kg 8 hourly
- iv no faster than 5mg/kg/hr
- im dilute before injection
- **Change to full course AL as soon as able to drink**

Prevent hypoglycaemia by feeding / fluids

Treating severe malaria using Artesunate

- Children weighing <20 kg should receive a higher parenteral dose of artesunate (3 mg/kg/dose) than that of larger children and adults (2.4 mg/kg/dose)
- Give 1st dose on admission; 2nd dose after 12 hours and 3rd dose at 24 hours
- Artesunate once daily doses can then be given for max 7 days but advisable to give for a minimum 24hrs then change to full course AL as soon as able to drink
- IV or IM routes of Artesunate can be used; and per rectal recommended for pre-referral treatment

Prevent hypoglycaemia by feeding / fluids

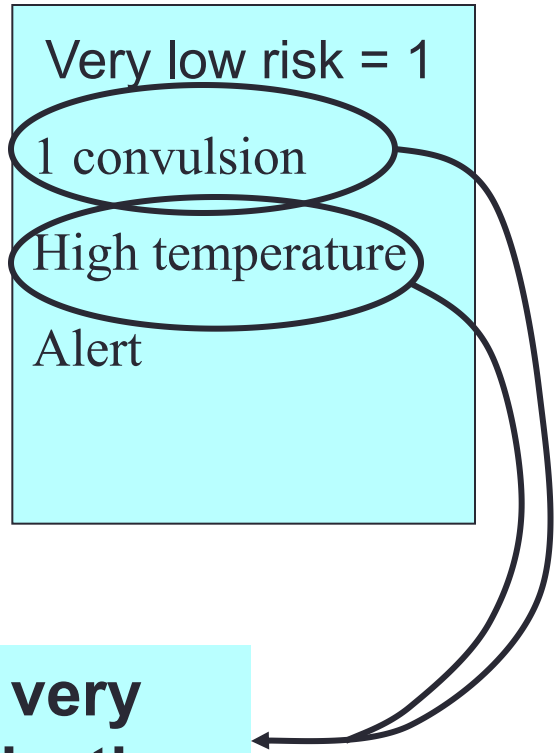
Treating severe malaria

Artesunate

- Dilute powder (60mg drug) first with 1ml 5% bicarbonate (provided with powder)
- **IV:** Add 5mls saline or 5% dextrose (total now 6mls)
- **IM:** Add 2mls saline or 5% dextrose (total now 3mls)
- **Do not mix with water for injection**
- **Do not add to iv fluids**

Non-severe malaria

These children need Oral treatment – It works faster than Quinine and likely as well as Artesunate!



Even if there are two features of very low risk then overall the risk of death does not increase

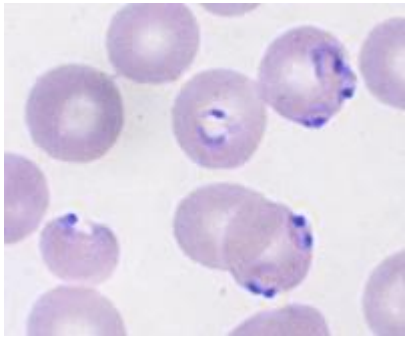
(Risk score 1 x 1 = 1!)

Treating malaria – the child who can drink (in hospital too!)

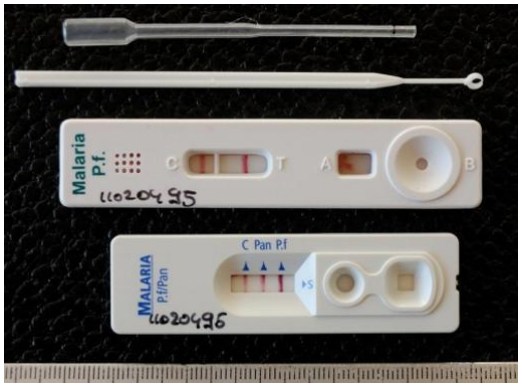
- ✓Treatment that works fast to kill parasites and reduce fever
- ✓Treatment that is safe
- ✓Treatment that is highly effective
- ✓Treatment that saves nurses time

Oral
AL or other ACT

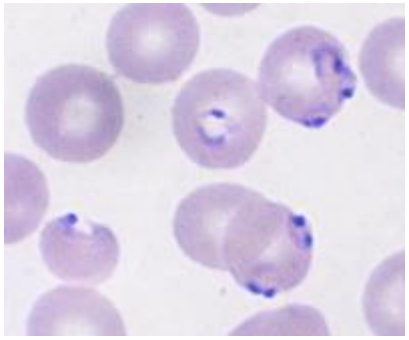
Mother / caretaker can monitor and report problems



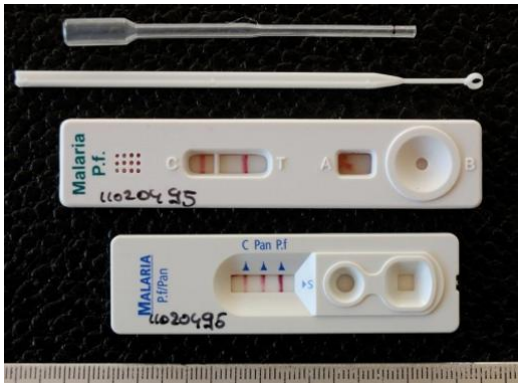
Malaria Testing 1



- Blood film preferred for severe malaria
- Rapid Diagnostic Test (RDT)
  - Know which type in use: HRP2 or pLDH
- **Suspected <u>severe malaria</u>**:
  - Negative test but received AL or artesunate before admission, treat for severe malaria but **look for another diagnosis**
  - Negative test and no prior malaria treatment then **look for another diagnosis**
    - Repeat test in 6-12 hours and at 24 hrs
    - Repeat negative tests = NOT malaria....



Malaria Testing 2



- Non-severe malaria suspected but **negative test:**
  - If concern (eg 1 convulsion) then observe and repeat test
  - **If no danger signs then no antimalarial** (high temperature is not a danger sign)
- Non-severe malaria suspected, **negative test, but already started course of AL:**
  - Complete course of AL

QUESTIONS?

Summary

- In malaria endemic areas severe malaria is defined by a positive test with:
  - AVPU < A or inability to drink
  - Respiratory distress (acidosis)
  - Severe anaemia with respiratory distress
- Cerebral malaria cannot be distinguished from meningitis or encephalitis without an LP
- Artesunate is preferred for severe malaria
- AL (oral ACT) is preferred if child can drink
- Base diagnosis and treatment on test results.