Hydrocephalus Guidelines for District hospitals

1. *Which patients are at risk of hydrocephalus and need follow up?*

- Preterm babies
- Children with low apgar score <7 at 10 minutes
- Children with congenital hydrocephalus OFC > 37 cm
- Children who have had meningitis
- Children with spina bifida
- Children with convulsions of unknown aetiology
- Children born to a mother with toxoplasmosis
- Children with recurrent otitis media → meningitis → hydrocephalus.

These children need regular follow up and control of head circumference (initially monthly or more)

2. When is the right time for referral? Reading of Head Circumference Charts

General Points:

- Measure the Head Circumference regularly. A tape measure is not expensive!
- Measure the Occipito-frontal circumference. Do it twice and write down the biggest reading. Children move around when you are trying to measure!
- Record the head circumference in centimetres and the date you measured it.
- Have the same person measure the head of a particular child. If you measured last time, measure the next time.
- Plot the head circumference on a percentile chart so you can quickly and easily see if it is in normal limits
- If the head is growing more rapidly than normal, see the child again soon – perhaps after 2 weeks.
- Normal growth: First 2 months of life, the head grows about 2 cm per month.
- By 4 months, it grows only about 1 cm per month.

Times to refer:

- Rapidly increasing head circumference (crossing across percentile lines or off the scale).

Situations to watch out for:

- A child with a shunt who has had stable head circumferences that suddenly starts increasing again. Think of shunt malfunction!
- A child with spina bifida who has just had surgery to close the back is at risk of developing hydrocephalus rapidly.

Refer with dates and measurements of head circumferences that you have measured.

To measure the head circumference is a simple and very effective way of following children with hydrocephalus.

3. Prevention of Hydrocephalus

- Congenital Infection – antenatal care and complete vaccinations
- Early detection of meningitis. NB: A positive blood slide does not rule out meningitis. Be prepared to do more lumbar punctures.
- A child with fever and convulsions and/or loss of consciousness should be treated like meningitis if a lumbar puncture cannot be done!
- Treatment of meningitis:
- Crystapen 250,000 IU per kg / day in 4 doses
- (OR Ampicillin 200 mg/kg/day) PLUS
- Chloramphenicol 100 mg/kg/day in 4 doses for 10-14 days IV.
- Alternative treatment for meningitis (if already partially treated at another centre or not clinically improving): Ceftriaxone 100mg/kg/day single dose IV for 10 - 14 days.
- In case of a chronic CNS infection: Think of brain abscess or tuberculous meningitis.

4. Surgical options for treatment of Hydrocephalus

- Ventriculoperitoneal Shunt is the most commonly used method
- Ventriculo-atrial Shunt (rarely used)
- Endoscopic Third Ventriculostomy (only at some centres)

5. How to recognise post-operative complications?

Early complications: fontanel still open

- Bulging fontanelle, increasing headcircumference
- Poor feeding
- Projectile vomiting
- Impaired vision – sunset phenomenon, squint eyes

<u>All are signs of the shunt not draining properly i.e shunt blockage or malfunction.</u>

Shunt infections

- Ventriculitis: Fever, convulsions, signs of meningitis.
- Redness along shunt track.

ACTION: Treat as meningitis with Chloramphenicol, Crystapen and add Gentamicin or Cloxacillin. Refer immediately if nearby large centre. If far from centre, treat with high dose antibiotics for maximum 3-4 days, organize transport, then refer.

Later Complications: fontanel closed

- headache
- blindness
- vision problems
- developmental regression (losing a skill that the child previously had)
- convulsions
- vomiting
- poor feeding leading to malnutrition

Refer all patients with signs of shunt dysfunction without signs of infection immediately.

These Guidelines were prepared by the participants of the 12th CPEP-Seminar at KCMC, September 2000 under coordination of Dr M. Oneko, c/o KCMC, Paediatric Department and Dr M. Nicol, CCBRT, Dar es Salaam.