

## BMC Medical Protocol 2018

### Malaria

The treatment of malaria is now with 2 drugs at all times. Malaria in adults can be treated with Artemether, Artesunate and Amodiaquine, Malarone, Mefloquine, and Quinine in various combinations. The most potent drugs are Artemether related compounds, owing to action on multiple points in the Life Cycle. Quinine should be combined with either fansidar, clindamycin, or doxycycline. Artesunate/Lumefantrine and Artesunate (50 mg)/amodiaquine (150 mg base) are the combinations for Nalerigu

**Please treat only Smear Positive individuals. African Adults, except if pregnant, rarely require IV Quinine.**

#### Inpatient - Severe Malaria

Artesunate <20kg 3mg/kg >20kg 2.4 mg/kg administered IV or IM at the time of admission and then at 12 hours and 24 hours and then daily until taking p.o. x 7 followed full course of ACT x 3d

If parenteral Artesunate is not available, artemether and quinine are acceptable alternatives:

Artemether 3.2 mg/kg IM given on admission and then 1.6 mg/kg at 8hrs and 24hrs and daily until taking PO(up until 4 days). (Adults-160 mg IM followed by 80 mg IM q.d. x4) then ACT x 3d

or

Quinine 10 mg/kilogram (max 600mg) q8 hours. If quinine cannot be administered IV, it can be given in the same dosage by IM injection in the anterior thigh. Each dose for IM injection should be diluted in normal saline to a concentration of 60-100 mg salt/mL and injected into 2 sites.

Duration of Parenteral therapy: A minimum of 24 hours in severe malaria.

**Complete treatment by getting a full course of Artesim-based combination therapy (ACT) when patient is able to take oral therapy but not before 24 hours of parenteral therapy. (The Insurance requires that if you start Quinine, you must finish with Quinine. It will not pay for the ACT as recommended above.)**

Be vigilant to treat hypoglycemia, anemia, septicemia, pneumonia, seizures, and dehydration. Fluid overload, pulmonary edema, and renal failure are uncommon in childhood malaria in hyperendemic areas.

If ACT is not available or if insurance will not pay, oral quinine may be given as follows:

Oral dosing of quinine (50 mg/5 mL) is as follows:

0-3 kg, ½ teaspoon TID

3.1-6 kg, 1 teaspoon TID

6.1-8 kg, 1 ½ teaspoon TID

8.1-11 kg, 2 teaspoon TID

11.1-13.5 kg, 2 ½ teaspoon TID

13.6-16 kg, 3 teaspoon TID

This could be combined with **Clindamycin** 10mg/kg (max 1.8 grams/d) bid or Doxy 3.5 mg/kg (max 100mg) daily x 7 days or either of the latter 2 could be combined with Artesunate 4mg/kg x 3 days or 4mg/kg loading and 2 mg/kg x 6 days.

**Outpatient****Artesunate/Amodiaquine (50/150 tab) (NB Variety of Tablet sizes available)(powder 25/75)**

| Weight (kg) | age (years) | Artesunate 50 mg tab/<br>Day 1      2      3 |   |   | Amodiaquine 150 mg tab |
|-------------|-------------|--|---|---|------------------------|
|             |             |  |   |   |                        |
| 5-10        | <1          | ½  | ½ | ½ |                        |
| 11-24       | 1-6         | 1  | 1 | 1 |                        |
| 25-50       | 7-13        | 2  | 2 | 2 |                        |
| 51-70       | 14-18       | 3  | 3 | 3 |                        |
| >70         | >18         | 4  | 4 | 4 |                        |

Note: The dose in mg/kg body weight is Artesunate 4 mg/kg + Amodiaquine 10 mg/kg daily x 3 days. The dose can be divided and given twice daily to decrease GI upset (i.e. 3 month old weighing 8 kg could get ½ tab daily or ¼ tab BID). On card write for example: Adult A/A 333 or if < 1yo ½ ½ ½ for order.

**Artemether/Lumefantrine (Lonart) (80/480; 40/240 tab; 20/120 ped tab exists)( NB- Variety of Tablet sizes) N.B. Shortest Post Treatment Prophylactic effect-important in areas of high transmission.**

Dosing is BID for 3 days

| Weight (kg) | age (years) | Artemether 40 mg tab | Lumefantrine 240 mg tab |
|-------------|-------------|----------------------|-------------------------|
| 5-14        | ½-3         | ½                    | ½                       |
| 15-24       | 4-8         | 1                    | 1                       |
| 25-34       | 9-12        | 1 ½                  | 1 ½                     |
| >35         | adult       | 2                    | 2                       |

Order eg. Adult dose A/L 40/240 2 Bid x 3 days

**Malarone (atovaquone 240/proguanil 100)**

Adults and children: 6-8 mg/kg/day for 3 days. In adults, this is equivalent to 4 tab daily x 3 days. This may also be used with artesunate 4 mg/kg/day for 3 days.

**Mefloquine**

15 mg/kg (base) as an initial dose followed by 10 mg/kg 8-24 hours later. This should be given along with artesunate 4 mg/kg/day.

**Anemia with Malaria** – Hct 12-15% transfuse 20ml/kg whole blood. If Hgb is 15—21% tranfuse if severe condition.

**Pregnancy**

First line in the 1<sup>st</sup> trimester is quinine 10 mg/kg TID x 7 days or combined with clindamycin 10 mg/kg/day divided BID (ACT may be used in 1<sup>st</sup> Trimester if no option). 2<sup>nd</sup> and 3<sup>rd</sup> Trimester- ACT (A/A or AL) – Increased data suggesting that ACT is safe in all trimesters.

Severe Malaria – Artesunate IV/IM followed by ACT or Quinine IV followed by Oral Quinine + Clindamycin, Alternative in 2<sup>nd</sup> and 3<sup>rd</sup> Trimester is Artemether followed by ACT. Artesunate is dosed 2-4 mg/kg/day x 3 days. If Artesunate not available, Artemether preferred over Quinine (Hypoglycemia)

The WHO advises administration of at least three doses of sulfadoxine-pyrimethamine (SP) for IPTp, ideally at each of three antenatal care visits in the second and third trimesters (per WHO guidance, these antenatal visits should occur at 24 to 26 weeks, 32 weeks, and 36 to 38 weeks of gestation) [14,15].

### Seasonal Malarial Chemoprevention (SMC)

Pyrimethamine/Sulfadoxine + Amodiaquine qmos during Malaria Season for those 3-59 mos.

**Seizures** (Ward Protocols are consistent with below)

*Diazepam* (Dilute 2ml in 8ml saline/glucose)

Newborn-5 yrs: 0.1-0.3 mg/kg IV Q10-15 minutes with a maximum dose of 5 mg daily (may be given rectally if no IV access- dose 0.5mg/kg via cutoff NGT to 3 cm on a syringe)

5-12 yrs: 0.1-0.3 mg/kg IV Q10-15 minutes with a maximum dose of 10 mg daily

>12 yrs: 5-10 mg IV Q10-15 minutes

*Phenobarbital*

Acute treatment

10-20 mg/kg as initial dose, then 5-10 mg/kg IV Q 15-30 minutes with a maximum dose of 40 mg/kg

Post-seizure

<2 months: 3-5 mg/kg PO/IV daily

>2 months: 5-8 mg/kg/day

WARNING:

*The combination of Phenobarbital and Diazepam causes CNS and Respiratory depression. Prophylactic Phenobarbital is not recommended in Cerebral Malaria*

### Typhoid Fever (Non-focal Fever>7 days without Malaria)

Ciprofloxacin 500 mg PO or IV q12h x 14 days in adults

Children 10mg/kg q12h PO x 14 days

Ceftriaxone: Adult: 2-4 g daily x 7 days

Children: 100 mg/kg IV daily x 7 days

Azithromycin: Adult: 500- 1 g PO daily x 7 days

Children: 10-20 mg/kg (up to 1 g) daily x 7 days

**With Ciprofloxacin resistance, this drug will become more important.**

In severe cases with depressed LOC or shock, dexamethasone 3 mg/kg IV loading dose followed by 1 mg/kg Q6H x 8 doses of steroids (controversial and the high dose will deplete our Dexa)

Chloramphenicol 2-3 g divided QID or 75-100 mg/kg divided Q6 x 10-14 days

Amoxicillin 100 mg/kg/day divided TID x 2 weeks (resistance)

Septtra 8-10/kg/day TMP divided QID (resistance)

Be vigilant to treat children for this with persistent fever and no evidence of malaria. Be cognizant of these patients developing acute abdomens from ileal perforation.

**Pneumonia – Score Age 1 for each: extremes(<5,>65), RR (A>30, C>50), P>120, BP <90, Restless and confused, Co-morb.(COPD, CHF, CKD, Multilobes, O2%<92)**

OUTPATIENT Pneumonia (Score<2)

No recent antibiotic therapy (>3 months):

Amoxicillin

Adults: 1000 mg TID x 7 days

Children: 50 mg/kg divided BID x 5 days

5-12 yrs: 500 mg TID x 7 days

1-5 yrs: 250 mg TID x 7 days

6 months – 1 yr: 125 mg TID x 7 days

+

Azithromycin

Adults 500mg daily x 3-6 days

Children 10mg/kg x 3-6 days

Or

Cefuroxime

Adult – 500mg po q 12h x 7 days

Children – 3mos-12 yr 30mg/kg/day, >12yr 250-500 q12h x 7days

*If recent antibiotic therapy (<3 months): use **Amoxicillin/Clav***

Adults: 500/125 mg (625 mg) TID x 7 days

Children: 6-12 yrs: 457 mg (10 mL) TID x 7 days

1-5 yrs: 228.5 mg (5 mL) TID x 7

6m – 1 yr.: 114 mg (2.5 mL) TID x 7 days

<1

If penicillin allergy or atypical organism suspected:

Erythromycin

Adults: 500 mg Q6H x 7 days

Children: 8-18 250-500 q6h x 7 days

2-8 yrs: 250 mg Q6H x 7 days

6 months-2 yrs: 125 mg Q6H x 7 days

INPATIENT Pneumonia –

**Severe** – Difficulty Breathing (< 2 mos >60 BPM, 2-11 mos >50, 1-5yrs >40), flaring, retractions, grunting

Amox-clav

Adults – 1.2 g IV q8h x 7

Children – 3 mos – 18y 30mg/kg q8h, <3mos 30mg/kg q12h

Ceftriaxone

Adults: 2 g IV daily x 7 days

Children: 50-80 mg/kg daily x 7 days

Ampicillin

Adults: 500 mg IV Q6 or other regimen depending on situation (aspiration)

If aspiration is suspected, add Metronidazole 500 mg IV Q8

Children: 100 -200 mg/kg/day IV/IM divided q6-8h (or benzyl penicillin 200K units/kg/day divided q6h) for at least 3 days and then switch to amoxicillin 25- 50 mg/kg/day divided q12h for 5-7 days if improving.

If doesn't improve but no complications – Cefuroxime 25-30 mg/kg q8h IM/IV.

Consider Staph(pneumatocoeles, empyema) – Flucloxacillin 50mg/kg q6h IV/IM+Gent

**Always consider TB****Adding Doxycycline or Azithromycin would cover Atypical Bact.**

**Very severe:** Cyanosis, lethargy, convulsions, vomiting, not feeding

Adults- Ceftriaxone 2 g qd + gentamycin 2-2.5 mg/kg IV Q8 x 1 week +Doxycycline or Azithromycin.

Children –Ampicillin 200 mg/kg/d div q6-8h (or Ceftriaxone 80mg/kg qd) + Gentamycin 7.5 mg/kg/day x 5 days – if child responds then Amox 15mg/kg po tid +IM Gentamycin x 5 days. If no response, change to Flucloxacillin 50 mg/kg IM/IV q6h or one may switch Ceftiaxone or Chloramphenicol 75 mg/kg/day divided q8h IM/IV or Cefuroxime 25-50 mg/kg q8h IM/IVx 5 days

Consider bronchodilators, steroids (1mg/kg of prednisolone oral)

Oral therapies:

Amoxicillin/Clavulanic acid: double outpatient doses

NOTE: while effective, the WHO recommends AGAINST use of fluoroquinolones (i.e. ciprofloxacin, levofloxacin) for pneumonia due to role in treating MDR tuberculosis.

**Asthma**

**Acute-** emergency

O2 – Nasal 2-6 liters

Nebulization - Salbutamol 2.5 -5mg (may repeat initially after 15 min x 1) then q2h until stabilized (children 2.5 mg or 0.5ml of 5/ml vial).

Hydrocortisone 200mg IV stat, then 100 mg IV q6h. (Children 6-12y 100mg q8h, 1-5y 50 q8h, <1y 5mg q8h)

For severe cases unresponsive to above, aminophylline 250 mg IV(over 20 min) Q6 may be given x 24h. In children the aminophylline loading dose is 3-5 mg/kg (given over 20 min)(max 300mg) and then q6h (Care for Toxicity).

Adrenalin (1:1000) 0.01 ml/kg up to 0.3 ml Q15 minx 2 if salbutamol not available. MgSO4 50% bolus 0.1 ml/kg (50 mg/kg) over 20 min. (MgSO4 not in Ghana Protocol)

Salbutamol oral (1-5 y) child 2mg tid) is available.

**Acute** –maintenance

Nebulization – Salbutamol 2.5-5 q6h

Prednisolone Adult 30-40 mg daily (children 1-2 mg/kg/day) PO x 5 days is available.

Dexamethasone (child 0.3mg/kg/dy divided BID) IV but has never been shown more effective than oral steroids.

Aminophylline 200 mg PO QID is available.

### **Meningococcal meningitis and others – Rapid Timing of First Dose is Key to Success**

Ceftriaxone: adult 2-4g IV daily, children 50-80mg/kg/day IV/IM x 10-14d, Neonates 20-50mg/kg once daily for 21d.(Covers Meningo, Pneu, H. Flu) **Be aware that Antibiotics run out so be careful with dosing**

Alternative - Penicillin: Adult 4gMU q4h + Chloramphenicol 1g IV q6h x 14d, Children 200MU/Kg q6h + 25mg/kg q6h x 14d

Dexamethasone 4-10 q6h x 5-7 days for Adults and Children decreases Hearing Loss.(alternative 1-1.5mg/kg/d divided q4-6h (max 16/d) (Benefit not Clear)

Single dose regimens of ceftriaxone and chloramphenicol in oil are effective in epidemic situations

Chemo Prophylaxis – Rifampin 600 bid x 2 days (>1mos 10mg/kg q12h,<1mos 5mg/kg q12h), Cipro 500 mg x 1 dose, Ceftriaxone 250mg IMx 1(<15yo 125mg IMx 1), Azithro 500mg x 1 (10mg/kg x1)

Practice (Vetted by 2 ID spec) Cipro 500mg on exit + vaccine)

**H. Flu Meningitis** – Chloramphenicol X 10 days, Ceftriaxone x 10 days, or Ampicillin 200 mg/kg/day x 10 days

**Pneumococcal** – Penicillin 400,000 units/kg/day q6h x 10 days

**TB** – fever>14d, fever>7d with family member with TB, Typical CXR, Coma despite Rx, CSF Lymphocytes  
Give RIPE x 2 mos and a Continuation Phase of INH and Rifampin x 10 mos.

### **Serious Neonatal(<1mos) Bacterial Infection**

This includes meningitis, pneumonia, and septicemia. (T>37.5 or <36.5, HR<100 or >160, RR>60 or <20)

Ampicillin 50 mg/kg IV/IM q12h in the first week of life and then q8h between weeks 2 and 4 of life  
+ Gentamicin 4 mg/kg/day given once daily

Or Ampicillin (as above) + Cefotaxime 20-25mg/kg q8h x7 days

Or alternatively Ceftriaxone 100mg/kg/day divided q12h alone (Does not cover Listeria)

Cord Sepsis

Flucloxacillin 15mg/kg IV q6h(<7d and q8h(>7d) + Gentamycin

Tx Guide: Term – give IV 3-4 days and if improving change to PO Pre-term(28wk) give for 7 days after last fever.

*Remember to treat hypoglycemia, hypoxemia and to keep neonate warm –*

Hypoglycemia – Dextrose 10% 4ml/kg bolus and *immediately* followed by maintenance fluids:

Day 1—D10% at rates below

Day 2 and subsequent, D5% ½ Darrow's (NS 0.18% in D10% in Ghana protocols, but BMC Darrow's does contain some glucose). Of note, at BMC nurses must mix D5 together with ½ Darrow's at equal quantities, as the mixture does not exist.

**IMPORTANT: FEED PO/NGT (EBM OR FORMULA) WHENEVER POSSIBLE, AT RATES BELOW, AS IVF RATES CANNOT BE REGULATED PRECISELY**

|       | <37 wk       | Term |
|-------|--------------|------|
| Day 1 | 60 ml/kg/day | 50   |
| Day 2 | 90           | 70   |
| Day 3 | 110          | 90   |
| Day 4 | 130          | 120  |
| Day 5 | 150          | 120  |

Seizures – Diazepam – See Page 3, Phenobarbital 10mg/kg stat and then 3-5 mg/kg PO/IV daily

Apnea of newborn or persistent respiratory distress (last resort):

Aminophylline 6 mg/kg loading and 1-2 mg/kg/dose q8h for respiratory distress, try to decrease to q12h after 3 days and daily after 6 days to avoid toxicity and observe effect.

### Neonatal Feeding

<32 wk GA will not be able to take 100% of PO goal intake of 120ml/kg/d – divide by 8 and give volume q3h (PO initially and rest by NGT as necessary)

Start low at 5 ml per feed and if no vomiting increase by 25ml/kg/d until at goal.

Premies need 22cal/oz milk. This can be provided in the following ways:

1 – EBM - Add ½ tsp of Formula (FM) Powder to 90 ml ( 3oz) of EBM. (For 24 cal/oz add 1tsp to 90ml EBM)

2 – FM – 1 ½ scoops FM to 90ml water (20cal/oz FM) + ½ tsp of FM Powder =22 cal/oz

Premies don't get Zinc, Phos, or Iron (transferred in 3<sup>rd</sup> trimester) so if possible formula is ideal for these nutrients, alternatively: human milk fortified

Breast milk 20 kcal/oz.

Goal weight gain 15-20 gm/kg/d

Pacifiers are great for practicing feeding

NB – Regular FM = 1 scoop to 60ml (2oz) =20 cal/oz

### Tetanus

Management: prevent toxin release, neutralize unbound toxin, and minimize the effect of already bound toxin, control muscle spasm and autonomic dysregulation

Prompt debridement, quiet room, IV, NGT, Hydration, Feeds (Newborn (NB) breast milk q1h

Adult -Metronidazole 500 mg IV q8h x 7-10 days, Children>1 mos. – Met. 7.5 mg/kg q8h

Penicillin 50,000 unit/kg stat and then 4 MU q6h x5 days is an option but high doses may exacerbate the effects of tetanus (Children 50,000 units/kg q6h x 5 days)

Others – Doxycycline, Clindamycin, Chloramphenicol

If mixed infection, add Ceftriaxone

Neonates – PCN 250,000 units q6h x 7 days + Gentamy4mg/kg IV q24 h x 7 days

Human Tetanus Immune Globulin – Adults and Children 150 units/kg (3000-6000 units), Neonates 500 units IM divided 2 separate sites – see prod info for specifics

Complete tetanus immunization as tetanus toxin is poorly immunogenic

Spasms –

Adults – Chlorpromazine 50 mg IM q 4-8 h + Diazepam 10 mg IV or IM q3-6h prn or Phenobarb 200 mg IM q8-12h prn.

Magnesium Sulfate 40 mg/kg over 30 min. followed by 1.5g(<45yo) – 2g(>45yo) per hour to control muscle spasms and autonomic dysfunction. (See Pre-Eclampsia for dosing help)

Labetalol infusion, Morphine Sulfate

Children – Diazepam IV/IM/PR 3-6 mg q3-6h prn + Phenobarbital 5mg/kg IM, NGT stat and then 2.5 mg/kg q 12 h, or Chlorpromazine 12.5-25mg IM, NGT q8h prn

Neonates – Chlorpromazine 7.5 mg IM or NGT q8h + Phenobarbital 30 mg stat and 7.5 mg IM or NGT q 12h, or Diazepam 2 mg IV, IM, NGT q3-6h prn

### Diarrhea in children

D/D Acute watery d, cholera, dysentery, persistent d>14 days, d with malnutrition, d associated with recent antibiotic use, Intussusception

The child should be assessed for the degree of dehydration and rehydrated appropriately with either IV solution, intraosseous, or ORS. Antibiotics should not be used routinely. They are only helpful for bloody diarrhea (shigellosis), suspected cholera, and other serious non-intestinal infections such as pneumonia. Anti-diarrheal drugs are useless and dangerous.

Acute Severe dehydration

Infants < 12 months – NS or RL, 6 hours total = 100mL/kg (**30 ml/kg in the first one hour** and then 70ml/kg over the next 5 hours)

12 months to 5 years – NS or RL, 3 hours total = 100ml/kg (**30 ml/kg in the first 30 minutes** and then 70ml/kg over the next 2-1/2 hours)

If unable to place an IV, place an NG tube with ORS solution given at 20mL/kg/hour for 6 hours

If the child is still dehydrated after the above, repeat the IV infusion. If the child is improving the IV can be stopped and ORS given for 4 hours (see below)

Mild to moderate dehydration

Give ORS during the first 4 hours according to the following regimen

< 6kg 200-400 ml

6-9kg 400-700 ml

10-11kg 700-900ml

12-19 kg 900-1400ml or (kg x 75)

This can be given via NGT or the mother can give a teaspoon every 1-2 minutes or frequent sips from a cup.

No dehydration

Breastfeed frequently

ORS – Give mother 2 packets (0-2 years 50 -100mL, >2 years 100- 200 ml, after each loose stool as sips from a cup)

If the child is not exclusively breast-fed, give ORS and food based fluid (soup, rice water, yogurt drinks) or plain water

Continue feeding

Micronutrients – folate, zinc(<6mos 10mg/dyx14, >6mos20mg/dyx10-14 days), vitamin A, iron copper, magnesium

Persistent diarrhea (14 days or longer)

Consider *recurrent viral infections*, non-intestinal infections (pneumonia, sepsis, UTI, oral thrush and otitis media)

**Pediatric Maintenance Fluids** - 1<sup>st</sup> 10kg 100ml/kg, 2<sup>nd</sup> !0kg 50ml/kg, Each added kg 25mg/kg add 10% every degree of fever.

If the child has **bloody diarrhea** treat for **Shigella** (ciprofloxacin 10-15 mg/kg BID for 5 days, azithromycin 15mg/kg on day 1, 10mg/kg/dy on day 2-5, or ceftriaxone 50mg/kg to 1.5grams for 2-5 days) Septra and ampicillin are no longer effective. Consider Intussusception and amebiasis if no response.

*Amebiasis* is treated with metronidazole 7.5mg/kg/dose TID for 7-10 days. (Tinidazole 2g qd x 3days)

*Giardia* is treated with metronidazole 5mg/kg TID for 5 days.

Also consider *intussusception*. **We see it frequently in Ghana.**

*Feeding* is critical. If a glucose test strip is positive in the stool, give a diet low in lactose such as whole eggs, rice, vegetable oil, glucose and finely ground chicken. Encourage breast-feeding. Encourage micronutrients as above.

### **Traveller's Diarrhea**

Caused by enterotoxigenic and enteroaggressive *Escherichia coli*. Only 5% caused by *Salmonella*, *Shigella*, *Campylobacter*, *Giardia* (vomiting and belching), virus or Amebiasis. It is only necessary to treat when the patient has more than 3 bowel movements in addition to symptoms (fever, bloody diarrhea)

Treatment options are Ciprofloxacin 500mg b.i.d for 1-3 days if sensitive, **Zithromax 1 G x 1-3 days**, or Rifimacin 200mg t.i.d. x 3 days. Imodium may be used for symptomatic relief if there is no blood or fever.

*Shigella* is covered by Ciprofloxacin 500 bid x 3 days and Azithromycin 500mg day 1 and 250 mg day 2- 5.

### **Cholera**

WHO definition – acute watery diarrhea in a patient 5 years or older with or without vomiting in an area where cholera is likely to occur. Laboratory diagnosis in our situation is impossible. Treatment is primarily fluid management. Antimicrobials are secondary. Doxy 300mg x 1, Tetracycline 500 q6hx3days, Azithromycin 1 g(20mg/Kg in peds) single dose.

### **Gastritis/Ulcer/GERD/Dyspepsia**

Ranitidine, Omeprazole, Metoclopramide, and Magnesium Trisilicate available

*H. Pylori* – Amox 1gram bid (or 500mg TID), Flagyl 500 BID, Omep 20 BID x 10-14 days

### **Hepatitis**

The most common etiology is Hepatitis A, transmitted fecal-orally. Those in the Developing World acquire it in the first few years of life. Hepatitis B & C are primarily transmitted through parenteral, sexual and perinatal exposure. In high prevalence areas HBV is primarily transmitted by vertical exposure from mother to child. It is often asymptomatic with higher rates of chronicity (90%) than infections acquired later in life. In Africa, transmission occurs perinatally and horizontally through ulcerated skin lesions. With hepatitis C, transmission is believed to occur by various percutaneous exposures by injections from conventional and traditional village health workers, dental procedures, cuts from barbers, male and female circumcision... This disease presents itself routinely in the chronic phase. Presentations are often with massive ascites, edema, or GI bleed (upper or lower). The mainstay of care is primarily symptomatic, as pharmacologic care is not possible. Patients with ascites are often in respiratory distress. Up to 5 liters can be removed at any given time. Diuresis with spironolactone and furosemide is acceptable. A 5:2 ratio of spiro:furo dosing provides the optimum synergistic effect. If portal hypertension is evident, propranolol 10 mg TID may be given to reduce risk of GI bleed. Salt restriction is essential. Always look out for SBP (>250WBC/ml, abdominal pain and fever) which may be treated with Cipro 200 mg IV q12h x 2 days followed by 500 mg po bid x 5 days or Ceftriaxone 2 grams daily x 5 days. *E. Coli* and *Klebsiella* are most common agents.

Hepatocellular Cancer is common at BMC.

### **Tuberculosis**

Common presentations are pulmonary, spinal (Pott's disease), TB peritonitis, TB Pericarditis (pericardial effusion= TB) and scrofula. If TB is suspected, a chest x-ray and 2 sputums may be collected (spine films if Pott's is suspected). Sputum may be negative in patients with TB (up to 50%); clinical suspicion should be taken into account, especially in wasting children. RIPE treatment (rifampin, isoniazid, pyrazinamide, ethambutol) is initiated and driven by public health. The special needs department of the hospital handles TB patients. If the patient is sick enough to be admitted, they should be admitted to TB isolation where they get RIPE treatment for 2 weeks before being discharged to the TB village. If they do not need admission, they may be sent to the TB village to start DOT therapy.

**Upper respiratory tract infections****Acute Bronchitis (complicated)**

Amox-Clav Adults: 1 g q12h x 5-7 days

Amox Clav Children (>12 y 500mg q12h, 6-12y 5ml(400/57 suspension) q12h x7, 1-6y 2.5ml q12hx7, 1mos-1y 2.5ml(125/31 suspension) q12h

PCN allergy – Azithromycin 500mg daily x 3, Children 10mg/kg daily x 3

**Pharyngitis/Tonsillitis (streptococcal)**

Amoxicillin

Adults: 500 mg Q6H x 10 days

Children: 6-12 yrs: 250 mg Q6H x 10 days (**Often no fridge in village**)

1-5 yrs: 125 mg Q6H x 10 days

<1 yr: 62.5 mg Q6H x 10 days

Oral Penicillin is 250 tid for 10 days or for a child <12yo 25mg/kg/day x 10 days

Erythromycin (if penicillin allergy)

Adults: 500 mg Q6H x 10 days

Children: 2-8 yrs: 250 mg Q6H x 10 days

0-2 yrs: 125 mg Q6H x 10 days

**Acute Epiglottitis (H. influenza)**

Chloramphenicol: 25 mg/kg Q6H IV x 7 days (change to PO when appropriate at following doses (max dose 4grams/day in divided doses)

<1 yr: 6.25 mg/kg Q6H

>1 yr: 12.5-25 mg/kg Q6H

Ceftriaxone: 50 mg/kg IV daily, change to PO cefuroxime at 125 mg Q12H x 10 days

Amox/Clav 1.2g q 6-8 (7days -12y 30mg/kg q 6-8h)

**Acute Otitis Media/Sinusitis**

Amoxicillin - Adults: 500-1000 mg Q6-8H x 10 days

Children: 6-12 yrs (<40 kg): 250 mg TID x 10 days

1-5 yrs (<20 kg): 125 mg TID x 10 days

<1 yr: 62.5 mg TID x 10 days

*Note: despite above dosing in children <40kg, amoxicillin 80-90 mg/kg/day is preferred over standard dosing due to concentration-dependent resistance of S. pneumonia*

Amoxicillin/Clavulanic acid

Adults: 500/125 mg BID -TID x 10 days

Children: 6-12 yrs: 400/57 mg (10 mL) BID x 10 days

1-5 yrs: 200/28.5 mg (5 mL) BID x 10 days

<1 yr: 100/14 mg (2.5 mL) BID x 10 days

**Penicillin Allergy**

Co-trimoxazole (septra)

Adults: 800/160 mg (2 SS tab) BID x 7 days

Children: 6-12 yrs: 400/80 mg (1 SS tab) BID x 7 days

6 months-5 yrs: 200/40 mg (5mL) BID x 7 days

6 wks-5 months: 100/20 mg (2.5 mL) BID x 7 days

Erythromycin - Adults: 250 mg Q6H x 10 days  
 Children: 2-8 yrs: 250 mg Q6H x 10 days  
 0-2 yrs: 125 mg Q6H x 10 days

If severe pain or pus still present after 5 days of therapy:

Cefuroxime

Adults: 500 mg BID x 10 days  
 Children: 250 mg BID x 10 days

Azithromycin

Adults: 500 mg daily x 3 days  
 Children: 10 mg/kg daily x 3 days

### Urinary Tract Infection

Uncomplicated: Co-trimoxazole(Bactrim)

Adults: 400/80 mg 2 BID x 3 days  
 Children: 6-12 yrs: 360-720 mg (7.5-15 mL) BID x 3-5 days  
 1-5 yrs: 180-360 mg (3.75-7.5 mL) BID x 3-5 days

Uncomplicated: Ciprofloxacin

Adults: 250 mg BID x 3-5 days  
 Children: not indicated

Uncomplicated: Cefuroxime

Adults: > 12yo: 500mg BID x 7 days  
 2 - 12yo: 15mg/kg(max 250mg) BID x 7 days.  
 3mos – 2yo: 10mg/kg(max 125) BID x 7days

Complicated: Ampicillin 1-2 g IV QID PLUS Gentamicin 2.5 mg/kg IV BID x 7-10 days OR  
 Ciprofloxacin 500 mg BID x 7-10 days

Pyelonephritis: Ceftriaxone 1-2 g IV daily x 14 days

Ciprofloxacin 500 mg IV BID x 14 days  
 Ampicillin 1-2 g IV QID PLUS Gentamicin 2.5 mg/kg IV BID x 14 days

Change to PO drug when appropriate

In pregnancy, co-trimoxazole (septra, bactrim) can be used until the 3<sup>rd</sup> trimester. Cipro should be avoided.

### Intestinal Parasites

|                         |   |
|-------------------------|---|
| Hookworm                | Albendazole 400 mgx1 or <b>200 mg &lt;1yo</b><br>Mebendazole 500 mg x 1 |
| Cutaneous Larva Migrans | Albendazole 400 mg dailyx7 days   |
| Ascaris                 | Albendazole 400 mg x 1  |
| Tricuris                | Albendazole 400 mg x 1<br>Mebendazole 500 mg x 1                        |
| Pinworms(Threadworms)   | Albendazole 400 mg x 1  |
| Esophagostomum          | Albendazole 400 mg daily x 5 days                                       |
| Strongyloides           | Albendazole 400 mg q12h x 3 days  |
| H. nana                 | Praziquantel 25 mg/kg x 1 dose, repeat in 10 days                       |
| Giardiasis              | Metronidazole 500 mg PO TID x 5 days (children 5 mg/kg TID x 5 days)    |

|                                      |   |
|--------------------------------------|---|
| Entamoeba histolytica                | Metronidazole 750 mg TID x 10 days (children 7.5-10 mg/kg TID x 5 days)                 |
| T. Saginata                          | Praziquantel 5-10 mg/kg x 1   |
| T. Solium                            | Praziquantel 5-10 mg/kg x 1   |
| Cysticercosis                        | treatment with albendazole is controversial due to cerebral reaction to dying parasites |
| Onchocerciasis                       | Ivermectin 150 mcg/kg x 1   |
| Bancroftian filariasis               | Ivermectin 150 mcg/kg x 1   |
| Shistosomiasis(Mansoni, Haematobium) | Praziquantel 40 mg/kg x1  |

### Rabies

Uniformly fatal here. Differential diagnosis includes tetanus, drug intoxications, hysteria, Guillain-Barre syndrome, viral encephalitis

Suspected rabies. Kill animal and send brain for evaluation to Pong Tamale OR observe animal for 10 days

Post-bite treatment. Immediate cleansing with a virucidal agent and debridement under anesthesia if necessary. Avoid suturing wound.

Active immunization for Rabies. (Intradermal regimen below is **no** longer CDC approved) Tissue culture vaccine-0.1 mL intradermal at 2 sites (both deltoids) on days 0, 3, 7, and on day 28 give 0.2 mL at one site (deltoid). A vial of vaccine can remain open in the refrigerator for 8 days, so try to immunize others at the same time. No RIG available. If vaccine plentiful follow label info and **not** Intradermal protocol above. Standard Vaccine at Standard Doses may be available locally or in Tamale.

Stop vaccination if the animal survives 10 days.

Post-exposure prophylaxis in previously vaccinated individuals. 0.1 mL intradermal on days 0 and 3, RIG not necessary.

Passive immunization. Rabies Immune Globulin (RIG) 40 IU/kg of equine RIG or 20 IU/kg of human RIG. Inject into wound site and at a remote site (not on buttocks). Not available in Nalerigu.

### Osteomyelitis

This disease is almost always seen in the advanced stages when the affected bone is already dead (the sequestrum) and the new bone (the involucrum) is being formed around it. Antibiotics do nothing for this. Surgery is needed when the involucrum is adequate to replace the affected bone (i.e. adequate for weight bearing on the lower limb). Order an x-ray of the affected limb with 2 views to assess the adequacy of the involucrum. If this is adequate, a sequestrectomy is scheduled. If the involucrum is not adequate, the patient should return in 3 months for follow-up x-ray.

### Anthrax

The hospital is in an area endemic for Anthrax, especially the village of Nagbo and the surrounding villages. The presentation is usually a cutaneous (ulcer with eschar and malignant edema) and occasionally systemically presenting with superior vena cava syndrome and severe respiratory distress which is uniformly fatal. One case of anthrax meningitis has been documented.

Unlike cases that are related to bioterrorism, the treatment for cutaneous anthrax is Pen VK 500 mg q.i.d x 7 days. Most cases will actually resolve spontaneously over 2-6 weeks.

Alternatively, ciprofloxacin 500mg PO bid for 7-10 days can be used. *Severe systemic infections* may be treated with Penicillin 4-6,000,000 units q.6.h + Cipro 400 IV q8h + Clindamycin 900 IV q8h x 14d.

Systemic steroids can also be used, along with drainage of pleural fluid and ascites (Decreases Toxin).

### Snake Bite

The most common poisonous snake is the carpet viper (*Echis carinatus*). Its venom acts as an anticoagulant. The other common poisonous snake is the spitting cobra. Cobras are generally provoked into attack, whereas carpet vipers are more aggressive by nature. The effect of the bite is assessed by the whole blood clotting time (WBCT). Assume that bites are never dry bites. If the 20WBCT is reported as "no clot", order ASV (anti-snake venom) x 2 amp. Stat and 1 amp(10ml) for each additional non-clotting WBCT. Clotting times are ordered twice daily (4 AM and 4 PM generally, and on admission). Adequate coagulation is assumed when there are 3 consecutive 20WBCT of < 5 minutes, and the patient may be discharged home. Give ATS 1500 for Tetanus Px.

The bite of the spitting cobra (*Naja Nigricollis*) causes primarily significant skin necrosis that extends to the fascia. The cobra also spits poison into the eye, creating a snake venom ophthalmia, characterized by corneal abrasions. Treatment is with ASV and, in case of ophthalmia, sterile eye irrigation and /or antibiotic eye drops x 1 week to prevent secondary infection.

### Scorpion Bite

The scorpion bites in this area produce primarily a local effect of severe pain. Rarely is there systemic envenomation. Treatment is with local injection of lidocaine or marcaine. Potent narcotic analgesics are often necessary. There is pethidine (meperidine), if available, 50-100 mg IM Q4-6 hour PRN or in children 1-1.75 mg/kg PO/SC/IM Q3-4 hour PRN. If given IV, dilute prior to use and administer slowly.

### Pregnancy

*Hyperemesis Gravidarum*; Mild – Metoclopramide 10mg po tid prn or Promethazine 25-50 mg tid prn

Severe – NS alt with D5W, Metoclopramide 5-10 mg q8h prn and

Promethazine 25-50 q8h prn

### Pregnancy-Induced Hypertension

#### Preeclampsia –Diagnostic Criteria

Blood Pressure >140/90 on two occasions 4 hours apart after 20 wks gestation  
>160/110 confirmed within a short interval AND

Proteinuria >300 mg/24 hr urine collection  
Or  
Protein/Creatinine ratio >0.3  
Dipstick reading 1+

OR, in the absence of proteinuria, new onset hypertension with the new onset of any of the following (**severe features**) – *Thrombocytopenia (<100,000)*, *renal insufficiency (Cr 1.1 or a doubling of baseline)*, *impaired liver function (twice normal concentration)*, *pulmonary edema*, *cerebral or visual symptoms*, *epigastric pain*, *RUQ pain*, **HA HELLP** HA, Elevated LFTs, Low platelets.

The patient should have intrapartum seizure prophylaxis with magnesium sulfate as follows:

MgSO<sub>4</sub> IM 5 g (one 10 mL vial) in each buttock (10gr total), followed by 5 g IM Q4 hours (keep in mind that if the patient needs caesarian section she cannot receive the epidural(not available) until 2 hours have passed since the last Mg dose). The MgSO<sub>4</sub> should continue 24 hrs. after delivery

The patient should have treatment for her blood pressure if it is >160/110 using Hydralazine 5-10 mg IV/IM Q20-30 minutes until the BP is 140/90 or better, or Nifedipine(immediate release) 10mg Q20-30 minutes to a maximum dose of 30 mg. Caution should be used with short-acting Nifedipine when combined with MgSO<sub>4</sub> as it may cause a precipitous drop in blood pressure. Aldomet is also available and may be used in doses up to 500 mg QID.

**Severe Preeclampsia (>160/110) +proteinuria, with or without severe symptoms or BP>140/90 +severe features (see above)**

Hospitalize for the remainder of the pregnancy. After 32-34 weeks stabilize and deliver the fetus. Prior to 32 weeks individualize decisions based on risks (i.e. G1, BP severity, symptoms, hyperreflexia). Look for **Hellp (hemolysis, elevated LFT's and low platelets)**. Place urinary catheter and check U/A.

*Continue below*

If labor is imminent, antenatal **corticosteroid** therapy is appropriate, given optimally 24 hours before delivery with protection lasting 7 days. In Ghana, **the dexamethasone protocol is 6 mg IM Q12 hours x 48 hours.**

Intrapartum: Start MgSO<sub>4</sub> but the loading dose should be IV 4 g (8 mL of a 50% solution mixed with 12 mL of NS for a 20 mL load in total=20%sln given over 4 min.) + 10 g IM, followed by 5 g IM Q4. Start management of hypertension as above. **Observe for Mg Toxicity**

**Eclampsia**

First, control the seizures, correct hypoxia, control BP (diastolic <90-100) and then deliver vaginally if possible.

Seizure control: higher IV loading doses of MgSO<sub>4</sub> 4-6 g (8-12 mL of a 50% sln. mixed with 12-18ml of NS for a 20-30 ml load). Valium 5-10 mg IV (may cause respiratory depression)

BP control as above.

Hypoxia – oxygen

**Abruption of Placenta**

Detachment of normally located placenta before delivery.

Signs and Sx: Vaginal Bleeding (may be occult), uterine tachysystole, uterine tenderness and/or increased tone between contractions, non-reassuring fetal heart, abdominal pain, back pain

Assess clotting - failure to clot after 7 min = coagulopathy

Transfuse fresh whole blood as necessary

Management:

Term – Deliver

Pre-Term:

- a. Give steroids (see above for severe pre-eclampsia)
- b. Close monitoring
  1. 7 days after bleeding stops
  2. Until delivery after 2<sup>nd</sup> bleed
  3. Growth Scans q 3-4 weeks
- c. Deliver if:
  1. Non-reassuring fetal status
  2. Concern for worsening maternal or fetal status (ideally steroids complete)
  3. Reaches 37 weeks
- d. Mode of Delivery
  1. Vaginal if possible with continuous monitoring
  2. C/S if fetus not tolerating labor or significant maternal hemorrhage
- e. Be prepared for massive hemorrhage

If Bleeding is heavy (evident or hidden) deliver ASAP

If cervix is dilated, deliver by vacuum

If vaginal delivery is not imminent, do C-Section. Be prepared for PP Hemorrhage

If Bleeding is light to moderate, the course of action depends on the fetal heart rate (FHR)

If FHR is normal or absent, rupture the membranes. If the contractions are poor, augment with Oxytocin. If cervix is unfavorable (firm, thick closed), perform a C-Section.

If FHR is abnormal (<100 or >180), perform a rapid vaginal delivery. If vaginal delivery is not possible, deliver by C-Section.

### **Tocolytic Therapy**

MgSO<sub>4</sub>: 6 g (12 mL) IV over 4 min. followed by 5 g IM Q4.

Nifedipine: load with 30 mg and if the contractions persist after 90 minutes give additional 20 mg. if labor is suppressed, give maintenance dose of 20 mg Q6 for 24 hours then Q8 for another 24 hours.

Antibiotics may prevent subclinical chorioamnionitis (ampicillin)

Antenatal steroids as above.

All tocolytic Therapy is controversial as the treatment is minimally effective and short lived <48hrs.

Justified if want to administer all doses Antenatal Steroids

### **Labor Induction with Cytotec**

Missed abortion (0-12 weeks): 800mcg PV or sublingual q3h x 2 doses and leave 1-2 wks

Incomplete abortion (0-12 week): 600mcg PO (single dose) , leave to work for 2 weeks unless bleeding or infection

Missed abortion\* (13-22 weeks): 400mcg PV q3h x 5. Use 200mcg if CS scar

IUFD (13-17 wks): 200 mcg pv q6h, 18-26 wks 100 mcg pv q6h, 27+ wks 25-50 q4h

Induction of labor (>24 weeks): 25mcg PV q4 h or 50 mcg PV q6h. Continue regimen until contracting 2-3x in 10 minutes. **Do not use if previous caesarian section.** Alternatively 25mcg PV and then after 4 hours start a 25 mcg solution PO q2h (200mcg tablet dissolved in 200ml of water = 25mcg/25mL). In Primips increase dose to 50mcg (50mL q2h). In cases of *IUFD*, if there is no response after 2 doses, the dose may be doubled

Postpartum hemorrhage: 1000 mcg per rectum. May shiver. A dose of 600mcg may be given to prevent bleeding

Molar pregnancy: may use to evacuate uterus, using doses appropriate for the size as above and somewhat greater doses. This removes a significant portion of the mole and makes a vacuum D&C much easier.

Cervical Ripening: Pre-procedure (D&C, IUD) 400 mcg PV 3h before procedure

Before delivery 25-50 mcg q4h x 4 doses followed by Pitocin (See separate dosing sheet, specific for Nalerigu) – Misoprostol regimen is followed until contracting 2-3x in 10 minutes

Cytotec is not in high supply. If a patient presents with retained products and less than 20 weeks, a D&C/MVA may be a better option especially if she is well-dilated. MVA/D&C are usually the standard of care here as opposed to cytotec or watchful waiting as many patients may not receive appropriate follow up.

**Labor Augmentation with Oxytocin**

Oxytocin may be indicated for augmenting labor in multiparous women whose uterus is hypotonic after several vaginal deliveries. Use caution to assess for cephalo-pelvic discordance and avoid in such instances. The drip protocol is as follows:

Oxytocin 5u injected into 1000 mL LR/NS (or 2.5 u/500ml LR/NS)

Start drip at 8 drops (2mu/min)/minute, increase by 8 drops/minute every 30 minutes to a maximum rate of 48 drops (12 mu/min) /minute, titrating according to the contraction pattern. (Calibrated for BMC Drip Chambers)

If fetal distress occurs, the drip should be stopped, patient put on her right side and fluids given.

**Molar Pregnancy**

Suction D&C (often broken) or Evacuation with MVA with large cannulas, alternating 2 devices

See above for Cytotec induction

Prophylactic chemotherapy is not necessary as 90% resolve spontaneously

Follow up with a pelvic exam q2 weeks x 3 months, then monthly x 3 months and the q6 months for a total of 2 years

Chest X-ray monthly or less often if the pregnancy test is negative

Pregnancy test at 8 weeks should be negative

No pregnancy for one year and do not use oral contraceptives

**External Cephalic Version**

Conditions: 37 weeks gestation, not engaged, adequate amniotic fluid

Contraindications: Previous C/S, antepartum hemorrhage, twins, ruptured membranes, severe HTN  
Salbutamol 1 vial (Terbutaline 0.25 ml) subcut 5-10 minutes prior to procedure or MgSO<sub>4</sub> 5 grams IM ½ hr prior. Salbutamol PO (equivalent to Albuterol 4 mg) can also be given 1 hr prior. Anxiety can be managed by Diazepam 5mg PO 1 hr prior.

US to check for fibroids and lie

Flex the Vertex towards the fetal chest while pushing the anterior thighs upward. Reverse directions if necessary.

FHT q5min x 30 min

If Cx > 2cm, check for prolapsed cord.

**Endometritis**

1st Antibiotic (Choose one) – Amox-Clav 1.2 grams IV q 8-12 h, Ampicillin 2 g IV/IM and then 1 g IV q6h, Chloramphenicol 1g IV/IM q6h, Ceftriaxone 1-2 g q24 hrs

2<sup>nd</sup> Antibiotic – Metranidazole 500 mg IV q8h

3<sup>rd</sup> Antibiotic – Gentamycin 80 mg IV/IM q8h

Once afebrile x 48h, may change to PO Medications.

**PROM – Rupture of Fetal Membranes prior to labor at GA>37 wks**

1. Confirmation of Memb. Rupture (Fluid flowing from Os, ferning, nitrazine test) (Cervical exams >37 wks not assoc with increased infection but the length of PROM increases Chorioamnionitis risk.)
2. Confirm maternal and fetal well being, fetal position, fever, tachycardia, uterine tenderness
3. Prompt induction of labor with Oxytocin or Misoprotol, unless contraindications and C-Section is necessary. If choice is for expectant management, then no more than 24 hours. Antibiotics not necessary unless > 18 hrs, as unable to test for GBS.

**Preterm PROM – Rupture of Fetal Membranes prior to labor at GA<37wks.**

1. Confirm Rupture of Membranes as above
2. Management
  - a. Expedient delivery if intrauterine infection, abruption, nonreassuring fetal heart rate, risk of cord prolapsed, or thick meconium
  - b. Expectant management for stable patients with PPROM<34 wks with the admin. of neonatal steroids and prophylactic antibiotics (Ampicillin 2 G IV q6h x 48hrs(Amoxy/Clav 1.2 G q8h), followed by amoxicillin 500mg tid x 5days. Alternative: Azithromycin 1G at time of admission and repeat 5 days later.)
  - c. 34- 37 weeks suggest delivery but new info suggests that expectant management until 37 weeks is acceptable. Neonatal steroids may be given at this GA (Dex 6mg q12x48h)
  - d. <32 wks in active labor, add Mag Sulfate (4gm IV slowly over 20 min + IM protocol) for neuroprotection(Not G. Prot)
  - e. Tocolysis – To delay delivery for 48hrs for admin. of steroids. Not if Cervix is >4cm, or evidence of chorioamnionitis.
  - f. *Balance of Risks* – Maternal complications easier to manage than neonatal. (eg. C-S easier to manage than neonatal sepsis)

**AFI – Deepest 2.5 cm or 8 cm total****Vaginal Candidiasis**

Oral: Fluconazole 150 mg PO x 1

Vaginal: Clotrimazole 100 mg x 2 vaginal tabs nightly x 3 days OR

2% cream 5 g vaginally nightly x 3 days

Nystatin 100,000 u vaginal tab nightly x 7-14 days

**Sexually Transmitted Infections****Gonorrhea**

Ceftriaxone 250 mg IM x 1

Azithromycin 2 g x 1 will treat both GC and Chlamydia

**Chlamydia**

Doxycycline 100 mg PO BID x 7 days

Erythromycin 500 mg Q6H x 7 days

Azithromycin 1 g PO x 1

**Syphilis**

Benzathine penicillin 2.4 MU IM x 1 (If latent use 3 doses 1 week apart)(Primary may now require 2 doses)

If penicillin allergic:

Doxycycline 100 mg BID x 14 days

Erythromycin 500 mg Q6H x 14 days

Azithromycin 2 g PO x 1

Ceftriaxone 1 g IM or IV daily x 8-10 days

Plus treat for chancroid as below

**Chancroid**

Ciprofloxacin 500 mg BID x 3 days

Ceftriaxone 250 mg IM

**LGV**

Doxycycline 100 mg BID for 14 – 21 days

**PID**

Outpatient: Ceftriaxone 250 mg IM + (Doxycycline 100 mg BID X14 days or Azithromycin 1g Q weekly x 2)

Inpatient: Ampillin 2g IV/IM now and 1g IV Q6H + Gentamycin 80 mg IV/IM Q6H + Metronidazole 500 IV Q8H (Metronidazole may be given PV)

Once better, continue for 2 days and then place on Doxycycline to complete 14d of antibiotics.

**HIV**

National Policy refers to Diagnosis in terms of Public Health Number (PH#). 279 is Positive and the 280 is negative. Testing is managed by Chaplaincy.

The following Medical Assistant is responsible for coordinating their care: Nelson at Public Health. All cases should be referred to them as they are familiar with the Ghana HIV Protocols.

**Malnutrition**

Malnutrition is highly prevalent in the area. The Baptist Medical Centre has an extensive program of inpatient and outpatient care. If one wants the Public Health Dept. to assist with the patient on the ward, they can be asked to come by writing "Feeding List" on your hospital order sheet. They can also be asked to come to assist in the outpatient department. Severe Z core <-3, Moderate <-2 but >-3, There is an outpatient malnutrition program in which patients may graduate to, for post-hospital management. Malnourished children may also be referred there from the outpatient department For those children with Severe Malnutrition, such as Kwashiorkor (Protein–Energy Malnutrition) and Marasmus, hospitalization may be necessary. 2/3 of deaths from acute severe malnutrition occur within the first week of admission. Special care is necessary. The basic principle is, after initial resuscitation, to give high energy foods with increased protein.

*See below:*

Resuscitation (days 1-7)

Avoid IV therapy due to the tendency to develop fluid overload.

ORS(Give ReSoMol if available) – 5mL /kg every 30 minutes for 2 hours, then 5-10ml/kg hourly for 4-10 hours. When hydrated start milk (F-75 if available) feeding 130mL/kg/day (100 ml/kg for edematous children)

Plumpy Nut is also available – 6 mo. – 59 mo. give 200 kcal/kg/day (sachet = 500 kcal)

Adults – 2000 kcal/day (4 Sachets)

If IV therapy is required, give Ringers' Lactate with 5% dextrose 15ml/kg over one hour and then 10mL/kg/hour over the next 5 hours.

Specific issues

*Diarrhea* - lactose intolerance may be treated with yogurt or a cereal/oil/sugar, if available. Treat Giardia with Metronidazole 7.5 mg/kg q8h x 7days.

*Hypothermia*- keep the child warm

*Hypoglycemia* - Check blood glucose and if low (54mg/dl or 3mm/l – conversion is 18xmm=mg) give 50 ml of 10% glucose solution or sugared water (1 teaspoon sugar in 3 1/2 tablespoons of water) followed by milk feedings. If glucose remains low, repeat glucose solution. If unconscious or convulsing, give 5mL/kg 10% dextrose IV/NGT

*Infection* – For mildly sick children showing no signs of infection give Amoxicillin (1mos -1yr 125mg PO bid x 10d, 1-5yr 250 bid x 10d, 5-18yr 500 bid x10d. In very sick children, give Ampicillin 50mg/kg IV q6h for 2-3 days and then oral amoxicillin 15mg/kg q8h for 5 days + Gentamicin 7.5mg/kg daily for 7 days. If the child is not responding after 48 hours add Chloramphenicol or Ceftriaxone in meningitis doses. Consider TB and HIV.

*Anemia* – for Hgb <4, or 4-6 in the very sick give 10ml/kg of whole blood

*Electrolytes and minerals* –potassium supplementation along with zinc and magnesium are important(folic 1mg/d, mvit, zinc 2mg/kg/d, copper 0.3mg/kg/d.

*Vitamin A* – If vitamin A has not been given within the last month, give as follows

<6 months 50,000 units

6-11 months 100,000 units

>12 months 200,000 units

If any **Xerophthalmia** eye signs (corneal ulceration, clouding and necrosis), give above doses on Day 1, 2 and 14.

*Antimalarials*- give as indicated if +BF or +rapid test

*Intestinal parasites* – In children over 12 months, give Mebendazole 500mgx1 dose or 100mg bid x 3 days or albendazole one dose

*Post-resuscitation* - The Public Health Malnutrition Team will continue to be involved with the patient on the ward and then the patient will be discharged to the Feeding Kitchen for daily care up to 6-8 weeks, as necessary

*Additional treatments* – Multivitamins with Folate should be used for at least 2-3 months. Iron supplements may begin 2 weeks after admission when the child has regained appetite and starts to gain weight.

### **Nephrotic Syndrome**

Commonly seen as a complication of malaria or the treatment of malaria. Confirm with urine specimen. Treatment is with salt restriction (2-4 g/day), furosemide to control edema, and using lisinopril to control hypertension. Steroids are helpful, prednisone 1-2 mg/kg/day for a couple of months until the proteinuria is resolved for a few weeks, then tapering over months. Maximum dose is 60 mg/day.

### **Cellulitis**

*Outpatient* - (Amoxicillin Ad 500-1 g q6 hrs x7, 6-12 yrs 250 q6 hours x7, 1-5 years, 125 q6 hrs x7,<1 yr 62.5 q6 hrs x7) (Flucloxacillin Ad 250-500 q6 hrs x7,> 10 yrs 250 500 q6 hrs x7, 2-10 yrs 125-250 q6 hrs x7,<2 years 62.5-125 q6 hrs x7) (Amox-Clav ad 500/125 q8 hrs x7, 6-12 yrs 5 mL 250/62, q8 hrs, 1-6 yrs. 5 mL, 125/30 q8 hrs x7, 1 mos- 1 yr 0.25 mL/kilogram 125/31 q hrs x7)

*Inpatient* – benzylpenicillin Ad 2 MU IV every 6 hours x7 children, 250,000/kilogram every 6 hours x7 or clindamycin ad 0.6-2.5 g daily in 3 divided doses, 12-18 yr 150 675 every 6 hours x7d, 1 month to 12 yrs 3.75-6.25 mg/KG every 6 hours x7d

### **Necrotizing Fasciitis**

The infection is usually mixed, so treat for Strep, Clostridium and Anaerobes with antibiotics such as Crystalline Penicillin, Flagyl and Gentamycin IV. *Clindamycin* is very good for Strep. The primary treatment is wide, aggressive surgical debridement. Often more than 2 debridements are necessary. If it is a Buruli ulcer (purple edges that are undermined), wide surgical debridement is the only treatment. Recent evidence shows that a course of Rifampicin with Streptomycin leads to a resolution of small lesions and enables larger lesions to be treated by less extensive excision and reduces the risk of recurrence after surgery.

### Skin ulcers

A chronic problem for many people. Most are *Tropical Ulcers* caused by staph/strep species. Small ones *with cellulitis* may be treated on an outpatient basis with Augmentin (625 mg TID) or Flucloxacillin (500 mg QID) for 2 weeks in conjunction with daily wound dressing using a topical antimicrobial. Antibiotics should not be given chronically. These patients should also be given vitamin C and advised to increase their protein intake. Large ones are often admitted to the isolation ward and provided wound care and antibiotics. Blood sugars should be checked to rule out diabetes. Rapidly progressing wounds may be indicative of HIV. Patients should receive hospital koko for protein supplementation as well as vitamin C daily. Any dead tissue (black or brown, necrotic, tough, not oozing blood) should be debrided under ketamine anesthesia. Once the wound is composed of red, viable tissue (usually after debridement and antibiotics for several days), skin grafting may be attempted. Usually once a graft has been placed, the patient should be kept for 5-7 days for wound care before discharge.

Consider *Buruli Ulcers* (common in S. Ghana) and *Yaws* (Benzathine Penicillin 0.9 gram IM x 1, E-mycin 250-500 mg or Doxycycline 100 or Tetracycline 500 qid x 14 days. Amox 500 qid x 14.)

Wounds are managed on the wards by the Nurses and as outpatients by the Dresser. Those who are being managed on an outpatient basis require a "Dressing Form" with the number of days of dressings and the followup plan, as in See the Doctor in ?#of days.

### Acute psychosis

The only anti-psychotic drug is chlorpromazine (Largactil). A typical dose is 50-100 mg IM followed by 25mg PO b.i.d. Valium is also available for sedation.

### Poisoning

This is usually the result of kerosene poisoning or DDT poisoning. Observation is all that is needed. Often have had NGT Lavage with charcoal before get to the bedside.

### Anesthesia

Ketamine (conc. 50mg/ml) 1-2(max) mg/kg IV, may repeat 0.5-1mg after 10 min.

(For IM use-double IV dose – 2.5 ml IV becomes 5ml (max 6mg/kg)

Ketamine causes increased secretions at 8 mg/kg doses, so if using IM anesthesia, must use Atropine which can be mixed with Ketamine. Do not give atropine in a febrile child(hyperthermia)

Premedicate with Atropine(0.015/kg or approx. 0.6 mg vial for an adult) and Diazepam 5-10 mg in adults (p. 5 for Peds dose)

Pressors: ephedrine mix 1 vial(50mg/ml) in 10ml saline and give as a 1ml boluses or 5-10 mg increments.

May also put 1 vial of adrenaline (1/1000 = 1mg) in 1000 ml of fluid or dilute 0.5 mg of Adrenaline(1/2 vial of 1:1000) in 20 ml and give in 1ml increments

Spinal: *Marcaine* (0.5%) amputation or hernia = 3ml

C-section = 2 -2.5ml(may repeat 2.5 ml after 8-10 min if spinal fails)

Prostate = 3.5-4 ml

Adolescent(7yo) = 2 ml

*5% Heavy Lidocaine* C-section = small woman 1.2ml, medium 1.5ml( 2.5ml if Lido is 2%), large 2ml

Hernia = 2 ml

Adolescent(7yo) = 1 ml

Local Anes– Make Lidocaine with Epi by adding 0.1ml of 1:1000 Epi to 20 ml of 1% Lidocaine

**Postoperative pain management**

Pethidine (Demerol) 50-70mg IM q 4-6h p.r.n (children 1-1.75mg/kg (PO/SC/IM) q3-4h(if not available  
Diclofenac 75 mg IM q12h)

**Hypertension**

First line is bendroflumethazide (BDFZ) (thiazide diuretic), 2.5 or 5 mg (no evidence that 5 mg lowers better than 2.5). *Beta-blocker* is atenolol (50-100mg daily divided bid), *ACE/ARB* is lisinopril (5-80 mg qd), losartan (25-100mg qd), the *calcium channel blockers* is nifedipine sr 20 mg qd or bid. furosemide (20–80 mg qd), aldactone (25-100 qd), aldomet (250-2000 mg daily in 2-4 divided doses), and propranolol (40-240 divided bid) are also available.

**Diabetes**

Metformin 500mg tab (500-2000 mg divided bid) is available. Glibenclamide 5mg (2.5-5mg qd-bid) and Glimperide 2 or 4mg tabs (1-8 mg qd) are the sulfonylureas available. Insulin availability is variable. Regular insulin or NPH are usually what is available, and patients may be sent home with insulin to be kept in a shaded place. Monitoring is with RBS (random blood sugar) or FBS (fasting).

**Available laboratory**

CBC, blood film (malaria), stool exam, urinalysis, fasting and random blood sugar, sedimentation rate, hepatitis B and C, PH number (HIV), AFB sputum, radiography. Cerebrospinal fluid, ascitic fluid, and fluid can be sent to lab for gram stain, WBC with differential, and AFB stain. Electrolytes and CD4 counts are done in Batches on Thursdays(if reagents available).

**Ward Notes**

Often patients on the wards are followed by a number of physicians. Please write clear, concise notes with good hand writing with a clear diagnosis and plan, even if you are not sure. Long, rambling notes in poor hand writing serve no purpose and compromise patient care. This is especially important when you are leaving and handing over care of your patients to another team.

**Ultrasound****Portable: Handle with care**

BPD: In order to perform this function, following the following sequence: Choose OB, Freeze appropriate frame, Choose CALC, Choose HEAD, Choose BPD, use L/R and Up/Down arrows to set calipers (Once you have set your first point, you must press “select” to get the 2<sup>nd</sup> point.) BPD reading is at the bottom of the screen.

Crown-Rump: Freeze, Calc, 1<sup>st</sup> Trimes, CRL, measure, select, set last point for measurement

AFI or other measurement in centimeters only, do as follows: Choose OB(or other mode), Freeze appropriate frame that you would like to measure, Choose CALIPERS, use L/R and Up/Down to set calipers (Once you have set your first point, you must press “select” to get the 2<sup>nd</sup> point.) Read measurement at bottom left. Normal deepest pocket is 2.5 cm and total is 8 cm.

**Stationary:**

BPD: Freeze frame by pressing **Δ**, Press SET to localize first point with roller ball. Choose FUNCTION and press the letter Q(BPD) and then press SET. With the roller ball, localize the 2<sup>nd</sup> point and read BPD.

**Anemia**

50% of the anemia is caused by iron deficiency. It normally coexists with a number of other causes including: Malaria, parasitic infections (Hookworm, Trichuris Trichiura, Schistosomiasis), Parvovirus B19, other nutritional deficiencies (folate, B12, vitamin A), hemoglobinopathies (sickle cell disease, thalassemia, hemoglobin C disease), inflammatory conditions causing anemia of chronic disease (HIV), hypersplenism. The highest risk groups are pregnant women and young children.

Definition(hemoglobin): 6 months to 5 years <11, 5 - 11 years<11.5, adult male<13, female<12.

Treatment:

a) Iron supplements - Children (elemental iron 5 mg/kilogram/day), adults (60 mg elemental iron/day)  
Preparations available: Ferrous sulfate 200mg(65 mg of elemental iron), Hematovit( 25 mg of elemental iron/5ml), Hematovit (other type) 100 mg of elemental iron + folate acid 1 mg.

b) Hookworm, Trichuris - albendazole 400 mg x1(not in first trimester)

c) Malaria (see previous sections)

d) Schistosomiasis – Praziquantel(adult-40 mg per kilogram in divided doses x1) (child >4yo 40 mg per kilogram divided doses bid x 1 day)

e) Folate deficiency - Folic acid 1 mg daily (1-11mos – 15mcg/kg po qd, 1-10yo (1mg daily)

f) B12 deficiency - B12 1 mg po daily (injectable not available)

g) Vitamin A – see malnutrition, Pregnancy 2500 units daily, non-pregnant 2300u, male 3000u

h) Transfusion

Decompensated anemia

Malaria if Hb<4 or if very ill Hgb<6 (Tendency at BMC to transfuse Hb<6 or Hct<18)

Sickle Cell Crisis and Hb<5 or 2 below baseline (goal Hgb 7-8)

Active GI Bleed –Keep Hgb>9 until rebleeding unlikely

Pregnant < 36 wks. and Hgb<5, >36 wks. and Hgb<6

Pregnant <36 wks. with CHF, Malaria, severe infection, heart disease and Hgb<7, >36 wks and Hgb<8.

Infants and children and Hgb<4

Surgery for minor procedures and Hgb<7-8

Major surgery or decompensated patient may require transfusion at higher Hgb

## Sickle Cell

*Routine:* Penicillin Prophylaxis (<2) 125 bid and 250 bid (>2) up to 5 yrs and later if no Pneumococcal Vac and Folic Acid 2.5 – 5 mg qd.

*Acute Care:* Oxygenation, Hydration, Pain Control, Asses for Infection (CBC, BF, UA, CXR, LP), Transfusion for severe and decompensated anemia

*Syndromes:*

Osteomyelitis–Staph, Salmonella (IV for 1<sup>st</sup> 2 weeks with therapy to 4-6 wks.)

Hand-Foot Syndrome (<18mos) Dactylitis–painful swelling of hand&feet

Hemolytic Crisis – deep jaundice, hemoglobinuria, acute drop in Hgb

Splenic Sequestration – Abd Pain, Distension, Shock, rapid Hgb drop

Aplastic Crisis – Pallor, weakness

Vaso-Occclusive (Pain) Crisis – Long bones, abdomen, hands/feet dactylitis

Priapism - acute care + aspiration and if fails glans/corpora fistula

Acute Chest Syndrome – cough, chest pain, hypoxia, tachypnea

CVA – HA, focal findings, Seizure - Acute care and keep Hgb>10, control seizures

Transfusion Indications: Hyperhemolysis, Splenic Seques., CVA, Unresponsive Priapism, Chest Syndrome, hypoxia

### Caesarian Section Pre-OP Orders

NPO and Notify theater of C-Section

IV NS 2 liters at fast rate

Urinary Catheter to drainage

Amox-Clav 1.2 grams IV now

Hct/HGB, BF now

Type and Cross 2 units of blood (Provisional depending on pre-op Hgb)

### Caesarian Section Post OP Orders

VS Q1h x 4 and then Q6h if stable, Advance diet as tolerated Urinary Catheter to drainage

IV NS at good rate

Antibiotic Coverage (Amox-Clav 1.2 grams Q8h x 24 hrs followed by Amoxicillin-Clav 625 bid x 5 days

Pethidine 50 mg IM Q4h PRN pain(if not available Diclofenac 75 mg IM q12h)

Acetaminophen 2 tabs QID PRN

Hct/HGB, BF in

### **Incarcerated Hernia**

Usually involves inguinal hernias in men. Often these patients may be watched for 1-2 hours before surgery should be alerted. Put the patient in trendelenburg and administer pethidine (or diclofenac 75 mg IM) and/or diazepam to allow muscles to relax and see if the hernia can be reduced or if it will reduce on its own. If the hernia hasn't reduced and the pain persists, urgent surgical consultation is needed.

### **Hernia Repair Pre-Op Orders**

Admit Male/Female Ward

NPO after Midnight

Notify theatre of Hernia Repair in AM

Consent for Hernia Repair signed

Flucloxacillin 1gram IV or Amox-Clav 1.2 grams in Am prior to Surgery (Pre-Op Antibiotics have become necessary for clean cases as a result of recognized breaks in Sterile Technique in OR which are unavoidable)

### **Hernia Repair Postop Orders**

Bedrest for 6 hours

May eat a regular diet

Pethidine 50 mg IM q.4 h. (or Diclofenac 75 mg IM every 12 hours) p.r.n. pain, Acetaminophen 2 tabs q.i.d. p.r.n.(don't write Tylenol)

### **Hernia Discharge**

(For a routine inguinal hernia, the patient is usually discharged the following day. If it is a complicated hernia additional days are added on depending on the problem. Hydroceles are often kept an extra day.)

**Burn Resuscitation for 40-80 kg person** –  $10\text{ml/hr} \times \text{TBSA burned (2}^{\text{nd}} \text{ and 3}^{\text{rd}}) = \text{vol/hr}$

e.g. 70 kg person with 40% burn –  $10 \times 40 = 400 \text{ ml/hr}$  or 9600/24hrs

### **Procedure for STSG**

*Equipment* – Blades, Knife Handle, Mesher, Saline with Adrenalin, Roll Gauze, ACE, Vaseline Gauze

1. Clean leg with Prep Solution
2. Debride Graft Site and apply adrenalin soaked saline gauze
3. Remove skin with Grafting Handle set at 1 and ½ spaces on scale or by visual
4. Place graft in Saline
5. Apply Gauze impregnated with Saline + Adrenalin to Donor site.
6. Mesh Skin with care to remove skin from the back portion of the Roller Blade. Skin must be attached to Roller Blade to begin process and the skin should be soaked with Saline throughout or it will stick to the Blade.
7. Place the meshed skin on the site and secure it with Staples or Interrupted Sutures.
8. Apply in order: Petrolatum gauze, regular fluffed gauze, roll gauze and then elastic bandage
9. Apply Splint as necessary to control movement
10. Write NO DRESSING on Chart and Dressing itself.
11. First Dressing by Operator on Day #3 and then daily afterwards by ward nurses.

### **Hydrocele**

May treat with Sclerosis if high Surgical Risk for Anesthesia – (<orange size hydrocoele)  
Tetracycline IV solution 500mg -1 gram injected into hydrocoele after Drainage of fluid.

**Uterine Prolapse** – Pessary: measure Pubic Symphysis to sacrum + 1-2 cm, bend vertically to insert under pubic bone. Have woman clean and replace daily, washing with soap and water.

## Head Trauma

Elevate head of bed 30-45 degrees, O2, normocapnia, deepening sedation and analgesia, normovolemia, temperature control, seizure control, Mannitol 0.25-1 gram/kg IV over 15-20 minutes, stress ulcer px, enteral nutrition, glycemic control.

**Glasgow Coma Score** The GCS is scored between 3 and 15, 3 being the worst, and 15 the best. It is composed of three parameters : Best Eye Response, Best Verbal Response, Best Motor Response, as given below :

### Best Eye Response. (4)

1. No eye opening.
2. Eye opening to pain.
3. Eye opening to verbal command.
4. Eyes open spontaneously.

### Best Verbal Response. (5)

1. No verbal response
2. Incomprehensible sounds.
3. Inappropriate words.
4. Confused
5. Orientated

### Best Motor Response. (6)

1. No motor response.
2. Extension to pain.
3. Flexion to pain.
4. Withdrawal from pain.
5. Localizing pain.
6. Obeys Commands.

A Coma Score of 13 or higher correlates with a mild brain injury, 9 to 12 is a moderate injury and 8 or less a severe brain injury.

## Transfer to Tamale

TTH -0372097179

**Ambulance-** Sammy (Director) Gambaga – 0200138045 best, 0207635358-, also 0370209696 (office)

**National ambulance-**193

**Fever – Normal Centigrade 37 (36.1 - 37.2)**

**Normal Fahrenheit 98.6 (97 – 99)**

**Each degree centigrade of Fever increase over normal = 2 degrees Fahrenheit increase**

**i.e. 38C = 100.6 F and 40 C = 104.6 F**