BMC Medical Protocol
Updated February, 2026

Table of Contents

Infectious Disease

Acute Epiglottitis **(H. influenza) Airway management is key**

Children - Ceftriaxone: 100 mg/kg loading and 50 mg/kg IVq6h x 5d, Ampicillin50 mg/kg q6h, Chloramphenicol 25 mg/kg q6-8h x 5d
Adults- Ceftriaxone 2 gr q24h x 7-10d, Ampicillin 2g IV q6h
Amox/Clav 1.2g Q6-8hr (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

Anthrax: The hospital is in an area endemic for Anthrax, especially the village of Nagbo and the surrounding villages. The presentation is usually cutaneous (an 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 Doxycycline 100mg bid x 7-10 days. Alternatively, ciprofloxacin 500mg PO bid for 7-10 days, or Amoxicillin 1gr tid x 7 days, or PenVK 500mg Q6h can be used.

Severe systemic infections may be treated with Meropenem + 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).

Cellulitis

Outpatient:
Non-purulent -Amoxicillin Adult 500-1 g q6 hrs ×7, 6-12 yrs 250 q6 hours ×7, 1-5 years, 125 q6 hrs ×7,<1 yr 62.5 q6 hrs ×7
Cephalexin 500 mg q6h x7
Fluclox Adult 250-500 q6 hr ×7,> 10 yrs 250 500 q6 hrs ×7, 2-10 yrs 125-250 q6 hrs ×7,<2 years 62.5-125 q6 hrs ×7
Amox-Clav Adult 500/125 q8 hrs ×7, 6-12 yrs 5 mL 250/62, q8 hrs, 1-6 yrs. 5 mL, 125/30 q8 hrs ×7, 1 mos- 1 yr 0.25 mL/kilogram 125/31 q hrs ×7 days
Purulent – MRSA coverage – add TMP-MSX 2 DS bid, Amox (875 bid) + Doxy(100 bid), or Clindamycin 450 q8h
Inpatient: (Require MRSA coverage)
Oxacillin 1-2 gm q6h, Clindamycin Adult 0.6-2.5 g daily in 3 divided doses, 12-18 yr 150 – 675 mg every 6 hours ×7d, 1 month to 12 yrs 3.75-6.25 mg/KG every 6 hours ×7d
Ceftriaxone adult 2 – 4 gr IV q 24 hrs (children 50 mg/kg q12h)
Exact choice of antibiotics may vary with site (eg face is more likely to have erysipelas)

Cellulitis, Orbital:

Ceftriaxone adult 2 – 4 gr IV q 24 hrs (children 50 mg/kg q12h) + rrut 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 and used in cases of mod to severe dehydration and in epidemics. Doxy 300mg x 1, Tetracycline 500 q6hx3days, Azithromycin 1 g (20mg/Kg in peds) single dose, or Cipro 1 gram(ped -20mg/kg) in single dose.

For Pre-septal Cellulitis - Amoxicillin-clavulanic acid (in children: 90 mg/kg per day divided every 12 hours [using the 600 mg/5 mL suspension]; in adults: 875 mg every 12 hours)

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 and used in cases of mod to severe dehydration and in epidemics. Doxy 300mg x 1, Tetracycline 500 q6hx3days, Azithromycin 1 g (20mg/Kg in peds) single dose, or Cipro 1 gram(ped -20mg/kg) in single dose.

COVID19:

Symptomatic patients with significant Covid are monitored in isolation.
Asymptomatic patients are quarantined in the Old Administration building
Testing – PCR available at times
Assess risk factors for severe Covid
O2 saturation target of PO2 =90-96 – start if available at O2 <94%
Outpatient management – Primarily symptomatic care – no evidence for use of steroids or antiplatelet agents (aspirin) in this population.
Inpatient Management –

a. O2 to goal of 90-96% - limited supplies

b. Steroids – Dexamethasone 6 mg IV qd until off O2 or equivalents: Prednisone 40 mg daily x 5 days or hydrocortisone 150 mg.
c. Ventilation not available – need to refer to Tamale Teaching Hospital if necessary
d. Antibiotics – In Ghana, Empiric antibiotics are routine – Ceftriaxone, Doxycycline
e. Proning
f. Conservative fluid management depending on status
g. Avoid Nebulizer treatments
h. nirmatrelvir-ritonavir (Paxlovid) rather than no therapy for the following patients, regardless of vaccination history – for specific patients with risk factors (not easy to find in Ghana

Diarrhea in children & dehydration Rx

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)

Shock – need 3 signs: 1. Cold extremities 2. Capillary refill > 3 sec. 3. Weak or faint pulse
Resuscitate with 10-20 ml/kg over 30-60 min and repeat 10-15 ml/kg if still in shock.
*If severe anemia (Hct,<15, Hgb<5), give blood.

Once stabilized, then maintenance fluids: **use isotonic fluids**

- Patients weighing <10 kg should receive fluids at a rate of 4 mL/kg/hour.
- Patients weighing 10 - 20 kg should receive 40 mL per hour for the first 10 kg, plus 2 mL/kg/hour for each kg above 10 kg.
- Patients weighing 20 - 80 kg should receive 60 mL per hour for the first 20 kg, 1 mL/kg/hour for every kg above 20 kg; total maintenance fluids are generally capped at approximately 2.5 liters daily.
- Patients weighing more than 80 kg should receive approximately 2.5 liters daily.

*If severe malnutrition, then less fluid, given slower. 10-15 ml/kg over 1 hr and then continue with NGT maintenance fluids and if no improvement, give blood 10 ml/kg over 3 hrs.

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)
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 5 days) Septra and ampicillin are no longer effective. Consider *Intussusception* and amebiais 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, especially with blood*. **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.

Diarrhea, Travelers'**:** Caused by enterotoxigenic and enteroaggressive Escherichia coli. Only 5% caused by Salmonella, Shigella, Campylobacter, Giardia(vomiting and belching), virus or Amebiasis. The primary treatment is with fluids to maintain hydration, preferably with ORS.
It is only necessary to treat with antibiotics when the patient has more than 3 bowel movements (incapacitating, inhibits activities) and in addition to symptoms (fever, bloody diarrhea).
Treatment options are, **Azithromycin 1000 mg as single dose or 500 mg daily x 3 (Children 10 mg/kg daily x3)**, Ciprofloxacin 500mg b.i.d for 1-3 days if sensitive or Rifimaxin 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 Ciprofloxicin 500 bid x 3 days and Azithromycin 500mg day qd x 3. Also Ceftriaxone 1-2 g IV daily x 5

ORS – In one liter of water add: ½ tsp salt, ½ tsp baking soda, 4 tbsp sugar

Fever Definition and Conversion C to F:

Normal Centigrade (C) 37 (36.1 - 37.2) or Fahrenheit (F) 98.6 (97 – 99)
Each degree C of fever increased over normal = 2 degrees F, i.e. 38C = 100.6 F and 40 C = 104.6 F

Hepatitis:

Note, see appendices for hepatitis B & Hepatitis C protocols (for overview & treatment)

Hepatitis A:
Transmitted fecal-orally. Those in the developing world acquire it in the first few years of life, and mostly w/o jaundice. So this is rarely seen at BMC.
Hepatitis B & C are endemic, with at least 12% carrier rate for both. These are primarily transmitted through parenteral, sexual and perinatal exposures (village injections, dental procedures, cuts from barbers, male and female circumcision etc)

Hepatitis B:
In high prevalence areas (sub-Saharan Africa & Ghana) HBV is primarily transmitted by vertical exposure from mother to child. Perinatally acquired hepatitis B has a 90% carrier rate, so it usually presents as asymptomatic or chronic liver disease in adults. Tenofovir treatment by protocol for chronic hepatitis B is available (see below). Aggressive education to vaccinate non-immune contacts is important. Acquisition of Hep B at older (>2) ages (from village injection, skin lesions, sexual etc) presents as acute infection with jaundice. Older acquisition results in less than 5% carrier risk and is generally treated according to the protocol.

CAUTION: Hepatitis B core antibody= anti-HBc; is NOT related to Hepatitis C antibody, which tests for a different virus
NOTE: (See protocols for Hep B and C treatment at end of this document)
Hepatitis C
Like Hep B, Hep C presents as asymptomatic and/or chronic liver disease (massive ascites, edema, GI bleed, encephalopathy). The mainstay of care is primarily symptomatic; as pharmacologic care is not easily available but is coming. Hep B vaccination should be provided to those not immune to hep B.

Ascites:
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.: furos. dosing provides the optimum synergistic effect. If portal hypertension is evident,propranolol 10 mg TID may be given to reduce risk of GI bleed from Varicies. Nadolol is not available. Salt restriction is essential.
Always look out for SBP (>250WBC/ml , abdominal pain and fever) which may be treated with Ceftriaxone 2gm q24h, Cefotaxime 2 grams Q8h x 5 days. If others not available Cipro 200mg IV q12h x 2 days followed by 500 mg po bid x 5 days
E.coli and Klebsiella are most common agents. Hepatocellular Cancer is common at BMC, diagnosed by US and rarely treatable.

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.

Intestinal Parasites (NB benzimadazoles teratogenic in 1st trimester)

Hookworm	Albendazole 400 mgx1 or **200 mg <2yo** Mebendazole 500 mg x 1
Cutaneous Larva Migrans	Ivermectin 200 mcg/kg x 2 days or Albendazole 400 mg dailyx3 days with a fatty meal
Ascaris	Albendazole 400 mg x 1 (pregnancy pyrantel pamoate 11 mg/kg up to 1gram x 1)
Tricuris	Albendazole 400 mg daily x 3 days Mebendazole 100 mg bid x 3 days
Pinworms(Threadworms)	Albendazole 400 mg x 1 and repeat in 2 wks
Esophagostomum	Albendazole 400 mg daily x 5 days
Strongyloides	Ivermectin 200 mcg/Kg x 2 days Albendazole 400 mg q12h x 3 days
H. nana	Praziquantel 25 mg/kg x 1 dose, repeat in 10 days
Giardiasis (Flagellates)	Metronidazole 500mg PO TIDx5d (children 5mg/kg TIDx 5d)
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

Malaria, including seizure Rx

The treatment of malaria is now with 2 drugs at all times. Malaria in adults can be treated with Artemether, Artesunate, 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 sulfadoxine-pyrimethamine, clindamycin, or doxycycline.
Artesunate Combined Therapy (ACT): Artesunate/Lumefantrine and Artesunate (50 mg)/amodiaquine (150 mg base) are the combinations available in Nalerigu.
Please treat only Smear Positive individuals. Blood Film – Hyperparasitemia is 250,000/ml

Inpatient - Severe Malaria

Artesunate Dose *<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 for a max of 7 days or until taking p.o. . This course is then followed by a full course of ACT x 3d
If parenteral Artesunate is not available, artemether and quinine are acceptable alternatives:
In children >5 yo give Artemether 3.2 mg/kg IM given on admission and then 1.6 mg/kg daily x 3 days until artesunate available or until taking PO. (Adults-160 mg IM followed by 80 mg IM q.d. x4) then follow with 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.
Rectal artensunate suppository for transport to hospital 100 mg 6 mos – 6yrs and 400 mg >6 yrs
Duration of Parenteral therapy: A minimum of 24 hours in severe malaria.
Complete treatment by getting a full course of Artesunate Combined Therapy (ACT) when patient is able to take oral therapy but not before 24 hours of parenteral therapy

Be vigilant to treat hypoglycemia, anemia, septicemia, pneumonia, seizures, and dehydration. Fluid overload, pulmonary edema, and renal failure are uncommon in childhood malaria in hyper-endemic areas. Do LP if altered sensorium and if no tap, then treat for CSM.
Note optic fundus – **white centered retinal hem**, vessel changes, white patches in retina
Gram neg. bacteremia is common (non-typhoidal salmonella) and is treated by Ceftriaxone, Quinolone or Azithromycin.

Hypoglycemia - <5y Glucose < 3 mm/l (<54), >5y Glucose < 2.2 mm/l (<40) – Bolus D10 2.5 ml/kg q15min until normal (Prepare D10 by withdrawing 100ml of fluid from a liter bag of D5 and replacing it with 100 ml of D50.)
Maintenance Fluids with Malaria should contain D5 + Isotonic Saline
Since hypoglycemia is recurrent, continue to monitor.

Maintenance fluids — Maintenance intravenous fluids should include 5 percent dextrose with isotonic 0.9% saline. The rate of fluid administration should be determined by weight [94]; intravenous fluid support should be continued until oral intake is tolerated.

- Patients weighing <10 kg should receive fluids at a rate of 4 mL/kg/hour.
- Patients weighing 10 - 20 kg should receive 40 mL per hour for the first 10 kg, plus 2 mL/kg/hour for each kg above 10 kg.
- Patients weighing 20 - 80 kg should receive 60 mL per hour for the first 20 kg, 1 mL/kg/hour for every kg above 20 kg; total maintenance fluids are generally capped at approximately 2.5 liters daily.
- Patients weighing more than 80 kg should receive approximately 2.5 liters daily.

Other calculation:1st 10kg 100ml/kg, 2nd 10kg 50ml/kg, and for ea. Kg>20 20ml/kg

Nutritional Supplementation
This should be supplied for children in coma by NGT within 24-48 hours. Local high nutrition enteral supplements should be provided in volume consistent with Maintenance IV fluids.

Fever > 38.5
Aggressive fever management may decrease neurologic morbidity
Acetaminophen 15mg/kg or Ibuprofen 10 mg/kg q 6h

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

Oral dosing of quinine (50 mg/5 mL) is as follows: (**unlikely to ever have to use Quinine**)
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
In **Children**, Quinine could be combined with **Clindamycin** 6.7 mg/kg base TID for 7days.
Clindamycin could be also combined with Artesunate 4mg/kg x 3 days or 4mg/kg loading and 2 mg/kg x 6 days without Quinine.
For **adults,** the Quinine dose is 650 mg(salt) TID x 3-7 days combined with Clindamycin 20mg/kg(max 1.8 grams) of base divided TID for 7 days, or Doxycycline 100mg BIDx7 days.

No role for post discharge Malaria prophylaxis in children as yet.
Outpatient Treatment
Artesunate/Amodiaquine **(A/A) Dose forms 25/75 and 50/150**
Best post treatment prophylactic effect
A/A (5-9 kg) 25/67.5 1 qd, (9-18 kg) 25/67,5 1 bid or 50/135 1 qd, (18-36 kg) 50/135 2 qd, (>36 kg) 200/540
Artemether/Lumefantrine **Short Post Treatment Prophylactic effect-important in areas of high transmission. Currently in the pharmacy, the doses are pre-packaged as Artemeter/Lumefantrine (A/L) (Brand Lumeter) 80/480 one bid x 3 days for adults > 35 kg.**
For children 5- 35 kg, dose as follows: 5 – 15 kg A/L 20/120 mg one bid x 3 days, 15-24 kg A/L 20/120 mg 2 bid x 3days, 24 – 35 kg 20/120 mg three 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. May cause psychosis.

Anemia with Malaria – Hct <16% - transfuse 20ml/kg whole blood. If Hgb is 16—21%, transfuse when in severe distress

Malaria in Pregnancy
First line for uncomplicated malaria is ACT (A/L or A/A)

Severe Malaria – First line is Artesunate 2.4mg/kg/dy IV/IM on admission, 12, 24 and 48hrs followed by ACT if taking PO and if not may continue Artesunate 4 more days. Alternative in 1st , 2nd and 3rd Trimester is Artemether followed by ACT. If Artesunate not available, Artemether preferred over Quinine (Hypoglycemia)

Pregancy with HIV requires daily sulfamethoxazole 800 and Trimethorprim 160 which provides prophylaxis for malaria and opportunistic infections.

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]. The dose of IPTp-SP is 1500 mg sulfadoxine/75 mg pyrimethamine.

Seasonal Malarial Chemoprevention (SMC)
Pyimethamine/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 if seizure not controlled after 2 doses of diazepam
5-15 mg/kg/day orally, NGT or slow IV push in divided doses q12h
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

Meningitis – Rapid Timing of 1st Dose is Key to Success

Meningococcal
Ceftriaxone: adult 2-4g IV daily x 7d or Cefotaxime 2g IV q4-6h, children 50-80mg/kg/day IV/IM x 10-14d, Neonates 20-50mg/kg once daily for 21d.(Covers Meningo, Pneu, H. Flu) Treat Pneumococcal Meningitis for 10d **Be aware that Antibiotics run out so be careful with dosing (Cefotaxime 2 g every 4-6 hrs may be available)**
Alternative - Penicillin: Adult 4gMU q4h + Chloramphenicol 1g IV q6h x 14d, Children 200MU/Kg q6h + 25mg/kg q6h x 14d
Dexamethasone 0.4 mg/kg q12hx 4 days for Adults and Children with Pneumococcal disease decreases Hearing Loss.(alternative 1-1.5mg/kg/d divided q4-6h (max 16/d) (Benefit not Clear in developing countries)
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)
Cipro 500 mg may on exit may not be necessary for health care workers unless exposed to respiratory secretions (Quinolone resistance is increasing)

H. Flu Meningitis – Chloramphenicol X 7-10 days, Ceftriaxone x 7-10 days, or Ampicillin 200 mg/kg/day x 7-10 days
Pneumococcal – Penicillin 400,000 units/kg/day q6h x 10 days, Ceftriaxone 2 gm q12h x 10-14d
TB – fever>14d, fever>7d with family member with TB, Typical CXR, Coma despite Rx, CSF Lympocytes
Give RIPE x 2 mos and a Continuation Phase of INH and Rifampin x 10 mos.

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 600-900 IV q8h)* 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. Buruli ulcers are rare in the N. Ghana, as primarily found in the South.
Antibiotic therapy is continued until all necrotic material is removed.

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.

Septic Arthritis – The incidence of MRSA in Northern Ghana is 2-3% but may be underestimated due to limited testing for this.

Drainage is key by either repeated aspirations or open drainage.

Staphylococci, including both *S. aureus* and coagulase-negative staphylococci, are the most common cause of bone and joint infections.
IV Treatment -Use of ceftriaxone 2 grams daily for definitive treatment of staphylococcal osteomyelitis is increasingly supported. If MRSA is suspected may add Clindamycin 600 q8hx 7d followed by oral therapy of Cephalexin 1g q6h or Amox-Clav 875 q12h for 7 – 14d.
Oral Therapy is now accepted as reasonable therapy after drainage avoiding long courses of IV therapy.

Pneumonia:

Determine PNA score: 1 point per extremes of age (<5, >65), RR (A>30, C>50), P>120, BP <90, Restless and confused, co-morbidities (COPD, CHF, CKD, Multilobes, O2%<92)

OUTPATIENT Pneumonia (Score<2):
No recent antibiotic therapy (>3 months), choose amoxicillin v. Azithromycin v. Cefuroxime:

Amoxicillin	50 mg/kg divided BID x 5d	6 mo–1yr: 125 mg TID x 7d
Adults: 1000mg TID x 7d	5-12 yrs: 500 mg TID x 7d	
Children:	1-5 yrs: 250 mg TID x 7d	**Azithromycin**

Adults: 500mg QD x3-6d
Children: 10mg/kg x3-6d

Cefuroxime
Adults: 500mg PO Q12 x7d

Children:
3mo-12yr: 30mg/kg/day
>12yr: 250-500 q12h x7d

If recent antibiotic therapy (<3 months): use **Amoxicillin/Clav PO**
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
1m – 1 yr.: 114 mg (2.5 mL) TID x 7 days
If penicillin allergy or atypical organism suspected:
Add Azithromycin – see above for dosing
If significant co-morbidities – use Amox-clav + Azithromycin

INPATIENT Pneumonia (Score>2):
Severe – Difficulty Breathing (< 2 mos RR>60 BPM, 2-11 mos RR>50, 1-5yrs RR>40), flaring, retractions, grunting

Amox-clav IV
Adults: 1.2 g IV q8h x 7
Children: 3 mos – 18yrs 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 amoxicillin25- 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 IM/IV +Gent
Always consider TB!

WHO recommendations for oral regimens in this situation – Amoxicilin 40mg/kg per dose bid for 5 days
Narrow spectrum antibiotics such as Amoxicillin remain effective as compared with broad spectrum drugs such as Ceftriaxone.

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, levofloxicin) for pneumonia due to role in treating MDR tuberculosis.

Upper respiratory tract infections

***Acute Bronchits* (complicated) (Most cases do not need antibiotics – see above for pneumonia score)**

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

Rabies: Uniformly fatal here. Differential diagnosis includes tetanus, drug intoxications, hysteria, Guillain-Barre syndrome, viral encephalitis. For suspected rabies, kill animal and send brain for evaluation to Pong Tamale OR observe animal for 10 days.
A palliative approach is taken rather than an aggressive one, especially since the latter approach has questionable efficacy except that monitoring in an ICU may improve survival.
The palliative approach is as follows:

A quiet private room is highly desirable.
•Pharmacologic restraints are preferred whenever possible over physical restraints. Benzodiazepines such as diazepam are useful for sedation and muscle

relaxation and can be given intravenously, intramuscularly, or per rectum. Lorazepam and midazolam are alternative benzodiazepines, and both can be given intravenously or subcutaneously.

- Haloperidol, which can be administered subcutaneously or intramuscularly, can be used for a variety of clinical manifestations, including restlessness, agitation, hyperexcitability, delirium, hallucinations, and aggression [36].
- For analgesia, morphine can be administered intravenously or subcutaneously, including a subcutaneous infusion using a syringe driver that avoids the need for multiple injections [37]. Both haloperidol and midazolam can also be given subcutaneously using this method, and also in two- or three-drug combinations (eg, morphine, haloperidol, and midazolam).
- Excessive salivary secretions can be treated with anticholinergics, including scopolamine and glycopyrrolate. The sensation of thirst can be alleviated with ice chips in the mouth.
- Fever can be treated with sponging and antipyretics, including acetaminophen and/or ibuprofen.

Although palliative care in a hospital is preferred, in some cultures, it may be important for the patient to leave the hospital and return home for privacy, to reduce hospital costs, and/or for religious rites to be performed before death [38].

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.

Serious Bacterial Infection of the Neonate **(< 1 mo)**

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

Term Newborn >34 weeks
Ampicillin 50 mg/kg IV/IM q8h (if R/O CSM)
+ Gentamicin 4 mg/kg/day given once daily), (add Cefotaxime if critically ill)
Options:
Ampicillin (as above) + Cefotaxime 20-25mg/kg q8h x7 days
Or alternatively Ceftriaxone 100mg/kg/day divided q12h alone (Does not cover Listeria)
Or Cefuroxime IV 25-30 mg/kg q8h (**preferred d/t risk of biliary sludge and hyperbili with ceftriaxone**)
Omphalitis/Cord Sepsis: Flucloxacillin 15mg/kg IV q6h(<7d and q8h(>7d) + Gentamycin

If CSM Ampicillin + Cefotaxime or Cefepime

If **Preterm** (<34 wks), dosing is as follows: Postnatal age <7 days – Ampicillin 50mg/kg q12h, if postnatal age >7 days 75mg/kg q12h.

Gentamicin – IV gentamicin dosing for preterm neonates is based on both GA and postnatal age [20,25].

- For neonates <30 weeks GA:
  - Postnatal age ≤14 days – 5 mg/kg per dose IV every 48 hours
  - Postnatal age >14 days – 5 mg/kg per dose IV every 36 hours
- For neonates 30 to 34 weeks GA:
  - Postnatal age ≤14 days old – 5 mg/kg per dose IV every 36 hours
  - Postnatal age >14 days old – 5 mg/kg per dose IV every 24 hours

Treatment Guide: If Term – give IV 3-4 days and if improving change to PO, of if Pre-term(<28wk) give for 7 days after last fever. Good PO regimen is Cefuroxime 30 mg/kg/day in 2 divided doses (Susp. 125/5ml) x 7 days

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

See Pediatrics below for hypoglycemia treatment
See Pediatrics below for treatment of apnea of the newborn or persistent respiratory distress

Sexually Transmitted Infections

Chancroid: Painful circumscribed ulcers with buboes, Ceftriaxone 250 mg IM or Azithromycin 1 gram PO as single dose –treat for syphilis also

Chlamydia: Doxycycline 100mg PO BIDx7d or Azithro 1g PO x1(if pregnant or if Doxy intolerant) Amoxocillin 500 tid x 7days

Gonorrhea: Ceftriaxone 500 mg IM x 1,or Cefataxime IM 500mg x1, or Cefixime 800 mg PO x 1, or Azithromycin 2gm x 1 + Gentamycin 240 mg IM)

LGV: Doxycycline 100 mg BID for 21 days

PID:

Outpatient: Ceftriaxone 500 mg IM + (Doxycycline 100 mg BID X14 days + Metronidazole 500 bid x 14 days

Inpatient: Ceftriaxone 2gm IV qd + Doxycycline 100mg po bid + Metronidazole 500 IV Q8H (Metronidazole may be given PO)

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

Syphilis:

Benzathine penicillin 2.4 MU IM x 1 (If latent use 3 doses 1 week apart

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 above

Herpes Simplex - *Primary infection* Acyclovir 400 mg TID x 7-10d, R*ecurrent* -800mg tidx2d

Granuloma Inguinale – Azithromycin 1g weekly or 500mg qd x 3 weeks

MPox – Majority of patients need supportive care and antiviral meds only indicated for very severe disease (pneumonitis, encephalitis), immunocompromised persons
Some patients may require pain relief medication (eg, for pain related to proctitis or tonsillitis). In addition, for conditions like proctitis, stool softeners, topical lidocaine, and/or sitz baths may be helpful. Resolution usually occurs within 14 days.

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 500 units IM, Neonates 500 units IM divided 2 separate sites (part of the dose infiltrated around the wound– see product info for specifics
If using Equine Tetanus Antitoxin doses vary from 500 to 6000 IU without clear data to give an exact dose. When equine antitoxin is used, an intradermal test dose of 0.1 mL in a 1:10 dilution should be administered prior to giving the full dose to evaluate for hypersensitivity reactions [
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 Phenobarbital 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. (For a 50 kg person = 2 gr = 4ml of 50% solution MgSO4 over 30 min followed by 2gr = 4ml/hr for the >45kg person)
Labetalol infusion (0.25-1mg)/min
,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

Tetanus prevention for Deep Wounds is **ATS** (anti-tetanus toxin) 1500 units IM (no Tetanus Toxoid available)

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. Many are now receiving medications to take to the village and return on a regular basis for further meds and assessment. Mr. Uriah Paul is the TB Coordinator

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

Ceftriaxone: Adult: 2-4 g daily x 10-14 days
Children: 50-100 mg/kg IV daily x 10-14 days
If Ceftriaxone not available – Cefataxime 1g q6h or 150-200 mg/kg in 3-4 divided doses
Cefotaxime 1-2 g IV q 6-8hrs x 10-14 days
Children 150-200 mg/kg IV in 3-4 divided doses (max 8g/day)
Ciprofloxacin 500 mg PO or 400mg IV q12h x 7-10 days in adults
Children PO 15mg/kg q12h or IV -10mg/kg q12h PO x 7-10 days
Cefixime PO 200 mg BID x 10-14 days
Children 20/kg in 2 divided doses
Azithromycin: Adult: 500- **1 g** PO daily x 5-7 days
Children: 10-20 mg/kg (up to 1 g) daily x 5-7 days
With Ciprofloxacin resistance (SE Asia), 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)
Septra 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.
Mortality is 14-34% with perforation.
Vaccination – only covers S. Typhi and not S. Paratyphi

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

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

Cefuroxime
Adults: > 12yo: 250mg BID x 7 days for uncomplicated infections
2 - 12yo: 15mg/kg(max 250mg) BID x 7 days.

3mos – 2yo: 10mg/kg(max 125) BID x 7days

Complicated: Amoxicillin-clavulanate 875 mg orally 2 or 3 times daily for 7 days OR
Ciprofloxacin 500 mg BID x 7-10 days
Pyelonephritis: Ceftriaxone 1-2 g IV daily x 7 days
Ciprofloxacin 500 mg IV BID x 7 days
Cefipime 1g q12h
Change to PO drug when appropriate
In pregnancy, co-trimoxazole (septra, bactrim) can be used in the 2nd trimester. Cipro should be avoided.

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

Adult Medicine

Acute psychosis

The anti-pyschotic injectable drugs include chlorpromazine (Largactil) and Fluphenazine. A typical dose of chlorpromazine is 50-100 mg IM acutely followed by 25mg PO b.i.d. Valium is also available for sedation. Fluphenazine decanoate IM is a maintenance anti-psychotic drug dosed 12.5 mg to 100 mg IM q3-6 weeks. Use Z track injection technique to prevent leakage.
Oral anti-psychotics include Risperidone 2mg, Olanzapine 5 mg and Chlorpromazine 50 & 100mg.

Alcohol Withdrawal

Syndrome	Clinical Findings	Onset after last drink
Minor withdrawal	Tremulousness, mild anx, HA, diaphoresis, palpitations, anorexia, GI upset, normal MS	6-36 hrs
Seizures	Generalized tonic-clonic, short postictal	6-48hr
Alcoholic hallucinosis	Visual/auditory hallucinations, orientation intact, nml VS	12-48hr
Delirium tremens	Delirium agitation, tachycardia, HTN, fever	48-96hr

- If in active delirium tremens: Phenobarbital 260mg IV once, then 100mg PO Q8hr x6 doses, then 60mg PO TID x6 doses, then 30mg PO TID x6 doses.
- If h/o DT: 100mg PO Q8hr x6 doses, then 60mg PO TID x6 doses, then 30mg PO TID x6 doses.
- If no h/o DT or mild withdrawal: 60mg PO TID x6doses, then 30mg PO TID x6 doses.

- Supplement with diazepam 5mg PO or IV Q4hr PRN agitation
- Fluids: DS NS @maintenance rate. Be mindful that pt may be severely hyponatremic and rapid correction ca be dangerous; switch to PO supplementation ASAP.
- Supplements: daily multivitamin, folate 5mg, thiamine (if available), KCl 600mg tab (can start with KCl IV if not taking PO). Also add Mag sulfate if severe withdrawal.

Anemia, including transfusion guidelines

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), Iron 3 Polymaltose (50mgof elemental iron)
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 – **patient condition** dictates transfusion threshold decisions:
Malaria if Hb<4 or if very ill Hb<6 (Tendency at BMC to transfuse Hb<6 or Hct<18)-transfuse 20 ml/kg whole blood if febrile and 30 ml/kg if nonfebrile – if not severe, use conservative measures.
For adults the restrictive threshold is Hb =7.
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
Prevention- Iron supplementation for children when combined with malaria prevention program, menstruating females and pregnant women, malaria control, deworming, delayed cord clamping (**60 seconds**)

Asthma (Adult & Pediatric):

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 or 3gm for a 60 kg person see OB for ml of MgSO4) over 20 min. (MgSO4 not in Ghana Protocol)
Salbutamol oral (1-5 y) child 2mg tid) is available.
Acute –exacerbation
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.

N.B. The WHO recommends following GINA guidelines but access to ICS, LABA's and SABA's are limited. Check with pharmacy for availability.

Burn Resuscitation

WHO – 100ml/kg/24hr (ORS or IV) for burns > 20% (ORS = 1 level tsp salt + 8 level tsp of sugar per liter of clean water) – probably underestimates volume necessary
Modified Brooke Formula - 2ml/kg x TBSA over 24 hrs with ½ volume given in the first 8 hours and the rest in the 2nd 16 hours
OR alternatively
40-80 kg person – 10ml/hr x TBSA burned (2nd and 3rd) = vol/hr
e.g. 70 kg person with 40% burn – 10 x 40 = 400 ml/hr or 9600/24hrs
Urine Output at 0.5ml/kg/hr in adults and 1ml/kg/hr in children <30kg
Use palm technique to estimate burn size – one palm =1% TBSA

Wound care – first aid: cool running tap water x 5 minutes
Dressings – honey, hydrogel, antibiotic ointment better than silver sulfadiazine – if not available cover with clean dry cloth
Local Materials – apply honey directly to wound or gauze – change qd or prn depending on exudate or infection (then bid) (unprocessed, non-heated or pasteurized local honey retains antimicrobial and enzymatic properties), do not dilute honey
May cover honey with a banana leaf with waxy side to wound

No need for prophylactic antibiotics

Constipation: Lactulose 3.7gram/5 ml 15-30 ml qd or bd and Bisacodyl 5 mg

Diabetes: Metformin 500mg tab (500-2000 mg divided bid) is available. Glibenclamide 5mg (2.5-5mg qd-bid) and Glimperide(preferred) 2 or 4mg tabs (1-8 mg qd) are the sulfonylureas available. Insulin availability is variable. Insulin 70/30 is available along Regular insulin 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). A1C can be obtained in local private labs

Gastritis/Ulcer/GERD/Dyspepsia

Ranitidine, Omeprazole (20 &40mg , Metoclopramide, Aluminum hydroxide, and Magnesium Trislicate available
H. Pylori – Amox 1gram bid (or 500mg TID), Flagyl 500 BID, Omep 20 BID x 10-14 days

Head Trauma: **1.**Elevate head of bed 30-45 degrees, 2. O2, 3. Normocapnia, 4. deepening sedation and analgesia, 4. normovolemia,5. Temperature control, 6. Seizure control,
7. Increased ICP - Mannitol 0.25-1 gram/kg IV over 30 minutes or Manitol 2% 250 mg q6-8h if have ICP monitoring but if no ICP probe give 1.4mg -2.1 mg/kg as single dose and repeat dose if clinical signs persist and renal function is stable, 8. Stress ulcer PPx, 9. enteral nutrition, 10. Glycemic control. 11. Hgb>7

A Glasgow Coma Score (GCS) 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.

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

Hypertension: First line is bendroflumethazide (BDFZ) (thiazide diuretic), 2.5 or 5 mg (no evidence that 5 mg lowers better than 2.5).
Beta-blockers are atenolol (50-100mg daily divided bid) and Carvedilol 6.25 mg tabs,
ACE/ARB is lisinopril (5-80 mg qd), losartan (25-100mg qd),
calcium channel blockers are nifedipine sr 20 mg qd or bid. and Amlodipine 5- 10 gm qd.
For other diuretics we have furosemide (20–80 mg qd), aldactone (25-100 qd)
Also aldomet (250-2000 mg daily in 2-4 divided doses), and propranolol (40-240 divided bid) are also available.

Nephrotic Syndrome: The most common cause in children is Minimal Change Disease.
Treatment is with salt restriction (2-4 g/day), furosemide (oral 2mg/kg once or twice daily, IV 1-2mg/kg and repeat in 6hrs) to control edema done with caution to avoid hypovolemia, and using Lisinopril to control hypertension. Prednisone is initiated at 2 mg/kg/day until remission based on urine protein (or 4 wks) and then continued at 1.5 mg/kg/day on alternate days for 4-8 wks
Treatment in adults depends on etiology.

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.

Scorpion Bite: The scorpion bites produce primarily a local effect of severe pain. Rarely is there systemic envenomation. Treatment is with local or digital 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 IM Q3-4 hour PRN. If given IV, dilute prior to use and administer slowly. Also available are Morphine, Fentanyl and Tramadol injections.
For severe reactions such a hypotension (Dobutamine), autonomic storm with hypertension (treat with prazosin 30 mcg/kg/dose q3h x2-4doses and antivenom), neuromuscular agitation (benzos), pulmonary edema (nitro), tetanus prophylaxis

Sickle Cell (Adult & Pediatric)

Routine: Penecillin Prophylaxis (<2) 125 bid and 250 bid (>2) up to 5 yrs and later if no Pnueumoccal 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 to a Hgb of 9.
Syndromes: .
Osteomyelits–Staph, Salmonella (IV for 1st 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-Occulusive (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

Skin ulcers: Most of the *Tropical Ulcers in Northern Ghana are* caused by polymicrobial infections of Fusobacterium (primary organism) Staph, Strep, H. Ducreyi, T. Pallidum pertenue (Yaws). Treatment is with basic wound care with washing with soap and water, clean dressings, debridement and appropriate antibiotics.
Metronidazole 1g/d for 2 weeks for Fusobacterium and Azithromycin 30mg/kg in one dose covers H. Ducreyi and Yaws. Flucloxacillin will cover Staph.

Buruli Ulcers (common in S. Ghana, but also in N. Ghana) Caused by Mycobacterium ulcerans and treated with Rifampin 10mg/kg and Clarithromycin 15mg/kg PO once weekly for 8 weeks. Diagnosis with PCR but can use AFB smears for Dx in our situation.

Yaws Treated with Azithromycin 30mg/kg in one dose or with benzathine penecilin.

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 follow-up plan, as in See the Doctor in ?#of days.

Snake Bite:

The most common poisonous snake is the carpet viper (Echis ocellatus). 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.
There is no evidence for prophylactic oral or IV antibiotics for the bite of either snake.

Transfusion Reaction

1. Stop the blood
2. IV normal saline
3. Adult-hydrocortisone 200 mg IV child-hydrocortisone 100 mg IV
4. Promethazine (Phenergan) Adult 25 mg IV

Anaphylaxis –In Ghana A patient with an apparent anaphylactic reaction (eg, hypotension, wheezing, angioedema) should promptly receive intramuscular (IM) epinephrine, preferably to the mid-outer thigh. The recommended dose of IM epinephrine for patients of any age is 0.01 mg/kg (maximum 0.5 mg), which requires use of a **1 mg/mL solution**. The dose may be repeated every 5 to 15 minutes (or more frequently) if needed. Patients weighing >50 kg can be given 0.5 mg IM (0.5 mL of the 1 mg/mL solution). In some countries other than the United States, 1 mg/mL solution may be labeled as 1:1000.
Patients > 25kg – 0.3 mg 10-25 kg 0.15 mg

In severe cases such as impending cardiovascular collapse refractory to IM epinephrine and volume resuscitation, a slow intravenous bolus of epinephrine is indicated, ideally with hemodynamic monitoring while an epinephrine infusion is prepared. In adults, the intravenous epinephrine dose is 0.05 to 0.1 mg, which requires 0.5 to 1 mL of a **0.1 mg/mL solution**; this

preparation is typically stocked on resuscitation carts as a syringe (1 mg epinephrine in 10 mL). In some countries other than the United States, the 0.1 mg/mL solution may be labeled as 1:10,000.
Intravenous fluids (saline) and an H1-antihistamine diphenhydramine, 25 or 50 mg orally or intravenously, for itch or angioedema) may also be administered.
Severe Bronchospasm is managed by inhaled bronchodilators.

Standard USA Protocol
Initial Early Management is Loratadine 10mg and Famotidine 20-40 mg. If patient develops at least 2 signs of impending anaphylaxis such as (Airway swelling, Diffuse hives, Hypotension, SOB, wheezing, confusion, persistent abdominal pain, chest pain, collapse) give Epinephrine 0.3 ml – 0.5 of a 1 mg/ml solution (1:1000 solution). If no improvement in 5-15 minutes, repeat Epinephrine. If no improvement give Methylprednisolone 80-125 mg IV or 40-60 Prednisone orally, Diphenhydramine 25-50 mg IV, IV Crystalloid (RL or NS) 2 liters if hypotensive, O2, Albuterol for wheezing.

Pediatrics

Anemia, see above under Adult Medicine & Infectious Disease (Malaria section) and below under Malnutrition

Apnea of newborn or persistent respiratory distress (last resort): Serious Bacterial Infections above under ID.

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.
If available, Caffeine citrate 20mg/kg IV over 10 minutes followed by 5mg/kg IV or PO (feeding tube) q24h + Bubble CPAP

Dehydration, see above under Infectious Disease (Diarrhea in Children section)

Hypoglycemia in Newborns

At Risk infants – Diabetic mother, SGA, IUGR, LGA, Late Preterm, perinatal stress, asphyxia
Key – Early breast feeding within 30 minutes + Dextrose Gel if availabe
Dextrose 10% 4ml/kg bolus and *immediately* followed by maintenance fluids:
Day 1—D10% at rates below
Day 2 and subsequent, D5% 0.9NS but move to PO/NGT ASAP

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 ml/kg/day
Day 2	90	70
Day 3	110	90
Day 4	130	120

Day 5 150 120

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.
There is an outpatient malnutrition program in which patients may graduate to, for post-hospital management. For those with **severe complicated malnutrition** it may be necessary to hospitalize the patient. This would include patients with sepsis, pneumonia, failure of outpatient care and general instability. 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.

Criteria – Z score < (-3), MUAC < 115mm, pitting edema Admit those with medical complications (severe infection, hypoglycemia, hypothermia, dehydration and shock), <6mos, edema

Complicated Severe Malnutrition –Watch for TB!
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 alternating with F-75 feeds
When hydrated start milk (F-75 if available) feeding 130mL/kg/day (100 ml/kg for edematous children) if fails Appetite Test. As child improves, advance to F-100 formula.

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 with close monitoring.
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.

Hypogylcemia - 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. Check RBG q4-6h for 1st 24-48h.

Hypothermia – Maintain ambient temperature above 25C (77F)

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 Ceftriaxone in meningitis doses. Consider TB and HIV.

Anemia – for Hgb <4, or 4-6 in the very sick give **10**ml/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 **Xeroopthalmia** 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. Do not give Fe in resuscitation phase as may worsen infections.

Sensory stimulation and emotional support – key to cognitive and developmental recovery

Uncomplicated Severe Malnutrition
This includes children 6 through 59 months of age, severe acute malnutrition (SAM) is defined by anthropometric criteria using mid-upper arm circumference (MUAC) <11.5 cm, weight-for-height Z-score (WHZ) <-3, or bilateral pitting edema with a good appetite (able to consume approximately 30 grams of ready-to-use therapeutic food (RUTF) and without significant infection.)

1. **Provision of ready-to-use therapeutic food (RUTF)**. The most common RUTF is a peanut-based paste that is readily taken by most children >6 months
2. **Brief course of empiric oral antibiotics** – For all children with SAM managed as outpatients in a resource-limited setting, we suggest empiric treatment with a brief course of oral antibiotics (eg, amoxicillin or cefdinir for seven days Amoxicillin (1mos -1yr 125mg PO bid x 10d, 1-5yr 250 bid x 10d, 5-18yr 500 bid x10d.)
3. **Regular follow-up**
4. **Discharge from treatment** – World Health Z score >-2, Mid upper arm circumference>12.5

Neonatal Feeding

<32 wk Gestational Age 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 3rd 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

Pediatric Maintenance Fluids 2 methods of calculation using NS as the preferred solution

1. 1st 10kg 100ml/kg/dy, 2nd 10kg 50ml/kg/dy, Each added kg 25mg/kg, add 10% every degree of fever.
2. <10 kg 4ml/kg/hr, 10-20kg 40ml/kg/hr for the 1st 10 kg plus 2ml/kg/hr for each added Kg > 10, 20-80kg, 60ml/kg/hr for the 1st 20kg then 1ml/kg/hr for each added Kg>20, max 2.5 liters/day

Seizures, see above under Infectious disease (Malaria section)
Diazepam OR Phenobarbital 10mg/kg stat and then 3-5 mg/kg PO/IV daily

Serious Bacterial Infection of the Neonate (< 1 mo), see infectious disease above

L&D Culture at BMC, notes from D. Smith regarding how OB at BMC differs from in the US

- BMC is a referral site for high risk OB, be prepared for high M&M. You may see complications including uterine rupture, eclampsia, and maternal and neonatal death
- There are significant differences in the approach to HTN in pregnancy, see below for details
- Local L&D culture is to prefer C-sections over IOL, partially given limited FHR monitoring
    - You will likely get push back for attempting IOL for anything but late term, including if doing IOL for indications that are considered standard per ACOG (i.e. pre-eclampsia at term, twins at 38wk, etc.)
- IOL starts in the morning, regardless of the hour that orders were placed (i.e. if you want to start IOL for pre-eclampsia with severe features at 10PM, you must state, "now," in your orders and talk with the head midwife) – you will get push back if you try to start an induction at night, even if it is medically indicated
- Women are hospitalized for 6hr s/p NSVD or 3 days s/p CS
- IUFDs are common:
    - If d/t obstructive labors, destructive procedures (ex. Cephalocentesis in setting of hydrocephalous) are performed to allow for NSVD
    - The fetus should remain attached to the placenta for burial, do not cut the umbilical cord
- Even for preterm infants, formula or fortified breastmilk is not well-accepted
- Local providers did not benefit from NRP training and don't prioritize respiration during neonatal resuscitations; try to help focus efforts on opening airway and bag-mask breathing
    - There is a high tolerance for what would be considered a low APGAR in the US, you may get push back for trying to be aggressive with NRP
    - You may need to scrub out of a CS to assist in NRP if the infant is not immediately vigorous
- High prevalence of twins, the 2nd born is considered the older because he/she sent the first twin out to assess the situation
- Babies are named for the day of the week they are born until their naming ceremony of DOL#7
- You will be frequently asked to check fetal presentation and positioning using your butterfly US that you borrow from Vince

Abruption of Placenta

Pathophysiology: Detachment (often partial) of placenta from uterus before delivery
Signs and Sx: Vaginal bleeding (may be occult), uterine tachysystole, uterine tenderness and/or increased tone between contractions, non-reassuring fetal heart, constant abdominal pain
Management:

1. Assess clotting, failure to clot in 7min = coagulopathy
2. Maternal resuscitation efforts as needed: IVF, transfuse fresh whole blood
3. Delivery:
    a. If term, perform IOL if stable or CS if patient is unstable, non-reassuring FHR present, or remote from delivery
    b. If preterm, administer steroids (see dosing below under, "Preterm Labor")
        i. If bleeding resolves, patient stable, and FHR is reassuring, monitor for 7 days and then plan for IOL at 37 wk
        ii. If severe hemorrhage or concern for worsening maternal or fetal status, deliver

Augmentation of Labor **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 RL/NS (or 2.5U/500ml RL/NS)
- Start drip at 8 drops (2mu/min), increase by 8 drops/min every 30 minutes to a maximum rate of 48 drops (12 mu/min), titrating according to the contraction pattern
- If fetal distress occurs, DC the Oxytocin gtt, place patient on her left side, and administer IVF

Caesarian Section Orders

*Only the patient's spouse or male family member (i.e. not the patient) can consent to a BTL

Pre-OP Orders
NPO and Notify theater of C-Section
Sign consent
IV NS 1 liter bolus
Urinary Catheter to drainage
Amox-Clav 1.2 grams IV stat
FBC (full blood count), BF now
GXM (Group and Match)

Post-OP Orders
Return to ward or transfer to recovery
NPO for 6 hrs after CS
VS Q15min until stable
IV NS 1L in 24 hrs, IV RL x 24hrs, IV Dex/NS 1L x 24 hrs
Advance diet as tolerated
Urinary Catheter to drainage
Cytotec 800 mcg rectally stat in OR x 1 dose
Amox-Clav 1.2 grams Q8h x 24 hrs
Gentamycin 80mg IV Q8h x 24 hrs
Amox-Clav 625 mg Bid x 5 days.
Morphine 10 mg IM q8hrs x 24hrs
Diclofenac supp 100 mg BD PR x 3/7
Paracetamol 1,000mg PO Q8h x24hrs
HGB in AM

On case by case basis add blood transfusions, Oxytocin (20-40 units added to 500 ml or1L of NS over 4-6 hrs and tranexamic acid (1g q8hr x 24 hrs)
**On POD#1, change antibiotics to Amox-Clav 625mg PO Q12hr x5 days
***Use, "RL" (Ringer's lactate) rather than, "LR" (which won't be understood)

Cord Prolapse

Diagnosis: umbilical cord palpated or visualized distal to presenting fetal part s/p ROM
Rx: Trendelenburg, fill bladder, with hand maintain upward pressure on presenting fetal part until stat CS, proceed with NSVD in setting of IUFD

- You may be the only person available to elevate the presenting fetal part; if the ORs are occupied, be prepared to stay there for some time
- Given no continuous fetal monitoring, may have to ask someone to bring you a Doppler intermittently to auscultate the HR of the fetus

Chorioamnionitis/Intra-Amniontic Infection (IAI)/Triple I:

Prophylactic Antibiotics for the following – C-section, Group B Strep, Manual Placental Removal, 3rd and 4th degree perineal tears, Pre-term ROM

Diagnosis: Intrapartum fever to 39C (102.2F) once or intrapartum fever to 38-39C (100.4-102.1F) with 1 of the following: FHR > 160 x10min, maternal WBC > 15, or purulent discharge from the cervical os. (ACOG used to also include maternal tachycardia and fundal tenderness in diagnostic criteria)

**In July 2024, ACOG provided an interim update stating it is reasonable to treat even without maternal fever if other signs or symptoms exist raising concern for infection; this is especially true in cases of previable prelabor ROM.

Rx: Be prepared for PPH, infection predisposes the uterus to atony → labor dystocia & PPH

- First line: Ampicillin 2gm IV Q6hr AND gentamycin 5mg/kg daily
- Reasonable alternative in Ghana: Amox-Clav 1.2 gm IV Q8hr
- Duration of antibiotic: Until delivery if NSVD OR continue for 24hr s/p delivery if CS
- Cover infant for SBI; in the US, labs risk stratify infants so that antibiotics are deferred in some

Criminal Abortion: Self-induced SAB, patient is charged double the cost of treatment for a SAB.

Endometritis

Diagnosis: Fever x2d on postpartum days 2-10, +/- uterine tenderness and foul-smelling discharge Rx: Targeting polymicrobial infection

- UpToDate: Clindamycin 600mg PO Q6hr + Gentamycin 4.5mg/Kg IM Q24hr until afebrile 24hr
- BMC Protocol has included combination of 3 antibiotics, change to PO once 48hr afebrile
    - 1st Antibiotic (Choose one): Amox-Clav 1.2gm IV Q8hr, Ampicillin 2g IV/IM and then 1 g IV q6h, Chloramphenicol 1g IV/IM q6h, OR Ceftriaxone 1-2 g q24 hrs
    - 2nd Antibiotic: Metranidazole 500 mg IV q8h
    - 3rd Antibiotic: Gentamycin 80 mg IV/IM q8h

Hepatitis B in pregnancy: Please see appendix at end of protocols

Hyperemesis Gravidarum: Diagnosis: 10% weight loss related to nausea/emesis of pregnancy

Rx (Mild): Metoclopramide 10mg po tid prn or Promethazine 25-50 mg tid prn

Rx (Severe): NS alt with D5W, Metoclopramide 5-10 mg q8h prn and Promethazine 25-50 q8h prn

Hypertension in Pregnancy

TABLE E-1. Diagnostic Criteria for Preeclampsia ⇦

Blood pressure	• Greater than or equal to 140 mm Hg systolic or greater than or equal to 90 mm Hg diastolic on two occasions at least 4 hours apart after 20 weeks of gestation in a woman with a previously normal blood pressure • Greater than or equal to 160 mm Hg systolic or greater than or equal to 110 mm Hg diastolic, hypertension can be confirmed within a short interval (minutes) to facilitate timely antihypertensive therapy
and	
Proteinuria	• Greater than or equal to 300 mg per 24-hour urine collection (or this amount extrapolated from a timed collection) or • Protein/creatinine ratio greater than or equal to 0.3* • Dipstick reading of 1+ (used only if other quantitative methods not available)
Or in the absence of proteinuria, new-onset hypertension with the new onset of any of the following:	
Thrombocytopenia	• Platelet count less than 100,000/microliter
Renal insufficiency	• Serum creatinine concentrations greater than 1.1 mg/dL or a doubling of the serum creatinine concentration in the absence of other renal disease
Impaired liver function	• Elevated blood concentrations of liver transaminases to twice normal concentration
Pulmonary edema	
Cerebral or visual symptoms	

* Each measured as mg/dL.

Diagnosis: Per ACOG 2013 update on Diagnosis & 2019 update on treatment

- Chronic HTN: BP > 140/90 x2 4hr apart prior to 20wk GA
- Gestational HTN: BP > 140/90 x2 4hr apart > 20 wk GA in the absence of proteinuria
- Pre-eclampsia without severe features: BP > 140/90 x2 4hr apart > 20 wk w/proteinuria
- Pre-eclampsia with severe features: BP > 140/90 with severe feature > 20wk GA
  - Severe features: BP > 160/110, Plt < 100, AST or ALT > 2x ULN, Cr 2x BL or 1.1, pulmonary edema, or cerebral/visual symptoms
  - Proteinuria not required for diagnosis if elevated BPs and severe feature
- HELLP: Hemolysis, elevated liver enzymes, and low platelet count
- Eclampsia: Tonic-clonic seizure in the setting of pre-eclampsia

Management (per ACOG):

- Chronic HTN: Per CHAP trial, should treat BP >140/90, start ASA @12wk, serial growth scans
  - If controlled w/o medications, deliver ~38 0/7 to 39 6/7
  - If controlled on medications, deliver ~37 0/7 to 39 6/7
  - If difficult to control, deliver ~36 0/7 to 37 6/7
  - Meds in Ghana: Methyl-dpa, Nifedipine (no PO labetolol)
- Gestational HTN: Assess Q wk for pre-eclampsia (proteinuria, severe feature), deliver at 37wks or at diagnosis if diagnosed later (if severe range pressures, deliver at 34wks or at diagnosis if dxd later)
- Pre-eclampsia without severe features: Monitor BP, deliver at 37wk or at diagnosis if dxd later
- Pre-eclampsia with severe features: Deliver if > 34 wk, balance of risks/benefits if < 34wk
  - Eclampsia PPx: MgSO4 IM 5g (one 10 mL vial) in each buttock (10g total), followed by 5 g IM Q4 hours until 24hr s/p delivery

    - Hypertensive urgency (if BP > 160/110): nifedipine 10mg PO Q20-30min (max 30mg) OR hydralazine 5-10mg IV/IM Q20-30min until BP < 160/110 OR labetalol IV 20mg
        - may receive pushback from nursing if trying to increase dose of medication or give a second dose of medication
- Eclampsia: start with basic supportive measures such as calling for help, prevention of maternal injury, placement in lateral decubitus position, prevention of aspiration, administration of oxygen, and monitoring vital signs including oxygen saturation. BP control as above, FHR changes typically transient and seizures usually self limited
    - MgSO4: 4-6gm (8-12 mL of 50% soln mixed with 12-18 mL of NS for 20-30mL load over 20min), then 5gm IM Q4hr until 24hr s/p delivery
    - If refractory repeat loading dose of MgSO4, can also give Valium 5-10mg IV PRN
    - Once the patient is stabilized, proceed to delivery. Method of delivery should depend on gestational age, fetal presentation, and the findings of the cervical examination. A high rate of failure may be anticipated with induction or augmentation in pregnancies less than 30 weeks of gestation if the patient is not in active labor and the Bishop score is unfavorable. In these cases, it may be preferable to opt for cesarean delivery without further delay.

*Although BP is only treated in pregnancy if > 160/105-110, postpartum Rx threshold is 140-150/90-100 (depending on which guideline you use)
Similarly, although ACOG still uses these parameters, in the US, there has been a movement towards BP goal < 140/90 for all women (cHTN/PEC/gHTN both antepartum & postpartum).

Differences in approach to HTN in pregnancy/local practice at BMC:

- Local providers are hesitant to treat elevated diastolic BPs (i.e. when systolic BPs are wnl)
- Dx of severe pre-eclampsia is per the 2002 ACOG Practice Bulletin (not with the 2013 updates)
    - Additional criteria include: BP 160/110 6hr apart (rather than on repeat ~15min), 3+ proteinuria, oliguria, RUQ/epigastric pain, IUGR
- Per the 2017 Ghana Treatment Guidelines (by the Ministry of Health):
    - Published guideline has 150/100 as treatment threshold (instead of 160/110 for PEC per ACOG or 140/90 for cHTN per CHAP) and states risk of fetal distress with lowering BP < 140/90 but this was routinely done in the prenatal clinic at BMIC in March 2019
    - These Ghanaian guidelines don't discuss timing of delivery but it seems local practice is to give anti-hypertensives and wait for spontaneous labor
- Sometimes you will have to ask multiple times for magnesium/antihypertensives to be administered, and must wait until you see they are given to make sure they are administered in a timely fashion

Malaria in Pregnancy, see above under, "Infectious Disease"; also Prenatal Prophylaxis

Malpresentation

External Cephalic Version: ~50% success rate (higher if with spinal or terb), breech/transverse

- Ideal candidate: multip, 37 wk, fetal head not engaged, adequate AFI
- Contraindications: prior CS (relative), abruption, multifetal gestation, ROM, severe HTN
- Procedure:
    1. POCUS: Assess AFI, confirm fetal presentation and lie, assess for fibroids/bicornuate uterus
    2. Relax the uterus: spinal OR salbutamol 1 vial (Terbutaline 0.25 ml) subQ 5-10 min prior to procedure OR MgS04 5gm IM 30min prior OR Salbutamol PO (equivalent to Albuterol 4 mg) 60min prior
    3. Lubricate abdomen generously

4. Have 1 clinician apply upwards pressure on the presenting fetal part while another clinician flexes the fetal head towards the fetal chest and applies continuous pressure. Every 1-2 min, stop to assess FHR.
5. Following procedure, check FHT Q5min x 30min

Breech: NSVD reasonable if complete or frank breech and clinician experienced with breech NSVD available (endorsed by ACOG since July 2018 following repeat analysis of Term Breech Trial)

- Contraindications: footling breech (d/t cord prolapse risk), macrosomia, inadequate pelvis, fetal head extension
- CAREFUL mnemonic from ALSO: **C**heck dilation/presentation/cord, **A**wait umbilicus (hands off), **R**otate arms, **E**nter for MSV (don't put finger in fetal mouth), **F**lex head, back **U**p, **L**ift baby
- Strategies for head entrapment: Suprapubic pressure, Duhrssen's incisions (cutting anterior cervix at midline), symphysiotomy, nitroglycerin (100mcg IV)

Misoprostol Dosing per misoprostol.org, regimens updated 2017

Contraindication: prior uterine scar d/t increased risk of uterine rupture (can use if < 28wk GA)
Associated Risks: uterine tachysystole, meconium-stained amniotic fluid

- Common side effects: GI upset (especially if PO or SL), fever, shivering

For cervical ripening at BMC: Initial dose 25ug given in AM and continued Q4hr until 2-3cntx/10min
Incomplete SAB/retained POC: D&C v. MVA are standard of care over expectant mgnt d/t poor f/u

<13 weeks' gestation	13–26 weeks' gestation	>26 weeks' gestation[8]	Postpartum use
Pregnancy termination[a,b,1] 800µg sl every 3 hours *or* pv*/bucc every 3–12 hours (2–3 doses)	**Pregnancy termination**[1,5,6] 13–24 weeks: 400µg pv*/sl/bucc every 3 hours[a,e] 25–26 weeks: 200µg pv*/sl/bucc every 4 hours[f]	**Pregnancy termination**[1,5,9] 27–28 weeks: 200µg pv*/sl/bucc every 4 hours[f,g] >28 weeks: 100µg pv*/sl/bucc every 6 hours	**Postpartum hemorrhage (PPH) prophylaxis**[i,2,10] 600µg po (x1) *or* **PPH secondary prevention**[i,11] (approx. ≥350ml blood loss) 800µg sl (x1)
Missed abortion[c,2] 800µg pv* every 3 hours (x2) *or* 600µg sl every 3 hours (x2)	**Fetal death**[f,g,1,5,6] 200µg pv*/sl/bucc every 4–6 hours	**Fetal death**[2,9] 27–28 weeks: 100µg pv*/sl/bucc every 4 hours[f] >28 weeks: 25µg pv* every 6 hours *or* 25µg po every 2 hours[h]	**PPH treatment**[k,2,10] 800µg sl (x1)
Incomplete abortion[a,2,3,4] 600µg po (x1) *or* 400µg sl (x1) *or* 400–800µg pv* (x1)	**Inevitable abortion**[a,2,3,5,6,7] 200µg pv*/sl/bucc every 6 hours	**Induction of labor**[h,2,9] 25µg pv* every 6 hours *or* 25µg po every 2 hours	
Cervical preparation for surgical abortion[d] 400µg sl 1 hour before procedure *or* pv* 3 hours before procedure	**Cervical preparation for surgical abortion**[a] 13–19 weeks: 400µg pv 3–4 hours before procedure >19 weeks: needs to be combined with other modalities		

Postpartum hemorrhage:

Be prepared (i.e. known risk factors): multifetal gestation, polyhydramnios, fibroids, prolonged labor, chorioamnionitis, known coagulopathy, C-section, operative vaginal delivery, retained POC
Assess underlying etiology: atony (70%), trauma, tissue (retained), thrombin (coagulopathy)
Rx for atony: bimanual massage, misoprostol 800mcg SL, Oxytocin 20U IV in 500mL RL, "ergot" (ergonovine) 0.2mg IM/IV (may repeat dose every 2 to 4 hrs if needed, up to max of 5 total doses), Bakri balloon > in Ghana, this will likely be a condom catheter place in the cervix and inflated with NS, B-Lynch sutures, uterine artery ligation, hysterectomy, maternal resuscitation (IVF, blood)
-There is no hemabate/carbaprost available at BMC

Molar Pregnancy

Procedure prep: Cervical block with 10ml 1% Lidocaine at 5 & 7 o'clock at cervico-vaginal junction

- If size < 12wk GA: Misoprostol 400mcg SL 1hr before or PV 3hr before procedure
- If size > 12wk GA: Oxytocin 20U IV in 500mL RL at time of procedure

Procedure: Evacuation via suction D&C (often broken) or MVA, cannula size ≅ weeks GA
Post-Op Rx: Azithromycin 1gm x1
Follow-Up: Defer pregnancy for 1yr, avoid OCPs, give LARC or Depo

- Serial pelvic exams: Q2wk x3month, then monthly x3months, then Q6mo for total of 2yr
- Serial pregnancy tests: Q2wk until neg, then Qmonth x6month (should be neg by 8wk)
- Serial CXR: Monthly, then space once pregnancy test is neg

Point of Care Ultrasound

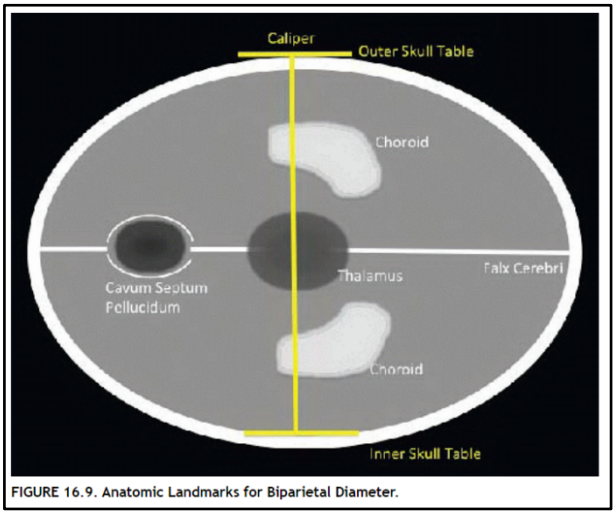

FIGURE 16.9. Anatomic Landmarks for Biparietal Diameter.

Fetal Biometry:

- CRL: Freeze, Calc, 1st Trimes, CRL, measure, select, set last point for measurement
- BPD: measure outer skull to inner skull; thought to be more accurate than FL at BMC

FHR via M-mode: OB exam, 2D mode, go to M-mode, adjust line to heart, Update, Freeze, Calc, choose FHR, measure between spikes (between 1 peak if iViz/Sonosite or 2 peaks if stationary US –
FHR OB mode, 2D mode, go to M-mode, adjust line to heart, Update, Freeze, Calc, choose FHR, measure between spikes – 1 peak.
AFI: Maintain curvilinear probe parallel to floor (not perpendicular to curve of gravid abdomen)

- AFI – Calc – 2nd screen – AFI, Select Pocket – save, measure each pocket scrolling down 1-4
- AFI is wnl if 5-25 or single deepest pocket 2-8

Premature Rupture of Membranes (PROM): ROM prior to the onset of labor at 37+ wk GA

Confirm Dx: fluid flowing from os, pooling, ferning, +Nitrazine test; if equivocal, assess AFI

Management: Some Ghanaian (& European) clinicians will discharge home w/expectant mgnt

- IOL with oxytocin per above gtt guidelines (no evidence to support prostaglandins in PROM)
- Monitor for signs of chorioamnionitis: fetal tachycardia, maternal fever, foul-smelling discharge
- Consider PCN for GBS PPx if ROM > 18hr; no universal GBS screening/PPx program in Ghana

Preterm PROM (PPROM): ROM prior to the onset of labor at < 37wk GA

Confirm Dx: As above. Also assess for infection, abruption, fetal heart rate, cord prolapse
Management:

- Expeditious delivery if intrauterine infection, abruption, non-reassuring FHR, risk of cord prolapse, or thick meconium
- If 34- 37 wk and stable plan to deliver, although new info suggests that expectant management until 37 weeks is acceptable. There is still benefit from neonatal steroids for fetal lung maturity.
- If < 34 wk and stable: administer latency antibiotics and neonatal steroids
  - Ampicillin 2gm IV Q6hr x48hrs (or Amox/Clav 1.2gm Q8h), then amoxicillin 500mg TID x5d
  - Alternative: Azithromycin 1gm at time of admission and repeat 5 days later
- If <32 wks in active labor, also add Mag Sulfate (4gm IV slowly over 20 min + IM protocol) for neuroprotection
  - Tocolysis: Goal = allow for admin of steroids. Defer if >4cm or evidence of chorioamnionitis
  - Balance of Risks: Maternal complications easier to manage than neonatal

Preterm Labor

Diagnosis: Regular contractions w/cervical change < 37wk GA
Management: Assess for underlying causes (infection, abruption, substance use, multiples, etc.)

- Steroids for fetal lung maturity: Administer from viability to 34 wk, consider 34-37wk
  - Dexamethasone 6mg Q12 IM x48hr
- Tocolytic therapy: Only administer if < 34wk and for 48hr while completing steroids
  - MgSO4: 6 g (12 mL) IV over 4 min, then 5 g IM Q4
  - Nifedipine : load with 30mg PO, if cntx persist at 90min repeat with 10mg. If labor is successfully suppressed, give maintenance dose of 20mg Q6 x24hr then Q8 x24hr
- Neuroprotection: If < 32 wk, Mag Sulfate (4gm IV slowly over 20 min + IM protocol)
- Periviable: Limit of viability at BMC is ~28wk, gather bag mask and oxygen prior to delivery

Trial of Labor After Cesarean (TOLAC):

Appropriate candidate if 1 prior low transverse CS (no h/o classical, T inversion or J extension). Although not an absolute contraindication, less ideal candidate if short inter-pregnancy interval; local practice at BMC is at least 2yr between deliveries to proceed with TOLAC. Likelihood of success is higher if prior NSVD, prior VBAC, normal BMI, and no prior CS for arrest of dilation or arrest of descent. Risk for uterine rupture is 1:200 with risk of serious M&M in 1:2,000. Prostaglandins increase the risk of uterine rupture

and are contraindicated. Local practice at BMC is to perform rCS rather than IOL with Oxytocin if a woman who would otherwise be a TOLAC candidate does not go into spontaneous labor by the end of 41wk GA.

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.

General Surgery

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 onset of action in 3-4 min)
These doses are on the low side.
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)
Pre-medicate with Atropine(0.015/kg or approx. 0.6 mg vial for an adult) and Diazepam (5-10 mg in adults)

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

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

Patient/Procedure	Marcaine (0.5%) Dosing	5% Heavy Lidocaine Dosing
Amputation	3 mL	
Hernia	3 mL	2 mL
Prostate	3.5-4 mL	
Adolescent (7yo)	2 mL	1 mL
C-section, small woman	2-2.5 mL *May repeat 2.5mL after 8-10min if 1st spinal fails	1.2 mL
C-section, medium woman		1.5 mL (2.5 mL if Lido is 2%)
C-section, large woman		2 mL

Chest Tube

Equipment (when bottles are unavailable): finger of a glove, urinary catheter tubing, chest tube Procedure: Tie finger of glove to tubing, cut small hole in glove (a one-way valve), connect the tubing to chest tube via a connector, place tube with glove under water in plastic/soda bottle.

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

Pre-Op Orders
Admit to Male/Female Ward
NPO after Midnight
Notify theatre of Hernia Repair in AM
Consent for Hernia Repair signed
Flucloxacillin 1gm IV in AM prior to surgery
(or Amox-Clav 1.2gm IV)
Postop Orders
Bedrest for 6 hours
May eat a regular diet
Pethidine 50mg IM Q4hr PRN pain
(or Diclofenac 75mg IM Q12hr)
Paracetamol 1,000mg PO QID PRN
(Don't write, "Tylenol"

Hernia, Incarcerated: 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 75mg IM) and/or diazepam 5-10 mg IV 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.

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- very painful.

Postoperative Pain Management

Adult: Pethidine (Demerol) 50-70mg IM Q4-6hr PRN or Diclofenac 75mg IM Q12hr PRN, Morphine 5-10 mg q6-8hr prn.
Children: Pethidine 1-1.75mg/kg (PO/SC/IM) Q3-4hr

Split Thickness Skin Graft

Equipment: Blades, Knife Handle, Mesher, Saline with Adrenalin, Roll Gauze, ACE, Vasoline Gauze
Procedure:

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.

Wound Vacuum: Apply gauze dressing, insert NG tube under gauze, wrap with Saran Wrap and carefully seal the entire dressing and NGT with tape, apply suction for 48 hours.

Rectal Prolapse – children

Causes – Malnutrition, Infectious (Trichuris, Ascaris), Neurologic conditions, others
Type 1 – Mucosal only – radial folds
Type 2 – Complete – concentric folds

Reduction –

1. Child in knee-chest position
2. Apply gentle, firm pressure to the tissue with a well-lubricated glove. May place finger in rectum to guide reduction. May take 5-15 minutes
3. Apply pressure dressing with lubricant, gauze and tape. May tape buttocks together to prevent recurrence.
4. If the rectal prolapse is very large and/or difficult to reduce, the clinician may apply either 50% glucose solution or up to one-half cup (113 g) of sugar over the prolapsed tissue to reduce the size of the swelling and permit manual reduction
5. If still unable to reduce, may attempt reduction under sedation or anesthesia.

Neonatal Resuscitation in Delivery Room

1. Assemble equipment – pre-heated warmer, bulb and mechanical suction, stethoscope, pulse Ox, bag and mask, laryngoscope blades (size 0&1), ETT (2.5,3,3.5), LMA, tape, Epinephrine diluted 1:10,000 (dilute 1ml of 1:1000 Epi with 9ml of 0.9 NS.)
2. Birth – is the infant term, have good tone, breathing/crying?
3. If not – warm, dry, suction, stimulate, position airway for 30 sec = ABC's
4. If gasping and HR<100 start PPV at 40-60 breaths/min – assess for chest rise, mask seal and head position
5. If HR<60 – Place ETT, start Chest Compression (90 comp. to 30 breaths – 3:1 Ratio), 100%O2
6. If HR<60 for 60 seconds – give IV (0.1-0.3ml/kg) or ETT (0.5-1.0ml/kg) of 1/10,000 epinephrine given q3-5 minutes until HR>60. Discontinue after 20 min of effective CPR and Epi.

A. If unable to inflate lungs with self-inflating bag & mask, may have to occlude pop-off valve to generate enough pressure to inflate lungs.
B. Consider LMA if unable to place ETT.
C. Normal Pox at 5 minutes is 80-85% and at 10 minutes is 85-95

Miscellaneous

Available laboratory/x-ray

Labs: CBC, blood film (malaria), stool exam, urinalysis, fasting and random blood sugar, sedimentation rate, hepatitis B and C, PH number (HIV), AFB sputum. 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). The lab available changes regularly. Lab not available at BMC may be ordered at Private Labs locally but often is of suspect quality.
X-ray machine: Login username = Iddi, password = 123 (Check for current UN and PW)

Transfer to Tamale

Tamale Teaching Hospital (TTH): 037-200-0180 apparently this number is Disconnected and you will have to have a personal contact in the ER to get approval.
Tamale Clinic Schedule: Gen Surg QD, OBGYN QD, Ortho Tues, Urology Fri, Neurology Tues
Ambulance: (Gambaga) 050-601-6616, David (Director) 054-518-2718, Cost C450
National ambulance-193

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.

Phone
Check Minutes *124#
Add Minutes *134*minute number#

“Cure sometimes, treat often, comfort always.” ~Hippocrates

Appendices

NONIMAGING WAYS TO DETERMINE LIKELIHOOD OF CIRRHOSIS:

-**PLATELETS BELOW NORMAL**
-APRI: measured AST/40 ÷ PLT count in "K" x 100:
If > 0.5, ≈ cirrhosis
Esp. for hep C/HIV/alcohol-related liver disease
-FIB-4 (use calculator) : Esp. for Hep C

Child-Turcotte-Pugh Class/one- & two yr **survival** without treatment:

- A=well-compensated disease; 100 & 85% survival
- B=significant functional compromise; 80 & 60% survival
- C=decompensated disease; 45 & 35% survival

Child-Turcotte-Pugh Classification for Severity of Cirrhosis			
Clinical and Lab Criteria	**Points***		
	1	2	3
Encephalopathy	None	Grade 1 or 2	Grade 3 or 4
Ascites	None	Mild to moderate (diuretic responsive)	Severe (diuretic refractory)
Bilirubin (mg/dL)	< 2	2-3	>3
Albumin (g/dL)	> 3.5	2.8-3.5	<2.8
Prothrombin time Seconds prolonged *or* International normalized ratio	<4 <1.7	4-6 1.7-2.3	>6 >2.3
***Child-Turcotte-Pugh Class obtained by adding score for each parameter (total points)**			
Class A = 5 to 6 points			
Class B = 7 to 9 points			
Class C = 10 to 15 points			