AAFP GLOBAL HEALTH SUMMIT

Primary Health Care and Family Medicine: Health Equity for All

Do No Harm: Diagnosis and Management of Diseases in East Africa Without a CT Scanner….or Mostly Anything Else

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I have no disclosures

GLOBAL HEALTH: SCIENCE AND PRACTICE
Dedicated to what works in global health programs
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COMMENTARY

Health Volunteers Overseas: A Model for Ethical and Effective Short-Term Global Health Training in Low-Resource Countries

Elizabeth MacNairn°

Three core attributes enable short-term volunteers to make incremental contributions to long-term outcomes at host institutions: (1) focusing on teaching rather than service delivery, (2) engaging in mutually beneficial and equitable partnerships with host institutions, and (3) operating within a structured management system.

Objectives

- Practice medicine within principles of humanitarianism
- Create your own Mary Poppins bag of tools and key resources
- Develop a road map for an effective approach to diagnosis and management
- Solve cases!

…ction

- **Humanity**: … purpose … respect fo…
- **Impartiality**: … alone, giv… adverse … belief, cla…
- **Independen**… economic… to areas …
- **Neutrality**: … in contro…

…r it is found. The …ealth and ensure …the basis of need …ss and making no …nder, religious …s from the political, …ay hold with regard …ited. …ostilities or engage …gical nature.

The Core Humanitarian Standard on Quality and Accountability

First Stop on our Road to Diagnosis

Know before you go

- EXTRA! EXTRA!
- READ ALL ABOUT IT!

- Read about the specific region where you will be working:
  - -Predeparture Preparation*
    - cultural humility/personal awareness
    - WASH (water, sanitation, hygiene)
    - health access
    - major causes of morbidity/death
    - malaria (how much and which type)

*Ethical Obligations regarding STGHE
Ann Inter Med 2018: 168:651-657

We will be in Kajiado County

--working primarily with Maasai
--all ages, including pregnant woman,
--mobile medical clinics
--direct patient care, partnership with hosts
--the closest hospital is 2 hours drive by car, longer by boda-boda
--dry season (less malaria)
--these are the lowlands (malaria!)
--increasing community resilience through partnering/mentorship

- Health Policy Project

Pack your Mary Poppins Bag

Do we have permission to treat?

esources

- Keny
  - http
- MSF
  - http://
- IMCI
  - https ?seq
- WHO
  - https =1
- Sanfo
- Micro
- UpTo

3.4 Acute Rheumatic Fever

This is an acute, systemic connective tissue disease related to an immune reaction to untreated group A beta haemolytic streptococcus infection of the upper respiratory tract in children. The major complication of this disease is cardiac involvement, which can eventually lead to severe heart valve damage. This is the commonest cause of heart disease in Kenyan children. The initial attack of acute rheumatic fever occurs in most cases between the ages of 3 and 15 years.

Clinical Features
- Major criteria: Migrating polyarthritis, carditis (signs of cardiac failure, persistent tachycardia, pericardial rub, or heart murmurs), Sydenham's chorea, erythema marginatum, and subcutaneous nodules.
- Minor criteria: Past history of rheumatic fever, raised ESR, fever, arthralgia.
- Diagnosis: 2 major and 1 minor or 1 major and 2 minor manifestations.

Investigations
- Anti-streptolysin-0-titre (ASOT) – titre of 1:300
- Throat swab for B-haemolytic Streptococci group A for C&S
- ESR
- Chest x-ray – features of cardiomegaly
- Electrocardiography
- Echocardiography

Management
- Eradicate streptococcal infection from the throat:
  - Amoxicillin 250–500mg (children 25–50mg/kg in divided doses) TDS for 10 days
  - If allergic to penicillin or amoxicillin, erythromycin 12.5mg/kg QDS for 10

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Basic Principles for DDX of Fever

- Don't get overwhelmed!
- Ask a local provider what they think it is (global humility)
- Consider local diagnoses early – what's going around the community?
- Look stuff up
  - Tropical Medicine book, UpToDate, WHO, local health statistics, national clinical guidelines
- Step back and look at broad categories (rheumatology, oncology)
- When thinking infectious, go from small to big
  - Viral
  - Bacterial
  - Protozoal
  - Helminth
- Fever duration is a big clue
  - < 14 days, > 14 days

It's your first day working in a mobile medical unit (MMU) set up in a school building

- A 9 year old girl arrives after school with a friend
- She looks tachypneic and appears acutely ill
- She collapses onto the floor and you rush to assist her
- She tells you she has a headache and her stomach hurts
- She has a fever to 39 deg

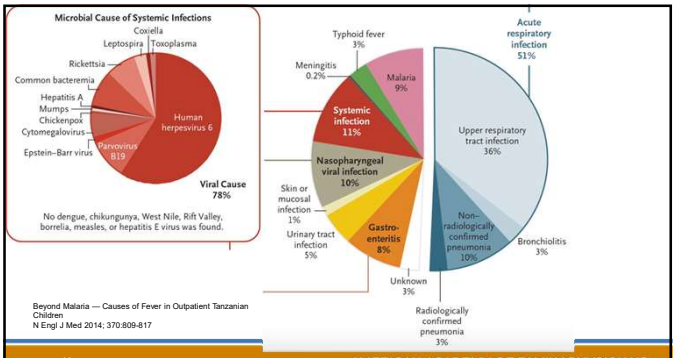
What infections might she have?

Acute Fever < 14 days
- Any virus
- Bacterial sepsis
- Pneumonia
- Typhus
- Borrelia
- Leptospirosis
- Typhoid
- Malaria

Chronic Fever > 14 days
- Any virus -relapsing fever
- HIV - Malaria
- TB -leishmaniasis
- Typhoid -HAT
- Borrelia -rickettsia
- Amebiasis/liver abscess
- Brucellosis
- Parasite (shisto/strongyloidiasis)

Take a Deeper Infectious Dive

- Viruses….
  - Influenza is less seasonal in the tropical areas
  - Plain ol' cold viruses
  - Hepatitis
  - HIV
  - Dengue/chikungunya (arboviruses)
- Bacterial—
  - Ear infections, pneumonia (common things are common)
  - typhoid, brucellosis, rickettsia, Leptospira, Borrelia (regional)
  - TB (in high burden areas)
- Protozoal
  - Malaria
  - Amebiasis/amoebic liver abscess/Chagas/trypanosomiasis/leishmaniasis
- Helminths—only a few cause fever
  - Schistosomiasis, strongyloidiasis



Beyond Malaria — Causes of Fever in Outpatient Tanzanian Children
N Engl J Med 2014; 370:809-817

Mortality among 5-17 year old children in Kenya [Pan Afr Med J.](#) 2017; 27: 121.

Clinical diagnosis at death	Number of patients	Percentage of total deaths
HIV/AIDS	29	18.10%
Malaria	27	16.90%
Anaemia	26	16.30%
Pneumonia	24	15.00%
Meningitis/encephalitis	17	10.60%
Tuberculosis	12	7.50%
Diarrhoea/Gastroenteritis	11	6.90%
Other injuries including burns	11	7.00%
Poisoning and/or suicide	8	5.00%
Sickle cell disease	7	4.40%
Tumours & Leukaemia	7	4.40%
Rheumatic fever and other heart diseases	6	3.80%
Intestinal obstruction	6	3.80%
Malnutrition	6	3.80%
Liver disease/Hepatitis	5	3.10%

We gathered a lot of useful information before we left

- In a health survey in 2010, the most common diseases among Maasai children included malaria 79%, diarrhea 71%, pneumonia 52%, and others including worms, malnutrition, and dental problems
- hypothesized causes of the conditions are contaminated water, consumption of contaminated foods, and poor ventilation of air in their living spaces
- Maasai are traditional pastoralists who live in close quarters with their cows/sheep

Second Stop on the Road to Diagnosis

-Disease prevalence and distribution helps you narrow down or add possibilities
https://www.healthmap.org/en/ Health Map
https://www.promedmail.org/ ProMED
https://www.istm.org/content.asp?contentid=326 Geosentinel
-work with your local health care providers
(mutually beneficial and equitable partnerships)
Global humility/learning from our host colleagues
Ask what illnesses are going around the community
-use your resources to looks stuff up

Physical Exam is your Best Friend

- Master your Physical Exam skills
  - https://www.accp.com/docs/positions/misc/PhysicalAssessmentCompendium.pdf
- Cardiac exam/murmurs
- Breath sounds/breathing patterns
- Skin findings
- Abdominal palpation

Infectious causes of fever according to localizing symptoms

Signs or symptoms	Possible aetiology
Meningeal signs, seizures	Meningitis/meningoencephalitis/severe malaria
Abdominal pain or peritoneal signs	Appendicitis/peritonitis/typhoid fever
Diarrhoea, vomiting	Gastroenteritis/typhoid fever
Jaundice, enlarged liver	Viral hepatitis
Cough	Pneumonia/measles/tuberculosis if persistent
Ear pain, red tympanic membrane	Otitis media
Sore throat, enlarged lymph nodes	Streptococcal pharyngitis, diphtheria
Dysuria, urinary frequency, back pain	Urinary tract infection
Red, warm, painful skin	Erysipelas, cellulitis, abscess
Limp, difficulty walking	Osteomyelitis/septic arthritis
Rash	Measles/dengue/haemorrhagic fever/Chikungunya
Bleeding (petechiae, epistaxis, etc.)	Dengue/haemorrhagic fever
Joint pain	Rheumatic fever/Chikungunya/dengue

MSF Clinical Guidelines Handbook

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Rapid Diagnostic Tests/POCT

WHO has a list of pre-approved RDTs
https://www.bio-connectdiagnostics.nl/ctk-biotech/cnt/page/6246

- Urinalysis
- Hemoglobin (Hb)
- Glucose (mmol x 18=mg)
- Pregnancy
- Malaria (*falciparum*)
- HIV (ISS)
- Hepatitis A, B, C, HEV
- Typhoid
- H. pylori

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Resource Tables

- Approach to Fever in the Returning Traveler
  N Engl J Med 2017; 376:548-560 February 9, 2017

https://www.nejm.org/doi/suppl/10.1056/NEJMra1508435/suppl_file/nejmra1508435_appendix.pdf

20 AMERICAN ACADEMY OF FAMILY PHYSICIANS

Fourth Stop on the Road to Diagnosis

- Use your POCT/rapid diagnostic tests to help rule in and rule out possibilities
- Urinalysis:
  -bilirubin, ketones, glucose, blood in urine (follow those clues)
- Glucose:
  -low in malaria, sepsis
- Hemoglobin:
  -often disease related eg. malaria
- Disease specific: HIV-5th vital sign
  -target endemic diseases

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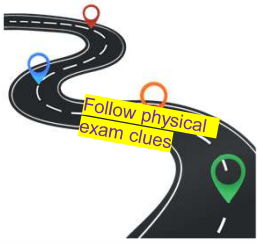
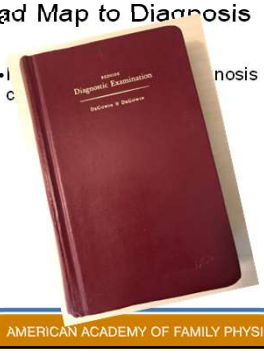
Third Stop on our Road Map to Diagnosis





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What Does She Have???

- Fever to 39 deg, tachycardic 110, tachypneic 20, BP 90/60
- Alert and oriented, no CNS/neuro signs, GCS =15
- HEENT- all normal
- Lungs are clear, heart is fast but normal
- Abd decreased bowel sounds, no hepatosplenomegaly, diffusely tender with guarding in the RLQ but no rebound
- What tests do you want?
  - Malaria RDT
  - UA
  - HB
  - Glucose
  - typhoid

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Sometimes You Just Have to Treat

-Provide supportive care
  -fluids (IV or ORS)
    -avoid fluid boluses if malaria is suspected
    (N Engl J Med 2011; 364:2483-2495)
  -anti-pyretics (paracetamol)
  -avoid NSAIDS if it might be a hemorrhagic fever (ie dengue)

- Treat the big killers if you can't figure it out
  - Malaria
  - Pneumonia/sepsis
  - Arboviruses

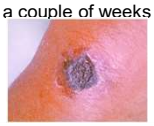
THE THREE CRITICAL ANTIMICROBIALS FOR THE "I-HAVE-NO-IDEA-WHAT-THIS-IS-FEVER"*

- Artemisinin based anti-malarials/ACT
  - If malaria is even remotely possible, treat
  - Remember that in hyperendemic areas, its possible to have chronic low levels of malaria AND another cause of the fever
- Third generation cephalosporin
  - This will cover bacterial pneumonia, leptospirosis, borreliosis, typhoid, bacterial meningitis
- Doxycycline: "don't let them die without doxy"
  -also helps with leptospirosis, covers arbovirus illnesses

* *shout out to Dr. Douglas Collins for his great presentation "approaching fever in the tropics" https://www.medicalmissions.com/

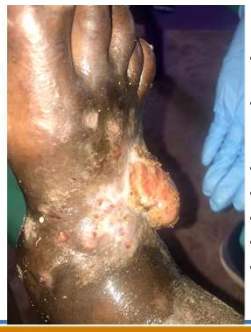
You've moved your MMU to a remote Boma

- 28 yo Maasai father of 3 comes in with a skin ulcer on his arm for 1 week, as well as feeling a little feverish for 5 days
  -the ulcer started as an itchy spot a couple of weeks ago



SHEEP!

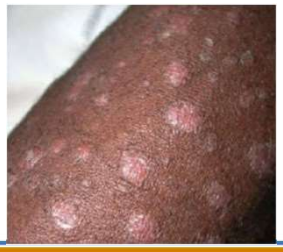
- leptospirosis;
- cysticercosis;
- zoonotic tuberculosis (TB);
- rabies;
- leishmaniasis (caused by a bite from certain sandflies);
- brucellosis;
- echinococcosis;
- toxoplasmosis;
- Q fever;
- zoonotic *trypanosomiasis* (sleeping sickness),
- hepatitis E;
- anthrax.



- 45 yo Massai female has had this foot lesion for 10 or so years
- She went to the local clinic (two hours away) and was told it was a "Maasai disease" with no further evaluation
- Walking is very difficult
- No fevers
- No one else in the Boma has this
- It all started by a thorn prick
- https://apps.who.int/iris/bitstream/handle/10665/272723/9789241513531-eng.pdf?ua=1

- 35 yo man comes in with a CC of a rash after a fish bit him a year ago
- He was fishing in the local river, and when he reached down to pull the fish out, it bit him between the web of his thumb and index finger, and he developed an ulcer which healed but now he has a persistent scaly rash and comes and goes for the past 12 months
- He is an otherwise healthy cow herd with 4 children
- He wife is currently pregnant

Scaly Rashes
beware the red herring



- follow the Road Map to diagnosis;
  - -history, prevalence
  - -Ask your host colleagues
  - -physical exam findings: follow the clues
  - -look stuff up
  - https://www.aafp.org/afp/2010/0315/p726.html
  - -use your rapid diagnostic tests

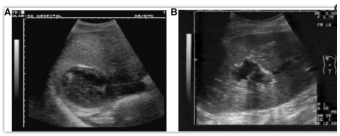
One Last Case for the Road

- 31 yo female comes in with about 4 week history of stomach discomfort
- She had some nausea, vomiting and fevers when it started
- She has some RUQ/epigastric pain on palpation, with hepatomegaly
- She is not jaundice and there is no splenomegaly

- Know before you Go
  - -H. pylori is endemic, leading to a high prevalence of esophageal CA
- Refer to the recent outbreaks/prevalence date
  - --typhoid is endemic
  - --ask your host providers for help
- Follow the physical exam clues
- Look stuff up
- Use your point of care tests

Right Upper Quadrant Pain

- Acute hepatitis
- Amoebic liver abscess
- Gallstones
- Liver flukes
- AIDS cholangiopathy
- RLL pneumonia
- Right heart failure
- Duodenal ulcer
- whipworms



(A) Right longitudinal upper quadrant view: amebic liver abscess posteriorly in the right lobe of the liver, presenting as a round hypoechoic lesion with hyperechoic debris and without a clearly discernable wall. (B) Right longitudinal upper quadrant view: pyogenic liver abscess presenting as an irregularly shaped, hypo- to anechoic lesion, containing hyperechoic gas bubbles with posterior acoustic shadowing.

Last stop on the road map to diagnosis
OUND

The Family Physician is Perfect for Global Health

- "Know before you Go"—Predeparture Preparation
  - –Personal awareness/cultural humility/Read about the area where you will be working
- Obtain a thorough history
  - –Use local prevalence data
- Perform appropriate physical exam
  - –Follow the clues to narrow down the differential
- Ask your local team members for input
  - –Always work with local health care providers/be a learner, not a knower
- Use your resources to create a differential diagnosis
  - –Look stuff up
- Apply diagnostic tools to rule in/rule out diagnoses
  - –Use your point of care diagnostics
  - –Employ that ultrasound
- Always work within the humanitarian principles and do no harm

Questions and Comments

- Don't get stuck in the diagnostic mud—follow your roadmap