The Infrequent Travel Medicine Consult

Part Two: Meds, Special Populations, Resources

Samantha Chittick, BSc, MD, CCFP, CTropMed

With some slide content borrowed from fantastic University of Minnesota Global Health lecturers

1

Who is Sam Chittick?

(and why is she worth listening to?)

- (Very) recent grad locuming in SW Ontario
- No "real life" Travel Medicine experience here (yet)
- ~1000hrs in person/online for University of Minnesota Global Health Course: Clinical Tropical, Migrant and Travel Medicine
- Certificate of Knowledge in Clinical Tropical Medicine and Travelers' Health (CTropMed) through American Society of Tropical Medicine and Hygiene (ASTMH)
- Volunteer ~yearly (8 months cumulative) in rural West Africa

ASTMH
AMERICAN SOCIETY OF TROPICAL MEDICINE & HYGIENE
ADVANCING GLOBAL HEALTH SINCE 1903

2

Important Stuff

- Conflicts..
  - Nope!
- Off label…
  - Definitely!
  - Especially pregnant women, young children
  - I will always mention
- Special Mention..
  - Material/content/tips and tricks borrowed from many fantastic UMN/CDC lecturers

3

Objectives – Part One

1. Become comfortable with an overall approach to pre-travel care and the travel medicine consult in your office
2. Discuss how to appropriately counsel travelers regarding infectious and non-infectious risks
3. Review indications, contraindications, and use routine and travel vaccinations for travelers

4

Objectives – Part Two

1. Review indications, contraindications, and use of prescription and non-prescription travel medications
2. Review vaccinations, medications, and recommendations for pediatric patients, pregnant women, immunocompromised patients, and those visiting friends and relatives (VFR).
3. Provide some point of care resources for you in your office.

5

Ready, Set, GO!!

(again ☺)

6

Approach to pre-travel care

1. Baseline patient understanding/background
1. Itinerary review – who/what/when/where/why/how
1. Vaccines – routine, travel
1. Meds – general, specific
1. Behavioural prep/counselling

PRO TIPS:
- **Ideally start minimum 1-2m in advance**
- **May take more than one visit**
- **Handouts handouts handouts**

7

Approach to pre-travel care

1. ~~Baseline patient understanding/background~~
1. ~~Itinerary review – who/what/when/where/why/how~~
1. ~~Vaccines – routine, travel~~
1. **Meds – general, specific**
1. ~~Behavioural prep/counseling~~

8

Baseline

- 1 minute to listen
- Get an idea of their goals, pre-conceived ideas, etc.
  - "Before we get into the nitty gritty, a couple quick questions to get an idea where you are coming from…"
  - "Have you ever traveled before? To a place like this?"
  - "What do you think you are most at risk from on this trip?"
  - "Why are you seeing me today for travel?"

9

Itinerary review

- WHO:
  - Who is going on trip?
- WHERE:
  - Geography – look it up!
  - RESOURCES AT END****
  - High risk vs. low risk destination (malaria, dengue, rabies, other outbreaks…)
  - Urban vs. rural
- WHEN:
  - How long til leaving?
  - How long there?
  - Time of year
- WHAT/WHY:
  - Why going? Doing what?
  - High risk vs. low risk activities
  - Eating where?
  - Sleeping where?
- HOW:
  - How travelling to country?
  - How travelling within country?

10

Approach to pre-travel care

1. ~~Baseline patient understanding/background~~
1. ~~Itinerary review – who/what/when/where/why/how~~
1. ~~Vaccines – routine, travel~~
1. **Meds – general, specific**
1. ~~Behavioural prep/counseling~~

11

General – first aid kit meds

- Analgesics
- Antidiarrheals
- Laxative
- Antihistamines
- Hydrocortisone cream
- Sleep aids
- Anti-motion sickness
- Antifungal for vaginal infectious or athlete's foot
- **Enough regular prescription meds**
- Malaria meds
- Altitude sickness treatment
- Antibiotics
  - For traveler's diarrhea
  - ?broad spectrum course
  - ?mupirocin

****Important meds in carry-on during travel****

12

General – first aid kit non-meds

- Sunscreen
- Bug spray
- Hand sanitizer
- Eye drops
- Ear plugs
- Condoms
- Personal hygiene products
- Water purification
- Flashlight
- Hat
- Gauze and adhesive tape
- Bandages and safety pins
- Antiseptic solution
- ?Wound closure
- Sunburn treatment
- Thermometer
- Knife
- Scissors
- Tweezers

****Handouts****

13

Approach to pre-travel care

1. ~~Baseline patient understanding/background~~
1. ~~Itinerary review – who/what/when/where/why/how~~
1. ~~Vaccines – routine, travel~~
1. **Meds –** ~~general,~~ **specific**
1. Behavioural prep/counseling

14

Approach to pre-travel care

1. ~~Baseline patient understanding/background~~
2. ~~Itinerary review – who/what/when/where/why/how~~
3. ~~Vaccines – routine, travel~~
4. **Meds –** ~~general,~~ **specific**
   - Malaria
     - Chloroquine
     - Mefloquine
     - Atovaquone-proguanil (Malarone)
     - Doxycycline
     - (Primaquine)
   - Traveler's Diarrhea
   - Altitude Medicine
1. Behavioural prep/counseling

15

Approach to pre-travel care

1. ~~Baseline patient understanding/background~~
2. ~~Itinerary review – who/what/when/where/why/how~~
3. ~~Vaccines – routine, travel~~
4. **Meds –** ~~general,~~ **specific**
   - **Malaria**
     - Chloroquine
     - Mefloquine
     - Atovaquone-proguanil (Malarone)
     - Doxycycline
     - (Primaquine)
   - Traveler's Diarrhea
   - Altitude Medicine
1. ~~Behavioural prep/counseling~~

16

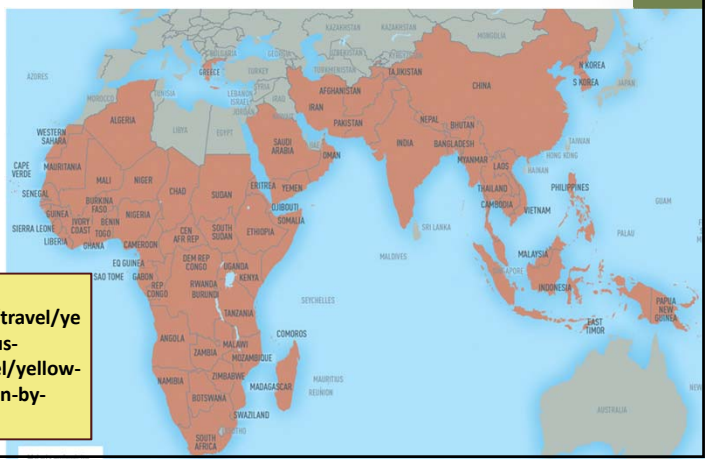
MALARIA - Refresher

- What:
  - Blood parasite, 5 species
    - P. falciparum = most common in Africa, most severe disease
    - P. vivax = Most common outside Africa, dormant liver stage
  - Anopheles mosquito:
    - Small
    - Evening/night biter
    - Quiet buzzing
    - Bites don't sting

17

MALARIA - Refresher

- Where: Large areas of Africa, Latin America, Caribbean, Asia, Eastern Europe, South Pacific
  - Varies widely between countries and within countries
  - Areas of resistance to different prophylaxis medications



LOOK IT UP!

https://wwwnc.cdc.gov/travel/yellowbook/2018/infectious-diseases-related-to-travel/yellow-fever-malaria-information-by-country

18

MALARIA - Refresher

- Why:
  - 200-250 million infections and 1 million deaths / year
    - 90% in Africa,
    - Children <5y highest risk
    - P. falciparum is the single most deadly organism worldwide for children <5y
  - Severe anemia, metabolic acidosis, hypoglycemia, shock, cerebral malaria (seizures, coma), renal failure, pulmonary edema/ARDS, DIC
  - Worldwide cases decreasing but cases in traveler's increasing

19

Approach to pre-travel care

1. ~~Baseline patient understanding/background~~
2. ~~Itinerary review – who/what/when/where/why/how~~
3. ~~Vaccines – routine, travel~~
4. **Meds –** ~~general,~~ **specific**
   - Malaria
     - **Chloroquine**
     - Mefloquine
     - Atovaquone-proguanil (Malarone)
     - Doxycycline
     - (Primaquine)
   - Traveler's Diarrhea
   - Altitude Medicine
1. ~~Behavioural prep/counseling~~

20

MALARIA prophylaxis - Chloroquine

- Where: only chloroquine susceptible areas
  - Predominance of non - P. falciparum (except small chloroquine resistant P. vivax areas)
  - Susceptible P. falciparum (e.g. Haiti/Dominican Republic)
- Administration: 500mg (8.3mg/kg peds) PO weekly
  - Start 2w prior, take during, continue 4w after
- Cost: $
- Notes:
  - Covered if already on plaquenil >100mg/d!
  - Don't use within 4wk of intradermal rabies vaccine

21

MALARIA prophylaxis - Chloroquine

Adverse Effects:

- Generally well tolerated
- Non-serious:
  - GI upset, headache, blurry vision, insomnia, dizziness
  - Pruritus
    - up to 30% in African descent
    - Can be severe, usually transient x 48-72h
  - May exacerbate psoriasis
- Serious: rare
  - Retinitis (very rare, long term use at high doses)

22

MALARIA prophylaxis - Chloroquine

Special Populations:

- Peds: safe in all ages
- Pregnancy: safe in all trimesters
- Breastfeeding: safe

23

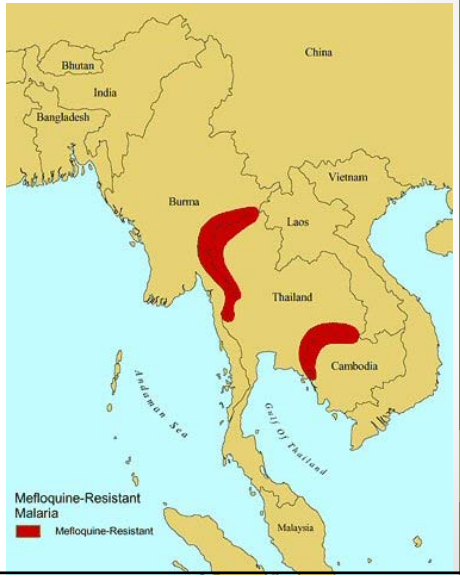
Approach to pre-travel care

1. ~~Baseline patient understanding/background~~
2. ~~Itinerary review – who/what/when/where/why/how~~
3. ~~Vaccines – routine, travel~~
4. **Meds –** ~~general,~~ **specific**
   - Malaria
     - ~~Chloroquine~~
     - **Mefloquine**
     - Atovaquone-proguanil (Malarone)
     - Doxycycline
     - (Primaquine)
   - Traveler's Diarrhea
   - Altitude Medicine
1. ~~Behavioural prep/counseling~~

24

MALARIA prophylaxis – Mefloquine

- Where: HIGHLY EFFECTIVE almost everywhere
  - Exception: Thai-Burma and Thai-Cambodia borders



25

MALARIA prophylaxis – Mefloquine

- Administration: 250mg PO weekly
  - 2w prior, during, 4w after
  - Consider starting 4w prior to rule out intolerable side effects
  - Children: 3m+ (5mg/kg) – dispense with a pill cutter
    - <10kg = need compounding pharmacy
    - 10-20kg: ¼ tab
    - 20-30kg: ½ tab
    - 30-45kg: ¾ tab
    - >45kg: 1 tab
  - Can't save tabs week to week because degrade once exposed to moisture!!
    - (but can share 1 tab between small kids each week)
- Cost: $$

26

MALARIA prophylaxis – Mefloquine

- Contraindication:
  - Any psychosis or seizure history
  - Active or recent depression, history of major psychiatric disorder
    - a remote history of non-severe depression is likely ok, but officially contraindicated
  - Heart block (conduction delay)
    - Being on a beta blocker does not count
  - Allergies to mefloquine or quinine compounds

27

MALARIA prophylaxis – Mefloquine

Adverse Effects:

- Generally well tolerated
- Non-serious:
  - Up to 25%: mild headache, GI upset, malaise, sleep disturbance, vivid dreams, and/or anxiety
  - Most tolerate or side effects resolve after 1-3 weeks
  - 11-17% of all patients stop due to non-serious side effects
- Serious: uncommon/rare!
  - Neuro/psych: case reports starting 1990s
    - 1/250 – 1/500: nightmares, irritability, depression, anxiety (requiring discontinuation)
    - 1/10 000: seizure or psychosis
  - Cardiac: sinus bradycardia and QT prolongation
  - Rare cases of persistent tinnitus or persistent psychosis

28

MALARIA prophylaxis – Mefloquine

- Black box warning (2013):

  Neuropsychiatric disorders:
  Mefloquine should not be prescribed for prophylaxis in patients with major psychiatric disorders. During prophylactic use, if psychiatric or neurologic symptoms occur, the drug should be discontinued and an alternative medication should be substituted.
  Neuropsychiatric effects:
  Mefloquine may cause neuropsychiatric adverse reactions that can persist after mefloquine has been discontinued.

- Risk hasn't changed! Still low risk but now increased fear, bad rap in media, requires discussion discussion discussion, documentation => less prescribed

29

MALARIA prophylaxis – Mefloquine

Special Populations:

- Peds: safe in 3m+
  - Generally well tolerated, few side effects
- Pregnancy: safe in all trimesters (Category B)
  - Prophylactic agent of choice if no contraindications
- Breastfeeding: safe

30

MALARIA prophylaxis – Mefloquine

What I do: If no contraindications, after discussion of side effects and black box warnings...

> ***"It has a bad rap but it's actually a pretty good drug. Yes, there are rare serious side effects, and 1 in 8 people will discontinue due to mild side effects… but if you are one of the other 7 people who tolerate it, it's a great drug! Cheap, once weekly, and safe for whole families from babies to pregnant women… it's totally up to you, but personally, I'm all for giving it a try!"***

(Personal note: I recommend it to all my friends/family and me and my whole family, including my baby, take it.)

31

Approach to pre-travel care

1. ~~Baseline patient understanding/background~~
2. ~~Itinerary review – who/what/when/where/why/how~~
3. ~~Vaccines – routine, travel~~
4. **Meds –** ~~general,~~ **specific**
   - Malaria
     - ~~Chloroquine~~
     - ~~Mefloquine~~
     - Atovaquone-proguanil (Malarone)
     - Doxycycline
     - (Primaquine)
   - Traveler's Diarrhea
   - Altitude Medicine
1. ~~Behavioural prep/counseling~~

32

MALARIA prophylaxis – Malarone

- Where: HIGHLY EFFICACIOUS everywhere
- Administration – dose forms:
  - Adult: 250-100mg daily
  - Pediatric: 62.5-25mg daily
- Administration – dosing:
  - 2d prior, during, 7d after (because targets liver stage)
  - Take with food
  - Children 5kg+
    - OFF LABEL: 5-8kg: ½ ped tab
    - OFF LABEL: 8-10kg: ¾ ped tab
    - 10-20kg: 1 ped tab
    - 20-30kg: 2 ped tabs
    - 30-40kg: 3 ped tabs
    - >40kg: 1 adult tab

33

MALARIA prophylaxis – Malarone

- Contraindication: severe renal compromise
- Adverse Effects:
  - Generally very well tolerated
  - Non-serious:
    - Mild GI upset, few cases vertigo
  - Serious: 1 case of anaphylaxis
- Cost: $$$$
- Notes:
  - May interact with warfarin – monitor INR/dose adjust

34

MALARIA prophylaxis – Malarone

Special Populations:

- Peds: used in 5kg+
  - Approved for 10kg+
  - Off label for 5-10kg for prophylaxis but approved in this age group for treatment
  - Cons: multiple pills to swallow daily depending on weight
- Pregnancy: probably safe but not much data (Category C)
- Breastfeeding: limited data, definitely ok if child 5kg+

35

Approach to pre-travel care

1. ~~Baseline patient understanding/background~~
2. ~~Itinerary review – who/what/when/where/why/how~~
3. ~~Vaccines – routine, travel~~
4. **Meds –** ~~general,~~ **specific**
   - Malaria
     - ~~Chloroquine~~
     - ~~Mefloquine~~
     - ~~Atovaquone-proguanil (Malarone)~~
     - **Doxycycline**
     - (Primaquine)
   - Traveler's Diarrhea
   - Altitude Medicine
1. ~~Behavioural prep/counseling~~

36

MALARIA prophylaxis – Doxycycline

- Where: HIGHLY EFFICACIOUS everywhere
- Administration: 100mg PO daliy
  - 2d prior, during, 28d
  - Children: 8y+ (2.2mg/kg/dose to max 100mg)
- Contraindication: children <8y, pregnant,
- Cost: $
- Notes:
  - May also prevent tick born illness, leptospirosis, some diarrhea
  - Cannot give live oral vaccines if taking

37

MALARIA prophylaxis – Doxycycline

Adverse Effects:

- Generally well tolerated
- Sun sensitivity (3-5%)
- GI upset
- Candidiasis
  - Tell women to bring an antifungal
- Rarely: pill esophagitis, anaphylaxis, C Diff

38

MALARIA prophylaxis – Doxycycline

Special Populations:

- Peds: 8y+ only
- Pregnancy: contraindicated
- Breastfeeding: limited data, maybe ok?

39

Approach to pre-travel care

1. ~~Baseline patient understanding/background~~
2. ~~Itinerary review – who/what/when/where/why/how~~
3. ~~Vaccines – routine, travel~~
4. **Meds –** ~~general,~~ **specific**
   - Malaria
     - ~~Chloroquine~~
     - ~~Mefloquine~~
     - ~~Atovaquone-proguanil (Malarone)~~
     - ~~Doxycycline~~
     - **(Primaquine)**
   - Traveler's Diarrhea
   - Altitude Medicine
1. ~~Behavioural prep/counseling~~

40

MALARIA prophylaxis – Primaquine

- What: Where:
  - New Guinea because high rates of chloroquine resistent P. vivax and co-existent P. falciparum
  - 2nd line prophylaxis, rarely used
- Cost: $$
- Contraindication: G6PD (or status unknown – MUST TEST!), pregnancy, breastfeeding
- Peds: rarely used, poorly studied
- Presumptive antirelapse therapy/terminal prophylaxis:
  - Only one that treats the dormant liver stages of P. vivax/ovale
  - Can use (higher dose) after extensive exposure residing in/prolonged stay in P. vivax/ovale area

41

MALARIA prophylaxis

	CHLOROQUINE	MEFLOQUINE	MALARONE	DOXYCYCLINE
WHERE:	restricted	not Thai borders	everywhere	everywhere
DOSING (adult):	500mg weekly	250mg weekly	250-100mg daily	100mg daily
DOSING (ped):	8.3mg/kg weekly	5mg/kg (or fixed wt dosing) weekly	62.5-25mg tabs (fixed wt dosing) daily	2.2mg/kg daily
DOSING (timing)	2w prior weekly 4w after	2-4w prior weekly 4w after	2d prior daily 7d after	2d prior daily 4w after
COST:	$	$$	$$$$	$
PEDS:	all ages	3m+	5-10kg (off label) 10kg+	8y+
PREG:	all trimesters	all trimesters (B)	minimal data ?maybe safe (C)	NO!
BFING:	safe	safe	Safe 5kg+ ?maybe safe smaller	probably safe

42

MALARIA prophylaxis

	CHLOROQUINE	MEFLOQUINE	MALARONE	DOXYCYCLINE
C/I:	-allergies	-allergies -psychosis or sz hx -active/recent depression -hx major psych disorder -heart block	-allergies -severe renal compromise (-pregnant)	-allergies -children <8 -pregnant
A/E:	-GI, HA, blurry, insomnia, dizzy -pruritus -worse psoriasis -rare retinitis	-HA, GI, malaise, sleep disturbance, vivid dreams, anxiety -1/250-1/500: nightmares, irritability, depression, anxiety -1/10 000: sz, psychosis -rare sinus brady or prolonged QT -rare persistent tinnitus or psychosis **BLACK BOX WARNING**	-mild GI -rare vertigo -1 case anaphylaxis	-GI, sun sensitivity, candidiasis -rare pill esophagitis, anaphylaxis, C.Diff

43

MALARIA prophylaxis

	CHLOROQUINE	MEFLOQUINE	MALARONE	DOXYCYCLINE
PROS:	Cheap, weekly, entire families (babies to pregnant)	Cheap, weekly, entire families (babies, pregnant, BFing),	Very well tolerated, babies 5kg+, maybe ok preg/BFing, last minute, shorter course after	Cheap, well tolerated, last minute
CONS:	Geographically limited	1/8 discontinue for mild s/e, black box warning and very rare risk neuropsych risk	Very expensive, daily, sometimes multiple pills, (esp. hard for kids), officially no in preg	Daily, not <8y, not preg,
NOTES:	-covered if >100mg/d plaquenil	-can't save opened tabs b/w wks	-may interact w/warfarin	-may prevent tick borne, leptospirosis, some diarrhea -cannot take w/live oral vaccines -prescribe antifungal to

44

Approach to pre-travel care

1. ~~Baseline patient understanding/background~~
2. ~~Itinerary review – who/what/when/where/why/how~~
3. ~~Vaccines – routine, travel~~
4. **Meds –** ~~general,~~ **specific**
   - ~~Malaria~~
     - ~~Chloroquine~~
     - ~~Mefloquine~~
     - ~~Atovaquone-proguanil (Malarone)~~
     - ~~Doxycycline~~
     - ~~(Primaquine)~~
   - **Traveler's Diarrhea**
   - Altitude Medicine
1. ~~Behavioural prep/counseling~~

45

Traveler's Diarrhea

- What: bacterial >>viral
  - (Parasite too but presentation different)
- Where: Developing nations
  - Increasing quinolone resistance worldwide, especially high in Southeast Asia

46

Traveler's Diarrhea – Prevention

Antibiotics – Prevention:

- Pros: can reduce attack rate by > 90%
- Cons:
  - Resistance: increasing to septra, doxycycline, fluoroquinolones
- **NOT recommended for most travelers**
  - Not protective against non-bacterial pathogens
  - Removes normal flora
  - Increases resistance
  - No acquired immunity
  - Self-limiting course of disease
  - Side effects, C. difficile, etc.
- Could consider for high risk patient or crucial short trip

47

Traveler's Diarrhea – Prevention

Bismuth - Prevention: 2 tabs QID

- Could consider for short trips
- Pros: can reduce traveler's diarrhea by ~50%
- Cons:
  - Black tongue/stool, nausea, constipation, rarely tinnitus
  - ++++tabs! Not recommended for long trips
- Contraindications: kids <12y, pregnant, renal insufficiency, gout, anticoagulants,

Probiotics: inconclusive evidence

Dukoral: NOT Recommended

- Significant reduction in ETEC (but ETEC causes only 25-50% of traveler's diarrhea)
- Only 6% reduction in all cause diarrhea
- Only lasts 3 months
- Could consider if immunocompromised or pediatric and high risk destination/exposure

48

Traveler's Diarrhea – Treatment

Antibiotics – Treatment:

- Early treatment better than prophylaxis
  - But only reduces duration by 1 day!
- Mild symptoms: **no treatment recommended**
  - All the same reasons as why prophylaxis not recommended
- Moderate symptoms: **consider treating**
- Severe symptoms +/-dysentery: **treat**
  - Azithromycin: 500mg BID x 1d or 1000mg x 1
- Pediatrics/Pregnancy: lower threshold for treating

49

Traveler's Diarrhea – Treatment

Antibiotics – Treatment:

- Know resistance patterns!
- Ciprofloxacin 750mg x 1 or 500mg BID x 3d
  - First line for moderate traveler's diarrhea
  - But growing resistance worldwide
  - Do not use for South and Southeast Asia
  - Off label second line for pediatrics
  - Category C for pregnancy
- Azithromycin: 500mg BID x 1d or 1000mg x 1
  - Second line for moderate traveler's diarrhea
  - First line for severe, pediatrics, pregnancy
  - Some resistance worldwide
  - Preferred if severe
- (Rifaximin for non-invasive)

50

Traveler's Diarrhea – Treatment

Oral Rehydration Solution: **recommended**

- Fluid and electrolyte replacement
- ORS saves lives!
- 1 packet to 1L boiled/treated water
  - 6 tsps sugar + ½ tsp salt + 1L water
- Especially important in pediatrics, pregnancy, breastfeeding

Loperamide: **recommended**

- Safety well established (when used with antibiotics)
- Reduces frequency of BMs and has antisecretory properties
- Contraindications: bloody diarrhea, fever, small children
- 2 tabs after 1st loose stool then 1 tab for each additional loose stool
- Not recommended for pediatrics or breastfeeding, ok for pregnancy

51

Traveler's Diarrhea – Treatment

Bismuth: **maybe?**

- 1-4 tab q30 min up to 8 doses
- Risk of salicylate toxicity
- Contraindications: kids <12y, pregnant, renal insufficiency, gout, anticoagulants,

52

Approach to pre-travel care

1. ~~Baseline patient understanding/background~~
2. ~~Itinerary review – who/what/when/where/why/how~~
3. ~~Vaccines – routine, travel~~
4. **Meds –** ~~general~~, **specific**
   - ~~Malaria~~
     - ~~Chloroquine~~
     - ~~Mefloquine~~
     - ~~Atovaquone-proguanil (Malarone)~~
     - ~~Doxycycline~~
     - ~~(Primaquine)~~
   - ~~Traveler's Diarrhea~~
   - **Altitude Medicine**
1. ~~Behavioural prep/counseling~~

53

Altitude Medicine - Refresher

- 1500-3500m (5000-11500ft)
  - Minor impairment of arterial oxgyen transport (Sa02 >90%)
- 3500-5500m (11500-18000ft)
  - Max arterial saturation <90%, pAO2 <60
- Extreme altitude (>5500m/18000ft)
  - Marked hypoxemia and hypocapnea
  - Deterioration eventually outstrips acclimatization
- Note: Everest base camp 5340m

54

Altitude Medicine - Refresher

- Acute mountain sickness (AMS):
  - Signs/symptoms: headache (cardinal symptom), fatigue, loss of appetite, nausea, "hangover"
  - Common, can resolve or progress → ataxia → HACE
- High altitude cerebral edema (HACE):
  - Signs/symptoms: profound lethargy, confusion, ataxia (cardinal symptom), death
  - Rare severe progression of AMS, often associated with HAPE
  - Death can occur within 24hours of ataxia if no descent
- High altitude pulmonary edema (HAPE):
  - Signs/symptoms: SOBOE→SOB at rest, tachycardia, tachypnea, orthopnea, crackles, hemoptysis, death. Can be sudden onset
  - Rare, can occur independently or with AMS and HACE
  - Most common cause of death from high altitude illness, can be more rapidly fatal than HACE

55

Altitude Medicine - Prophylaxis

- Risk assessment (look it up):
  - Rate of ascension
  - Where sleeping at night
  - Total height,
  - History of altitude illness
  - Underlying patient characteristics/PMhx
  - https://wwwnc.cdc.gov/travel/yellowbook/2018/the-pre-travel-consultation/altitude-illness
- Moderate risk: consider prophylaxis
- High risk: give prophylaxis

56

Altitude Medicine - Prophylaxis

- Non-medication:
  - Slow ascent, good hydration, high carb diet
  - NO ALCOHOL!!!
- AMS/HACE prophylaxis:
  - Acetazolamide 125mg PO BID
    - peds 2.5mg/kg BID (max 125mg/dose)
    - 250mg PO BID if >100kg
    - Contraindication: sulfa allergy
  - (Dexamethasone is a second line option, not for kids)
- HAPE prophylaxis: (give only if ++susceptible)
  - Nifedipine 30mg ER PO BID or 20mg ER PO TID
  - (other options tadalafil 10mg PO BID, sildenafil 50mg PO TID, +/- salmeterol 125mg inhaled BID)

57

Altitude Medicine - Treatment

- Non-medication:
  - ****IMMEDIATE DESCENT****
  - Oxygen
- AMS/HACE:
  - Acetazolamide 250mg PO BID (peds 2.5mg/kg BID)
  - + Add dexamethasone for HACE
    - 8mg x 1 dose then 4mg PO/IV/IM q6h
    - Peds 0.15mg/kg/dose q6h (max 4mg/dose)
- HAPE: Not many options
  - Nifedipine 30mg ER PO BID or 20mg ER PO TID
  - Other options: hydralazine, phentolamine
  - Sildenafil and dexamethasone not effective

58

Approach to pre-travel care

1. ~~Baseline patient understanding/background~~
2. ~~Itinerary review – who/what/when/where/why/how~~
3. ~~Vaccines – routine, travel~~
4. **~~Meds –~~** ~~general,~~ **~~specific~~**
   - ~~Malaria~~
     - ~~Chloroquine~~
     - ~~Mefloquine~~
     - ~~Atovaquone-proguanil (Malarone)~~
     - ~~Doxycycline~~
     - ~~(Primaquine)~~
   - ~~Traveler's Diarrhea~~
   - ~~Altitude Medicine~~
1. ~~Behavioural prep/counseling~~

59

Approach to pre-travel care

1. ~~Baseline patient understanding/background~~
1. ~~Itinerary review – who/what/when/where/why/how~~
1. ~~Vaccines – routine, travel~~
1. ~~Meds – general, specific~~
1. ~~Behavioural prep/counseling~~

WHEW!! We did it!!

60

Special Populations

1. Pediatrics:
2. Pregnancy:
3. Breastfeeding:
4. Immunocompromised/Chronic Disease:
5. Visiting friends and relatives (VFR):

61

Special Populations

1. **Pediatrics:**
2. Pregnancy:
3. Breastfeeding:
4. Immunocompromised/Chronic Disease:
5. Visiting friends and relatives (VFR):

62

Pediatrics - Counseling

- Don't get BIT: Mosquitos
  - Protective measures most important
  - Bug Spray:
    - Avoid ingestion (avoid hands, feet in babies, around mouth)
    - DEET: safe 2m+ can safely use up to 30%
      - Can use lower % but need to reapply more often
    - Picaridin/icaridin: safe 6m+
- Don't get BIT: Rabies
  - Do not let children play with street dogs!
  - Pre-exposure prophylaxis for mobile kids
  - Post-exposure prophylaxis always – counsel parents

63

Pediatrics - Counseling

- Don't get HIT:
  - Travel with a car seat
- Don't get LIT:
  - Especially counsel teens
- Don't do IT:
  - Condoms
  - Talk with all, preteens+
- Don't eat SH*T:
  - The usual stuff

64

Pediatrics – Vaccinations

- General
  - Watch for minimum age requirements
  - Many different formulations, combination vaccines, dosing schedules = COMPLICATED
  - Be cautious of interactions
    - E.g. live with live ok or 4w apart EXCEPT MMR+YF can't be given together
  - Extra boosters often needed if early doses given
- Routine Vaccinations:
  - Ensure up to date
  - Often rapid schedules available for catch up or early
  - Schedules vary drastically between provinces, but rapid schedules standardized
- Travel Vaccinations:
  - Often increased risk of acquiring diseases + more severe outcomes
  - Usually worth giving the travel vaccination if age/destination appropriate

65

Pediatrics – Vaccinations: Travel

- MMRV:
  - 6m+: Give! If high risk travel
    - Doesn't "count" towards 2 lifetime doses
- Polio:
  - 6w+: Give! If high risk travel.
- Diphtheria, tetanus, pertussis, HiB, rotavirus, pneumococcal:
  - 6w+: Give if high risk travel

66

Pediatrics – Vaccinations: Travel

- Hepatitis A:
  - Usually mild disease <6y but can be severe and high likelihood of transmission to others
  - 6-12m: off label but give if high risk travel
  - 12m+: Give!
- Hepatitis B:
  - Routine in infancy in some provinces (e.g. BC)
  - Birth+ or 6m+ with Hep A
- Meningococcal:
  - Men-C-ACYW
    - 2m+ (Menveo) or 24m+ (any ACYW)
    - Don't need to give Men-C-C if getting series of ACYW
  - 4CMenB (Bexsero)
    - Rarely extra for travel (outbreaks)
    - Indications for specific high risk populations regardless of travel

67

Pediatrics – Vaccinations: Travel

- Typhoid:
  - High risk of acquiring, serious disease
  - 2y+: Give! Typh-I
  - 5y+: Give! Typh-O
- Rabies:
  - Highest risk in kids as more likely to have animal interactions/bites and less likely to report
  - No guidelines on minimal age… Give when mobile!
  - Same dosing and schedule as adult
- Yellow Fever
  - <6m: absolutely no
  - 6-9m: generally not recommended but consider if very high risk destination/season/activities
  - 9m+: Give!

68

Pediatrics – Vaccinations: Travel

- ETEC/Cholera
  - Higher risk of acquiring traveler's diarrhea (but vaccination pretty useless)
  - 2y+ for Traveler's Diarrhea: Consider
  - 2y+ for Cholera: Give!
- Japanese Encephalitis
  - Not authorized for kids in Canada (but same vaccine approved in USA)
  - 2m+: very likely won't give (rarely indicated in adults or children), but consider if high risk
- Influenza:
  - Year round risk
  - Give!

69

Pediatrics – Vaccinations

Earliest starting at:

- Birth:
  - Hep B (highest immunity by 4-6m)
- 6 weeks:
  - Polio, Diphtheria, tetanus, pertussis, HiB, pneumococcal (highest immunity by 12m)
  - Rotavirus (highest immunity by 10-14w)
- 2 months:
  - Men-C-ACYW (Menveo only), 4CMenB, (highest immunity by 12m)
  - Japanese Encephalitis (USA approved, Canada not approved) (highest immunity by 12m)

70

Pediatrics – Vaccinations

Earliest starting at:

- 6 months:
  - MMR (highest immunity by 13m)
  - Influenza (highest immunity by 7m)
  - Hep A (highest immunity by 12m)
  - ?Rabies (no lower age limit available)
  - ?Yellow fever (consider but precaution)
- 9 months:
  - Yellow Fever
  - Rabies
- 12 months:
  - Varicella (highest immunity by 15m)
- 2 years:
  - Typh-I
  - Dukoral (for Cholera prevention, consider for traveler's diarrhea)

71

Pediatrics – Malaria Prophylaxis

- General:
  - Malaria more severe in kids than adults,
  - Highest risk <5y and VFR "visiting friends and relatives"
  - All prophylactic meds well tolerated, safe (within age restrictions)
- Delivery:
  - All taste AWFUL (mefloquine>malarone)
  - No liquids available, tabs ok to crush
  - If child smaller than smallest tab, need compounding pharmacy to dose in gelcap
  - Crush into powder and mix with sweet food (e.g. jam, sweetened condensed milk)

72

Pediatrics – Malaria Prophylaxis

- Chloroquine: all ages
  - Pros: weekly, all ages, $
  - Cons: hard to split, geographically restricted
- Mefloquine: 3m+
  - Pros: weekly, $$, very young/small infants, highly efficacious almost everywhere
  - Cons: can't save week to week, decreased use due to black box warnings, Thai border resistance
- Atovaquone-Proguanil (Malarone): 5kg+
  - Pros: young/small infants, highly efficacious everywhere,
  - Cons: $$$$, daily, multiple pills for some weights
- Doxycycline: 8y+
  - Pros: $, highly efficacious everywhere
  - Cons: daily, sun sensitivity, older kids only
- (Primaquine: Not used in kids)

73

Pediatrics – Traveler's Diarrhea

- General:
  - 30% of pediatric traveler's aged 0-2y per 2w trip
  - More likely to have prolonged course, more likely severe symptoms
- Prevention:
  - Usual water/food handling measures
  - Breastfeeding
  - Antibiotics rarely used as prevention
    - Consider if extremely high risk (e.g. IgA deficiency, immunocompromised)
  - Could consider Dukoral

74

Pediatrics – Traveler's Diarrhea

- Antibiotic Treatment: **generally recommended**
  - Mild: can watch and hydrate
  - Give antibiotics if:
    - Younger age
    - Further from healthcare
    - Any signs of "severe" disease: fever, vomiting, dysentery
  - Azithromycin: 10mg/kg x 3d
    - If travel >2w, order un-reconstituted powder and have pharmacy give syringe + reconstitution instructions
  - Cipro: off label

75

Pediatrics – Traveler's Diarrhea

- Prevent Dehydration: ORS ORS ORS!
  - Initiate immediately with onset of diarrhea
  - Teaspoon/syringe x5min (continue even if vomiting)
  - Continue breastfeeding and diet as tolerated if not dehydrated
- Bismuth Treatment: Not recommended
  - Concern re: salicylate toxicity
- Loperamide: Usually not recommended

76

Pediatrics – Altitude Medicine

- General:
  - Infants <6w higher risk
  - Young children: ?
    - Symptoms not as clear, especially in pre-verbal
  - Older children and adolescents: likely no increased risk

77

Pediatrics – Altitude Medicine

- Prophylaxis:
  - AMS/HACE:
    - Acetazolamide 2.5mg/kg BID (max 125mg/dose)
      - Contraindication: sulfa allergy
    - Don't give dexamethasone
  - HAPE: nothing
- Treatment:
  - AMS/HACE:
    - Acetazolamide 2.5mg/kg BID (max 125mg/dose)
    - +Add dexamethasone for HACE
      - 0.15mg/kg/dose q6h (max 4mg/dose)
  - HAPE: nifedipine only if not responding to oxygen and decent

78

Pediatrics – Resources

- CDC: https://wwwnc.cdc.gov/travel/yellowbook/2018/international-travel-with-infants-children/traveling-safely-with-infants-children
- Health Canada: entire immunization guide https://www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide-part-4-active-vaccines.html
- Health Canada: traveler https://www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide-part-3-vaccination-specific-populations/page-9-immunization-travellers.html

79

Special Populations

1. ~~Pediatrics:~~
2. **Pregnancy:**
3. Breastfeeding:
4. Immunocompromised/Chronic Disease:
5. Visiting friends and relatives (VFR):

80

Pregnancy – Counseling

- Don't get BIT: Mosquitos
  - Bug Spray:
    - Does cross placenta, no adverse effects noted
    - (Malaria is definitely worse!!)
    - DEET: safe in 2nd and 3rd trimester
      - RCT in 2nd and 3rd trimester showed no adverse effects on survival, growth or development at birth or one year
      - First trimester not studied
    - Everything else: Not studied

81

Pregnancy – Counseling

- Don't get HIT:
  - Accidents even higher risk
- Don't get LIT:
  - Self explanatory
- Don't do IT:
  - Condoms
  - New HIV infection is high risk
- Don't eat SH*T:
  - The usual stuff

82

Pregnancy – Counseling

- Advice:
  - Bring prenatal documents
  - Know blood type
  - Don't travel alone
  - Emergency OB provider at destination
  - Rhogam availability at destination (if applicable)
  - Decrease itinerary intensity

83

Pregnancy – Counseling

- Education:
  - Additive DVT risk with airplane travel
  - Increased risk of dehydration
  - "what to do if…"
    - Bleeding – how much?
    - Contractions – how severe/frequent?
    - ROM vs. typical discharge
    - Fever, vomiting and diarrhea, UTI symptoms
    - Pre-eclampsia symptoms
    - Etc.
  - Definitely no: scuba diving, water skiing, horseback riding, motorcycles…

84

Pregnancy – Counseling

- Restrictions and insurance:
  - Airline/cruise restrictions (usually 28w cruiselines, 26-36w airlines)
  - Insurance doesn't cover labour/infant
- Med kit list:
  - No NSAIDs in 3rd trimester
  - Antibiotics for GI and for GU
  - Antinausea
  - ORS
  - Vaginitis treatment
  - vitamins

85

Pregnancy – Vaccinations

- Vaccinations:
  - Often increased risk of acquiring diseases + more severe outcomes
  - Live vaccines officially contraindicated, but on a theoretical basis.
    - Most have no evidence of harm in pregnancy in many years of inadvertent doses given
    - Consider risks vs. benefits. Sometimes still worth giving!
  - Non-live vaccines ok, sometimes highly advised

86

Pregnancy – Vaccinations

- Always give in every pregnancy:
  - **TdaP** and **influenza** for all pregnancies regardless of travel
- Definitely give if high risk travel (benefits >> risks):
  - Increased maternal and/or fetal risk if acquire disease
  - Vaccines likely safe (no theoretical risk)
  - **Hepatitis A**: GIVE!
    - Disease more likely to have fulminant course and can cause pre-term labour, placental abruption, other bleeding disorder
  - **Hepatitis B**: GIVE! (if not already immune/infected)
    - Disease more severe, high transmission of vertical transmission in new infection
  - **Typhoid**: GIVE! (Typh-I)
    - Disease more apt to result in intestinal perforation

87

Pregnancy – Vaccinations

- Probably give if high risk travel (benefits > risks):
  - Disease risks similar to non-pregnant traveler
  - Likely safe (no theoretical risk, limited data shows safe)
  - **Polio**, **Meningococcal**
- Could give of high risk travel (benefits ? > risk):
  - **Rabies** vaccine may give inadequate response
  - Likely safe (no theoretical risk, limited data shows safe)
  - (ALWAYS give post-exposure prophylaxis!)

88

Pregnancy – Vaccinations

- Don't give unless incredibly high risk travel (risk likely > benefits):
  - **MMR**, **Varicella**, **Yellow Fever**
    - But risk is theoretical and some situations may benefits > risks (e.g. rubella outbreak, volunteering in refugee camp, high risk yellow fever area, etc.)
    - Note: waiver for Yellow Fever may need to be given
  - **Typh-O**
    - Give Typh-I instead
- No data:
  - **Japanese Encephalitis**
  - **Dukoral**

89

Pregnancy – Malaria

- General - Maternal:
  - Higher chance of getting malaria
  - Difficult to diagnose early (placental sequestration)
  - Higher levels parasitemia,
  - Higher chance of cerebral malaria, anemia, hypoglycemia, relapse
  - High mortality (up to 40%!)
- General - Fetus:
  - Higher risk of complications: low birth weight, prematurity, abruption, thrombocytopenia, seizures, splenic rupture, congenital malaria

90

Pregnancy – Malaria Prophylaxis

Medication options not extensive BUT
Risk of disease >>>> risk of medications

- Chloroquine: safe and recommended but geographically restricted
- Mefloquine: safe (Category B) and recommended
- Atovaquone-Proguanil (Malarone): probably safe (Category C) but minimal data, not recommended
- Doxycycline: NO
  - Maybe could use in first trimester if desperate, as no demonstrated dental/bone issues, unlike tetracycline?
- (Primaquine: Definitely NO)

91

Pregnancy – Malaria Prophylaxis

Pregnancy + seizure/serious psych history? Difficult conversation!

- Malarone (but category C) vs. mefloquine (but seizure/psych history) vs. none (but ++++risk of get malaria!)
- Travel avoidance is always best

92

Pregnancy – Traveler's Diarrhea

- General:
  - More likely to acquire
  - More likely to have prolonged course, more likely severe symptoms
- Prophylaxis:
  - Bismuth: No
  - Dukoral: No
  - Antibiotics: generally not recommended
- Treatment:
  - Hydration: treat vigorously with ORS
    - Low threshold for IV fluids (beware unsterile equipment)
  - Loperamide: OK
  - Antibiotics: **generally recommended**
    - Azithromycin not ciprofloxacin
  - Bismuth: No

93

Pregnancy – Altitude Medicine

- General:
  - Low risk pregnancy likely no extra risk
    - No studies/case reports of harm to fetus during brief high altitude travel
    - ?Advise to sleep <10000ft/3000m
    - BUT far from medical care if new complication develops!
  - High risk pregnancy contraindicated
- Prophylaxis/Treatment:
  - Acetazolamide: minimal data
  - Dexamethasone: category C, worse in first trimester and at moderate to higher doses (as used for altitude medicine)
  - Nifedipine: category C, with increased risk of pregnancy complications

94

Pregnancy – Resources

- CDC: https://wwwnc.cdc.gov/travel/yellowbook/2018/advising-travelers-with-specific-needs/pregnant-travelers
- Health Canada: https://www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide-part-3-vaccination-specific-populations/page-4-immunization-pregnancy-breastfeeding.html

95

Special Populations

1. ~~Pediatrics:~~
2. ~~Pregnancy:~~
3. **Breastfeeding:**
4. Immunocompromised/Chronic Disease:
5. Visiting friends and relatives (VFR):

96

Breastfeeding – Vaccines

- General:
  - No evidence of decreased maternal or infant immune responses
  - Most safe for mom
  - Data limited for babe
    - Routine vaccinations: no reported adverse events
    - Travel vaccinations: most probably ok (see below)
- Definitely give if increased risk travel (safe):
  - MMR, Varicella, Polio, Meningococcal, TdaP, Hep A, Typh-I, Rabies
  - Hep B (decreases transmission risk to fetus)

97

Breastfeeding – Vaccines

- Don't give (not safe):
  - Yellow Fever (3 cases of infants <1m developing encephalitis)
    - Low risk destination but legal requirement: medical waiver
    - High risk destination: consider giving
- No data:
  - Japanese Encephalitis
  - Dukoral
  - Typh-O

98

Breastfeeding – Malaria

- General:
  - Medications excreted in breast milk but in very low amounts (<1%)
- Chloroquine: safe
- Mefloquine: safe
- Atovaquone-Proguanil (Malarone): probably safe but limited data
  - Definitely ok with infants 5+kg
- Doxycycline: limited data, maybe ok?
- (Primaquine: NO)

99

Breastfeeding – Traveler's Diarrhea

- General:
  - Increased risk of passing on to infant
  - Increased risk of dehydration
- Prophylaxis/Treatment:
  - Hydration!!!!!!!
  - Similar to pregnancy except: ?loperamide possibly present in high enough concentrations that might be make it less safe (minimal data)

100

Breastfeeding – Altitude Medicine

- General:
  - Infants <6w high risk
  - Young children probably higher risk
- Prophylaxis/Treatment:
  - Acetazolamide: present in breastmilk, may have risk to fetus
  - Dexamethasone: minimal data, present in breastmilk
  - Nifedipine: present in low concentration, may be safe

101

Breastfeeding – Resources

- CDC: https://wwwnc.cdc.gov/travel/yellowbook/2018/international-travel-with-infants-children/travel-and-breastfeeding
- Health Canada: https://www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide-part-3-vaccination-specific-populations/page-4-immunization-pregnancy-breastfeeding.html

102

Special Populations

1. ~~Pediatrics:~~
2. ~~Pregnancy:~~
3. ~~Breastfeeding:~~
4. **Immunocompromised/Chronic Disease:**
5. Visiting friends and relatives (VFR):

103

Immunocompromised/Chronic Disease

- General:
  - Immunocompromised: very complicated, many different variations of what/how.
    - Guidelines very patient specific – look them up!
  - Increased risk of exacerbating underlying chronic diseases
  - Increased risk of acquiring infections + more severe course
- Meds and Vaccines:
  - Interactions between usual medications (especially immunosuppressants) and travel meds
  - In immunocompromised:
    - Some vaccines may have inadequate response or be contraindicated
    - Some vaccines may be particularly recommended

104

Immunocompromised/Chronic Disease

- Advice:
  - Don't travel alone
  - Meds
    - Carry all in carry on
    - Bring list of generic names
    - Discuss storage requirements with pharmacist (e.g. "room temp" at destination)
  - Special requests far in advance (e.g. special diet, oxygen)
  - Emergency medical providers at destination
  - ?Med alert bracelets
- Insurance and Health Care:
  - Travel insurance may not cover well
  - Host country health care may be poor

105

Immunocompromised/Chronic Disease

- Older Adults:
  - Assess fitness level
  - Recommend decreased intensity of itinerary
  - CV disease and accidental trauma most common causes of death
  - Greater susceptibility to heat/cold
  - Vaccine response may be less robust

106

Immunocompromised/Chronic Disease

- Diabetes:
  - Do not travel alone, travel companions aware of DM and what to do if hypoglycemia
  - Med alert bracelet
  - Increased activity/unpredictable schedules while on hypoglycemics and insulin
    - Target higher glucose levels
    - Frequent POC checks
    - Carry glucose tabs
  - Managing crossing time zones and insulin
  - Special attention to foot care/infections
  - Adequate supplies (e.g. enough test strips)

107

Immunocompromised - Resources

- CDC: immunocompromised https://wwwnc.cdc.gov/travel/yellowbook/2018/advising-travelers-with-specific-needs/immunocompromised-travelers
- CDC: chronic diseases https://wwwnc.cdc.gov/travel/yellowbook/2018/advising-travelers-with-specific-needs/travelers-with-chronic-illnesses
- Health Canada: immunocompromisedhttps://www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide-part-3-vaccination-specific-populations/page-8-immunization-immunocompromised-persons.html
- Health Canada: chronic diseases https://www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide-part-3-vaccination-specific-populations/page-7-immunization-persons-with-chronic-diseases.html

108

Special Populations

1. ~~Pediatrics:~~
2. ~~Pregnancy:~~
3. ~~Breastfeeding:~~
4. ~~Immunocompromised/Chronic Disease:~~
5. **Visiting friends and relatives (VFR):**

109

VFR - Definitions

- VFR: any traveler "visiting friends and relatives"
- Immigrant VFR vs. Traveler VFR:
  - Immigrant VFR:
    - Immigrants themselves, returning to visit their home country
  - Traveler VFR:
    - Not immigrants themselves, visiting their ethnic country of origin
    - E.g. first or second generation immigrants
    - Often children accompanying their immigrant parent VFRs
- Newer definition:
  - Travel is for the purpose of visiting friends and relatives
  - AND there is an epidemiologic risk gradient between area of departure and destination

110

VFR – Risk

- Travel is common
  - Worldwide travel: VFR = leisure/holiday
- Risk is increased
  - E.g. systemic febrile illness, malaria, and intestinal parasites higher in VFR travelers vs. leisure/holiday travelers
  - Immigrant VFR > traveler VFR > leisure/holiday traveler

111

VFR – Risk

- Travel characteristics:
  - More likely last minute travel
  - More likely to stay in rural areas
  - More likely prolonged stay
- Traveler characteristics:
  - More likely age extremes and worse baseline health status
  - Often lower SES and unable to pay for travel vaccines/medications
  - Often lower/no insurance coverage
  - Sometimes language barriers
  - Sometimes mistrust of western system and authorities

112

VFR – Risk

- Infectious disease prevention measures:
  - Less likely to have immunizations up to date
  - Less likely to seek pre-travel care
  - Less likely to get travel vaccination and use antimalarials
- Non-infectious disease prevention measures:
  - More likely to eat local food and less likely to do proper food handling
  - More likely to take risks such as unsafe local transportation
  - More likely to stay in lower SES places
  - Less likely to use bug nets and mosquito spray

113

VFR – Counseling

- 1 minute to listen…
  - What do you think you are most at risk of?
    - E.g. likely don't realize MVA biggest risk
  - What do you know about malaria?
    - E.g. "I'm immune to malaria because I'm Kenyan"
  - How do you plan to obtain clean water?
    - (don't just tell them to do it!)
  - How will you get around? Do you plan on using a seatbelt? Do you plan on bringing a carseat?
  - Are you concerned about the cost of travel med visit/meds/vaccines
    - (e.g. so you know not to focus all your time on vaccines if they can't/won't be getting them)
  - What do you plan to do if you get sick? In an accident?

114

VFR - Resources

- CDC: https://wwwnc.cdc.gov/travel/yellowbook/2018/advising-travelers-with-specific-needs/immigrants-returning-home-to-visit-friends-relatives-vfrs

115

Special Populations

1. ~~Pediatrics:~~
2. ~~Pregnancy:~~
3. ~~Breastfeeding:~~
4. ~~Immunocompromised/Chronic Disease:~~
5. ~~Visiting friends and relatives (VFR):~~

DONE!!!

116

Resources – Quick Office Search

- Global TravEpiNet:
  - Punch in traveler characteristics and get USA recommendations for vaccines/meds
  - Concise but details available
  - can punch in multiple destinations, exact age, patient characteristics
  - www.promedmail.org
- CDC Travel
  - Punch in traveler charachteristics and get USA recommendations
  - Concise,
  - only one destination at a time, patient characteristics
  - Shows outbreaks under "travel health notices" section
  - https://wwwnc.cdc.gov/travel

117

Resources – USA CDC guides

- USA CDC: great, succinct, informative, up-to-date
  - Chapter 2: handouts and counseling info
  - Chapter 3: succinct summaries for travel illnesses
  - Chapter 4: organized by country
  - Chapter 7: infants and children, breastfeeding
  - Chapter 8: special populations
  - https://wwwnc.cdc.gov/travel/yellowbook/2018/table-of-contents
- Yellow fever and malaria by country:
  - https://wwwnc.cdc.gov/travel/yellowbook/2018/infectious-diseases-related-to-travel/yellow-fever-malaria-information-by-country
- Updated polio requirements:
  - https://wwwnc.cdc.gov/travel/news-announcements/polio-guidance-new-requirements

118

Resources – Canadian immunization Guide

- Note: not always the most up-to-date or easy to read, but good info
- Detailed immunizations: Tip: read "key information" for good summaries
  - https://www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide-part-4-active-vaccines.html
- Immunization of Travelers (Canada):
  - https://www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide-part-3-vaccination-specific-populations/page-9-immunization-travellers.html
- Special populations: Includes pregnancy, brestfeeding, immunocompromised (Canada)…
  - https://www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide-part-3-vaccination-specific-populations.html
- Minimum age/intervals for vaccines (Canada):
  - https://www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide-part-1-key-immunization-information/page-10-timing-vaccine-administration.html

119

Resources – Outbreaks

- http://www.promedmail.org
  - Kinda clunky but has some info on outbreaks if you go to "search" tab
- https://wwwnc.cdc.gov/travel/notices
  - Punch in countries to get some recent outbreak information

120

Pediatrics – Resources

- CDC: https://wwwnc.cdc.gov/travel/yellowbook/2018/international-travel-with-infants-children/traveling-safely-with-infants-children
- Health Canada: entire immunization guide https://www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide-part-4-active-vaccines.html
- Health Canada: traveler https://www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide-part-3-vaccination-specific-populations/page-9-immunization-travellers.html

121

Pregnancy – Resources

- CDC: https://wwwnc.cdc.gov/travel/yellowbook/2018/advising-travelers-with-specific-needs/pregnant-travelers
- Health Canada: https://www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide-part-3-vaccination-specific-populations/page-4-immunization-pregnancy-breastfeeding.html

122

Breastfeeding – Resources

- CDC: https://wwwnc.cdc.gov/travel/yellowbook/2018/international-travel-with-infants-children/travel-and-breastfeeding
- Health Canada: https://www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide-part-3-vaccination-specific-populations/page-4-immunization-pregnancy-breastfeeding.html

123

Immunocompromised - Resources

- CDC: immunocompromised https://wwwnc.cdc.gov/travel/yellowbook/2018/advising-travelers-with-specific-needs/immunocompromised-travelers
- CDC: chronic diseases https://wwwnc.cdc.gov/travel/yellowbook/2018/advising-travelers-with-specific-needs/travelers-with-chronic-illnesses
- Health Canada: immunocompromisedhttps://www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide-part-3-vaccination-specific-populations/page-8-immunization-immunocompromised-persons.html
- Health Canada: chronic diseases https://www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide-part-3-vaccination-specific-populations/page-7-immunization-persons-with-chronic-diseases.html

124

VFR - Resources

- CDC: https://wwwnc.cdc.gov/travel/yellowbook/2018/advising-travelers-with-specific-needs/immigrants-returning-home-to-visit-friends-relatives-vfrs

125

References

- https://www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide-part-4-active-vaccines.html
- https://www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide-part-3-vaccination-specific-populations/page-9-immunization-travellers.html
- https://wwwnc.cdc.gov/travel/yellowbook/2018/table-of-contents
- Much of above links
- Various course material and lectures from multiple amazing lecturers through University of Minnesota Global Health Course

126

THANK YOU!!

127