

The Infrequent Travel Medicine Consult

Part One: Approach, Counseling, and Vaccines

Samantha Chittick, BSc, MD, CCFP, CTropMed

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

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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



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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

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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

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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.

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Ready, Set, **GO!!**

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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

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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?”

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Approach to pre-travel care

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Approach to pre-travel care

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1. Behavioural prep/counseling

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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?

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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 characteristics and get USA recommendations
 - Concise,
 - only one destination at a time, patient characteristics
 - <https://wwwnc.cdc.gov/travel>

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Approach to pre-travel care

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1. Meds – general, specific
- 1. Behavioural prep/counseling**

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Counseling

- Never the focus of travel medicine visits but actually the most important!
- Risk of death/injury: MVA>>>>malaria!
- People take risks they'd NEVER take back home
 - *"What happens in _____ stays in _____"*
- Handouts handouts handouts!

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Counseling

Borrowed from a University of Minnesota lecturer...

Don't get BIT: Mosquitos

- ABCs
 - Awareness of malaria risk
 - Bite avoidance measures
 - Chemoprophylaxis
 - Diagnosis of febrile illness
- Types of mosquitos
 - Anopheles (E.g. Malaria) – dusk/night, quiet, small, painless bites
 - Aedes (e.g. Dengue, Yellow Fever) – daytime, prolific with minimal water
 - Culex (e.g. Japanese Encephalitis, West Nile)
- Abstinence is the only true prevention
 - Lots of diseases you can't immunize/chemoprophylax against (Dengue, West Nile, Zika...)
 - Where you sleep is often the most important risk factor

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Counseling

Don't get BIT: Mosquitos

- Bug spray
 - Re-apply every few hours!!
 - DEET (20-50%)
 - Plateau effect at 50%, greater is unnecessary
 - Pro: reapply q6h, easily available
 - Con: Strong smell, Stains clothing
 - Picaridin (20-30%)
 - 20% picaridin = 20% DEET
 - Pro: Minimal smell
 - Con: Less readily available (MECC), reapply q4h
 - Lemon eucalyptus oil (30%)
 - Pro: Strong smell (nicer??)
 - Con: strong smell, reapply q4h
 - IR3535: not recommended for protection against malaria

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Counseling

Don't get BIT: Mosquitos

- Other protective measures
 - Daytime: long sleeves/pants (permethrin coated), loose fitting clothes, neutral coloured clothing
 - Nighttime: insecticide treated BED NETS!!!,
 - screened windows, AC (but don't replace bed nets)
- Things that don't work:
 - Skintastic, skin so soft, citronella, DEET/picaridin <10%
 - Vaporizers, mosquito coils, essential oil candles, knock down insecticide sprays...
 - No evidence that decreases mosquito-borne illnesses!

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Counseling

Don't get BIT: Other vectors (E.g. Ticks, tsetse fly, sandfly...)

- Lots of other vector borne diseases
- Bug spray often decreases risks of these also
- Check for ticks
- Permethrin treated clothing
- Neutral coloured clothing
- Doxycycline: decreased risk of Rickettsial disease,

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Counseling

Don't get BIT: Rabies

- Pre-exposure prophylaxis
 - Takes minimum 21 days, expensive
- All mammals are susceptible
 - Especially dogs, bats, monkeys
- Location of bite matters
 - The closer to the brain, the worse it is
- Post-exposure
 - Medical attention ASAP
 - Wound management
 - Post exposure prophylaxis
 - Vaccines (everyone)
 - HRIG (if no pre-exposure prophylaxis)

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Counseling

- **Don't get HIT:**
 - Accidents/injuries are the leading cause of preventable deaths in travelers
 - Seatbelts, helmets, look both ways
- **Don't get LIT:**
 - Alcohol and recreational drugs
 - Impaired decision making (=high risk choices)
 - Varying laws on drug use in different countries

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Counseling

- **Don't do IT:**
 - 448 million STIs annually
 - Increased sexual promiscuity and casual sexual activity during overseas travel
 - Condoms!! (even if you don't plan to use them)
 - Talk with everyone 13y to 85y

"What happens in _____ stays in _____" (except STIs)

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Counseling

Don't eat SH*T:

- Cook it, boil it, peel it, bleach it, or forget it
- Highest risk:
 - Ice,
 - Tap water,
 - Street vendor food,
 - Raw/undercooked meat,
 - Handwashing after restroom and before eating,
 - Duration of travel
 - Buffets

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Approach to pre-travel care

- ~~1. Baseline patient understanding/background~~
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 - ~~1. Behavioural prep/counseling~~

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Notes on my annotations...

“Start at 6w + 4w + 6m = fastest 6w / 10w / 36w”

- “Start at 6w + 4w + 6m” means:
 - Start at 6 weeks old
 - 2nd dose 4 weeks later
 - 3th dose 6 months later
- means:
 - Fastest schedule would be starting at 6 weeks old
 - 2nd dose at 10 weeks
 - 3rd dose at 36 weeks
- “= fastest 6w / 10w / 36w”
- “Day 0 / 1m / 6m” means:
 - 1st dose whenever you give it (=day 0)
 - 2nd dose 1 month after day 0
 - 3rd dose 6 months after day 0

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Approach to pre-travel care

1. Baseline patient understanding/background
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3. Vaccines:

- | | |
|--|--|
| <ul style="list-style-type: none"> • Routine: <ul style="list-style-type: none"> • MMRV • Polio • Hepatitis B • Meningococcal • Other childhood | <ul style="list-style-type: none"> • Travel <ul style="list-style-type: none"> • Hepatitis A • Typhoid • Rabies • Yellow Fever • Japanese Encephalitis • Cholera/Traveler’s Diarrhea |
|--|--|

1. Meds – general, specific
2. Behavioural prep/counseling

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Vaccines (Routine) : MMRV

- Where:
 - All (MMRV) endemic in many places in the world
 - Ongoing outbreaks due to under-immunization
 - Most of the developing world does not immunize for varicella, many don't do mumps or rubella either
- Vaccines: live attenuated IM (MMR or MMRV)
- Travel Indications:
 - Consider early routine or booster (if needed) if travel or residing in endemic area or areas with outbreaks

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Vaccines (Routine) : MMRV

- **Other vaccinations:** concomitantly or >4wks from other live parenteral vaccines
- **Note:**
 - Same day as TST/IGRA or >4wks
 - Avoid ASA for 6w after Varicella
 - Officially contraindicated in pregnancy
 - Contraindicated if immunocompromised
 - Safe in breastfeeding

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Vaccines (Routine) : MMRV

- **Administration MMR: 2 doses IM**
 - **Infants**
 - Routine (e.g. 12m / 4-6y in Ontario)
 - Rapid schedule: 12m + minimum 1m later
 - Infants 6-12m: if at risk travel (doesn't "count" towards 2 lifetime doses)
 - **Adults**
 - Born 1970-1990: may need booster
 - Born <1970: presumed natural immunity (consider still giving if at risk travel)
- **Administration Varicella: 2 doses IM**
 - Routine (e.g. 12-18m / 4-6y)
 - Rapid schedule: 12m + 3m (= fastest 12m / 15m)
 - Can do with MMR or separate

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Approach to pre-travel care

1. Baseline patient understanding/background
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3. Vaccines:

- Routine:
 - ~~MMRV~~
 - **Polio**
 - Hepatitis B
 - Meningococcal
 - Other childhood
- Travel
 - Hepatitis A
 - Typhoid
 - Rabies
 - Yellow Fever
 - Japanese Encephalitis
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1. Meds – general, specific
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Vaccines (Routine) : **POLIO**

- **What:**
 - Enterovirus, 3 wild types + vaccine derived type
 - Fecal-oral and oral-oral
- **Where:**
 - +++worldwide eradication efforts
 - Endemic: Afghanistan, Nigeria, Pakistan
 - Other counties with ongoing outbeaks due to importation

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Vaccines (Routine) : POLIO

- **Vaccine:** Inactivated IM “IPV”
- **Travel Indications:**
 - Rapid schedule for infants with travel to country/neighbouring country that is endemic or has outbreaks
 - One lifetime adult booster if primary series of 3 and increased risk of exposure during travel
 - Some countries have entry/exit requirements
 - March 2019 WHO recommends: Afghanistan, DRC, Indonesia, Kenya, Niger, Nigeria, Pakistan, Papua New Guinea, Somalia
 - <https://wwwnc.cdc.gov/travel/news-announcements/polio-guidance-new-requirements>
- **Other vaccines:** ok

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Vaccines (Routine) : POLIO

- **Administration:** 3 doses + booster, various combo vaccines
 - Routine (2m / 4m (/6m) /18m / 4-6y booster in Ontario)
 - Rapid infant
 - Starting at 6w + 4w + 4w + 6m + (5th dose at or after 12m if 4th dose before) + booster at 4-6y
 - = Fastest: 6wk / 10w / 14w / 40w / 12m / 4-6y booster
 - one lifetime adult booster
- **Notes:**
 - Safe in pregnancy and pediatrics

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Vaccines (Routine) : POLIO

- **Vaccine:** Live attenuated PO “OPV”
 - No longer available in Canada
 - Pros: used during outbreaks worldwide
 - Cons: rarely can lead to vaccine derived strains

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3. Vaccines:

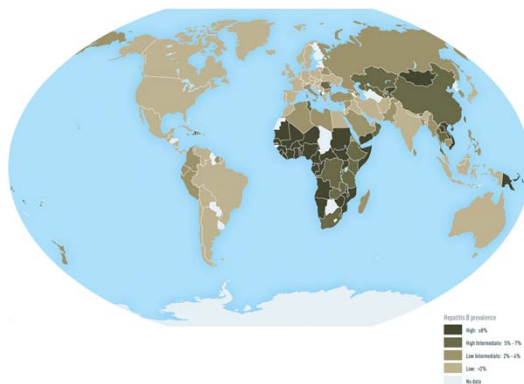
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Vaccines (Routine) : HEP B

- **Where:**
 - Moderate-highly endemic in Far East, Middle East, Africa, South America, Eastern Europe, Central Asia.



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Vaccines (Routine) : HEP B

- **Vaccines:** recombinant IM
- **Travel Indications:**
 - Indicated before travel to endemic area especially if increased risk of exposure while there
 - Particularly for pregnant and breastfeeding women
- **Other vaccinations:** ok
- **Notes:**
 - Generally need enough to complete entire series
- **Administration - Routine:**
 - Widely varying schedules between provinces
 - E.g. starting at birth (NB) vs. 2m (BC) vs. 10y (MB) vs. gr 7 (ON)

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Vaccines (Routine) : HEP B

- **Administration - Travel:**
 - Varies depending on which vaccines used, age of patient, timing before trip
 - **Infant (monovalent):**
 - Preferred fastest: birth + 4w + 4m (= birth / 4w / 6m)
 - Fastest: birth + 4w + 2m + (= birth / 4w / 4m)
 - **Child (HAHB):**
 - Starting 6-12m (Twinrix Jr): day 0 / 1m / 6m
 - Starting 12m-15y (Twinrix): day 0 / 6m
 - **Adult (HAHB)(Twinrix):**
 - Preferred: = day 0 / 1m / 6m
 - Fastest: = day 0 / 7d / 21-30d / booster at 1y
 - (If <21 d until departure, give HA and HB separately)

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Vaccines (Routine) : MENINGOCOCCAL

- **Where:**
 - Endemic throughout the world,
 - different strains, (e.g. Canada = B, C, Y)

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- **Where:**
 - Africa meningitis belt (90% of global disease),
 - seasonal (Jan-June, mostly Feb-April)
 - **A**(>80%), W135, X, C

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Vaccines (Routine) : MENINGOCOCCAL

- **Vaccines:** conjugate IM
 - Men-C-C
 - Men-C-ACYW (3 brands, only Menveo approved for <12m)
 - 4CMenB (Bexsero)
- **Travel Indications:**
 - travelers to countries where endemic or during epidemic prone times of year and health care workers at any time of year
 - Men-C-C alone not enough for travelers to high risk areas.
 - Give Men-C-ACYW (most places) and rarely 4CMenB

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Vaccines (Routine) : MENINGOCOCCAL

- **Administration - Travel: Men-C-ACWY**
 - Starting 2-12m : 4 doses Men-C-ACWY-CRM (Menveo only)
 - Ideal: day 0 + 8w + 8w + another at 12-24m (8w after last)
 - = 2m / 4m / 6m / 12m
 - Most rapid: day 0 + 4w + 4w + another at 12-24m (4w after last)
 - = fastest 2m / 3m / 4m / 12m
 - Starting 12-24m: 2 doses Men-C-ACWY-CRM (Menveo only)
 - Ideal: day 0 + 8w
 - Most rapid: day 0 + 4w = fastest 12m / 13m
 - Starting 24m+ : 1 dose any Men-C-ACWY
 - Boosters if ongoing risk:
 - If vaccinated <6y : q3-5y until age 7 then q5
 - If vaccinated 7y+ : q5y
 - Note: not officially licensed for >56y, but considered appropriate if high risk

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Vaccines (Routine) : MENINGOCOCCAL

- **Administration - Travel: 4CMenB**
 - Starting 2-5m : 4 doses
 - Day 0 + 8w + 8w + another at 12-24m (8w after last) = Fastest 2m / 4m / 6m / 12m
 - Starting 6m-12m : 3 doses
 - Day 0 + 8w + another at 12-24m (8w after last) = fastest 6m / 8m / 12m
 - Starting 12m-10y: 2 doses
 - Day 0 + 8w
 - Starting 11y+: 2 doses
 - Day 0 + 4w

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Vaccines (Routine) : MENINGOCOCCAL

- **Other vaccinations: ok**
 - “Further studies needed” for concomitant Menveo + Pneu-C-13
 - May reduce pertussis response for concomitant Menveo + Tdap (clinical significance unknown)
 - = Consider pneu-c-13 and Tdap 1m+ after Menveo
- **Notes:**
 - 4CMenB more likely to have fever post-vaccine
 - Don't need to give Men-C-C if given Men-C-ACYW
 - Proof of immunization required for some countries, E.g. Saudia Arabia for Hajj or Umra pilgrims
 - Not studied in pregnancy but no theoretical risk
 - Safe in breastfeeding

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1. Meds – general, specific
2. Behavioural prep/counseling

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Vaccines (Routine) : OTHER

Diphtheria, tetanus, pertussis, HiB:

- Routine - infants:
 - All usually given with IPV +/- HB at some variation of 2m / 4m / 6m / 12m / 18m
- Travel – infants: Can do a rapid schedule starting at 6w
 - 6w + 4w + 4w + 6m
 - Fastest: 6w / 10w / 14w / 40w (/5th dose at or after 12m if 4th dose before)
- Boosters everyone:
 - Tetanus + diphtheria:
 - At 4-6y then q10y (q5y w/high risk wound)
 - Pertussis
 - At 4-6y then one booster in adulthood
- Pregnancy/breastfeeding:
 - Safe
 - GIVE Tdap!! The pertussis and the tetanus is protective

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Vaccines (Routine) : OTHER

Pneumococcal:

- Routine - infants:
 - Usually given 2m / 4m / 12m (ON)
- Travel – infants: Can do a rapid schedule starting at 6w
 - 6w + 8w + 8w + 8W (last dose at 12m earliest)
 - Fastest: 6w / 14w / 22w / 12m

Rotavirus:

- Routine - infants:
 - Monovalent: usually given 2m / 4m (ON)
 - Pentavalent: usually given 2m / 4m / 6m
- Travel – infants: Can do a rapid schedule starting at 6w
 - Monovalent: 6w + 4w (= fastest 6w / 10w)
 - Pentavalent: 6w + 4w + 4w (= fastest 6w / 10w / 14w)

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Vaccines (Routine) : OTHER

Influenza:

- Travel considerations
 - Many tropical countries have risk all year round
 - Southern Hemisphere vaccines not available and overlap varies
 - Mandatory for some things like Hajj and Umra pilgrams
- Routine - infants:
 - 6m + 1m then yearly

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• Routine:

- MMRV
- Polio
- Hepatitis B
- Meningococcal
- Other childhood

• Travel

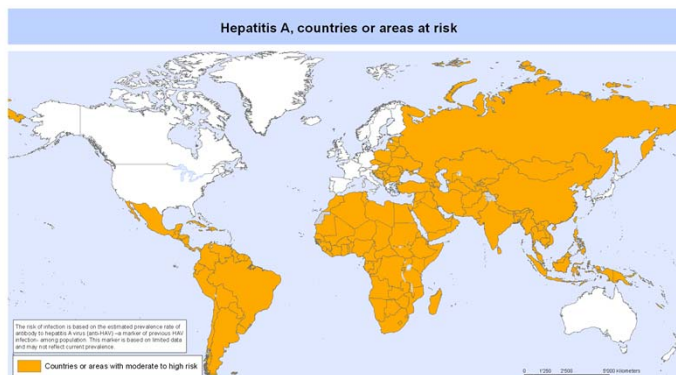
- **Hepatitis A**
- Typhoid
- Rabies
- Yellow Fever
- Japanese Encephalitis
- Cholera/Traveler's Diarrhea

1. Meds – general, specific
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Vaccines (Travel) : HEP A

- **What:** virus, fecal-oral transmission (usually via food)
- **Where:** worldwide, especially developing nations



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Vaccines (Travel) : HEP A

- **Why:**
 - Millions of cases worldwide/yr
 - In travelers: one of most common vaccine preventable illnesses
 - Children <6y usually mild or asymptomatic
 - Older children and adults usually symptomatic and possibly severe
 - 10-15% have prolonged/relapsing course over 6-9m
 - ~25% of adult cases require hospitalization
 - Overall case fatality rate 0.5% but up to 2.6% in adults >60y

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Vaccines (Travel) : HEP A

- **Vaccines:** inactivated IM
 - Various formulations (monovalent, HAHB, HA-Typh-I)
 - Various dosing and schedules
- **Indications:**
 - Routine childhood in many places (e.g. USA)
 - Travelers to developing nations 6-12m+ old
 - 6-12m = off label
 - 12m+ = approved
 - Particularly indicated for pregnant women
- **Other vaccines:** ok

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Vaccines (Travel) : HEP A

- **Administration:**
 - Day 0 + 6-36m (formulation dependent)
 - = fastest 6m / 12m
 - Give HAHB when possible to cover both
 - But check HB schedule
 - May be given up to day of departure, but preferred minimum 7-10d prior
 - If <21d to departure, give HA and HB separately
- **Notes:**
 - Safe in breastfeeding

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Vaccines (Travel) : HEP A

High risk of acquiring disease
+ Potentially serious outcome
+ Easy/safe/efficacious vaccine
= ALMOST ALWAYS WORTH IT

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Approach to pre-travel care

1. ~~Baseline patient understanding/background~~
2. ~~Itinerary review – who/what/when/where/why/how~~

3. Vaccines:

~~Routine:~~

- ~~• MMRV~~
- ~~• Polio~~
- ~~• Hepatitis B~~
- ~~• Meningococcal~~
- ~~• Other childhood~~

• Travel

- ~~• Hepatitis A~~
- **Typhoid**
- Rabies
- Yellow Fever
- Japanese Encephalitis
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1. Meds – general, specific
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Vaccines (Travel) : TYPHOID

- **What:** bacteria, fecal-oral transmission (usually via food)
- **Where:** developing world (esp. India/Southern Asia (80% of cases))

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Vaccines (Travel) : TYPHOID

- **Why:**
 - In endemic countries: >26 million cases/yr, 200 000 – 600 000 deaths/yr
 - High probability of long term consequences and/or becoming chronic carriers
 - Mortality 10-20% untreated (pre-antibiotic era) vs. <1% treated
 - In travelers: destination affects risk but overall risk low
 - 1:3000 South Asia >>>> Sub-Saharan Africa/North Africa/Middle East/South America >>> 1:300 000 Caribbean, Central America, Eastern Mediterranean

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Vaccines (Travel) : TYPHOID

- **Vaccines:** live attenuated PO or polysaccharide IM
- **Efficacy:** 50 – 80% (PO or IM)
 - Large inoculum can overcome vaccine response
- **Indications:**
 - Travelers to South Asia: all
 - Especially children and pregnant women
 - Travelers to other developing nations:
 - Increased risk (e.g. rural, prolonged, VFR, adventurous eaters,)
 - Risk averse
 - Natural infection does not provide immunity against re-infection (e.g. VFR)
- **Contraindications:** <2y
- **Notes:** safe in breastfeeding

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Vaccines (Travel) : TYPHOID

IM polysaccharide "Typh-I"

- **Indications:** 2y+
- **Administration:** 1 dose
 - Complete minimum 2w prior to travel
- **Boosters:** q2-3y
- **Adverse events:** generally well tolerated
- **Other vaccines:** ok
- **Notes:** vaccine of choice for pregnancy and immunocompromised

Oral live attenuated "Typh-O"

- **Indications:** 5-6y+
- **Administration:** 4 doses q2d
 - Complete minimum 1w prior to travel
- **Boosters:** q5-7y
- **Contraindications:** immunocompromised, acute GI condition, IBD
- **Adverse events:** mild GI upset, mild systemic
- **Other vaccines:** ok except 8h from oral cholera
- **Notes:** avoid antibiotic use for 7d prior/during/7d after, avoid in pregnancy

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Vaccines (Travel) : TYPHOID

Low risk of acquiring disease + Modestly effective vaccine
BUT
Potentially serious outcome + Possibility of chronic carrier
 + Easy/safe vaccine
 = **USUALLY WORTH IT**

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Approach to pre-travel care

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3. Vaccines:

• Routine:

- MMRV
- Polio
- Hepatitis B
- Meningococcal
- Other childhood

• Travel

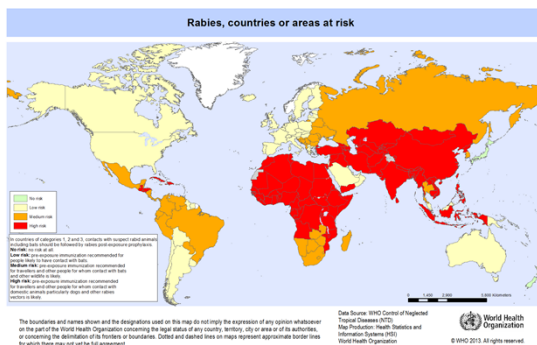
- Hepatitis A
- Typhoid
- **Rabies**
- Yellow Fever
- Japanese Encephalitis
- Cholera/Traveler's Diarrhea

1. Meds – general, specific
2. Behavioural prep/counseling

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Vaccines (Travel) : RABIES

- **What:** virus, saliva of infected mammal
 - North America: mainly bats/skunks
 - Worldwide: 99% deaths due to canine variant
- **Where:** worldwide, 95% cases Africa/Asia



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Vaccines (Travel) : RABIES

- **Indications – pre-exposure prophylaxis:** for travelers living or traveling to high risk areas, especially if poor access to immediate HRIG
 - Particularly children as highest risk
- **Adverse events:**
 - Mild local common
 - Mild-moderate systemic common: headache, nausea, abdo pain, dizziness
 - Immune complex reaction (7% after booster): generalized urticaria, arthralgia, fever, malaise
 - Serious adverse reactions rare
- **Other vaccines:** not much data available, expert opinion = ok

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Vaccines (Travel) : RABIES

- **Vaccines:** same vaccine can be given IM or ID
 - 1mL IM: longer history, standard in USA
 - \$250 x 3 doses!
 - 0.1mL ID: comparable alternative, WHO + Health Canada approved
 - Drastically reduces cost if can share a vial
 - Correct technique is crucial (not subcut!)
 - Titres at 2w
 - Don't use in immunocompromised or those taking chloroquine within a month
- **Administration: 3 doses**
 - Day 0 / 7d / 21-28d for IM (deltoid not gluteal) or ID
 - (off label for ID: some do 2 ID doses x 3 visits as per one Australian study)
 - No minimal age for children? Give when mobile, same dosing and schedule as adult.

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Vaccines (Travel) : RABIES

- **Notes:**
 - If unable to complete 3 dose series, don't start
 - Repeat serology and boosters generally not necessary for travelers
 - Except serology at 2wk if given ID
 - Safe in breastfeeding
 - Safe in pregnancy but may not get optimal response

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Vaccines (Travel) : RABIES

**Low risk of acquiring disease + Expensive vaccine
+ Multiple visits required**

BUT

Fatal outcome + Safe/Efficacious vaccine

**= PRE-EXPOSURE PROPHYLAXIS
WORTH IT FOR KIDS AND MOST
TRAVELLERS TO HIGH RISK PLACES**

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Vaccines (Travel) : RABIES

POST EXPOSURE PROPHYLAXIS
BENEFITS >>> RISKS
(even for special populations)
DO NOT DELAY!

- Pre-exposure prophylaxis?
 - NO = post-exposure prophylaxis (vaccines) + HRIG
 - YES = **still need post-exposure prophylaxis** (just no HRIG)

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Approach to pre-travel care

1. Baseline patient understanding/background
2. Itinerary review – who/what/when/where/why/how

3. Vaccines:

- | | |
|--|--|
| <ul style="list-style-type: none"> • Routine: <ul style="list-style-type: none"> • MMRV • Polio • Hepatitis B • Meningococcal • Other childhood | <ul style="list-style-type: none"> • Travel <ul style="list-style-type: none"> • Hepatitis A • Typhoid • Rabies • Yellow Fever • Japanese Encephalitis • Cholera/Traveler's Diarrhea |
|--|--|

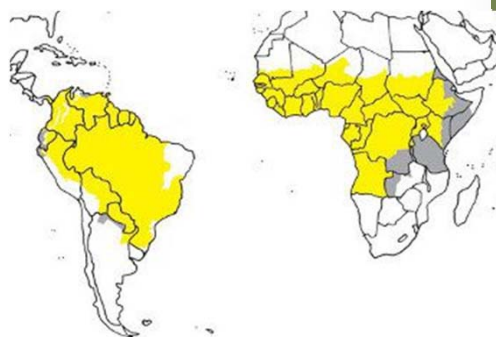
1. Meds – general, specific
2. Behavioural prep/counseling

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Vaccines (Travel) : YELLOW FEVER

- **What:** virus, mosquito
- **Where:** Africa >>> South America
- **Why:** 200 000 cases/yr
 - 1-2% death, no treatment
 - Travellers: low risk of acquiring

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



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Vaccines (Travel) : YELLOW FEVER

- **Vaccines:** live attenuated subcutaneous
- **Indications:**
 - 9m-60y who travel to/reside in endemic area
 - Consider for 6-9m and 60y+ if very high risk destination
 - Increased risk for prolonged travel, extensive outdoor activities, and rural/jungle exposure
 - Entry requirements (countries with disease or with vectors that could acquire)
- **Contraindications:** chicken/egg allergy, infants <6m, immunocompromised
- **Precaution:** infants 6-9m, adults 60y+, asymptomatic HIV, pregnancy, breastfeeding
- **Medical waivers:** if medically contraindicated (not guaranteed acceptance)

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Vaccines (Travel) : YELLOW FEVER

Adverse events – common mild:

- low fever, headache, myalgias, injection site inflammation

Adverse events – rare serious: (case reports)

- Anaphylaxis (chicken/egg allergy)
 - 1.3/100 000
- YF vaccine associated neurologic disease (YEL-AND)
 - 0.8/100 000 overall (2.2/100 000 for age >60y) (high rates in <6m)
 - Meningoencephalitis, GBS, transverse myelitis, etc.
 - Outcome: rarely fatal
- YF vaccine associated viscerotropic disease (YEL-AVD)
 - 0.3/100 000 overall (1.2/100 000 for age >60y)
 - Severe illness similar to wild type disease
 - Outcome: ~50% case fatality

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Vaccines (Travel) : YELLOW FEVER

- **Administration:** 1 lifetime dose subcutaneous
 - Minimum 10d prior to arrival
- **Booster:** unnecessary for most as of 2016
 - Unless pregnant at time of 1st dose or stem cell transplant after 1st dose
 - (but will all borders/customs approve?)
- **Other vaccines:**
 - concomitant with or >4wks from other live parenteral vaccine
 - MMR should NOT be given concomitantly
- **Notes:**
 - Outbreaks have led to depleted worldwide stockpiles
 - Fractional dose of 1/5th regular dose an acceptable alternative if full dose not available
 - Fractional dose considered protective for 1 year only
 - Don't donate blood 2w post vaccine

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Vaccines (Travel) : YELLOW FEVER

- **Notes:**

- Outbreaks have led to depleted worldwide stockpiles
 - Fractional dose of 1/5th regular dose an acceptable alternative if full dose not available
 - Fractional dose considered protective for 1 year only
- Don't donate blood 2w post vaccine
- Avoid in pregnancy
 - Very very low risk to fetus but less robust immune response
 - Could consider giving if +++high risk
- Avoid in breastfeeding
 - 3 cases of infants <1m developing encephalitis
- Avoid in immunocompromised

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Vaccines (Travel) : YELLOW FEVER

**Very low risk of acquiring disease + Expensive vaccine
+ Rare serious vaccine side effects**

BUT

**Serious outcomes of disease + Efficacious vaccine +
Legal entry requirements**

**= USUALLY WORTH IT, GENERALLY
REQUIRED FOR TRAVELERS TO HIGH
RISK AREAS**

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Approach to pre-travel care

1. Baseline patient understanding/background
2. Itinerary review – who/what/when/where/why/how

3. Vaccines:

• Routine:

- MMRV
- Polio
- Hepatitis B
- Meningococcal
- Other childhood

• Travel

- Hepatitis A
- Typhoid
- Rabies
- Yellow Fever
- **Japanese Encephalitis**
- Cholera/Traveler's Diarrhea

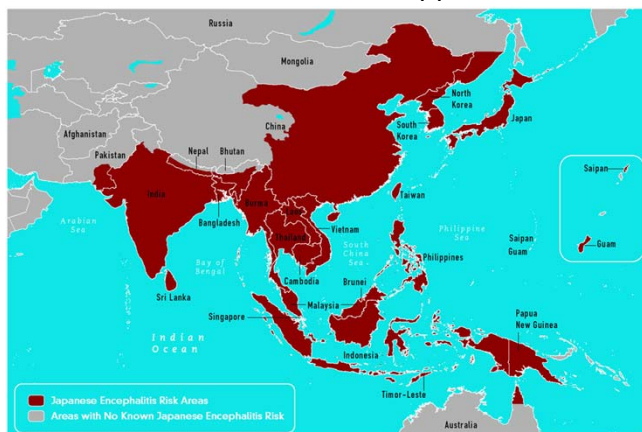
1. Meds – general, specific
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Vaccines (Travel) :

JAPANESE ENCEPHALITIS

- **What:** virus, mosquito
- **Where:** SE Asia, India, China, South Pacific, (especially Northern Thailand, Bali, China, Philippines)



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Vaccines (Travel) : JAPANESE ENCEPHALITIS

- **Why:**
 - **Endemic countries:**
 - 99% asymptomatic or nonspecific febrile
 - <1% neuroinvasive
 - 20-30% case fatality, >50% survivors have physical/cognitive disability
 - Mainly disease of children
 - Most common vaccine-preventable encephalitis and leading cause of neuro-related disability in Asia
 - **Travelers:**
 - Very low risk (<1/100 000 - <1/1million per month of travel)
 - Much higher risk if outdoor/nighttime in rural areas
 - Disease of adults and children
 - >60% of cases died or serious morbidity

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Vaccines (Travel) : JAPANESE ENCEPHALITIS

- **Vaccines:** inactivated IM
 - \$\$\$\$
- **Indications:**
 - Prolonged stays (1m+) in rural farming areas of countries at high risk
 - Shorter stays during transmission season (summer/fall) with extensive outdoor exposure
 - Current known epidemic/outbreak
- **Adverse events:** Mild local or systemic, serious are very rare
- **Other vaccines:**
 - Data limited, likely ok

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Vaccines (Travel) : JAPANESE ENCEPHALITIS

- **Administration:** 2 doses
 - Day 0 / 28d / 1y
 - Adults >18y : 0.5mL/dose for >3y
 - Children <18y :
 - Canada: not authorized
 - USA: 2m-16y, 0.25mL/dose for 2m-2y
 - Complete series 10-14d prior to arrival
- **Booster:**
 - At one year (adults)(info pending for children)
- **Notes:**
 - If departing in <4w do not start series
 - No data on pregnancy or breastfeeding

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Vaccines (Travel) : JAPANESE ENCEPHALITIS

Very very very low risk of acquiring disease
 + **Expensive vaccine**
BUT
Serious outcomes of disease + Efficacious vaccine
= PROBABLY NOT WORTH IT UNLESS
EXTENSIVE RURAL EXPOSURE IN HIGH
RISK COUNTRY

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Approach to pre-travel care

1. Baseline patient understanding/background
2. Itinerary review – who/what/when/where/why/how

3. Vaccines:

• Routine:

- MMRV
- Polio
- Hepatitis B
- Meningococcal
- Other childhood

• Travel

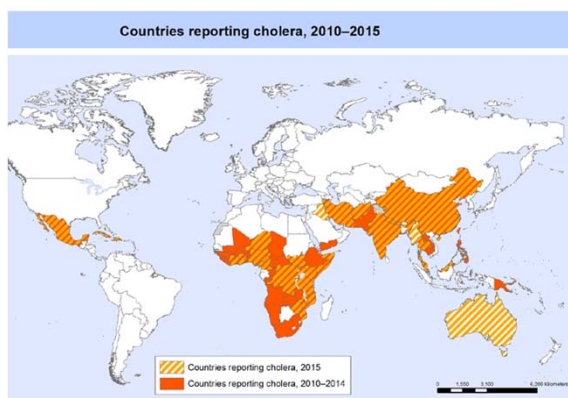
- Hepatitis A
- Typhoid
- Rabies
- Yellow Fever
- Japanese Encephalitis
- **Cholera/Traveler's Diarrhea**

1. Meds – general, specific
2. Behavioural prep/counseling

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Vaccines (Travel) : ETEC/CHOLERA

- Where:
 - ETEC: worldwide (especially developing nations)
 - Cholera: developing nations
- Why:
 - ETEC:
 - 25-50% of traveler's diarrhea,
 - Generally mild and self limited
 - Cholera:
 - severe diarrhea



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Vaccines (Travel) : ETEC/CHOLERA

- **Vaccine:** inactivated + recombinant PO
- **Efficacy:** 6% against all cause diarrhea
- **Indications:**
 - Cholera: Travelers to endemic countries and likely to be at significantly increased exposure risk
 - Traveler's diarrhea: limited value, not recommended except high risk travelers
 - High risk of health complications
 - Serious inconvenience

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Vaccines (Travel) : ETEC/CHOLERA

- **Administration:** 2-3 doses PO (Dukoral)
 - 2-6y: day 0 + 1-6w + 1-6w
 - 6y+: day 0 + 1-6w
 - Complete 1+w prior to arrival
- **Booster:**
 - Cholera:
 - 2-6y: q6m
 - 6y+ q2y
 - Repeat primary series if >5y since last dose
 - Traveler's diarrhea: q3m
- **Adverse events:** Mild GI upset
- **Other vaccines:** Ok except for typh-O 8+h separated
- **Notes:** No data on pregnancy or breastfeeding

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Vaccines (Travel) : ETEC/CHOLERA

Low risk of acquiring disease

BUT

Serious outcomes of disease + Cheap/easy/somewhat efficacious vaccine

= WORTH IT FOR CHOLERA IF SIGNIFICANT EXPOSURE RISK

High risk of acquiring disease + cheap/easy vaccine

BUT

Mild self-limited disease + Ineffective vaccine

= NOT WORTH IT FOR TRAVELER'S DIARRHEA

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Approach to pre-travel care

1. Baseline patient understanding/background
2. Itinerary review – who/what/when/where/why/how

3. Vaccines:

• Routine:

- MMRV
- Polio
- Hepatitis B
- Meningococcal
- Other childhood

• Travel

- Hepatitis A
- Typhoid
- Rabies
- Yellow Fever
- Japanese Encephalitis
- Cholera/Traveler's Diarrhea

1. Meds – general, specific
2. Behavioural prep/counseling

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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~~

BREAK!!!

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AFTER THE BREAK...

- Meds — general, specific
 - Malaria
 - Chloroquine
 - Mefloquine
 - Atovaquone-proguanil (malarone)
 - Doxycycline
 - (Primaquine)
 - Traveler's Diarrhea
 - Altitude Medicine
- **Special Populations** (risks, counseling, vaccines, medications, recommendations)
 - Pediatrics
 - Pregnant women
 - Immunocompromised
 - Visiting friends and relatives (VFR)
- Resources

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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 characteristics 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>

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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>

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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, breastfeeding, 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>

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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

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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>

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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>

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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>

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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: immunocompromised <https://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>

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VFR - Resources

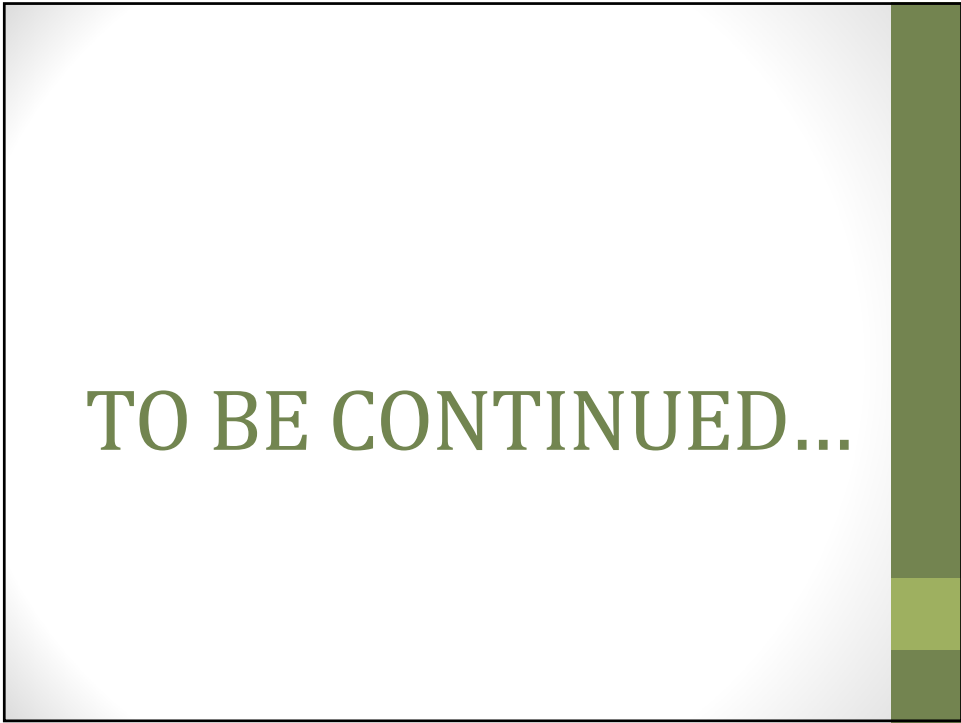
- CDC:
<https://wwwnc.cdc.gov/travel/yellowbook/2018/advising-travelers-with-specific-needs/immigrants-returning-home-to-visit-friends-relatives-vfrs>

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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

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