**Travel vaccinations, travel related illnesses and resources – MM Oct 2017**

**Routine vaccination notes**

**Measles**

* Ongoing introduction to Aus from travellers – 169 cases in 2012 introduced by one guy visiting Thailand!
* 76 cases so far in 2017; 340 cases in 2014
* Young adults (<45yo) main group affected – approx. 20% not immune
* Main risk regions – Europe, S/SE Asia, Pacific islands
* Offer free pre-travel dose to anyone born after 1966 unless 2 prior doses given – 2 dose MMR began in 1994; ensure practice staff are vaccinated
* Public health unit (PHU) outbreak advice - if anyone presents with fever and rash (or fever and overseas travel), immediately apply mask and isolate in a separate room, if you suspect measles then call PHU while patient is with you

**Diphtheria**

* Endemic in Africa, Eastern Europe, Caribbean, Central/Sth America, SE Asia & Middle East – worldwide decrease in numbers however sporadic outbreaks with majority of cases occurring among adolescents and adults (usually unvaccinated) instead of children; 5-10% cases fatal
* Huge epidemic in former USSR in 1990s -40-50,000 cases; huge public health response
* Frequent introduction of toxigenic *C. diphtheria* in wounds in Pacific Is. – 1 fatality in Aus in 2011 contracted from partner who travelled to PNG
* Need minimum 3 lifetime doses for immunity
* 4 cases in Aus so far this year

**Tetanus**

* 1-2 cases/yr in NSW (4 cases in Aus so far this year)
* Booster if >10yrs since last dose
* dTpa or dTpa-IPV – use latter for Pakistan and Afghanistan (require documentation for travel as endemic – min 4 wks before entry)
* need minimum 3 doses at 4wk intervals if no previous vax

**Hepatitis B**

* WHO stance is to cover everyone because accidents are common, hence increased risk of requiring medical intervention, and in developing countries, rate of reusing needles/medical equipment is high so risk of BBV transmission is high
* Also risk of IVDU and new sex partners in developing countries
* Need 3 doses if no previous vax – can do rapid schedule (day 0, 7 & 21)

**Required vaccine notes**

**Polio**

- Enterovirus – faecal-oral transmission

- dTPA-IPV – use for Pakistan and Afghanistan (require documentation for travel as endemic – min 4 wks before entry/travel)

* need minimum 3 doses at 4wk intervals if no prev vax
* 10yrly booster if ongoing risk

**Yellow fever – Stamaril (live)**

* Flavivirus spread by day biting mosquito (*Ae aegypti*)
* Endemic in Sth America and Africa and intermittently epidemic – current outbreak in Brazil (261 deaths in 2017) and recently in Angola and DRC (6000 cases, 400 deaths 2016)
* Single lifetime dose ratified from July 2016 (International health regulations)– documentation will depend on country (expect lag)
* Need to provide proof of vax (yellow card from authorised provider) or exemption letter for travel – valid from 10 days after administration
* Vax contraindicated if: previous anaphylaxis to vaccine or eggs, <9mo, severe immunodeficiency, thymus disorder (myasthenia gravis, DiGeorge syndrome, thymoma, thymectomy), pregnant or breastfeeding women (unless travel totally unavoidable)
* Careful in >60yo as more s/e
* Booster only for those who were pregnant or had HIV when given original vax
* 6 days quarantine if not vaccinated

**Meningococcal ACWY - Menactra, Menveo (4 valent conjugate vax)**

* Compulsory if attending Hajj pilgrimage (Saudi Arabia)
* Cover for meningitis belt of Africa – meningitis A is endemic
* Menactra – more expensive but longer immunity (5yrs cf 2yrs) and eradicates nasopharyngeal carriage

**Recommended vaccine notes**

**Influenza**

* most preventable illness because most frequent – give vax 2wks before travel
* Recommend if travelling to opposite hemisphere or on crowded transport (bus/train/ship/plane)
* VFR travel causes 6-fold increased risk in developing influenza
* See interseasonal peaks in travellers – in 2016 revaccination not recommended, different story in 2017! Almost 200,000 cases in Aus

**Hepatitis A**

* commonest gastro illness seen – peaks every Jan-Feb in returning travellers – food and water safety mainstay
* Faecal-oral transmission
* 2 doses provide longterm immunity – don’t restart if delay btwn doses
* Can give with Hep B or typhoid

**Typhoid**

* same peaks as Hep A but fewer cases – food and water safety mainstay
* Greatest risk in Pacific and Indian subcontinent
* Parenteral vax easier – single dose, more rapid and higher protection (84%), can be used in kids <6yo, immunocompromised and pregnant pts
* Oral – live, 3 doses, must keep cold chain, 75% response, must avoid antibiotics and antimalarials for 3 days post vax because of possible inactivation
* Booster after 3yrs – levels wane btwn 2-3yrs
* No paratyphoid vax

**Cholera**

* Offer to aid workers, long stay in remote destinations, high risk pts (gastric acid suppression, complicated DM, IBD, immunocompromised)
* Need 8hr interval btwn oral cholera and oral typhoid vax because cholera buffer may affect transit of typhoid vax thru GIT
* 2 oral doses from 7 days to 6 weeks apart, protection for 2yrs
* Enterotoxigenic E coli (ETEC) labile toxin (LT) is similar to cholera toxin – antibodies prevent attachment of toxin to gut cells
* Cholera vax was initially thought to offer a 15–20% short-term (3 months) reduction in traveller’s diarrhoea (TD), a recent Cochrane review showed no statistically significant effects on ETEC diarrhoea or all-cause diarrhoea.[15](http://www.racgp.org.au/afp/2015/januaryfebruary/advising-travellers-about-management-of-travellers%E2%80%99-diarrhoea/) Overall, there is, therefore, insufficient evidence to support general use of the cholera vaccine for TD protection, but it may still be considered for individuals with increased risk of severe or complicated TD (eg immunosuppressed or underlying inflammatory bowel disease).

**Rabies**

* Rare but fatal
* Exists in most countries including Australia – we have it in our bats but call it Lyssavirus (same virus, different name)
* Immunise – if extended stay especially to rural high risk areas with difficult access to medical care – educate re individual risk
	+ Bites, scratches or saliva exposure (eg lick) from monkeys, bats and street dogs – Bali, India, Thailand – don’t feed them!
	+ Kids most at risk because of smaller stature, curiosity and often get bitten closer to CNS (face, neck) plus less likely to report minor injuries for fear of getting in trouble – recommend vaccination
	+ Pre-exposure prophylaxis (PrEP) - 3 doses (0, 7, 21 or 28d) give lifetime cover Rabipur or Merieux IM – safe and well-tolerated vax for adults and children; intradermal not routinely recommended - cheaper than IM but requires expertise and time to check serology 2-3wks after course completion
* Insure
* Post-exposure care – immediately wash wound ++++ with soap and water for 15 minutes and apply antiseptic (decreases transmission by 80%), and see Dr asap as rabies is usually fatal
* Post-exposure prophylaxis (PEP) – see AIH diagrams 4.16.1
	+ Depends on category of exposure (3 types), if immunocompetent or not and if previously vaccinated
		- Non-immune immunocompetent - needs 4 dose +/- RIG – days 0, 3, 7 and 14
		- Non-immune immunocompromised - needs 5 doses +/- RIG - days 0, 3, 7, 14 and 28
		- Immune – needs 2 doses day 0 and 3 (no RIG)
	+ rabies immunoglobulin (RIG) infiltrated into high risk wounds up to 7 days after vax commenced (painful) PLUS vax – contact PHU
	+ 500 cases rabies in NSW in 2015 – 303 from animal bites/scratches (zero cases in Aus in 2017 so far)
	+ RIG is often difficult to get overseas plus worry about contaminated blood products – usually means end to holiday and return to Australia asap for treatment plus delay in commencing treatment
* [https://youtu.be/E9j3c-K5jsc](https://l.facebook.com/l.php?u=https%3A%2F%2Fyoutu.be%2FE9j3c-K5jsc&h=ATPQfPrIoiXRoocnZjDeJI3VPOH3LWiy2p3EzGtI6T9c5MX5ZVdfK54VuwG8nnahf7Gd5QgDmJUCfXurIOlFa4iW0PuFutfu0h5UT_XSAE2RgZZQLxBegBh0DAUvS-mObRpDLuwBCQ) GP made information video

**Pneumococcal disease (Pneumovax)**

* General population - 23v PPV Schedule from 65yo and booster 5yrs later
* Indigenous population - from 50yo or younger if immunocompromised
* Asplenic pts – complex see AIH, need 13vPCV plus 23vPPV

**Tuberculosis**

* consider in children (especially <5yo) moving to countries of high TB prevalence (check http://www.who.int/tb/en/) for >3mths
* worldwide vax shortage – access via Chest Clinic
* live vax
* 50-80% effective in preventing meningeal & military TB

**Japanese encephalitis**

* Rare but fatal; vaccine expensive
* Risk of infection is low in travellers – overall incidence <1 in 1 million for rural travel in at risk areas
* Mortality can be up to 30-70% (especially with encephalitis) which decreases to 10% with high quality medical care; 1 in 200 infected develop encephalitis and pregnant women high risk intrauterine infection and foetal death
* Flavivirus transmitted by water birds to domestic animals, usually pigs, then to humans by mosquitoes
* Greatest risk in rural areas near rice paddies during wet season – especially Indian subcontinent, SE Asia, China, PNG, TSI
* Vaccines (fewer s/e with these newer vax)
	+ JEspect - inactivated, from 2mo age, 2 doses IM – 4wks apart; rapid D0 +7 probably ok; boosters depend on age of primary course
	+ Imojev - live, , from 9mo, single dose subcut, boosters depend on age of primary course
* AIH recommends vaccinate travellers >1mo rural Asia/ PNG/ TSI especially in wet/endemic season; travellers >1yo any part Asia; residents TSI
* Mainstay is to prevent mosquito bites
* Early symptoms are fever, headache, N+V and encephalitis (seizures and focal neuro signs) may follow; most cases are asymptomatic

**Herpes zoster (Zostavax)**

* The shingles vaccine, Zostavax®, has been approved to be placed on the National Immunisation Program (NIP), to be provided free of charge from 1 November 2016 to people aged 70 years, subject to vaccine supply. There will also be a five year catch-up program for people aged 71 – 79 years – this was announced in Aug 2015.
* Herpes zoster (HZ) is reactivation of varicella zoster virus (VZV). Occurs in pts with increased age (>50yo), immunocompromised or having VZV in 1st yr of life, with lifetime risk of 20-30% and affects 50% of those living to 85yrs.
* 13-26% people with HZ have complications with post herpetic neuralgia (PHN) most common (more common with inc age; rare in kids)
* Live attenuated vax – same strain as VZV but 14x more potent
* Routine vaccination of persons aged 70–79 years is expected to obtain the greatest benefits against HZ and its complications. Although the vaccine efficacy against HZ is lower in this age group compared with younger ages, persons ≥70 years of age experience a greater risk of disease.
* Can be given following an episode of HZ and is suggested that the vaccine could be given at least 1 year after the episode of HZ (definite timeframe not established).
* Shingles Prevention Study (SPS) - Vaccination reduced the incidence of HZ by 51.3%, the incidence of PHN by 66.5%, and the burden of illness associated with HZ by 61.1% over a median of more than 3 years follow-up.
* Don’t give if previous given varicella vaccine - preliminary information suggests that the incidence of HZ in persons who have received varicella vaccine is lower than in those infected with wild-type varicella

**Travel illnesses**

**Dengue Fever**

* Flavivirus transmitted by largely urban dwelling *Aedes aegypti* mosquito which bites during the day
* Global public health problem – WHO estimates 50-100 million cases/yr; increasing problem in northern QLD
* 4 serotypes + no cross immunity; more severe reaction with subsequent infection with other serotype eg DHF, DSS – occurs if reinfected within 6mo -5yrs
* No vaccine and no cure – supportive Rx only
* Prevent mosquito bites
* Severe Influenza like illness within 4-7 days of bite – fever, headache (retroorbital), myalgias (especially low back pain), rash, lymphadenopathy

DHF = dengue haemorrhaghic fever

DSS = dengue shock syndrome

**Schistosomiasis (Bilharzia)**

* Transmission occurs with 1 minute of exposure
* Acute schistosomiasis diagnosis relies on thorough history and exclusion of other infections
* Thought to be a hypersensitivity reaction to schistosomules
* Symptoms usually occur 2-6 weeks post exposure (range 1-12wks) – sometimes get a pruritic maculopapular rash within 24hrs of fresh water exposure (lasts minutes –hours)
* Typical sx include fever, abdo pain, cough, headache, myalgia, urticarial rash and sx last days to weeks (cough 6 wks)
* No specific diagnostic test in acute phase – eosinophilia is common but not universal plus delayed by 3wks after sx onset; ova production takes 30-60 days post exposure
* Serum conversion takes minimum 6 weeks post exposure – mean interval is 26 days from symptom onset to seroconversion
* Acute schistosomiasis usually resolves spontaneously but there have been case reports of serious acute complications including myocarditis, pericarditis and neurological complications secondary to eosinophilia-induced cerebral vasculitis
* Acute schistosomiasis is increasingly being recognised in returning travellers from endemic countries, especially Africa. Awareness is low in GPs.
* Praziquantel should not be used immediately post exposure or in acute schistosomiasis as it can worsen symptoms. Ideally treat at 3 months post exposure. Repeat dose can be given for ongoing symptoms, ongoing eosinophilia or parasite identification.

**Zika**

* Zika was first described in 1946.
* Flavivirus similar to dengue fever. Transmitted by Aedes aegypti (Yellow fever) mosquito (day biting) – vertical and sexual transmission.
* Symptoms develop 3-12 days after being bitten – rash commonest sx, also fever, headache, nonpurulent conjunctivitis, small joint arthralgias, myalgias, asthenia
* DDx – malaria, dengue, measles, chikungunya
* Positive Zika in males - must use condoms consistently for 6 months following diagnosis because of confirmed association with severe congenital microcephaly especially if infected in 1st or 2nd trimester (1% risk)
* All people must use condoms/avoid pregnancy for 8 weeks post return from Zika risk area (including females who have had Zika confirmed)
* Pregnant women should avoid unprotected sex with a partner (male or female) who has been to a High or Moderate risk country for the duration of the pregnancy.
* there is no preventative treatment or vaccination available – bite prevention is mainstay; no sex with pregnant partner and pregnant women advised not to travel (DoH, RANZCOG; plus insurance may not be valid)
* 80% of people infected are asymptomatic, otherwise usually mild illness
* Guillain-Barre Syndrome is an uncommon complication
* Testing – PCR +/- serology (ICPMR Westmead) – d/w local ID/ PHU
* Resources: <http://www.health.gov.au/internet/main/publishing.nsf/Content/ohp-zika-health-practitioners.htm>

**Travellers’ diarrhoea (TD)**

* Classic TD is >= 3 loose bowel motions PLUS 1 other sx – nausea, vomiting, abdo cramps/ pain, fever, blood in stool
* Travellers’ diarrhoea continues to affect 20–50% of people undertaking trips to areas with under-developed sanitation (despite good progress in aetiological agents and individual risk factors) – so unlikely to see significant change unless food and water safety in destination country improves.
* Usually occurs within 1st week of travel and most episodes last 3-4 days. However 8-15% travellers’ have sx >1wk and 2% have sx >1mth. IBS occurs in 3-10% traveller’s – 5x risk of IBS post TD
* 50-80% cases bacterial, most common is ETEC; 10-20% norovirus (commonest cause of cruise ship gastro outbreaks). Consider protozoal infection if diarrhoea lasts >14d or antibiotics don’t shorten illness
* Not recommended to give cholera vax as routine for TD prevention
* A consensus group doesn’t recommend probiotic use to prevent TD - limited effectiveness
* In 50–80% of TD cases, TD is caused by bacterial infection. Rehydration is the mainstay. Mild diarrhoea can be managed with an antimotility agent (loperamide) alone, but for moderate or severe diarrhoea, early self-treatment with loperamide in conjunction with antibiotics is advised. No loperamide for children <12yo.
* Recommended empirical antibiotics are fluoroquinolones (norfloxacin / ciprofloxacin) or azithromycin for up to 3 days, although in the setting of increasing resistance, the latter is preferred for travellers to South and South-East Asia. Can take unconstituted azithromycin powder for children – preferred ab.
* 2g tinidazole stat can be recommended if TD persists despite 3d course abs – more likely to be parasitic (giardia)
* Self-treatment antibiotic scripts are private not PBS. Give clear written instructions.

**Resources:**

* <https://www.racgp.org.au/Education/Curriculum/Travel-medicine>
* <http://wwwnc.cdc.gov/travel>
* [www.who.int](http://www.who.int/)
* <http://www.fitfortravel.nhs.uk/home.aspx>
* <http://www.immunise.health.gov.au/internet/immunise/publishing.nsf/Content/Handbook10-home~handbook10part3~handbook10-3-2> Australian Immunisation Handbook (AIH)
* <http://www.travelhealthadvisor.com.au/>
* <http://welltogo.com.au/>
* <https://www.qantas.com.au/infodetail/flying/beforeYouTravel/mediform.pdf>
* <http://smartraveller.gov.au/Pages/default.aspx>
* <http://www.racgp.org.au/afp/2015/januaryfebruary/advising-travellers-about-management-of-travellers%E2%80%99-diarrhoea/>
* RACGP check Travel health Unit 524 Jan-Feb 2016
* eTG
* <http://www.health.gov.au/cdnareport> - National Notifiable Diseases Surveillance System – current Communicable Diseases network Australia (CDNA) fortnightly report
* <https://www.youtube.com/watch?v=E9j3c-K5jsc&feature=youtu.be> GP made rabies information video
* <https://www.allergy.org.au/>
* Morgan et al Travel Medicine Encounters of Australian General Practice Trainees—A Cross-Sectional Study *J Travel Med 2015* <https://www.ncbi.nlm.nih.gov/pubmed/26031394>