National Immunisation
Schedule Changes

July 1st changes and
2017 HPV changes
## July 2017 schedule changes summary

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*For previously unvaccinated children with no history of chickenpox infection

**Prevenar13 remains for high risk pneumococcal programme
Varicella vaccine – good news

- National Schedule for all infants at 15 months from 1st July 2017
- A single dose
- Catch-up for those susceptible aged 11 years from 1st July 2017
  - No history of disease or previous vaccination
- Expected to significantly reduce hospitalisations, disability and mortality outcomes
- Disease will be monitored to consider the need for a second dose option in the future

Image: Vesicular rash CDC, Dr K Herman Public Health Information Library (PHIL)
Varicella in New Zealand

• About 50,000 cases annually in New Zealand
• Several hundred hospitalised annually
  • Māori and Pacific Islanders 3 – 4 times higher rate than Europeans
• Varicella can cause severe and fatal disease
  - especially for immune-suppressed individuals
• 1-2 cases of long term disability or death occur annually
• Up to one case of congenital varicella syndrome is estimated to occur annually, although few are reported

Varicella complications

Majority of complications occur in otherwise healthy individuals

**Skin/soft tissue bone joint infections**
- Secondary skin infections
- Scarring
- Septic arthritis
- Osteoarthritis
- Necrotizing fasciitis

**Central nervous system complications**
- Acute cerebellar ataxia
- Encephalitis
- Meningitis
- Central facial palsy
- Reye’s syndrome

**Respiratory complications**
- Pneumonia
- Broncholitis

Varicella vaccine schedule

• Commences from 1\textsuperscript{st} July 2017
• Single dose at 15 months alongside Hib, PCV10 and MMR
• Four different injection sites
• Catch-up for 11 year olds if unvaccinated with no history of chickenpox infection
• Funding criteria for special groups remain the same
• Purchase of varicella vaccine remains an option from 9 months for families who request early, two dose programme or post exposure prophylaxis
NZ Funded varicella vaccine

- **Varilrix:** live attenuated Oka strain of varicella-zoster virus presented as a slightly cream/yellowish/pinkish coloured powder in a glass vial
- Sterile water diluent in a prefilled syringe
- Each 0.5ml reconstituted:
  - Not less than $10^{3.3}$ plaque-forming units (PFU) of attenuated varicella zoster virus
  - Human albumin
  - Lactose
  - Neomycin sulphate residual
  - Polyalcohols (mannitol and sorbitol)
- Store between 2°C and 8°Celsius
- Once reconstituted use as soon as possible
Vaccine effectiveness and efficacy

• 1 Dose
  • Over 95% effective against moderate to severe disease
  • Approximately 70 - 90% effective overall

• 2 Doses
  • For children 97 - 99% against moderate to severe disease
  • For adults approximately 79 – 91% effective against moderate to severe disease

• Breakthrough varicella (BV) in vaccinated people
  • Usually mild
  • Severity does not increase with time post vaccination

• Immunocompromised
  • Contraindicated as it is a live vaccine
  • Mild suppression may still get seroconversion
  • Seek advice

SAGE Systematic review of available evidence on effectiveness and duration of protection of varicella vaccines: WHO 2014
Impact of varicella vaccination US

per 100,000 population Northern California. US

Vaccine safety

• Adverse events following immunisation generally mild and self-limiting
  • Fever 5-12 days post vaccination
  • 1-3% localised rash
  • 3-5% generalised varicella-like rash 5-26 days post vaccination
  • No increased risk of febrile seizures
  • No increased risk of cerebella ataxia, encephalitis or ischaemic stroke

• Transmission of vaccine virus to others
  • Possible but extremely rare
  • Cover post-vaccination rash and isolate from immune-suppressed

WHO (2014) Safety of varicella and MMRV vaccines: A systematic review
Contraindications

• General vaccination contraindications
  • Anaphylaxis to vaccine or components/ Acutely unwell – moderate to severe

• Specific contraindications
  • Immunocompromised
  • Pregnancy - registry now closed (928 reports of inadvertent admin)
    ➢ No congenital varicella syndrome or increased birth defects
  • Known anaphylaxis to neomycin
  • Active untreated Tuberculosis (can be given if on treatment)

• Breastfeeding - NO concerns, NOT a contraindication

What about MMR-V?

N.B. MMR-V is not currently available in New Zealand

• Giving MMR-V combined vaccine at 15 months is associated with **increased risk of febrile convulsions post vaccination**

• This rate equates to **one extra case of febrile convulsions per 2,500 vaccinations** compared to when giving separately on the first occasion or when given combined as a second dose

• Therefore separated vaccines were chosen to reduce the risk of febrile convulsions

Four in a row
For best protection

1. Hib (Hiberix) Vastus lateralis IM
2. Varicella (Varilrix) Deltoid SC
3. Pneumococcal (Synflorix) Vastus lateralis IM
4. MMR (Priorix) Deltoid SC

Get all four at 15 months

Find out more at immune.org.nz

The Immunisation Advisory Centre
Request for two visits?

- Identify concerns and try to address
- Reassure that four injections is safe and best protection
- Delaying leaves child at risk
- Emotionally hard on toddlers to return for another vaccine
- If parents *insist* give live vaccines (MMR and Varicella) first
  - Reschedule *as soon as feasible* for Hib and PCV (no gap needed)
Adolescents

• Funded single dose at age 11
• Only if previously unvaccinated with no history of chickenpox infection
• Only eligible if turning 11 from 1\textsuperscript{st} July 2017 (and then until 18\textsuperscript{th} birthday)

Image: Health Education Resources
A single varicella vaccine at the 15 month event from 1\textsuperscript{st} July 2017

Funded for those born from 1\textsuperscript{st} April 2016

This will involve four injections at 15 months, two subcutaneous and two intramuscular

A confident vaccinator can reassure parents that this is best

One dose to 11 year olds previously unvaccinated with no history of chickenpox infection
Rotavirus disease control

- Common cause of hospitalisation
- Spread by fecal-oral route, no antiviral treatment
- Prior to vaccination most 3 year olds had had rotavirus disease,
- Post vaccination reduction of disease in under five year olds was dramatic
- New vaccine has advantage of two doses prior to 25 weeks for improved protection of vulnerable groups

www.cdc.gov/rotavirus/
Institute of Environmental Science and Research Ltd – unpublished data
Hospitalisation data children <5 years 2010-15

Number of rotavirus hospital discharges

% of all gastroenteritis

Year

Institute of Environmental Science and Research Ltd – unpublished data
Rotavirus vaccine schedule

- First dose
  - Scheduled at the **6 week immunisation event**
  - Must be commenced prior to 15 weeks (14 weeks and 6 days)
- Second (last) dose
  - Scheduled at the **3 month immunisation event**
  - At least 4 weeks after first dose
  - Must not be administered prior to 25 weeks (last dose 24 weeks and 6 days)
Rotavirus presentation

- Each pack contains:
  - 10 oral applicators prefilled with vaccine
  - The applicator will change, probably in 2018

- Composition
  - Live attenuated vaccine
  - Animal Vero cell line used for culture
  - High in sucrose – give before injections to mitigate injection pain/distress

- Storage
  - Store in packaging between 2° and 8°Celsius
  - Do not freeze - discard if frozen
Rotavirus vaccine administration

- The child is held in a semi reclining position
- Give oral rotavirus vaccine before injectable vaccines
- Insert the Rotarix applicator into the mouth between cheeks and gums and depress the plunger to slowly administer
- The vaccine dose is 1.5mls, the child may not take the full dose all at once, administer small amounts slowly
- Regurgitation – do not repeat the dose
- **DO NOT INJECT**
Contraindications

- History of anaphylaxis after a previous dose of rotavirus vaccine or any component
- History of intussusception

- Mild illness such as upper respiratory tract infection or mild diarrhoea is not a contraindication
Rotavirus vaccine AEFI messages

• Rotavirus vaccines have a good safety profile
• Most infants given rotavirus vaccine have no side effects
• The risk of intussusception is much lower than the risk of severe rotavirus disease in unvaccinated children
• Any adverse events should be reported through the national reporting system with CARM
  • Reassure the parent/caregiver, admit any uncertainty, investigate fully and keep the community informed
Rotavirus change key points

- Rotavirus is common and very easily transmitted
- Vaccines have good safety profile
- Vaccination has reduced disease significantly
- First dose prior to 15 weeks second dose prior to 25 weeks
- On time vaccination reduces risk of intussusception
- Follow basic hygiene measures for live vaccines
- Diarrhoea in a vaccinated child can be from another cause
Pneumococcal vaccine change

- PCV10 (Synflorix) is funded from 1\textsuperscript{st} July 2017
- Overall the data shows that both PCV10 and PCV13 (Prevenar 13) vaccines are suit disease reduction in New Zealand children
- PCV10 has demonstrated cross protection for serotypes not included
- PCV13 and 23PPV (Pneumovax 23) will continue to be funded for high risk groups only
Invasive pneumococcal disease NZ

Vaccine Type introduced = June 2008 PCV 7 added to schedule; change to PCV10 July 2011 and to PCV13 in July 2014

MMR Vaccine (Priorix) brand change

- Priorix will replace M-M-R II from 1st July 2017 when stocks are used up
- Presented as a slightly pink pellet for reconstitution
- The diluent is presented in a pre-filled single dose syringe for reconstitution
- The reconstituted vaccine may vary from clear peach to fuchsia pink due to slight variations in the pH
- Administer as the last injection in a set to mitigate pain and distress
Haemophilis influenzae type b – brand change

- Hiberix will replace Acthib from 1st July 2017 when stocks are used up
- Hiberix is presented lyophilised vaccine is presented as a white powder in a glass vial
- The sterile diluent is in a pre-filled single use syringe for reconstitution
- Administer as the first of four injections at the 15 month event
- Hiberix vaccine has been used on the New Zealand schedule in the past
HPV Infection

- HPV is a virus
- It infects the skin and mucous membranes
- Most infections clear within 18 months
- Clearing infection does not confer immunity
- *Persistent* infection with oncogenic types may cause cancers
- HPV cancers affect genitourinary and the head-neck regions
- The number of HPV related oropharyngeal cancers are increasing

HPV types differ by disease association

**Mucosal sites of infection**
- >40 Types
- High risk (oncogenic)
  - HPV 16, 18 most common
- **Cervical Cancer**
  - Anogenital Cancers
  - Oropharyngeal Cancer
  - Cancer Precursors
  - Low Grade Cervical Disease

**Cutaneous sites of infection**
- >80 Types
- Low risk (non-oncogenic)
  - HPV 6, 11 most common
- **Genital Warts**
- Laryngeal Papillomas
- Low Grade Cervical Disease
- “Common”
  - Hand and Foot Warts
Cancers caused by high-risk HPV types

- Cervix: >99%
- Penis: >63%
- Vulva, Vagina: >70%
- Anus: >90%
- Oropharynx: >70%

www.cdc.gov/hpv/parents/cancer
Head and neck cancers

- Oral cavity cancers, associated with tobacco and alcohol, are decreasing
- Cancers of the tongue, base of the tongue & other oropharyngeal sites are increasing
- These are associated with HPV 16
- In New Zealand oropharyngeal cancers have increased rapidly since 2005
- These are at least twice as common in men than women

Image: www.cancer.org
HPV9 vaccine

- HPV4 covers >70% of oncogenic types leading to cervical cancer - 6,11,16,18
- HPV9 covers >87% of oncogenic serotypes:
  - 6,11,16,18 plus 31,33,45,52,58 Contains extra antigen and adjuvant
- Studies suggest the vaccine protection is long-lasting - no evidence of waning immunity
- Available evidence indicates protection for at least 10 years with HPV4

Effectiveness of HPV4 vaccine

• Over 130 published studies to June 2016
• Maximal reduction of around 90% for HPV infection, genital warts and cervical abnormalities (57 studies)
• Profound reduction in genital warts (e.g. Australia and Denmark)
  • Elimination of genital warts may be possible
  • Mediocre coverage also leads to significant reductions

HPV vaccine has an Excellent safety profile

- Extensive post-market surveillance – no safety signals raised
- Summary of post-market safety associations
  - Syncope (related to injection reaction)
  - Possible skin infections (probably injection site reactions misclassified)
  - Pregnancy (contraindicated but inadvertent admin)
    - No theoretical risk (not a live vaccine)
    - No differences in outcome pregnant/non pregnant

HPV9 vaccine

• 15,000 subjects in 31 countries
• HPV9 slightly more reactogenic than HPV4
  • injection site reactions: only significant difference was in injection site swelling
  • common systemic events all slightly higher e.g. headache 14.6% (13.7% with HPV4), pyrexia 5% (4.3% with HPV4)

What about stories on the internet about . . .

- Complex regional pain syndrome (CRPS)
- Postural Orthostatic Tachycardia Syndrome (POTS)

The evidence:
- >15,000 received ≥1-dose HPV9
- Pregnancies were followed to outcome (n=2950)
- Safety outcomes followed for 7 – 72 months
- New medical conditions collected at each visit
  - 2 developed CRPS, both related to a previous injury
  - 2 developed POTS, one case >3 years after vaccination

Pediatrics 2016;138 (2) e2015438
HPV9 vaccine and pregnancy

- Remains a contraindication
- 2950 accidental pregnancies (out of 15,000 subjects) were followed up
- Outcomes similar to placebo (HPV4) group
- No increase in rates of spontaneous miscarriage, birth defects or other pregnancy outcomes compared to general population


Image: Let’s talk about immunisation resource, Ministry of Health
2017 HPV schedule

• 2 doses, 0 and 6–12 months for those under 15 years
  • Minimum interval 5 months

• 3 doses, at 0, 2 and 6 months, for:
  • aged 15–26 years inclusive
  • aged 9–26 years inclusive:
    • with confirmed HIV infection
    • who are transplant (including stem cell) patients

• An additional dose aged 9–26 year olds post-chemotherapy

• Start with HPV4 may complete HPV4 or with HPV9

• Those who had funded HPV4 course not eligible for HPV9

• Count all funded doses given, do not restart
Expected vaccine responses

• Expected vaccine responses for HPV4:
  • Fainting, especially adolescents
  • Pain, redness and swelling at the injection site
  • Headache
  • Fever less than 39°C

• Slightly increased for HPV9 due to increased levels of the adjuvant and some antigens

HPV delivery in primary care

• Two doses funded = **standard schedule**
  • For to 11-14 year olds who decline in school based programme

• Three dose schedule is **catch-up** if missed or **high risk** (check NIR data)
  • Aged 15-26 years old
  • 11-26 years old with positive HIV, immune-deficiency, or post transplant

• Completion only funded if first dose given before 27

• **Resource permitting** primary care can call 14 – 26 year olds who have not completed a course of HPV vaccine
Current HPV programme targets

- **Girls born in 2003 (vaccinated in 2016)**
  
  Dose three (3) target is 70%
  
  Measured in 2017

- **Girls born in 2004 (due vaccination 2017)**
  
  Dose two (2) target is 75%
  
  Measured in 2018

- **Boys are not included in the targets yet**
HPV communication

• Unique challenges of the HPV vaccine programme:
  • The vaccine targets youth before their sexual debut - recommended for those 9 – 13 years of age
  • However the benefits of the vaccine are not seen for years, even decades

• The long term plan is the programme will will become a routine health strategy to prevent cancer

WHO (2016) HPV vaccine communication: Special considerations for a unique vaccine
HPV immunisation key points

- HPV vaccine most effective at younger ages
- Less doses when given under age 15 years
- School programmes result in higher coverage and reduced inequities
- Primary health can provide catch-ups to improve coverage
- Specific communication is needed to explain to young people and address community concerns
Questions?