



# Principles of managing incomplete immunisation schedules

2017



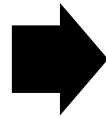
# Learning objectives

- Identify the steps to take in managing incomplete immunisation schedules
- Practise using PHE's incomplete immunisation algorithm in managing incomplete immunisation schedules

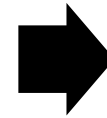


## Steps to take ...

Establishing  
Vaccine  
History



Identifying  
recommended  
vaccines



Planning the  
schedule



## Establishing Vaccine History

### Review all reliable records:

- Personal child health record
  - CHIS (Child Health Information Services)
  - Previous GP surgery
  - Assess patients/parents verbal history
  - Non UK schedule use resources to translate/decipher
-



Immunization schedule selection centre:

The Regions, Countries, Vaccines lists are multiselect-enabled;  
You are free to select any amount of any combination of items.

Regions list;

- AFR
- AMR
- EMR
- EUR
- SEAR
- WPR

Countries list

- Afghanistan
- Albania
- Algeria
- Andorra
- Angola
- Antigua and Barbuda

Vaccines list

- BCG..... Bacille Calmette-Guérin vaccine
- CHOLERA.....Cholera
- Dip.....Diphtheria vaccine
- DT.....Tetanus and diphtheria toxoid childrens' dose
- DTaP..... Diphtheria and tetanus toxoid with acellular pertussis vaccine
- DTaPHepBIPV.....Diphtheria and Tetanus and Pertussis and Hepatitis B and Polio
- DTaPHepIPV.....Diphtheria and tetanus toxoid with acellular pertussis, HepB and IPV vaccine
- DTaPHib.....Diphtheria and tetanus toxoid with acellular pertussis and Hib vaccine
- DTaPHibHep..... Diphtheria and tetanus toxoid with acellular pertussis, Hib and HepB vaccine
- DTaPHibHepB.....Diphtheria and tetanus toxoid with acellular pertussis, Hib and HepB vaccine
- DTaPHibHepIPV.....Hexavalent diphtheria, tetanus toxoid with acellular pertussis, Hib, hepatitis B and IPV vaccine
- DTaPHibiPV.....Diphtheria and tetanus toxoid with acellular pertussis, Hib and IPV vaccine

Select all vaccines Unselect all vaccines

OK

<http://vaccine-schedule.ecdc.europa.eu/Pages/Scheduler.aspx>

This website is part of the ECDC (European Centre for Disease Prevention and Control) network

European Centre for Disease Prevention and Control

Vaccine Schedule

**QUICK SEARCH** Country:  Age group:  Child  Adult

**ADVANCED SEARCH**

**Compare national immunisation schedules**

Compare:  with:

Age group:  Child  Adult

**Immunisation schedules by target disease**

Select a disease:

in:

Comparisons can be made for vaccination policies between two countries or by disease for all or a selection of countries. Despite this platform being continuously monitored, it is suggested the national competent bodies are also consulted for the most up to date policies.

Please inform ECDC of incorrect or missing information at: [vpd@ecdc.europa.eu](mailto:vpd@ecdc.europa.eu). This platform was developed by ECDC with [mesvaccins.net](http://mesvaccins.net)

Click on the link for: [Immunization schedules by disease covered by antigens within age range](#)

Employment | Other UN Sites | Search | Suggestions | RSS | Privacy  
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[http://apps.who.int/immunization\\_monitoring/globalsummary/schedules](http://apps.who.int/immunization_monitoring/globalsummary/schedules)





# Principle 1

- Unless there is a reliable vaccine history, individuals should be assumed to be **unimmunised and a full course of immunisations planned**





## Additional doses



### Vaccinating

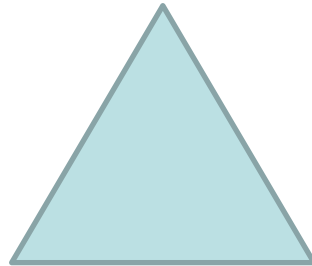
Protect

Possible AEFIs

### Not vaccinating

Risk of disease

Associated morbidity





# Why is it safe to vaccinate when the history is unknown?

## Effect

- Reactivate the immune system

## Result:

- Increased level of antibody
- Increased level of protection
- Expected side effects e.g. sore arm, temperature

For live vaccines e.g. MMR

- Any pre-existing immunity inhibits replication of the vaccine virus

Exception BCG – immune response after 2<sup>nd</sup> dose  
maybe vigorous





## Identifying recommended vaccines

### Routine schedule changes with age:

- Diseases immunised against
- Number of doses for some vaccines
- Type of vaccine used for tetanus/polio/diphtheria



## Principles 2 & 3

- Individuals coming to UK part way through their immunisation schedule should be transferred onto the UK schedule and immunised as appropriate for age
- If the primary course has been started but not completed, continue where left off – **no need to repeat doses or restart course**



# Planning the schedule

- What antigens are in each vaccine?
  - Do you need to give more than one live vaccine?
-



## Principle 4

- Plan catch-up immunisation schedule with **minimum number of visits** and within a **minimum possible timescale** – aim to protect individual in shortest time possible

# Vaccination of individuals with uncertain or incomplete immunisation status

For online Green Book, see [www.gov.uk/government/organisations/public-health-england/series/immunisation-against-infectious-disease-the-green-book](http://www.gov.uk/government/organisations/public-health-england/series/immunisation-against-infectious-disease-the-green-book) • For other countries' schedules, see [http://apps.who.int/immunization\\_monitoring/globalsummary/](http://apps.who.int/immunization_monitoring/globalsummary/)

## Infants from two months of age up to first birthday

**DTaP/IPV/Hib<sup>+</sup> + PCV<sup>\*\*</sup> + MenB<sup>\*\*</sup> + rotavirus<sup>\*\*\*</sup>**  
Four week gap  
**DTaP/IPV/Hib + rotavirus<sup>\*\*\*</sup>**  
Four week gap  
**DTaP/IPV/Hib + PCV<sup>\*\*</sup> + MenB<sup>\*\*</sup>**

- \* When Hib has not been given as part of a primary course give *either*
- Three doses of DTaP/IPV/Hib vaccine at monthly intervals if D, T, aP or IPV also required or
- Three doses of Hib/ MenC combined vaccine if no other components required
- \*\* Doses of PCV and MenB should ideally be given two months apart but can be given one month apart if necessary to ensure the immunisation schedule is completed (i.e. if schedule started at 10 months of age)
- \*\*\* Vaccination with rotavirus should not be started for infants aged 15 weeks or older
- First dose to be given **only** if infant is more than 6 weeks and under 15 weeks
- Second dose to be given **only** if infant is less than 24 weeks old

## Boosters + subsequent vaccination

As per UK schedule ensuring at least a one month interval between DTaP/IPV/Hib and Hib/MenC doses and a two month interval between PCV and MenB doses (ie if primary course commenced close to first birthday)

## General principles

- Unless there is a reliable vaccine history, individuals should be assumed to be **unimmunised** and a full course of immunisations planned
- Individuals coming to UK part way through their immunisation schedule should be transferred onto the UK schedule and immunised as appropriate for age
- If the primary course has been started but not completed, continue where left off – **no need to repeat doses or restart course**
- Plan catch-up immunisation schedule with minimum number of visits and within a minimum possible timescale – aim to protect individual in shortest time possible

## Children from first up to second birthday

**DTaP/IPV/Hib<sup>+</sup> + PCV<sup>†</sup> + Hib/Men C<sup>†</sup> + MenB<sup>††</sup> + MMR**  
Four week gap  
**DTaP/IPV/Hib<sup>†</sup>**  
Four week gap  
**DTaP/IPV/Hib + MenB<sup>††</sup>**

- † DTaP/IPV can be given if DTaP/IPV/Hib not available. All un- or incompletely immunised children require one dose of Hib, Men C and PCV over the age of one year (until teenage booster). It does not matter if two Hib-containing vaccines are given at the first appointment or if the child receives additional Hib at subsequent appointments if DTaP/IPV/Hib vaccine is given
- †† Only children born on or after 1/5/15 should be offered MenB. Children born on or after 1/7/15 who received less than 2 doses of MenB in the first year of life should receive two doses of MenB at least two months apart before their second birthday.

## Boosters + subsequent vaccination

As per UK schedule

## MMR – from first birthday onwards

- Doses of MMR/measles vaccine given prior to 12 months of age should not be counted
- For individuals <18 months of age a minimum interval of three months should be left between first and second doses
- For individuals >18 months of age a minimum of one month should be left between first and second doses
- Two doses of MMR should be given irrespective of history of measles, mumps or rubella infection and/or age

## Flu vaccine (during flu season)

- Those aged 65yrs and older (including those becoming age 65 years by 31/3/17)
- Children aged 2, 3 or 4yrs on/before 31/8/16 (DOB on/after 1/9/11 and on/before 31/8/14)
- Children of school years 1 (5-6yrs), 2 (6-7yrs) and 3 (7-8yrs) (given in school or primary care according to local arrangements)
- Those aged 6 months and older in the defined clinical risk groups (see Green Book Influenza chapter)

## Pneumococcal polysaccharide vaccine (PPV)

- Those aged 65yrs and older
- Those aged 2yrs and older in the defined clinical risk groups (see Green Book Pneumococcal chapter)

## Shingles vaccine One dose for

- Those aged 70 and 78
- In addition, individuals who have been or have become eligible since the start of the shingles programme in September 2013 remain eligible until their 80th birthday (see eligibility chart on PHE website)

## Children from second up to tenth birthday

**DTaP/IPV/Hib<sup>+</sup> + Hib/Men C<sup>+</sup> + MMR**  
Four week gap  
**DTaP/IPV/Hib<sup>+</sup> + MMR**  
Four week gap  
**DTaP/IPV/Hib<sup>+</sup>**

- \* DTaP/IPV can be given if DTaP/IPV/Hib not available. All un- or incompletely immunised children require one dose of Hib and Men C over the age of one year. It does not matter if two Hib-containing vaccines are given at the first appointment or if the child receives additional Hib at subsequent appointments if DTaP/IPV/Hib vaccine is given.

## Boosters + subsequent vaccination

First booster of DTaP/IPV or dTaP/IPV can be given as early as one year following completion of primary course to re-establish on routine schedule. Additional doses of DTaP/IPV/Hib-containing vaccines given under three years of age in some other countries do not count as a booster to the primary course and should be discounted  
Second booster – as per UK schedule

## From tenth birthday onwards

**Td/IPV + MenACWY<sup>a</sup> + MMR**  
Four week gap  
**Td/IPV + MMR**  
Four week gap  
**Td/IPV**

- \*\* Those aged from 10 years up to 25 years who have never received a MenC-containing vaccine should be offered MenACWY
- Those aged 10 years or over who have previously received a MenC vaccine may be eligible or may shortly become eligible for MenACWY. Refer to MenACWY national programme information for further information on eligibility

## Boosters + subsequent vaccination

**First Td/IPV**  
Preferably five years following completion of primary course  
**Second Td/IPV**  
Ideally ten years (minimum five years) following first booster

## HPV vaccine for girls from twelfth up to eighteenth birthday

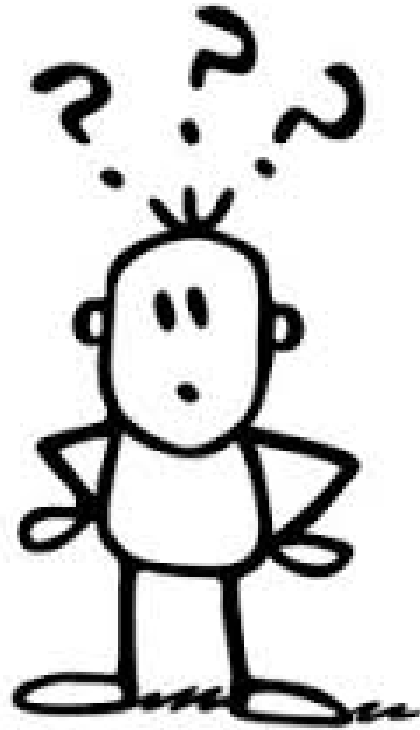
- Girls commencing HPV vaccine course:
  - before age 15 yrs should follow 2 dose 0, 6-24 months schedule
  - at age 15 yrs and above should follow 3 dose 0, 1, 4-6 months schedule
- If interrupted, course should be resumed but not repeated, ideally allowing appropriate intervals between remaining doses
- For two dose course, give second dose even if more than 24 months have elapsed since first dose or girl is then aged 15 yrs or more
- Three dose courses started but not completed before eighteenth birthday should be completed ideally allowing 3 months between second and third doses (minimum one month interval if otherwise unlikely to complete course)
- If girl commenced three dose course under 15yrs prior to September 2014, and has:
  - only received one dose, give a second dose 6-24m later to complete a two dose course
  - received two doses less than six months apart, give a third dose at least three months after second dose

IMW186.04 Effective from July 2016 Authorised by: Laura Craig  
Review date: July 2017

Note: BCG and Hepatitis B vaccines should be given to those at risk as per Green Book recommendations and have therefore not been included in this algorithm



# Working the algorithm



VACCSline



# Vaccination of individuals with uncertain or incomplete immunisation status

For online Green Book, see [www.gov.uk/government/organisations/public-health-england/series/immunisation-against-infectious-disease-the-green-book](http://www.gov.uk/government/organisations/public-health-england/series/immunisation-against-infectious-disease-the-green-book) • For other countries' schedules, see [http://apps.who.int/immunization\\_monitoring/globalsummary/](http://apps.who.int/immunization_monitoring/globalsummary/)

**Infants from two months of age up to first birthday**

**Children from first up to second birthday**

**Children from second up to tenth birthday**

**From tenth birthday onwards**

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# Vaccination of individuals with uncertain or incomplete immunisation status

For online Green Book, see [www.gov.uk/government/organisations/public-health-england/series/immunisation-against-infectious-disease-the-green-book](http://www.gov.uk/government/organisations/public-health-england/series/immunisation-against-infectious-disease-the-green-book) • For other countries' schedules, see [http://apps.who.int/immunization\\_monitoring/globalsummary/](http://apps.who.int/immunization_monitoring/globalsummary/)

## General principles

- Unless there is a reliable vaccine history, individuals should be assumed to be **unimmunised** and a full course of immunisations planned
- Individuals coming to UK part way through their immunisation schedule should be transferred onto the UK schedule and immunised as appropriate for age
- If the primary course has been started but not completed, continue where left off – **no need to repeat doses or restart course**
- Plan catch-up immunisation schedule with minimum number of visits and within a minimum possible timescale – aim to protect individual in shortest time possible





## Steps to take ...



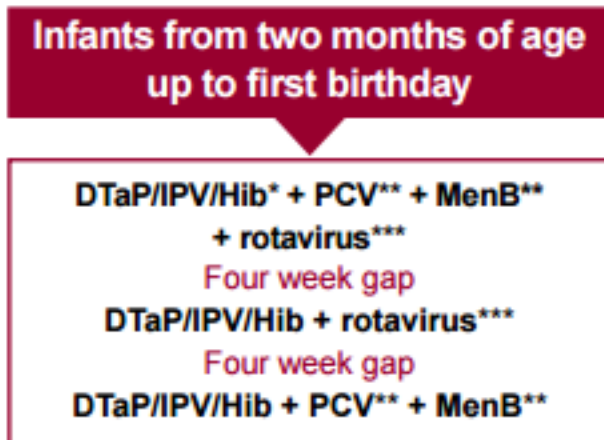
- Q 1: How old are they now?
  - Q 2: Which vaccines have they had?
  - Q 3: Which vaccines are they missing for their current age?
  - Q 4: Schedule catch up
-



# Infant presents, 20 weeks old Not had any vaccinations



- Q1: how old are they now?  
**20 weeks**
  - Q 2: what vaccines have they had?  
**None**
  - Q 3: what vaccines are they missing for their current age?  
**Men B, DTaP/IPV/Hib, PCV,**
- Q 4: Using algorithm to help schedule catch up:



As 20 weeks too old  
to start rotavirus  
course



# Scenario 1



Baby Charlie 6 months old

Imms history:

At 8 weeks – DTaP/IPV/Hib +PCV+ Men B +Rotavirus

At 12 weeks– DTaP/IPV/Hib + Rotavirus

- Q1: how old are they now?  
**6 months**
- Q 2: what vaccines have they had?  
**1<sup>st</sup> and 2<sup>nd</sup> primary imms**
- Q 3: what vaccines are they missing for their current age?  
**DTaP/IPV/Hib, PCV, Men B,**
- Q 4: Using algorithm to help schedule catch up:  
**DTaP/IPV/Hib, PCV, Men B**



## Infants from two months of age up to first birthday

**DTaP/IPV/Hib\* + PCV\*\* + MenB\*\*  
+ rotavirus\*\*\***

Four week gap

**DTaP/IPV/Hib + rotavirus\*\*\***

Four week gap

**DTaP/IPV/Hib + PCV\*\* + MenB\*\***

- \* When Hib has not been given as part of a **primary** course give *either*
- Three doses of DTaP/IPV/Hib vaccine at monthly intervals if D, T, aP or IPV also required or
- Three doses of Hib/ MenC combined vaccine if no other components required
- \*\* Doses of PCV and MenB should ideally be given two months apart but can be given one month apart if necessary to ensure the immunisation schedule is completed (i.e. if schedule started at 10 months of age)
- \*\*\* **Vaccination with rotavirus should not be started for infants aged 15 weeks or older**
- First dose to be given **only** if infant is more than **6 weeks** and under **15 weeks**
- Second dose to be given **only** if infant is less than **24 weeks** old

## Boosters + subsequent vaccination

As per UK schedule ensuring at least a one month interval between DTaP/IPV/Hib and Hib/MenC doses and a two month interval between PCV and MenB doses (ie if primary course commenced close to first birthday)



## Scenario 2



Amy 22mths old (born prior to 1/5/15). Imms history:

- DTaP/IPV/Hib, PCV and Men C, at 9 months of age

- Q1: how old are they now?

22 months

- Q 2: what vaccines have they had?

1<sup>st</sup> 5 in 1, 1 PCV and 1 Men C

- Q 3: what vaccines are they missing for their current age?

2 x DTaP/IPV/Hib, PCV, Hib/Men C, MMR

- Q 4: Using algorithm to help schedule catch up:

Visit 1: DTaP/IPV/Hib, Hib/MenC, MMR, PCV

Visit 2 (1 month later): DTaP/IPV/Hib,



## Children from first up to second birthday

**DTaP/IPV/Hib<sup>†</sup> + PCV<sup>†</sup> + Hib/Men C<sup>†</sup>  
+ MenB<sup>††</sup> + MMR**  
Four week gap  
**DTaP/IPV/Hib<sup>†</sup>**  
Four week gap  
**DTaP/IPV/Hib + MenB<sup>††</sup>**

<sup>†</sup>DTaP/IPV can be given if DTaP/IPV/Hib not available.

All un- or incompletely immunised children require one dose of **Hib, Men C** and **PCV** over the age of one year (until teenage booster). It does not matter if two Hib-containing vaccines are given at the first appointment or if the child receives additional Hib at subsequent appointments if DTaP/IPV/Hib vaccine is given

<sup>††</sup> Only children born on or after 1/5/15 should be offered MenB. Children born on or after 1/7/15 who received less than 2 doses of MenB in the first year of life should receive two doses of MenB at least two months apart before their second birthday.

## Boosters + subsequent vaccination

As per UK schedule

## MMR – from first birthday onwards

- Doses of **MMR/measles** vaccine given prior to 12 months of age should not be counted
- For individuals <18 months of age a minimum interval of three months should be left between first and second doses
- For individuals >18 months of age a minimum of one month should be left between first and second doses
- Two doses of **MMR** should be given irrespective of history of measles, mumps or rubella infection and/or age

## Flu vaccine (during flu season)

- Those aged 65yrs and older (including those becoming age 65 years by 31/3/17)
- Children aged 2, 3 or 4yrs on/before 31/8/16 (DOB on/after 1/9/11 and on/before 31/8/14)
- Children of school years 1 (5-6yrs), 2 (6-7yrs) and 3 (7-8yrs) (given in school or primary care according to local arrangements)
- Those aged 6 months and older in the defined clinical risk groups (see Green Book Influenza chapter)



## Scenario 3



**Katie 5 yrs of age. Imms history:**

- **All vaccines given as an infant**
- **MMR, Hib/Men C and PCV at 12 months of age**
- **Nothing since**

- Q1: how old are they now?

**5 years**

- Q 2: what vaccines have they had?

**Primary infant and 12 month vaccines**

- Q 3: what vaccines are they missing for their current age?

**Pre school booster DTaP/IPV, MMR and Flu**

- Q 4: Using algorithm to help schedule catch up:

**Visit 1: DTaP/IPV/Hib, MMR, Nasal flu vaccine**

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## Children from second up to tenth birthday

**DTaP/IPV/Hib<sup>\*</sup> + Hib/Men C<sup>\*</sup> + MMR**

Four week gap

**DTaP/IPV/Hib<sup>\*</sup> + MMR**

Four week gap

**DTaP/IPV/Hib<sup>\*</sup>**

<sup>\*</sup> DTaP/IPV can be given if DTaP/IPV/Hib not available.

All un- or incompletely immunised children require one dose of **Hib** and **Men C** over the age of one year. It does not matter if two Hib-containing vaccines are given at the first appointment or if the child receives additional Hib at subsequent appointments if DTaP/IPV/Hib vaccine is given.

## Boosters + subsequent vaccination

First booster of DTaP/IPV or dTaP/IPV can be given as early as one year following completion of primary course to re-establish on routine schedule. Additional doses of DTaP/IPV/Hib-containing vaccines given under three years of age in some other countries do not count as a booster to the primary course and should be discounted  
Second booster – as per UK schedule

## MMR – from first birthday onwards

- Doses of **MMR/measles** vaccine given prior to 12 months of age should not be counted
- For individuals <18 months of age a minimum interval of three months should be left between first and second doses
- For individuals >18 months of age a minimum of one month should be left between first and second doses
- Two doses of **MMR** should be given irrespective of history of measles, mumps or rubella infection and/or age

## Flu vaccine (during flu season)

- Those aged 65yrs and older (including those becoming age 65 years by 31/3/17)
- Children aged 2, 3 or 4yrs on/before 31/8/16 (DOB on/after 1/9/11 and on/before 31/8/14)
- Children of school years 1 (5-6yrs), 2 (6-7yrs) and 3 (7-8yrs) (given in school or primary care according to local arrangements)
- Those aged 6 months and older in the defined clinical risk groups (see Green Book Influenza chapter)





## Scenario 4



**Heidi is 12 yrs old. Imms history:**

- **TDP/pol as infant x 1**
- **Nothing since**

- Q1: how old are they now?

**12 years**

- Q 2: what vaccines have they had?

**1 x Tet, dip,pert,pol**

- Q 3: what vaccines are they missing for their current age?

**2 x primary tet,dip,pol, 1<sup>st</sup> booster tet,dip,pol, 2 X MMR,  
2x HPV, Men ACWY**

- Q 4: Using algorithm to help schedule catch up:

**Visit 1: Td/IPV (2) + MMR + Men ACWY+ HPV**

**Visit 2 (1 month): Td/IPV (3) + MMR**

**Visit 3 (6-24 months) HPV**

**5 yrs later: 1<sup>st</sup> booster Td/IPV**

**5-10 yrs later: 2<sup>nd</sup> booster Td/IPV**

## From tenth birthday onwards

### Td/IPV + MenACWY<sup>a</sup> + MMR

Four week gap

### Td/IPV + MMR

Four week gap

### Td/IPV

- Those aged from 10 years up to 25 years who have never received a MenC-containing vaccine should be offered MenACWY
- Those aged 10 years or over who have previously received a MenC vaccine may be eligible or may shortly become eligible for MenACWY. Refer to MenACWY national programme information for further information on eligibility

## Boosters + subsequent vaccination

### First Td/IPV

Preferably five years following completion of primary course

### Second Td/IPV

Ideally ten years (minimum five years) following first booster

## HPV vaccine for girls from twelfth up to eighteenth birthday

- Girls commencing HPV vaccine course:
  - before age 15 yrs should follow 2 dose 0, 6-24 months schedule
  - at age 15 yrs and above should follow 3 dose 0, 1, 4-6 months schedule
- If interrupted, course should be resumed but not repeated, ideally allowing appropriate intervals between remaining doses
- For two dose course, give second dose even if more than 24 months have elapsed since first dose or girl is then aged 15 yrs or more
- Three dose courses started but not completed before eighteenth birthday should be completed ideally allowing 3 months between second and third doses (minimum one month interval if otherwise unlikely to complete course)
- If girl commenced three dose course under 15yrs prior to September 2014, and has:
  - only received one dose, give a second dose 6-24m later to complete a two dose course
  - received two doses less than six months apart, give a third dose at least three months after second dose



# Working the algorithm



- Takes practice
- Gets easier the more you use it



## Summary

- Try and establish vaccine history – use resources to help
  - If no reliable vaccine history assume unimmunised - safe to repeat doses
  - If a vaccine course is interrupted there is no need to restart
  - Consider required spacing between vaccine antigens when planning catch up schedule
  - Practise using the algorithm
-