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Interrupted vaccination schedules: general principles for travel health professionals

Guidance on how to manage interrupted vaccination schedules

The immune response that occurs following vaccination is complex. Vaccine contains one or more weakened, inactivated or engineered agents (antigens) that resemble the disease-causing organism(s). Generally, in a person with a healthy immune system, vaccination induces an immune response to the antigen in the vaccine resulting in antibody production and protection, without causing the disease; furthermore, specialist memory cells enable the immune system to recognise and quickly respond when exposed to natural infections (immune memory) [1, 2].

Some travel related vaccines only need one dose to induce an immune response, which may be relatively short lasting (e.g. injectable typhoid vaccine) or confer long-lasting immunity, and effective immune memory (e.g. yellow fever). For others a primary course of vaccine, requiring multiple doses given over a specified period, is required (e.g. hepatitis B, Japanese encephalitis, oral typhoid, poliomyelitis, rabies), with a re-enforcing ('booster' dose) recommended at a defined period following the primary course to maintain immunity (where the traveller continues to be at risk) [1, 2].

Studies show that vaccines given to the recommended schedule provide the best protection. Therefore, for all vaccines, it is best practice to complete the primary course and receive a booster dose (if indicated) at the recommended time intervals [1]. However, in some circumstances this may not be possible e.g. if travel is postponed, the traveller fails to return as directed or during exceptional times such as the current COVID-19 pandemic, which has resulted in government advice against all but essential overseas travel [3] and reprioritisation of clinical activities [4].

General principles

Keep to the recommended vaccination schedule: clinical studies following vaccine development determine which vaccine schedule (spacing between vaccines and interval to reinforcing dose) offers the best chance for immunity to develop. Recommended schedules should be adhered to wherever possible.

Every dose in a course counts: a course of vaccine may require multiple doses over a specified time period and each dose is important. The first dose of a multiple dose course begins to prime the immune system, but further doses, given at the recommended intervals, are necessary for immunity to develop.

The effectiveness of vaccines given outside the recommended schedule may not have been evaluated in clinical studies [1] and should be considered as 'off label' administration (see below).

For interrupted schedules - start where you left off: immune memory already laid down by previous dose(s) of a vaccine means that repeating doses or re-starting a course of vaccine is rarely necessary (but also see 'exceptions'). For most vaccines, where a record exists of previous doses, start where you left off and complete the course, observing the same interval between future doses as indicated by the manufacturer [1, 2].

Lengthening intervals between doses: generally, the immune response is not impaired where doses are given at longer than the recommended interval [1].

Off label administration: the administration of vaccine given outside the recommended schedule may be 'off label' i.e. the vaccine is being administered in a way that is different to that described in the marketing authorisation [license]. As with any prescribed medical product, a vaccine schedule that is 'off label' may be considered if the prescribing clinician thinks it to be in the travellers' best interest [5].

Patient group directions (PGDs) may include 'off label' use of a medication when this use is clearly justified by best clinical practice [6]. The PGD should clearly state that the medicine is being used outside the terms of the marketing authorisation in this situation and health care professionals should consider informing the customer that the use is off-label, in line with [General Medical Council guidance on prescribing unlicensed medicines](#). If the PGD does not cover this situation, off label administration would require a [patient specific direction](#) to be written by the prescriber.

Exceptions

Shortening intervals between doses: where doses are given at less than the recommended interval, the immune response may be impaired; where possible, avoid shortening the recommended interval between doses [1]. If vaccine has been administered this way, we recommend you seek advice on a case by case basis.

Re-starting a course of vaccine: in some circumstances such as where the effect of interrupted doses in a schedule may not be clear (**i.e. oral typhoid vaccine or oral cholera vaccine - Dukoral**) re-starting a course may be recommended. Additionally, where there is no, or inadequate documentation of previous doses, to be certain that a person is protected, re-starting a course of vaccine may be an option after individual risk assessment. We recommend you seek advice on a case by case basis.

Health professionals can call the [NaTHNaC Advice Line](#) for further guidance.

UK immunisation programme during the COVID-19 pandemic

NHS England and NHS Improvement have stated that providers and commissioners must maintain good vaccine uptake and coverage of immunisations [7].

[Public Health England: Vaccine Update](#) March 2020, stresses the importance of maintaining good vaccination coverage, particularly in the childhood immunisation programme. Ensuring good vaccination coverage will avoid outbreaks of vaccine-preventable diseases that could impact on health services [8].

The Royal College of General Practitioners also state that routine (e.g. seasonal flu and pneumococcal) and childhood vaccinations should continue, regardless of the prevalence of COVID-19, for the duration of this pandemic [9].

Resources

- [Electronic Medicines Compendium](#)
- [Public Health England: Vaccine incident guidance: responding to errors in vaccine storage, handling and administration](#)
- [Public Health England: Vaccination of individuals with uncertain or incomplete immunisation status](#)

- [Royal College of Nursing: Immunisation](#)

References

1. Kroger AT, Atkinson WL, Pickering LK General Immunization Practices. In: Plotkin SA, Orenstein WA, Offit PA, Edwards KM (eds). Plotkin's Vaccines. 7th Edn. Philadelphia 2018. p96-120
2. [Public Health England. Immunisation against infectious disease. Ch1.Immunity and how vaccines work. \[Accessed 06 May 2020\]](#)
3. [Foreign and Commonwealth Office: Travel advice Coronavirus \(COVID-19 \[Accessed 06 May 2020\]](#)
4. [Royal College of General Practitioners. Guidance on workload prioritisation during COVID-19. V5. 23 March 2020 \[Accessed 06 May 2020\]](#)
5. [Public Health England. NHS. Off-label vaccines: and introductory guide for health professionals 2019 \[Accessed 06 May 2020\]](#)
6. [National Institute for Health and Care Excellence. Patient Group Directions. Medicines practice guideline \[MPG2\] Last updated: 27 March 2017 \[Accessed x May 2020\]](#)
7. [NHS England and NHS Improvement. Important - for action - second phase of NHS response to COVID-19. 29 April 2020](#)
8. [Public Health England: Vaccine Update 303. 2020; Keep calm and carry on vaccinating \[Accessed 06 May 2020\]](#)
9. [Royal College of General Practitioners. British Medical Association. Guidance on workload prioritisation during COVID-19. v 8. 10 April 2020 \[Accessed 06 May 2020\]](#)