

# 30

## Tetanus

**NOTIFIABLE**

### The disease

Tetanus is an acute disease caused by the action of tetanus toxin, released following infection by the bacterium *Clostridium tetani*. Tetanus spores are present in soil or manure and may be introduced into the body through a puncture wound, burn or scratch – which may go unnoticed. The bacteria grow anaerobically at the site of the injury and have an incubation period of between four and 21 days (most commonly about ten days).

The disease is characterised by generalised rigidity and spasms of skeletal muscles. The muscle stiffness usually involves the jaw (lockjaw) and neck and then becomes generalised. The case–fatality ratio ranges from 10 to 90%; it is highest in infants and the elderly. It varies inversely with the length of the incubation period and the availability of intensive care.

Tetanus can never be eradicated because the spores are commonly present in the environment, including soil. Tetanus is not spread from person to person.

Neonatal tetanus is an important cause of death in some countries in Africa due to infection of the baby's umbilical stump. Worldwide elimination of neonatal tetanus by 1995 was one of the targets of the [World Health Organization \(WHO\)](#), and the number of countries in which neonatal tetanus occurs is progressively decreasing.

### History and epidemiology of the disease

Tetanus immunisation was first provided in the UK to the Armed Forces in 1938. From the mid-1950s it was introduced in some localities as part of the primary immunisation of infants, then nationally in 1961. The disease had almost disappeared in children under 15 years of age by the 1970s (Galbraith *et al.*, 1981). In 1970, it was recommended that people with tetanus-prone wounds should routinely be offered passive immunisation and complete a primary immunisation course.

Between 1984 and 2017, there were 293 cases of tetanus (combined data from notifications, deaths and laboratory reports) in England and Wales – Figure 30.1 (Collins *et al.*, 2016, PHE 2015, PHE 2016, PHE 2017 and PHE 2018). Sixty three per cent occurred in individuals aged 45 years or over, and 21% were in individuals aged from 25 to 44 years. The highest incidence of tetanus was in adults over 65 years of age, with no cases of tetanus reported in infants or children under five years of age. Eight cases were notified in Northern Ireland between 1984 and 2017.

Twenty five cases of tetanus were reported in people who inject drugs (PWID) between July 2003 and February 2004 (Health Protection Agency (HPA), 2004). Seven were closely clustered in time and possibly caused by a contaminated batch of illicit drugs (HPA, 2003). Tetanus in PWID had previously been reported rarely in the UK, in contrast to the US, where PWID accounted for 15 to 18% of cases reported between 1995 and 2000 (Centers for Disease Control and Prevention (CDC), 2003). Since the 2003/2004 cluster, only nine sporadic cases of tetanus were reported in PWID to the end of 2017.

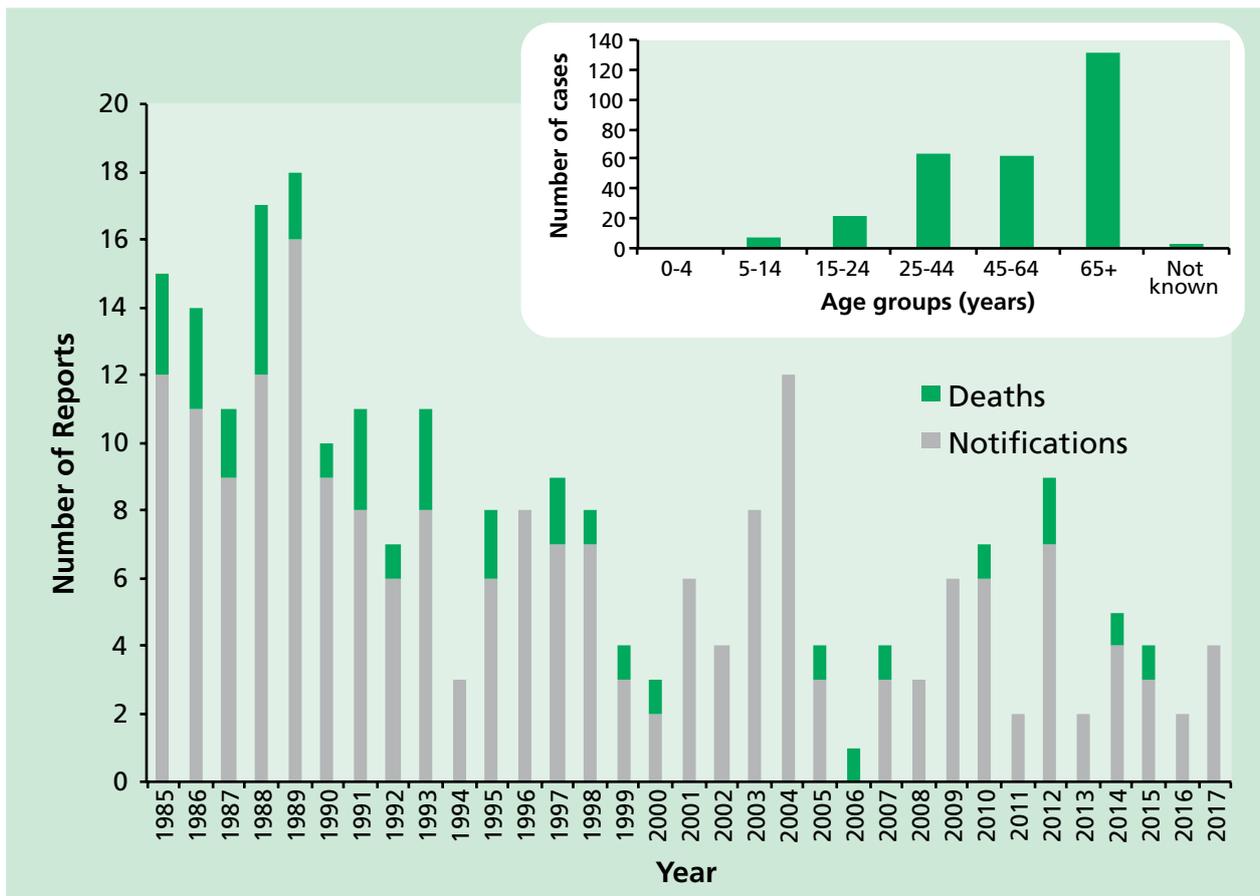


Figure 30.1 Reported cases of tetanus by year and age 1985 – 2017.

## The tetanus vaccination

The vaccine is made from a cell-free purified toxin extracted from a strain of *C. tetani*. This is treated with formaldehyde that converts it into tetanus toxoid. This is adsorbed onto an adjuvant, either aluminium phosphate or aluminium hydroxide, to improve its immunogenicity.

Tetanus vaccines used for primary immunisation contain not less than 40IU of tetanus toxoid; vaccines used for boosters contain not less than 20IU. The tetanus vaccine is only given as part of combined products for the UK national vaccination programme:

- diphtheria/tetanus/acellular pertussis/inactivated polio vaccine/*Haemophilus influenzae* type b/Hepatitis B (DTaP/IPV/Hib/HepB)
- diphtheria/tetanus/acellular pertussis/inactivated polio vaccine (DTaP/IPV or dTaP/IPV)
- tetanus/diphtheria/inactivated polio vaccine (Td/IPV)

The above vaccines are thiomersal-free. They are inactivated, do not contain live organisms and cannot cause the diseases against which they protect.

The combined vaccines above should be used where protection is required against tetanus, diphtheria or polio in order to provide comprehensive, long-term protection against all three diseases.

## Storage

Vaccines should be stored in the original packaging at +2°C to +8°C and protected from light. All vaccines are sensitive to some extent to heat and cold. Heat speeds up the decline in potency of most vaccines, thus reducing their shelf life. Effectiveness cannot be guaranteed for vaccines unless they have been stored at the correct temperature. Freezing may cause increased reactogenicity and loss of potency for some vaccines. It can also cause hairline cracks in the container, leading to contamination of the contents.

## Presentation

Tetanus vaccine should only be used as part of combined products. DTaP/IPV, dTaP/IPV, and Td/IPV are supplied as a pre-filled syringe. DTaP/IPV/Hib/HepB is supplied as a pre-filled syringe, or a single dose ampoule, plus a separate vial containing a powder. Prefilled syringes/ampoules should have a uniform cloudy white suspension. The suspension may sediment during storage and should be shaken to distribute the suspension uniformly before use.

## Administration

Vaccines are routinely given intramuscularly into the upper arm or anterolateral thigh. This is to reduce the risk of localised reactions, which are more common when vaccines are given subcutaneously (Mark *et al.*, 1999; Diggle and Deeks, 2000; Zuckerman, 2000). However, for individuals with a bleeding disorder, vaccines should be given by deep subcutaneous injection to reduce the risk of bleeding.

Tetanus-containing vaccines can be given at the same time as other vaccines such as MMR, MenACWY and hepatitis B. The vaccines should be given at a separate site, preferably in a different limb. If given in the same limb, they should be given at least 2.5cm apart (American Academy of Pediatrics, 2003). The site at which each vaccine was given should be noted in the child's records.

## Dosage and schedule

- first dose of 0.5ml of a tetanus-containing vaccine
- second dose of 0.5ml, one month after the first dose
- third dose of 0.5ml, one month after the second dose
- fourth and fifth doses of 0.5ml should be given at the recommended intervals (see below)

## Disposal

Equipment used for immunisation, including used vials, ampoules, or discharged vaccines in a syringe, should be disposed of safely in a UN-approved puncture-resistant 'sharps' box, according to local authority regulations and guidance in the [technical memorandum 07-01: Safe management of healthcare waste](#) (Department of Health, 2013).

## Recommendations for the use of the vaccine

The objective of the immunisation programme is to provide a minimum of five doses of tetanus-containing vaccine at appropriate intervals for all individuals.

To fulfil this objective, the appropriate vaccine for each age group is determined also by the need to protect individuals against diphtheria, pertussis, Hib, hepatitis B and polio.

## Primary immunisation

### Infants and children under ten years of age

The primary course of tetanus vaccination consists of three doses of a suitable tetanus-containing vaccine (containing 40IU of tetanus toxoid) with an interval of one month between each dose. DTaP/IPV/Hib/HepB is recommended to be given at two, three and four months of age but can be given at any stage from two months up to ten years of age. If the primary course is interrupted it should be resumed but not repeated, allowing an interval of one month between the remaining doses.

### Children aged ten years or over, and adults

The primary course of tetanus vaccination consists of three doses of a suitable tetanus-containing vaccine (containing a minimum of 20 IU tetanus toxoid) with an interval of one month between each dose. Td/IPV is recommended for all individuals aged ten years or over. If the primary course is interrupted it should be resumed but not repeated, allowing an interval of one month between the remaining doses.

## Reinforcing immunisation

Children under ten years should receive the first tetanus booster (containing a minimum of 20 IU tetanus toxoid) combined with diphtheria, pertussis and polio vaccines. The first booster of a tetanus-containing vaccine should ideally be given three years after completion of the primary course, normally at three years four months of age or soon after. When primary vaccination has been delayed, this first booster dose may be given at the scheduled visit provided it is one year since the third primary dose. This will re-establish the child on the routine schedule. DTaP/IPV or dTaP/IPV should be used in this age group. Td/IPV should not be used routinely for this purpose in this age group because it does not provide protection against pertussis.

Individuals aged ten years or over who have only had three doses of a tetanus-containing vaccine, with the last dose at least five years ago, should receive the first tetanus booster combined with diphtheria and polio vaccines (Td/IPV).

The second booster dose of Td/IPV should be given to all individuals ideally ten years after the first booster dose. When the previous doses have been delayed, the second booster should be given at the school session or scheduled appointment provided a minimum of five years have lapsed between the first and second boosters. This will be the last scheduled opportunity to ensure long-term protection.

If a person attends for a routine booster dose and has a history of receiving a vaccine following a tetanus-prone wound, attempts should be made to identify which vaccine was given. If the vaccine given at the time of the injury was the same as that due at the current visit and was given after an appropriate interval, then the routine booster dose is not required. Otherwise, the dose given at the time of injury should be discounted as it may not provide long-term protection against all antigens, and the scheduled immunisation should be given. Such additional doses are unlikely to produce an unacceptable rate of reactions (Ramsay *et al.*, 1997).

PWID are at greater risk of tetanus. This may result from tetanus-contaminated illicit drugs, especially when they have sites of focal infection such as skin abscesses that may promote growth of anaerobic organisms (Health Protection Agency, 2003). As PWID may be reluctant to present to health services, every opportunity should be taken to ensure that

they are fully protected against tetanus. Booster doses should be given if there is any doubt about their immunisation status. Awareness of the risk and value of vaccination in this group, and awareness among those working with them, is extremely important.

### **Vaccination of individuals with unknown or incomplete immunisation status**

Where a child born in the UK presents with an inadequate immunisation history, every effort should be made to clarify what immunisations they may have had (see Chapter 11 on vaccination schedules). A child who has not completed the primary course should have the outstanding doses at monthly intervals. Children may receive the first booster dose as early as one year after the third primary dose to re-establish them on the routine schedule. The second booster should be given at the time of leaving school to ensure long-term protection by this time, provided a minimum of five years is left between the first and second boosters.

Children coming to the UK who have a history of completing immunisation in their country of origin may not have been offered protection against all the antigens currently used in the UK, but will probably have received tetanus-containing vaccines in their country of origin. Country immunisation schedules can be found on the [WHO website](#).

Individuals coming from areas of conflict or from population groups who may have been marginalised in their country of origin (e.g. refugees, gypsy or other nomadic travellers) may not have had good access to immunisation services. In particular, older children and adults may also have been raised during periods before immunisation services were well developed or when vaccine quality was sub-optimal. Where there is no reliable history of previous immunisation, it should be assumed that any undocumented doses are missing and the UK catch-up recommendations for that age should be followed (see Chapter 11).

Children coming to the UK may have had a fourth dose of a tetanus-containing vaccine that is given at around 18 months in some countries. This dose should be discounted as it may not provide satisfactory protection until the time of the teenage booster. The routine pre-school and subsequent boosters should be given according to the UK schedule.

Further advice on vaccination of children with unknown or incomplete immunisation status is published by [Public Health England](#).

### **Travellers and those going to reside abroad**

All travellers should ensure that they are fully immunised according to the UK schedule (see above). Additional doses of vaccines may be required according to the destination and the nature of travel intended (see [NaTHNaC](#)).

For travellers to areas where medical attention may not be accessible and whose last dose of a tetanus-containing vaccine was more than ten years previously, a booster dose should be given prior to travelling, even if the individual has received five doses of vaccine previously. This is a precautionary measure in case immunoglobulin is not available to the individual in the event of a tetanus-prone injury.

Where tetanus, diphtheria or polio protection is required and the final dose of the relevant antigen was received more than ten years ago, Td/IPV should be given.

## Tetanus vaccination in laboratory workers

Individuals who may be exposed to tetanus in the course of their work in microbiology laboratories, are at risk and must be up to date for tetanus vaccination (see [Chapter 12](#)). A booster may be required in the event of a recognised exposure.

### Contraindications

There are very few individuals who cannot receive tetanus-containing vaccines. When there is doubt, appropriate advice should be sought from the relevant specialist consultant, the local screening and immunisation team or local Health Protection Team rather than withholding vaccine.

The vaccines should not be given to those who have had:

- a confirmed anaphylactic reaction to a previous dose of a tetanus-containing vaccine, or
- a confirmed anaphylactic reaction to neomycin, streptomycin or polymyxin B (which may be present in trace amounts)

Confirmed anaphylaxis occurs extremely rarely. Data from the UK, Canada and the US point to rates of 0.65 to 3 anaphylaxis events per million doses of vaccine given (Bohlke *et al.*, 2003; Canadian Medical Association, 2002). Other milder allergic conditions may occur more commonly and are not contraindications to further immunisation. A careful history of the event will often distinguish between anaphylaxis and other events that either are not due to the vaccine or are not life-threatening. In the latter circumstance, it may be possible to continue the immunisation course. Specialist advice must be sought on the vaccines and circumstances in which they could be given. The risk to the individual of not being immunised must be taken into account.

### Precautions

Minor illnesses without fever or systemic upset are not valid reasons to postpone immunisation.

If an individual is acutely unwell, immunisation should be postponed until they have fully recovered. This is to avoid wrongly attributing any new symptom or the progression of symptoms to the vaccine.

### Systemic and local reactions following a previous immunisation

This section gives advice on the immunisation of children with a history of a severe or mild systemic or local reaction within 72 hours of a preceding vaccine. Immunisation with tetanus-containing vaccine **should** continue following a history of:

- fever, irrespective of its severity
- hypotonic-hyporesponsive episodes (HHE)
- persistent crying or screaming for more than three hours
- severe local reaction, irrespective of extent

Children who have had severe reactions, as above, have continued and completed immunisation with tetanus-containing vaccines without recurrence (Vermeer-de Bondt *et al.*, 1998; Gold *et al.*, 2000).

### Pregnancy and breast-feeding

Tetanus-containing vaccines may be given to pregnant women without delay when protection is required. There is no evidence of risk from vaccinating pregnant women or those who are breast-feeding with inactivated virus, bacterial vaccines or toxoids (Plotkin *et al.*, 2018).

Since October 2012, tetanus containing vaccines have been given as part of the maternal pertussis programme. The Medicines and Healthcare products Regulatory Agency (MHRA) has used the Yellow Card Scheme and the Clinical Practice Research Datalink to follow pregnancy outcomes following vaccination. The study based on a cohort of 18,000 vaccinated pregnant women found no evidence of an increased risk of stillbirth and no evidence of an increased risk of any of an extensive list of maternal, fetal and neonatal adverse outcomes in vaccinated mothers (Donegan *et al.*, 2014).

### Premature infants

Premature infants should be vaccinated in accordance with the national routine immunisation schedule according to their chronological age.

Very premature infants (born  $\leq 28$  weeks of gestation) who are in hospital should have respiratory monitoring for 48-72 hrs when given their first immunisation, particularly those with a previous history of respiratory immaturity. If the child has apnoea, bradycardia or desaturations after the first immunisation, the second immunisation should also be given in hospital, with respiratory monitoring for 48-72 hrs (Pfister *et al.*, 2004; Ohlsson *et al.*, 2004; Schulzke *et al.*, 2005; Pourcyrus *et al.*, 2007; Klein *et al.*, 2008).

As the benefit of vaccination is high in this group of infants, vaccination should not be withheld or delayed.

### Immunosuppression and HIV infection

Individuals with immunosuppression or HIV infection (regardless of CD4 count) should be given tetanus-containing vaccines in accordance with the recommendations above. These individuals may not make a full antibody response. Re-immunisation should be considered after treatment is finished and recovery has occurred. Specialist advice may be required.

Further guidance is provided by the [Royal College of Paediatrics and Child Health](#), the British HIV Association ([BHIVA](#)) *Immunisation guidelines for HIV-infected adults* (BHIVA, 2006) and the Children's HIV Association of UK and Ireland ([CHIVA](#)) Immunisation guidelines.

### Neurological conditions

The presence of a neurological condition is not a contraindication to immunisation but in a child with evidence of current neurological deterioration, deferral of vaccination may be considered, to avoid incorrect attribution of any change in the underlying condition. The risk of such deferral should be balanced against the risk of the preventable infection, and vaccination should be promptly given once the diagnosis and/or the expected course of the condition becomes clear.

## Deferral of immunisation

There will be very few occasions when deferral of immunisation is required (see above). Deferral leaves the child unprotected; the period of deferral should be minimised so that immunisation can commence as soon as possible. If a specialist recommends deferral, this should be clearly communicated to the general practitioner, who must be informed as soon as the child is fit for immunisation.

## Adverse reactions

Pain, swelling or redness at the injection site are common and may occur more frequently following subsequent doses. A small painless nodule may form at the injection site; this usually disappears and is of no consequence. The incidence of local reactions is lower with tetanus vaccines combined with acellular pertussis vaccines than with whole-cell pertussis vaccines and is similar to that after a combined tetanus diphtheria (DT) vaccine (Miller, 1999; Tozzi and Olin, 1997).

Fever, convulsions, high-pitched screaming and episodes of pallor, cyanosis and limpness (HHE) occur with equal frequency after both DTaP and DT vaccines (Tozzi and Olin, 1997).

Confirmed anaphylaxis occurs extremely rarely. Data from the UK, Canada and the US point to rates of 0.65 to 3 anaphylaxis events per million doses of vaccine given (Bohlke *et al.*, 2003; Canadian Medical Association, 2002).

Other allergic conditions may occur more commonly and are not contraindications to further immunisation.

All suspected adverse reactions to vaccines occurring in children, or adults, to vaccines should be reported to the [Medicines and Healthcare products Regulatory Agency \(MHRA\)](#) through the Yellow Card scheme.

## Management of patients with tetanus-prone wounds

Although any wound can give rise to tetanus, clean wounds are considered to have a low likelihood of harbouring tetanus spores and of developing the anaerobic and acidic conditions that promote spore germination (Roper *et al.*, 2018). Therefore, in the case of wounds such as clean cuts, immediate post exposure treatment is not indicated. However for those who are incompletely immunised, further doses should be offered to complete the recommended schedule to protect against future exposures.

Tetanus-prone wounds include:

- puncture-type injuries acquired in a contaminated environment and likely therefore to contain tetanus spores e.g. gardening injuries
- wounds containing foreign bodies
- compound fractures
- wounds or burns with systemic sepsis
- certain animal bites and scratches - although smaller bites from domestic pets are generally puncture injuries animal saliva should not contain tetanus spores unless the animal has been routing in soil or lives in an agricultural setting

Note: individual risk assessment is required and this list is not exhaustive e.g. a wound from discarded needle found in a park may a tetanus-prone injury but a needle stick injury in a medical environment is not

High-risk tetanus-prone wounds include: Any of the above with either:

- heavy contamination with material likely to contain tetanus spores e.g. soil, manure
- wounds or burns that show extensive devitalised tissue
- wounds or burns that require surgical intervention that is delayed for more than six hours are high risk even if the contamination was not initially heavy

Thorough cleaning of wounds is essential.

The rationale for using intramuscular tetanus immunoglobulin (IM-TIG) is to sufficiently and rapidly raise antibody levels in exposed individuals with antibody levels below the protective threshold, and who are not expected to make a sufficiently rapid memory response to vaccination. The median incubation period for tetanus is reported as 7 days but can range from 4-21 days and therefore it is important that either IM-TIG administration or active boosting occurs promptly following an exposure. Peak levels are achieved 4 days after an IM-TIG dose. In individuals who receive a vaccine booster after having completed a full primary course, a measurable increase in antibody titres has been observed as early as 4 days, and levels increase substantially from day 7. The antibody levels achieved 5-7 days after a reinforcing dose of vaccine likely exceeds the estimated antibody boost from a prophylactic dose of IM-TIG in an adult.

Guidance on the use of tetanus containing vaccine and/or immunoglobulin for management of individuals following injury are summarised in table 30.1. These recommendations are based on what would be considered an adequate priming course (defined as receiving at least 3 doses of tetanus vaccine). These individuals would be expected to retain antibody levels above the protective threshold for between 5 to 10 years (depending on the age at which they received their last dose). Such individuals would be expected to have adequate protection following a tetanus prone injury and therefore not require any immediate treatment, but may need further doses of vaccine as required to complete the recommended schedule.

Individuals who have received an adequate priming course but are more than 5-10 years since the last dose (depending on the age of the final dose) would be expected to make a rapid response to a booster dose of vaccine and so all individuals in this group are recommended a booster dose of vaccine for immediate protection. This is likely to be sufficient except in situations of heavy contamination and therefore, only individuals who have sustained a high risk injury require IM-TIG in addition to a reinforcing dose of vaccine. Further doses of vaccine may be required to complete the recommended schedule for future immunity

For individuals who have not received an adequate priming course, any tetanus prone injury should receive both IM-TIG and a reinforcing dose of vaccine. This should include individuals with an uncertain immunisation status and /or those born before routine immunisation in 1961. Further doses of vaccine will be required to complete the recommended schedule.

Table 30.1 Immunisation recommendations for clean and tetanus-prone wounds

Immunisation Status	Immediate treatment			Later treatment
	Clean wound <sup>1</sup>	Tetanus Prone	High risk tetanus prone	
<p>Those aged 11 years and over, who have received an adequate priming course of tetanus vaccine<sup>2</sup> with the last dose within 10 years</p> <p>Children aged 5-10 years who have received priming course and pre-school booster</p> <p>Children under 5 years who have received an adequate priming course</p>	None required	None required	None required	Further doses as required to complete the recommended schedule (to ensure future immunity)
<p>Received adequate priming course of tetanus vaccine<sup>2</sup> but last dose more than 10 years ago</p> <p>Children aged 5-10 years who have received an adequate priming course but no preschool booster</p> <p><i>Includes UK born after 1961 with history of accepting vaccinations</i></p>	None required	Immediate reinforcing dose of vaccine	<p>Immediate reinforcing dose of vaccine</p> <p>One dose of human tetanus immunoglobulin<sup>3</sup> in a different site</p>	Further doses as required to complete the recommended schedule (to ensure future immunity)
<p>Not received adequate priming course of tetanus vaccine<sup>2</sup></p> <p><i>Includes uncertain immunisation status and/or born before 1961</i></p>	Immediate reinforcing dose of vaccine	<p>Immediate reinforcing dose of vaccine</p> <p>One dose of human tetanus immunoglobulin<sup>3</sup> in a different site</p>	<p>Immediate reinforcing dose of vaccine</p> <p>One dose of human tetanus immunoglobulin<sup>3</sup> in a different site</p>	

1 Clean wound is defined as wounds less than 6 hours old, non-penetrating with negligible tissue damage

2 At least 3 doses of tetanus vaccine. This definition of "adequate course" is for the risk assessment of tetanus-prone wounds only. The full UK schedule is five doses of tetanus containing vaccine at appropriate intervals

3 If TIG is not available, Human Normal Immunoglobulin (HNIG) may be used as an alternative.

Given a lack of evidence on use in the clinical pathway, point of care antibody testing is not currently recommended for use in assessment of tetanus prone wounds or diagnosis of suspected tetanus by the WHO. Determination of vaccination status using vaccination records remains the preferred method.

Patients who are severely immunosuppressed may not be adequately protected against tetanus, despite having been fully immunised. In the event of an exposure they may require additional boosting and/or immunoglobulin.

For those whose immunisation status is uncertain, and individuals born before 1961 who may not have been immunised in infancy, a full course of immunisation is likely to be required.

[PHE guidance](#) on the management of tetanus prone wounds and clinical management of tetanus cases is available.

## Dosage of human tetanus immunoglobulin and human normal immunoglobulin

### For prevention:

Tetanus immunoglobulin (TIG) - 250IU by intramuscular (IM) injection, or 500IU if more than 24 hours have elapsed since injury, there is a risk of heavy contamination or following burns. This preparation is available in 1ml ampoules containing 250IU.

Human normal immunoglobulin (HNIG) can be used as an alternative in the absence of IM-TIG. This includes Subgam 16%, Cuvitru 20% or Gammanorm 16.5%. More detailed information on the dosage (based on potency testing) and administration of these products is available in the [PHE guidance](#).

## Management of cases

Early recognition and treatment may be life-saving but few clinicians in the UK now have experience of managing tetanus. Awareness of the potential diagnosis in those with a history of a tetanus-prone wound, and in those at higher risk, including PWID, is essential.

### For treatment:

An intravenous (IV) tetanus immunoglobulin (TIG) product is no longer available in the UK, and the volume of IM-TIG required to reach a therapeutic dose would be too large in most individuals. Therefore, in the absence of IV-TIG, human intravenous immunoglobulin (IVIG) is the recommended treatment for clinical suspected tetanus. The recommendation is based on previous testing of the IVIG product Vigam 5% for anti-tetanus antibodies, which was carried out by the National Institute for Biological Standards and Control (NIBSC) and showed that the IVIG product Vigam contained reasonable levels of tetanus antibody when measured by ELISA and these results correlated well with the in-vivo Toxin Neutralising Test (TNT). More recently, ten further IVIG products: Gammplex 5%, Privigen 10%, Octagam (5% & 10%, Intratect (5% & 10%), Flebogama (5% & 10%), Panzyga 10%, Gammunex 10%) have been tested for the presence of anti-tetanus antibodies by NIBSC and have been shown to be comparable to Vigam in terms of their anti-tetanus potency, please see the latest PHE guidance for advice. If none of these products are available there may be alternatives, please see the latest [PHE guidance](#).

The recommended dose by infusion is 5,000IU for individuals less than 50kg and 10,000IU for individuals over 50kg. This equates to a dose of 400ml IVIG for individuals less than 50kg with 5% IVIG products and 200ml for 10% products, and doses of 800ml and 400ml for individuals for individuals over 50kg with 5% and 10% IVIG respectively.

## Supplies

### Vaccines

- Infanrix hexa (diphtheria/tetanus/3-component acellular pertussis/inactivated polio vaccine/*Haemophilus influenzae* type b/Hepatitis B (DTaP/IPV/Hib/HepB)) – manufactured by GlaxoSmithKline
- Repevax (diphtheria/tetanus/5-component acellular pertussis/inactivated polio vaccine (dTaP/IPV)) – manufactured by Sanofi Pasteur
- Infanrix IPV (diphtheria/tetanus/3-component acellular pertussis/inactivated polio vaccine (DTaP/IPV)) – manufactured by GlaxoSmithKline
- Revaxis (diphtheria/tetanus/inactivated polio vaccine (Td/IPV)) – manufactured by Sanofi Pasteur
- Boostrix IPV (diphtheria/tetanus/5-component acellular pertussis/inactivated polio vaccine (dTaP/IPV)) – manufactured by Glaxosmithkline

Tetanus containing vaccines are available in England, Wales and Scotland from ImmForm  
Tel: 0844 376 0040.

Website: [www.immform.dh.gov.uk](http://www.immform.dh.gov.uk)

If not already registered on ImmForm you will need register in good time before placing an order.

In Northern Ireland, supplies should be obtained under the normal childhood vaccines distribution arrangements, details of which are available by contacting the Regional Pharmaceutical Procurement Service on 028 9442 4089.

## Immunoglobulin

### Intravenous products

In England, Wales, Scotland and Northern Ireland, IV TIG is no longer available.

In England and Wales IVIG should be sourced from hospital pharmacies or directly from the suppliers.

In Northern Ireland, the source of IVIG is the Northern Ireland Blood Transfusion Services (Tel: 028 9032 1414) (issued via hospital pharmacies).

In Scotland, IVIG should be obtained from local hospital pharmacy departments. Details of these are available from Procurement, Commissioning & Facilities of NHS National Services Scotland 0131 275 6725.

### Intramuscular products

IM-TIG and IM-HNIG (Subgam) are available in England from Bio Products Laboratory (Tel: 020 8258 2342/2200). Other HNIG products are available from hospital pharmacies or suppliers.

In Scotland, IM-TIG and IM-HNIG should be obtained from local hospital pharmacy departments. Details of these are available from Procurement, Commissioning & Facilities of NHS National Services Scotland 0131 275 6725.

In Wales IM-TIG/IMHNIG are available from the Welsh Blood Transfusion Service (Tel: 01443 622034/035) and are issued by hospital pharmacies.

In Northern Ireland, IM-TIG/IM-HNIG are obtained through hospital pharmacies.

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