



Public Health  
England

Protecting and improving the nation's health

# **Antimicrobial Prophylaxis Guidance for Bomb Blast Victims**

Version 1.0

# About Public Health England

Public Health England exists to protect and improve the nation’s health and wellbeing, and reduce health inequalities. We do this through world-class science, knowledge and intelligence, advocacy, partnerships and the delivery of specialist public health services. We are an executive agency of the Department of Health, and are a distinct delivery organisation with operational autonomy to advise and support government, local authorities and the NHS in a professionally independent manner.

Public Health England  
Wellington House  
133-155 Waterloo Road  
London SE1 8UG  
Tel: 020 7654 8000  
[www.gov.uk/phe](http://www.gov.uk/phe)  
Twitter: @PHE\_uk  
Facebook: [www.facebook.com/PublicHealthEngland](https://www.facebook.com/PublicHealthEngland)

© Crown copyright 2017

You may re-use this information (excluding logos) free of charge in any format or medium, under the terms of the Open Government Licence v3.0. To view this licence, visit OGL or email [psi@nationalarchives.gsi.gov.uk](mailto:psi@nationalarchives.gsi.gov.uk). Where we have identified any third party copyright information you will need to obtain permission from the copyright holders concerned.

Produced May 2017  
PHE publications  
Gateway number: 2017091

PHE supports the UN  
Sustainable Development Goals



# Contents

About Public Health England	2
Background	4
Principles of treatment	4
Tetanus prophylaxis	5
Blood-borne virus prophylaxis	6
Antibiotic prophylaxis	7
Acknowledgements	9

## Background

This guidance was originally drafted in response to the Manchester Arena bombing that took place on 22 May 2017.

Teams responding to the incidents recognised the need for tailored guidance on antimicrobial prophylaxis specific to such incidents, recognising that some of the important characteristics of such events may include:

- Paediatric casualties
- Blast injuries involving embedded metalwork (e.g. nuts, bolts)
- Large number of victims who originate from regions outside the incident area

The team from Central Manchester Foundation Hospitals Trust and Public Health England that prepared this guidance is grateful for the expert advice offered by colleagues from Queen Elizabeth Hospital Birmingham.

## Principles of treatment

This advice is suitable for ALL age groups of our patients.

This guidance is based on the best available evidence but its application must be modified by professional judgement and any knowledge of previous culture results. A dose and duration of treatment is suggested. In severe or recurrent cases consider a larger dose or longer course.

This guidance has been prepared mindful of best practice in the management of antimicrobial resistance issues.

In the event of any uncertainty clinicians are advised to contact their local microbiology department for advice.

1. Where multiple injuries have been sustained (e.g. bone fractures and eye injuries) it may be possible to rationalise antibiotic regimes following discussions with local microbiology departments.
2. Blast injured patients will mount a brisk inflammatory response and so inevitably have pyrexia and a high CRP. If WCC is rising assess carefully for infection. Consider monitoring Procalcitonin (PCT) every other day to differentiate infection

from an inflammatory response linked to Systemic Inflammatory Response Syndrome (SIRS) or trauma<sup>1</sup>

3. Local microbiology advice should be sought to consider possibility of nosocomial infection and take into account any prevalent organisms that have posed infection control risks.
4. Consider linking patients in the laboratory using IT systems (such as LIMS).
5. To ensure continuity of prescribing it is advised that treating hospitals dispense sufficient medication to allow patients to complete antibiotic courses at home.
6. MRI will show high marrow signal after blast injury which mimics osteomyelitis – these changes last for around six months, so bear in mind if investigating possible bone infection.
7. Where receiving hospitals have had problems with resistant gram negative rods (especially carbapenemase producing enterobacteriaceae – CPE); affected patients will require isolation and screening as per PHE guidance<sup>2</sup>
8. Zygomycete infection has presented around 10 days post injury in military casualties where there was implantation of organic matter. This scenario is less likely following bomb injuries acquired in a civilian setting, but the microbiology of wounds should be monitored for invasive fungal infection.

## Tetanus prophylaxis

ALL bomb victims with injuries must have their tetanus immunisation status checked and treated according to the extant advice on management of patients with tetanus prone wounds in the 'Green Book'<sup>3</sup>.

---

<sup>1</sup> PCT may be expected to be elevated in the first 24-48 hours post trauma but fall quickly (Castillo GP et al, critical care medicine 2009, 37 (6): 1845-9 Procalcitonin as a prognostic and diagnostic tool for septic complications after major trauma).

<sup>2</sup> <https://www.gov.uk/government/publications/carbapenemase-producing-enterobacteriaceae-early-detection-management-and-control-toolkit-for-acute-trusts>

<sup>3</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/148506/Green-Book-Chapter-30-dh\\_103982.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/148506/Green-Book-Chapter-30-dh_103982.pdf)

## Blood-borne virus prophylaxis

Guidance on the appropriate post-exposure prophylaxis of blood-borne viruses is contained in a separate guidance document<sup>4</sup>. In summary the current recommendations from PHE are:

1. All patients who sustained injuries that breached the skin as a result of a bomb injury must receive an accelerated course of hepatitis B vaccination (0, 1, and 2 months, or, day 0, day 7, day 21 and at 12 months).
2. Patients who are discharged from inpatient care before completion of an accelerated hepatitis B vaccination course should receive their remaining doses of vaccine either at out-patient follow up, or by arrangement with their GP.
3. All patients should be tested at 3 months to determine their hepatitis B vaccine response and at 3 months and 6 months to determine their hepatitis C and HIV status. These samples should be referred for testing to their local PHE public health laboratory, quoting the relevant ILog reference number to ensure that the results of these tests can be linked to their patient record.
4. Post exposure prophylaxis for HIV should not normally be given.

PHE will liaise with primary care to ensure that vaccination schedules and screening tests have been properly scheduled and completed.

---

<sup>4</sup> <https://www.gov.uk/government/publications/bloodborne-virus-managing-risk-in-bomb-blast-victims>

## Antibiotic prophylaxis

These regimens are appropriate for adult and patients with normal renal and hepatic function. For further information and doses for paediatric patients please refer to the British National Formulary for Children (BNFc), local hospital formulary, or contact local microbiology department.

<p><b>Soft tissue injury</b> <b>(No foreign body in situ)</b></p>	<p>Co-amoxiclav 1.2g IV 8 hourly <b>OR</b> Cefuroxime 1.5g IV 8 hourly/Metronidazole 500mg IV 8 hourly until first surgical debridement/washout.</p> <p>Then to complete 1 week course with oral co-amoxiclav 625mg 8 hourly</p>
<p><b>Soft tissue injury</b> <b>(Foreign body in situ)</b></p>	<p>Co-amoxiclav 1.2g IV 8 hourly <b>OR</b> Cefuroxime 1.5g IV 8 hourly/Metronidazole 500mg IV 8 hourly until first surgical debridement/washout and removal of projectile foreign body.</p> <p>Then to complete 2 week course with oral co-amoxiclav 625mg 8 hourly</p> <p>If foreign body remains in situ liaise with local microbiology department regarding duration of antibiotics.</p>
<p><b>Open fractures</b> <b>OR</b> <b>“Through and through fractures”<sup>5</sup></b> <b>OR</b> <b>Intra-articular injuries</b></p>	<p>Co-amoxiclav 1.2g IV 8 hourly <b>OR</b> Cefuroxime 1.5g IV 8 hourly/Metronidazole 500mg IV 8 hourly Stat dose of Gentamicin (3mg/kg IV – see table 1 in the Orthopaedic Surgical Prophylaxis guidelines on the MicroGuide App at <a href="http://microguide.horizonsp.co.uk/viewer/u/nm/adult">http://microguide.horizonsp.co.uk/viewer/u/nm/adult</a> guideline) during initial operation (repeated if septic during subsequent operations).</p> <p>Continue IV antibiotics until wound closure <b>OR</b> until no planned return to theatre<sup>6</sup>. Complete a six week course of oral co-amoxiclav<sup>7</sup> 625mg 8 hrly after conversion from IV antibiotics.</p>

<sup>5</sup> An injury involving a penetrating object which has passed through a victim.

<sup>6</sup> For example a decision made to allow a wound to heal by secondary intention.

<sup>7</sup> Extended duration recommended due to the high risk of a contaminated foreign body and the logistical challenges of ensuring appropriate follow-up for all victims due to their geographical dispersion.

<p><b>Penetrating CNS injury (Foreign body in situ)</b></p>	<p>Ceftriaxone (high dose) 2g IV 12 hourly/Metronidazole 500mg IV 8 hourly</p> <p>Continue for 6 weeks.</p>
<p><b>Penetrating CNS injury (Foreign body removed / not in situ)</b></p>	<p>Ceftriaxone (high dose) 2g IV 12 hourly/Metronidazole 500mg IV 8 hourly</p> <p>Continue for 2 weeks.</p>
<p><b>Open skull fracture from penetrating trauma</b></p>	<p>IV ceftriaxone 2g IV 12 hourly until closure, then, if no brain injury, continue with oral co-amoxiclav 625mg 8 hourly for 6 weeks.</p>
<p><b>CSF leak post-skull fracture</b></p>	<p>No antibiotics indicated.</p> <p>Give 0.5ml dose of 23 valent pneumococcal polysaccharide vaccine intra-muscularly.</p>
<p><b>Penetrating eye injuries</b></p>	<p>Ciprofloxacin 400mg IV / 500mg PO 12 hourly <b>AND</b> Clindamycin 450mg IV/PO 6 hourly <b>AND</b> topical chloramphenicol 0.5% eye drops</p> <p>Continue for 2 weeks after removal of any foreign body.</p> <p>If foreign body remains in situ liaise with local microbiology department regarding duration of treatment.</p>
<p><b>Penetrating abdominal injuries</b></p>	<p>Co-amoxiclav 1.2g IV 8 hourly <b>OR</b> Cefuroxime 1.5g IV 8 hourly/Metronidazole 500mg IV 8 hourly</p> <p>Add fluconazole 400mg IV stat day 1 then 200mg IV daily thereafter if perforation and spillage of gastrointestinal contents.</p> <p>Continue intravenous antibiotics for a minimum duration of 7 days following surgery.</p>

	If foreign body remains in situ liaise with local microbiology department regarding duration of treatment.
<b>Penetrating chest trauma</b>	<p>Co-amoxiclav 1.2g IV 8 hourly <b>OR</b> Cefuroxime 1.5g IV 8 hourly/Metronidazole 500mg IV 8 hourly</p> <p>If oesophageal perforation consider adding fluconazole 400mg IV stat day 1 then 200mg IV daily thereafter.</p> <p>Continue intravenous antibiotics for a minimum duration of 7 days following surgery.</p> <p>If foreign body remains in situ liaise with local microbiology department regarding duration of treatment.</p>

## Acknowledgements

This guidance was ratified for use at UHNM at the May 2017 meeting of the Antimicrobial Stewardship Group.

This guidance was created by PHE and the Central Manchester University Hospitals NHS Foundation Trust (CMFT), working in partnership with colleagues from Queen Elizabeth Hospital Birmingham. Contributors:

Dr Kirsty Dodgson – Consultant Clinical Microbiologist & Deputy Infection Control Doctor, CMF

Dr Louise Sweeney – Consultant Microbiologist, CMFT

Dr Andrew Dodgson - Consultant Microbiologist, CMFT

Dr Ed Kaczmarek – Consultant Microbiologist, Head of PHE Reference Laboratory (Manchester)

Mr Amer Shoaib – Consultant Orthopaedic Surgeon, CMFT

Dr Nick Gent – Consultant, PHE Emergency Response Department

Dr Will Welfare – Consultant in Health Protection, PHE North West

Dr Matthieu Pegorie – Consultant in Health Protection, PHE North West

Dr Nick Riches – Public Health Registrar, PHE North West

Dr Debbie Mortiboy and Dr Martin Gill, Consultant Microbiologists, University Hospital Birmingham NHS Foundation Trust