Public Health England

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Antimicrobial Prophylaxis Guidance for Bomb Blast Victims

Version 1.0

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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 incident, recognising that some of the important characteristics of such events may include:

- paediatric casualties
- blast injuries involving embedded metalwork (eg 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 (eg 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 Sydrome (SIRS) or trauma[1]

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[2]

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'[3].

[1] 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)
[2] https://www.gov.uk/government/publications/carbapenemase-producing-enterobacteriaceae-early-detection-management-and-control-toolkit-for-acute-trusts
[3] 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[4]. 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 remainng 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.

[4] https://www.gov.uk/government/publications/bloodborne-virus-managing-risk-in-bomb-blast-victims

Antibiotic prophylaxis

These regimens are appropriate for adult and paediatric patients. For dosing recommendations refer to the British National Formulary (BNF), local hospital formulary, or contact local microbiology department.

Soft tissue injury **(No foreign body in situ)**	IV Co-amoxiclav **OR** Cefuroxime/Metronidazole until first surgical debridement/washout Then to complete 1 week course with oral Co-amoxiclav
Soft tissue injury **(Foreign body in situ)**	IV Co-amoxiclav **OR** Cefuroxime/Metronidazole until first surgical debridement/washout and removal of projectile foreign body. Then to complete 2 week course with oral Co-amoxiclav If foreign body remains in situ liaise with local microbiology department regarding duration of antibiotics
Open fractures **OR** **"Through and through fractures"**[5] **OR** **Intra-articular injuries**	IV Co-amoxiclav **OR** Cefuroxime/Metronidazole Stat dose of Gentamicin during initial operation (repeated if septic during subsequent operations) Continue IV antibiotics until wound closure **OR** until no planned return to theatre[6] Complete a six week course of oral Co-amoxiclav[7] after conversion from IV antibiotics

[5] An injury involving a penetrating object which has passed through a victim
[6] For example a decision made to allow a wound to heal by secondary intention.
[7] 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.

Penetrating CNS injury **(Foreign body in situ)**	IV Ceftriaxone (high dose)/Metronidazole Continue for 6 weeks
Penetrating CNS injury **(Foreign body removed/not in situ)**	IV Ceftriaxone (high dose)/Metronidazole Continue for 2 weeks
Open skull fracture from penetrating trauma	IV ceftriaxone until closure, then, if no brain injury, continue with oral Augmentin for 6 weeks
CSF leak post-skull fracture	No antibiotics indicated Give Pneumovax
Penetrating eye injuries	IV/PO Ciprofloxacin **AND** IV/PO Clindamycin **AND** topical chloramphenicol Continue for 2 weeks after removal of any foreign body If foreign body remains in situ liaise with local microbiology department regarding duration of treatment
Penetrating abdominal injuries	IV Co-amoxiclav **OR** Cefuroxime/Metronidazole) Add Fluconazole if perforation and spillage of gastrointestinal contents Continue intravenous antibiotics for a minimum duration of 7 days following surgery If foreign body remains in situ liaise with local microbiology department regarding duration of treatment
Penetrating chest trauma	IV Co-amoxiclav **OR** Cefuroxime/Metronidazole If oesophageal perforation consider adding fluconazole Continue intravenous antibiotics for a minimum duration of 7 days following surgery If foreign body remains in situ liaise with local microbiology department regarding duration of treatment

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