

Soft Tissue Infection associated with Water Exposure in Adults - Microbiology Summary Clinical Guideline

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Cellulitis associated with water exposure: management

Exposure to fresh, brackish, or seawater; symptoms and signs of cellulitis

Investigation

- Microbiology: ± blood cultures, MRSA screen, ± pus swab
- Blood sciences: FBC, CRP, ± lactate, U&Es, and LFTs

Treatment, criteria for intravenous antibiotics: (1) proximity of cellulitis to medical device (e.g. prosthetic joint); (2) progression of symptoms and signs after 48 hours of per oral antibiotics; (3) suboptimal vasculature - e.g. chronic venous insufficiency, diabetes mellitus, peripheral vascular disease - impeding delivery of antibiotics; (4) intolerant of per oral antibiotics; (5) sepsis; (6) septic shock

No criteria for intravenous

Per oral antibiotics in the community:

- First line: levofloxacin 500 mg 12 hourly
- Second line: doxycycline 100 mg 12 hourly
- Third line: co-trimoxazole 960 mg 12 hourly

Criteria for intravenous

Intravenous therapy in hospital:

- First line:
 - Piperacillin tazobactam 4.5 g 6 hourly **and**:
 - Levofloxacin 500 mg 12 hourly; **or**
 - Doxycycline 100 mg (NB per oral) 12 hourly
- Second line, [if non-immediate without systemic involvement penicillin allergy](#):
 - Ceftazidime 2 g 8 hourly **and**:
 - Levofloxacin 500 mg 12 hourly; **or**
 - Doxycycline 100 mg (NB per oral) 12 hourly
- Third line, [if immediate rapidly evolving or non-immediate with systemic involvement penicillin allergy](#):
 - Levofloxacin 500 mg 12 hourly **and**:
 - Doxycycline 100 mg (NB per oral) 12 hourly; **or**
 - Co-trimoxazole 960 mg 12 hourly

Directed antibiotics with culture and susceptibilities (please note, pages 3-4)

Necrotising soft tissue infection associated with water exposure: management

Differential diagnosis

- Exposure to fresh, brackish, or seawater; symptoms (e.g. crescendo pain), signs (e.g. haemorrhagic bullae, crepitus), sepsis, or septic shock raising the differential diagnosis of necrotising soft tissue infection

Diagnosis

- Immediate collaboration with the relevant surgical registrar/consultant on call
- If surgery suspects necrotising soft tissue infection, surgical intervention is the overriding priority
- Time is tissue: NCEPOD code 1 (immediate lifesaving/limb or organ-saving intervention within 30 minutes)

Pre-operative investigation and treatment

- FBC, CRP, lactate, U&E, LFT. Aspartate aminotransferase or creatine kinase
- Blood cultures x 2-3. MRSA screen
- Empiric, intravenous antibiotics within 1 hour:
 - First line:
 - Piperacillin tazobactam 4.5 g 6 hourly **and**:
 - Levofloxacin 500 mg 12 hourly **or** doxycycline 100 mg (NB per oral) 12 hourly
 - Second line, [if non-immediate without systemic involvement penicillin allergy](#):
 - Ceftazidime 2 g 8 hourly **and** metronidazole 500 mg 8 hourly **and**:
 - Levofloxacin 500 mg 12 hourly **or** doxycycline 100 mg (NB per oral) 12 hourly
 - Third line, [if immediate rapidly evolving or non-immediate with systemic involvement penicillin allergy](#):
 - Levofloxacin 500 mg 12 hourly **and** metronidazole 500 mg 8 hourly **and**:
 - Doxycycline 100 mg (NB per oral) 12 hourly **or** co-trimoxazole 960 mg 12 hourly
 - NB If clinical concerns re the risk of MRSA, add teicoplanin, [dose as per hospital guidelines](#), target pre dose level 15-30 mg/l

Intra-operative and post-operative investigation and treatment

- Surgical exploration ± debridement ± amputation. Return to theatre ≤ 24 hours after the first surgical intervention for re-inspection. Return to theatre 24-48 hourly thereafter, until the surgical team are satisfied that no necrotic soft tissue remains
- Multiple fluid (≥ 1 ml), pus (≥ 1 ml), and/or tissues (~0.5 - 1 cm³) in universal containers for MC&S
- Post-operative transfer to ICU
- Early consultation with both plastic surgery (regarding reconstruction) and tissue viability

References

- Baddour, L. M.** 2021. Soft tissue infections following water exposure. UpToDate. Available at: [Soft tissue infections following water exposure - UpToDate](#).
- Bennett, J. E., Dolin, R., and Blaser, M. J.** 2015. Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases, 8th Edition. Elsevier.
- Diaz, J. H.** 2014. Skin and Soft Tissue Infections Following Marine Injuries and Exposures in Travelers. Journal of Travel Medicine.
- European Committee on Antimicrobial Sensitivity Testing (EUCAST).** 2023. Clinical breakpoints. Available at: http://www.eucast.org/clinical_breakpoints/.
- Johns Hopkins ABX Guide.** 2023. Available at: <https://www.hopkinsguides.com/hopkins>.
- Sanford Guide Antimicrobial Therapy.** 2023. Available at: <https://www.sanfordguide.com/products/digital-subscriptions/>.

Document control

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