Hand infections – Full Clinical Guideline

Ref no: CG-ANTI/2017/025

1. Treatment of cellulitis and non-penetrating flexor sheath infection in hand clinic

Exclusions

- patients with prosthetic material in the hands (see next section)
- post-op surgical infections (see next section)
- major trauma to the hands including penetrating injuries
- fight and bite infections (see separate guidelines)

In IVDUs consider the possibility of infection with Clostridium or Anthrax species. The patient can deteriorate very quickly. Contact the consultant microbiologist for advice.

These guidelines are for empirical treatment, when the causative organism is unknown. Treatment should be adjusted accordingly once culture and sensitivity results are available.		
Severity	**First Line**	**If allergic to penicillin or known MRSA+ve**
In all classes, add metronidazole if anaerobic cover needed e.g dirty wounds, soil contamination		
Class I	No signs of systemic toxicity and no uncontrolled co-morbidities.	
Screen for MRSA and send wound swab if open wound	Flucloxacillin 500mg – 1G PO qds. Give the higher dose if tolerated.	Doxycycline 200mg stat then 100mg bd (check previous results if known MRSA)
Class II	Febrile, malaise, but no nausea or vomiting or confusion *or* systemically well but with co-morbidity which may complicate or delay resolution.	
Assess the suitability of the patient for Outpatient Parenteral Antibiotic Therapy (OPAT) Screen for MRSA and send wound swab if open wound Send blood culture if febrile	**If treating as an inpatient** Flucloxacillin 2G IV qds	IV Vancomycin or teicoplanin – dosed according to guidelines
	If treating as OPAT Ceftriaxone 2G IV or IM daily (see OPAT section for more detail)	If non-immediate reaction without systemic involvement penicillin allergy Ceftriaxone can still be used if no MRSA. If immediate rapidly evolving or non-immediate with systemic involvement penicillin allergy, or in MRSA Teicoplanin – see OPAT dosing guidelines below
Class III	Significant systemic upset such as acute confusion, tachypnoea, hypotension or unstable co-morbidities or a limb threatening infection due to vascular compromise. Treat as inpatient.	
Screen for MRSA and send wound swab if open wound Blood culture	Flucloxacillin 2G IV qds	IV vancomycin or teicoplanin– dosed according to guidelines Or Clindamycin IV 600mg qds

Severity	First Line	If allergic to penicillin or known MRSA+ve
Class IV	Life threatening infection such as necrotizing fasciitis. Urgent surgical referral and discuss with consultant microbiologist	
Screen for MRSA and send wound swab if open wound Blood culture Tissue sample or aspirate for urgent Gram stain and culture and sensitivity testing	Piperacillin tazobactam 4.5 g 8 hourly and clindamycin 1.2 g 6 hourly Review and de-escalate therapy with results of cultures when available.	If non-immediate without systemic involvement penicillin allergy: meropenem 1 g 8 hourly and clindamycin 1.2 g 6 hourly dual therapy If clinical concerns re risk of MRSA, add IV vancomycin or teicoplanin – dosed according to guidelines If immediate rapidly evolving or non-immediate with systemic involvement penicillin allergy: metronidazole 500 mg 8 hourly and ciprofloxacin 400 mg 12 hourly and linezolid 600 mg 12 hourly

DURATION AND ORAL SWITCHING

- Usually 3-4 days of IV treatment in uncomplicated cases
- Total duration 1-2 weeks, may be longer in complicated cases. Group A streptococcal infection requires minimum of total 10 days antibiotic therapy.
- Switch to oral when pyrexia is settling, erythema less intense, inflammatory makers falling, co-morbidities stable
- Redness may be slow to resolve, or there may be a slight worsening initially, but if inflammatory markers and fever are improving it is not usually necessary to change treatment
- If the cellulitis is not resolving, use imaging to exclude a deep collection

Oral switches – according to sensitivity results or if no results then
Flucloxacillin 500mg – 1G qds

If penicillin allergy
Doxycycline 100mg bd (check for previous resistance to tetracycline)

For more detailed advice on treatment according to sensitivities, see the full Trust cellulitis guideline

If MRSA +ve
According to C+S results

Further information on outpatient parenteral antibiotic therapy (OPAT)

EXCLUSION criteria for OPAT

- Inability to self–care
- Cellulitis secondary to osteomyelitis
- Pulse > 100
- Other by clinical judgement
- IVDA patients
- Immunosuppressed patients
- SBP < 110

Antibiotic dosing in OPAT

	Ceftriaxone	**Teicoplanin (dosing for cellulitis only)** *To facilitate initiation of treatment as an outpatient in the hand clinic the initial dose has been doubled rather than giving two doses at 12 hour intervals.*
Dosing	2G IV or IM daily	Teicoplanin IV (based on approx. 6mg/kg) < 70kg 800mg stat for 1 dose followed by 400mg once daily starting 24 hours later. 70–100kg 1200mg stat dose for 1 dose, then 600mg once daily starting 24 hrs later >100kg 1200mg stat dose then 800mg once daily starting 24 hours later In heavier patient, consider increasing loading dose to 1600mg and giving a higher maintenance dose – contact pharmacy for further information
Administration	2G IV dose - reconstitute and administer using 50ml NaCl 0.9% in Ecoflac Plus. Give over 30 minutes (If IM Dissolve each 1G in 3.5ml of 1% lidocaine injection. Doses over 1G should be divided between more than one site)	Doses ≤ 800mg may be given as a bolus over 3-5 minutes. Doses greater than 800mg should preferably be given as an infusion over 30 minutes.
Dosing in renal impairment	No dose reduction needed	**CrCl 30–80 mL/minute** Use normal dose regimen on days 1–4, then use normal maintenance dose every 48 hours. **CrCl < than 30 mL/min** Use normal dose regimen on days 1–4, then use normal maintenance dose every 72 hours.

Patient to return to the hand clinic for daily clinical review and administration of antibiotics. At weekends will attend ward 204 to receive doses. Patient should receive information regarding the care of their peripheral cannula whilst at home.

2. Post surgical hand infections (deep) including prosthetic joint implant infection or metal work arthrodesis infection

Microbiological samples

- Taking pre antibiotic deep tissue aspirate, deep tissue samples & bone for C&S is very important
- Do not send amputated parts of bone or tissue. Bone from the remaining resection margin is needed to exclude on-going bone infection/osteomyelitis.
- MRSA wound swab & nasal
- If empiric antibiotic cover is needed whilst awaiting results:

	No penicillin allergy	If non-immediate without systemic involvement penicillin allergy	If immediate rapidly evolving or non-immediate with systemic involvement penicillin allergy
Prosthesis or metal work in place	IV teicoplanin + IV piperacillin-tazobactam 4.5 g tds	IV teicoplanin + IV ciprofloxacin 400mg tds +/- metronidazole	IV teicoplanin + IV ciprofloxacin 400mg tds +/- metronidazole
No prosthesis or metal work in place	IV ceftriaxone +/- metronidazole (Add IV teicoplanin if MRSA positive or high risk MRSA)	IV ceftriaxone +/- metronidazole (Add IV teicoplanin if MRSA positive or high risk MRSA)	IV teicoplanin + IV ciprofloxacin 400mg tds +/- metronidazole

Review with culture and sensitivity results and discuss with a consultant microbiologist. If there is evidence of bone (osteomyelitis) or joint (septic arthritis) patient usually needs at least 2 weeks of IV treatment before switching to oral treatment; total duration of antibiotics 4- 6 weeks.

Documentation Controls

Development of Guidelines:	Consultant Microbiologists Consultant hand surgeons Antimicrobial Pharmacist
Approved By;	Antimicrobial Stewardship Group 24/6/2021 Surgical division Risk and governance group
Changes from previous guideline	Penicillin allergy information updated with insertion of hyperlink Choices in penicillin allergy changed from linezolid as this should be kept in reserve. Doxycycline alone for class 2 oral switch rather than adding

	clindamycin too. Ceftriaxone dose changed to 2G for all patients regardless of weight. First line treatment for Class IV infection altered, in line with necrotising skin and soft tissue infection guidelines. Alternatives to gentamicin for post surgical infections.
Review Date:	June 2024
Key Contact:	Mr Dan Armstrong – Consultant hand surgeon

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