University Hospitals of Derby and Burton NHS Foundation Trust

Peripheral Venous Catheter Infection - Microbiology Summary Clinical Guideline

Reference number: CG-ANTI/4006/22

Management: peripheral venous catheter localised infection **without** sepsis

Clinical concerns re peripheral venous catheter localised infection (e.g. pain, erythema, warmth, tenderness, and/or swelling of the skin) without sepsis

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Treatment: remove the peripheral venous catheter

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Investigate

- Blood sciences:
  - FBC, CRP, lactate, U&E, and LFT
- Microbiology:
  - ± Tip for culture and susceptibilities: for example, if clinical concerns re bloodstream infection, sepsis, or septic shock
  - ± Pus/Wound swab: e.g. if purulent discharge
  - ± Blood cultures. Indications for initial blood cultures include the initiation of treatment with intravenous antibiotics

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Treatment: empiric, per oral antibiotics

- First line: flucloxacillin 1 g 6 hourly
- Second line: clarithromycin 500 mg 12 hourly
- Third line: doxycycline 100 mg 12 hourly
- Fourth line: clindamycin 300-450 mg 6 hourly
- Fifth line: linezolid 600 mg 12 hourly

or*

Treatment: empiric, intravenous antibiotics*

- First line: flucloxacillin 2 g 6 hourly
- Second line, if penicillin allergy and/or clinical concerns re the risk of MRSA: glycopeptide (vancomycin or teicoplanin), dose as per hospital guidelines, vancomycin target pre dose level 15-20 mg/l, teicoplanin target pre dose level 15-30 mg/l
- Third line, if penicillin allergy: clindamycin 600 mg 6 hourly
- Fourth line, if penicillin allergy and/or clinical concerns re the risk of MRSA: linezolid 600 mg 12 hourly (NB or per oral [absorption 100%])
- Fifth line, if penicillin allergy and/or clinical concerns re risk MRSA: daptomycin 4-6 mg/kg daily

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Directed antibiotics with microbiology cultures and susceptibilities
Duration of antibiotics 5-7 days

* Indications for empiric, intravenous antibiotics include: (1) progression of symptoms and signs after 48 hours of per oral antibiotics; (2) suboptimal vasculature - e.g. chronic venous insufficiency, diabetes mellitus, peripheral vascular disease - impeding delivery of antibiotics; (3) intolerant of per oral antibiotics

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Management: peripheral venous catheter infection with sepsis

Clinical concerns re peripheral venous catheter infection (e.g. pain, erythema, warmth, tenderness, and/or swelling of the skin) **and** Clinical concerns re sepsis (life threatening organ dysfunction caused by a dysregulated host immune response to infection) or septic shock

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Treatment: remove the peripheral venous catheter

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Investigate

- Blood sciences:
  - FBC, CRP, lactate, U&E, and LFT
- Microbiology:
  - Blood cultures
  - ± Tip for culture and susceptibilities: for example, if clinical concerns re bloodstream infection, sepsis, or septic shock
  - ± Pus/Wound swab: e.g. if purulent discharge

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If for empiric, intravenous antibiotics, ensure completion of the Sepsis 6

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Treatment: empiric, intravenous antibiotics

- First line: glycopeptide (vancomycin or teicoplanin), deep-seated dosage as per hospital guidelines, vancomycin target pre dose level 15-20 mg/l, teicoplanin target pre dose level 30-40 mg/l; **and** piperacillin tazobactam 4.5 g 6 hourly
- Second line, if non-immediate without systemic involvement penicillin allergy: glycopeptide (vancomycin or teicoplanin), deep-seated dosage as per hospital guidelines, vancomycin target pre dose level 15-20 mg/l, teicoplanin target pre dose level 30-40 mg/l; **and** ceftazidime 2 g 8 hourly
- Third line, if immediate rapidly evolving or non-immediate with systemic involvement penicillin allergy: glycopeptide (vancomycin or teicoplanin), deep-seated dosage as per hospital guidelines, vancomycin target pre dose level 15-20 mg/l, teicoplanin target pre dose level 30-40 mg/l; **and** ciprofloxacin 400 mg 8 hourly

Blood cultures positive

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Antibiotics intravenously ± per oral

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Please note relevant hospital guidelines on *Staphylococcus aureus* bloodstream infection, blood cultures and bloodstream infections, and native and prosthetic valve infective endocarditis

Blood cultures negative 48-72 hours

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Stop antibiotics intravenously

- Directed, per oral antibiotics with microbiology cultures and susceptibilities
  Total duration of antibiotics 5-7 days

or

- Empiric, per oral antibiotics (flucloxacillin or clarithromycin or doxycycline, etc.)
  Total duration of antibiotics 5-7 days

References

Bennett, J. E., Dolin, R., and Blaser, M. J. 2015. Mandell, Douglas, and Bennett's Principles and Practice of Infectious Disease, 8th Edition. Elsevier.
Calderwood, M. S. 2019. Intravascular non-hemodialysis catheter-related infection: Clinical manifestations and diagnosis. UpToDate. Available at: Intravascular non-hemodialysis catheter-related infection: Clinical manifestations and diagnosis - UpToDate (accessed May 2020).
Calderwood, M. S. 2019. Intravascular non-hemodialysis catheter-related infection: Treatment. UpToDate. Available at: Intravascular non-hemodialysis catheter-related infection: Treatment - UpToDate (accessed May 2020).
CREST. 2005. Guidelines on the management of cellulitis in adults. Available at: http://www.acutemed.co.uk/docs/Cellulitis%20guidelines,%20CREST,%2005.pdf (accessed July 2019).
Gaynes, R. and Jacob, J. T. 2020. Intravascular catheter-related infection: Epidemiology, pathogenesis, and microbiology. UpToDate. Available at: Intravascular catheter-related infection: Epidemiology, pathogenesis, and microbiology - UpToDate (accessed November 2020).
Mermel, L. A. 2017. Short-term Peripheral Venous Catheter-Related Bloodstream Infections: A Systematic Review. Clinical Infectious Diseases.
National Institute for Health and Care Excellence (NICE). 2019. Cellulitis and erysipelas: antimicrobial prescribing (Draft for consultation, April 2019). Available at: www.nice.org.uk (accessed May 2019).
Ripa, M., Morata, L., Rodriguez-Nunez, O., Cardozo, C., Puerta-Alcade, P., Hernandez-Meneses, M., Ambrosioni, J., Linares, L., Bodro, M., Valcarcel, A., Casals, C., de los Angeles Guerrero-Leon, M., Almela, M., Garcia-Vadal, C., del Rio, A., Marco, F., Mensa, J., Martinez, J. A., and Soriano, A. 2018. Short-Term Peripheral Venous Catheter-Related Bloodstream Infections: Evidence for Increasing Prevalence of Gram-Negative Microorganisms from a 25-Year Prospective Observational Study. Antimicrobial Agents and Chemotherapy.
Smith, R. N. and Nolan, J. P. 2013. Central venous catheters. BMJ.
Spelman, D. 2019. Cellulitis and skin abscess: Clinical manifestations and diagnosis. Available at: https://www.uptodate.com/contents/cellulitis-and-skin-abscess-clinical-manifestations-and-diagnosis?topicRef=110530&source=see_link (accessed May 2019).
Spelman, D. 2019. Cellulitis and skin abscess in adults: Treatment. Available at: https://www.uptodate.com/contents/cellulitis-and-skin-abscess-in-adults-treatment (accessed May 2019).
Sullivan, T. and de Barra, E. 2018. Diagnosis and management of cellulitis. Clinical Medicine.
Weng, Q. Y., Raff, A. B., and Cohen, J. M. 2017. Costs and Consequences Associated With Misdiagnosed Lower Extremity Cellulitis. The Journal of the American Medical Association Dermatology.

Document control

Development of guidelines:	Angelina Dyche, Kayleigh Lehal, Dr Peter Slovak
Consultation with:	Antimicrobial Pharmacist, Lead Antimicrobial Pharmacist, Microbiology Consultant
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Key contacts:	Dr Peter Slovak, Microbiology Consultant p.slovak@nhs.net Kayleigh Lehal, Lead Antimicrobial Pharmacist kayleigh.lehal@nhs.net Angelina Dyche, Antimicrobial Pharmacist angelinadyche@nhs.net