Diabetic foot infection: antimicrobial prescribing

NICE National Institute for Health and Care Excellence

Background

In diabetes, all foot wounds are likely to be colonised with bacteria

Diabetic foot infection has at least 2 of:

- local swelling or induration
- erythema
- local tenderness or pain
- local warmth
- purulent discharge

Severity is classified as:

- Mild - local infection with 0.5 to less than 2 cm erythema
- Moderate - local infection with more than 2 cm erythema or involving deeper structures (such as abscess, osteomyelitis, septic arthritis or fasciitis)
- Severe - local infection with signs of a systemic inflammatory response

Prescribing considerations

When choosing an antibiotic, take account of:

- the severity of infection (mild, moderate or severe)
- the risk of complications
- previous microbiological results
- previous antibiotic use
- patient preference

Give oral antibiotics first line if possible

Review intravenous antibiotics by 48 hours and consider switching to oral antibiotics if possible

Review need for continued antibiotics regularly

October 2019

Diabetic foot infection

H

Refer to hospital immediately and inform multidisciplinary foot care service if there are limb- or life-threatening problems such as:

- ulceration with fever or any signs of sepsis, or
- ulceration with limb ischaemia, or
- suspected deep-seated soft tissue or bone infection, or
- gangrene

For all other active diabetic foot problems, refer to foot service within 1 working day

- **Do not offer antibiotics to prevent diabetic foot infection**
- **Advise seeking medical help if symptoms of diabetic foot infection develop**

- Start antibiotic treatment as soon as possible
- Take samples for microbiological testing before, or as close as possible to, the start of antibiotic treatment
- When choosing an antibiotic, take account of prescribing considerations

Give advice about:

- **possible adverse effects of the antibiotics**
- **seeking medical help if symptoms worsen rapidly or significantly at any time, or do not start to improve within 1 to 2 days**

When microbiological results are available:

- review the choice of antibiotic, and
- change the antibiotic according to results, using a narrow spectrum antibiotic, if appropriate

Reassess if symptoms worsen rapidly or significantly at any time, do not start to improve within 1 to 2 days, or the person becomes systemically very unwell or has severe pain out of proportion to the infection. Take account of:

- **other possible diagnoses, such as pressure sores, gout or non-infected ulcers**
- **symptoms or signs suggesting something more serious such as limb ischaemia, osteomyelitis, necrotising fasciitis or sepsis**
- **previous antibiotic use**

Refer to hospital if needed (see above)

This is a summary of the recommendations on antimicrobial prescribing for diabetic foot infection from NICE's guideline on diabetic foot problems: prevention and management. For more general recommendations on diabetic foot problems, see the NICE guideline at www.nice.org.uk/guidance/ng19

Diabetic foot infection: antimicrobial prescribing

NICE National Institute for Health and Care Excellence

Mild infection: choice of antibiotic for adults aged 18 years and over

Antibiotic[1]	Dosage and course length[2]
First choice oral antibiotic	
Flucloxacillin	500 mg to 1 g four times a day for 7 days[3,4]
Alternative oral antibiotics for penicillin allergy or if flucloxacillin unsuitable (guided by microbiological results when available)	
Clarithromycin	500 mg twice a day for 7 days[3]
Erythromycin (in pregnancy)	500 mg four times a day for 7 days[3]
Doxycycline	200 mg on first day, then 100 mg once a day (can be increased to 200 mg daily) for 7 days[3]

[1]See BNF for appropriate use and dosing in specific populations, for example, hepatic impairment, renal impairment, pregnancy and breast-feeding.
[2]Oral doses are for immediate-release medicines.
[3]A longer course (up to a further 7 days) may be needed based on clinical assessment. However, skin does take some time to return to normal, and full resolution of symptoms at 7 days is not expected.
[4]The upper dose of 1 g four times a day would be off-label. The prescriber should follow relevant professional guidance, taking full responsibility for the decision. Informed consent should be obtained and documented. See the General Medical Council's Good practice in prescribing and managing medicines and devices for further information.

Diabetic foot infection: antimicrobial prescribing

Moderate or severe infection: choice of antibiotic for adults aged 18 years and over

Antibiotic[1]	Dosage[2]	
First choice antibiotics (guided by microbiological results when available)[3,4,5,] In severe infection give IV for at least 48 hours (until stabilised). Course length is based on clinical assessment: minimum 7 days and up to 6 weeks for osteomyelitis (use oral antibiotics for prolonged treatment)[6]		
Flucloxacillin ***with or without***	1 g four times a day orally[7]	**or** 1 to 2 g four times a day IV
Gentamicin[8,9] ***and/or***	Initially 5 to 7 mg/kg once a day IV, subsequent doses adjusted according to serum gentamicin concentration	
Metronidazole	400 mg three times a day orally	**or** 500 mg three times a day IV
Co-amoxiclav ***with or without***	500/125 mg three times a day orally	**or** 1.2 g three times a day IV
Gentamicin[8,9]	Initially 5 to 7 mg/kg once a day IV, subsequent doses adjusted according to serum gentamicin concentration	
Co-trimoxazole (in penicillin allergy)[9,10] ***with or without***	960 mg twice a day orally	**or** 960 mg twice a day IV (can be increased to 1.44 g twice a day)
Gentamicin[8,9] ***and/or***	Initially 5 to 7 mg/kg once a day IV, subsequent doses adjusted according to serum gentamicin concentration	
Metronidazole	400 mg three times a day orally	**or** 500 mg three times a day IV
Ceftriaxone ***with***	2 g once a day IV	
Metronidazole	400 mg three times a day orally	**or** 500 mg three times a day IV
Additional antibiotic choices if *Pseudomonas aeruginosa* suspected or confirmed (guided by microbiological results when available)[3,4,5,11]		
Piperacillin with tazobactam	4.5 g three times a day IV (can be increased to 4.5 g four times a day)	
Clindamycin ***with***	150 to 300 mg four times a day orally (can be increased to 450 mg four times a day)	**or** 600 mg to 2.7 g daily IV in two to four divided doses, increased if necessary in life-threatening infection to 4.8 g daily (maximum per dose 1.2 g)
Ciprofloxacin (consider safety issues[12]) ***and/or***	500 mg twice a day orally	**or** 400 mg two or three times a day IV
Gentamicin[8,9]	Initially 5 to 7 mg/kg once a day IV, subsequent doses adjusted according to serum gentamicin concentration	
Antibiotics to be added if MRSA infection suspected or confirmed (combination therapy with an antibiotic listed above)[4,5]		
Vancomycin[8,9]	15 to 20 mg/kg two or three times a day IV (maximum 2 g per dose), adjusted according to serum vancomycin concentration	
Teicoplanin[8,9]	Initially 6 mg/kg every 12 hours for three doses, then 6 mg/kg once a day IV	
Linezolid (if vancomycin or teicoplanin cannot be used; specialist use only)[9]	600 mg twice a day orally	**or** 600 mg twice a day IV

[1]See BNF for use and dosing in specific populations, for example, hepatic and renal impairment, pregnancy and breast-feeding, and administering IV (or, where appropriate, intramuscular) antibiotics.
[2]Oral doses are for immediate-release medicines.
[3]Give oral antibiotics first-line if the person can take oral medicines, and the severity of their condition does not require intravenous antibiotics.
[4]Review intravenous antibiotics by 48 hours and consider switching to oral antibiotics if possible.
[5]Other antibiotics may be appropriate based on microbiological results and specialist advice.
[6]Skin takes some time to return to normal, and full resolution of symptoms after a course of antibiotics is not expected. Review the need for continued antibiotics regularly.
[7]The dose of 1 g four times a day would be off-label. The prescriber should follow relevant professional guidance, taking full responsibility for the decision. Informed consent should be obtained and documented. See the General Medical Council's Good practice in prescribing and managing medicines and devices for further information.
[8]See BNF for information on therapeutic drug monitoring.
[9]See BNF for information on monitoring of patient parameters.
[10]Not licensed for diabetic foot infection, so use would be off label (see above).
[11]These antibiotics may also be appropriate in other situations based on microbiological results and specialist advice.
[12]See MHRA advice for restrictions and precautions for using fluroquinolone antibiotics due to very rare reports of disabling and potentially long-lasting or irreversible side effects (March 2019).