

Using your medicines exemptions: the case of antibiotics

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Introduction

The Health and Care Professions Council (HCPC) register lists the names of podiatrists who are currently registered with the HCPC. Each entry gives the registrant's registration number and shows their right to access groups of Prescription Only Medicines (POMs) via their annotations.

In 2016, the annotation wording within the HCPC-Register was altered (Borthwick & Fitzpatrick 2016).

The annotation now reads:

- Prescription-Only Medicines Administration (POM-A)
- Prescription-Only Medicines Supply (POM-S)

The drugs available to Podiatrists via the POMs-annotations are detailed in the Podiatry Exemption List. This list can be found in the Human Medicines Regulations (2012). From time to time this list is updated and so the most recent edition of the list can also be found on the College website (<u>https://cop.org.uk/</u>).

The annotation POM-A indicates that the podiatrist can access and administer a range of injectable medicines for clinical use e.g. some local anaesthetics, cortico-steroid and adrenaline for emergency use.

The annotation POM-S indicates that the podiatrist can access and supply a range of oral and topical medicines e.g. some analgesics, antibiotics, anti-inflammatory and anti-fungal medications. Three antibiotics are included within the POM-S annotation.

The listed exempt prescription only medicines can be used by any HCPC-Registered Podiatrist whose entry is annotated appropriately, and can only be accessed on behalf their patients, to be used as part of their clinical practice. When a podiatrist renews their registration, they make a legally binding declaration that they are cognisant and competent in all aspects of practice, including the indication for and use of any POMs which their entry confirms they may access.



Antibiotics are a class of prescription-only medicines that are widely used throughout medicine to control bacterial (but *not fungal or viral*) infections. These drugs may be administered via the oral or intravenous route or, in some cases, topically (e.g.: by direct application to the skin).

There are a wide range of groups of antibiotic drugs which have differing and varying modes of action (see Table 1),

Table 1: Types of Antibiotic Medicines

- Benzyl-penicillin
- Penicillinase-resistant penicillin
- Broad spectrum penicillin
- Anti-pseudomonal penicillin,
- Mecilinams
- Cephalosporins
- Tetracyclines
- Aminoglycosides
- Macrolides
- Clindamycin
- Sulphonamides
- Trimethoprim
- Glycopeptides

Antibiotic Resistance

Antibiotics are used to combat bacterial infections but certain strains of bacteria, e.g. Staphylococcus aureus, have developed resistance to many antibiotics, particularly to penicillin and its derivatives. Resistant bacteria are thus no longer susceptible to the effects of this group of agents. Methicillin-resistant staphylococcus aureus (MRSA) is the most commonly known resistive bacteria, however others now exist.

The increase in antibiotic resistance (ABR) is a major concern worldwide and all practitioners have a responsibility to use any antibiotics judiciously and appropriately to help limit its further development. This is often referred to as antibiotic stewardship. The international increase in antibiotic-resistant bacteria, is likely to lead to widespread untreatable and overwhelming infections and is a major public health threat. As the result of increasing ABR, it is estimated that 'hard-to-treat' infections could become routine and, regretfully even the norm in medicine, within the foreseeable future. <u>https://antibioticguardian.com/</u>

Classification of Bacteria

Bacteria may be classified, histologically, according to their ability to absorb Gram stain:

• Gram positive bacteria have a relatively simple cell wall structure and readily take up Gram stain (gentian violet). Gram positive bacteria also take in and react to antibiotic drugs more readily



• In contrast, Gram negative bacteria have a much more complex cell wall structure that is less easily penetrated by Gram stain, or antibiotic drugs. Thus, Gram negative infections (for example, pseudomonas infections) tend to be less easily treated and require specifically targeted antibiotic drugs to be overcome.

Actions of antibiotic drugs

Antibiotic drugs act in two basic ways:

- 1. Bacteriostatic antibiotics interfere with bacterial function.
 - Bacteriostatic antibiotics upset and interfere with aspects of bacterial cellular metabolism such as normal bacterial protein production, or cell replication. This provides a better opportunity for the host's immune response to overcome the infection
 - Examples of bacteriostatic antibiotics include: tetracyclines, sulphonamides, trimethoprim, chloramphenicol, macrolides (erythromycin) and lincosamides
 - Many bacteria have developed resistance to these types of antibiotics
- 2. Bactericidal Antibiotics have the ability to kill bacteria.
 - Bactericidal antibiotics achieve their action by interfering with the formation of the bacterial cell wall or essential elements of its cellular contents, resulting in the death of the organism.
 - Examples of these drugs include penicillin and penicillin derivatives, fluoroquinolones, metronidazole (which is used to combat infections caused by anaerobic bacteria), and cotrimoxazole.
 - o Many bacteria have developed resistance to these types of antibiotics

Most antibiotics were originally isolated by screening soil-derived actinomycetes (fungi) during the golden era of antibiotic discovery in the 1940s to 1960s. More recently, fewer and fewer natural antibiotics have been discovered, and research has focused more on screening synthetic compounds for antibiotic properties. These synthetic compounds tended to have less therapeutic action, due to their inability to penetrate the bacterial cell wall as efficiently as the natural drug. Current research is directed to investigating untapped natural product sources to establish rules of compound penetration that could lead to the development of

- better synthetic antibiotics
- species-specific antibiotics
- and prodrugs that have the potential to eradicate dormant multi-drug resistance in common bacteria.

Thus, the future success of the development of new antibiotics, to which bacteria do not rapidly develop resistance, is uncertain. In order to prolong the effectiveness of the current range of antibiotic drugs and minimize the development of further antibiotic resistance, effective antibiotic stewardship is required to prevent the widespread and profligate use of antibiotics, and where possible antibiotic use should be avoided. However, where there is evidence/suspicion of bacterial infection it is appropriate to use antibiotics. The advice is to 'Start smart and then focus', dependant on swab results for microscopy, culture and sensitivity or early clinical follow up. The British National Formulary [BNF] is available in hard copy and electronically for mobile devices, and provides

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extensive information on indications for use, dosages and drug interactions (in Appendix 1) with any of the available antibiotics.

The BNF App is available free of charge at Apple and Android app stores. In addition, members can access the BNF via the web using their NHS account or via NICE online.

In those cases where the infection does not respond to first line POM-S antibiotic treatment in a timely fashion the patient should be referred on.

The referral could be

• To the patient's GP, advising the GP of the type and dose of antibiotic therapy that has already been provided and its start date, with the request that an alternative antibiotic is prescribed for the patient.

Where antibiotic sensitivities have been identified in a pathology report, but a POM-S antibiotic is identified as non-effective to combat that infection,

- The appropriate antibiotic management could be provided by a doctor
- Alternatively, the appropriate antibiotic could be provided by the Podiatrist if there was access to an existing Patient Group Directive for a suitable agent, or the patient could be referred to a podiatrist who is annotated in the HCPC Register as an Independent Prescriber (IP)

Antibiotics available to Podiatrists whose registration is annotated as Prescription-Only Medicines, Supply (POM-S).

HCPC-Registered Podiatrists whose register annotation shows the term 'Prescription-Only Medicines, Supply '(POM-S) are entitled to access and supply (but not prescribe) a limited number of antibiotic drugs for patients who present with bacterial skin and / or soft tissue infections of the foot. These antibiotics are generally regarded as effective first line therapy in case of infection. The patient's GP should be informed in writing whenever antibiotics are supplied. Where the Podiatrist is working within an NHS Trust, care should be taken to ensure that the supply of antibiotics fits within the Trust's antibiotic policy. The local Formulary will provide guidance on the Trust's preferred agent for specific areas of practice.

 Note: In March 2008 NICE advised that the use of an antibiotic cover for patients with a history of rheumatic heart disease undergoing minor surgical and dental procedures was no longer recommended. These guidelines were updated in 2016 <u>https://bnfc.nice.org.uk/treatmentsummary/antibacterials-use-for-prophylaxis.html</u>

POM-S Registered podiatrists can supply the following antibiotics to their patients:

- Penicillins
 - <u>Flucloxacillin</u> a penicillinase-resistant antibiotic the shows good action against susceptible Gram positive bacteria, e.g.: Staphylococcus aureus
 - <u>Amoxicillin</u> a broad spectrum penicillin-derived antibiotic that shows action against both Gram positive and Gram negative bacteria
- Macrolides



• <u>Erythromycin</u> a moderate spectrum macrolide antibiotic, that may be indicated to overcome infection in those patients who show penicillin-allergy. However, this medicine tends to interact with a wide range of other drugs.

Flucloxacillin

<u>Bacterial Susceptibility</u>: Flucloxacillin is a beta-lactam penicillin-type antibiotic, that is a derivative of benzyl penicillin.

- It has a bactericidal action, as it inhibits the synthesis of bacterial cell walls.
- It is used to treat non-complex skin and soft tissue infections (cellulitis) caused by flucloxacillinsusceptible Gram positive bacteria, such as Staph. aureus. It is effective even though these bacteria produce an enzyme (beta-lactamase) that can negate the action of other antibiotics.
- Flucloxacillin is not effective against Gram negative organisms and is less effective against non-beta lactamase producing Gram positive bacteria. It is ineffective against MRSA, and generalized bacterial resistance to the effects of flucloxacillin is becoming increasingly common.

Administration:

- Flucloxacillin is routinely administered as 250mg or 500mg capsules, via the oral route as it is well absorbed from the gut. Severe and spreading infections (generalized sepsis) may require initial administration via the intravenous route to achieve a rapid high-level drug concentration.
- The required dose of Flucloxacillin is administered four times daily (qds), usually for 5-7-days continuously
- Patients should be counselled to ensure that they remember to take the fourth dose each day: this is usually taken just before going to bed, and tends to be easily forgotten, with resultant reduced drug effectiveness
- As the drug is better absorbed from an acid gut environment, capsules should be swallowed, with water, when the stomach is empty, preferably 30 mins before food, or 2 hours after eating.
- It is metabolised in the liver, and its metabolic by-products are excreted via the kidney.

<u>Precautions for use</u>: The BNF and the BNF app provide extensive advice for practitioners regarding dose and frequency of administration. Many electronic health records also often include software that checks for and alerts to interactions between medications. Where such software is not available BNF Appendix 1 provides such information in detail.

Flucloxacillin is often used as a 'first line ' choice of initial antibiosis for skin and soft tissue infection in non-penicillin allergic patients. Ideally, a pathology swab should be taken for microscopy, culture and sensitivity to confirm the causative organism of the infection and its antibiotic sensitivity and the patient should be reviewed with the report where possible. Antibiotic treatment should be modified dependent on the results of the culture and sensitivity test if possible. When no microbiology report is available one should not continue therapy in the long term especially if the wound fails to respond, as it is likely that the infection is not susceptible to this agent.

- Flucloxacillin <u>must not be used</u> in patients with known penicillin allergy
- It should be used with caution in patients with known renal and liver dysfunction;
- In the elderly, or where administration exceeds 2 weeks, there is an increased risk of cholestatic jaundice

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- Its excretion rate is lower in patients who are taking probenecid and this may result in higher blood concentrations.
- Female patients should be counselled that its use may decrease the effectiveness of oral contraceptive drugs.
- Patients who are taking methotrexate may require modification of their methotrexate dose when taking flucloxacillin, as co-medication of these drugs increases the plasma concentration of methotrexate.
- Patients should be advised of other possible side effects of using Flucloxacillin, which may include gastro-intestinal upset (e.g.: diarrhoea and / or vomiting), allergic reactions (skin rashes and hives) or even anaphylaxis. Patients should be warned that the medication should be stopped immediately, should they develop any of these symptoms.
- Patients supplied with this medicine should be advised to read the included Patient Information Leaflet, and cease to use the medication and seek further advice if they develop any of the side or adverse effects described therein
- The podiatrist should ensure that the drug is effective (beginning to control the infection) by reviewing the patient within 72 hrs of issuing the medicine.

Amoxicillin

<u>Bacterial Susceptibility:</u> Amoxicillin is another beta-lactam penicillin-type antibiotic which shows a broader spectrum of activity than flucloxacillin.

- It has a bacteriolytic action, inhibiting the synthesis of the cell walls of both Gram positive and Gram negative bacteria.
- It is used to overcome mixed microbial infections (caused by amoxicillin-susceptible bacteria) in skin and soft tissues

Administration:

Amoxicillin is well absorbed from the gut following oral administration

- It is routinely administered as 250mg-500mg capsules, taken in regular doses, three times a day (tds) for 5-7 days continuously
- Doses can be taken without reference to food intake, as its absorption is not affected by the presence of food in the stomach, or gastric acidity.
- Many bacteria are able to produce an enzyme (beta-lactamase) that degrades the beta-lactam ring structure of this penicillin-type antibiotic, rendering amoxicillin ineffective
- Amoxicillin's susceptibility to beta-lactamase degradation is overcome if the drug is combined with clavulanic acid (Co-amoxiclav) but POM-S registered podiatrists currently *do not have access to that drug*,
- Bacterial resistance to amoxicillin is increasingly common,
- Patients supplied with this medicine should be advised to read the included Patient Information Leaflet, and cease to use the medication and seek advice if they develop any of the side or adverse effects included therein

Precautions for use:

• Known allergy to one penicillin means allergy to all penicillins: thus Amoxicillin should not be used in patients who are allergic to penicillin-type medications



- Use should be avoided in patients who have renal impairment, or who have chronic lymphocytic leukaemia.
- Female patients should be counselled that its use may decrease the effectiveness of oral contraceptive drugs.
- Amoxicillin, like flucloxacillin and other penicillin-like drugs, shows the same potential to induce sideeffects in some patients. These include diarrhoea and/or vomiting, non-allergic rashes (which may affect 3-10% of children medicated with this drug), and anaphylaxis, and patients should be warned of this
- The podiatrist should ensure that the drug is effective (beginning to control the infection) by reviewing the patient within 72 hrs of issuing the medicine. Patients whose infection does not respond to this medicine should be referred on.

Erythromycin

Bacterial Susceptibility:

Erythromycin is a bacteriostatic macrolide antibiotic with a slightly wider antimicrobial spectrum of action than the penicillin-type antibiotics (e.g.: amoxicillin; flucloxacillin)

- It is often used as a safe alternative to penicillins in patients who are penicillin allergic, i.e.: those with a history of reaction to penicillin-type antibiotics.
- It concentrates well in areas of infection and is indicated for skin and soft tissue infections.
- It is the drug of choice for corynebacteria infection (erythrasma)

Administration:

- It is usually supplied as 250mg or 500mg capsules, which should be taken at regular intervals, four times throughout the day (qds), for 5-7 days continuously
- Patients should be counselled to ensure that they remember to take to the fourth dose each day: this is usually taken just before going to bed, and tends to be easily forgotten, with resultant reduced drug effectiveness
- In contrast to flucloxacillin, its antimicrobial action is inactivated by stomach acid, and thus the medicine must be taken with food.

Precautions for use:

Overall, erythromycin tends to cause less side effects than other antibiotics

- However, it can predispose susceptible users to gastro-intestinal tract (GIT) upsets (colitis), reduced hearing acuity, allergic rashes, cardiac dysrhythmias, jaundice, Stevens-Johnson syndrome, epidermal necrolysis, and thrombocytopaenia
- It must be used with caution in patients who have hepatic (liver), renal (kidney) and cardiac (heart) dysfunction
- It should be avoided by patients who suffer from porphyria
- It should not be taken those who are pregnant, or nursing mothers, and should not be given to infants.



Although its side effects can be less than those of penicillin-type antibiotics, it interacts with a wide range of drugs. Further detailed advice is available in BNF Appendix 1 however it must be noted that:

- erythromycin should not be used by patients who take a wide range of other medicines, which include warfarin, oral contraceptive agents (the 'Pill'), corticosteroids, statins, anti-migraine drugs, verapamil, terfenadine, clindamycin, and alcohol.
- Its use is directly contraindicated with a range of other medicines, including anti-histamines (e.g.: terfinadine), anti-psychiotics, anti-virals, anxiolytics, hypnotics, ciclosporin, cilostazol, cytotoxics, diuretics, ergot alkaloids, serotonin agonists, lipid-regulating drugs (statins), cimetidine, and some cardio-active drugs

Antibiotic Drug	Flucloxacillin	Amoxicillin	Erythromycin
Antibiotic type	Beta-lactamase	Beta-lactam	Macrolide antibiotic
	resistant penicillin	penicillin derived	
	derived antibiotic	antibiotic	
Indication for	Skin and soft tissue infections caused by Gram positive and some		
podiatric use	Gram negative microorganisms.		
Anti-bacterial	Narrower spectrum	Broader spectrum	Wide spectrum
action	Gram positive	Gram positive and	(Gram positive,
	Microorganisms	some Gram negative	Gram negative,
	(MOs)	MOs.	Some pseudomonas,
	(e.g.: Staph aureus)		Some yeasts.
	Not MRSA or	Not MRSA	Not MRSA
	pseudomonas		
Administration	Generally oral	Generally oral	Generally oral
route / formulation	administration for	administration for	administration for
	low grade infection.	low grade infection.	low grade infection.
	(IV administration is	(IV administration is	(IV administration is
	permitted where	permitted where	permitted where
	suitable training has	suitable training has	suitable training has
	may be most	may be most	may be most
	appropriate in diabetic	appropriate in diabetic	appropriate in diabetic
	and surgical teams)	and surgical teams)	and surgical teams)
Adult oral dose	250-500mg	250-500mg	250-500mg
Dose frequency	4 x day (qds)	3 x day (tds)	4 x day (qds)
Dose duration	5-7 days	5-7 days	5-7 days
Review period	1-3 days	1-3 days	1-3 days
Special instructions	Take medicine 30	Spread doses evenly	Take medicine with
to patient	mins before or 2 hrs	though daytime	food
	after food	Complete the full	

Table 2: POM-S Antibiotics: Summary of Characteristics



	Do not forget the 4 th	course of medicine	Do not forget the 4 th
	dose each day		dose each day
	Complete the full		Complete the full
	course of medicine		course of medicine
Side effects:	See BNF	See BNF (Broad	See BNF
	(Penicillinase-	spectrum penicillins)	(Macrolides)
	resistant peniciliins))		
Drug interactions	See BNF Appendix 1	See BNF Appendix 1	See BNF Appendix 1

How do I obtain antibiotics for my patients?

Any Podiatrist wishing to access these drugs must be POM-S annotated.

- NHS-employed Podiatrists may supply any POM-S exempted drug including the antibiotics listed above. This is generally done in accordance with local protocols and in association with the Trust's Pharmacy Department.
- Those in private practice need to follow an alternative route to access the exempted drugs on behalf of their patients. There are 2 methods by which supplies may be obtained.

<u>1: Private practitioners may purchase the listed antibiotics (flucloxacillin, amoxicillin, erythromycin)</u> from a reputable pharmacy supplier and keep these securely in your practice and supply a course directly to your patient when clinically indicated.

- All medicines should be stored in a locked metal container
- All medicines should be supplied in the manufacturer's package and be correctly labelled with the manufacture's and pharmacist's labels.
- In addition, the podiatrist should add an additional label which lists the patient's name, and date of birth, the date of issue of the medicine, and the name (and HCPC-Registration number) of the podiatrist issuing the medicine
- All medicines stocks should be used in strict rotation and used within date.
- Many suppliers are reluctant to sell small quantities of 2 or 3 courses for you to stock, preferring to sell in bulk with boxes of perhaps 10 or more courses. In a general private practice, the stock may possibly go out of date before it is required, with resultant waste, cost and disposal issues
- Out of date stock should be returned to a pharmacy for disposal, and new stock purchased
- Where supplies from a pharmacy to the podiatrist can be facilitated, the podiatrist should issue the medicines to the patient in the manufacturer's package which will generally mirror the BNF guidance notes for managing infection.
- The manufacturer's original packages should not be broken down into smaller quantities

<u>2: You may make prior arrangements with one or more local pharmacies to supply the medicines to</u> your patients on your behalf.

• This arrangement is known as 'using a signed order'



The pharmacist will charge the patient for the supply of medicines under a signed order; you should forewarn the patient of the likely cost you when you issue the signed order to the patient.

- Note: This is NOT prescribing but provides you with a formal route of supply for the drugs which you are entitled to access for you patients, via a pharmacist.
- The College website has an example form that you can use once you have added your personal details.

How do I activate a signed order?

When you require a patient to have a course of antibiotics or indeed any other POM on the POMsexemption list, you should complete a copy of your signed order provision form requesting the pharmacist to supply the required drug (See Table 3: 10-Points of Information included on a Signed Order Form)

Table 3: 10-Points of Information that should be included on a Signed Order Form)

- I. Your Name, practice address, qualifications & HCPC Registration Number and contact number
- II. Patient details (Name, Date of Birth, Address)
- III. Allergy status of the patient
- IV. Medicine requested
- V. Dose required
- VI. Frequency of administration (QDS, TDS, BD or OD dependent on the drug used)
- VII. Duration of the course
- VIII. Purpose of order (why is it required)
 - IX. Signed by a podiatrist
 - X. Date the order was written

The information listed in Table 3 follows the guidance given in the BNF.

For example, if your patient (whom you had, by questioning, determined had no known penicillin allergy) presented with an infected onychocryptosis, which you thought should be initially treated by antibiosis, your written request (i.e.: the signed order that the patient would be given to take to the named pharmacy) would use a form of words similar to that given in Table 4:



Table 4: Example of a completed Signed Order Form

Your name, qualifications, HCPC Number, Surgery address and the date of your writing the Signed Order:

To: Named Pharmacy:

Dear Pharmacist

Re: Mr John Smith (DoB 01.01.41), 1, Jones Road, London SW1 1AA

This patient presented today with an infected in-growing toe nail (right 1st toe).

Allergy Status: No Known Allergies

Please supply the following:

- Flucloxacillin: 500mg,
- Dose: qds (4 times a day)
- Duration of course: 7 days.

Signed:

A.N Other. Podiatrist, HCPC-Registration No: 00001

Using a Signed Order Provision has many advantages. These include

- not having to stock the agents yourself, as many supply houses will only supply packets of drugs in bulk which may become out of date before being used.
- not having to deal with stock rotation
- not having to dispose of out of date stock
- the pharmacist will undertake the normal pharmacy checks at the time of issue of the medicines, such as the patient's previous use of the drug, their allergy status, and possible drug interactions.

Setting up this arrangement should be straight forward as the Royal Pharmaceutical Society have advised its members of our right in this regard some time ago.

- It is advisable for you to set up the relationship in advance by visiting the pharmacy with evidence of your HCPC registration, Photo ID and a copy of the proposed paperwork you intend to use for the signed order provision.
- Confirmation of your eligibility is available on the College website, and can also be found on the website of the Royal Pharmaceutical Society at <u>https://www.rpharms.com/resources/quick-reference-guides/supply-of-medicines-to-podiatrists-and-their-patients</u>.



• Finally remember to contact the GP to advise them of the antibiotic supplied, at the time of initiating the antibiotic therapy.

References

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DoH Antibiotic Resistance: <u>https://www.gov.uk/government/publications/chief-medical-officer-annual-report-volume-2</u>

Erythromycin: https://medlineplus.gov/druginfo/meds/a682381.html

Flucloxacillin: https://www.medicines.org.uk/emc/product/545/smpc

HCPC Register: <u>https://www.hcpc-uk.org/check-the-register/</u>

Nice. Prophylaxis against endocarditis <u>https://www.nice.org.uk/guidance/cg64/evidence/full-guideline-pdf-196759981 accessed 4th Feb 2019</u>