Skin infections

Incorporating NICE antimicrobial prescribing guidelines

TARGET antibiotics

2023

AUDIENCE: Primarily primary care Prescribers, GPs, pharmacists, nurses, A&E clinicians, students

COVERING Skin infection topics (listed), based on NICE prescribing guidelines updated 2020/21 & Clinical Knowledge Summaries

Introductions

Linda Strettle
General practitioner
Speaker

Philippa Moore
Consultant medical microbiologist
Panellist

Avril Tucker
Antimicrobial pharmacist
Panellist

Krishna Gohil
Clinical lead: NWCSP
Panellist

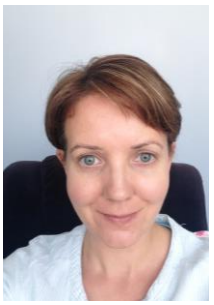
Rachael Lee
Clinical Implementation Manager: NWCSP
Panellist

NWCSP: National wound care strategy programme

Feel free to put your individual questions to the panel

Introductions – TARGET Team

Donna Lecky
Head, Primary Care & Interventions Unit



Emily Cooper
Programme manager

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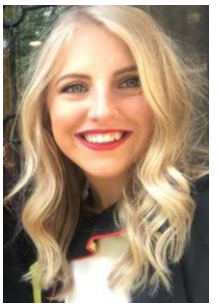

Fionna Pursey
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Feel free to put your individual questions to the panel

Development team

Dr Tessa Lewis	General practitioner
Dr Claire Neill	General practitioner
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Camilla Stevenson	Project manager at RCGP
Dr Dharini Shanmugabavan	Medical director at RCGP

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Presenter talk

We would like to say thank you for all those who have helped develop this webinar.

Aims

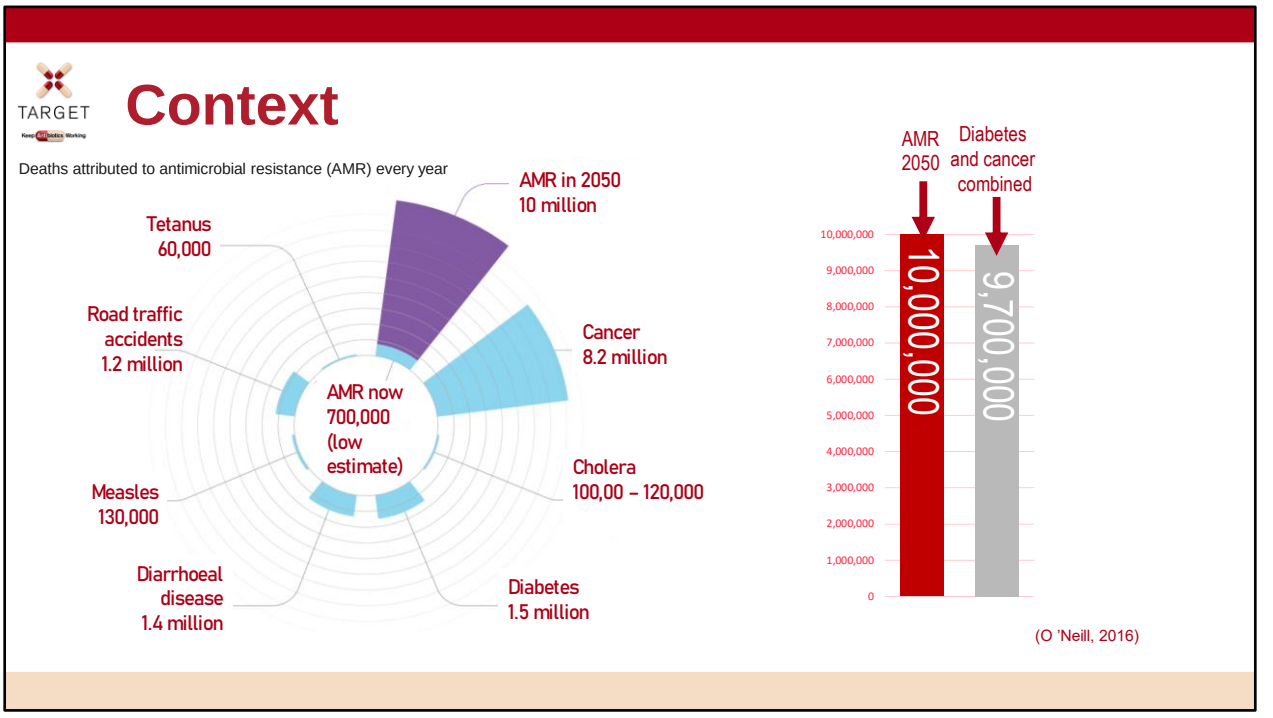
Understand and discuss

1. Management and treatment of impetigo, cellulitis and leg ulcers in line with NICE prescribing guidance for skin infections

2. Prescribing rates and resistance trends for impetigo, cellulitis and leg ulcers in England

3. Antimicrobial stewardship (AMS) of skin infections

Presenter talk
The aims of this webinar are to discuss with you, using clinical scenarios, the need for optimising antibiotic prescribing for certain skin conditions.
We will cover NICE prescribing guidelines for 3 conditions: Impetigo, leg ulcers and cellulitis. By attending this webinar we hope you will be better able to do the following three things:



Presenter talk

There is much information available about the threat and consequences of antimicrobial resistance but lets put that into context. A recent UN report (2), (April 2019) highlighted that by 2050, AMR could kill 10 million people per year, in its worst-case scenario. This is more than diabetes and cancer combined. This will also come at a cost of £66 trillion pounds.

There have been a number of initiatives and developments at a national level to get people thinking responsibly about antibiotic prescribing. NICE issued guidance on Antimicrobial Stewardship (NG 15); the NHS and Public Health England jointly issued a Patient Safety Alert around AMS; there are prescribing quality measures and incentives and the DH would like us to get back to the level of prescribing that we had in 2010.

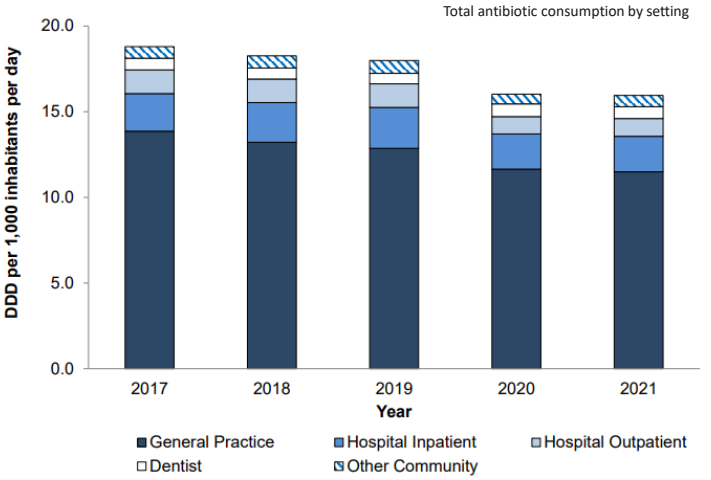
The TARGET Guide to Resources provides more detail on these measures, and the TARGET toolkit helps to optimise your use of antibiotics.

Slide references

(1) The review on antimicrobial resistance, chaired by Jim O'Neill. Tackling drug-resistant infections globally: final report and recommendations. 2016. [Available from: https://amr-review.org/sites/default/files/160518_Final%20paper_with%20cover.pdf]

(2) IACG (2019). “No time to wait: securing the future from drug-resistant infections”

The majority of antibiotics are prescribed in General Practice



(UKHSA, 2022)

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Presenter talk

What does that mean for us? We know that 1 in 3 individuals in England take at least one course of antibiotics in a year and the majority of these (around 80%) are prescribed in primary care. And despite the decline in antibiotic prescribing between 2017-2021, the majority of antibiotic prescribing still occurs in primary care (GP setting). This data is from the ESPAUR report (English surveillance programme for antimicrobial utilisation and resistance).

The drop during 2020 and 2021 is likely to be temporary. We need to continue our efforts.

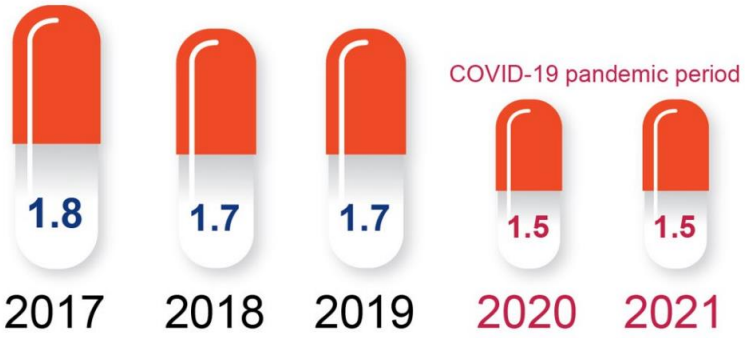
Presenter notes

Graph – Total antibiotic consumption by setting, expressed as DDDs per 1000 inhabitants per day, England, 2017 – 2021

Slide references

(1) UK Health Security Agency (2022). English surveillance programme for antimicrobial utilisation and resistance (ESPAUR), Report 2021-2022.

Why focus on antimicrobial stewardship in primary care?



(Items per 1,000 inhabitants per day)

Antibiotic prescribing in England 2017-2021

(UKHSA, 2022)

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Presenter talk

The good news is that in 2015 we saw the first fall in antibiotic use in general practice for some years and this trend continued into 2021.

The ESPAUR report was published in November 2022. It is an annual report that includes national data on antibiotic prescribing and resistance, antimicrobial stewardship implementation, and awareness activities in England.

The 2022 report showed that:
Overall antibiotic consumption declined - predominantly driven by reductions in primary care utilisation in 2020.
NOTE IMPACT OF COVID-19 PANDEMIC

Slide references

(1) UK Health Security Agency (2022). English surveillance programme for antimicrobial utilisation and resistance (ESPAUR), Report 2021-2022.

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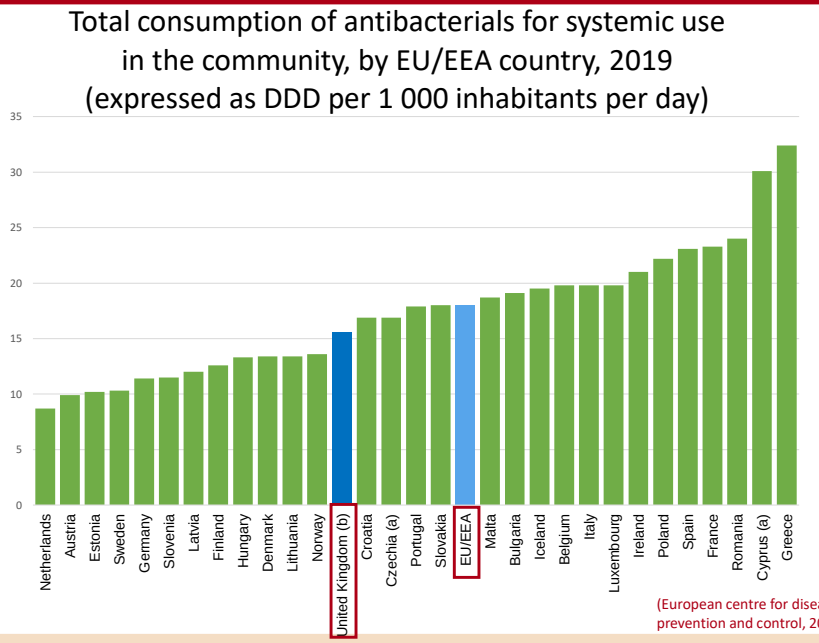
Antibiotic consumption



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Presenter talk

However we still have some way to go compared to some other European countries. Although as this slide shows in comparison to other European countries in the community we prescribe much less than Greece, which has a major resistance problem. However we do prescribe almost twice as much as the Netherlands which has a similar population to us. This suggests therefore that there is an opportunity to reduce our community antibiotic prescribing. The differences are partially due to cultural norms in the UK compared to other Northern EU countries who prescribe less for respiratory tract infections.

Presenter notes

The EU expresses community antibiotic consumption in Defined Daily Doses per 1 000 inhabitants and per day, which is slightly different to the ADQs used in the UK. Each bar refers to a specific country while the colours indicate the recorded consumption of the different antibiotic classes in that country.
Total community antibiotic consumption ranged from 11 DDD per 1 000 inhabitants and per day in Netherlands to 37 DDD per 1,000 inhabitants and per day in Greece. As in previous years, antibiotics of the penicillin class were the most frequently used antibiotics in all countries .

The UK still prescribes more than any of our northern European colleagues. DDDs (or if we used ADQs) is influenced by antibiotic dose, so as clinicians use of

amoxicillin increases from 250 to 500mg routinely, the ADQs and DDDs increase, even if the number of items remains the same.

Slide references

(1) European Centre for Disease Prevention and Control. Antimicrobial consumption in the EU/EEA. 2019.
https://www.ecdc.europa.eu/sites/default/files/documents/Antimicrobial-consumption-in-the-EU-Annual-Epidemiological-Report-2019.pdf

Why skin infections?

- **16.3%** of antibiotics in primary care are prescribed for skin infection
  - Majority prescribed for "boil or abscess",
  - Cellulitis is the 3rd most common reason for prescribing in skin infections
  - 56% of all β-Lactamase-resistant penicillin are linked to a skin problem
  - About 50% of codes for "impetigo" are linked to an oral antibiotic prescription
- GPs want more information to support daily practice for cellulitis and leg ulcers

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Presenter talk

So why skin infections? After RTIs and UTIs, skin infections are the third most common reason for prescribing antibiotics in primary care - over 16% of antibiotics in primary care are prescribed for skin infection, the majority of which are for abscess and boils.

Additionally, one study researching what English GPs say they need – found that GPs ranked leg ulcers and cellulitis in the top 6 conditions they would like more evidence in to support their daily practice (3).

Presenter notes

Among prescriptions linked to an informative read code (1),

- *46.0% linked to RT/ENT*
- *22.7% linked to urogenital tract*
- ***16.3% linked to skin (including wounds)***

Pouwels - Duration of antibiotic treatment for common infections in English primary care: cross sectional analysis and comparison with guidelines
Data 2013-2015 (2)
Cough and bronchitis (386 972, 41.6% of the included consultations), acute sore throat (239 231, 25.7%), acute otitis media (83 054, 8.9%),
acute sinusitis (76 683, 8.2%), cellulitis (54 610, 5.9%), and acute cystitis (53 010,

5.7%)

Slide references

(1) F Christiaan K Dolk, Koen B Pouwels, David R M Smith, Julie V Robotham, Timo Smieszek, Antibiotics in primary care in England: which antibiotics are prescribed and for which conditions?, *Journal of Antimicrobial Chemotherapy*, Volume 73, Issue suppl_2, February 2018, Pages ii2–ii10, https://doi.org/10.1093/jac/dkx504

(2) Pouwels K B, Hopkins S, Llewelyn M J, Walker A S, McNulty C A, Robotham J V et al. Duration of antibiotic treatment for common infections in English primary care: cross sectional analysis and comparison with guidelines *BMJ* 2019; 364 :l440 doi:10.1136/bmj.l440

(3) Lecky, D.M.; Granier, S.; Allison, R.; Verlander, N.Q.; Collin, S.M.; McNulty, C.A.M. Infectious Disease and Primary Care Research—What English General Practitioners Say They Need. *Antibiotics* 2020, *9*, 265. https://doi.org/10.3390/antibiotics9050265

Resistance to second line antibiotics

- Flucloxacillin is often the oral antibiotic of choice for many skin infections
- Alternative oral antibiotics are often required (e.g. for penicillin allergies)
- Macrolides (e.g. clarithromycin) are often the alternative choice:
- English surveillance programme for antimicrobial utilisation and resistance - 2021-2022 ESPAUR
  - 18.6% of meticillin-susceptible staph. (MSSA) are resistant to macrolides
  - 53% of meticillin-resistant staph. (MRSA) are resistant to macrolides
- Recent NICE antimicrobial prescribing guidelines:
  - Impetigo (Aug 2020)
  - Cellulitis and erysipelas (Sept 2019)
  - Leg ulcer infection (Aug 2020)

Presenter talk

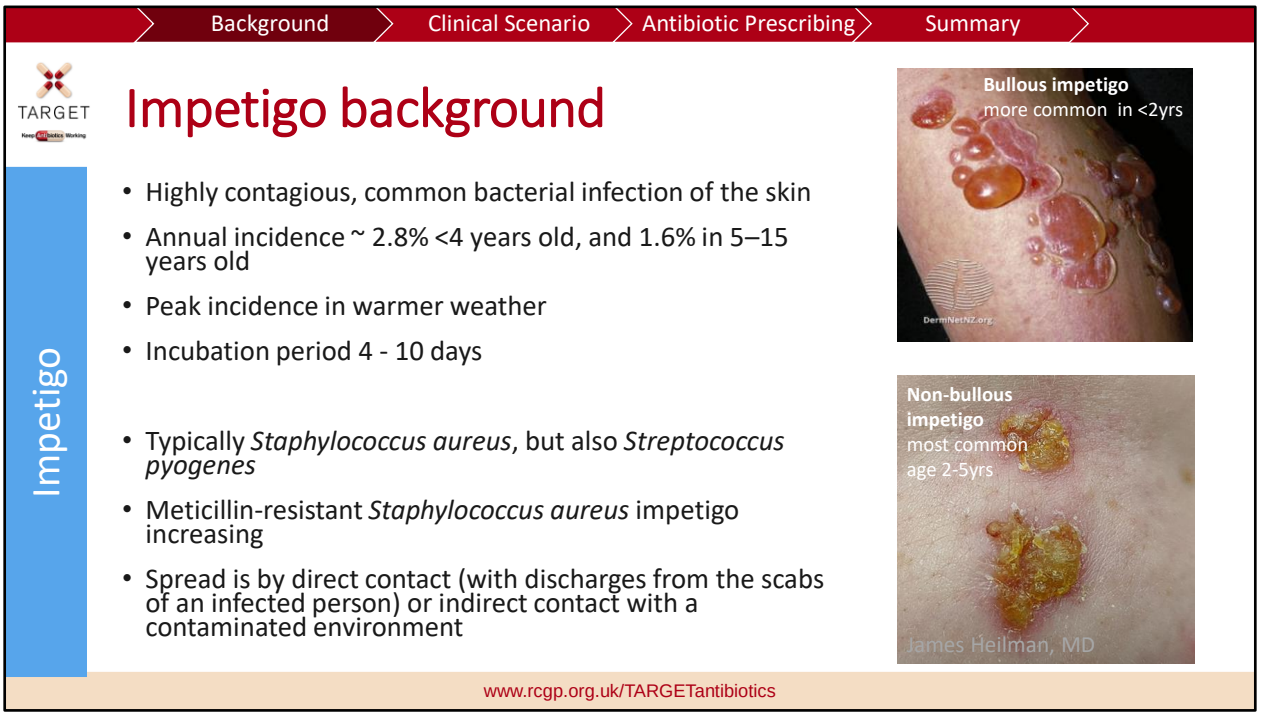
Resistance among *S. aureus* to flucloxacillin and other antibiotics, is a key area of concern. The recent 2021-2022 ESPAUR report has reported resistance data for second line/ alternative antibiotics. Although flucloxacillin is often the first drug of choice for a lot of skin infections, alternatives are essential (e.g. for those with penicillin allergies). For macrolides (e.g. clarithromycin) it was reported 18.6% of MSSA and 53% of MRSA are resistant to macrolides.

This emphasises the importance of appropriate prescribing for skin infections.

So to help support appropriate prescribing, we will be discussing the recent NICE antimicrobial prescribing guidelines for the following skin infections..

Slide references

(1) UK Health Security Agency. English surveillance programme for antimicrobial utilisation and resistance (ESPAUR), Report 2021-2022. 2022.



Presenter talk

The first skin infection we will cover is impetigo. There are two distinct presentations: Bullous which are flaccid fluid filled vesicles and blisters, which rupture leaving a thin flat yellow/brown crust

And non-bullous where lesions begin as thin walled vesicles or pustules, they release exudate forming a characteristic golden/brown crust

Presenter notes

Although it can affect anyone, impetigo is most frequently observed in children. It is usually a mild condition and complications are rare. Cold sores can be mis-diagnosed as impetigo. Ask about (i) Recurrent episodes at the same site. (ii) Lesions may be preceded by discomfort, burning, tingling, itching, paraesthesia Appearance: Crops of vesicles that rupture, leaving superficial ulcers that crust over and heal (usually without scarring)

Methicillin-resistant Staphylococcus aureus impetigo increasing (2)

Slide references

(1) NICE CKS. Impetigo. 2022 [Available from: https://cks.nice.org.uk/topics/impetigo/.]

(2) Galli L, Novelli A, Ruggiero G, Stefani S, Fortina AB. Pediatric impetigo: an

expert panel opinion about its main controversies. Journal of Chemotherapy. 2022;34(5):279-85.

(3) Image: Bullous Impetigo [Available from: https://dermnetnz.org/images/impetigo-images]

(4) Image: Non-bullous impetigo - James Heilman MD – Creative commons

Impetigo Clinical Scenario

Impetigo

Video call with parent:

- 5year old daughter
- Spot on her cheek over 3 days, 50p sized area
- Several other yellow crusty lesions; other spots under chin
- Otherwise well, no allergies.
- You diagnose impetigo (non-bullous)

Presenter notes

If presenting this virtually we suggest having a mentimeter poll for all clinical scenarios

Ask the audience to consider the attached clinical scenario and possible treatment options

Slide references

(1) Image: Non-bullous impetigo - James Heilman MD – Creative commons

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Impetigo Clinical Scenario

Impetigo

What are your treatment recommendations?

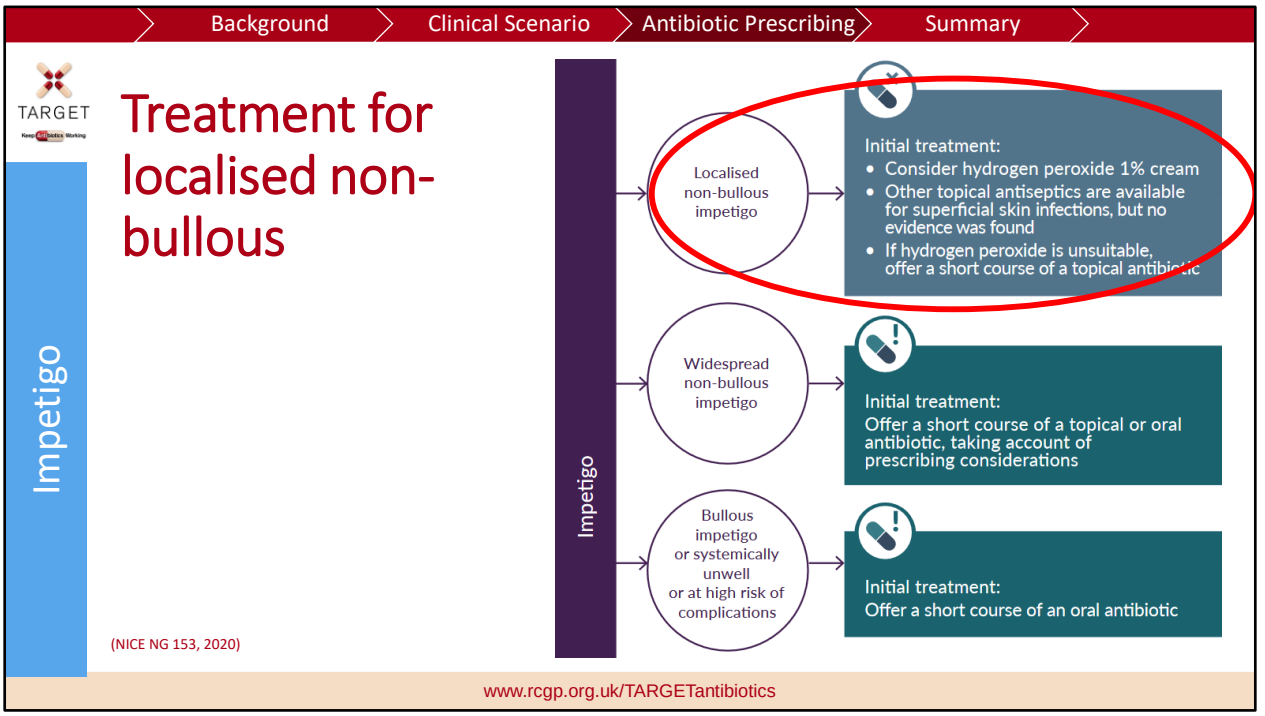
1. Clarithromycin (oral)
2. Hydrogen peroxide cream
3. Flucloxacillin
4. Fusidic acid 2%

Tip: If antiseptic/ hydrogen peroxide not used this time, can suggest at onset if future lesions

This slide is animated, the correct answer will appear on the mouse click, and click again to reveal useful tip/information.

Presenter talk
There is two correct answers here: you could prescribe Hydrogen peroxide cream or Fusidic acid 2%.

The consideration of hydrogen peroxide is one of the biggest changes in the NICE guidance we discuss today. In the next few slides we will look at the prescribing guidance in more depth and why hydrogen peroxide is now recommended (for localised non-bullous impetigo).



Presenter talk

Lets first look at the NICE prescribing guidance, the first scenario highlighted with the red circle is for localised non-bullous impetigo (the same as the clinical scenario example). The guidance states to **consider** hydrogen peroxide or if this is unsuitable then a topical antibiotic (e.g. Fucidin 2% cream).

Hydrogen peroxide has not previously been widely used therefore the next slide will look at the evidence and practical implications.

Presenter notes

One important note is this is a 'consider recommendation' (1): (NICE terminology, not as strong as offer see below for further info)

Further information – guideline wording

1.1.12 Consider hydrogen peroxide 1% cream for people with localised non-bullous impetigo who are ***not systemically unwell*** *or at* ***high risk of complications****.*
Although other topical antiseptics are available for treating superficial skin infections, ***no evidence was found for using them to treat impetigo.***
1.1.3 If hydrogen peroxide 1% cream is unsuitable, offer a short course of a topical antibiotic for people with localised non-bullous impetigo who are not systemically unwell or at high risk of complications [NICE NG153]

Further information - NICE terminology

(It is not mandatory to apply NICE recommendations, - the guideline does not override the responsibility to make decisions appropriate to the circumstances of the individual, in consultation with them and their families and carers or guardian)

Recommendation for

A strong recommendation is given when there is high-certainty evidence showing that the overall benefits of the intervention are clearly greater than the disadvantages. This means that all, or nearly all, patients will want the recommended intervention.

Recommendation against *A strong recommendation against the intervention is given when there is high-certainty evidence showing that the overall disadvantages of the intervention are clearly greater than the benefits. A strong recommendation is also used when the examination of the evidence shows that an intervention is not safe.*

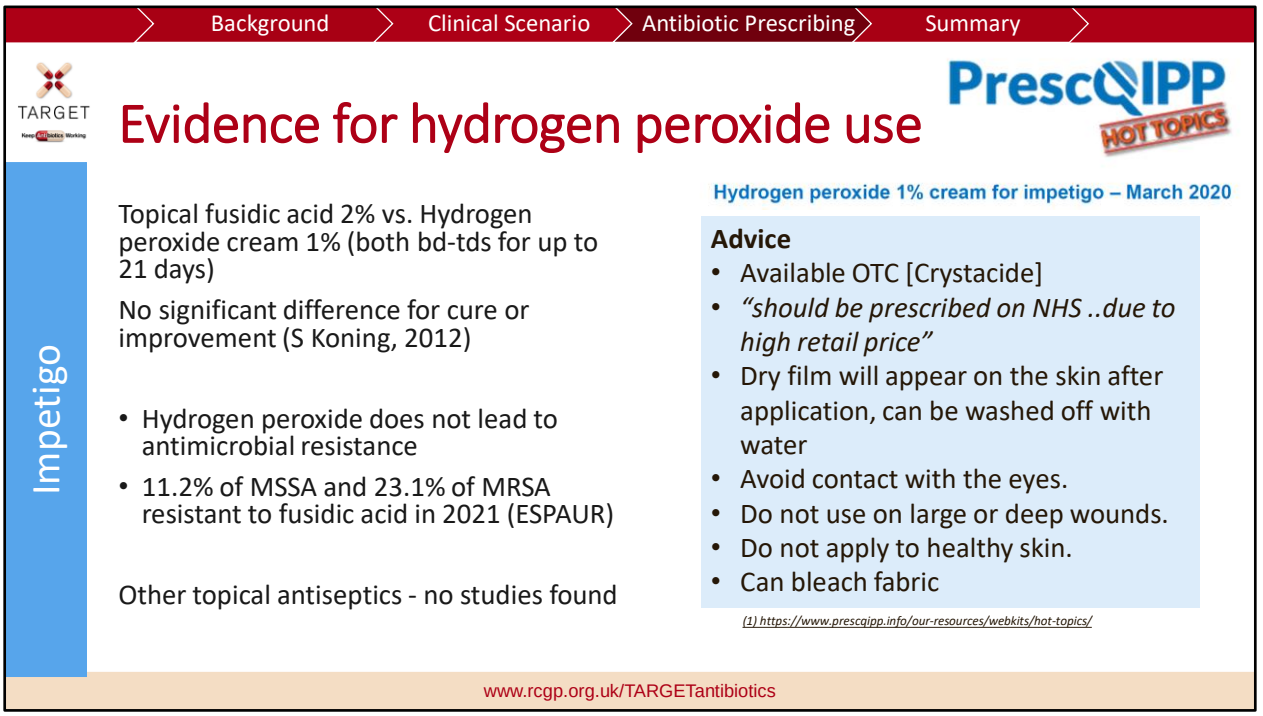
Conditional recommendation for *A conditional recommendation is given when it is considered that the benefits of the intervention are greater than the disadvantages, or the available evidence cannot rule out a substantial benefit of the intervention while assessing that the adverse effects are few or absent. This recommendation is also used when patient preferences vary.*

Conditional recommendation against *A conditional recommendation is given against the intervention when it is judged that the disadvantages of the intervention are greater than the benefits, but when this is not substantiated by strong evidence. This recommendation is also used when there is strong evidence of both beneficial and harmful effects, but when the balance between them is difficult to determine. Likewise, it is also used when patient preferences vary.*

Consensus recommendation *A consensus recommendation can be given for or against the intervention. This type of recommendation is used when there is not enough evidence to give an evidence-based recommendation, but the panel still regards it as important to give a recommendation.*

Slide References

(1) NICE. Impetigo: antimicrobial prescribing [NG153], 2020. [Available from: https://www.nice.org.uk/guidance/ng153]



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Presenter talk

A 2012 Cochrane Review assessed the effects of treatments for impetigo (2).

Findings highlighted that topical antibiotics were as effective as oral antibiotics for the treatment of impetigo, and that topical fusidic acid (2% twice to three times a day for up to 21 days) was not significantly different to hydrogen peroxide cream (1% twice to three times a day for up to 21 days) in children with impetigo for cure or improvement (follow-up not reported; 1 RCT, n=256, 82.0% versus 71.9%, RR 1.14, 95% CI 1.00 to 1.31; moderate quality evidence).

Nor was there any significant difference in the number of children experiencing adverse events leading to withdrawal (1 RCT, n=256, 2.3% versus 0%, RR 7.00, 95% CI 0.37 to 134.16; low quality evidence) or the number of children with mild side effects (1 RCT, n=256, 7.0% versus 10.2%, RR 0.69, 95% CI 0.31 to 1.56; low quality evidence).

It is important to highlight here that hydrogen peroxide does not lead to antibiotic resistance. The ESPAUR report 2021-2022 highlights percentage of MSSA resistant to fusidic acid as 11.2% and MRSA as 23.1% (3)

Presenter notes

The alternative topical antibiotic if resistance to fusidic acid suspected or confirmed is mupirocin

When deciding which to prescribe, some practicalities to consider are (4):

- ***Does hydrogen peroxide bleach skin****? "Whilst hydrogen peroxide can bleach darker hair and skin. The NICE committee noted that there were no warnings in the BNF or BNFC regarding skin bleaching for hydrogen peroxide. They agreed that this wasn't likely at a 1% concentration"*
- ***Avoiding contact with eyes*** *– hydrogen peroxide may be less appropriate choice for toddlers & v young children who may be more likely to rub into eyes*
- ***Other topical antiseptics*** *are available for superficial skin infections, but no evidence was found for using these on impetigo.*
- *Reasonable to encourage antiseptic or Hydrogen peroxide at onset if future lesions*

Hydrogen peroxide: approx £11-14 ; NHS cost £8.07/25g (generics may become available) Fucidin cream NHS tariff £2.74 /15g

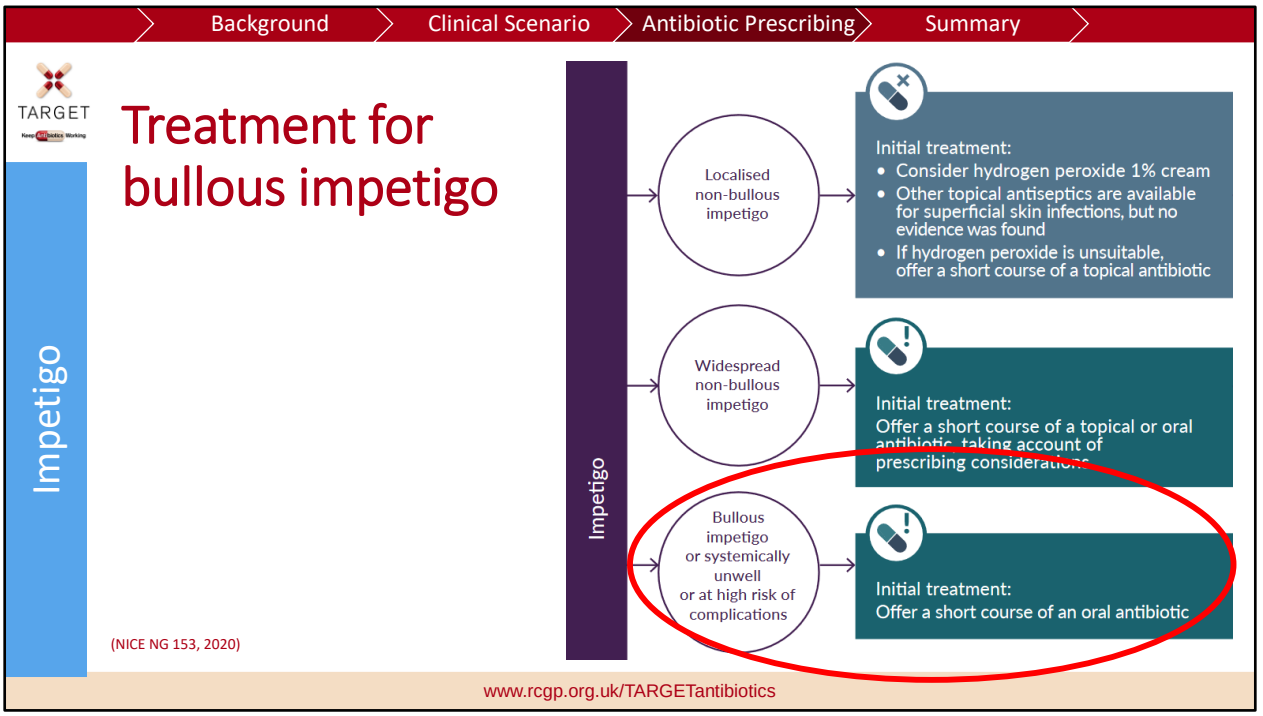
Slide References

(1) Prescqipp. Hot Topics: Hydrogen peroxide 1% cream for impetigo. [Available from: https://www.prescqipp.info/our-resources/webkits/hot-topics/.

(2) Koning S, van der Sande R, Verhagen AP, van Suijlekom-Smit LW, Morris AD, Butler CC, Berger M, van der Wouden JC. Interventions for impetigo. Cochrane Database Syst Rev. 2012 Jan 18;1(1):CD003261. doi: 10.1002/14651858.CD003261.pub3. PMID: 22258953; PMCID: PMC7025440.

(3) UK Health Security Agency. English surveillance programme for antimicrobial utilisation and resistance (ESPAUR), Report 2021-2022. 2022

(4) NICE. Impetigo: antimicrobial prescribing [NG153], 2020. [Available from: https://www.nice.org.uk/guidance/ng153]



Presenter talk

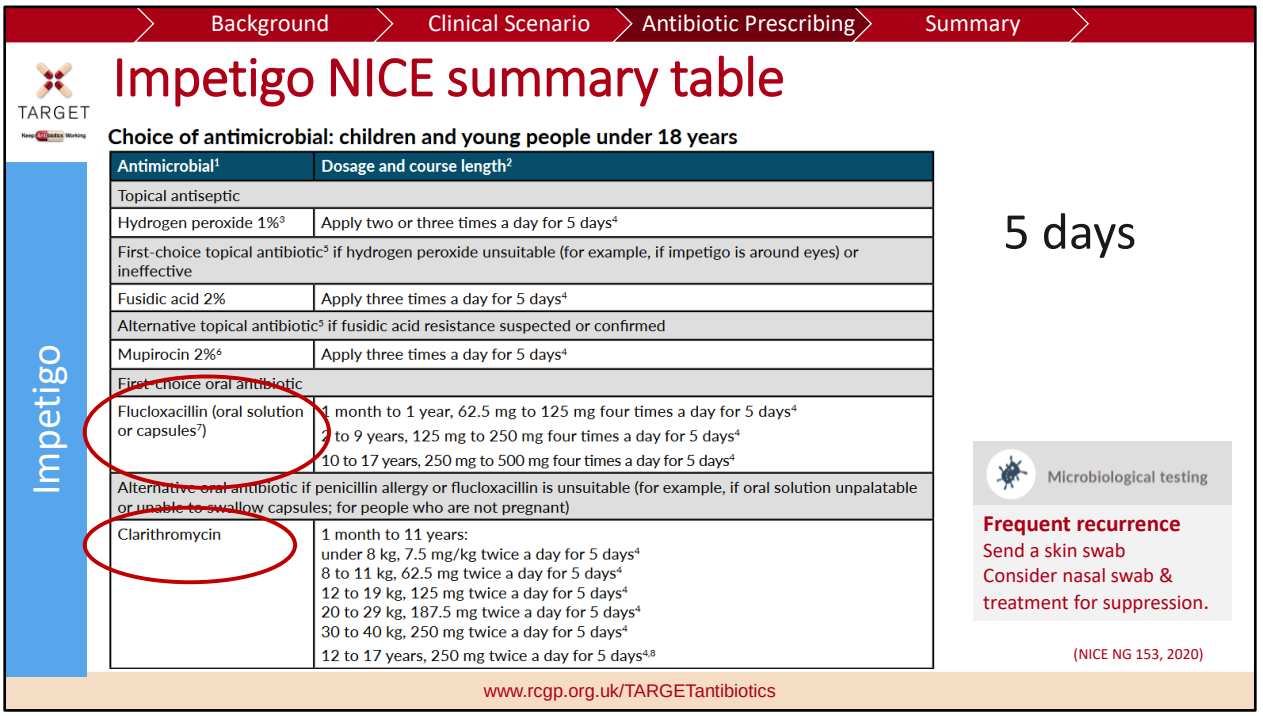
Now on to the other types of impetigo:

To focus on the bottom circle: This is for bullous impetigo in people who are systemically unwell or at high risk of complications. The guidance here is to offer oral (or admit) as with all the common infection prescribing guidelines.

Now lets look at the prescribing considerations: next slide

Slide references

(1) NICE. Impetigo: antimicrobial prescribing [NG153], 2020. [Available from: https://www.nice.org.uk/guidance/ng153]



Presenter talk

This slide contains the NICE guidance summary table. We can see here the first line oral antibiotic is flucloxacillin for 5 days and the alternative antibiotic is clarithromycin if penicillin allergy.

Often children are not keen on the taste of flucloxacillin suspension. If child refuses to take then can follow NICE guidance for “if flucloxacillin is unsuitable” and offer clarithromycin

Note on the slide what to do if frequent recurrence of impetigo.
We don’t go into detail on suppression or decolonisation here but further information can be found on CKS - https://cks.nice.org.uk/topics/boils-carbuncles-staphylococcal-carriage/

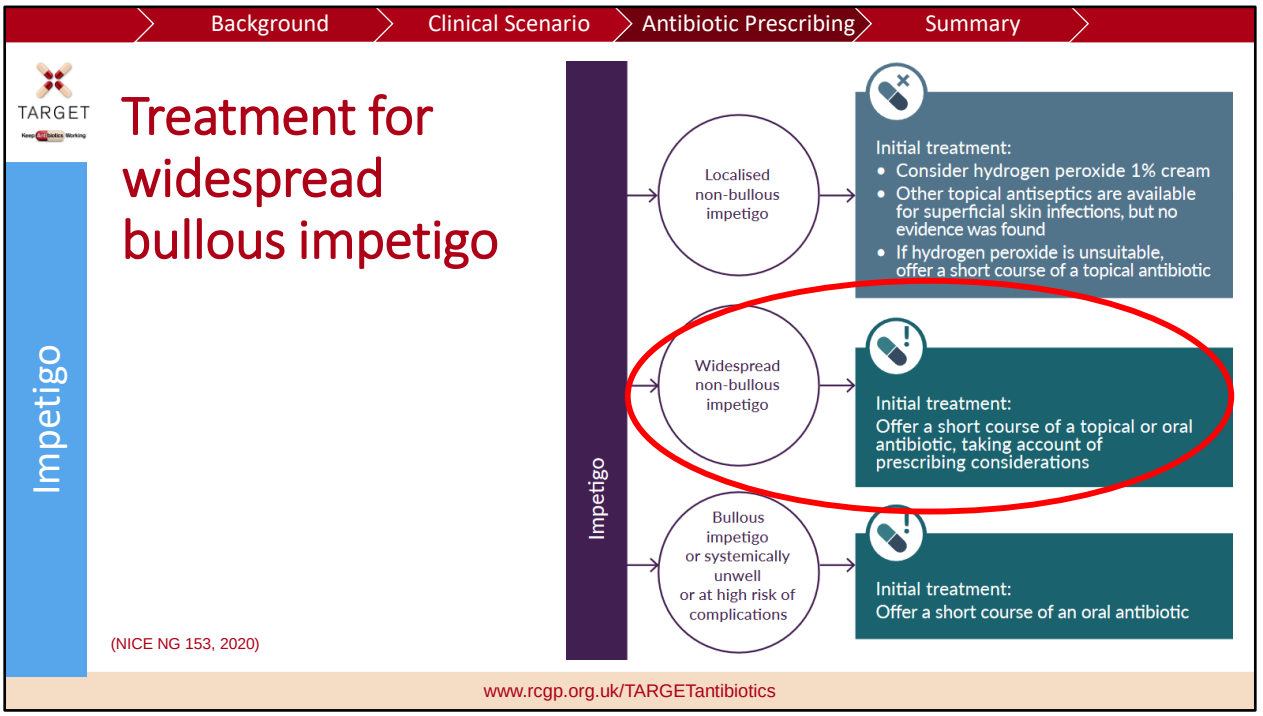
Presenter notes

NICE Summary table of treatment choice.

- ***5-day*** *course is appropriate for most, can be increased to 7 days based on clinical judgement, depending on the severity and number of lesions*

Slide references

(1) NICE (2020). "Impetigo: antimicrobial prescribing [NG153]." from https://www.nice.org.uk/guidance/ng153



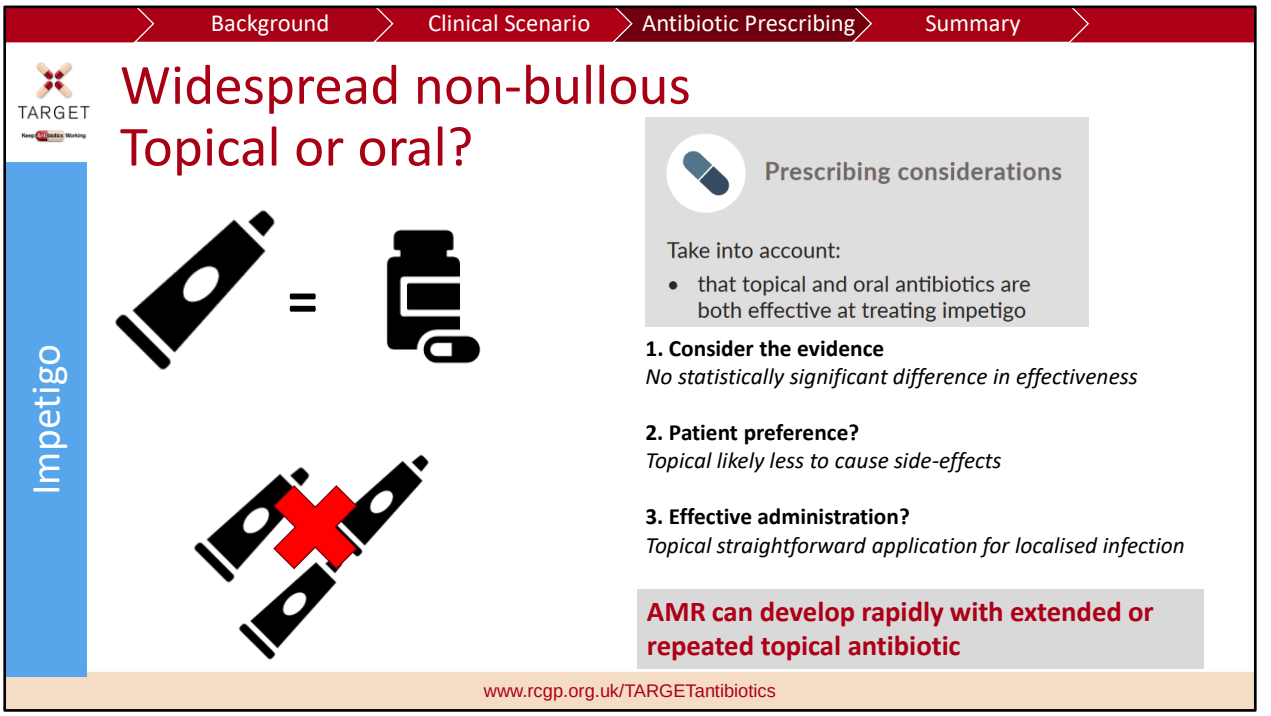
Presenter talk

The final type of impetigo is widespread non-bullous impetigo (middle circle). Notice the guidelines here say topical **or** oral antibiotic – **NOT dual** topical+oral

This is an important decision, that requires consideration. So how do we make the choice?

Slide references

(1) NICE. Impetigo: antimicrobial prescribing [NG153], 2020. [Available from: https://www.nice.org.uk/guidance/ng153]



This slide is animated, click to make red AMR text appear

Presenter talk
First we consider the evidence of the effectiveness of topical vs oral. And as previously stated, the 2012 Cochrane review highlighted no difference in outcomes between topical vs oral antibiotics.
Therefore we can factor in patient preference/side effects and the effective administration of topical antibiotics for a localised infection.

It is important to consider that AMR can develop rapidly with extended or repeated topical antibiotic – consider what the patient has been given previously

Presenter notes
Patient preference: Topical likely to cause fewer side effects, application usually straightforward for localised impetigo

Palatability & frequent dosing oral antibiotic liquids can be challenging .Paediatrician reported young children (e.g.6yrs) able to swallow tablets. Resources to support tablet swallowing https://www.medicinesforchildren.org.uk/helping-your-child-swallow-tablets (e.g. turning head to side, not backwards)

Evidence impetigo topical vs oral Effectiveness

Based on SR & MA Koning et al 2012 (1), a number of analyses found no statistically significant differences in clinical effectiveness (outcome - cure or improvement) but a large analysis was topical mupirocin vs oral erythromycin adults & children 10RCTs N=581 mod quality evidence. Another was Fucidin vs erythromycin babies lower quality evidence

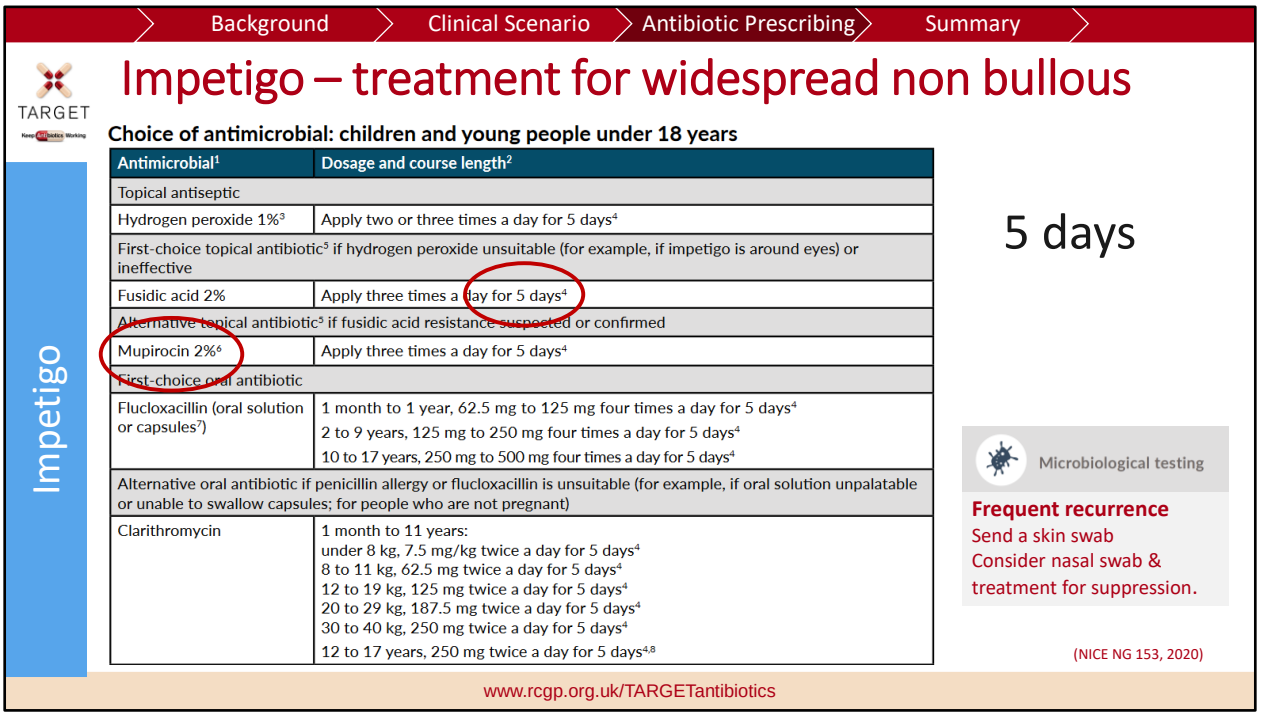
ER evidence for route of administration of antibiotics for impetigo comes from 1 systematic review and meta-analysis (Koning et al. 2012), and 2 RCTs Al-Samman et al. 2014 (n=52) [IM Cef] (2) and Bowen et al. 2014 (non-inferiority trial; n=508)[cotrim vs IM.] (3).

Slide references

(1) Koning S, van der Sande R, Verhagen AP, van Suijlekom-Smit LW, Morris AD, Butler CC, Berger M, van der Wouden JC. Interventions for impetigo. Cochrane Database Syst Rev. 2012 Jan 18;1(1):CD003261. doi: 10.1002/14651858.CD003261.pub3. PMID: 22258953; PMCID: PMC7025440.

(2) Al-Samman, Dina K. Comparison of single-dose ceftriaxone versus seven days cefadroxil in addition to fucidic acid cream as adjuvant therapy for the treatment of children with impetigo. Pharmacie Globale. 2013;4(9).

(3) Bowen AC, Tong SY, Andrews RM, O'Meara IM, McDonald MI, Chatfield MD, et al. Short-course oral co-trimoxazole versus intramuscular benzathine benzylpenicillin for impetigo in a highly endemic region: an open-label, randomised, controlled, non-inferiority trial. Lancet. 2014;13-19(9960):2132-40.



Presenter talk

For widespread non-bullous impetigo, topical antibiotics include fusidic acid 2% for 5 days or mupirocin 2% if resistance to fusidic acid is suspected/confirmed

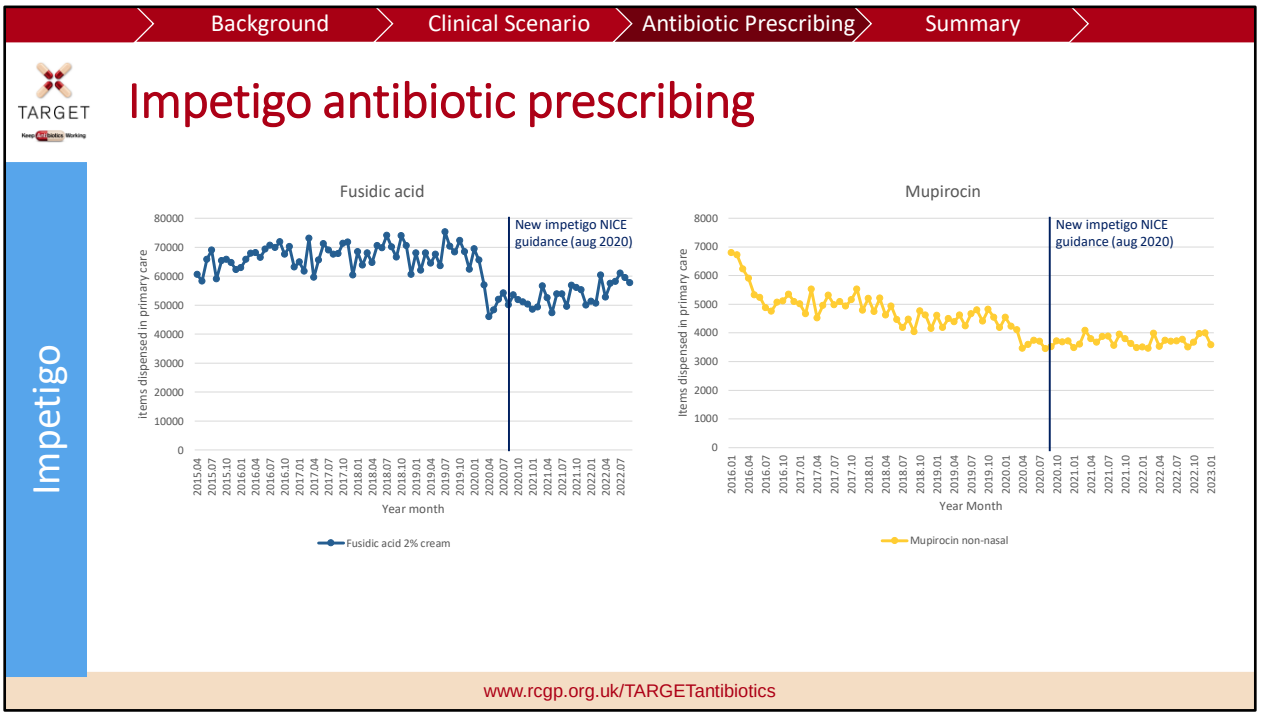
Presenter notes

NICE Summary table of treatment choice.

- *5 days topical & oral . **5-day** course is appropriate for most, can be increased to 7 days based on clinical judgement, depending on the severity and number of lesions*
- ***Do not offer combination** topical+oral*

Slide references

(1) NICE. Impetigo: antimicrobial prescribing [NG153], 2020. [Available from: https://www.nice.org.uk/guidance/ng153]



Presenter talk

Here we have prescribing data for the first line topical antibiotic (fusidic acid) and alternative topical antibiotic (mupirocin). This data has been given to us by the UKHSA antimicrobial prescribing team.

The line at August 2020 shows when the NICE guidance was published.

The initial drop in fusidic acid and mupirocin use was before the new guidance was published and therefore could be attributed to Covid-19. For fusidic acid we can see the number of items dispensed slowly start to rise again. This is a reminder that the guidance for localised non-bullous impetigo is to consider hydrogen peroxide as an alternative to the topical antibiotic and to keep prescribing rates lower. For mupirocin lower levels of prescribing have been maintained. A caveat for this data is we cannot solely attribute it to impetigo prescribing as it is data for all antibiotic items dispensed.

Presenter notes

Could perhaps highlight to audience that individuals can use fingertips public health data to look at prescribing in their area/practice "AMR local indicators"

Slide references

Data obtained from UKHSA antimicrobial prescribing team

Impetigo infection control advice

Impetigo

Hygiene

Condition is highly infectious:
Wash affected areas with soap and water:

- **Wash hands regularly** particular after touching a patch of impetigo
- **Avoid scratching** affected areas
- **Avoids sharing towels**
- **Clean potentially contaminated** toys and play equipment. [CKS]

Exclusion Criteria

Children should be excluded from school nursery or childcare until:

- **lesions are crusted** and healed or
- **48 hours after commencing antibiotic** treatment [UKHSA]

Food handlers are required by law to inform employers immediately if they have impetigo [CKS]

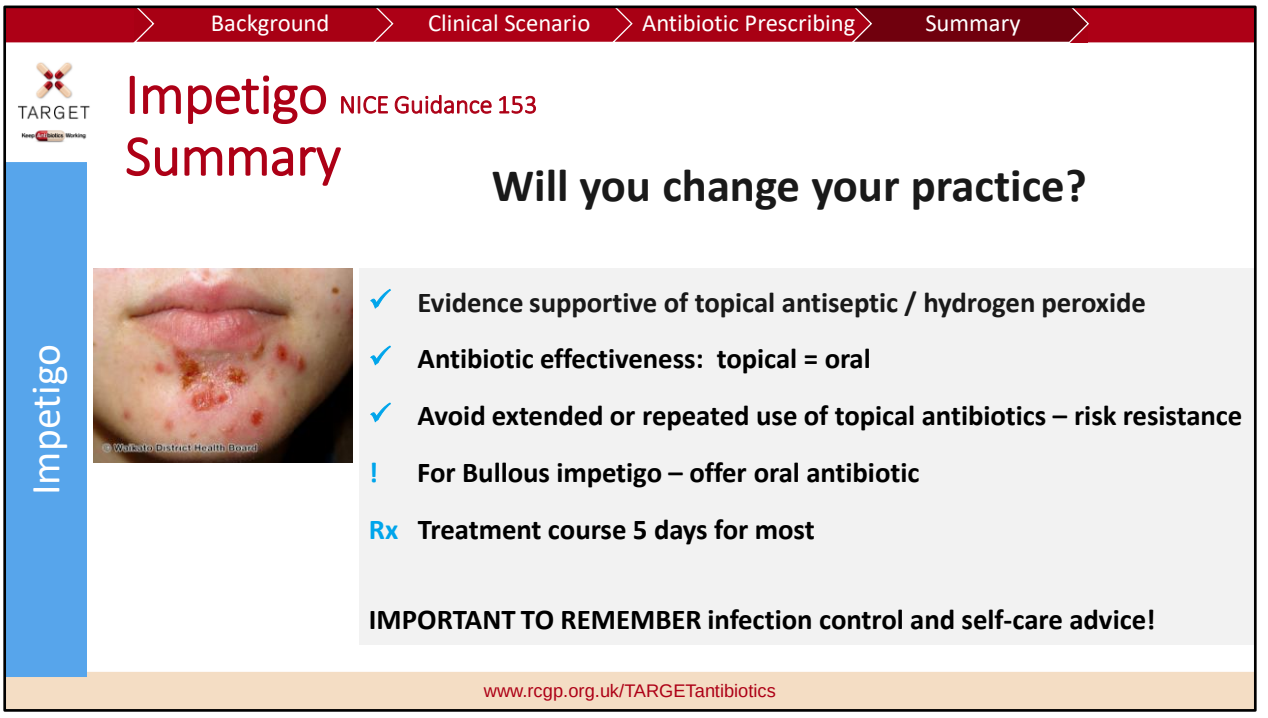
Direct patients to https://www.nhs.uk/conditions/impetigo/ for self care advice

Presenter talk
One thing to take particular care with is the highly infectious nature of impetigo. It is spread by direct contact with discharges from the scabs of an infected person and the bacteria invade skin through minor abrasions and then spread to other sites by scratching. Infection is spread mainly on hands, but indirect spread via toys, clothing, equipment and the environment may occur.

Because of this there is specific infection control advice. This is highlighted on the slide. For healthcare workers there should be caution especially if working with v vulnerable/ immunocompromised people. And food handlers are to report to employers immediately, according to law.

Presenter notes
The exclusion advice will increase the enthusiasm for antibiotics vs antiseptic. Oral /topical antibiotic is not specified by UKHSA. UKHSA is not expected to alter this guidance.

Slide references
(1) UKHSA. Health protection in children and young people settings, including education 2023 [Available from: https://www.gov.uk/government/publications/health-protection-in-schools-and-other-childcare-facilities#impetigo.



Presenter talk

That's all for impetigo, to summarise the key points:

- Evidence suggests no significant difference in use of hydrogen peroxide over topical antibiotics
- The evidence also highlighted that topical antibiotics were as effective as oral antibiotics for the treatment of impetigo
- Repeated use of topical antibiotics can lead to antimicrobial resistance

- Offer an oral antibiotic for bullous impetigo
- And most treatment course last 5 days for impetigo

Presenter notes

Discussion tips

- *What is the **important gap** between evidence and current practice?*

Use of antiseptics is interesting, but oral = topical antibiotic for impetigo has better evidence and is important in terms of antimicrobial resistance & preserving the microbiome - or avoid repeated use Fucidin

Slide references

(1) Image: Impetigo [Available from: https://dermnetnz.org/images/impetigo-images]

Background | Clinical Scenario | Antibiotic Prescribing | Summary

TARGET

Leg ulcer background

Leg Ulcer

- Prevalence estimated between 1.5 and 3 per 1,000 population (UK)
- Classification includes: venous (~70%), arterial, mixed disease, other

- Venous leg ulcers can take more than 2 weeks to heal and tend to develop on the inside of the leg, just above the ankle.
- Assessment needed regarding sampling and prescribing

www.rcgp.org.uk/TARGETantibiotics

Presenter talk
We will now move onto leg ulcers, our second condition.

Leg ulceration is mainly cause by venous inefficiency, making up 70% of leg ulcers. Other classifications are:
- arterial -10% of leg ulcers
- mixed disease - 15% of leg ulcers
- less common causes - 5% of leg ulcers (2)

They can take a long time to heal and occur above the malleolus which differentiations them from a foot ulcer.

Presenter notes
There are a several different prevalence figures. The figure of between 1.5-3 per 1000 population was selected due to evidence from the references (1-3).

The recommendations signpost to relevant clinical guidelines or outline evidence-informed care to manage lower limb ulcers that will improve healing and optimise the use of healthcare resources
[Available from: *https://www.nationalwoundcarestrategy.net/wp-content/uploads/2021/04/Lower-Limb-Recommendations-WEB-25Feb21.pdf]*

Slide references

(1) Adeyemi Adeyi SM, Indrajit Gupta,. Leg Ulcers in Older People: A Review of Management. British Journal of Medical Practitioners. 2009;2(3):21-8.

(2) Agale SV. Chronic Leg Ulcers: Epidemiology, Aetiopathogenesis, and Management. Ulcers. 2013;2013:413604.

(3) Nelson EA, Adderley U. Venous leg ulcers. BMJ Clin Evid. 2016;2016.

(4) Image: Leg ulcer [Available from: https://dermnetnz.org/topics/leg-ulcer-images]

TARGET

Leg Ulcer Clinical Scenario

Leg Ulcer

74 year old lady

- Seen by the district nurse, who requests antibiotics
- Leg ulcer at routine dressing, greenish discharge and characteristic odour
- No other signs or symptoms
- PMHx: Osteoarthritis, hypertension
- What do you do?

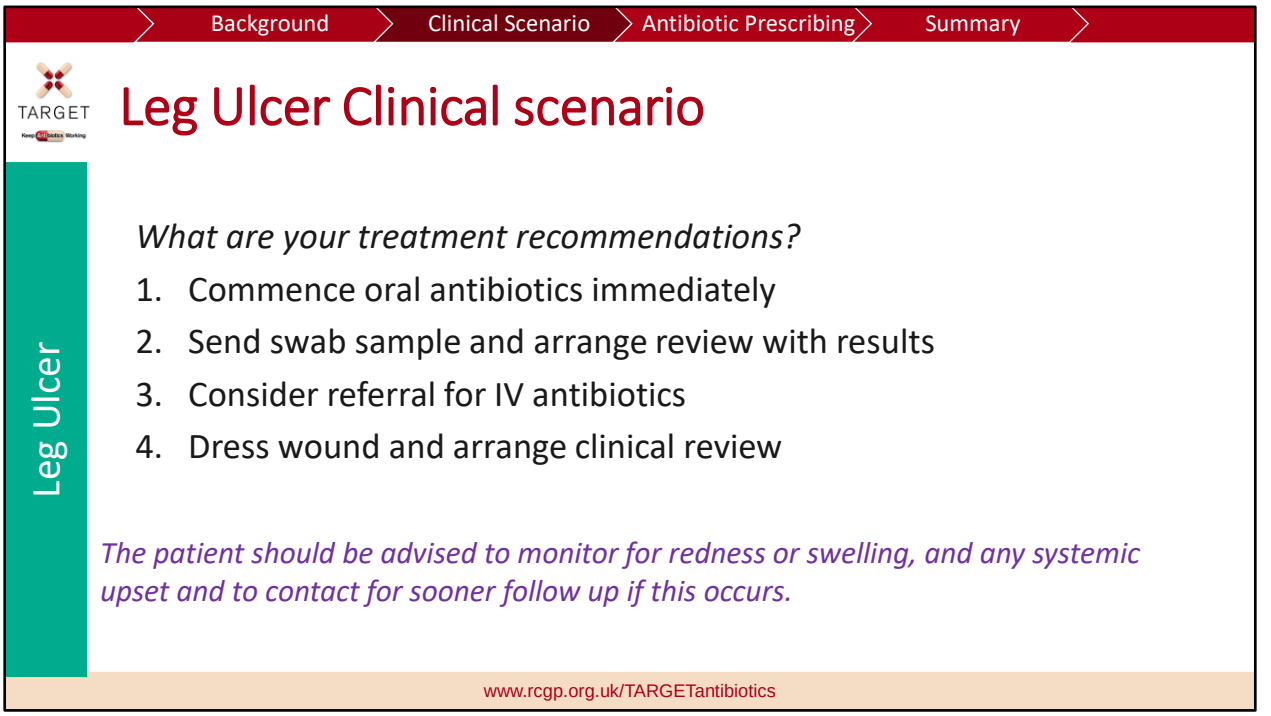
Presenter notes

Ask the audience to consider the attached clinical scenario and possible treatment options

PMHx – past medical history

Slide references

(1) Image: Leg ulcer [Available from: https://www.shutterstock.com/image-photo/leg-ulcer-secondary-cellulitis-preceeded-by-1106340626]



This slide is animated, the correct answer will appear on the mouse click

Presenter Talk
The correct answer is option 4 – the patient should be advised to monitor for redness or swelling, and any systemic upset and to contact for sooner follow up if this occurs.

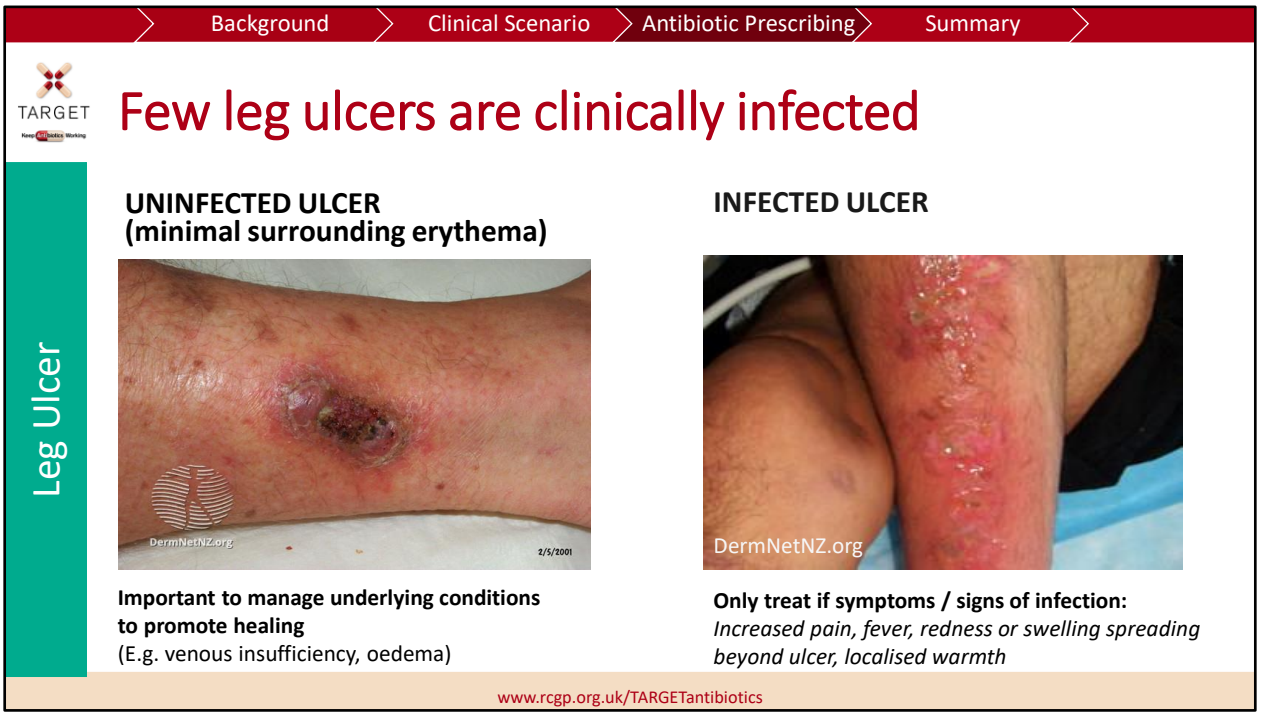
So why do some leg ulcers not require antibiotic treatment?

Presenter notes
Discussion points:
Will you decline to prescribe if no documented signs/symptoms of infection?

Dressings – different dressings will alter the surface of an ulcer.
Antibiotics aim to target the deeper bacteria i.e. stop the ulcer getting deeper larger and more painful . A spreading cellulitis associated with an ulcer is most likely to be caused by staph & strep

No robust evidence has been identified to support the superiority of any dressing type over another for any type of leg wounds. Therefore, simple low-adherent dressings with sufficient absorbency are recommended as first line care but this recommendation does not replace clinical judgement and decision making in relation to the needs of the individual patient

Often cannot distinguish those patients who may benefit from silver or honey dressings although can be considered if standard dressings not leading to healing with other factors taken into account (elevation, control oedema and diabetes etc).



Presenter Talk

An important note is few leg ulcers are clinically infected, most are colonised. - Abx don't promote healing if not clinically infected - Systemic antibiotics will not get to the surface of an ulcer as there is no mechanism for delivery into slough – antibiotics deal with bacteria invading into normal tissue that cause the ulcer to deepen, enlarge, produce inflammation etc

A need to treat underlying condition e.g. venous insufficiency & oedema

Optional:

Pseudomonas commonly causes colonisation – it has a characteristic fresh cut grass odour and a typical blue-green colour. Widespread in soil water /moist environments and hospital patients may be colonised at moist sites, such as ulcers
It tends to have a low virulence unless the host is compromised
Tends to be mild but HAI is more severe.
The clinical scenario example had this greenish discharge/characteristic smell however as pseudomonas is more commonly a coloniser - antibiotics will not promote healing if the wound is not clinically infected.

Presenter Notes

Many causes: *There are various types of ulcers with different aetiology: pressure*

sores, diabetic foot ulcers, venous leg ulcers, arterial ulcers, autoimmune conditions such as pemphigus/pemphigoid. All ulcers are invariably colonised by a polymicrobial flora.

Ankle brachial pulse index (ABPI) (1)
***Between 0.8 and 1.3** suggests no evidence of significant arterial disease .Compression may be safely applied in most people.*
***Greater than 1.3** may suggest the presence of arterial calcification, such as in some people with diabetes, rheumatoid arthritis, systemic vasculitis, atherosclerotic disease, and advanced chronic renal failure. For values above 1.5, the vessels are likely to be incompressible, and the result cannot be relied on to guide clinical decisions. Care must be taken in interpreting ABPI results in people with these conditions, as they may be misleadingly high [CKS]*

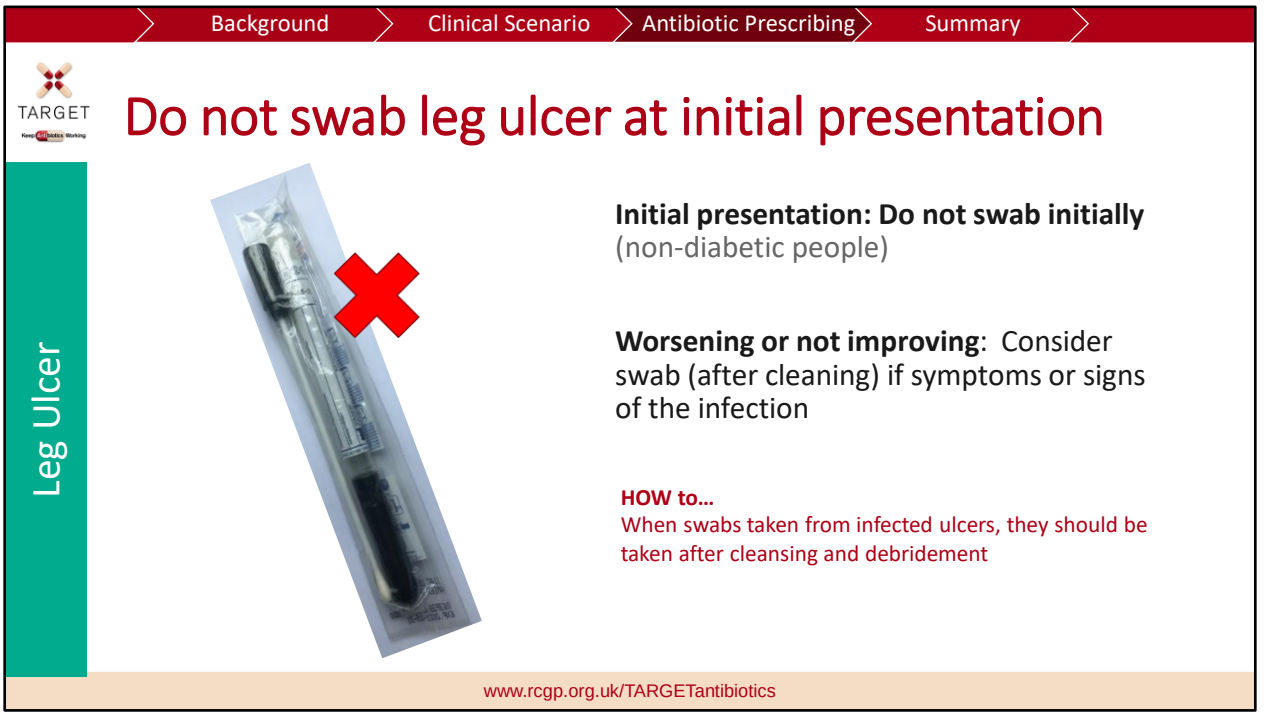
***Refer/specialist advice if more serious illness eg sepsis , necrotising fasciitis osteomyelitis** consider if not responding to abx*

Slide references

(1) NICE. How should I interpret ankle brachial pressure index (ABPI) results? 2021. [Available from: https://cks.nice.org.uk/topics/leg-ulcer-venous/diagnosis/interpretation-of-abpi/]

(2) Image: Uninfected ulcer [Available from: https://dermnetnz.org/topics/leg-ulcer-images]

(3) Image: Infected ulcer [Available from: https://dermnetnz.org/topics/leg-ulcer-images]



Presenter talk

Advice is not to swab at initial presentation, however, if patient returns with leg ulcer that is not improving or worsening then consider a swab.

UK standards for microbiology investigations state that when swabs taken from infected ulcers, they should be taken **after cleansing and debridement**. If this is not done, the swab may detect bacteria from overlying polymicrobial slough (including pseudomonas), rather than the invasive causative organism invading normal tissue.

This will give false indication of infection and therefore lead to inappropriate antimicrobial prescribing.

However, GPs often receive swab results taken by others. In this case it is important to use clinical examination to assess if infected or not. Despite receiving a positive swab result.

Key message is to remember to look for signs of infection before prescribing

Slide references

(1) NICE. Scenario: Venous leg ulcers, 2021. [Available from: https://cks.nice.org.uk/topics/leg-ulcer-venous/management/venous-leg-ulcers/]

TARGET

When to consider antibiotics for leg ulcers

Leg Ulcer

Offer an antibiotic for adults when there are symptoms or signs of infection (e.g. redness or swelling spreading beyond the ulcer, localised warmth, increased pain or fever).

When choosing antibiotics, consider:
1. Severity of symptoms or signs
2. Risk of developing complications
3. Previous antibiotic use

First line, as cellulitis flucloxacillin 500mg qds 7 days
because usually *Staphylococcus aureus*
(Penicillin allergy: clarithromycin or doxycycline)

- It will take some time for a leg ulcer infection to resolve
- Not expected until after antibiotic course completed
- However, advise to seek medical help if condition worsens at any time, or does not start to improve within 2-3 days of starting treatment.

www.rcgp.org.uk/TARGETantibiotics

Presenter talk
Antibiotics aim to target the deeper bacteria i.e. stop the ulcer getting deeper larger and more painful. A spreading cellulitis associated with an ulcer is most likely to be caused by staph & strep – therefore treat with flucloxacillin (500mg 7 days)

Give advice to seek medical help if symptoms or signs of infection:
• worsen rapidly or significantly at any time, or
• do not start to improve within 2 to 3 days of starting treatment

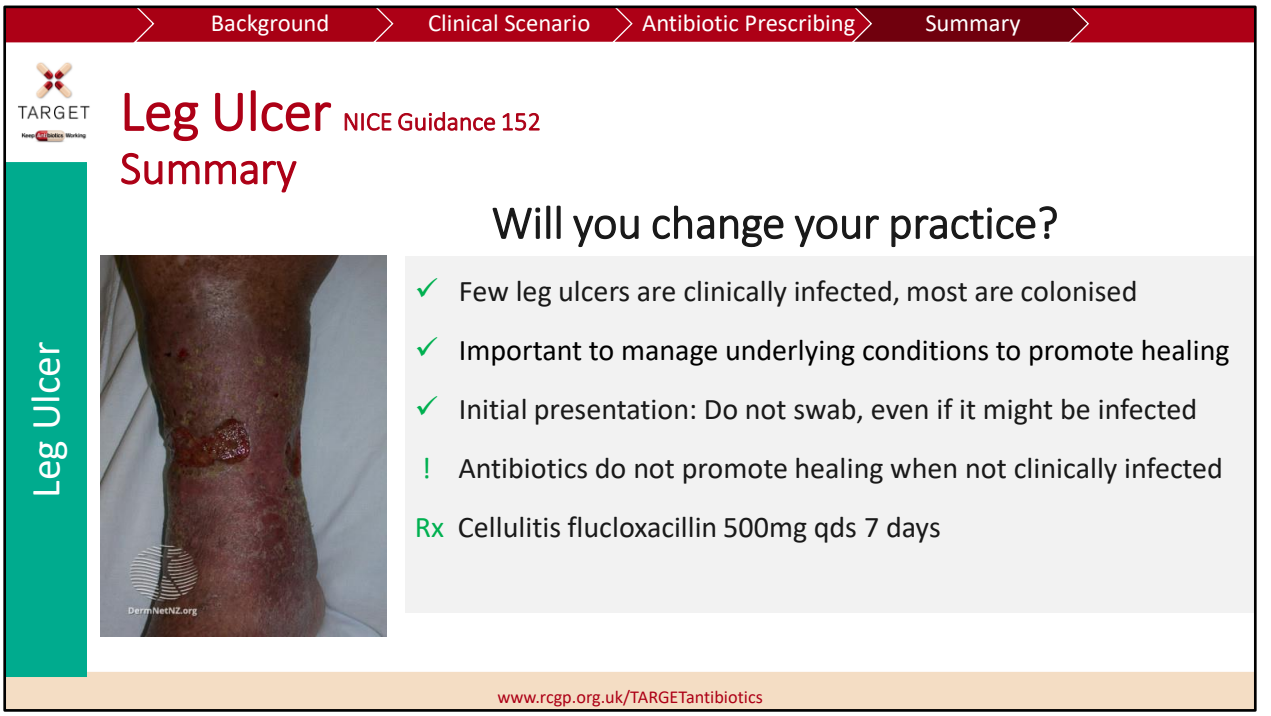
Be aware that it will take some time for a leg ulcer infection to resolve, with full resolution not expected until after the antibiotic course is completed. [NG152] -and therefore a further course of antibiotics may not be needed

Presenter notes
It is worth noting fluclox 500mg is not going to be adequate for very extensive cellulitis and IVs may be needed– follow NICE guidance for severe infection:
- *Co-amoxiclav 500/125 mg three times a day orally for 7 days*
- *Cefuroxime 750 mg to 1.5 g three or four times a day IV*

Further information - Very long standing ulcers that have failed to heal on treatment, might need to consider whether any underlying osteomyelitis

Slide references

(1) NICE. Leg ulcer infection: antimicrobial prescribing [NG152], 2020. [Available from: https://www.nice.org.uk/guidance/ng152]



Presenter notes
To summarise:

- Few leg ulcers are clinically infected, most are colonised
- Important to manage underlying conditions to promote healing
- During initial presentation, NICE advices that you do not swab, even if it might be infected

Our take-home point is - Antibiotics do not promote healing when not clinically infected

And when a leg ulcer is infected treat with Cellulitis flucloxacillin 500mg qds 7 days

Slide references
(1) Image: Leg ulcer [Available from: https://dermnetnz.org/topics/leg-ulcer-images]

TARGET

Cellulitis

Cellulitis

- Acute bacterial infection of the dermis and subcutaneous tissue
- Incidence 0.2 to 24.6 per 1000 person-years in different populations
- Commonly *Strep pyogenes* and *Staph aureus*
- Requires entry via disruption to the skin

Usually unilateral (and more commonly lower limb)

Most resolve with treatment, though recurrence is common

Risk factors
- Skin trauma
- Ulceration
- Obesity

Presenter talk
Cellulitis is the third and final condition we will be focussing on today.

NICE guidance groups both Erysipelas and cellulitis together. Erysipelas is a superficial infection, affecting the upper layers of the skin, while cellulitis affects the deeper tissues. They can overlap, so it is not always possible to make a definite diagnosis between the two.
We will refer to cellulitis throughout the webinar however treatment of erysipelas is the same.

Some background information of cellulitis includes: incidence rates (found to be between 0.2 and 24.6 per 1000 person-years (1,2)), causative bacteria include *Strep pyogenes* and *Staph aureus,* and infection occurs when bacteria enter via a disruption to the skin.

Slide references
(1) Dalal A, Eskin-Schwartz M, Mimouni D, Ray S, Days W, Hodak E, et al. Interventions for the prevention of recurrent erysipelas and cellulitis. Cochrane Database Syst Rev. 2017;6(6):Cd009758.

(2) NICE. Cellulitis – acute, 2023 [Available from:

https://cks.nice.org.uk/topics/cellulitis-acute/.]

(3) Image: Cellulitis – picture obtained with patient consent

TARGET

Cellulitis Clinical Scenario

Cellulitis

77 year old lady, contacted by carer:

- Inflamed, painful, swollen lower legs, out of sorts and not eating much
- Says had tablets 3 months ago for this
- PMHx: Osteoarthritis, Hypertension
- Penicillin allergy
- No thermometer but doesn't feel feverish, no shivers, aches or sweats
- Has a BP monitor & agrees to check obs: Pulse 98/min , BP 146/73

Cellulitis in people with dark skin tones may present as a painful swollen area of skin with change in colour and altered texture

This slide is animated, click for point on dark skin tones, and click again for the clinical scenario image

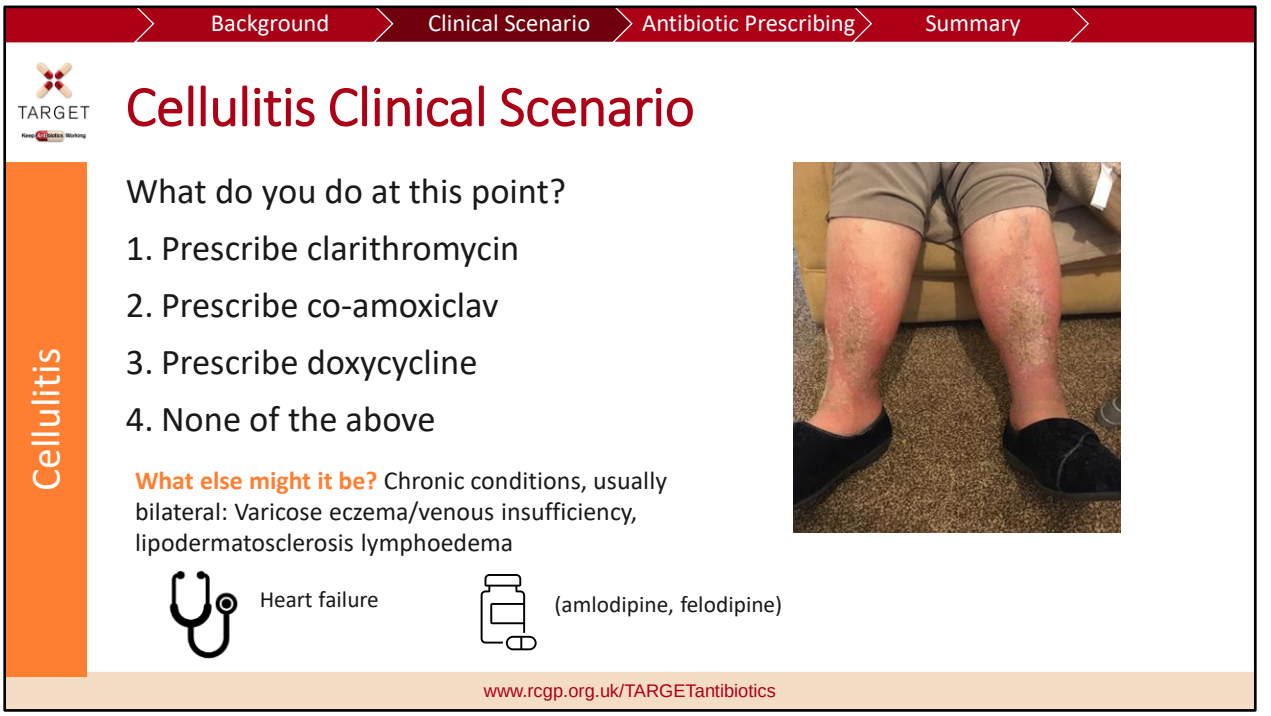
Presenter notes

Ask the audience to consider the attached clinical scenario and possible treatment options

Note on dark skin tones, language used for cellulitis such as "redness" is not always applicable

Slide references

(1) Image: Cellulitis mimic – picture obtained with patient consent



Answer revealed through animation, and click again for discussion point

Presenter talk

To summarise, the question is for a 77yr-old, red painful swollen lower legs, malaise, obs normal

The answer is “None of the above” - no antibiotics at this point as uncertain diagnosis

Bilateral cellulitis is unlikely

Need further information to diagnosis

Presenter notes

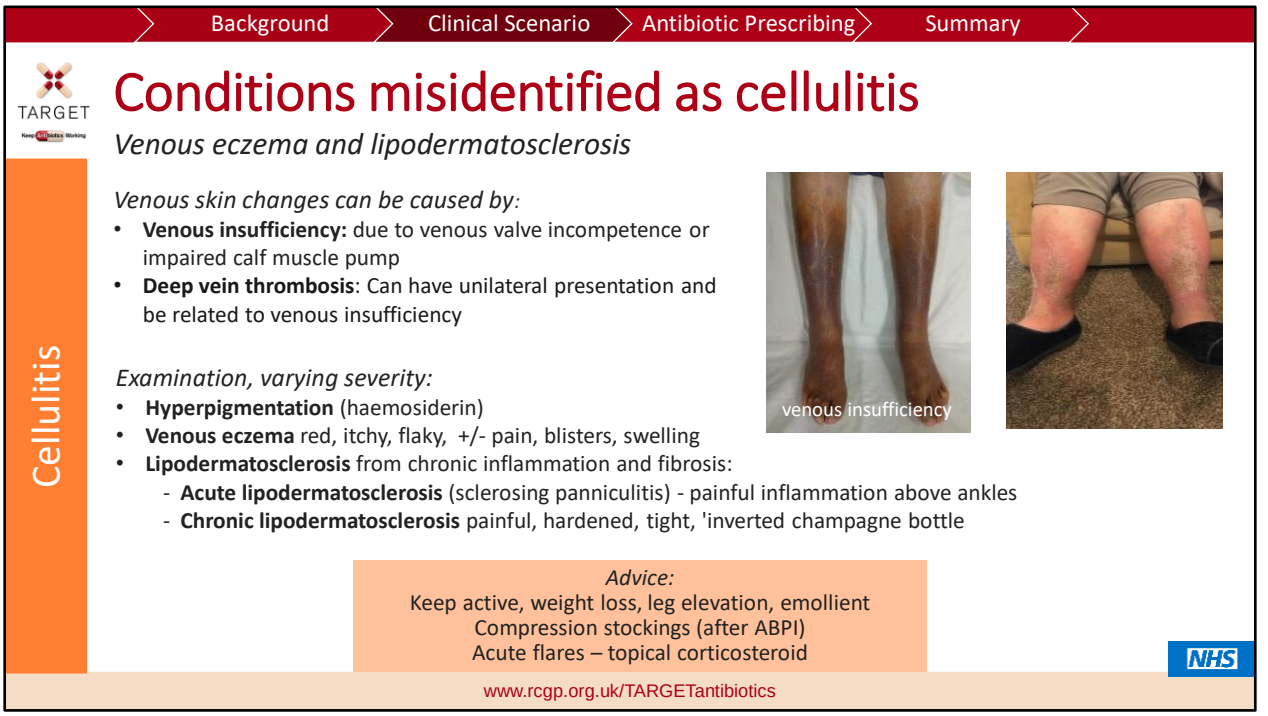
Differential Diagnosis:

Unilateral swelling – DVT, Bakers cyst , thrombophlebitis

Chronic usually bilateral ***but if worse on one side, it may be difficult to exclude superimposed cellulitis*** *(if it was cellulitis doxy or clarithro ok)*

Slide references

(1) Image: Cellulitis mimic – picture obtained with patient consent



This slide is animated, click for information on varying severity and click again for advice

Presenter talk

This slide highlights conditions often misidentified for cellulitis
Self care is important and advice includes elevation, keep physically active , weight loss if high BMI
And do not use compression stocking if active cellulitis (1)

Presenter notes

NHS website info excellent (2)
CKS varicose eczema/lipodermato (3)
DVT (4)

Venous insufficiency

- ***Risks**: Immobility, obesity, VVs, previous DVT*
- ***Symptoms**: heaviness, aching, swelling, and itching, typically worse at end of day, relieved by leg elevation*

DVT

- ***Risks** –previous DVT, cancer, >60yr old, obesity,*
- ***Symptoms**: Unilateral localised pain, tenderness, skin changes, which include*

oedema, redness, and warmth, and vein distension.

Slide references

(1) National Wound Care Strategy Programme. Recommendations for Lower Limb Ulcers. 2020. [Available from: https://www.nationalwoundcarestrategy.net/wp-content/uploads/2021/04/Lower-Limb-Recommendations-WEB-25Feb21.pdf]

(2) NHS. Varicose eczema 2019 [Available from: https://www.nhs.uk/conditions/varicose-eczema/.

(3) NICE CKS. Venous eczema and lipodermatosclerosis 2022 [Available from: https://cks.nice.org.uk/topics/venous-eczema-lipodermatosclerosis/.

(4) NICE CKS. Deep vein thrombosis 2022 [Available from: https://cks.nice.org.uk/topics/deep-vein-thrombosis/.

(5) Image: Cellulitis mimic – picture obtained with patient consent

(6) Image: Venous Insufficiency - James Heilman MD – Creative commons

TARGET

Cellulitis

Cellulitis Clinical Scenario

83-year old male:

- A warm red swollen and painful left lower leg, and now covers a 15cm area
- You notice a small abrasion on the side of his foot (he remembers he had knocked it in the garden)
- O/E Temp 37.7
- PMHx: Ischemic heart disease, atrial fibrillation, hypertension

- Offer an antibiotic

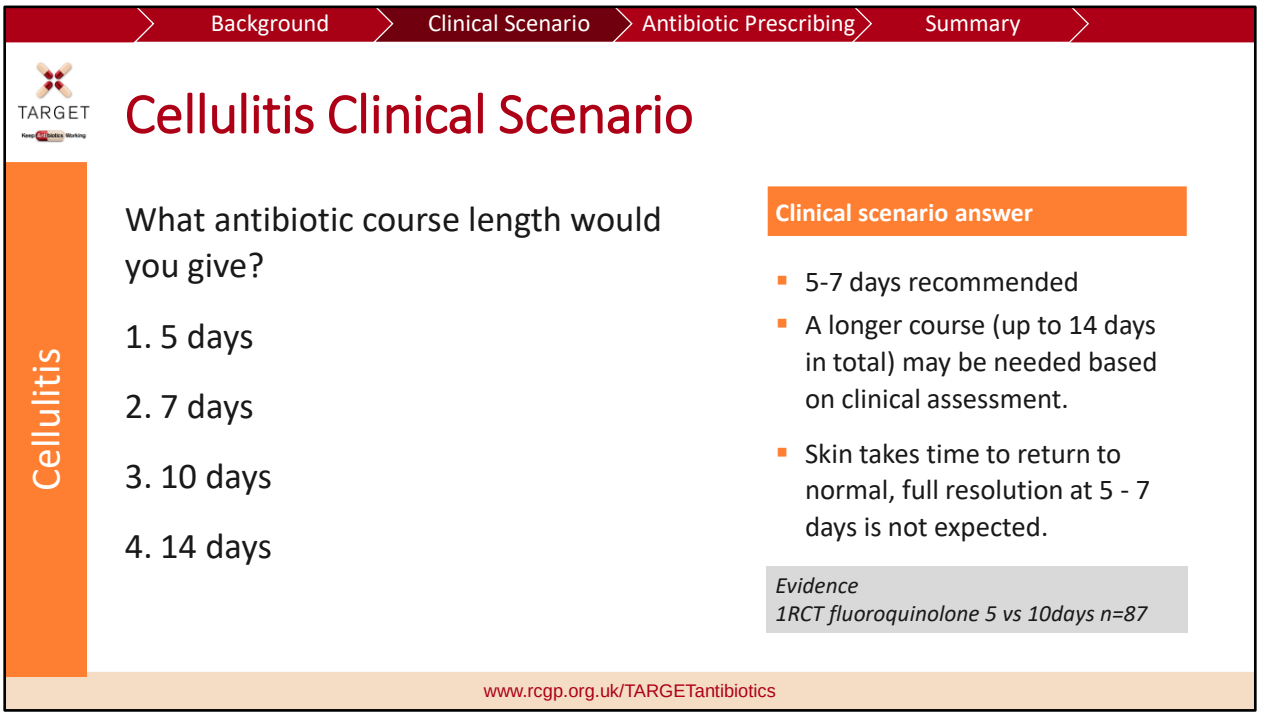
This slide is animated, click to reveal that an antibiotic should be offered

Presenter notes

Ask the audience to consider the attached clinical scenario and possible treatment options

Slide references

(1) Image: Cellulitis – picture obtained with patient consent



This slide is animated, click to reveal answer, and click again for further information

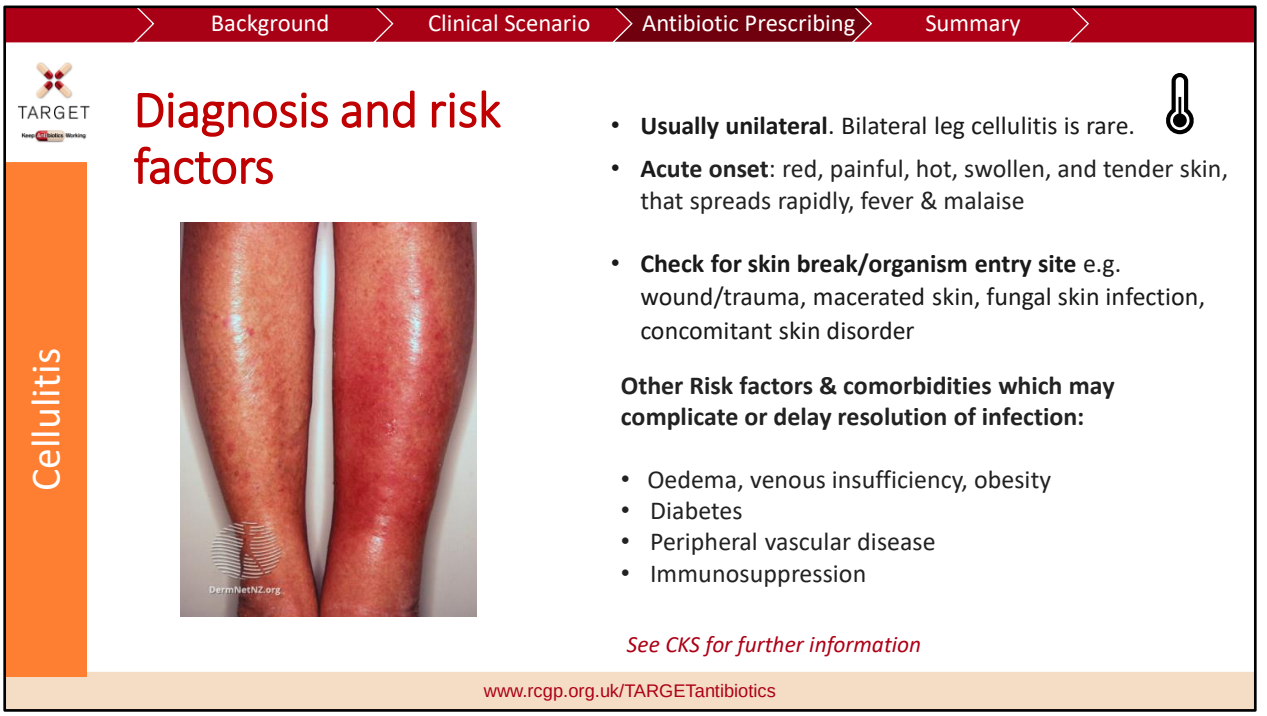
Presenter talk
We have established that an antibiotic will be prescribed but what course length would be appropriate?
(In this case study the patient is not diabetic)

The answer is either 5 or 7 days. However a longer course may be recommended based on clinical assessment.

Presenter notes
Evidence for cellulitis course length
Five days versus 10 days of a fluoroquinolone
One systematic review (Kilburn et al 2010) included 1 RCT which compared 5 days of a fluoroquinolone (oral levofloxacin) with 10 days of a fluoroquinolone (oral levofloxacin) at the same daily dose.
Oral levofloxacin for 5 days was not significantly different to oral levofloxacin for 10 days for the ***outcome of 'symptom free or reduced' at end of treatment, 14 days follow-up*** *(1 RCT, n=87, 97.7% versus 97.7%, RR 1.00, 95% CI 0.94 to 1.07; high quality evidence). (1)*

Slide references

(1) Kilburn SA, Featherstone P, Higgins B, Brindle R. Interventions for cellulitis and erysipelas. Cochrane Database Syst Rev. 2010;2010(6):Cd004299.



Presenter talk

This slide is to help highlight signs and symptoms of cellulitis to aid with diagnosis and therefore appropriate antibiotic prescribing.
Also to highlight risk factors that may complicate the infection

Presenter notes

NICE doesn't stratify treatment according to severity. (1)

- *Class I — there are no signs of systemic toxicity and the person has no uncontrolled comorbidities.*
- *Class II — the person is either systemically unwell or systemically well but with a comorbidity (for example peripheral arterial disease, chronic venous insufficiency, or morbid obesity) which may complicate or delay resolution of infection*
- *Class III — the person has **significant systemic upset, such as acute confusion, tachycardia, tachypnoea, hypotension,** or unstable comorbidities that may interfere with a response to treatment, or a limb-threatening infection due to vascular compromise.*
- *Class IV — the person has sepsis or a severe life-threatening infection, such as necrotizing fasciitis*

Consider underlying comorbidities (such as diabetes mellitus) that predispose to infection

Slide references

(1) NICE CKS. Cellulitis - acute 2023 [Available from: https://cks.nice.org.uk/topics/cellulitis-acute/.]

(2) Image: Cellulitis [Available from: https://dermnetnz.org/image-catalogue/bacterial-skin-infection-images?stage=Live]

TARGET

Cellulitis

Acute complications

- Necrotizing fasciitis:
  - Destructive, severe, rapidly progressive soft tissue infection
  - Involves the deep subcutaneous tissues and fascia (and occasionally muscles), which is characterized by extensive necrosis and gangrene of the skin and underlying structures.
  - Early symptoms – **intense pain out of proportion to skin damage**
  - Group A streptococcus is a major causative agent in Type II necrotizing fasciitis.
  - Rapid progression, skin discolouration , crepitus, bulla, gangrene
  - Refer – IV antibiotics & surgical
- Myositis: inflammation of muscle due to infection.
- Sepsis (potentially fatal).
- Subcutaneous abscesses.
- Post-streptococcal nephritis

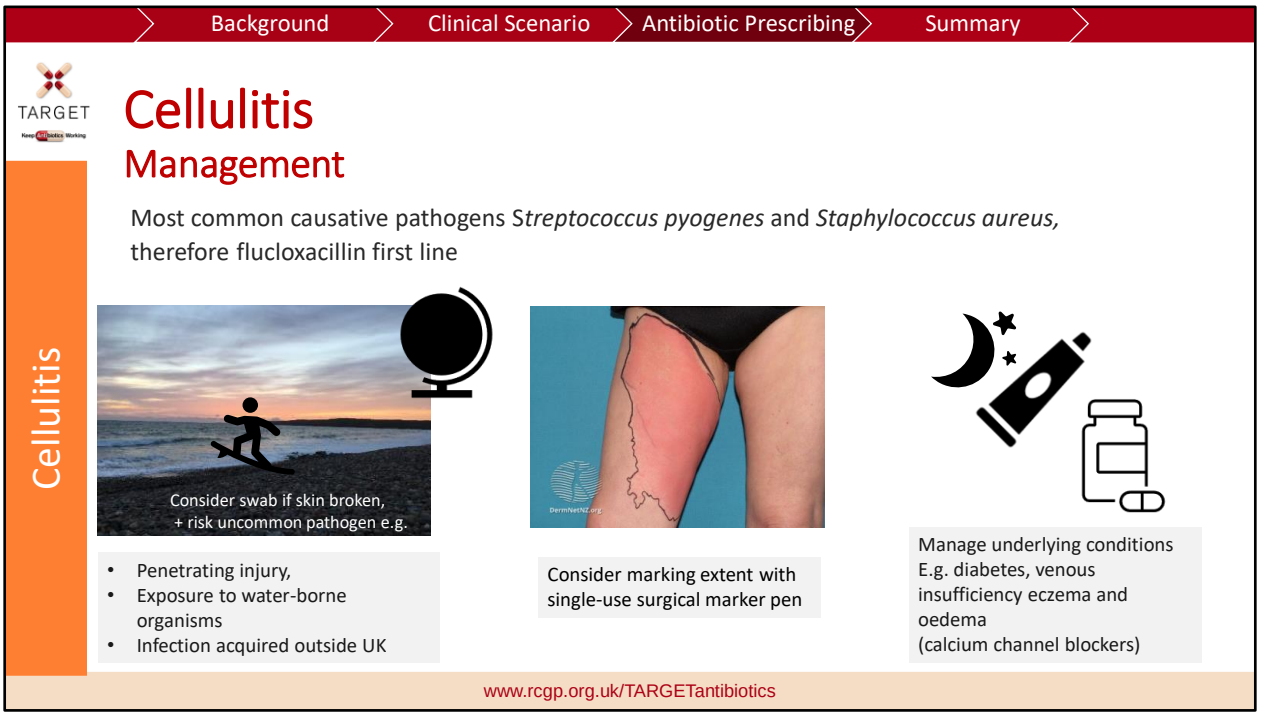
Presenter talk

Here we highlight a range of acute complications of cellulitis

Slide references

(1) NICE. Cellulitis - acute 2023 [Available from: https://cks.nice.org.uk/topics/cellulitis-acute/.]

(2) CDC. Type II Necrotizing Fasciitis 2022 [Available from: https://www.cdc.gov/groupastrep/diseases-hcp/necrotizing-fasciitis.html#:~:text=Necrotizing%20fasciitis%20can%20affect%20any,accompanied%20by%20the%20following%20signs%3A&text=The%20pain%20experience%20by%20the,of%20the%20local%20skin%20infection.



Presenter talk

For management of cellulitis you can (1):

1. Consider swabbing if there is evidence of a penetrating injury and risk of exposure to an uncommon pathogen (water-borne or infection acquired outside of UK)
2. Use a surgical pen to mark the outline of the extent of infection for future comparison
3. Manage underlying conditions

Presenter notes

Less common organisms include: beta haemolytic streps inc G (which can also cause necrotizing fasciitis), C occas and B, Streptococcus pneumoniae, Haemophilus influenzae, Gram negative bacilli and anaerobes

Risk for atypical organisms (2):

- ***profound immunosuppression***
- *animal or human bites*
- ***intravenous drug use*** *(including skin-popping*
- *sea or freshwater exposure (to broken skin) including* ***pools and spas***

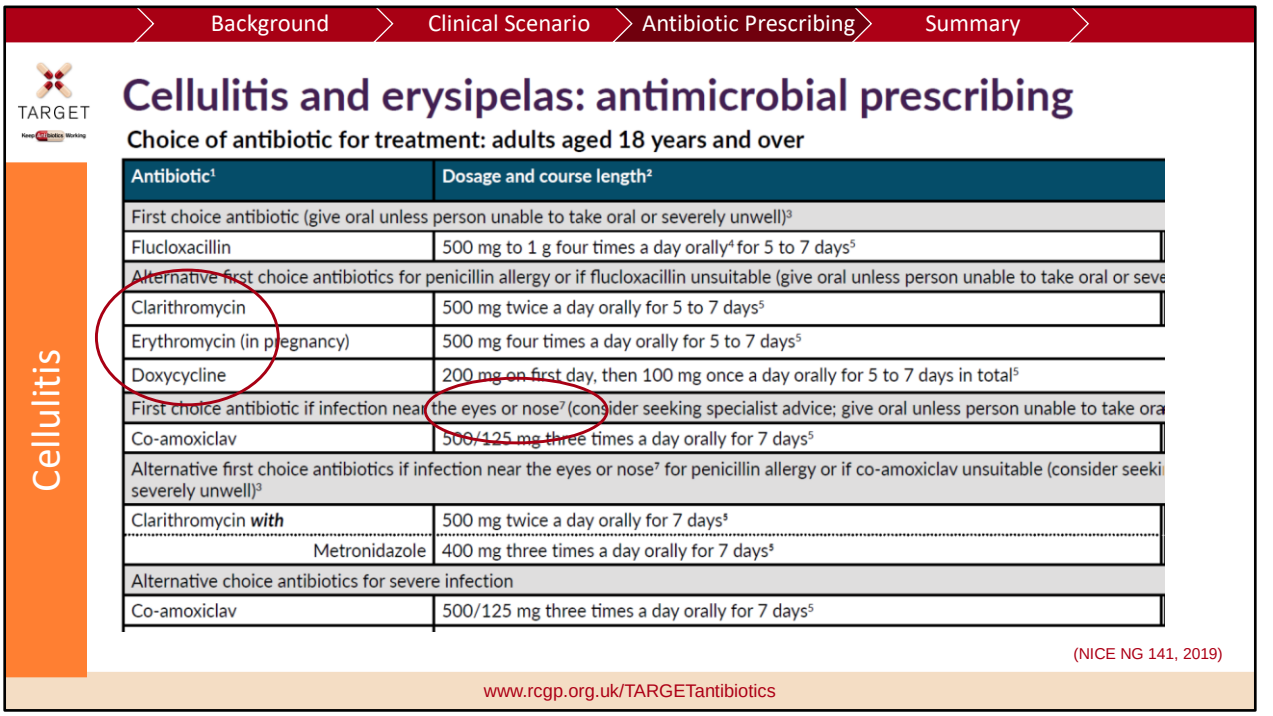
- *exposure to animals, fish, or reptiles*

Slide references

(1) NICE. Cellulitis - acute 2023 [Available from: https://cks.nice.org.uk/topics/cellulitis-acute/.

(2) Sullivan T, de Barra E. Diagnosis and management of cellulitis. Clinical Medicine. 2018;18(2):160-3.

(3) Image: Cellulitis {Available from: https://dermnetnz.org/topics/cellulitis]



Presenter talk

Here we have the NICE summary table for cellulitis antimicrobial prescribing
As previously discussed Flucloxacillin (500mg 5-7 days) is the first choice antibiotic.

But alternative first choice antibiotics if penicillin allergy include clarithromycin, erythromycin and also doxycycline

If infection is near the eyes or nose there are different recommendations with first choice as co-amoxiclav or clarithromycin with metronidazole if penicillin allergy.

Presenter notes

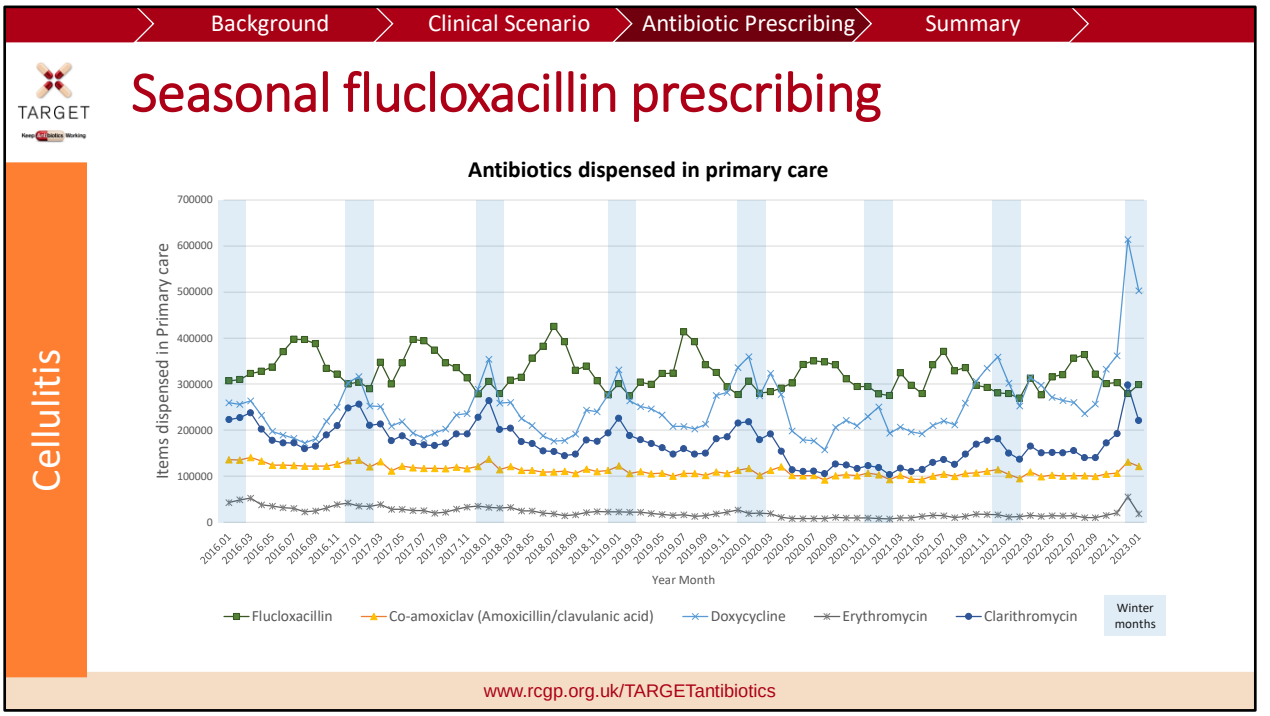
Guideline rationale : "oral antibiotics should be used in preference to intravenous antibiotics where possible. Intravenous antibiotics should only

be used for people who are severely ill, unable to tolerate oral treatment, or where oral treatment would not provide adequate coverage or tissue penetration"

Remember to check the BNF for considerations if someone has renal/hepatic impairment. And consider prescribing differences for obese patients.

Slide references

(1) NICE. Cellulitis and erysipelas: antimicrobial prescribing NG141 2019 [Available from: https://www.nice.org.uk/guidance/ng141.]



This slide is animated, click to highlight winter months

Presenter talk

Here we have antibiotic prescribing data for 5 different antibiotics. Flucloxacillin is in green and is the first choice antibiotic for cellulitis. The three alternative antibiotic choices are clarithromycin (dark blue), erythromycin (for pregnancy and in grey) and doxycycline (light blue). We also have co-amoxiclav data which is first choice for infection around the eyes and nose.

(*click for animation*) We can see quite a clear seasonal pattern for some of the antibiotics with flucloxacillin prescribing high in summer and doxycycline and clarithromycin high in winter. As with the impetigo data we cannot contribute this solely to cellulitis and so seasonal patterns are likely due to other conditions for the alternative antibiotics. And for the jump in winter 2022 likely due to a change in guidance for acute sore throats

However, it is important to highlight we want to preserve these antibiotics and use only when necessary, especially for macrolides such as clarithromycin which have high resistance rates as previously discussed.

Presenter notes

Could perhaps highlight to audience that individuals can use fingertips public health data to look at prescribing in their area/practice "AMR local indicators"

Slide references
Data obtained from UKHSA antimicrobial prescribing team

TARGET

Safety netting advice

Cellulitis

Advice & reassessment:

• Skin will take time to return to normal after finishing the antibiotics

• Seek medical help/reassess if:

- Worsen rapidly or significantly at any time,
- Or do not start to improve in 2 to 3 days
- The person is very unwell, has severe pain, or redness or swelling

***Admit** if they have any symptoms or signs suggesting a more serious illness or condition, such as orbital cellulitis, osteomyelitis, septic arthritis, necrotising fasciitis or sepsis.*

Presenter talk

This slide contains some safety netting advice to help with management.

Presenter talk
Finally to summarise the cellulitis key learning points:

- Exclude other causes of skin redness & oedema
- Look for site of entry e.g. skin break
- Usually affects one limb, bilateral cellulitis is rare
- It is important to manage underlying conditions
- And the first line antibiotic is flucloxacillin (500mg/1g), 4 times a day, 5-7 days (up to 14 days)

Presenter notes
Possible discussion points:

1. *In your experience do people get repeated courses of antibiotic for cellulitis*

2. *Study BJGP by Teasdale (1) found approx. 2/3 people surveyed reported receiving no information about cause or prevention of recurrence. (also important to name condition)*

Slide references
(1) Teasdale E, Lalonde A, Muller I, Chalmers J, Smart P, Hooper J, et al. Patients' understanding of cellulitis and their information needs: a mixed-methods study in

primary and secondary care. British Journal of General Practice. 2019;69(681):e279-e86.

(2) Image: Cellulitis {Available from: https://dermnetnz.org/topics/cellulitis]

Summary table

Condition	Course length	Footnote
Impetigo	**5 days**	5-day course is appropriate for most Can be increased to 7 days based on clinical judgement, depending on the severity and number of lesions
Leg Ulcer	**7 days**	7 day course of flucloxacillin is the first line guidance. It is important to manage underlying conditions to promote ulcer healing Antibiotics do not promote healing when not clinically infected
Cellulitis	**5-7 days**	A longer course (up to 14 days in total) may be needed based on clinical assessment. However, skin does take time to return to normal, and full resolution at 5 to 7 days is not expected.

www.rcgp.org.uk/TARGETantibiotics

Presenter talk

Here we have a short summary table for antibiotic course lengths.