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Keep Antibiotics Working

# Skin infections

Incorporating NICE antimicrobial prescribing guidelines

TARGET antibiotics

2023



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# Introductions



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NWCSP: National wound care strategy programme

# Introductions – TARGET Team



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# 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

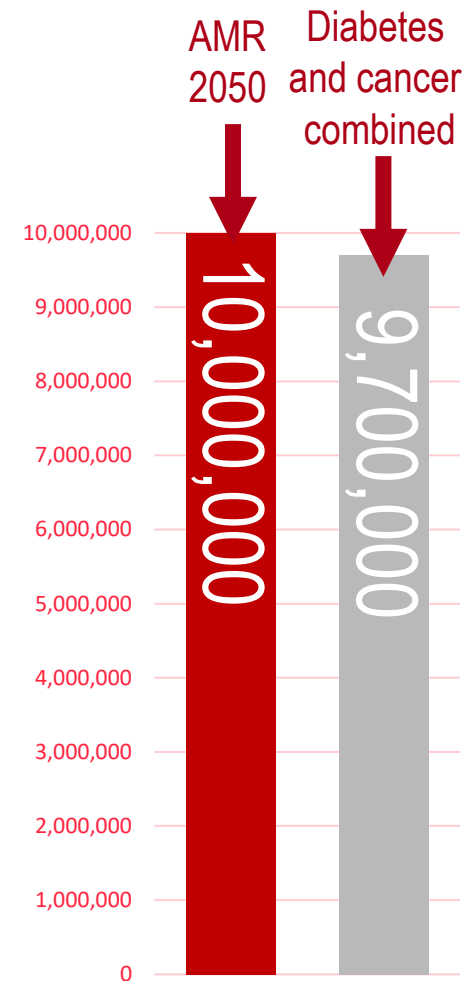
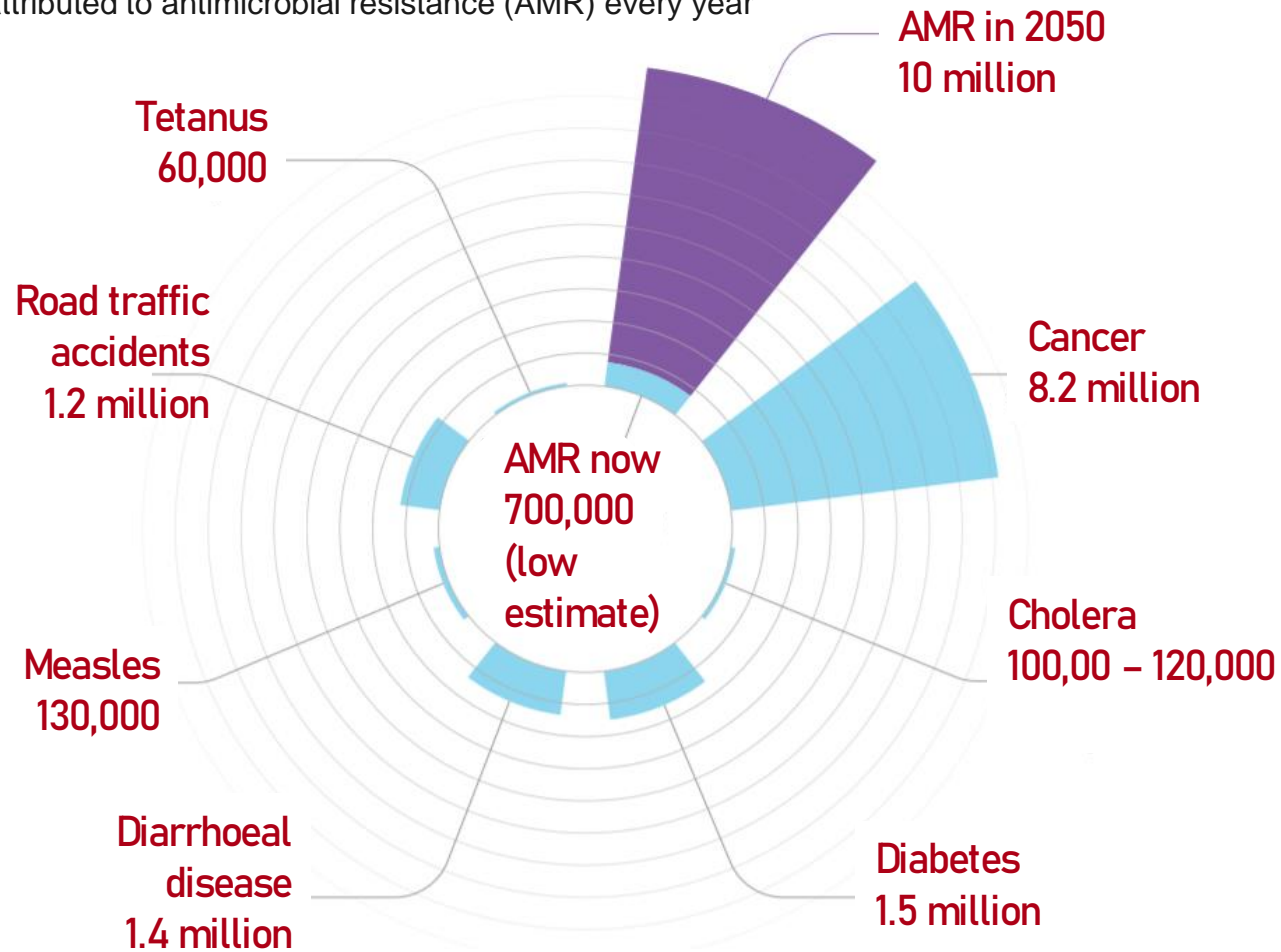


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# Context

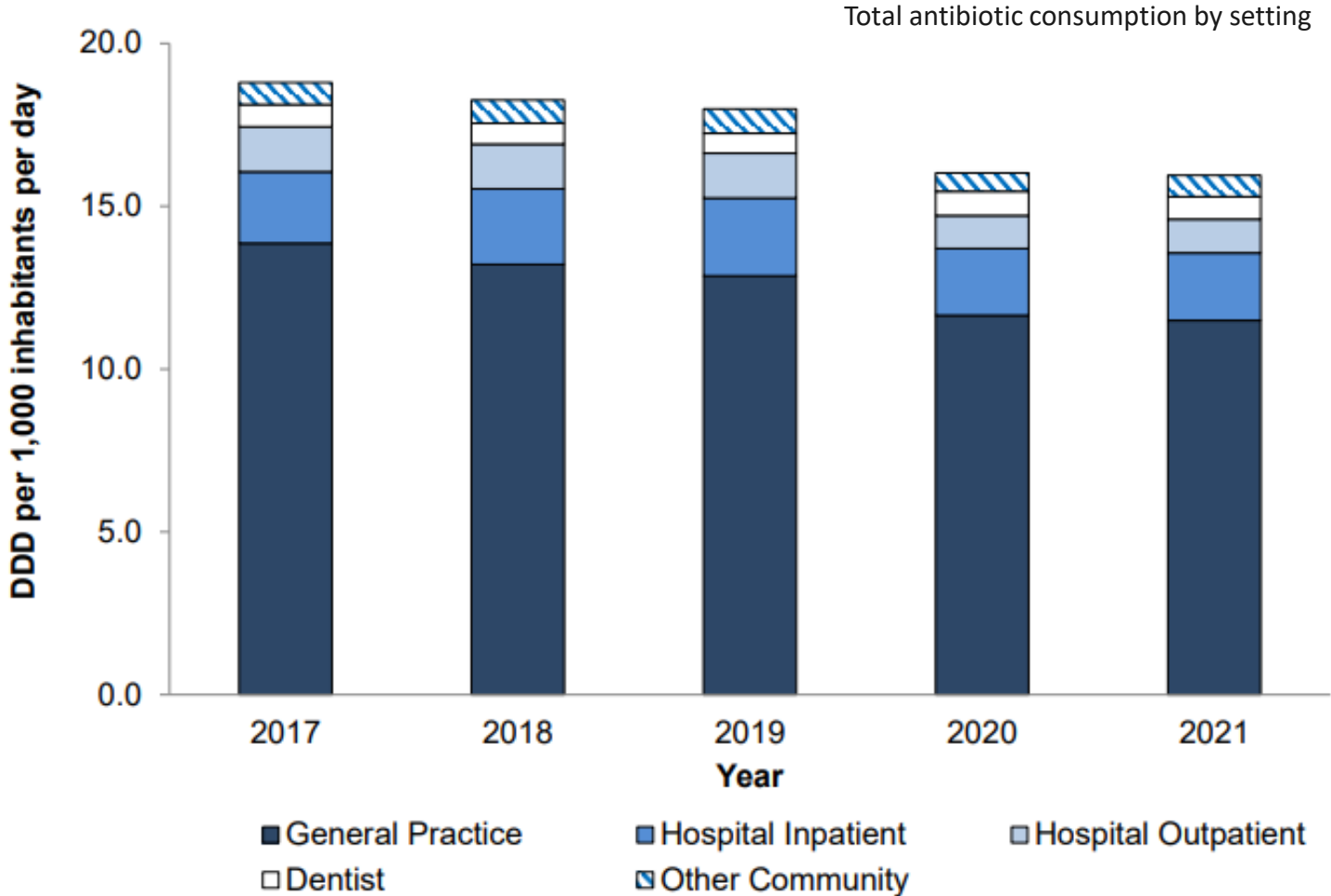
Deaths attributed to antimicrobial resistance (AMR) every year



(O'Neill, 2016)



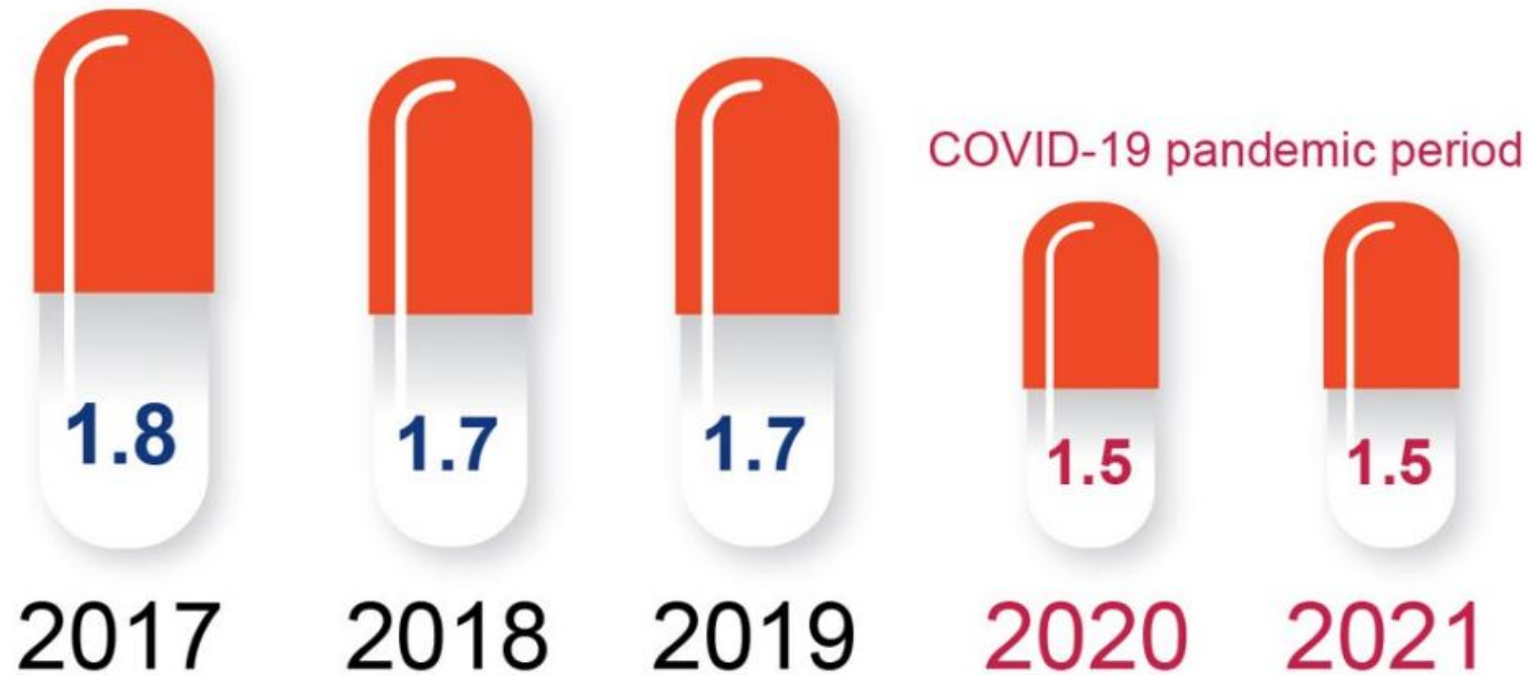
# The majority of antibiotics are prescribed in General Practice



(UKHSA, 2022)



# Why focus on antimicrobial stewardship in primary care?



(Items per 1,000 inhabitants per day)

Antibiotic prescribing in England 2017-2021

(UKHSA, 2022)



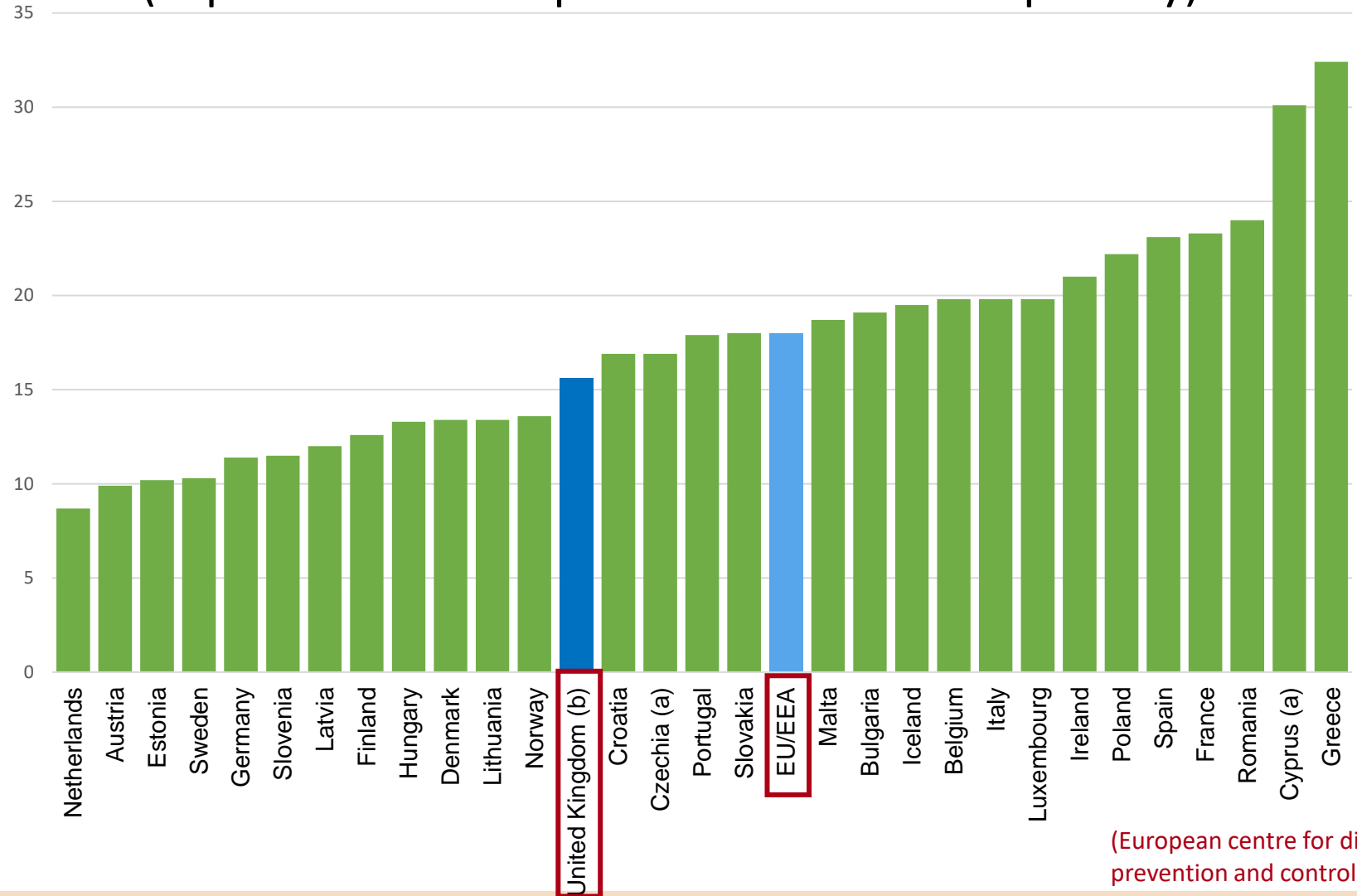


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# Antibiotic consumption

Total consumption of antibacterials for systemic use in the community, by EU/EEA country, 2019 (expressed as DDD per 1 000 inhabitants per day)



(European centre for disease prevention and control, 2019)

# Why skin infections?

- **16.3%** of antibiotics in primary care are prescribed for skin infection
  - Majority prescribed for “boil or abscess”,
  - Cellulitis is the 3<sup>rd</sup> most common reason for prescribing in skin infections
  - 56% of all  $\beta$ -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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# 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)



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Impetigo

# Impetigo background

- Highly contagious, common bacterial infection of the skin
- Annual incidence ~ 2.8% <4 years old, and 1.6% in 5–15 years old
- Peak incidence in warmer weather
- Incubation period 4 - 10 days
- Typically *Staphylococcus aureus*, but also *Streptococcus pyogenes*
- Meticillin-resistant *Staphylococcus aureus* impetigo increasing
- Spread is by direct contact (with discharges from the scabs of an infected person) or indirect contact with a contaminated environment





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# 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)





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# Impetigo Clinical Scenario

*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*

Impetigo



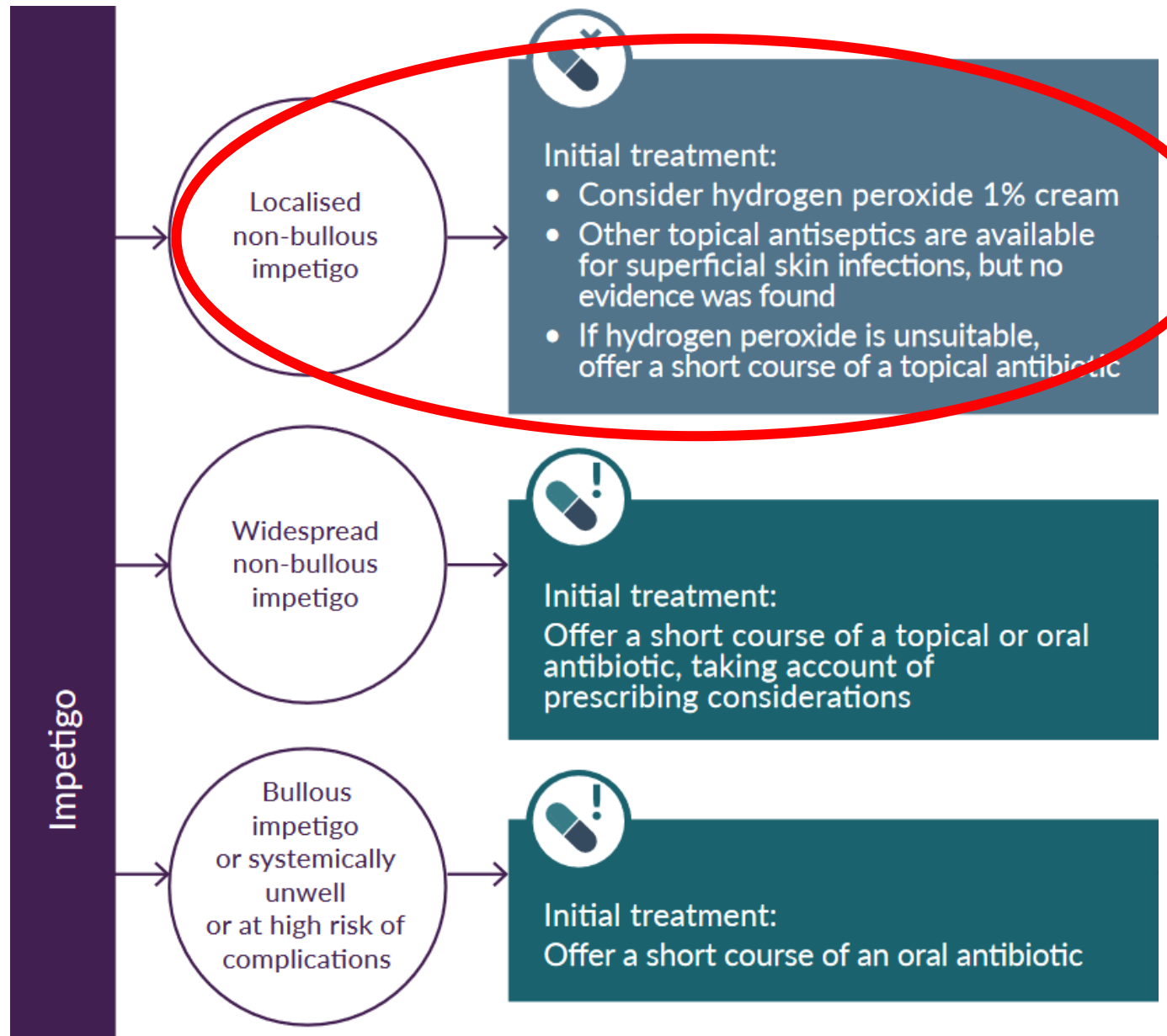
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# Treatment for localised non-bullous

Impetigo

(NICE NG 153, 2020)







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# Evidence for hydrogen peroxide use

Topical fusidic acid 2% vs. Hydrogen peroxide cream 1% (both bd-tds for up to 21 days)

No significant difference for cure or improvement (S Koning, 2012)

- Hydrogen peroxide does not lead to antimicrobial resistance
- 11.2% of MSSA and 23.1% of MRSA resistant to fusidic acid in 2021 (ESPAUR)

Other topical antiseptics - no studies found

Hydrogen peroxide 1% cream for impetigo – March 2020

## Advice

- Available OTC [Crystacide]
- *“should be prescribed on NHS ..due to high retail price”*
- Dry film will appear on the skin after application, can be washed off with water
- Avoid contact with the eyes.
- Do not use on large or deep wounds.
- Do not apply to healthy skin.
- Can bleach fabric

(1) <https://www.prescqipp.info/our-resources/webkits/hot-topics/>

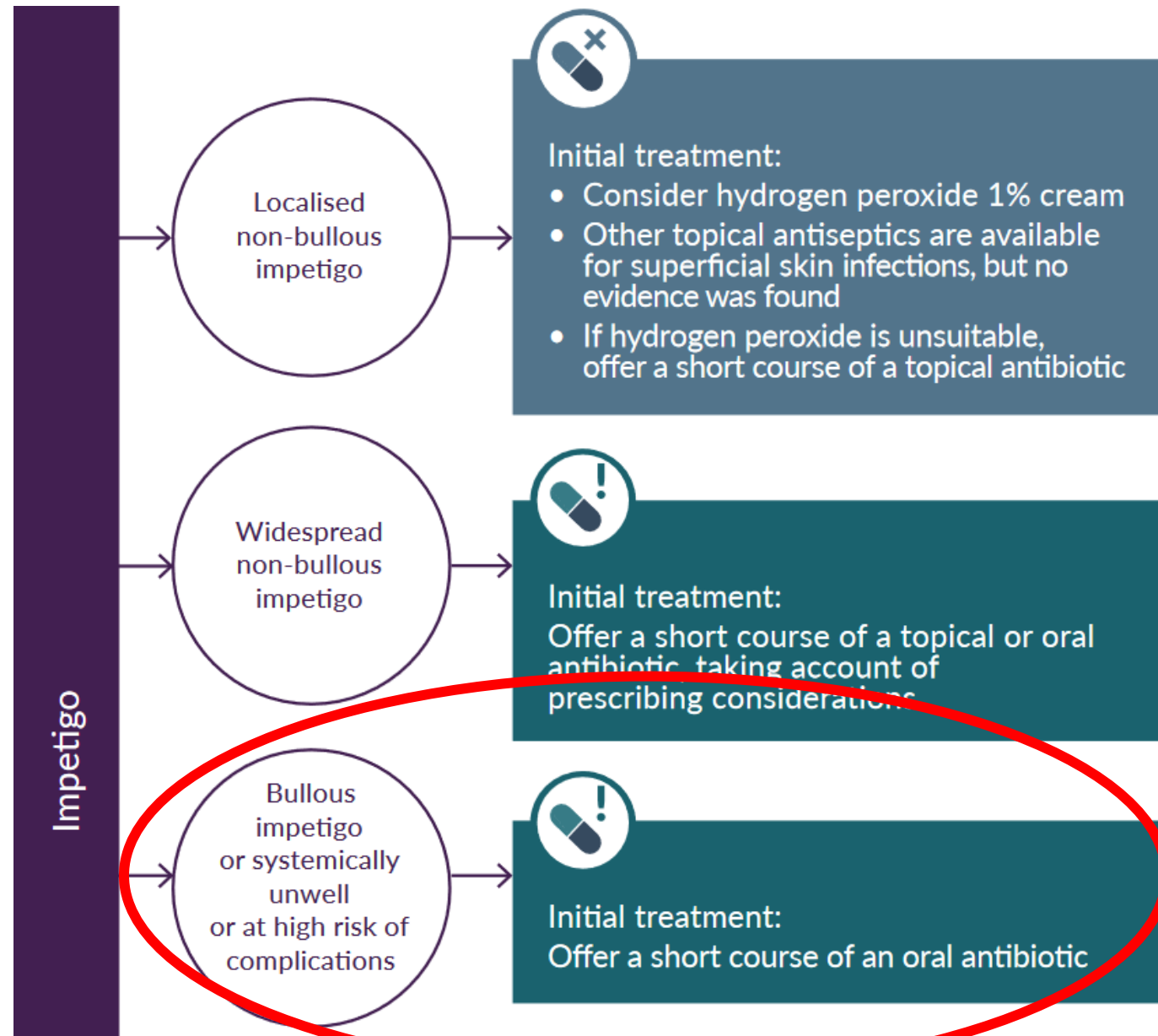


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# Treatment for bullous impetigo

Impetigo



(NICE NG 153, 2020)



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# Impetigo NICE summary table

## Choice of antimicrobial: children and young people under 18 years

Antimicrobial <sup>1</sup>	Dosage and course length <sup>2</sup>
Topical antiseptic	
Hydrogen peroxide 1% <sup>3</sup>	Apply two or three times a day for 5 days <sup>4</sup>
First-choice topical antibiotic <sup>5</sup> if hydrogen peroxide unsuitable (for example, if impetigo is around eyes) or ineffective	
Fusidic acid 2%	Apply three times a day for 5 days <sup>4</sup>
Alternative topical antibiotic <sup>5</sup> if fusidic acid resistance suspected or confirmed	
Mupirocin 2% <sup>6</sup>	Apply three times a day for 5 days <sup>4</sup>
First-choice oral antibiotic	
Flucloxacillin (oral solution or capsules <sup>7</sup> )	1 month to 1 year, 62.5 mg to 125 mg four times a day for 5 days <sup>4</sup> 2 to 9 years, 125 mg to 250 mg four times a day for 5 days <sup>4</sup> 10 to 17 years, 250 mg to 500 mg four times a day for 5 days <sup>4</sup>
Alternative oral antibiotic if penicillin allergy or flucloxacillin is unsuitable (for example, if oral solution unpalatable or unable to swallow capsules; for people who are not pregnant)	
Clarithromycin	1 month to 11 years: under 8 kg, 7.5 mg/kg twice a day for 5 days <sup>4</sup> 8 to 11 kg, 62.5 mg twice a day for 5 days <sup>4</sup> 12 to 19 kg, 125 mg twice a day for 5 days <sup>4</sup> 20 to 29 kg, 187.5 mg twice a day for 5 days <sup>4</sup> 30 to 40 kg, 250 mg twice a day for 5 days <sup>4</sup> 12 to 17 years, 250 mg twice a day for 5 days <sup>4,8</sup>

# 5 days



Microbiological testing

**Frequent recurrence**  
Send a skin swab  
Consider nasal swab & treatment for suppression.

(NICE NG 153, 2020)

Impetigo



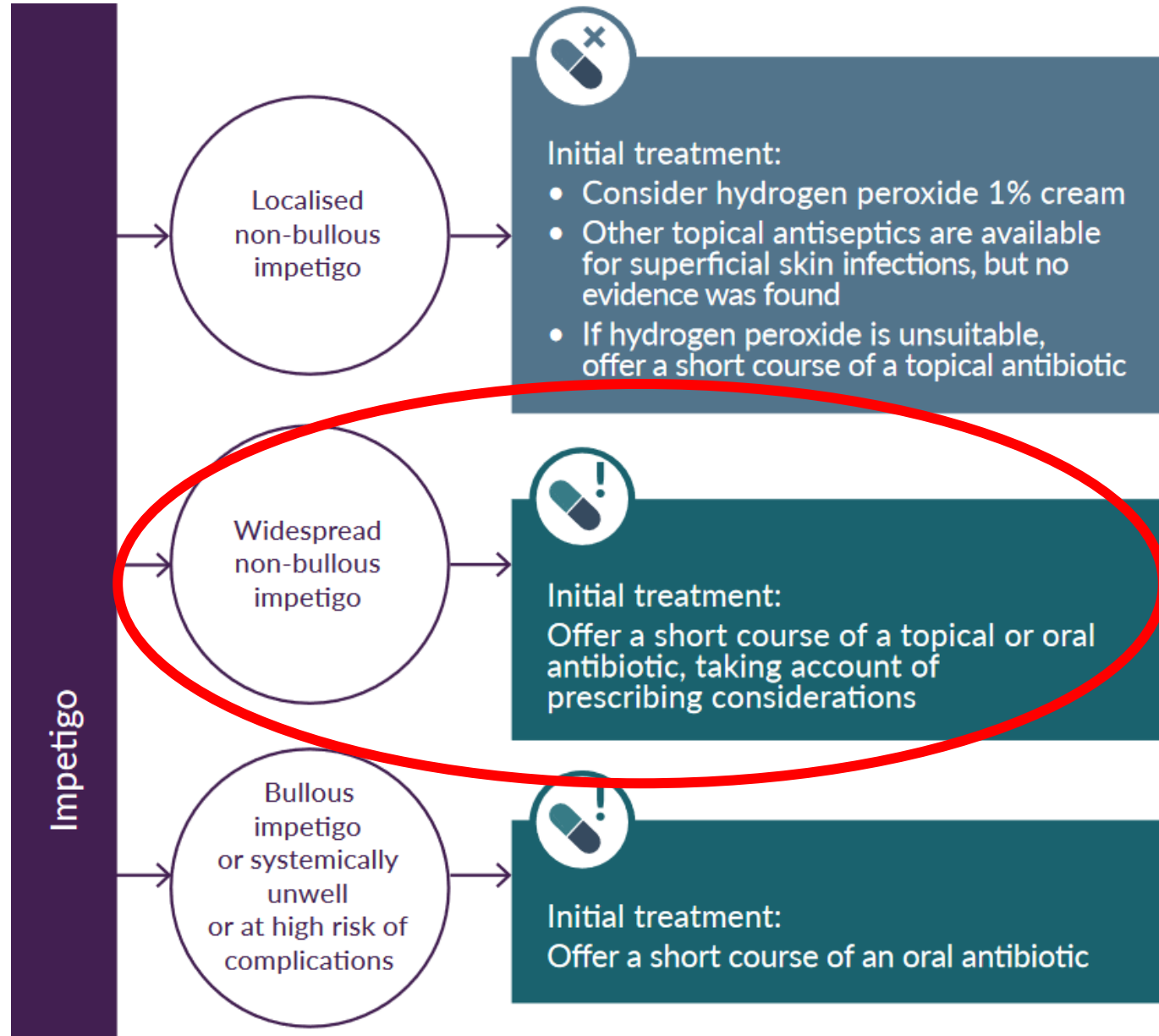
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# Treatment for widespread bullous impetigo

Impetigo

(NICE NG 153, 2020)

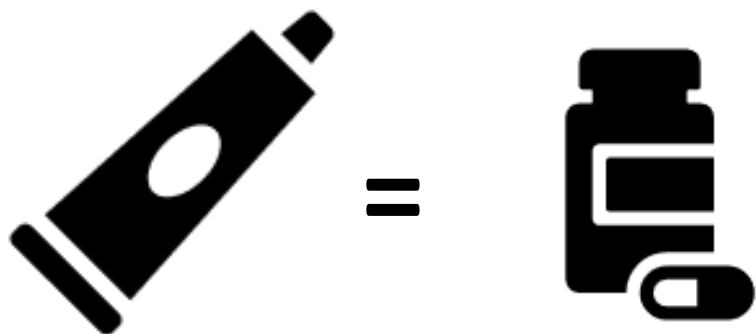




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# Widespread non-bullous Topical or oral?



## Prescribing considerations

Take into account:

- that topical and oral antibiotics are both effective at treating impetigo

### 1. Consider the evidence

*No statistically significant difference in effectiveness*

### 2. Patient preference?

*Topical likely less to cause side-effects*

### 3. Effective administration?

*Topical straightforward application for localised infection*

**AMR can develop rapidly with extended or repeated topical antibiotic**



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# Impetigo – treatment for widespread non bullous

## Choice of antimicrobial: children and young people under 18 years

Antimicrobial <sup>1</sup>	Dosage and course length <sup>2</sup>
Topical antiseptic	
Hydrogen peroxide 1% <sup>3</sup>	Apply two or three times a day for 5 days <sup>4</sup>
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# 5 days

Impetigo



Microbiological testing

### Frequent recurrence

Send a skin swab  
Consider nasal swab &  
treatment for suppression.

(NICE NG 153, 2020)

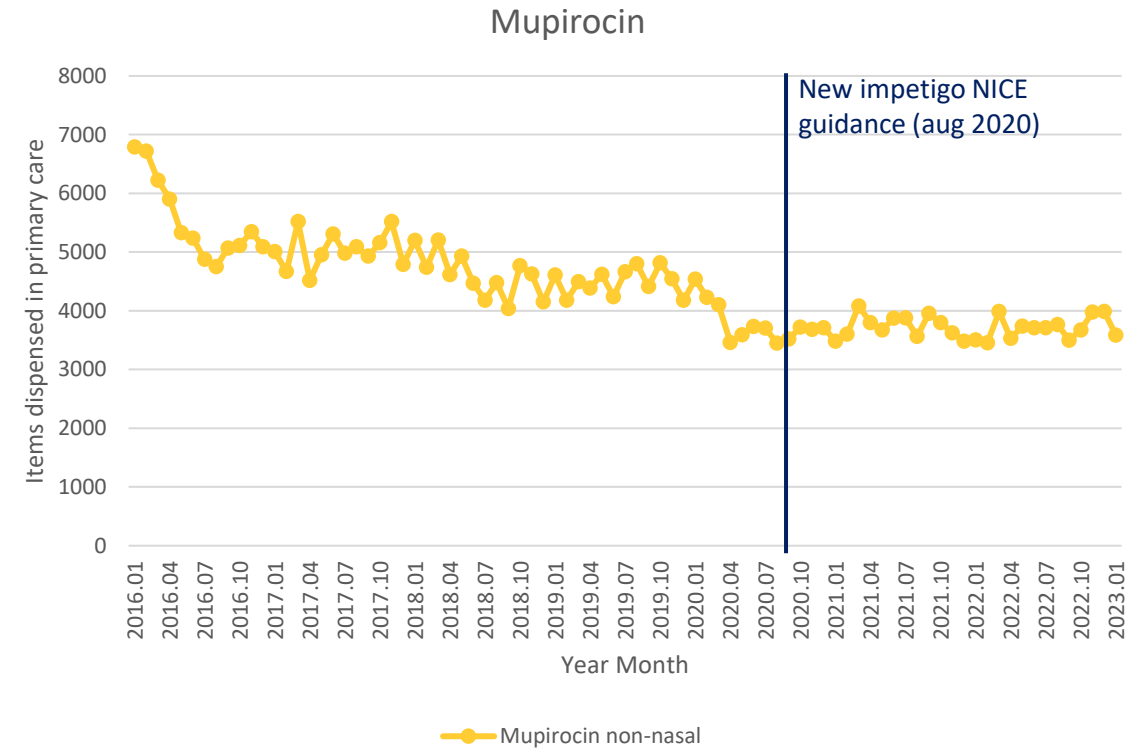
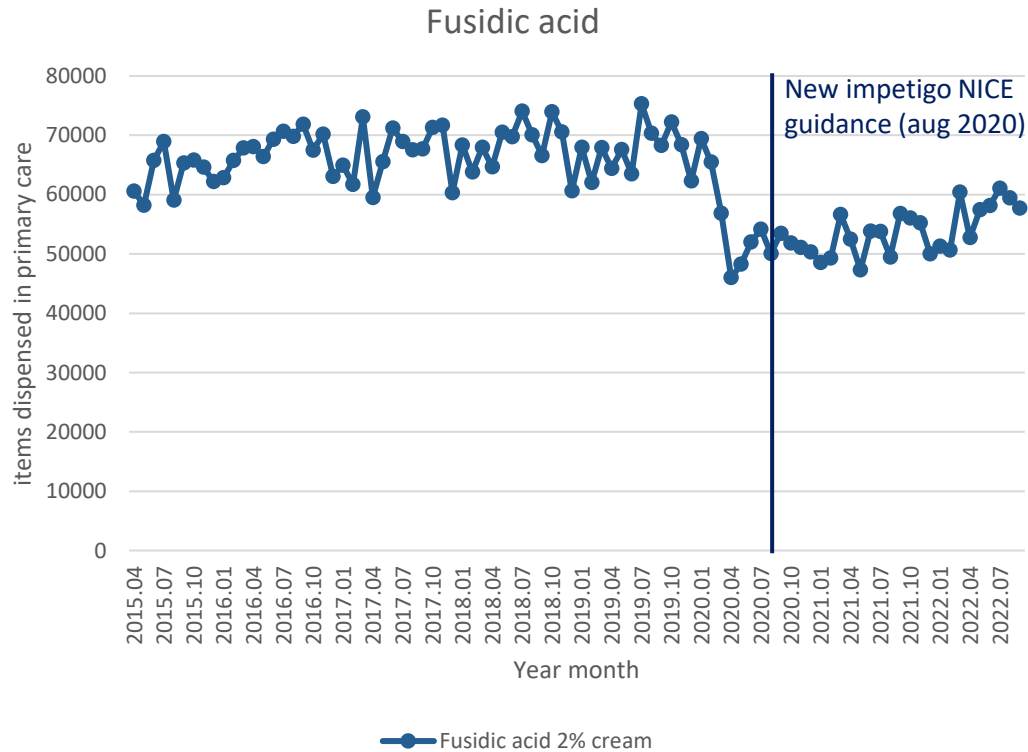


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# Impetigo antibiotic prescribing

Impetigo







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# Impetigo infection control advice

## 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



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# Impetigo NICE Guidance 153

## Summary

### Will you change your practice?



- ✓ Evidence supportive of topical antiseptic / hydrogen peroxide
- ✓ Antibiotic effectiveness: topical = oral
- ✓ Avoid extended or repeated use of topical antibiotics – risk resistance
- ! For Bullous impetigo – offer oral antibiotic
- Rx Treatment course 5 days for most

**IMPORTANT TO REMEMBER** infection control and self-care advice!

Impetigo



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# Leg ulcer background

- 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





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# 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?





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# Leg Ulcer Clinical scenario

*What are your treatment recommendations?*

1. Commence oral antibiotics immediately
2. Send swab sample and arrange review with results
3. Consider referral for IV antibiotics
4. Dress wound and arrange clinical review

*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.*





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# Few leg ulcers are clinically infected

## UNINFECTED ULCER (minimal surrounding erythema)



**Important to manage underlying conditions to promote healing**  
(E.g. venous insufficiency, oedema)

## INFECTED ULCER



**Only treat if symptoms / signs of infection:**  
*Increased pain, fever, redness or swelling spreading beyond ulcer, localised warmth*



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# Do not swab leg ulcer at initial presentation



**Initial presentation: Do not swab initially**  
(non-diabetic people)

**Worsening or not improving:** Consider swab (after cleaning) if symptoms or signs of the infection

**HOW to...**

When swabs taken from infected ulcers, they should be taken after cleansing and debridement





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# 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.



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# Leg Ulcer

NICE Guidance 152

## Summary

### Will you change your practice?

- ✓ Few leg ulcers are clinically infected, most are colonised
  - ✓ Important to manage underlying conditions to promote healing
  - ✓ Initial presentation: Do not swab, even if it might be infected
  - ! Antibiotics do not promote healing when not clinically infected
- Rx Cellulitis flucloxacillin 500mg qds 7 days



Leg Ulcer



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# 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

Cellulitis



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Cellulitis

# Cellulitis Clinical Scenario

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*





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# Cellulitis Clinical Scenario

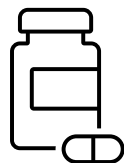
What do you do at this point?

1. Prescribe clarithromycin
2. Prescribe co-amoxiclav
3. Prescribe doxycycline
4. None of the above

**What else might it be?** Chronic conditions, usually bilateral: Varicose eczema/venous insufficiency, lipodermatosclerosis lymphoedema



Heart failure



(amlodipine, felodipine)







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# Conditions misidentified as cellulitis

## *Venous eczema and lipodermatosclerosis*

*Venous skin changes can be caused by:*

- **Venous insufficiency:** due to venous valve incompetence or impaired calf muscle pump
- **Deep vein thrombosis:** Can have unilateral presentation and be related to venous insufficiency

*Examination, varying severity:*

- **Hyperpigmentation** (haemosiderin)
- **Venous eczema** red, itchy, flaky, +/- pain, blisters, swelling
- **Lipodermatosclerosis** from chronic inflammation and fibrosis:
  - **Acute lipodermatosclerosis** (sclerosing panniculitis) - painful inflammation above ankles
  - **Chronic lipodermatosclerosis** painful, hardened, tight, 'inverted champagne bottle'



### *Advice:*

Keep active, weight loss, leg elevation, emollient  
 Compression stockings (after ABPI)  
 Acute flares – topical corticosteroid



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# 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

Cellulitis





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# Cellulitis Clinical Scenario

What antibiotic course length would you give?

1. 5 days
2. 7 days
3. 10 days
4. 14 days

## Clinical scenario answer

- 5-7 days recommended
- A longer course (up to 14 days in total) may be needed based on clinical assessment.
- Skin takes time to return to normal, full resolution at 5 - 7 days is not expected.

### *Evidence*

*1RCT fluoroquinolone 5 vs 10days n=87*




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# Diagnosis and risk factors



Cellulitis

- **Usually unilateral.** Bilateral leg cellulitis is rare. 
- **Acute onset:** red, painful, hot, swollen, and tender skin, that spreads rapidly, fever & malaise
- **Check for skin break/organism entry site** e.g. wound/trauma, macerated skin, fungal skin infection, concomitant skin disorder

## Other Risk factors & comorbidities which may complicate or delay resolution of infection:

- Oedema, venous insufficiency, obesity
- Diabetes
- Peripheral vascular disease
- Immunosuppression

*See CKS for further information*



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# Acute complications

## Cellulitis

- 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



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# Cellulitis

## Management

Most common causative pathogens *Streptococcus pyogenes* and *Staphylococcus aureus*, therefore flucloxacillin first line

Cellulitis



Consider swab if skin broken,  
+ risk uncommon pathogen e.g.

- Penetrating injury,
- Exposure to water-borne organisms
- Infection acquired outside UK



Consider marking extent with  
single-use surgical marker pen



Manage underlying conditions  
E.g. diabetes, venous  
insufficiency eczema and  
oedema  
(calcium channel blockers)



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# Cellulitis and erysipelas: antimicrobial prescribing

## Choice of antibiotic for treatment: adults aged 18 years and over

Antibiotic <sup>1</sup>	Dosage and course length <sup>2</sup>
First choice antibiotic (give oral unless person unable to take oral or severely unwell) <sup>3</sup>	
Flucloxacillin	500 mg to 1 g four times a day orally <sup>4</sup> for 5 to 7 days <sup>5</sup>
Alternative first choice antibiotics for penicillin allergy or if flucloxacillin unsuitable (give oral unless person unable to take oral or severely unwell) <sup>3</sup>	
Clarithromycin	500 mg twice a day orally for 5 to 7 days <sup>5</sup>
Erythromycin (in pregnancy)	500 mg four times a day orally for 5 to 7 days <sup>5</sup>
Doxycycline	200 mg on first day, then 100 mg once a day orally for 5 to 7 days in total <sup>5</sup>
First choice antibiotic if infection near the eyes or nose <sup>7</sup> (consider seeking specialist advice; give oral unless person unable to take oral or severely unwell) <sup>3</sup>	
Co-amoxiclav	500/125 mg three times a day orally for 7 days <sup>5</sup>
Alternative first choice antibiotics if infection near the eyes or nose <sup>7</sup> for penicillin allergy or if co-amoxiclav unsuitable (consider seeking specialist advice; give oral unless person unable to take oral or severely unwell) <sup>3</sup>	
Clarithromycin <i>with</i>	500 mg twice a day orally for 7 days <sup>5</sup>
Metronidazole	400 mg three times a day orally for 7 days <sup>5</sup>
Alternative choice antibiotics for severe infection	
Co-amoxiclav	500/125 mg three times a day orally for 7 days <sup>5</sup>

(NICE NG 141, 2019)

Cellulitis



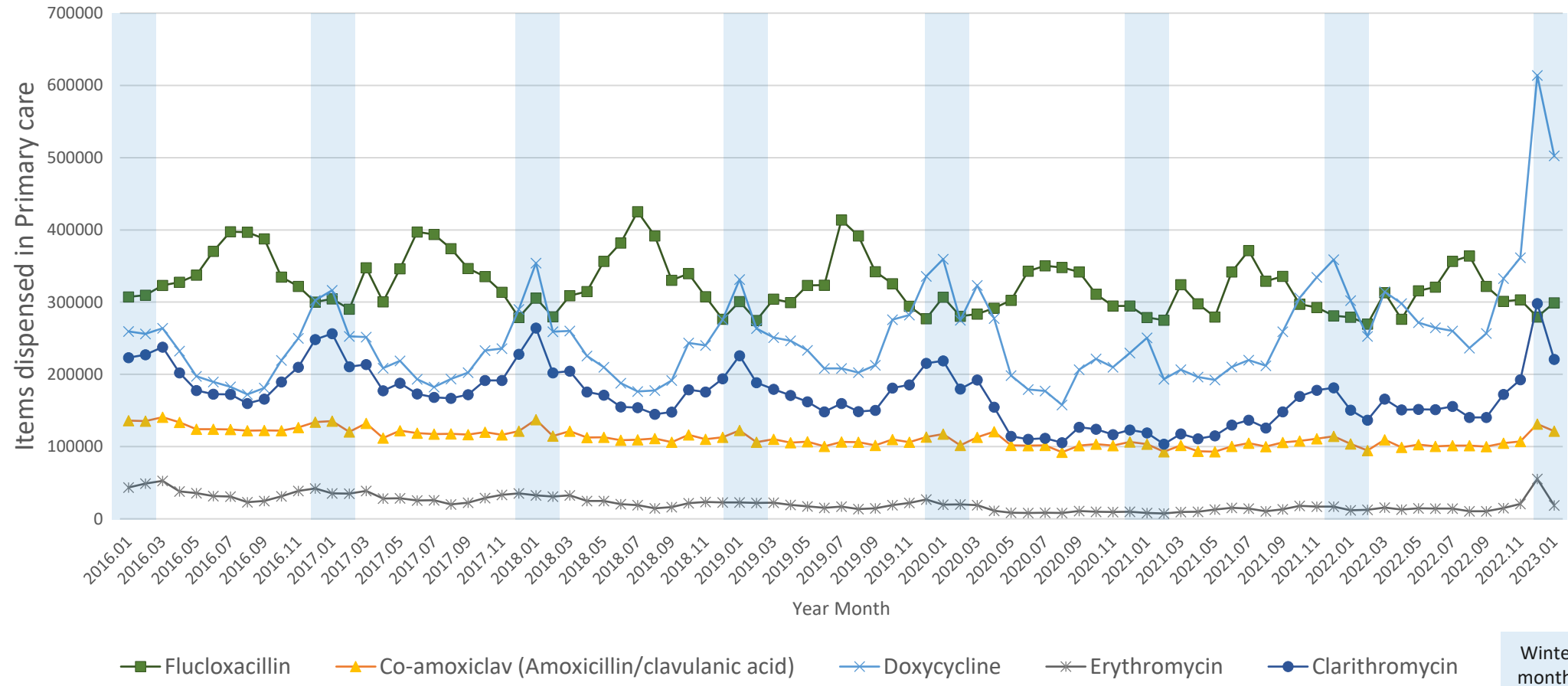
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# Seasonal flucloxacillin prescribing

Cellulitis

## Antibiotics dispensed in primary care







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# 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.*





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# Cellulitis

NICE Guidance 141

## Summary

Cellulitis



- ✓ Exclude other causes of skin redness & oedema
- ✓ Look for site of entry e.g. skin break
- ✓ Usually affects one limb, bilateral cellulitis is rare
- ! Manage underlying conditions

**Rx** First line - flucloxacillin (500mg/1g), 4 times a day, 5-7 days (up to 14 days)

Give prevention advice and advise that skin takes some time to return to normal after antibiotics finished



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# Summary table

Condition	Course length	Footnote
Impetigo	<b>5 days</b>	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	<b>7 days</b>	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	<b>5-7 days</b>	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.