Optimising Antibiotic Use in Childhood Respiratory Infections in Primary Care: From Guidance to Practice.

Mildred Iro
Senior Clinical Lecturer, QMUL
Consultant in paediatric infectious diseases and immunology, Royal London Hospital, Barts Health NHS Trust

NEL TARGET Antibiotics Webinar
24 March 2026

Learning Objectives

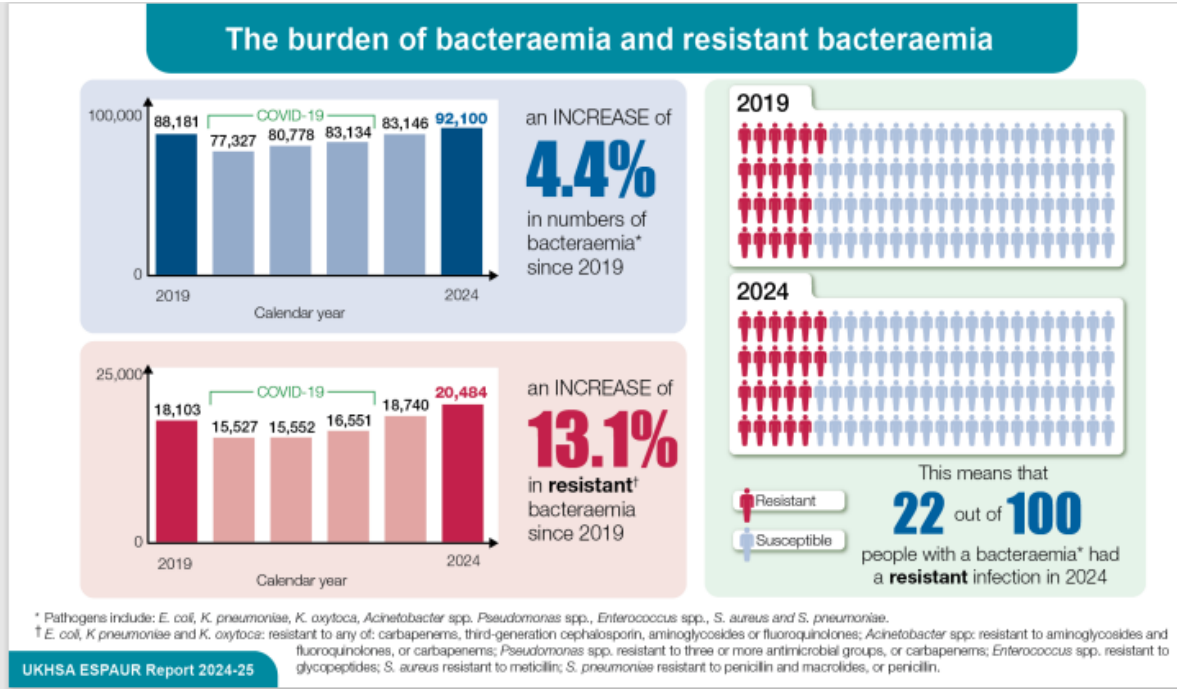
1. Outline the key drivers and consequences of antimicrobial resistance (AMR), and discuss why urgent, collective action is required.

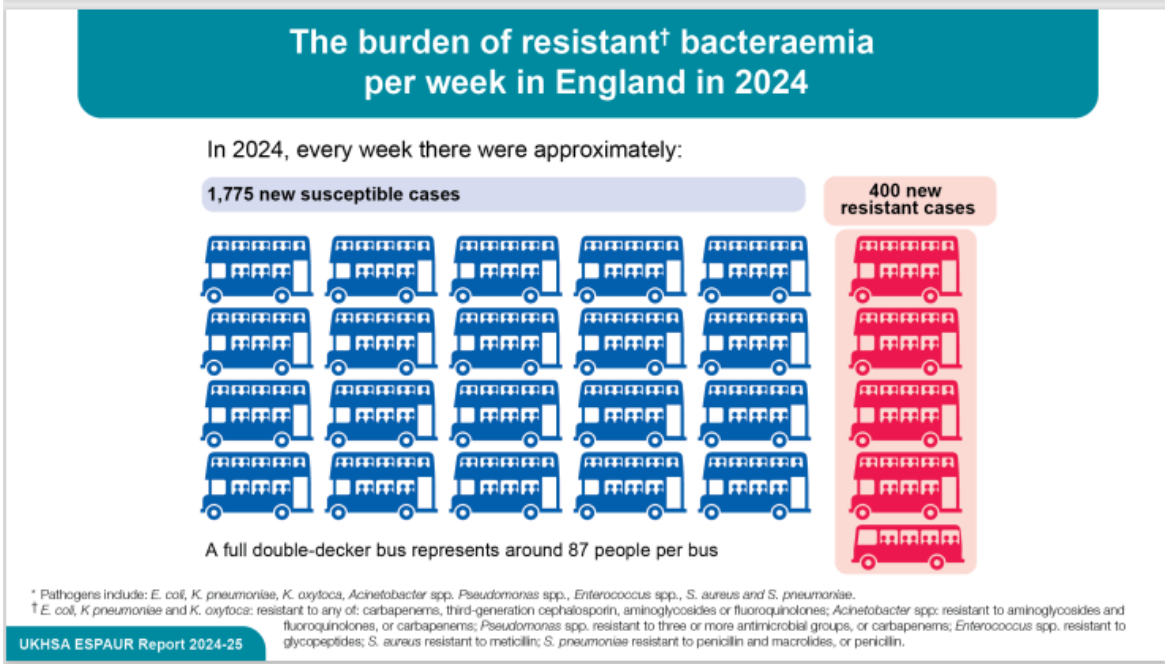
2. Apply evidence-based guidance (e.g. NICE, TARGET) to optimise antibiotic prescribing for respiratory tract infections (RTIs) in primary care settings.

3. Discuss effective, evidence-based communication strategies to support discussions with patients and carers about paediatric RTIs

4. Use clinical reasoning in case-based scenarios to identify which RTIs in children are self-limiting and which require escalation, supporting safe and appropriate prescribing decisions

Antimicrobial resistance (AMR) is a significant global health problem

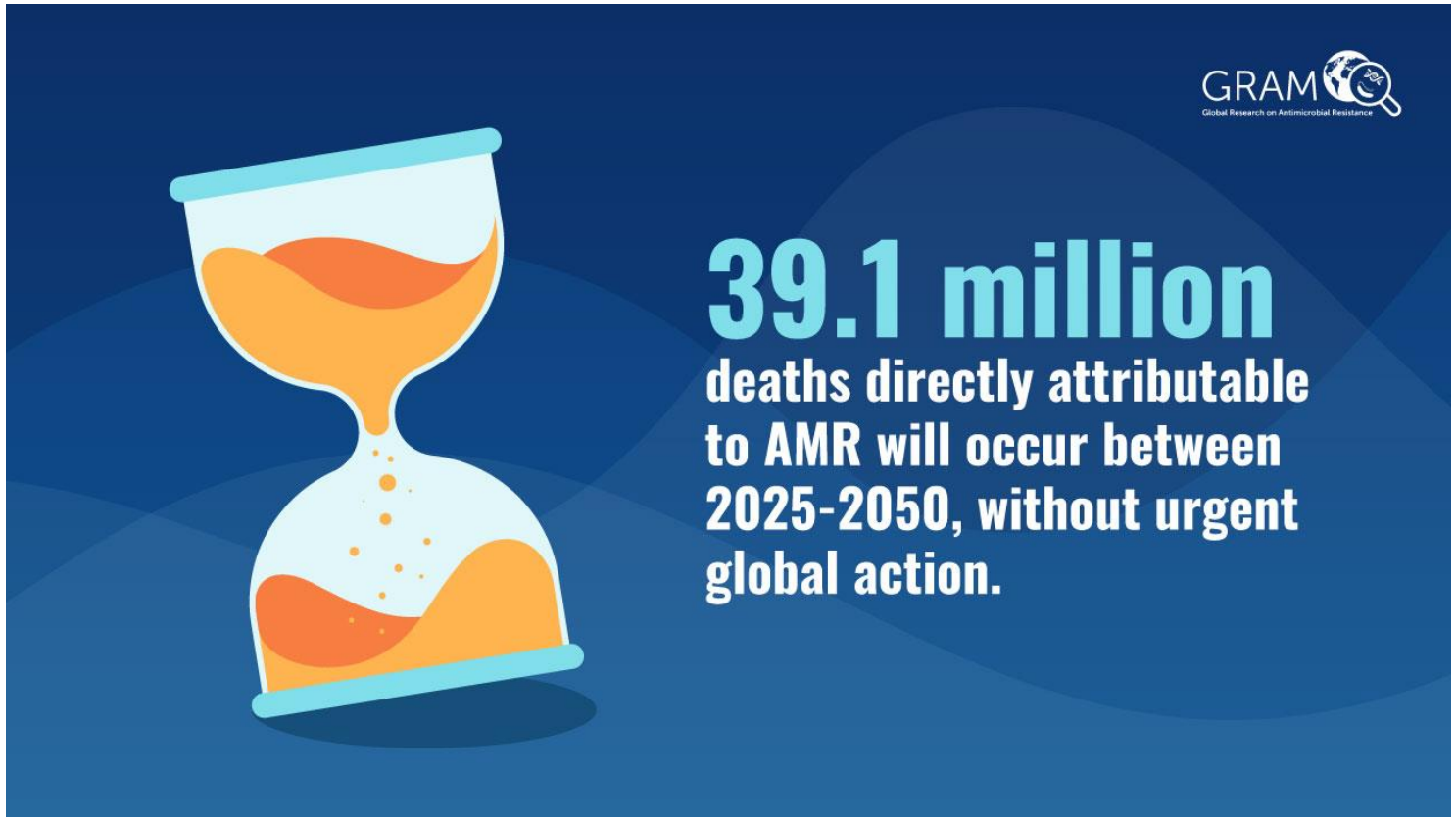




13.1% increase between 2019 and 2024

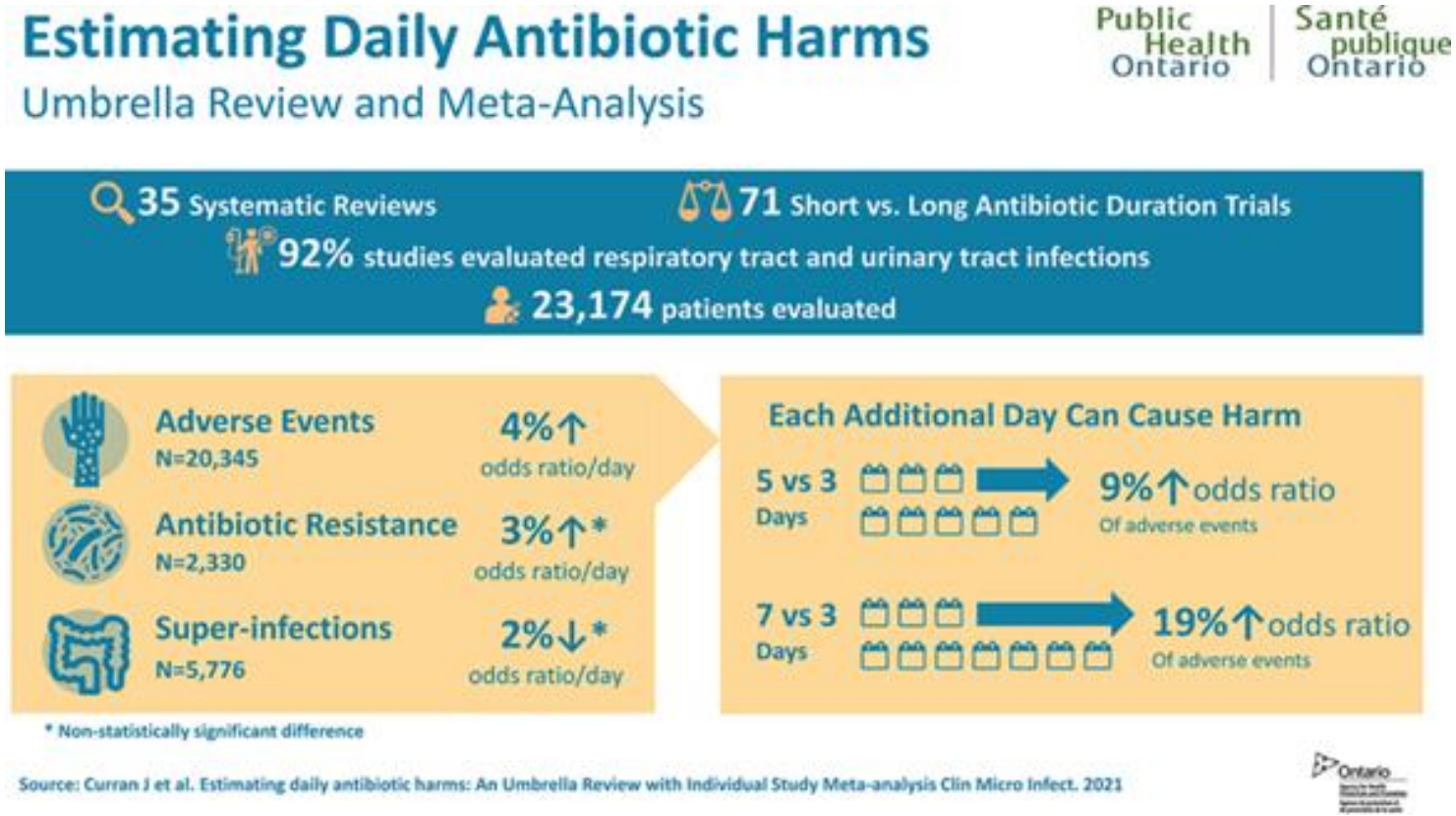
That is an average of nearly 400 new patient episodes of resistant bacteraemia each week

AMR kills: a stark mortality gradient



Over prescribing of antibiotics is a major driver for AMR

Systematic review of 71 RCTs comparing short and longer antibiotic courses



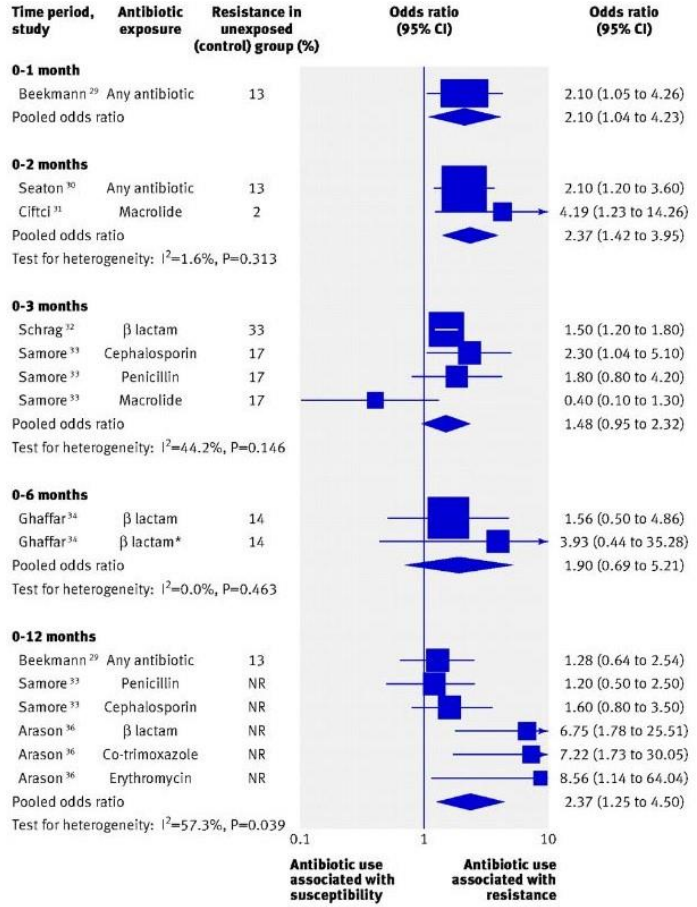
Curran et al, Clin Microbiol Infect 2022; 28:479-490

Impact of prescribing amoxicillin to a child in primary care for RTI

- Within 2 weeks:

- 2.4-fold increase in the odds of isolating a resistant organism after exposure

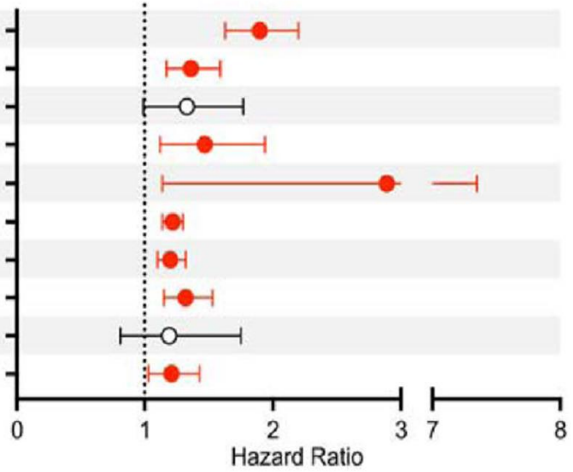
- Resistance can persist for up to 12 months after a course of antibiotics

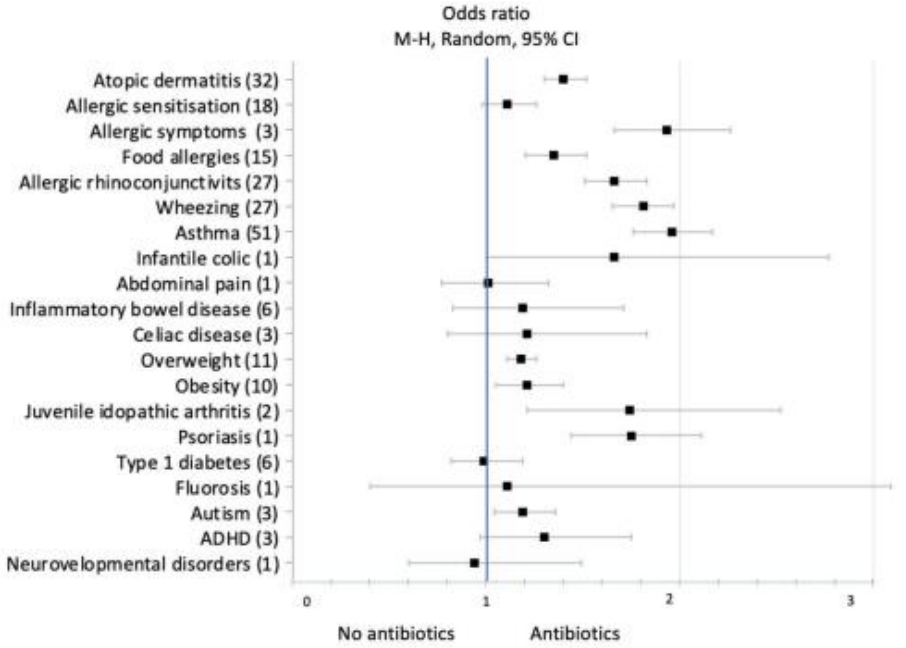


[1]Chung et al, *BMJ* 2007; **35**:429; [2]Costelloe et al, *BMJ* 2010; **340**:c2096

Potential long-term harm from long antibiotic courses

Condition	No. of subjects	No. of events	HR (95% CI)	p-value
Asthma	14299	1176	1.90 (1.63-2.20)	<.001
Allergic rhinitis	14545	971	1.36 (1.17-1.59)	<.001
Food allergy	14402	261	1.33 (0.99-1.77)	.054
Atopic dermatitis	14166	297	1.47 (1.12-1.94)	.006
Celiac disease	14569	45	2.89 (1.14-7.35)	.025
Overweight	12873	4856	1.22 (1.14-1.30)	<.001
Obesity	13649	2567	1.20 (1.10-1.32)	<.001
ADHD	14572	1085	1.32 (1.15-1.53)	.001
Autism	14571	142	1.19 (0.81-1.75)	.385
Learning disability	14392	751	1.21 (1.03-1.43)	.022





1. Duong Q et al. **Antibiotic exposure and adverse long-term health outcomes in children: A systematic review and meta-analysis**. Journal of Infection, 2022; 85, 213-300;
2. Aversa, Z. et al *Mayo Clinic Proc* 2021; **96**: 66

TARGET

Keep Antibiotics Working

NHS

Barts Health

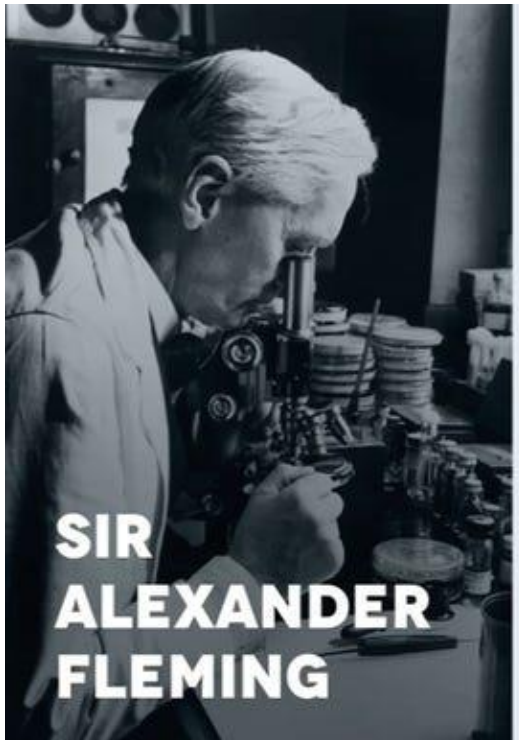
NHS Trust

Professor Dame Sally Davies: 'If we don't contain AMR, we lose modern medicine'

"Without new antibiotics, we will move into an apocalyptic phase. The data already shows that more people are dying of AMR than of climate change every year, and it's going to get worse."

– Professor Dame Sally Davies, **UK Special Envoy for AMR**

Antimicrobial stewardship isn't optional - it's a moral responsibility to safeguard our patients now and in the future



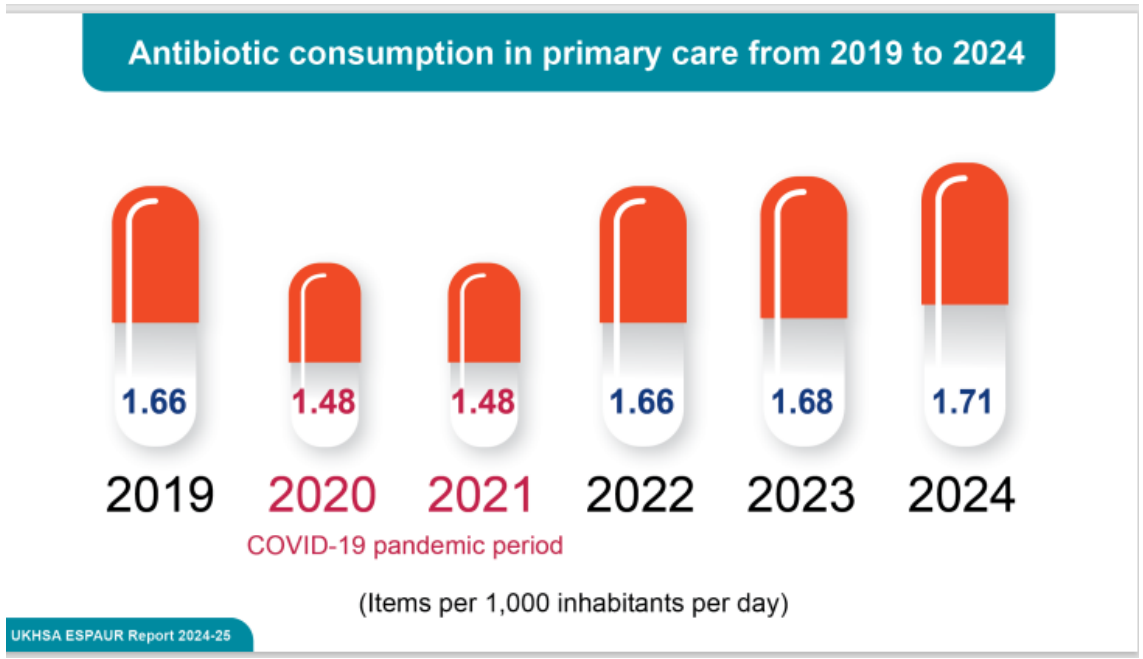
The thoughtless person playing with penicillin treatment is morally responsible for the death of the man who succumbs to infection with the penicillin-resistant organism.

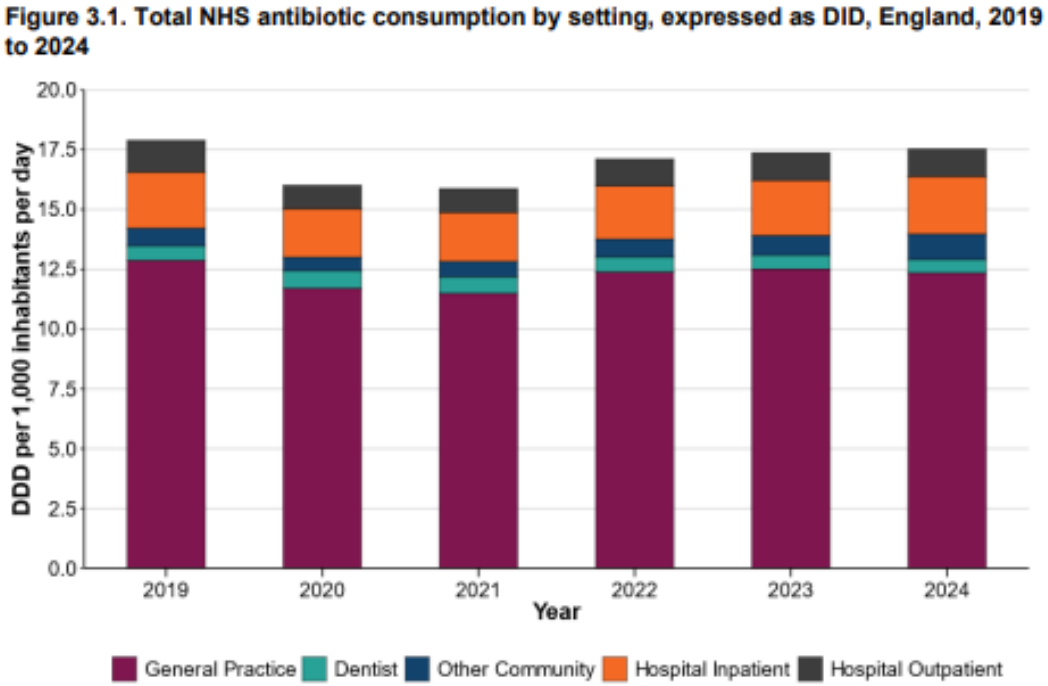
TECH

Penicillin's discoverer predicted our coming post-antibiotic era 70 years ago

By Julia Calderone

80% of antibiotics are prescribed in primary care (70% in GP practices)



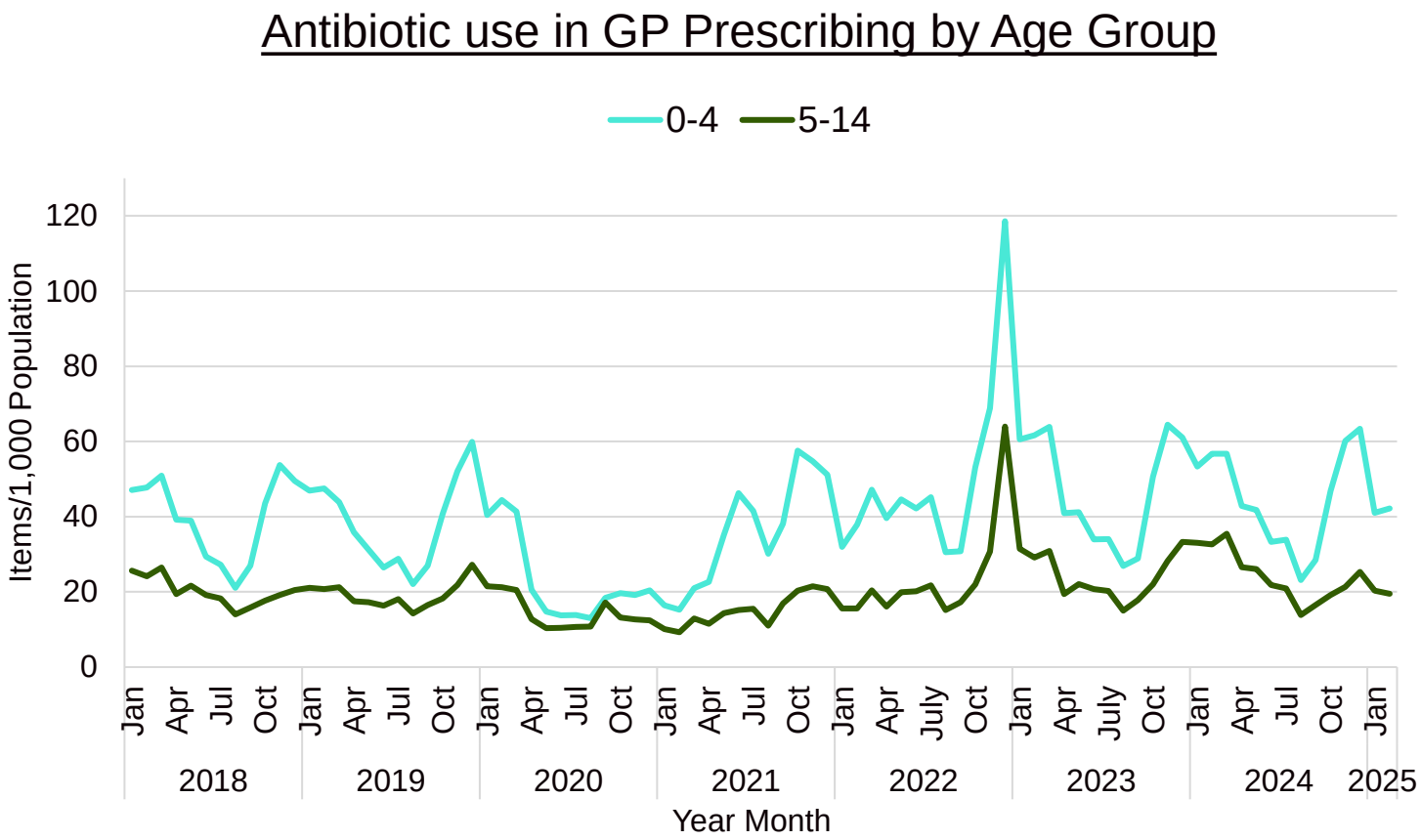


Paediatric prescribing in general practice

On average (2018-2024), every year

0-14 age group accounted for **12.2%** of antibiotic prescriptions in general practice in England

That is around **3.1 million** antibiotic prescriptions



Statistics courtesy of UKHSA Antimicrobial Resistance and Prescribing Team

Volume of prescribing of antibiotics to children aged 0-14 in England 2022-23

Antibiotic prescriptions for children aged 0-14y

Proportion of antibiotic prescriptions that are for children aged 0-4y

Proportion of all children aged 0-4y prescribed an antibiotic

ESPAUR report 2022-23

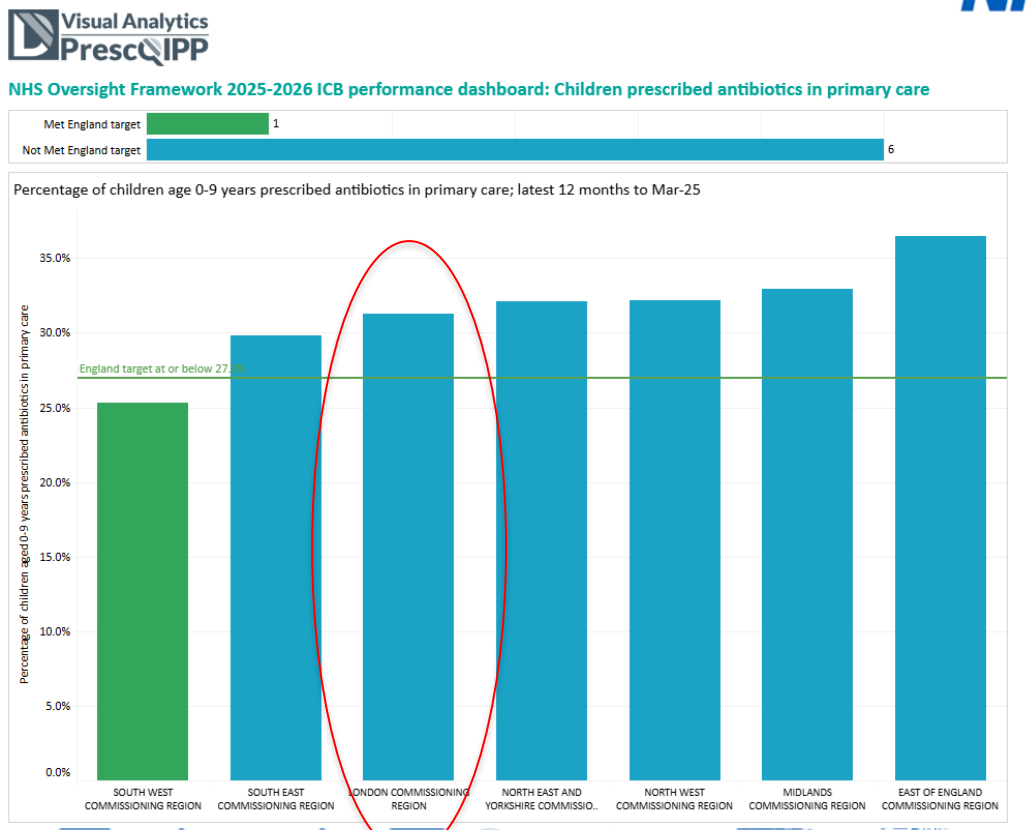
Paediatric prescribing in primary care

Percentage of children aged 0-9 years who have been prescribed at last one antibiotic in primary care (latest 12 months to March 2025)

Regions/ICB performance assessed as Met or Not Met against a fixed nation England target: At or below 27%

31.7%

children under 10 were prescribed antibiotics in the last year



PrescQIPP, 2023

Pattern of antibiotic prescribing for children in primary care (NEL ICB)

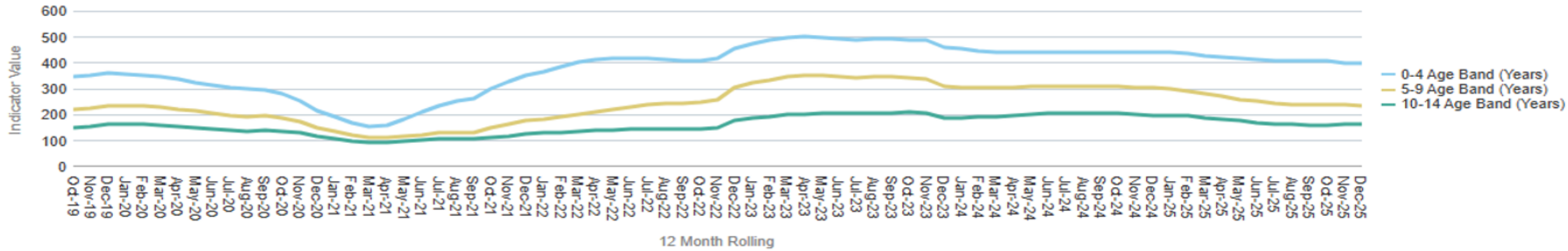
Children prescribed antibiotics in the 0-9 years age band in NHS NORTH EAST LONDON ICB - A3A8R: 12 Months to Dec-25

Quartile 4 - Highest 25%	Quartile 4 - Highest 25%			
466	314	87,642	71,758	15,884
Prescribing of antibacterial items per 1,000 children	Number of children prescribed antibiotics per 1,000 children	Number of children prescribed antibiotics	Number of children prescribed one antibiotic	Number of children prescribed two or more antibiotics

ASC02 - Number of children prescribed antibiotics per 1,000 children

12 Month Rolling trend over time for children prescribed per 1,000 children on registered list size for each age band in NHS NORTH EAST LONDON ICB - A3A8R

Graph



What antibiotics are being prescribed for children in primary care (NEL ICB)

ASC04 - Prescribing of specific antibiotic items per 1,000 children

Items prescribed per 1,000 children on registered list size in the 0-9 years age band in NHS NORTH EAST LONDON ICB - A3A8R highlighted within results for NHS NORTH EAST LONDON INTEGRATED CARE BOARD: 12 Months to Dec-25

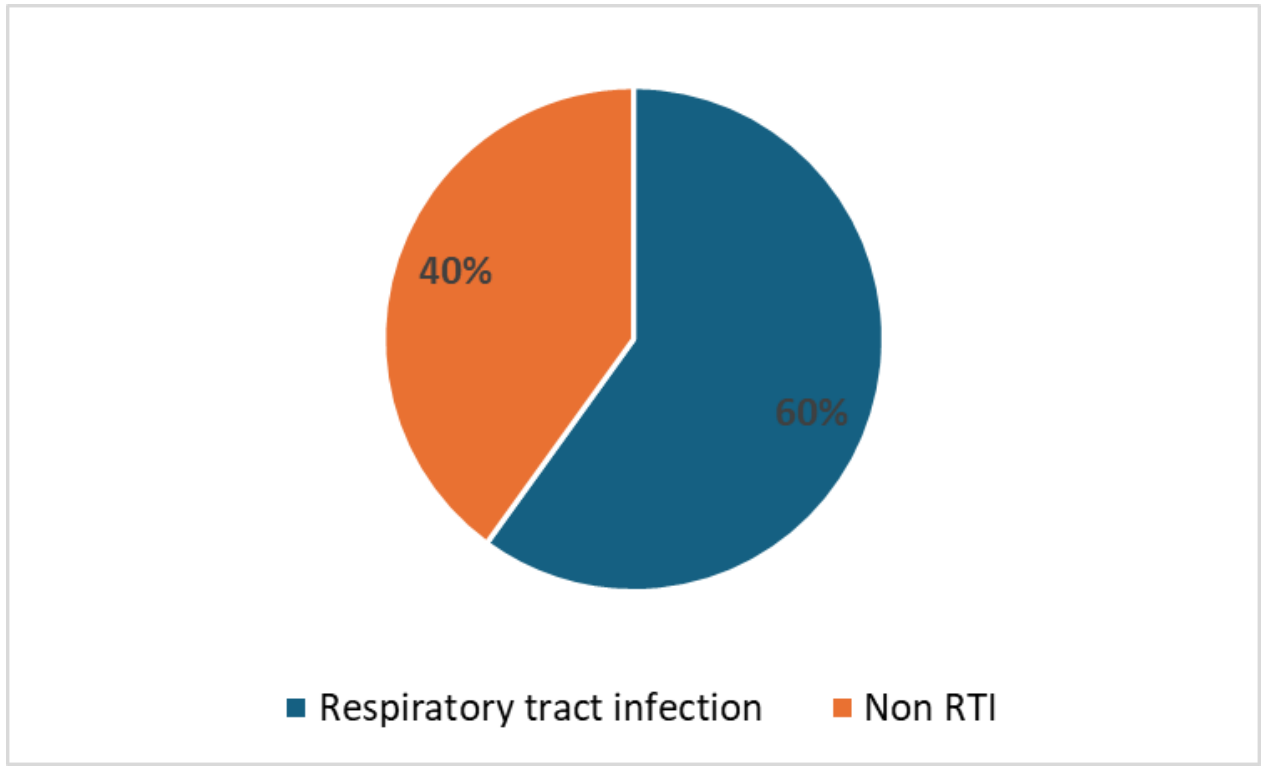
Quartile 4 - Highest 25%	Quartile 4 - Highest 25%	Quartile 4 - Highest 25%	Quartile 4 - Highest 25%	Quartile 4 - Highest 25%	Quartile 4 - Highest 25%	Quartile 4 - Highest 25%	Quartile 4 - Highest 25%	Quartile 4 - Highest 25%
255	4	14	32	46	3	85	0	23
Amoxicillin	Cephalosporins	Co-Amoxiclav (Amoxicillin/Clavul Acid)	Flucloxacillin	Macrolides	Nitrofurantoin	Phenoxymethylpenicillin (Penicillin V)	Tetracyclines	Trimethoprim

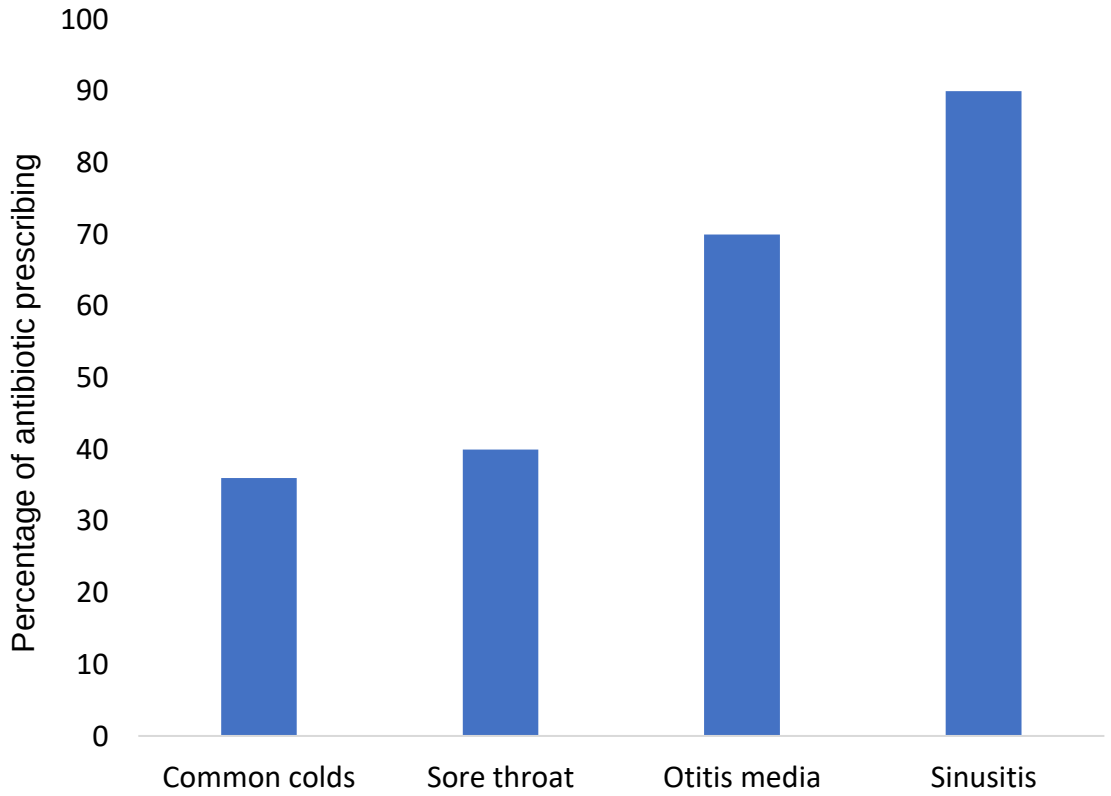
ASC04 - Prescribing of specific antibiotic items per 1,000 children

Items prescribed per 1,000 children on registered list size in the 0-4 years age band in NHS NORTH EAST LONDON ICB - A3A8R highlighted within results for NHS NORTH EAST LONDON INTEGRATED CARE BOARD: 12 Months to Dec-25

Quartile 4 - Highest 25%	Quartile 4 - Highest 25%	Quartile 4 - Highest 25%	Quartile 4 - Highest 25%	Quartile 4 - Highest 25%	Quartile 4 - Highest 25%	Quartile 4 - Highest 25%	Quartile 4 - Highest 25%	Quartile 4 - Highest 25%
363	4	16	36	57	2	103	0	23
Amoxicillin	Cephalosporins	Co-Amoxiclav (Amoxicillin/Clavul Acid)	Flucloxacillin	Macrolides	Nitrofurantoin	Phenoxymethylpenicillin (Penicillin V)	Tetracyclines	Trimethoprim

Why focus on respiratory tract infections





Why parents visit healthcare settings

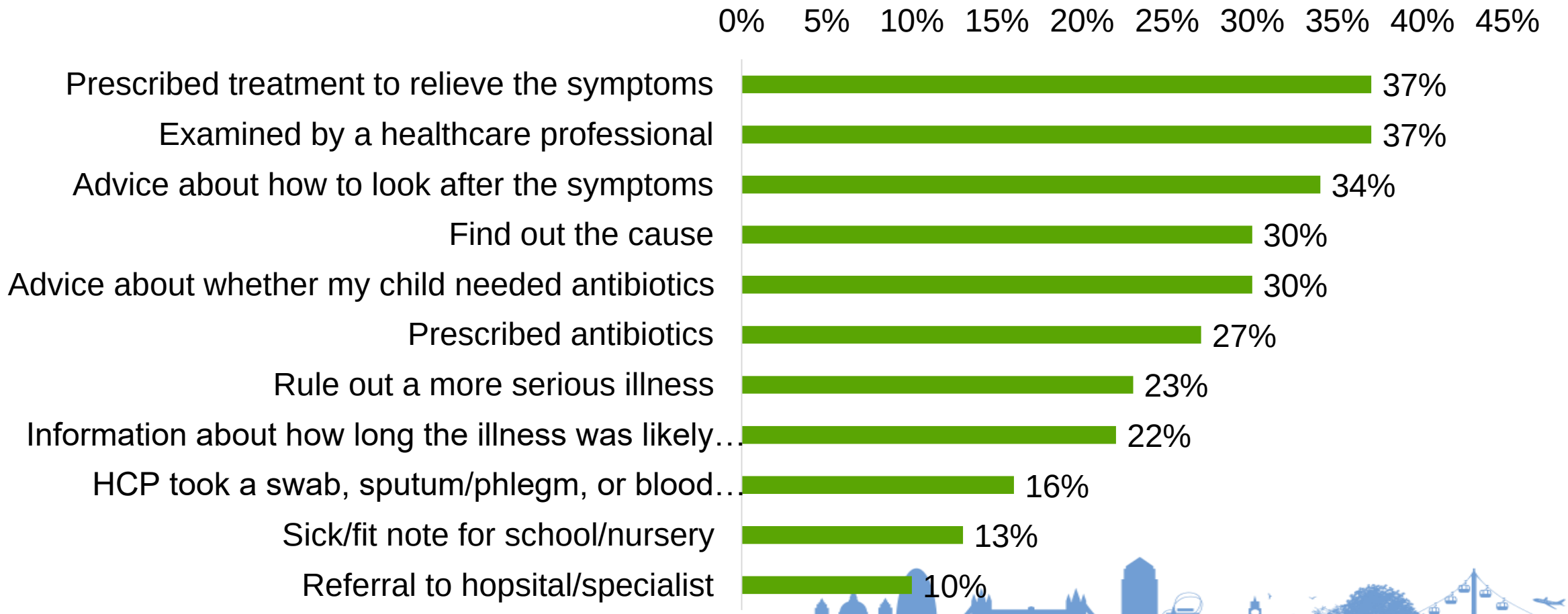
Remove health threat through appropriate treatment.
Seeking safety in the face of uncertainty

Want **reassurance**, parental anxiety is high

Parents cautious about antibiotics and wanted to be prescribed **only when necessary**
Preference for natural remedies, need for clarity about what was wrong

Cabral et al. (2015), Szymczak et al. (2018), Nicholson et al. (2020), Kubb et al. (2020)

2024 parent public survey findings highlight that antibiotic prescribing is not parents' main expectation when visiting the GP



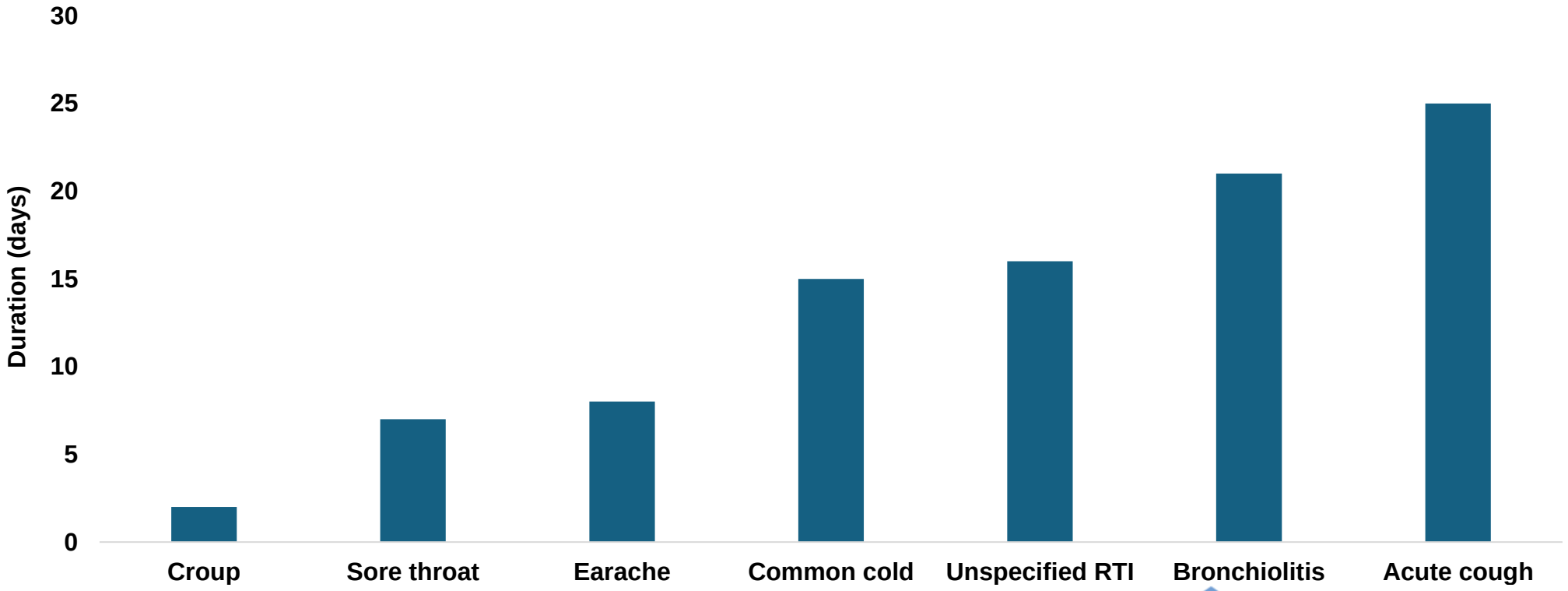
Strategies for reducing antibiotic prescribing

NO ANTIBIOTIC STRATEGY

DELAYED PRESCRIPTION

SHORTEST DURATION OF TREATMENT

Time to resolution of symptoms in children with RTI



Thompson et al, BMJ 2013; **347**:f7027

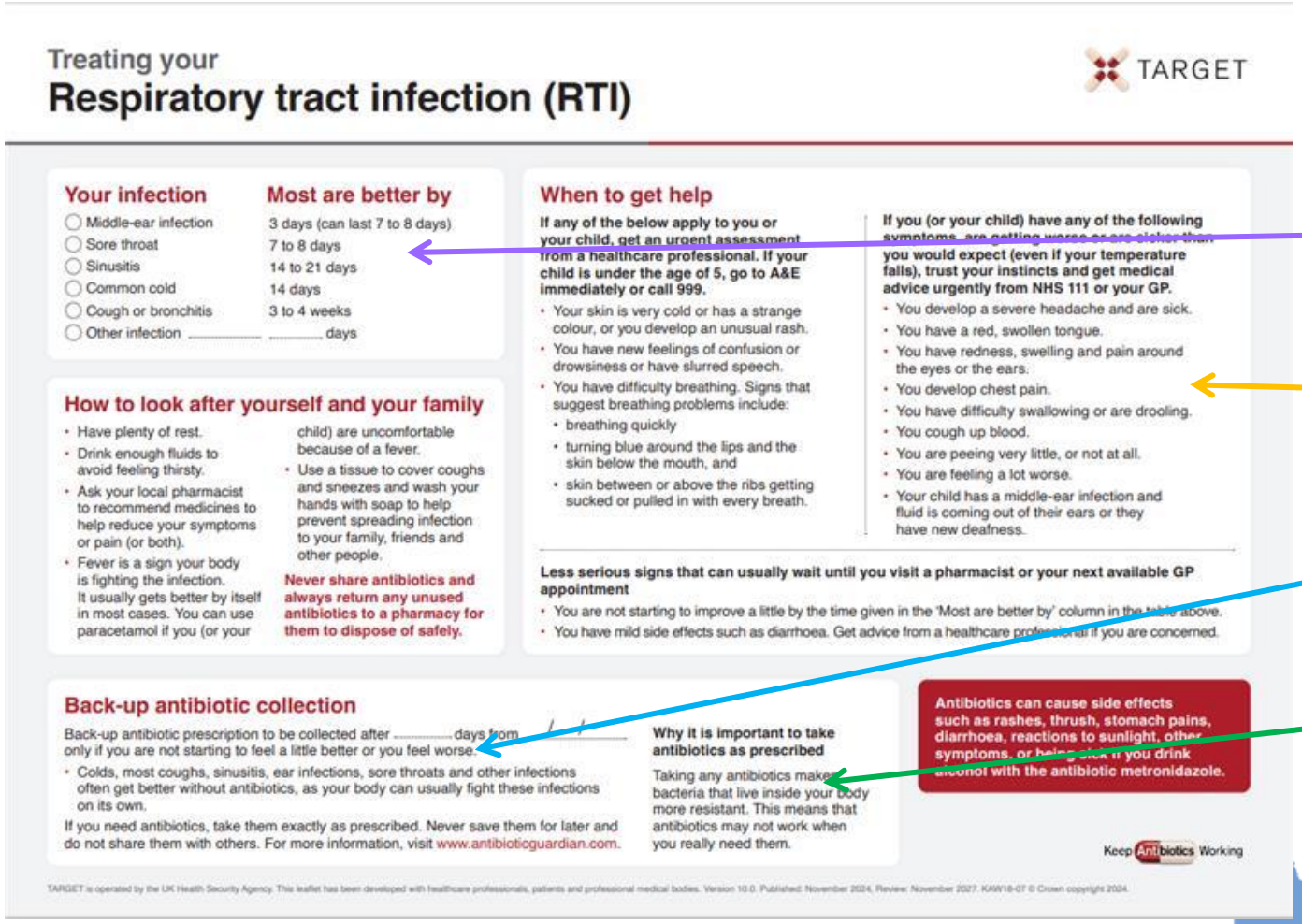
What can aid a ‘no antibiotic’ strategy

- Having a satisfactory/effective consultation
- Promoting self-care & safety netting with patient information leaflets & resources e.g. CHICO leaflet, Healthier Together website, Polar Bear Leaflet, TARGET resources)

TARGET: Treating Your Infection RTI Leaflet

TARGET
Keep Antibiotics Working

NHS
Barts Health
NHS Trust



Treating your
Respiratory tract infection (RTI)

TARGET

Your infection / **Most are better by**

Middle-ear infection	3 days (can last 7 to 8 days)
Sore throat	7 to 8 days
Sinusitis	14 to 21 days
Common cold	14 days
Cough or bronchitis	3 to 4 weeks
Other infection	..... days

How to look after yourself and your family

- Have plenty of rest.
- Drink enough fluids to avoid feeling thirsty.
- Ask your local pharmacist to recommend medicines to help reduce your symptoms or pain (or both).
- Fever is a sign your body is fighting the infection. It usually gets better by itself in most cases. You can use paracetamol if you (or your child) are uncomfortable because of a fever.
- Use a tissue to cover coughs and sneezes and wash your hands with soap to help prevent spreading infection to your family, friends and other people.

Never share antibiotics and always return any unused antibiotics to a pharmacy for them to dispose of safely.

When to get help

If any of the below apply to you or your child, get an urgent assessment from a healthcare professional. If your child is under the age of 5, go to A&E immediately or call 999.

- Your skin is very cold or has a strange colour, or you develop an unusual rash.
- You have new feelings of confusion or drowsiness or have slurred speech.
- You have difficulty breathing. Signs that suggest breathing problems include:
  - breathing quickly
  - turning blue around the lips and the skin below the mouth, and
  - skin between or above the ribs getting sucked or pulled in with every breath.

If you (or your child) have any of the following symptoms, are getting worse or are sicker than you would expect (even if your temperature falls), trust your instincts and get medical advice urgently from NHS 111 or your GP.

- You develop a severe headache and are sick.
- You have a red, swollen tongue.
- You have redness, swelling and pain around the eyes or the ears.
- You develop chest pain.
- You have difficulty swallowing or are drooling.
- You cough up blood.
- You are peeing very little, or not at all.
- You are feeling a lot worse.
- Your child has a middle-ear infection and fluid is coming out of their ears or they have new deafness.

Less serious signs that can usually wait until you visit a pharmacist or your next available GP appointment

- You are not starting to improve a little by the time given in the 'Most are better by' column in the table above.
- You have mild side effects such as diarrhoea. Get advice from a healthcare professional if you are concerned.

Back-up antibiotic collection

Back-up antibiotic prescription to be collected after ..... days from / / only if you are not starting to feel a little better or you feel worse.

- Colds, most coughs, sinusitis, ear infections, sore throats and other infections often get better without antibiotics, as your body can usually fight these infections on its own.

If you need antibiotics, take them exactly as prescribed. Never save them for later and do not share them with others. For more information, visit www.antibioticguardian.com.

Why it is important to take antibiotics as prescribed

Taking any antibiotics make bacteria that live inside your body more resistant. This means that antibiotics may not work when you really need them.

Antibiotics can cause side effects such as rashes, thrush, stomach pains, diarrhoea, reactions to sunlight, other symptoms, or being sick if you drink alcohol with the antibiotic metronidazole.

Keep Antibiotics Working

TARGET is operated by the UK Health Security Agency. This leaflet has been developed with healthcare professionals, patients and professional medical bodies. Version 10.0. Published: November 2024. Review: November 2027. KAW18-07 © Crown copyright 2024.

'Most are better by' section to help patients know when to (re) consult

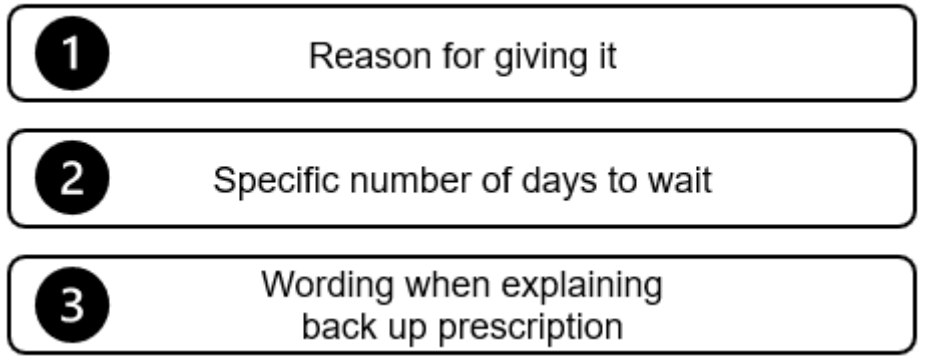
Safety netting

Back-up prescription

Information about antibiotics & AMR

What about back up antibiotics?

- Patients are still satisfied – no difference to immediate antibiotics (86% vs 91% immediate)
- Reduction in antibiotics use (30% vs 93% immediate)
- No difference in re-consultation rates compared to immediate antibiotics



Spurling et al, *Cochrane Database Syst Rev* 2023;**10**:CD004417

Shorter duration of antibiotics for non-severe CAP – what is the evidence

	SCOUT-CAP	CAP-IT	SAFER	Greenberg et al	MASCOT trial
Year	2016-2019	2017-2019	2012-2014 (pilot) and follow up 2016-2019	2016-2019	2017-2019
Country	USA	UK and Ireland	Ontario	Israel	Pakistan
Participants	308 (6 months to 71 months)	824 (6 months and older) –	281 (6 months -10 years)	140 (6 -59 months)	2000 (2 to 59 months)
Intervention and comparator	5 versus 7 days	Low dose/high dose amoxicillin for 3 or 7 days	5 versus 10 days of amoxicillin	High dose amoxicillin: 3 vs 10 days 5 vs 10 days	3 days vs 5 days amoxicillin
Outcome	End of treatment response	Clinically indicated antibiotic re-treatment for respiratory infection within 28 days after randomisation	Clinical cure at 14 to 21 days	Treatment failure	Treatment failure
Summary of main findings	5-day antibiotic strategy was superior to a 10-day strategy	Lower-dose noninferior to higher dose 3-day duration noninferior to 7 days	Short-course antibiotic therapy comparable to standard care	High dose amoxicillin for 5 days was not inferior to 10 days 3 days may be associated with unacceptable failure rate	3-days of oral amoxicillin non inferior to 5 days Treatment failure associated with non-compliance

SCOUT-CAP trial, CAP-IT trial, MASCOT trial, Greenberg et al 2014 SAFER trial

Resources to support paediatric AMS discussions

- Course: TARGET antibiotics toolkit hub | RCGP Learning
- Your gut friends V0.3
- Super Bodies - NHS Cheshire and Merseyside
- Leaflets to discuss with patients | RCGP Learning

TARGET
Keep Antibiotics Working

NHS
Barts Health
NHS Trust

Clinical Scenarios

Join at
slido.com
#1548 108

Clinical Scenario: Acute Otitis Media

Consider the following details:

- 5-year-old boy, screaming with pain in left ear.
- No history of fever, temp 37.4°C.
- Not vomiting.
- Paracetamol helps but pain returns before next dose due.
- Had AOM this time last year and was prescribed antibiotics.
- Left ear drum bulging and red, no otorrhoea
- No penicillin allergy

Clinical Scenario: Acute Otitis Media

What would you do?

1. Offer regular doses of paracetamol or ibuprofen for pain
2. Offer Phenazone and Lidocaine ear drops for pain
3. Offer a back-up antibiotic prescription (amoxicillin)
4. Offer an immediate course of amoxicillin

5-year-old, earache. What would you do?

Acute Otitis Media: Evidence

Clinical Scenario
Acute Otitis Media

Antibiotics

- Symptoms last between 3-7 days (60% AOM resolve within 24 h without antibiotics)
- Antibiotics do not reduce pain at 24 hours, modest effect at 2-3 days (NNTB 20), 4-7 days (NNTB 16) compared to placebo; more side effects in treated children
- Antibiotics offer only very small benefits for middle-ear outcomes (NNTB 11–33), making routine use unnecessary
- No significant difference between watchful waiting/back-up or immediate antibiotics for pain at 3-6 days

→ No antibiotic strategy or back-up antibiotic strategy

Venekamp et al. Cochrane Review, 2015 (updated 2023)

NG91: Otitis Media (acute) antimicrobial prescribing

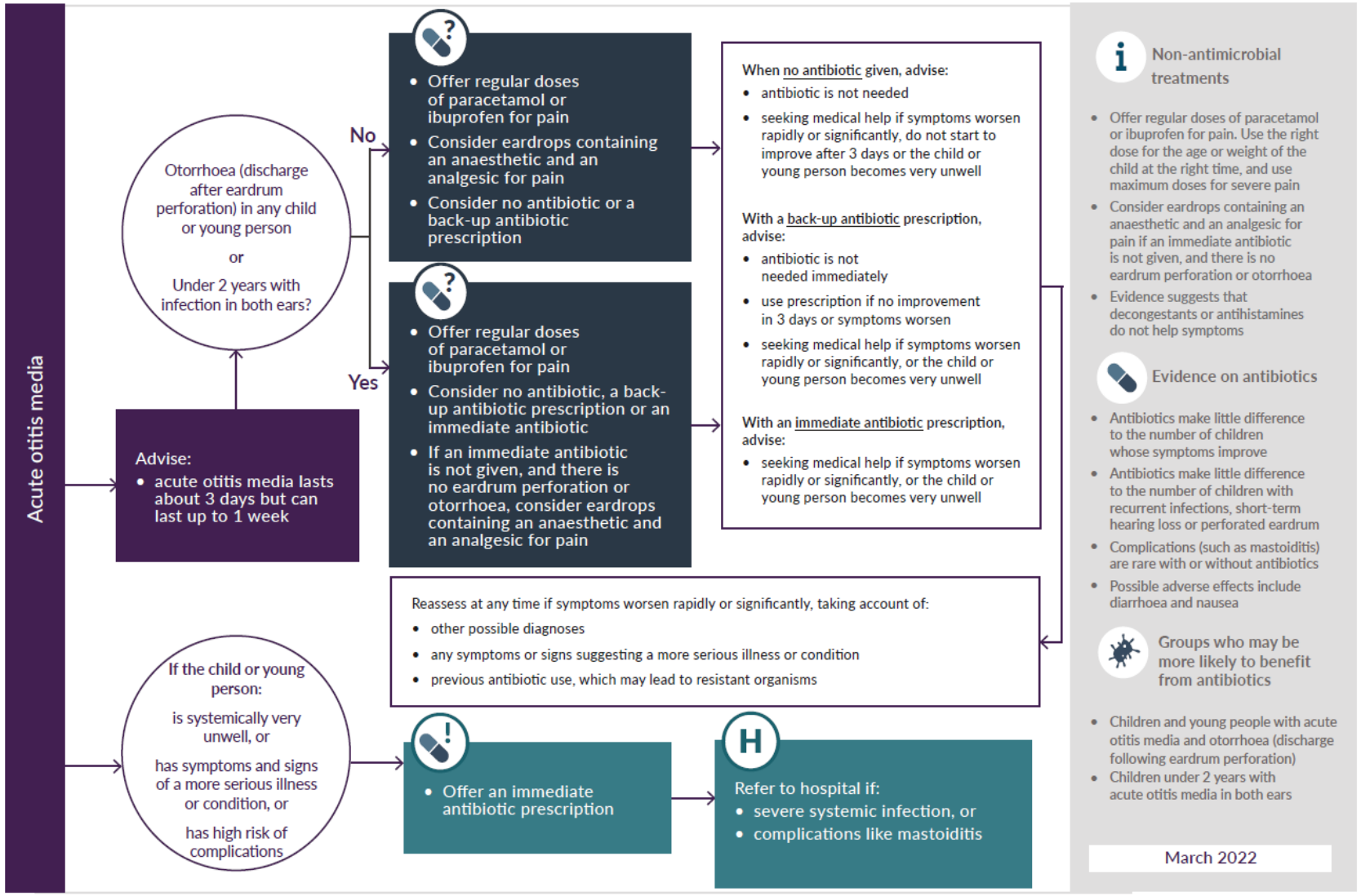
Otitis media (acute): antimicrobial prescribing

NICE National Institute for Health and Care Excellence

TARGET Keep Antibiotics Working

NHS Barts Health NHS Trust

Clinical Scenario
Acute Otitis Media



Acute Otitis Media: Evidence

Clinical Scenario
Acute Otitis Media

Anaesthetic and analgesic ear drops

- Higher proportion of children with a 50% (p = 0.01) and 25% (p = 0.02) reduction in pain within 10 minutes compared to placebo.

- Decrease in proportion of children consuming antibiotics at day 8 compared to usual care (2.6% vs 29.0%, p= *0.009*)

- Reduction in parent-reported pain scores at day 2 (p = 0.001; 88% were on analgesia)

1. Foxlee et al. Cochrane Review, 2006
2. Hay et al. Health Technol Assess 2019

NG91: Otitis Media (acute) antimicrobial prescribing; Foxlee, 2006; Hay, 2019

Otitis media (acute): antimicrobial prescribing

NICE National Institute for Health and Care Excellence

NHS Health NHS Trust

TARGET Keep Antibiotics Working

Choice of treatment: children and young people under 18 years

Treatment[1]	Dosage and course length[2]
Eardrops containing an anaesthetic and an analgesic	
Phenazone 40 mg/g with lidocaine 10 mg/g	Apply 4 drops two or three times a day for up to 7 days Use only if an immediate oral antibiotic prescription is not given, and there is no eardrum perforation or otorrhoea
First choice oral antibiotic	
Amoxicillin	1 to 11 months: 125 mg three times a day for 5 to 7 days 1 to 4 years: 250 mg three times a day for 5 to 7 days 5 to 17 years: 500 mg three times a day for 5 to 7 days
Alternative first choice oral antibiotic for penicillin allergy or intolerance (for people who are not pregnant)	
Clarithromycin	1 month to 11 years: Under 8 kg: 7.5 mg/kg twice a day for 5 to 7 days 8 to 11 kg: 62.5 mg twice a day for 5 to 7 days 12 to 19 kg: 125 mg twice a day for 5 to 7 days 20 to 29 kg: 187.5 mg twice a day for 5 to 7 days 30 to 40 kg: 250 mg twice a day for 5 to 7 days or 12 to 17 years: 250 mg to 500 mg twice a day for 5 to 7 days
Alternative first choice oral antibiotic for penicillin allergy in pregnancy	
Erythromycin	8 to 17 years: 250 mg to 500 mg four times a day or 500 mg to 1,000 mg twice a day for 5 to 7 days Erythromycin is preferred if a macrolide is needed in pregnancy, for example, if there is true penicillin allergy and the benefits of antibiotic treatment outweigh the harms. See the Medicines and Healthcare products Regulatory Agency (MHRA) Public Assessment Report on the safety of macrolide antibiotics in pregnancy
Second choice oral antibiotic (worsening symptoms on first choice taken for at least 2 to 3 days)	
Co-amoxiclav	1 to 11 months: 0.25 ml/kg of 125/31 suspension three times a day for 5 to 7 days 1 to 5 years: 5 ml of 125/31 suspension three times a day or 0.25 ml/kg of 125/31 suspension three times a day for 5 to 7 days 6 to 11 years: 5 ml of 250/62 suspension three times a day or 0.15 ml/kg of 250/62 suspension three times a day for 5 to 7 days 12 to 17 years: 250/125 mg three times a day or 500/125 mg three times a day for 5 to 7 days
Alternative second choice oral antibiotic for penicillin allergy or intolerance	
Consult local microbiologist	

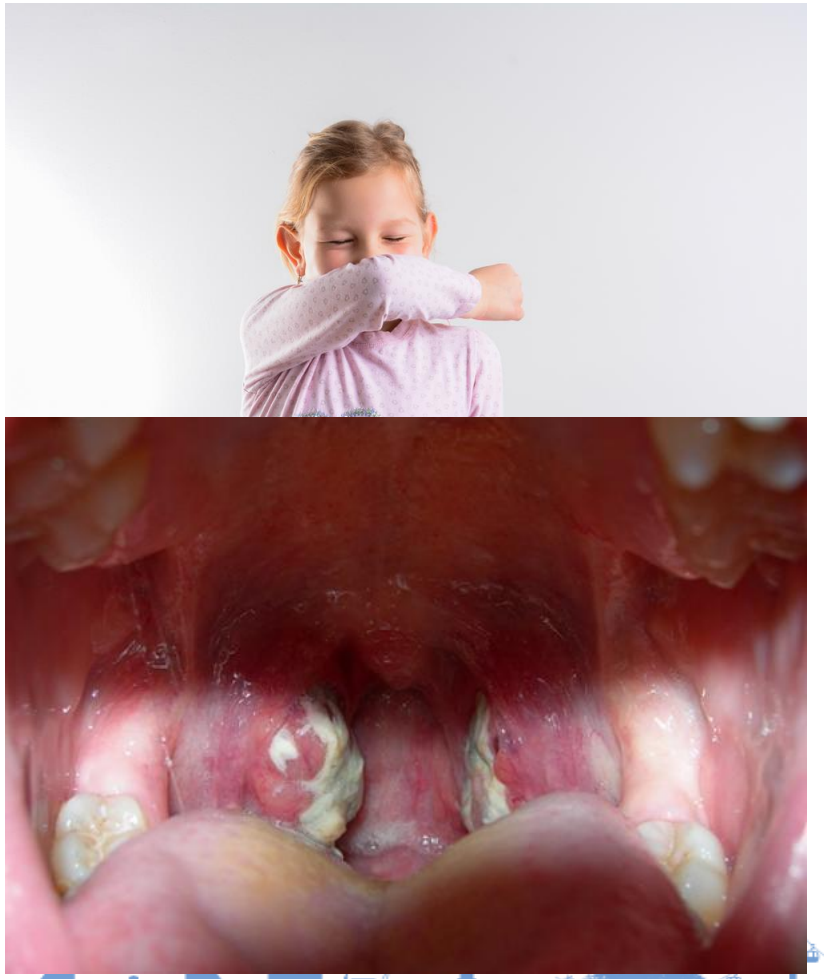
[1] See the BNF for children for appropriate use and dosing in specific populations, for example, hepatic impairment and renal impairment.
[2] The age bands apply to children of average size. In practice, the prescriber will use age bands along with other factors such as the severity of the condition and the child's size in relation to the average size of children of the same age. Doses given are by mouth using immediate-release medicines, unless otherwise stated.

Clinical Scenario: Acute Sore Throat

Clinical Scenario
Acute Sore Throat

Consider the following details:

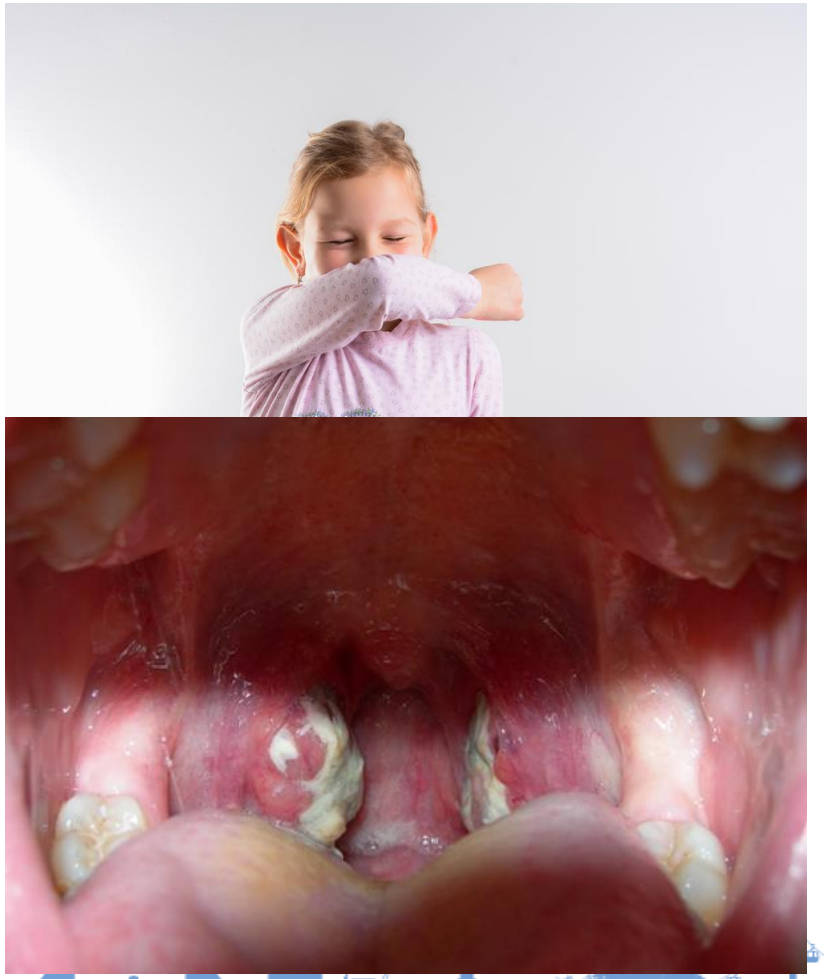
- 8-year-old girl
- 4/7 days sore throat, parents report high fever last night, tiredness, cough
- Difficulty swallowing
- Temp 37.5° C
- Slough on swollen tonsils, palatal petechiae
- Cervical and axillary lymphadenopathy
- ‘Antibiotics helped’ for tonsils last year



Clinical Scenario: Acute Sore Throat

What would you do?

1. Consider 5 days of Pen V, with self care and safety netting advice
2. Consider no antibiotic with self care and safety netting advice
3. Consider delayed antibiotic with self care and safety netting advice



Sore throat - What would you do?

Clinical scoring systems

Clinical Scenario
Acute Sore Throat

FeverPAIN criteria (scores 0-5)
Designed and validated with patients aged 5 and above

- **Fever** (in last 24 hours)
- **P**urulence (pus on tonsils)
- **A**ttend rapidly (within 3 days of symptom onset)
- (severely) **I**nflamed tonsils
- **N**o cough or coryza (inflammation of mucus membranes in the nose)

https://ctu1.phc.ox.ac.uk/feverpain/index.php

Little P et al. BMJ Open 2013, 2013;3:e003943. doi:10.1136/bmjopen-2013-003943

Clinical Scenario: Acute Sore Throat Feedback FeverPAIN

TARGET
Keep Antibiotics Working

Clinical Scenario
Acute Sore Throat

- 8-year-old girl
- 4/7 days sore throat, “high” fever last night, tiredness
- Temp 37.5°C
- Slough on swollen tonsils, palatal petechiae
- Cervical and axillary lymphadenopathy
- ‘Antibiotics helped’ for tonsils last year

FeverPAIN criteria (scores 0-5)

Fever (in last 24 hours)

Purulence (pus on tonsils)

Attend rapidly (within 3 days of symptom onset)

(severely) **I**nflamed tonsils

No cough or coryza (inflammation of mucus membrane

Hit Count: 2125

Fever PAIN Clinical Score

Background Information

Further guidance on the treatment of respiratory infection is available from the Health Protection Agency

How to create a desktop shortcut for this site

History	
Sore throat	None / Mild / **Moderate** / Severe / No answer
Cough or Cold symptoms	**None** / Mild / Moderate / Severe *
Muscle aches	**None** / Mild / Moderate / Severe / No answer
History of Fever in last 24 hours	**Yes** / No *
Onset of illness	0-3 days / **4-7 days** / 7+ days *
Examination	
Cervical glands	None / **1-2cm** / > 2cm / No answer
Inflamed tonsils	None / Mild / **Moderate** / Severe *
Pus on tonsils	**Yes** / No *
Fever present Type in here the temperature and any other free text needed for the summary	37.5

Display Score

Score

```
FeverPain Clinical Score = 3

A score of 2 or 3 is associated with 34-40% isolation of streptococcus-
A delayed prescribing strategy is appropriate after discussion
```

Sore throat (acute): antimicrobial prescribing

TARGET
Keep Antibiotics Working

Clinical Scenario
Acute Sore Throat

Acute sore throat

Use FeverPAIN or Centor score for assessing symptoms

Advise:

- sore throat can last around 1 week
- manage symptoms with self-care

FeverPAIN score 0 or 1 **or** Centor score 0, 1 or 2 → Do not offer an antibiotic

FeverPAIN score 2 or 3 → Consider no antibiotic or a back-up antibiotic prescription

FeverPAIN score 4 or 5 or Centor score 3 or 4 → Consider an immediate antibiotic or a back-up antibiotic prescription

When no antibiotic given, advise:

- antibiotic is not needed
- seeking medical help if symptoms worsen rapidly or significantly, do not start to improve after 1 week or the person becomes very unwell

With a back-up antibiotic prescription, advise:

- antibiotic is not needed immediately
- use prescription if no improvement in 3 to 5 days, or symptoms worsen
- seeking medical help if symptoms worsen rapidly or significantly or the person becomes very unwell

With an immediate antibiotic prescription, advise:

- seeking medical help if symptoms worsen rapidly or significantly or the person becomes very unwell

Reassess at any time if symptoms worsen rapidly or significantly, taking account of:

- other possible diagnoses
- any symptoms or signs suggesting a more serious illness or condition
- previous antibiotic use, which may lead to resistant organisms

If the person:

is systemically very unwell, or

has symptoms and signs of a more serious illness or condition, or

has high risk of complications

→ Offer an immediate antibiotic prescription → Refer to hospital if:

- severe systemic infection, or
- severe complications

NICE National Institute for Health and Care Excellence

Self-care

- Consider paracetamol for pain or fever, or if preferred and suitable, ibuprofen
- Drink adequate fluids
- Some evidence that medicated lozenges can help reduce pain in adults
- No evidence was found for non-medicated lozenges, mouthwashes, or local anaesthetic mouth spray on its own

Evidence on antibiotics

- Antibiotics make little difference to how long symptoms last or the number of people whose symptoms improve
- Withholding antibiotics is unlikely to lead to complications
- Possible adverse effects include diarrhoea and nausea

FeverPAIN score

- Fever; purulence; attend within 3 days or less; severely inflamed tonsils; no cough or coryza

1 point for each

Centor score

- Tonsillar exudate; tender anterior cervical lymphadenopathy or lymphadenitis; history of fever (>38°C); no cough

1 point for each

Updated February 2023

NHS Health NHS Trust

NICE antimicrobial prescribing guidelines for acute sore throat in children

TARGET
Keep Antibiotics Working

NHS
Barts Health
NHS Trust

Clinical Scenario
Acute Sore Throat

Antibiotic [1]	Dosage and course length for children and young people under 18 [2]
First choice	
Phenoxymethylpenicillin	1 to 11 months: 62.5 mg four times a day, or 125 mg twice a day for 5 to 10 days 1 to 5 years: 125 mg four times a day, or 250 mg twice a day for 5 to 10 days 6 to 11 years: 250 mg four times a day, or 500 mg twice a day for 5 to 10 days 12 to 17 years: 500 mg four times a day, or 1000 mg twice a day for 5 to 10 days Five days of phenoxymethylpenicillin may be enough for symptomatic cure, but a 10-day course may increase the chance of microbiological cure
Alternative first choice for penicillin allergy or intolerance (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 8 to 11 kg: 62.5 mg twice a day for 5 days 12 to 19 kg: 125 mg twice a day for 5 days 20 to 29 kg: 187.5 mg twice a day for 5 days 30 to 40 kg: 250 mg twice a day for 5 days 12 to 17 years: 250 mg to 500 mg twice a day for 5 days
Alternative first choice for penicillin allergy in pregnancy	
Erythromycin	8 to 17 years: 250 mg to 500 mg four times a day, or 500 mg to 1000 mg twice a day for 5 days Erythromycin is preferred if a macrolide is needed in pregnancy, for example, if there is true penicillin allergy and the benefits of antibiotic treatment outweigh the harms. See the Medicines and Healthcare products Regulatory Agency (MHRA) Public Assessment Report on the safety of macrolide antibiotics in pregnancy

1 Note: see the BNF for children for appropriate use and dosing in specific populations, for example, hepatic impairment or renal impairment.

2 Note: the age bands given in the table apply to children of average size and, in practice, the prescriber will use the age bands in conjunction with other factors such as the severity of the condition and the child's size in relation to the average size of children of the same age.

Sore throat – key messages

- Antibiotics make little difference to how long symptoms last for OR the number of people whose symptoms improve
- Complications are not any more likely with withholding antibiotics
- More adverse events with antibiotics
- Use scoring systems to guide management
- Appropriate safety netting is key
- Immediate antibiotics reserved for those who are systemically very unwell or at high risk of complications

Acute cough clinical scenario

- 6-month-old boy, born at term
- 3 days of cough, coryza, low-grade fever (38.1ºC), feeding slightly reduced- taking 60% of usual feeds, one wet nappy today
- Mother worried about the increasing frequency of cough
- Alert and interactive, mild subcostal recession, saturations 95% in air, mild respiratory distress, bilateral crackles.

Acute cough (infant) – what would you do?

1. Symptomatic treatment – suggest nasal drops and raising head of bed and provide safety net advice

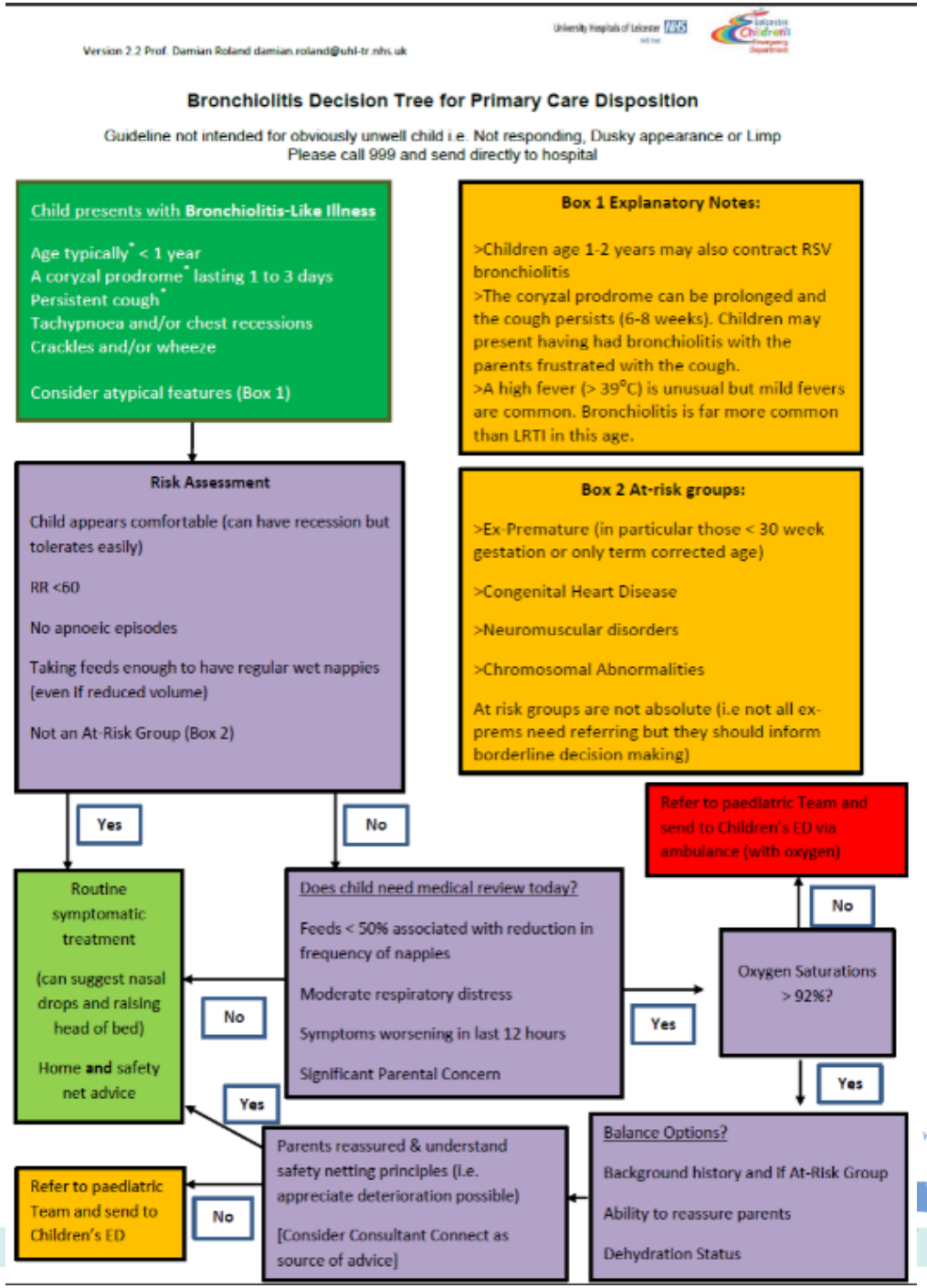
2. Give oral amoxicillin to cover possible superadded bacterial infections and to prevent worsening of symptoms

3. Refer to paediatrics given age

Bronchiolitis – clinical decision tree

Safety netting is essential:

- reduced feeding (<50%)
- fewer wet nappies
- worsening work of breathing
- persistent fever >5 days
- apnoeas



Acute cough (infant)- key points

- This is the typical viral picture (bronchiolitis or viral LRTI)
- Fever in viral infections can last up to 5 days, symptoms peak around day 5 of illness, cough can last 2–3 weeks, and disturbed sleep up to 2 weeks
- Antibiotics do not shorten illness or prevent complications in viral LRTI but can cause side effects.
- Safety-netting is essential: reduced feeding (<50%), fewer wet nappies, increased work of breathing, persistent fever >5 days, or parental concern

Bronchiolitis - how to set expectations

- Can get worse before they get better (peak day 5)
- Fever in viral infections can last up to 5 days
- Cough can last a couple of weeks even when they’re getting better.
- We don’t use antibiotics for viral chest infections because they don’t help and can cause side effects
- Antibiotics do not shorten illness or prevent complications but can cause side effects

Acute cough: clinical scenario 2

Clinical Scenario
Acute Cough

- 4-year-old with cough, yellowish sputum
- Temp 37.8˚ C
- Several previous episodes of lower respiratory tract infection and parents insists antibiotics ‘always help’
- Respiratory rate within normal limits for age, no sign of significant work of breathing
- Scattered coarse crepitations and wheeze, vesicular breath sounds, no focal crepitations

Acute cough: clinical scenario

Clinical Scenario
Acute Cough

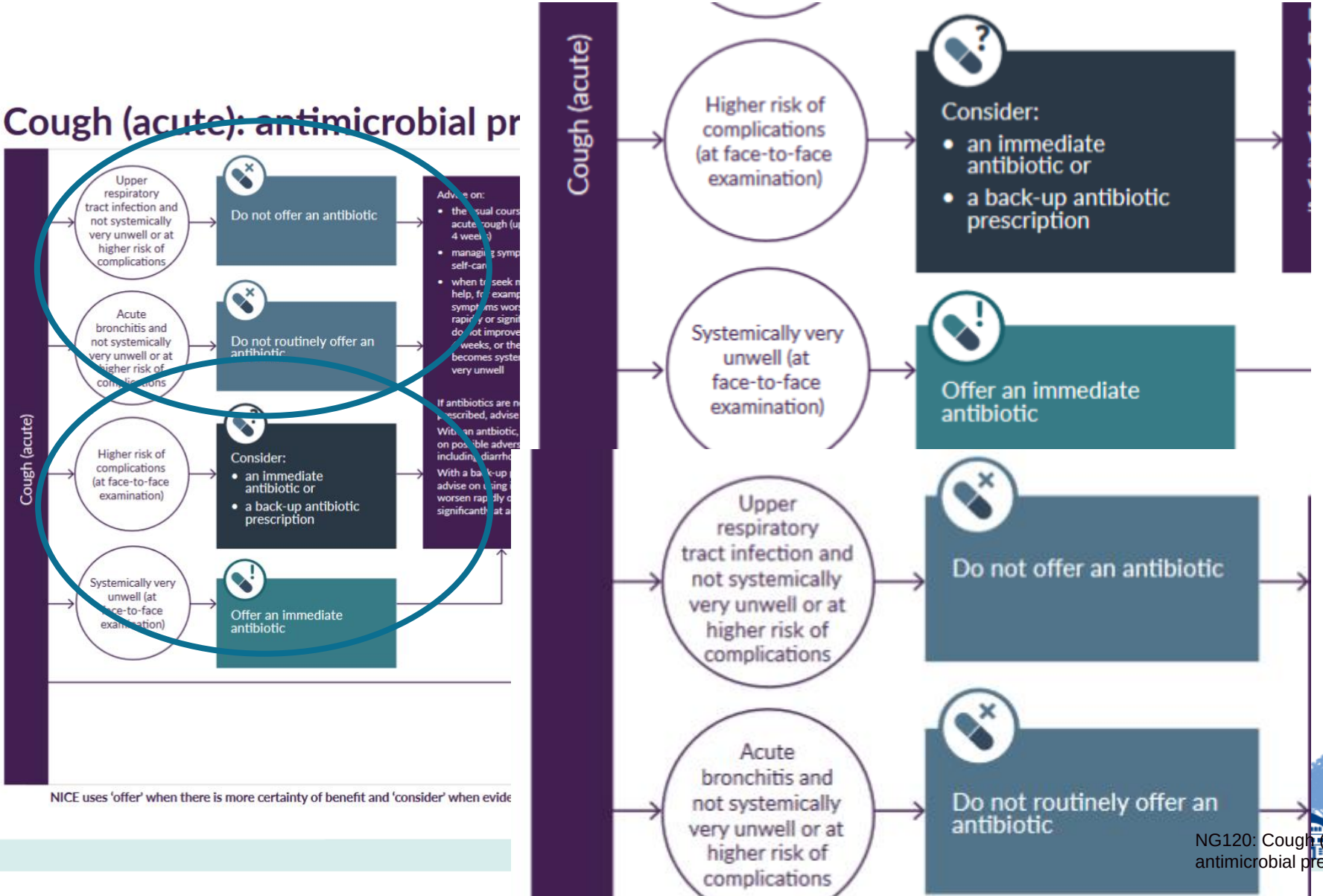
What would you do?

1. Prescribe 5 days of doxycycline, with self care and safety netting advice
2. No antibiotic with self care and safety netting advice
3. Delayed antibiotic with self care and safety netting advice
4. Prescribe 5 days of amoxicillin, with self care and safety netting advice

Acute cough - what would you do?

Acute cough antibiotic prescribing

Clinical Scenario
Acute Cough



NICE uses 'offer' when there is more certainty of benefit and 'consider' when evide

NG120: Cough (acute): antimicrobial prescribing

Acute cough clinical scenario: Feedback

Clinical Scenario
Acute Cough

- 4-year-old with cough for past 4 days, yellowish sputum
- Temp 37.8° C
- Several previous episodes of lower RTI and insists antibiotics ‘always help’
- Respiratory rate within normal limits for age, no sign of significant work of breathing
- Scattered course creps and wheeze, vesicular breath sounds, no focal crepitations

- Antibiotic little benefit as no co-morbidity
- Consider no antibiotics OR if high risk of complications, 5 days back-up antibiotic prescription with safety netting
- Share a leaflet with the patient e.g. TARGET RTI leaflet
- Advise patient symptom resolution can take 3 weeks

TARGET
Keep Antibiotics Working

Clinical Scenario
Acute Cough

Acute cough antibiotic prescribing for children

NICE antimicrobial prescribing guidance:
Choice of antibiotic for children and young people under 18

Choice of antibiotic: children and young people under 18 years

Antibiotic[1]	Dosage and course length[2]
First choice	
Amoxicillin	1 to 11 months: 125 mg three times a day for 5 days 1 to 4 years: 250 mg three times a day for 5 days 5 to 17 years: 500 mg three times a day for 5 days
Alternative first choices[3]	
Clarithromycin	1 month to 11 years: Under 8 kg, 7.5 mg/kg twice a day for 5 days 8 to 11 kg, 62.5 mg twice a day for 5 days 12 to 19 kg, 125 mg twice a day for 5 days 20 to 29 kg, 187.5 mg twice a day for 5 days 30 to 40 kg, 250 mg twice a day for 5 days 12 to 17 years: 250 mg to 500 mg twice a day for 5 days
Erythromycin	1 month to 1 year: 125 mg four times a day or 250 mg twice a day for 5 days 2 to 7 years: 250 mg four times a day or 500 mg twice a day for 5 days 8 to 17 years: 250 mg to 500 mg four times a day or 500 mg to 1000 mg twice a day for 5 days
Doxycycline[4]	12 to 17 years: 200 mg on first day, then 100 mg once a day for 4 days (5-day course in total)

[1] See BNF for children for appropriate use and dosing in specific populations, for example, hepatic impairment and renal impairment
[2] The age bands apply to children of average size and, in practice, the prescriber will use the age bands in conjunction with other factors such as the severity of the condition and the child's size in relation to the average size of children of the same age.
[3] Amoxicillin is the preferred antibiotic in pregnancy. Erythromycin is preferred if a macrolide is needed in pregnancy, for example, if there is true penicillin allergy and the benefits of antibiotic treatment outweigh the harms. See the Medicines and Healthcare products Regulatory Agency (MHRA) Public Assessment Report on the safety of macrolide antibiotics in pregnancy
[4] Doxycycline should not be used in pregnancy, and the possibility of pregnancy should be considered in women of childbearing age

NG120 Cough (acute): antimicrobial prescribing

STARWAVe trial

- A tool to predict risk of hospitalisation within 30 days for children presenting with acute cough & RTI
- 7 characteristics were independently associated with hospital admission
- Distinguishes between three hospital admission risk strata –
  - very low,
  - normal or
  - high risk

Development and internal validation of a clinical rule to improve antibiotic use in children presenting to primary care with acute respiratory tract infection and cough: a prognostic cohort study

Alastair D Hay, Niamh M Redmond, Sophie Turnbull, Hannah Christensen, Hannah Thornton, Paul Little, Matthew Thompson, Brendan Delaney, Andrew M Lovering, Peter Muir, John P Leeming, Barry Vipond, Beth Stuart, Tim J Peters, Peter S Blair

"Clinical characteristics can distinguish children at very low risk, normal and high risk of future hospital admission for respiratory tract infection and *could be used to reduce antibiotic prescriptions in primary care* for children at very low risk"

Hay et al, Lancet Respir Med 2016; **4**:902

TARGET
Keep Antibiotics Working

Barts Health NHS Trust

Clinical Scenario
Acute Cough

STARWAVe was developed to help predict future hospitalisation among children with cough

The 7 symptoms and signs are:

S	**Short** duration of illness (≤3 days)
T	Parent reported fever in the previous 24 hours or **temperature** ≥37.8°C at presentation
A	**Age** is less then 2 years
R	Clinician reported inter- or subcostal **recession**
W	Clinician reported **wheeze** of auscultation
A	Current diagnosis of **asthma**
V	Parent reported moderate or severe **vomiting** in the previous 24 hours

Blair et al. (2023)

STARWAVe was developed to help predict future hospitalisation among children with cough

STARWAVe score		
0-1 (67% of all children)	At very low risk of future admission, 1:320	No antibiotic strategy
2-3 (30% of all children)	‘Normal’ risk of future admission, 1:70	No or back-up antibiotic strategy
≥4 (3% of all children)	Monitor closely for signs of deterioration	Same-day or next-day follow up, with immediate antibiotic

Symptom benefit from antibiotics

	Total Duration untreated	Beneficial effect from antibiotics	NNT for one additional patient to benefit	NNT for one additional adverse effect
Otitis media	4 -12 days	8-12 hours	20	10
Sore throat	8 days	12-18 hours	6-18	-
Sinusitis	12-15 days	24 hours	18	8
Bronchitis	20-22 days	11-24 hours	10-22	24

Cochrane reviews Otitis media: Venekamp et al (2023), Sore throat: Spinks et al. 2021, Sinusitis: Lemiengre M et al. (2012), bronchitis: Smith et al. (2017)

Take home messages

- The demand for antibiotics for RTIs seems unrelenting – we need to get better at managing that

- **Key actions:**
  - **Effective/successful consultations that address parent/carer concerns and expectations**
  - **Communicate and be explicit about the expected duration of symptoms (how long it will take 90% of children to feel better)**
  - **Provide verbal and written safety netting advice**
  - **Signpost to Healthier Together website for additional support**
  - **Make sure the whole team is taking the same approach**

Acknowledgements

Many thanks to:

- Graham Duce, Audlem Medical Practice, NHS Cheshire & Merseyside ICB
- Conor Jamieson – Regional Antimicrobial Stewardship Lead Midlands Region, NHS England
- Lisa Boateng - Highly Specialist Pharmacist, Antimicrobials and Infection Control, Barts Health NHS Trust
- Reema Patel - Lead Medicines Optimisation Pharmacist: Barking & Dagenham, NHS North East London
- Laura Whitney - Regional Antimicrobial Stewardship Lead London, NHS England

TARGET

Keep Antibiotics Working

NHS

Barts Health

NHS Trust

Our actions protect antibiotics

BECOME AN ANTIBIOTIC GUARDIAN

Join us at antibioticguardian.com

Keep Antibiotics Working