TARGET
Keep Antibiotics Working

From guidance to practice: Managing paediatric respiratory tract infections through clinical scenarios

TARGET Antibiotics Webinar
21 January 2026

Introductions – TARGET and RCGP

Dr Donna Lecky

Emily Cooper

Catherine Hayes

Ming Lee

Emily Whitehorne

Julie Brooke

Liam Clayton

Joseph Besford

Camilla Stevenson

Introductions – Speakers and Panellists

Dr Graham Duce
GP, Audlem Medical Practice

Cheshire Place GP AMS Lead

Speaker and Panellist

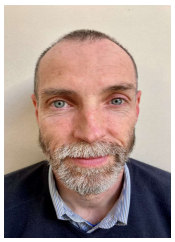
Dr Alicia Demirjian
Consultant in Paediatric Infectious Diseases and Immunology

Consultant Epidemiologist

Panellist

Dr Sanjay Patel
Consultant in Paediatric Diseases and Immunology

Panellist



Dr Conor Jamieson
Regional Antimicrobial Stewardship Lead (Midlands)

Panellist

Reena Barai
Community Pharmacist

Panellist

21/1/2026

Learning Objectives

1. Implement current diagnostic and decision-making tools for managing acute otitis media, sore throat, and cough in children and young people.

2. Understand patient perspectives on antibiotic prescribing for RTIs in children and young people.

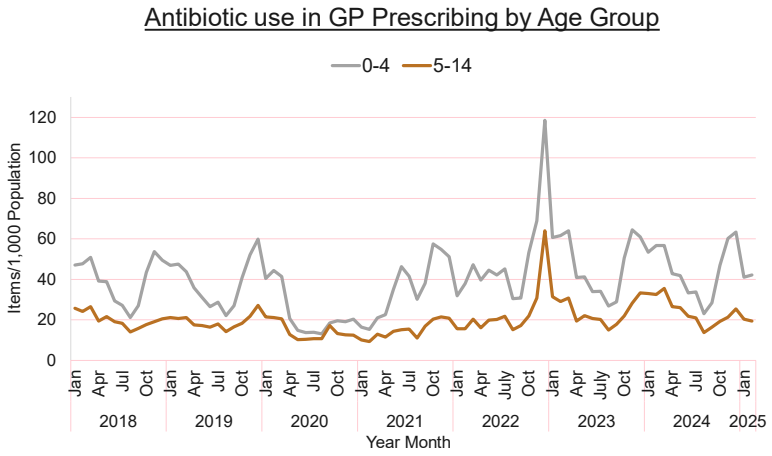
3. Use evidence-based strategies and resources to support discussions with patients and their carers in the context of paediatric RTIs, including how to address concerns and manage expectations.

Paediatric prescribing

On average (2018-2024), each year

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

That is **3.1 million** antibiotic prescriptions



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Statistics courtesy of UKHSA Antimicrobial Resistance and Prescribing Team

Presenter Talk:

On average each year 2018-2024, antibiotic prescribing for children under 15 accounted for 12.2% of antibiotic prescribing in general practice in England. That is about 3.1 million antibiotic prescriptions.
In 2024 (latest ESPAUR) 0-14 years accounted for 13.5% of items prescribed in general practice.
Peak in 2022-23 due to iGAS outbreak that year which affect children to a much higher extent than previous seasons and years (1)

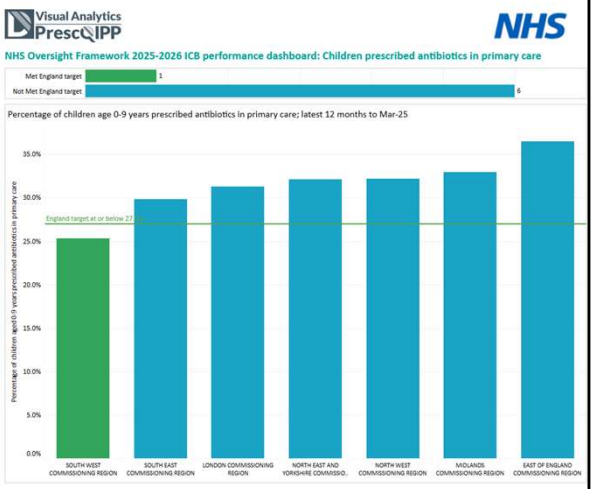
Paediatric prescribing

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



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PrescQIPP, 2023

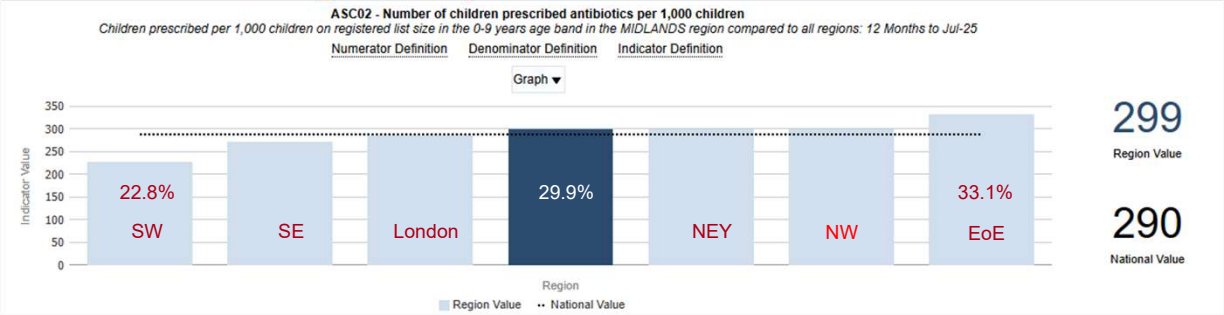
Presenter Talk

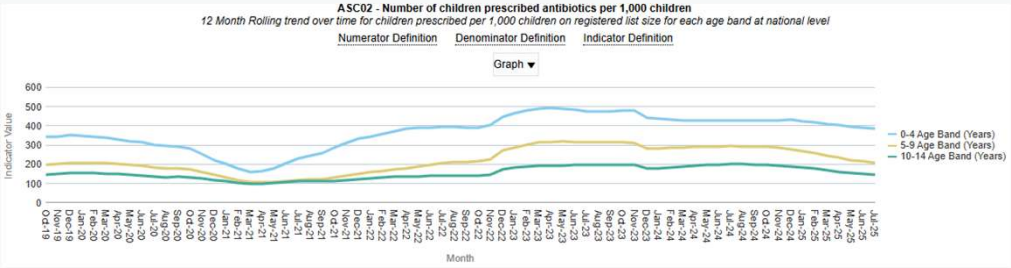
Based on NHSE estimates, 31.7% of children under 10 were prescribed antibiotics in the last year (1). Only 7 ICBs meeting the 27% target.

Most of antibiotic prescribing occur in primary care while surveillance data show that antibiotic resistant disproportionately affects people living in the most deprived communities. Taken together this trend in paediatric prescribing is worrying and underscores the significant responsibility healthcare professionals carry in judicious use of antibiotics .

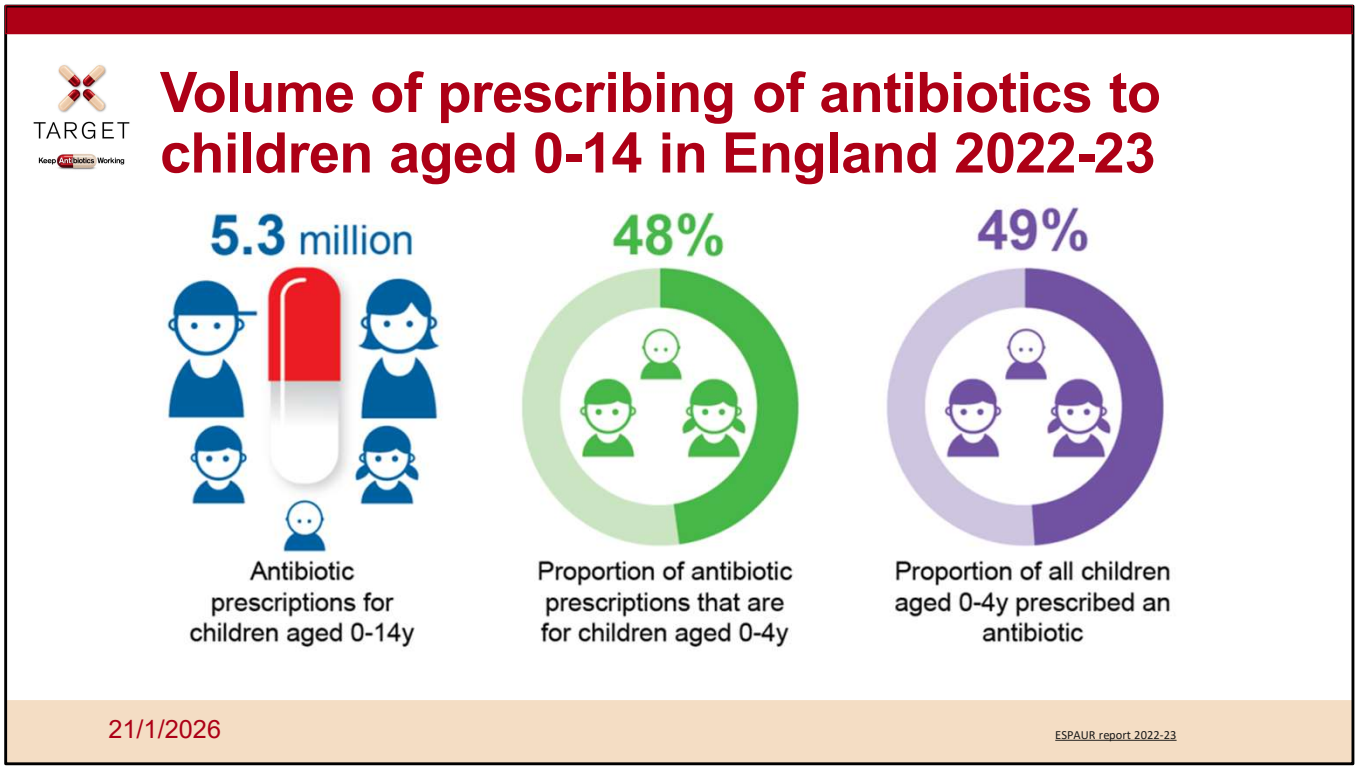
Data for this can be obtained from PrescQIPP NHS Oversight Framework 2025-2026 - ICB performance dashboard: Children prescribed antibiotics in primary car

Variation between regions in England (prescribing for children aged 0-9 years, 12 month rolling data)





Source: ePACT2



These infographics are from the English Surveillance Programme for antimicrobial utilisation and resistance (ESPAUR) – a kind of annual stock take of all antimicrobial consumption, antimicrobial resistance and healthcare associated infections that is published in November each year.

This slide shows the number of prescriptions for children aged 0-14 issued in 2022 – shockingly, almost half of all prescriptions are for children aged 0-4 years, and almost half of all children aged 0-4 received an antibiotic in 2022.

Presenter Talk

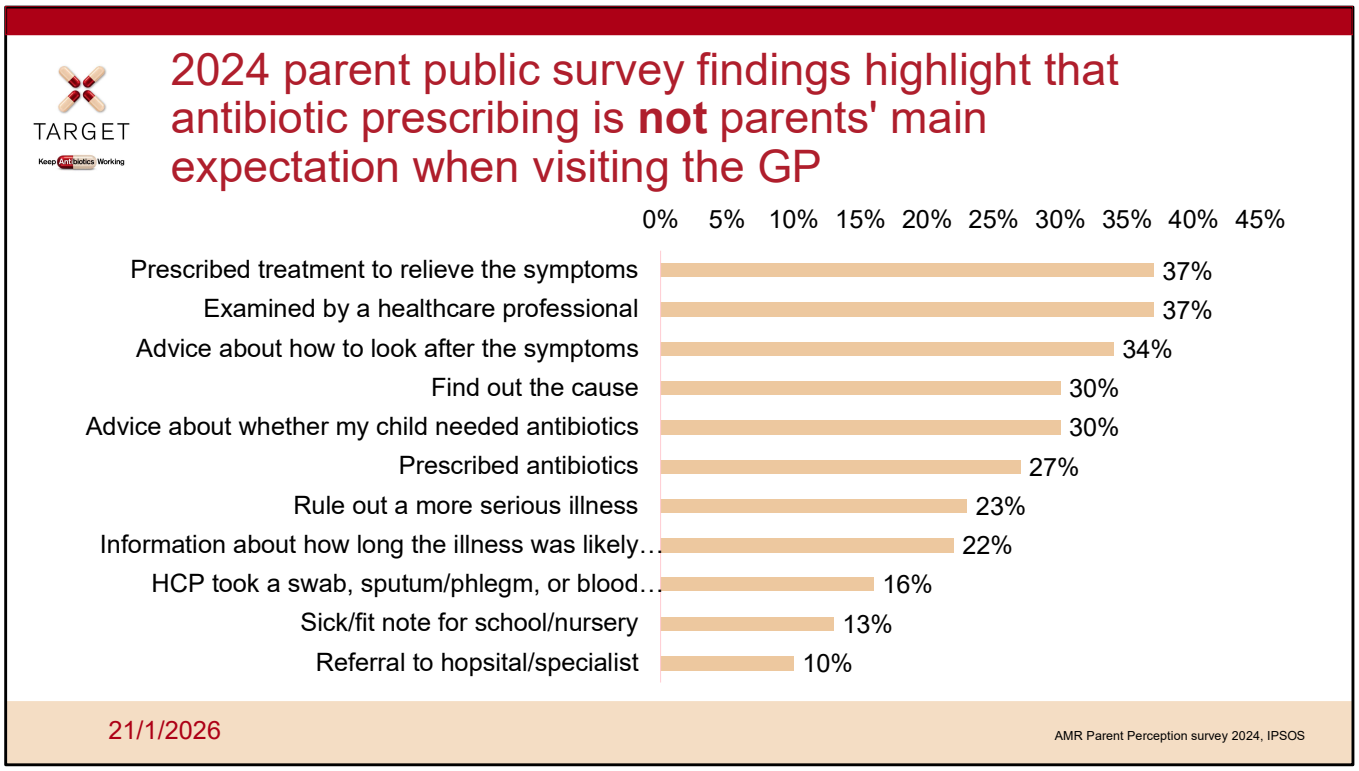
It is important to highlight that evidence with parents suggests when they visit healthcare settings, they are generally not looking for antibiotics- they are anxious and want reassurance, ways to remove the health threat.
Parents are cautious about antibiotics and want to be prescribed only when necessary.

References

1. Cabral C, Lucas PJ, Ingram J, Hay AD, Horwood J. "It's safer to ..." parent consulting and clinician antibiotic prescribing decisions for children with respiratory tract infections: An analysis across four qualitative studies. Soc Sci Med. 2015 Jul;136-137:156-64. doi: 10.1016/j.socscimed.2015.05.027. Epub 2015 May 16. PMID: 26004209.
2. Julia E Szymczak, Sarah B Klieger, Matthew Miller, Alexander G Fiks, Jeffrey S Gerber, What Parents Think About the Risks and Benefits of Antibiotics for Their Child's Acute Respiratory Tract Infection, *Journal of the Pediatric Infectious Diseases Society*, Volume 7, Issue 4, December 2018, Pages 303–309, https://doi.org/10.1093/jpids/pix073
3. Nicholson, E., McDonnell, T., De Brún, A. *et al.* Factors that influence family and

parental preferences and decision making for unscheduled paediatric healthcare – systematic review. *BMC Health Serv Res* **20**, 663 (2020). https://doi.org/10.1186/s12913-020-05527-5

4. Kubb C, Foran HM. Online Health Information Seeking by Parents for Their Children: Systematic Review and Agenda for Further Research. J Med Internet Res. 2020 Aug 25;22(8):e19985. doi: 10.2196/19985. PMID: 32840484; PMCID: PMC7479585.



Presenter Talk

Findings from research highlighted in the previous slide are reflected in the latest online survey of parents (2024). Parents were asked what they expected from contact or visit to the doctor's surgery (n=435).

The key takeaway is that antibiotic prescription is not the main expectation, instead parents are hoping for their child to be:

1. Prescribed treatment to relieve symptoms
2. Examined by a healthcare professional
3. Advised about how to look after the symptoms

Expectation to be prescribed antibiotics was ranked lower than these. This suggests the importance of shared decision making during consultation.

These findings were based on all parents and guardians who reported that they visited or contacted a doctor's surgery/GP out of hours service (n=435) following their child's last RTI episode

Reference:

1. UKHSA AMR Parent Perceptions survey, IPSOS, 2024 – unpublished

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Clinical Scenarios

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We will be using clinical scenarios to highlight appropriate prescribing for RTIs in children.

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Clinical Scenario
Acute Otitis Media

Clinical Scenario: Acute Otitis Media

Consider the following details:

- 5-year-old boy, screaming with pain in right 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.
- Right ear drum bulging and red.
- No penicillin allergy

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Presenter talk/notes:
Consider this case of AOM

Show poll (Answer next slide):

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

Clinical Scenario: Acute Otitis Media

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

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Presenter Notes:

What does the evidence show? Most importantly 60% of AOM resolve in 24 h without antibiotics,
Furthermore, antibiotics only reduce pain at 2 days when most would have already resolved with Number Needed To Treat (NNT) of 20
Antibiotics do not prevent deafness

Consider 2 or 3-day delayed or immediate antibiotics for pain relief if:
• <2 years AND bilateral AOM (NNT4) or bulging membrane & ≥ 4 marked symptoms
• All ages with otorrhoea NNT3

Therefore, in this situation antibiotics are unlikely to be beneficial

If the child does not have ear drum perforation or otorrhoea you could consider eardrops containing an anaesthetic and an analgesic.

Evidence

Rovers MM, Glasziou P, Appleman CL, Burke P, McCormick DP, Damoiseaux RA, Little P, Le Saux N, Hoes AW. Predictors of pain and/or fever at 3 to 7 days for children with acute otitis media not treated initially with antibiotics: a meta-analysis of individual patient data.

Pediatrics 2007;119(3):579-85

RATIONALE: The risk of prolonged illness was 2 times higher for children <2years with bilateral AOM than for children with unilateral AOM. For this sub-group parents should be advised that symptoms may persist for up to 7 days, and they should optimise analgesia use.
The protective immunity against infections with encapsulated bacteria, such as the species that cause AOM, depends on the ability to produce specific antibodies against bacterial capsular polysaccharides, which is inadequate until 2 years of age. The anatomic features of the eustachian tubes and the nasopharynx also differ with age. Consequently, children under 2 years of age seem to be more susceptible to AOM.

Acute Otitis Media: Evidence

Clinical Scenario
Acute Otitis Media

Antibiotics

- Symptoms last between 3-7 days
- Antibiotics do not reduce pain at 24 hours, modest effect at 2-3 days (NNTB 20), 4-7 days (NNTB 16) compared to placebo
- 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

NG91: Otitis Media (acute): antimicrobial prescribing

Presenter Talk:

Based on NICE guidance and evidence, otitis symptoms last between 3 to 7 days. Antibiotics do not reduce pain in 24 compared to placebo and no significant difference seen between watchful waiting/backup or immediate antibiotics for pain at 3-6 days. This supports a no antibiotic strategy or back up antibiotic strategy

Presenter Notes:
Otitis media symptoms last between 3-7 days.
Cochrane review highlights that otitis media resolves in 60% in 24 h without antibiotics. If antibiotics are used, it does not reduce pain at 24 hours, modest effect in pain reduction seen at 2 days (NNTB20) or 4-7 days (NNTB 16) compared to placebo and does not prevent deafness
In fact, children treated with antibiotics had more adverse effects
Children ≤ 2 years of age and with bilateral infection at higher risk of prolonged fever & symptoms – likely due to age related weaker immune response and anatomical development (Rovers et al, 2007, Pediatrics)

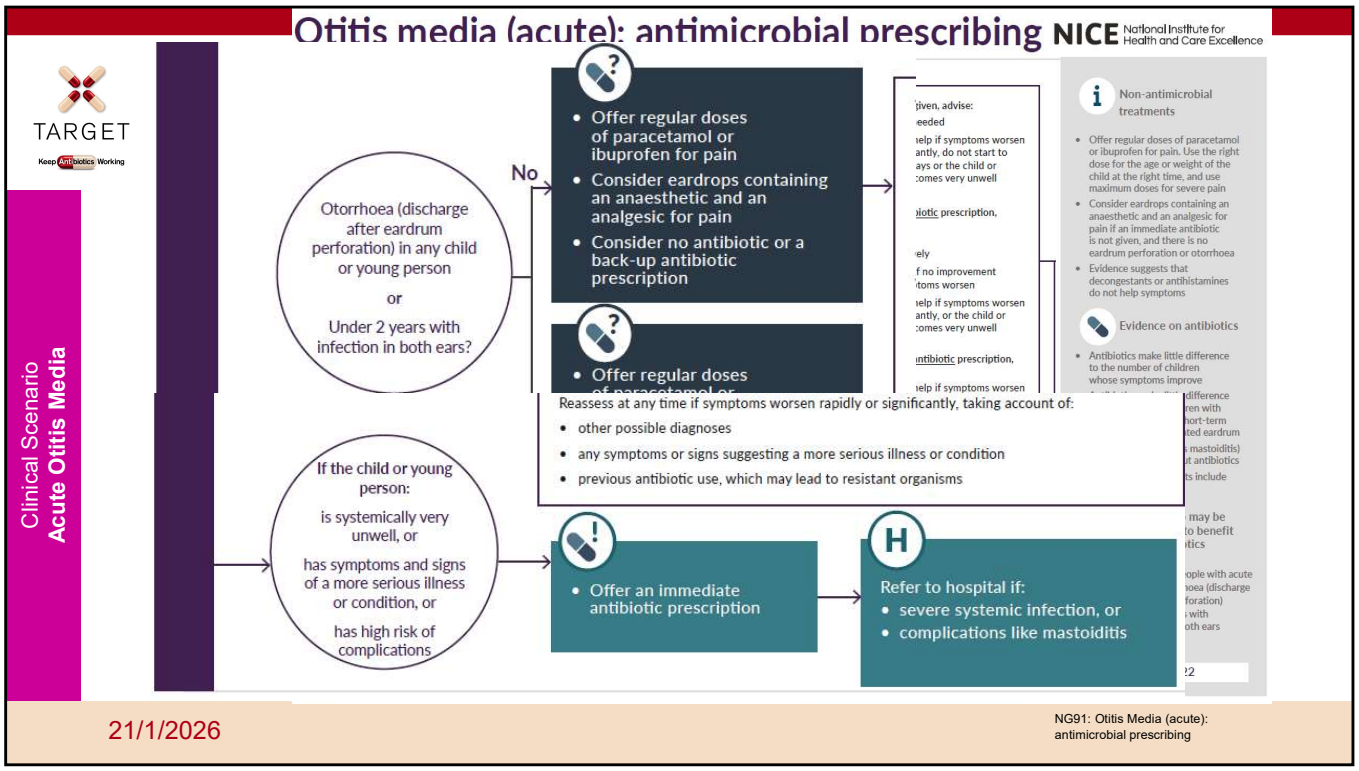
NICE recommends → No antibiotic strategy and back-up strategy for most children: important to optimise analgesia

Reference:
1. Otitis Media (acute): antimicrobial prescribing
NICE guideline [NG91] Last updated: 11 March 2022
https://www.nice.org.uk/guidance/ng91

2. Little P, Gould C, Williamson I, Moore M, Warner G, Dunleavey J. Pragmatic randomised controlled trial of two prescribing strategies for childhood acute otitis media. *BMJ*. 2001 Feb; 322(7282):336-342. Available from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC26576/.
RATIONALE: A randomised controlled trial of 315 children aged between six months and ten years presenting with acute otitis media. Two important observations were noted: parents tend to underestimate the amount of analgesia they have administered, and when recommending a no antibiotic strategy, it is all the more important to optimise analgesia.

3. Venekamp RP, Sanders S, Glasziou PP, Del Mar CB, Rovers MM. Antibiotics for acute otitis media in children. *Cochrane Database Syst Rev*. 2023; 11:1-85. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000219.pub4/epdf.
A systematic review, revealing that antibiotics have no early effect on pain, a slight effect on pain in the days following, and only a modest effect on the number of children with tympanic perforations, contralateral otitis episodes, and abnormal tympanometry findings (at two to four weeks, and six to eight weeks) compared with placebo in children with acute otitis media. In high-income countries, most cases of acute otitis media spontaneously remit without complications. The authors conclude that the benefits of antibiotics must be weighed against the possible harms, eg for every 14 children treated with antibiotics, one child had an adverse event (vomiting; diarrhoea; rash) that would not have occurred if antibiotics not given.
Why under 2 years? The protective immunity against infections with encapsulated bacteria, such as the species that cause AOM, depends on the ability to produce specific antibodies against bacterial capsular polysaccharides, which is inadequate until 2 years of age. The anatomic features of the eustachian tubes and the nasopharynx also differ with age. Consequently, children under 2 years of age seem to be more susceptible to AOM.

The evidence for treating those with more severe symptoms comes from: Rovers MM, Glasziou P, Appleman CL, Burke P, McCormick DP, Damoiseaux RA, Little P, Le Saux N, Hoes AW. Predictors of pain and/or fever at 3 to 7 days for children with acute otitis media not treated initially with antibiotics: a meta-analysis of individual patient data. *Pediatrics* 2007;119:579-85 *RATIONALE: The risk of prolonged illness was 2 times higher for children <2years with bilateral AOM than for children with unilateral AOM. For this sub-group parents should be advised that symptoms may persist for up to 7 days, and they should optimise analgesia use.*



Presenter Talk:

This is an example of the NICE antimicrobial prescribing guidance. Please check to see if there are local modifications that have been made through your ICB

(click once to bring in larger font and again to go back to full view)
If systemically very unwell, has signs and symptoms of a serious illness or high risk of complications – offer an immediate antibiotic or refer to hospital

(click once to bring in larger font and again to go back to full view)
Consider 2 or 3-day delayed or immediate antibiotics for pain relief if:
• <2 years AND bilateral AOM
OR
- Otorrhoea (discharge from eardrum) in any child our young person

- Consider Phenazone 40 mg/g with lidocaine 10 mg/g drops if immediate antibiotic is not given and there is no ear drum perforation or otorrhoea
- If providing no antibiotic or back up prescription advise to seek medical help (or take back-up prescription) if no improvement in 3 days.
- Advise to seek medical help if child/young person becomes very unwell.

Presenter notes:

OM resolves in 60% in 24 h without antibiotics, which only reduce pain at 2 days (NNT20) and does not prevent deafness

Notes/References:
1. Otitis Media (acute): antimicrobial prescribing
NICE guideline [NG91] Last updated: 11 March 2022
https://www.nice.org.uk/guidance/ng91

Optimise analgesia:
2. Little P, Gould C, Williamson I, Moore M, Warner G, Dunleavey J. Pragmatic randomised controlled trial of two prescribing strategies for childhood acute otitis media. *BMJ*. 2001 Feb; 322(7282):336-342. Available from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC26576/.
RATIONALE: A randomised controlled trial of 315 children aged between six months and ten years presenting with acute otitis media. Two important observations were noted: parents tend to underestimate the amount of analgesia they have administered, and when recommending a no antibiotic strategy, it is all the more important to optimise analgesia.

Little effect of antibiotics:
3. Venekamp RP, Sanders S, Glasziou PP, Del Mar CB, Rovers MM. Antibiotics for acute otitis media in children. *Cochrane Database Syst Rev*. 2023;11:1-85. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000219.pub4/epdf.
A systematic review, revealing that antibiotics have no early effect on pain, a slight effect on pain in the days following, and only a modest effect on the number of children with tympanic perforations, contralateral otitis episodes, and abnormal tympanometry findings (at two to four weeks, and six to eight weeks) compared with placebo in children with acute otitis media. In high-income countries, most cases of acute otitis media spontaneously remit without complications. The authors conclude that the benefits of antibiotics must be weighed against the possible harms, eg for every 14 children treated with antibiotics, one child had an adverse event (vomiting; diarrhoea; rash) that would not have occurred if antibiotics not given.
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The evidence for treating those with more severe symptoms comes from: Rovers

MM, Glasziou P, Appleman CL, Burke P, McCormick DP, Damoiseaux RA, Little P, Le Saux N, Hoes AW. Predictors of pain and/or fever at 3 to 7 days for children with acute otitis media not treated initially with antibiotics: a meta-analysis of individual patient data. *Pediatrics* 2007;119:579-85 *RATIONALE: The risk of prolonged illness was 2 times higher for children <2years with bilateral AOM than for children with unilateral AOM. For this sub-group parents should be advised that symptoms may persist for up to 7 days, and they should optimise analgesia use.*

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)

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

Presenter Talk:
Data indicates that analgesic ear drops may be helpful in treating the pain associated with AOM in children. Ear pain diminishes rapidly for most sufferers and itis likely that the concomitant administration of oral analgesics aids this process. Patients who were offered ear drops were less likely to consume antibiotics at day 8 compared to those on usual care, highlighting that ear drops offer as an effective and accessible treatment option for children with AOM.

Presenter Notes:

Acute Otitis media prescribing guidance was updated by NICE in March 2022 as a licensed preparation of ear drops containing an anaesthetic and an analgesic is now available in the UK.

Guidance allows for the provision of anaesthetic drops with back-up prescription and if no ear drum perforation/otorrhoea.

Meta-analysis of five trials (391 participants); two compared anaesthetic drops to placebo (inactive) drops; and three compared anaesthetic drops to herbal ear drops.

Findings show statistically significant difference in the proportion of children achieving a 50% reduction in pain in favour of anaesthetic drops 10 minutes after instillation (risk ratio (RR) 2.13, 95% confidence interval (CI) 1.19 to3.80) and 30 minutes after instillation (RR 1.43, 95% CI 1.12 to 1.81) on the day AOM was diagnosed. The proportion of children achieving a 25% reduction in pain was significantly higher in the anaesthetic group at all time points (T10, RR 1.5, 95% CI 1.1 to 2.2; T20, RR 1.3, 95% CI 1 to 1.7 and T30, RR 1.3, 95% CI 1.1 to 1.6)

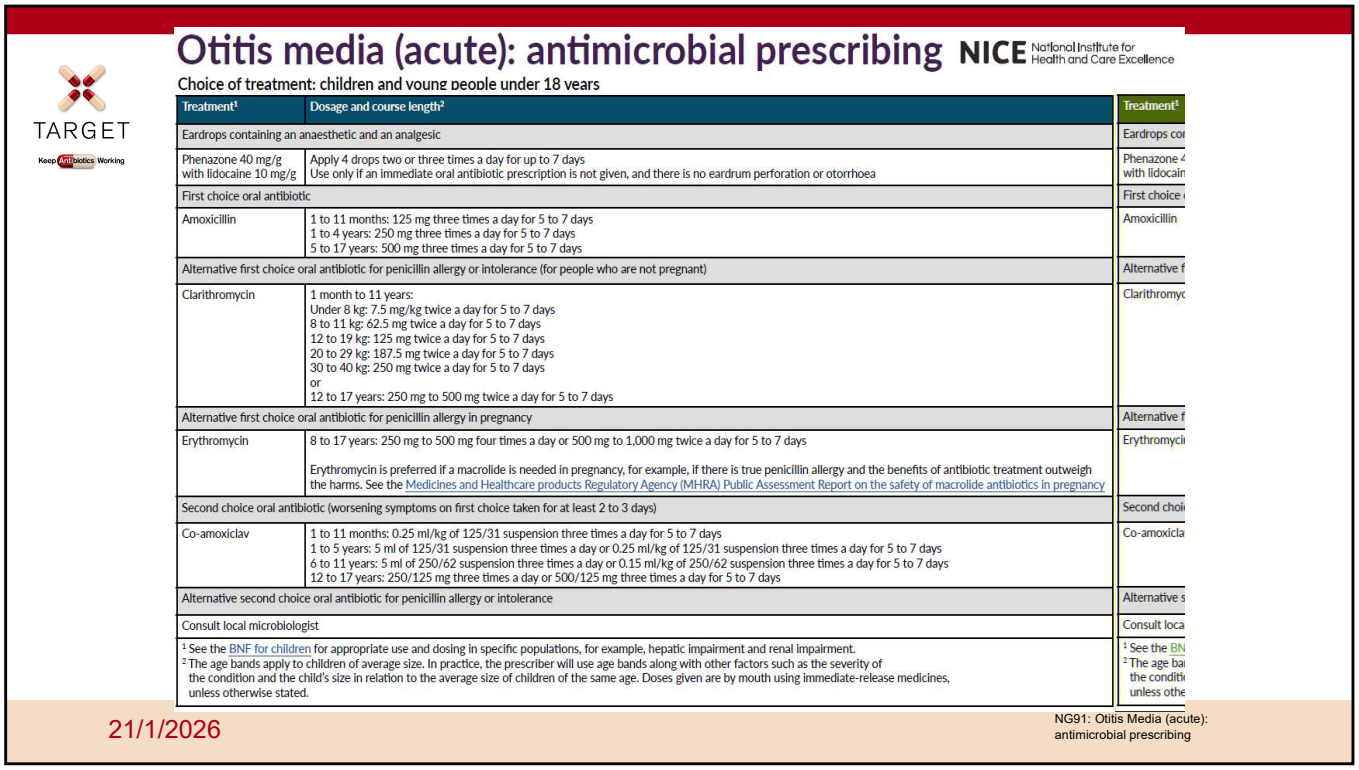
A multicentre, randomised, parallel group trial found that there was a decrease in proportion of children consuming antibiotics at day 8 when anaesthetic-analgesic ear drops were provided compared to usual care, there were also a significant reduction in parent-reported pain scores at day 2.

Reference:

1. Otitis Media (acute): antimicrobial prescribing
NICE guideline [NG91] Last updated: 11 March 2022
https://www.nice.org.uk/guidance/ng91

2. Foxlee R, Johansson AC, Wejfalk J, Dooley L, Del Mar CB. Topical analgesia for acute otitis media. Cochrane Database of Systematic Reviews 2006, Issue 3. Art. No.: CD005657. DOI: 10.1002/14651858.CD005657.pub2. Accessed 11 December 2025.

3. Hay AD, Downing H, Francis NA, Young GJ, Clement C, Harris SD, Ahern A, Schofield B, Thomas TE, Horwood J, Blair PS, Hollingworth W, Wilson V, Metcalfe C, Stoddart P, Nunez D, Lyttle MD, Little P, Moore MV. Anaesthetic-analgesic ear drops to reduce antibiotic consumption in children with acute otitis media: the CEDAR RCT. Health Technol Assess. 2019 Jul;23(34):1-48. doi: 10.3310/hta23340. PMID: 31304912; PMCID: PMC6661537.



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Otitis media (acute): antimicrobial prescribing

NICE National Institute for Health and Care Excellence

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.

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NG91: Otitis Media (acute): antimicrobial prescribing

Presenter talk:
In the NICE prescribing guidance, if eardrops are prescribed this will be Phenazone with lidocaine – only if antibiotics not given and there is no eardrum perforation or otorrhea
If antibiotics are needed

First line: Amoxicillin

Alternative if PCN allergy or intolerance (if not pregnant): clarithromycin

If PCN allergy and pregnant: Erythromycin

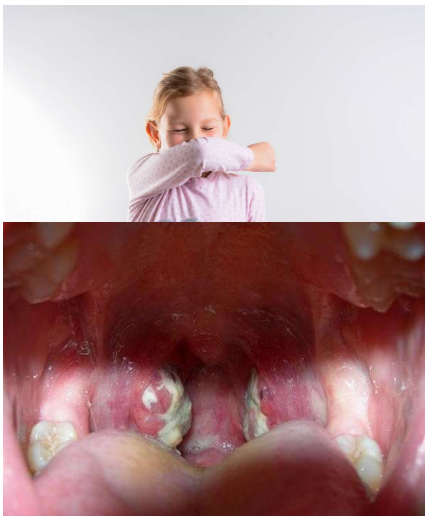
Save Co-amoxiclav for second choice oral if worsening symptoms after first choice taken for at least 2-3 days

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



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Presenter notes
Moving on to acute sore throat, what would you do in the following situation?

Show poll (Answer next slide):

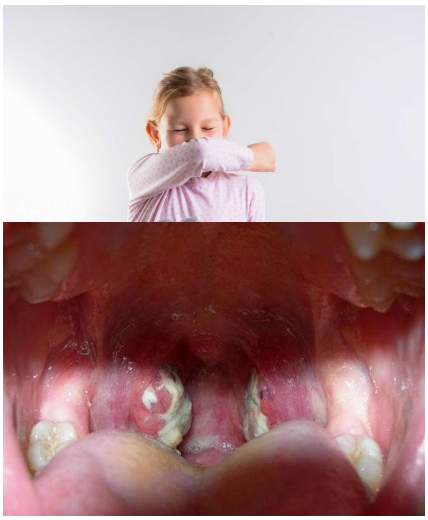
1. Consider 5 days of Pen V, with self care and safety netting advice
2. Consider no antibiotic with self care and safety netting advice
3. Consider delayed antibiotic with self care and safety netting advice
4. Consider 5 days of amoxicillin, with self care and safety netting advice

Clinical Scenario: Acute Sore Throat

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
4. Consider 5 days of amoxicillin, with self care and safety netting advice



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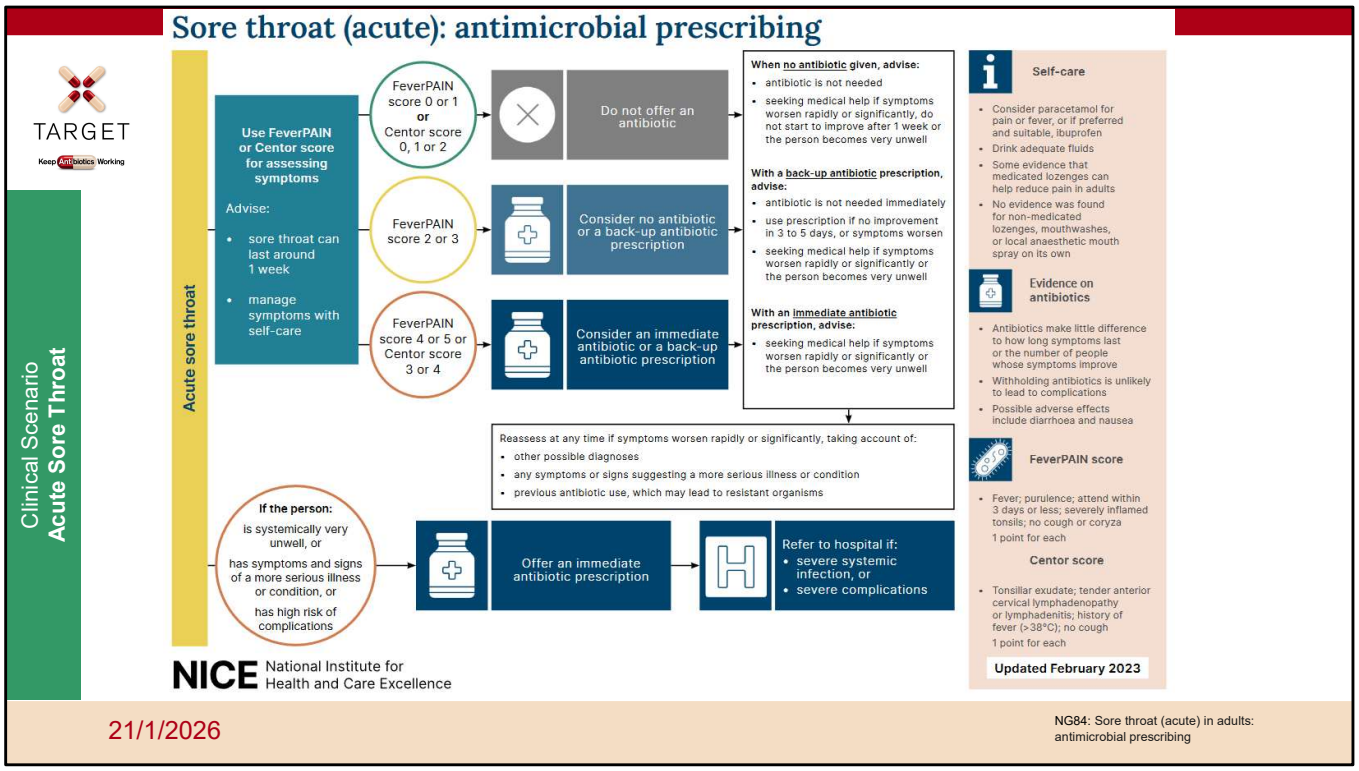
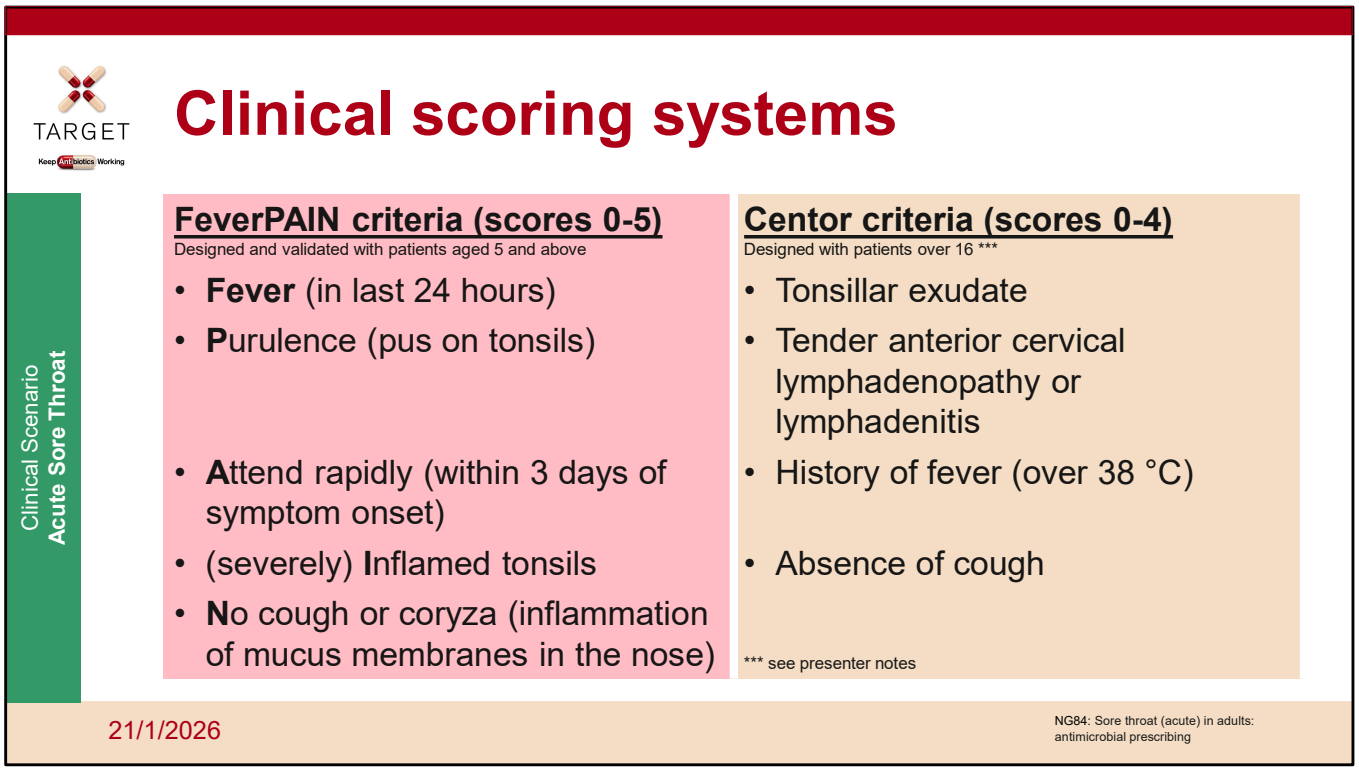
Click once to reveal answer

Explanation of answer next slide



Presenter notes:
This is an overview of the NICE guidelines. It recommends the use of clinical scoring systems. Lets have a look at the scoring systems in a bit more detail using the scenario presented.

Slide reference:
Sore throat (acute): antimicrobial prescribing
NICE guideline [NG84] Published: 26 January 2018
https://www.nice.org.uk/guidance/ng84



Presenter talk
NICE suggest that clinicians should use either the Fever PAIN or CENTOR score to help decide on the management of adult acute sore throat. Many of you will be familiar with one or both of these clinical scoring tools.

Presenter Notes
The FeverPAIN score was developed with over 500 UK general practice patients, and then tested in a further cohort of over 600 patients, so the findings of the study are really robust.
The score was not just used to predict Group A strep sore throats like the Centor score, but also other streptococcal sore throats such as C, G.

Each of the FeverPAIN criteria score 1 point (maximum score of 5). A score of 0 or 1 is thought to be associated with a 13 to 18% likelihood of isolating streptococcus. A score of 2 or 3 is thought to be associated with a 34 to 40% likelihood of isolating streptococcus. A score of 4 or 5 is thought to be associated with a 62 to 65% likelihood of isolating streptococcus (NG84).

- Fever (during previous 24 hours)
- Purulence (pus on tonsils)
- Attend rapidly (within 3 days after onset of symptoms)

- Severely Inflamed tonsils
- No cough or coryza (inflammation of mucus membranes in the nose

Centor has been around since 1981 and was developed to predict the probability of the presence of *Streptococcus* pyogenes or group A β haemolytic *Streptococcus* (GABHS) in a throat swab culture.

Centor criteria

•Tonsillar exudate

•Tender anterior cervical lymphadenopathy or lymphadenitis

•History of fever (over 38 degrees Celsius)

•Absence of cough

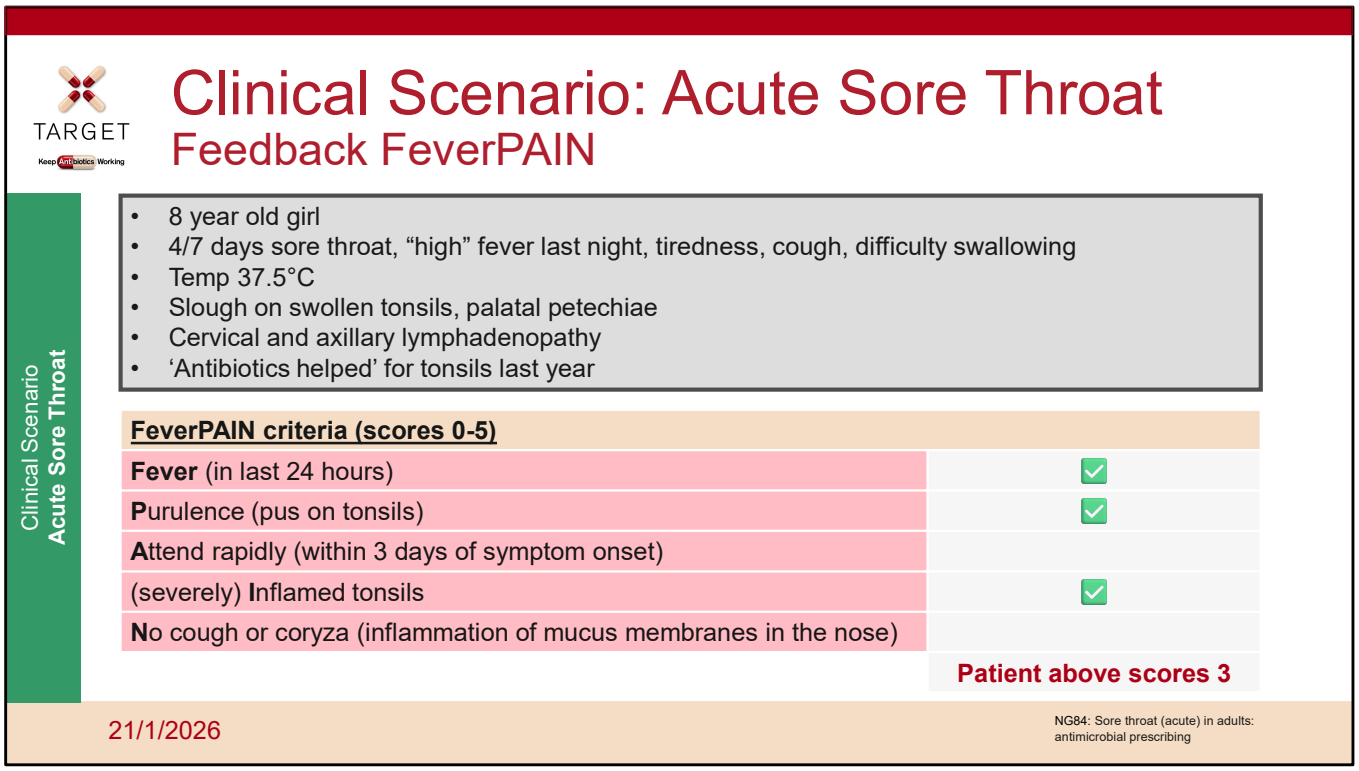
Each of the Centor criteria score 1 point (maximum score of 4). A score of 0, 1 or 2 is thought to be associated with a 3 to 17% likelihood of isolating streptococcus. A score of 3 or 4 is thought to be associated with a 32 to 56% likelihood of isolating streptococcus.

Whilst both scoring systems are very similar, the Fever PAIN score found that cervical lymphadenopathy was not predictive of streptococcal sore throat, and this may not surprise us as this occurs also in viral sore throats, so does not help to differentiate the two.

***Centor however was specifically developed for adults, so in 2004 McIsaac and team developed modified criteria, which add the age of the patient (+1 if age 3–14, 0 if age 15–44 and -1 if age ≥45), taking into account the fact that GABHS is more prevalent in the age group of 5–15 years. Still, several studies have shown that neither signs and symptoms, nor signs and symptoms combined as prediction rules, were reliable to distinguish between GABHS and non-GABHS pharyngitis.

Slide references

1. Centor R, Witherspoon J, Dalton H, et al. The diagnosis of strep throat in adults in the emergency room. *Med Decis Making* 1981;1:239–46
2. Little P, Moore M, Hobbs FDR, et al. BMJ Open 2013, 2013;3:e003943. doi:10.1136/bmjopen-2013-003943



Presenter talk
So lets take a look at using the FeverPAIN score
The Fever PAIN score gives the likelihood of having a streptococcal sore throat, which can be discussed with the patient.
Based on the patient presentation, she scores a 3.
What does this mean?

Presenter notes
So the FeverPAIN is a five-item score based on Fever (during previous 24 hours), Purulence (pus on tonsils), Attend rapidly (within 3 days after onset of symptoms), Severely Inflamed tonsils, No cough or coryza (inflammation of mucus membranes in the nose)

(FeverPAIN)
You can link to a scoring system at https://ctu1.phc.ox.ac.uk/feverpain/index.php

Clinical Scenario: Acute Sore Throat
Feedback FeverPAIN

FeverPAIN is a five-item score based on **Fever**, **Purulence**, Attend rapidly (3 days or less), **severely Inflamed tonsils** and No cough or coryza

SCORE	PRESENCE OF STREPTOCOCCUS	SUGGESTED MANAGEMENT
0-1	13-18% have streptococcus	No antibiotic strategy
2-3	34-40% have streptococcus	Back-up antibiotic strategy
≥4	62-65% have streptococcus	Immediate antibiotics or short delayed prescribing strategy

21/1/2026

Presenter Notes:

If the FeverPAIN score is 0 or 1 then the likelihood of a patient having a streptococcus in their throat is 13-18% which is close to the background carriage of streptococci, and therefore antibiotics are not warranted.

This patient has 3 of the 5 FeverPAIN criteria **(fever in last 24 hours, purulence, and severe inflammation)** – and therefore has a 34-40% likelihood of a beta haemolytic streptococcus. She could warrant a back-up/delayed antibiotic and this needs to be discussed with the patient.

If the Fever PAIN score is ≥4: there is a 62-65% of having a streptococcus, therefore consider an **immediate** antibiotic if symptoms are severe, or a **short delayed** prescribing strategy may be appropriate if symptoms are not severe and the patient is happy to wait and see how their symptoms progress. (48 hour)

In this case our patient has a FEVERPAIN score of 3 suggesting back-up/delayed antibiotics.

Presenter additional background information

References for FeverPAIN score development and testing

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

ABSTRACT: Objective: To assess the association between features of acute sore throat and the growth of streptococci from culturing a throat swab. **Design:** Diagnostic cohort. **Setting:** UK general practices.

Participants: Patients aged 5 or over presenting with an acute sore throat. Patients were recruited for a second cohort (cohort 2, n=517) consecutively after the first (cohort 1, n=606) from similar practices. **Main outcome:** Predictors of the presence of Lancefield A/C/G streptococci. **Results:** Variables significant in multivariate analysis in both cohorts were rapid attendance (prior duration 3 days or less; multivariate adjusted OR 1.92 cohort, 1.67 cohort 2); fever in the last 24 h (1.69, 2.40); and doctor assessment of severity (severely inflamed pharynx/ tonsils (2.28, 2.29)). The absence of coryza or cough and purulent tonsils were significant in univariate analysis in both cohorts and in multivariate analysis in one cohort.

A five-item score was suggested based on Fever, Purulence, Attend rapidly (3 days or less), severely Inflamed tonsils and No cough or coryza (FeverPAIN) had moderate predictive value (bootstrapped area under the ROC curve 0.73 cohort 1, 0.71 cohort 2) and identified a substantial number of participants at low risk of streptococcal infection (38% in cohort 1, 36% in cohort 2 scored ≤1, associated with a streptococcal percentage of 13% and 18%, respectively). A Centor score of ≤1 identified 23% and 26% of participants with streptococcal percentages of 10% and 28%, respectively

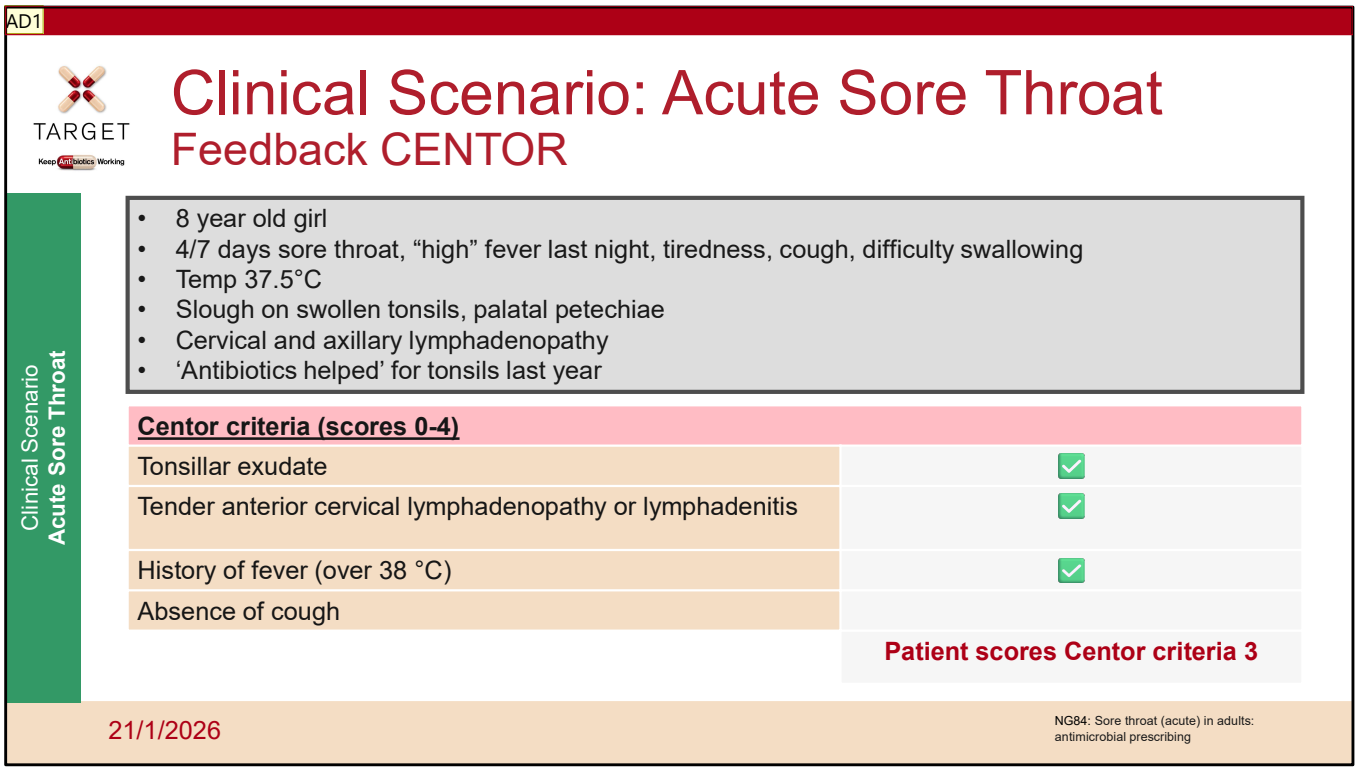
This score was further tested in an RCT: **Little P, Hobbs FDR, Moore M. et al. Clinical score and rapid antigen detection test to guide antibiotic use for sore throats: randomised controlled trial of PRISM (primary care streptococcal management). 2013. BMJ. Available from: http://www.bmj.com/content/347/bmj.f5806.**

Rationale: A multicentre randomised controlled trial in UK general practices designed to determine the effect of clinical scores that predict streptococcal infection or rapid streptococcal antigen detection tests compared with delayed antibiotic prescribing in patients aged >3 with acute sore throat.

This study compared three strategies for limiting or targeting antibiotic using a validated FeverPAIN score in 631 patients with sore throat: they compared delayed antibiotic prescribing, the use of a clinical score designed to identify streptococcal infection, and the targeted use of rapid antigen tests according to the clinical score. Findings suggest that across a range of practitioners and practices, use of either the simple FeverPAIN clinical score or the clinical FeverPAIN score with a rapid antigen test is likely to moderately improve symptom control and reduce antibiotic use; the addition of the Rapid antigen test to the FeverPAIN score gave no clear advantages compared with use of the FeverPAIN score alone. Use of antibiotics in the clinical score group (60/161) was 29% lower (adjusted risk ratio 0.71, 95% confidence interval 0.50 to 0.95; P=0.02) and in the antigen test group (58/164) was 27% lower (0.73, 0.52 to 0.98; P=0.03). There were no significant differences in complications or reconsultations. **The authors therefore suggest the use of the following scoring system and clinical management:** With a low FeverPAIN score of 0-1: only 13-18%

have streptococcus, close to background carriage and therefore a no antibiotic strategy is appropriate with discussion. With a FeverPAIN score of 2-3: 34-40% have streptococcus, therefore a back-up/delayed antibiotic is appropriate with discussion. With a FeverPAIN score of >4: 62-65% have streptococcus, therefore consider immediate antibiotic if symptoms are severe or a short 48 hour delayed antibiotic prescribing strategy may also be appropriate after agreement with the patient and safety netting advice.

If a patient is unwell with a Centor score of 3-or-4 then the chance of developing Quinsy is 1:60.



Presenter talk
Lets have a look at the same scenario but using the Centor score.

As we saw before the Centor scoring system is very similar but includes lymphadenopathy which this patient has – giving a score of 3,

Slide 24

AD1 no need for a capital letter - would add "(peritonsillar abscess)"
Alicia Demirjian, 2025-09-29T09:30:58.025

ML1 0 Unsure where to add this? We mention development of quinsy in next slide
Ming Lee, 2025-10-09T15:16:15.669

Clinical Scenario: Acute Sore Throat
Feedback CENTOR

Centor Criteria: **History of fever**; absence of cough; **tender anterior cervical lymphadenopathy** and **tonsillar exudates**.

- Centor score 0-2: has a high negative predictive value (80%) and indicates low chance of Group A Beta Haemolytic Streptococci (GABHS)
  → **No antibiotic strategy**
- Centor score 3 or 4: suggests the chance of GABHS is 40%
  → **Back up or immediate antibiotic strategy.**
- If a patient is unwell with a Centor score of 3 or 4 then the chance of developing Quinsy is 1:60.

21/1/2026

Presenter Talk

This patient has 3 of the 4 Centor criteria (because they have a history of fever, lymphadenopathy, and exudate) – and is therefore more likely to have a group A beta haemolytic Streptococcus. She could warrant an immediate or back-up/delayed antibiotic – however the benefit with immediate antibiotics may still be quite small and needs to be discussed with the patient. Centor leads to more prescribing than Fever PAIN

Presenter Notes

Centor Criteria: History of fever; absence of cough; tender anterior cervical lymphadenopathy and tonsillar exudates.

A low Centor score (0-2) has a high negative predictive value (80%) and indicates low chance of Group A Beta Haemolytic Streptococci (GABHS).

A Centor score of 3-or-4 suggests the chance of GABHS is 40%.

If a patient is unwell with a Centor score of 3-or-4 then the chance of developing Quinsy is 1:60.

Slide reference

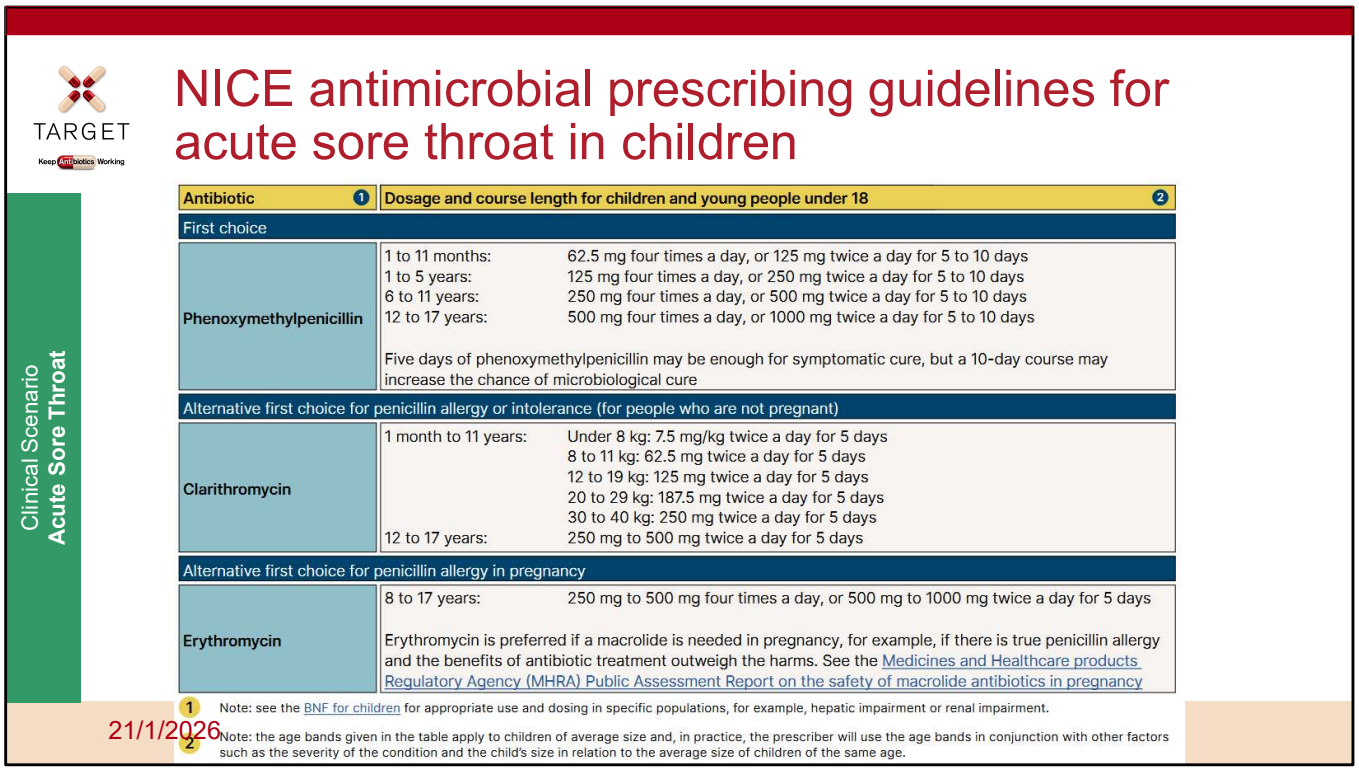
Centor RM, Whitherspoon JM, Dalton HP, Brody CE, Link K. The diagnosis of strep throat in adults in the emergency room. *Med Decision Making* 1981;**1**:239-46.

Studies that back up the use of Centor

Aalbers J, O'Brien KK, Chan WS, Falk GA, Teljeur C, Dimitrov BD, and Fahey T (2011) Predicting streptococcal pharyngitis in adults in primary care: a systematic review of the diagnostic accuracy of symptoms and signs and validation of the Centor score. *BMC Medicine*, 9:67.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3127779/pdf/1741-7015-9-67.pdf

Fine AM, Nizet V, and Mandl KD (2012) Large-scale validation of the Centor and McIsaac scores to predict group A streptococcal pharyngitis. *Arch Intern Med*, 172(11):847-852.
https://jamanetwork.com/journals/jamainternalmedicine/article-abstract/1157417

Hassan MF, Eida MM, Metwally LA, and Mahmoud HA (2015) Evaluation of Appropriateness of Antibiotic Use and Validation of the McIsaac-Modified Centor Score for Group A Beta Hemolytic Streptococcal Acute Pharyngitis in Suez Canal Area. *Suez Canal University Medical Journal*, 18(2):117-124.
https://journals.ekb.eg/article_45612_a3c5f8106208278c29773deb5a076b0e.pdf



Presenter talk

So we have managed this case in line with National NICE guidance. This is a snapshot of the aims and principles of treatment section of the Antibiotic Prescribing Implementation Tool for acute sore throat. As you can see each section has links to other guidance, comments on when antibiotics should be used, recommended first and second line antibiotics dose and duration.

The guidance recommends oral penicillin V for AST as first line

Presenter please tell the participants where to find your local guidance and how locums can get extra copies if needed.

Presenter notes

We have been presenting guidelines based on NICE guidance, however, appreciate that there may be local guidelines in place. It would be good to highlight them here and consider discussion around duration.

Acute cough: clinical scenario

Clinical Scenario
Acute Cough

Consider the following details:

- 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

21/1/2026

Presenter notes

Moving on, lets consider a case of cough. What would you do in this situation?

Show Poll (Answers next slide)
A. Prescribe 5 days of doxycycline, with self care and safety netting advice

B. No antibiotic with self care and safety netting advice

C. Delayed antibiotic with self care and safety netting advice

D. Prescribe 5 days of amoxicillin, with self care and safety netting advice

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

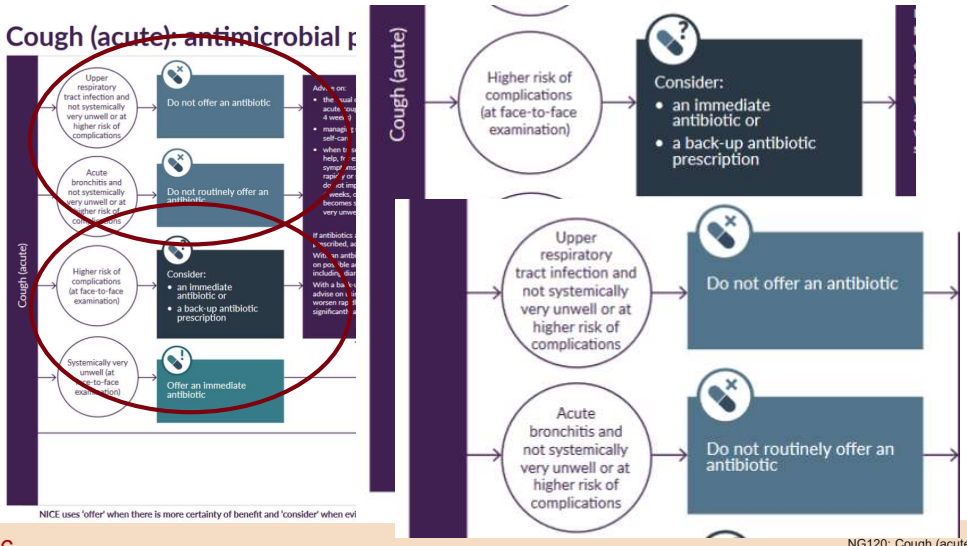
21/1/2026

Click once for answer

Guidance and feedback on next slide

Acute cough antibiotic prescribing

Clinical Scenario
Acute Cough



21/1/2026

NG120: Cough (acute): antimicrobial prescribing

Presenter talk

The TARGET website also links to the NICE national antibiotic guidance for acute cough, which is used by most ICBs to develop their local guidance. Please make sure to check your local guidance.

This is a snapshot of the visual summary of the Management of Infection Guidance for acute cough – last updated January 2022.

Speaker to click through the animations for each part of the guidance.

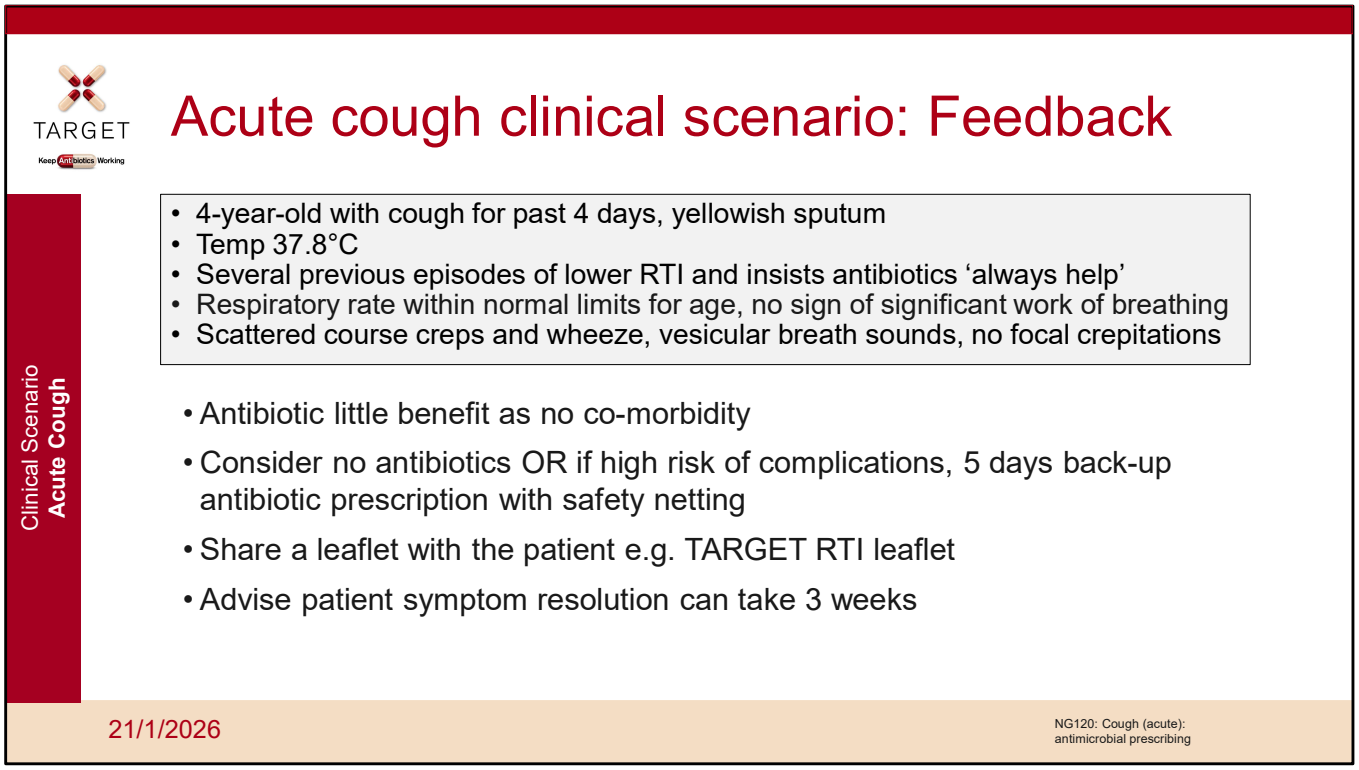
As you can see each section has information on what criteria is needed to indicate antibiotics should be prescribed. It also provides information on self care.

Presenter notes

We suggest you also refer to your local guidance.

Slide references

1) NICE (2019). Cough (acute): antimicrobial prescribing. Available at: https://www.nice.org.uk/guidance/ng120/evidence



Presenter talk

In this case a no, or back-up antibiotic prescription (5 day) strategy with safety netting advice using a patient leaflet (see TARGET) could be used as the symptoms do not suggest immediate antibiotic use is required. But the clinician needs to assess how "ill" they consider the patient is.

People with high risk of complications include:

- Those with pre-existing comorbidities e.g. heart, lung disease
- Young children born prematurely
- >65 years with 2 or more of the following or > 80 years with 1 or more of the following (hospitalisation in previous year, type 1 or type 2 diabetes, history of congestive heart failure, current use of oral corticosteroids)

Patients should be advised that resolution of symptoms can take up to 3 weeks and that antibiotic therapy will make little difference to their symptoms and may result in side effects. Patients should also be advised to seek a clinical review if condition worsens or becomes prolonged.

The evidence – see references below:

In a European study of 3,000 primary care patients with acute cough across 13 countries, clinical outcome was similar whether antibiotics were given or not (1).

In an RCT of amoxicillin 1g tds vs placebo in 2061 patients 18yrs and over with acute LRTI when pneumonia was not suspected. New or worsening symptoms were significantly less common in amoxicillin (15.9%) than in the placebo group 19.3% (NNT30). Nausea, rash or diarrhoea were significantly more common in the amoxicillin group (number needed to harm 21). There was no increased benefit in those over 60 yrs (2). In this same patient series those with a history of significant co-morbidities experienced a significantly greater reduction in symptom severity between days 2 & 4. Those with a short prior illness <7days, or non smokers antibiotics provided a modest benefit (3).

NICE published guidelines in October 2023 to Suspected acute respiratory infection in over 16s: assessment at first presentation and initial management. These guidelines are to be used in conjunction with the This guideline should be read alongside NICE's antimicrobial prescribing guidelines on acute cough and acute sore throat. The guidelines state: *If, after clinical assessment, it is unclear if antibiotics are needed for someone with a lower respiratory tract infection, consider a point-of-care C-reactive protein (CRP) test to support clinical decision making and:*
•*offer immediate antibiotics if the CRP level is more than 100 mg/litre*
•*consider a back-up antibiotic prescription if the CRP level is between 20 mg/litre and 100 mg/litre*
•*do not routinely offer antibiotics if the CRP level is less than 20 mg/litre*.

Slide references

1. Butler C C, Hood K, Verheij T, Little P, Melbye H, Nuttall J et al. Variation in antibiotic prescribing and its impact on recovery in patients with acute cough in primary care: prospective study in 13 countries BMJ 2009; 338 :b2242 doi:10.1136/bmj.b2242- https://www.bmj.com/content/bmj/338/bmj.b2242.full.pdf

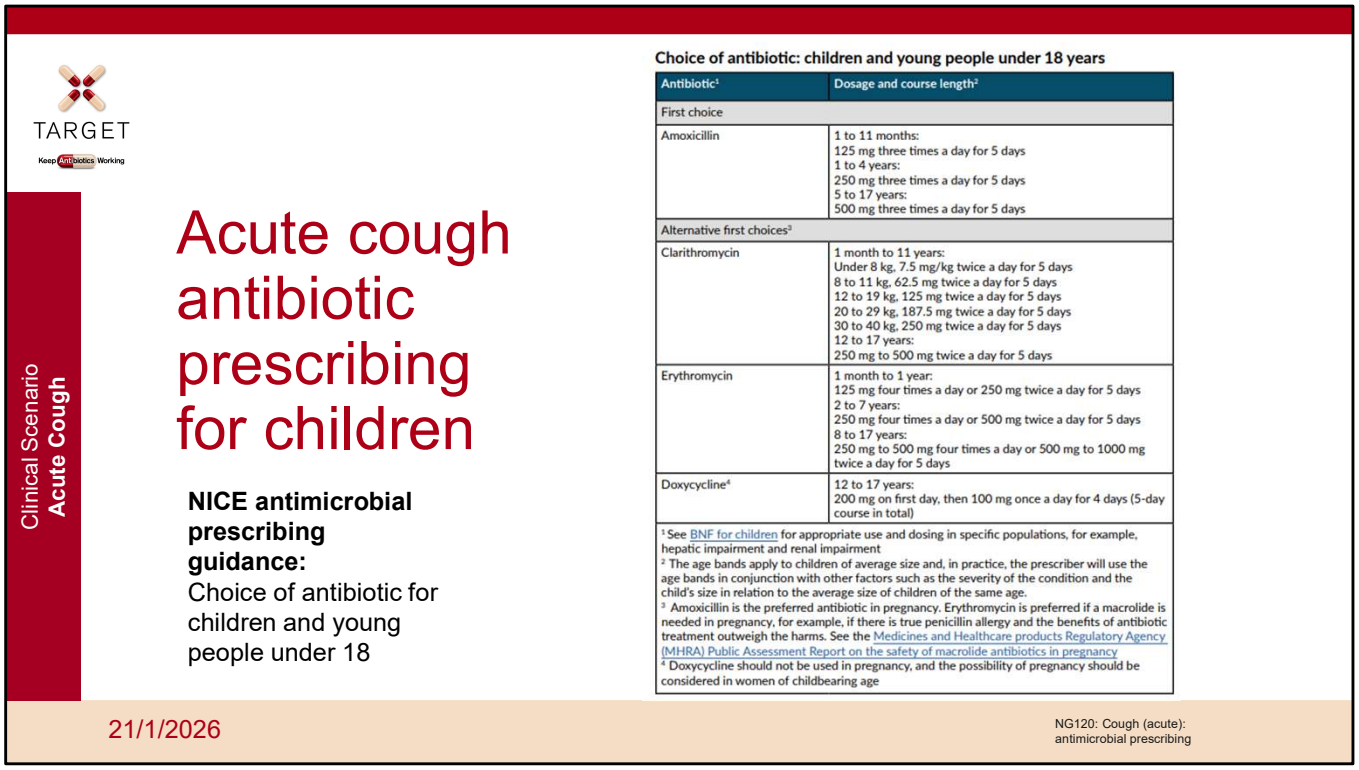
2. Little P, Stuart B, Moore M, Coenen S, Butler CC, Godycki-Cwirko M, Mierzecki A, Chlabicz S, Torres A, Almirall J, Davies M, Schaberg T, Mölstad S, Blasi F, De Sutter A, Kersnik J, Hupkova H, Touboul P, Hood K, Mullee M, O'Reilly G, Brugman C, Goossens H, Verheij T; GRACE consortium. Amoxicillin for acute lower-respiratory-tract infection in primary care when pneumonia is not suspected: a 12-country, randomised, placebo-controlled trial. Lancet Infect Dis. 2013 Feb;13(2):123-9. doi: 10.1016/S1473-3099(12)70300-6. Epub 2012 Dec 19. PMID: 23265995. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3905438/pdf/bjgpfeb2014-64-

619-e75.pdf

3. Moore M, Stuart B, Coenen S, Butler CC, Goossens H, Verheij TJ, Little P; GRACE consortium. Amoxicillin for acute lower respiratory tract infection in primary care: subgroup analysis of potential high-risk groups. Br J Gen Pract. 2014 Feb;64(619):e75-80. doi: 10.3399/bjgp14X677121. Erratum in: Br J Gen Pract. 2014 Mar;64(620):126. PMID: 24567620; PMCID: PMC3905438.
https://bjgp.org/content/bjgp/64/619/e75.full.pdf

4. NICE Clinical Guidelines [CG237] Suspected acute respiratory infection in over 16s: assessment at first presentation and initial management. Published: 31 October 2023. Last updated: 16 November 2023. Accessed: December 2023. https://www.nice.org.uk/guidance/ng237

5. NICE (2019). Cough (acute): antimicrobial prescribing. Available at: https://www.nice.org.uk/guidance/ng120/evidence



Presenter talk

This is a screenshot of the treatment section of the NICE Management of Infection Guidance for acute cough and includes recommended first and second line antibiotics dose and duration. For acute cough, we suggest that antibiotics have little benefit if no co-morbidity. This NICE guidance also has an extensive rationale section which is really useful if you would like more information for yourself or the patient.

The guidance recommend amoxcillin first line; with alternatives of clarithromycin, erythromycin and doxycycline. Co-amoxiclav is not a recommended first line or second line alternative for acute cough (if pneumonia is not diagnosed).

Presenter notes

We suggest you also refer to your local guidance.

Slide references

1) NICE (2019). Cough (acute): antimicrobial prescribing. Available at: https://www.nice.org.uk/guidance/ng120/evidence

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"

Slide courtesy of NHS England

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

Presenter notes

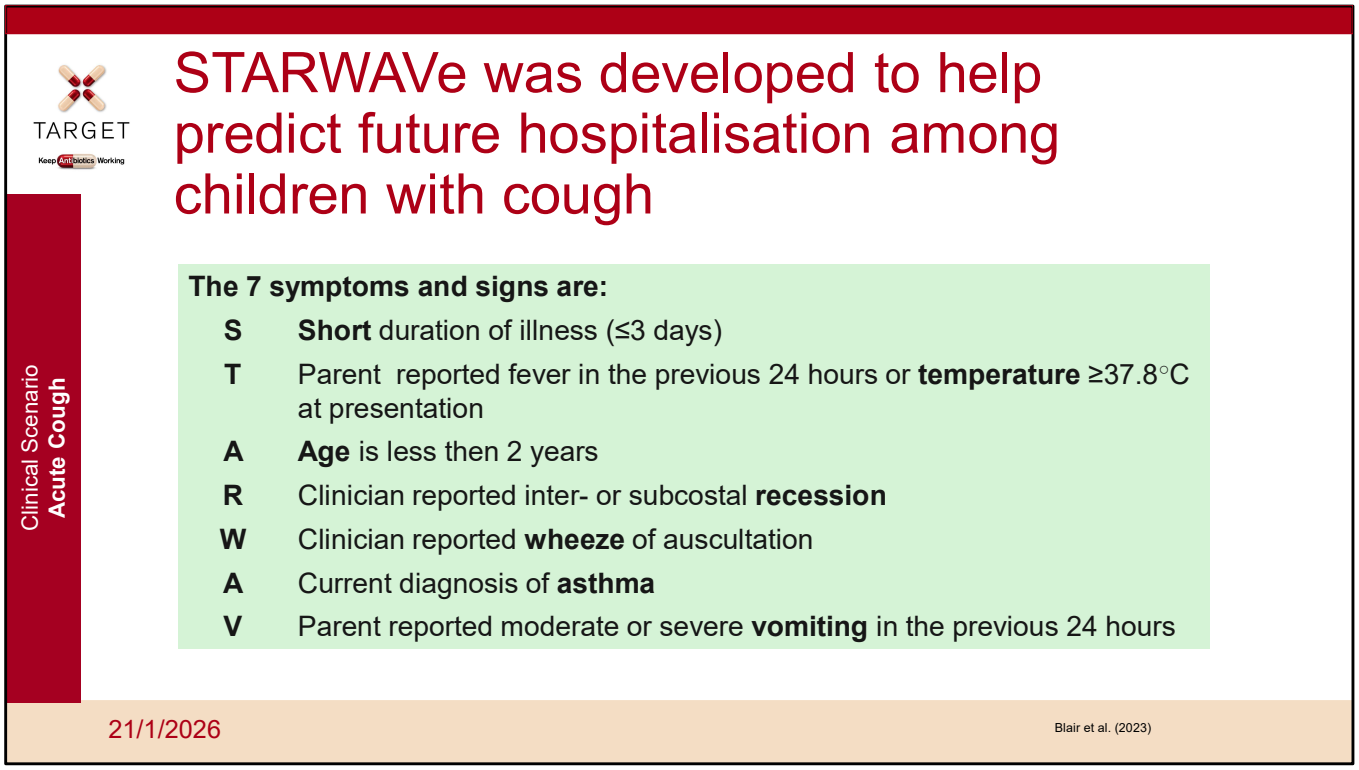
As we mentioned at the start of the talk, concern about rapid deterioration of a child and their perceived vulnerability often drives clinicians to prescribe antibiotics.

This study by Alastair Hay and colleagues, in English general practices (so patient cohorts like yours) developed a 7 point prognostic guide that allows children to be stratified according to their risk of admission to hospital over the subsequent 30 days.

They can be stratified into very low risk (1 patient in 449), normal risk (1 in 104) and high risk (1 in 23 patients) and the authors suggest that this could be used to reduce antibiotic prescriptions in primary care for children at very low risk

References:

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
Hay, Alastair D et al.
The Lancet Respiratory Medicine, Volume 4, Issue 11, 902 - 910



Presenter talk

Antibiotics have little benefit if there is no comorbidity and in our worked example, we highlight using a no antibiotic or delayed prescribing strategy. Qualitative research suggest that prescribers are still prescribing due to uncertainty, fear of missing something serious, and just in case. STARWAVe is a tool that may alleviate that anxiety about the likelihood of deterioration and could be useful alongside your clinical judgement.

Unlike some similar decision making algorithms, STARWAVe is not currently included in management guidance so please discus with your ICB medicines management leads before using as an intervention in your clinical practice.

Presenter Notes

STARWAVe is a clinical scoring tool developed by researchers at University of Bristol to help predict possible hospitalisation among children who have presented to in-hours primary care with acute (≤28 days) cough and respiratory tract infection (RTI).

STARWAVe was developed in response to primary care clinicians saying they prescribe antibiotics “just in case” children’s illnesses deteriorate. However, as with

all tools, use of STARWAVe should support, not replace, clinical judgement.

STARWAVe was used as part of a multi-faceted intervention to improve management of antibiotics for children presenting to primary care with acute cough and respiratory tract infection and was evaluated in a recent randomised controlled trial (CHICO), from Nov 2018 to Sept 2021. The trial period included COVID-19 pandemic, which changed how consultations occurred and rates of infection. Full trial results showed contradictory or non-significant findings. However, when a post hoc sensitivity analysis was conducted that excluded data after March 2020, the findings showed a reduced dispensing rate in the intervention arm (Adjusted rate ratio - 0.967 (95% CI: 0.946 to 0.989), p= 0.003). The findings also showed no difference in hospitalisations or emergency room visits between the intervention and control group.

The value of STARWAVe is to reduce clinical uncertainty when managing children with acute cough.
Children with 0-1 STARWAVe symptoms and signs (67% of all children): are at very low risk (around 1:320) of future admission and a 'no' antibiotic strategy should be considered for this group.
Children with 2-3 STARWAVe symptoms and signs (30% all children) who are at 'normal' risk of future admission (around 1:70). In keeping with NICE guidelines, a 'no' or 'delayed' antibiotic prescribing strategy should be considered.
Children with 4 or more STARWAVe symptoms and signs (3% of all children) should be closely monitored for signs of deterioration, with consideration given to proactively arranging same-day or next-day follow-up and prescribing an immediate antibiotic.

Presenter notes

STARWAVe development details are here:
https://www.thelancet.com/journals/lanres/article/PIIS2213-2600(16)30223-5/fulltext

The intervention included the STARWAVEe algorithm embedded into GP systems and personalised printout recording decisions made at the consultation, covering common concerns and providing safety netting information, which was based on a leaflet co-designed with parents (Caring for children with cough).

https://www.bristol.ac.uk/media-library/sites/primaryhealthcare/documents/target/caring-for-children-with-cough-leaflet-print-ready.pdf

We found no difference in the rate of hospital admissions at 0.013 (0.010 to 0.018) and 0.015 (0.012 to 0.020) for the intervention and control arms, respectively. This translates into 13 or 15 admissions a year per 1000 children, and the rate ratio was 0.952 (0.905 to 1.003). As 1.003 lies below the 1.01 non-inferiority margin we set, the intervention was considered non-inferior. Pre-specified sensitivity analyses that

incorporated hospital admissions with "missing diagnosis" did not change these results (supplementary table A). The seasonal winter peak of hospital admissions was absent during the pandemic (fig 2). The secondary outcome of emergency department attendance rates were 0.045 (0.038 to 0.054) and 0.044 (0.037 to 0.052) for the intervention and control arms, respectively. This translates into approximately 49 and 45 attendances a year per 1000 children; the rate ratio was 1.013 (0.980 to 1.047; P=0.44). Pre-specified sensitivity analyses that incorporated "missing diagnosis" admissions and emergency department attendances are shown in the supplementary material.

References

Blair P S, Young G, Clement C, Dixon P, Seume P, Ingram J et al. Multi-faceted intervention to improve management of antibiotics for children presenting to primary care with acute cough and respiratory tract infection (CHICO): efficient cluster randomised controlled trial BMJ 2023; 381 :e072488 doi:10.1136/bmj-2022-072488 Multi-faceted intervention to improve management of antibiotics for children presenting to primary care with acute cough and respiratory tract infection (CHICO): efficient cluster randomised controlled trial | The BMJ

Bristol University - Using STARWAVe in practice to predict hospitalisation. Available at: https://www.bristol.ac.uk/media-library/sites/primaryhealthcare/documents/target/Using%20STARWAVe%20evidence%20in%20practice%20(19.12.2023).pdf

[accessed 03.01.24]

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

https://www.bristol.ac.uk/media-library/sites/primaryhealthcare/documents/target/Using%20STARWAVe%20evidence%20in%20practice%20(19.12.2023).pdf

TARGET
Keep Antibiotics Working

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

21/1/2026

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

Presenter notes:
To summarise, how useful are antibiotics for common respiratory tract infections? This table includes much of the research on what we know about common respiratory tract infections, how long the symptoms usually last, and how much patients benefit from taking antibiotics. As you can see, antibiotics reduce symptoms for between 8 and 24 hours. So at best about 12 hours in otitis media, an illness that lasts for 4 to 8 days; taking a look at the NNT Benefit and NNT Harm columns – 20 patients with OM need to be treated with antibiotics for one patient to benefit, but for 10 patients receiving antibiotics one will experience an adverse effect. For bronchitis, an illness that lasts for about three weeks, the reduction in days with cough was less than half a day and the reduction in days feeling ill was just over half a day with antibiotics.

Any benefit that our patients achieve from antibiotics is tiny and the numbers needed to treat to achieve one satisfactory earlier resolution needs to be weighed against the one in 10 chance of causing side effects such as diarrhoea, vomiting, rash, allergic reaction (1 in 15) or the risk of carrying a resistance bacteria. So, unless symptoms are particularly severe, there is no reason for using antibiotics in the majority of patients presenting with respiratory symptoms because they do not help.

Evidence
This evidence is all outlined in the PHE antibiotic guidelines and NICE CG69, but most recent systematic reviews include:

Otitis media
Venekamp et al (2023) Antibiotics for acute middle ear infection (acute otitis media). Cochrane
https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD000219.pub5/full#CD000219-abs-0001
This systematic review included 13 RCTs involving 3401 children with otitis media (3938 episodes). Pain was not reduced by antibiotics at 24 hours. A third fewer had residual pain at 2-3 days (at which point pain levels are usually substantially reduced) and NNT for an additional beneficial outcome was 20. Antibiotics reduced the number of Tympanic Membrane perforations, but NNT for Benefit is 33. Severe complications were rare and did not differ between children given antibiotics and those given placebo. Immediate antibiotics were associated with a substantial increased risk of vomiting, diarrhoea or rash compared with no treatment (NNTH10).

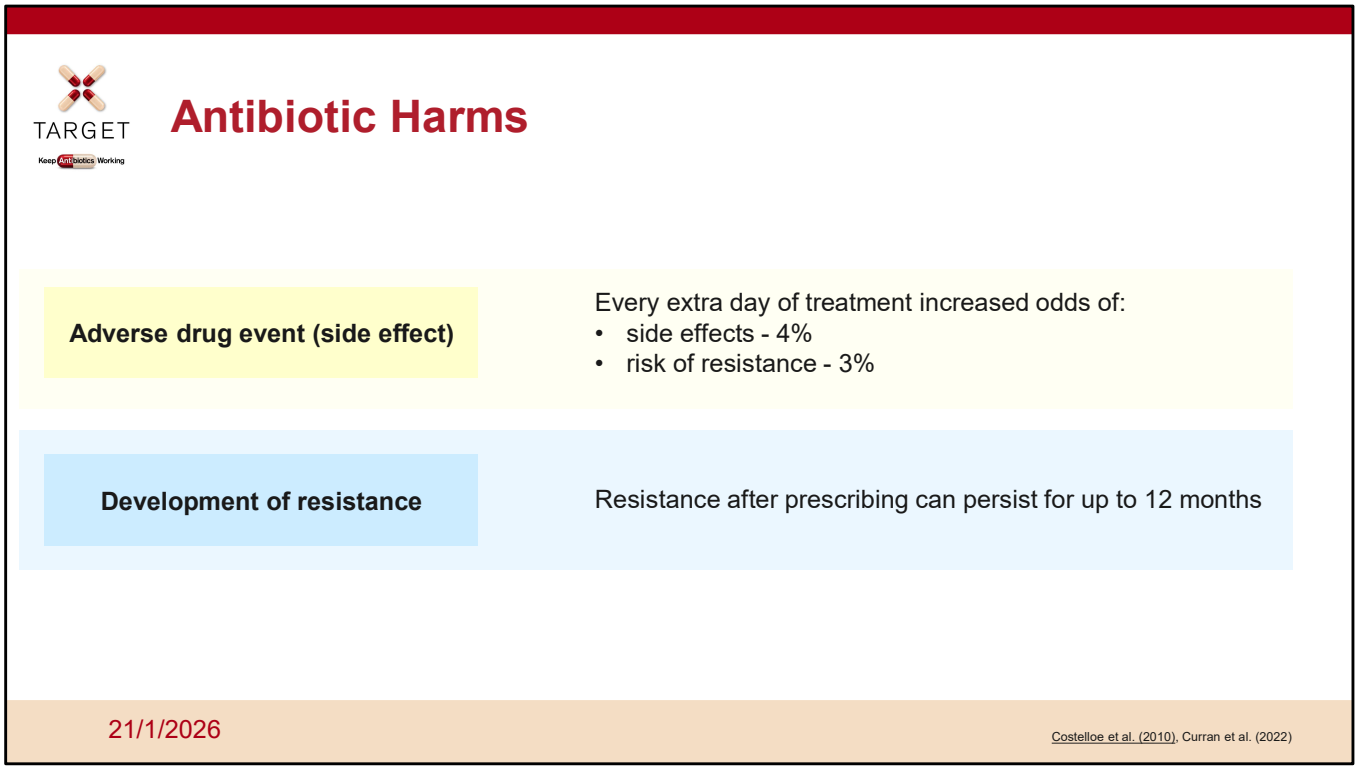
Sore throat
Spinks A et al. (2021) Antibiotics for sore throat. Cochrane
https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD000023.pub5/full
29 RCTs of antibiotics for sore throat vs placebo including 15 377 cases. Antibiotics were most beneficial if given at day three if throat swabs were positive for streptococcus (NNTB 6) compared to NNTB at day 7 of 18.

Little P et al (2013) – 2 studies within the PRISM trial used a Clinical score compared to rapid antigen detection test to guide antibiotic use for sore throats. The RCT using clinical scores to predict streptococcal infection in patients and found that the use of FeverPAIN is likely to moderately improve symptom control and reduce antibiotic use. PHE and NICE guidance suggests Consider immediate antibiotics if symptoms severe or a short 48 hour back-up strategy may be appropriate, when the FeverPAIN score is 4 or over. Consider back-up or no antibiotic if score 2-3.
https://www.bmj.com/content/bmj/347/bmj.f5806.full.pdf

Sinusitis
Leminengre M et al. (2012) Antibiotics for clinically diagnosed acute rhinosinusitis in adults. Cochrane.
http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD006089.pub4/pdf/abstract
10 RCTs of antibiotics vs placebo including 2450 participants. Irrespective of treatment group 47% of patients were cured after 1 week, 71% after 14 days. 18 patients need to be treated for a faster cure rate between 7 and 14 days. If several of: purulent nasal discharge; severe localised unilateral pain; fever; marked deterioration after initial milder phase, patients were more likely to benefit from antibiotics, when PHE and NICE recommend a **back-up antibiotic.** One disease related complication (brain abscess) occurred in patient treated with antibiotics, but

complications are rare.

Bronchitis/LRTI (without pneumonia)
Smith S et al. (2017) Antibiotic treatment of people with clinical diagnosis of acute bronchitis. Cochrane
http://www.cochrane.org/CD000245/ARI_antibiotic-treatment-people-clinical-diagnosis-acute-bronchitis
17 trials with 5099 participants were included. The number needed to treat for one additional beneficial outcome was 22 (NNTB 22). The reduction in days with cough was 0.46 days and days feeling ill was 0.64 days (CI 1.16-0.13). NNT for an additional adverse effect was 24.



Presenter Talk

We highlighted that any benefit that patient achieve from antibiotics is tiny on the previous slide. This slide highlights the potential harms of antibiotics
Research shows antibiotics are not risk-free: about 20% of patients experience adverse effects, and every extra day of treatment increases the odds of harm and resistance. Meta-analyses confirm antibiotic use drives persistent resistance for up to 12 months, with longer courses and repeated use worsening the problem.

Presenter Notes

1. Adverse drug reaction (2)
Umbrella review and meta analysis of systematic reviews of 71 RCT comparing short and longer courses of antibiotics, mix of adult and children and from multiple settings but mainly primary care
Highlighted that about 20% of patients experienced an adverse drug event e.g. nausea, diarrhoea, headache
Every extra day of treatment increased the odds of experiencing and ADR by 4% and the risk of resistance by 3%.
This study demonstrates clearly that every extra day of antibiotic treatment can be harmful – which is why it is so important to prescribe the optimal duration of antibiotics as per guidelines

2. Development of resistance (1)
Research show that consumption of antibiotics leads to demonstrable and persistent development of resistance.
Meta analysis (not specific to RTIs) shows antibiotic treatment being associated with subsequent detection of susceptible or resistant organisms shows a trend towards development of resistance and this persists for up to 12 months.

The meta analysis referenced included 24 studies; 22 involved patients with symptomatic infection and two involved healthy volunteers; 19 were observational studies (of which two were prospective) and five were randomised trials. In five studies of urinary tract bacteria (14 348 participants), the pooled odds ratio (OR) for resistance was 2.5 (95% confidence interval 2.1 to 2.9) within 2 months of antibiotic treatment and 1.33 (1.2 to 1.5) within 12 months. In seven studies of respiratory tract bacteria (2605 participants), pooled ORs were 2.4 (1.4 to 3.9) and 2.4 (1.3 to 4.5) for the same periods, respectively. Studies reporting the quantity of antibiotic prescribed found that longer duration and multiple courses were associated with higher rates of resistance. Studies comparing the potential for different antibiotics to induce resistance showed no consistent effects. Only one prospective study reported changes in resistance over a long period; pooled ORs fell from 12.2 (6.8 to 22.1) at 1 week to 6.1 (2.8 to 13.4) at 1 month, 3.6 (2.2 to 6.0) at 2 months, and 2.2 (1.3 to 3.6) at 6 months.

References
(1) Costelloe C, Metcalfe C, Lovering A, Mant D, Hay AD. Effect of antibiotic prescribing in primary care on antimicrobial resistance in individual patients: systematic review and meta-analysis. BMJ. 2010 May 18;340:c2096. doi: 10.1136/bmj.c2096. PMID: 20483949. https://pubmed.ncbi.nlm.nih.gov/20483949/ [Accessed 06 December 2023]

(2) Curran J, Lo J, Leung V, Brown K, Schwartz KL, Daneman N, Garber G, Wu JHC, Langford BJ. Estimating daily antibiotic harms: an umbrella review with individual study meta-analysis. Clin Microbiol Infect. 2022 Apr;28(4):479-490. doi: 10.1016/j.cmi.2021.10.022. Epub 2021 Nov 12. PMID: 34775072.

TARGET

Keep Antibiotics Working

Back up prescribing and resources

21/1/2026

Back-up antibiotic prescriptions - How?

1. Reason for giving it
2. Specific number of days to wait
3. Wording when explaining back up prescription
4. Code your treatment choice

READ codes (Emis, Vision)	SNOMED code (System One)	Definition
8OAN	967191000000104	**Provision of Treating Your Infection self-care patient leaflet with back-up antibiotic prescription issued (procedure)**
8CAk	248041000000103	**Patient advised to delay filling of prescription (situation)**
n/a	1065591000000109	**Delayed prescription given (situation)**

21/1/2026

Presenter Talk

For all the clinical scenarios presented, we mention the use of back up prescription. How do you go about giving it?

1. Reason for giving:

   Provide reassurance that there is no need for an immediate antibiotic and that they are more likely to cause side effects than bring any benefit

   Acknowledge that although the illness is likely to be self limiting, it is not possible to predict exactly how it will progress

   So you would like the patient to have access to antibiotics should their symptoms get worse or not improve as expected

2. Specific number of days to wait

   Be specific, as patients might worry about waiting too long if they lack confidence about when to start antibiotics

   Tailor advice to the patient's current experience of the infection, the

prior duration and expected natural history, any co-morbidities and their ability to access antibiotics in a timely manner.

3. Wording when explaining back up presctiption

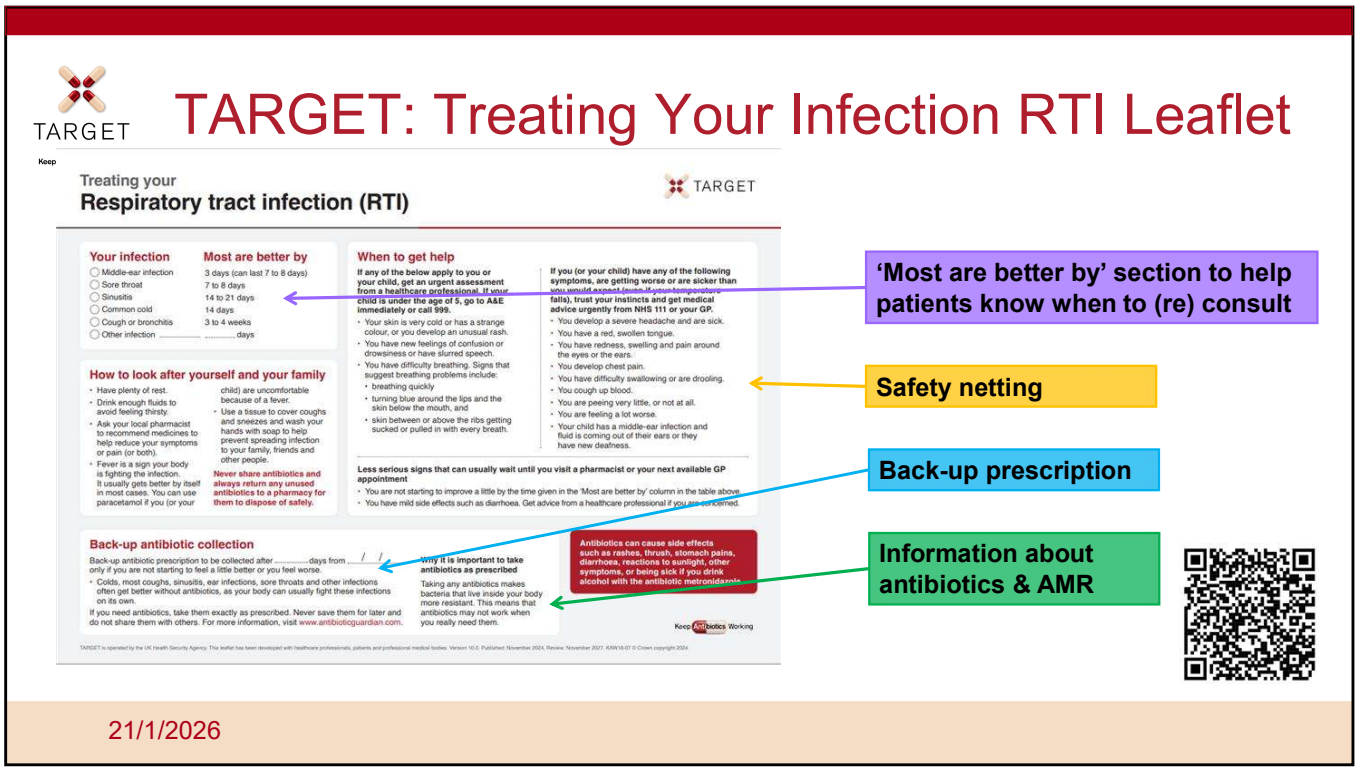
"At the moment, there are no signs of a serious infection

Your body is fighting the infection and that's usually enough for you to recover

It usually takes *X* days for 9/10 children with {*infection type, e.g. sore throat*] to feel better

If your symptoms get worse (red flag advice) at any time or don't feel better by *X* day, then you can use the back up prescription"

4. Don't forget to code your treatment choice. Much of the evidence presented today use Read/Snomed codes to trawl the data, if you haven't coded its makes it difficult for researchers to understand the benefit or not of any treatment. It also helps if you want to look back and audit your prescribing.



Presenter talk:

To support patients, you can use the TARGET leaflet, accessible through the QR code. The treating your infection leaflet has been developed through extensive feedback with patients and clinicians over the last 2 years. It is designed to be shared with the patient and completed with them during the consultation. Its aim is to increase the patients confidence to self-care, and to facilitate the use of back-up antibiotics, but it also allows the patients to go away with something, so ending the consultation on a positive note.

Presenter notes:

<u>Bring in 'most get better by' text box</u>

The 'usually lasts' section allows patients to understand not only for this consultation but also others when they should consult. This section has consistently been seen as very useful by patients of all ages.

<u>Bring in safety netting box</u>

Whatever the infection, in this era of antibiotic resistance and with increasing numbers of elderly or vulnerable patients, it is extremely important to give some clear safety netting instructions. These are some that can be used and saved by patients.

<u>Bring in back-up prescription box</u>

The back-up prescription can reduce antibiotic prescribing by about 40%, and is extremely useful for particularly demanding patients or just before a weekend to reduce visits to out of hours services. These different options are given, so that the patient understands where to pick up the leaflet, a recent study by Little et al shows that either of the options leads to similar % of antibiotics being taken, but that giving the patients the prescription and advising them when to pick the antibiotic up –leads to slightly greater patient satisfaction.

<u>Bring in information box</u>

Although most patients know they shouldn't take antibiotics for coughs and colds, far fewer know that sinusitis, ear infections and sore throats and many other infections get better on their own without antibiotics.

the last year reported having some left-overs, and this was 28% of 16-24 year olds. Of those with left-overs 30% kept them for future use just in case. So take the opportunity to stress not to share antibiotics, and to return left-overs to a pharmacy.

There is a READ code for delayed/ back-up antibiotics or leaflet given and if you Read code the infections featured the leaflet with EMIS and some other systems this leaflet will appear on your computer via the patient.co.uk system.

<u>Extra notes for presenter:</u> Most prescribers have access to many leaflets, both paper ones and ones that can be printed off their computer system or the web. However, not all information resources are based on the best available evidence or have been developed through rigorous processes. The Antibiotic Information Leaflet has been developed through over 24 months of literature searching, consultation, focus groups with patients and staff, drafting and revision.

Overview of the leaflet
To use this leaflet properly, it is important that clinicians use it as a tool to interact with patients, rather than just handing it to them as a 'parting gift'. In order to communicate this effectively you must make sure that you are very familiar with its content. Please make sure that, in addition to completing this training, you take some time to thoroughly familiarise yourself with the leaflet before you start using it.

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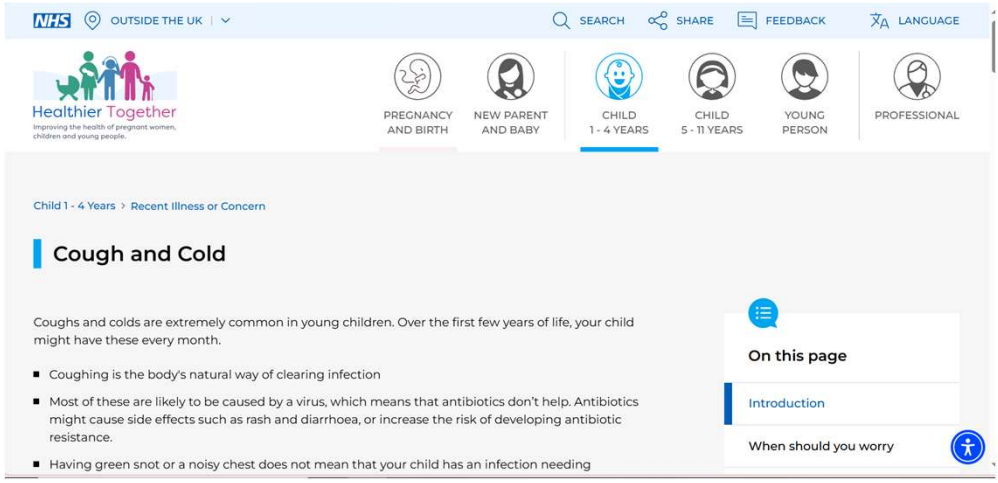
TARGET pictorial TYI leaflet

Same for this slide, this is the more pictorial version of the TARGET RTI leaflet

Healthier Together



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Presenter Talk:

Another useful resource is the Healthier Together website which provides parents further information on symptoms and when they should worry

Children with coughs (Polar bear) leaflet

Caring for children with COUGHS

University of BRISTOL

This leaflet contains information about how to look after a child who has a cough (not due to asthma).
For more detail see www.bristol.ac.uk/child-cough

COUGH

Coughs can last for 3-4 weeks and make your child feel quite unwell but will still get better by themselves.

'Noisy chests' or 'chesty coughs' are quite common when young children catch a cold and are not necessarily a sign of a 'chest infection'.

Healthy children typically get a cough 7-10 times a year and this is not a sign that there is anything wrong with their immune system.

© University of Bristol

DISTURBED SLEEP

Coughs will often wake your child in the night. When the child lies down, more of the mucus from the nose and throat runs downwards and your child coughs more to clear it.

Coughing is part of the body's defence system which helps keep the lungs clear and fight the illness. Unfortunately this can wake the child in the night but does not mean the illness is more severe.

For children over 1 year, a spoon of honey (perhaps in a warm drink) half an hour before bed may help them to wake less often.

For children over 2 years, vapour rubs (containing camphor, menthol and/or eucalyptus) may help children sleep better.

FEVER/HIGH TEMPERATURE

In children, a temperature of over 37.5°C is considered a fever.

Fever is a normal response to illness and does not harm children. It may even help to fight illness.

Children with a high temperature may be more likely to have a more severe illness, although most do not. Occasionally a child may have a fit. This shouldn't cause harm and treating the fever doesn't prevent it.

It is safe to use child paracetamol and ibuprofen to manage children's fever (and pain) for as long as needed. Follow the dosage on the bottle.

DRINKING/EATING LESS

Children often eat and drink less when they have normal childhood illnesses. Most children can go a few days without eating much and this will not affect their longer term growth and development.

All children need to drink regularly to avoid becoming dehydrated, especially if they are vomiting.

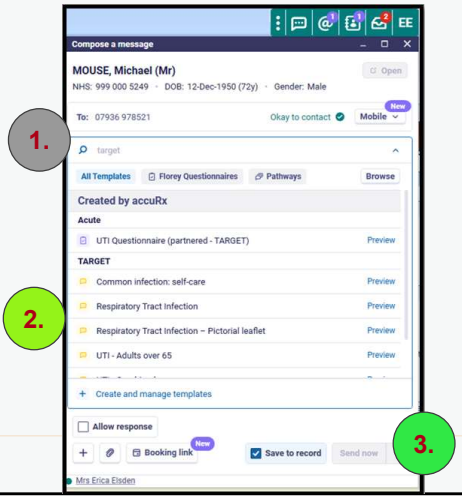
To help prevent dehydration, encourage your child to have sips of water.

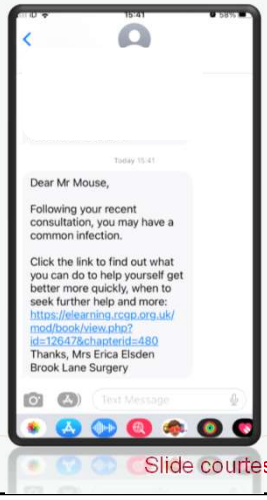
Available at: bristol.ac.uk/child-cough

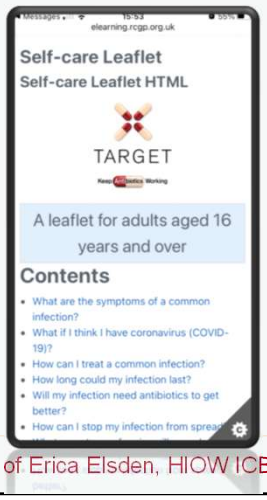
The Polar bear leaflet is a really nice resource for parents/carers of young children with coughs – more child friendly than the TARGET RTI leaflet.

Sending TARGET Information Leaflets via AccuRx

1. In the AccuRx message template search bar, type “target”
2. Click on the desired TARGET patient leaflet
3. Press ‘Send Now’
4. The patient will receive a link to the chosen patient leaflet
5. The link will bring the patient to the leaflet on the TARGET website







Slide courtesy of Erica Elsden, HIOW ICB

Most clinicians will be familiar with sending patient-facing resources electronically, this is just a reminder of how to do it via AccuRx

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

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