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Supplementary Material

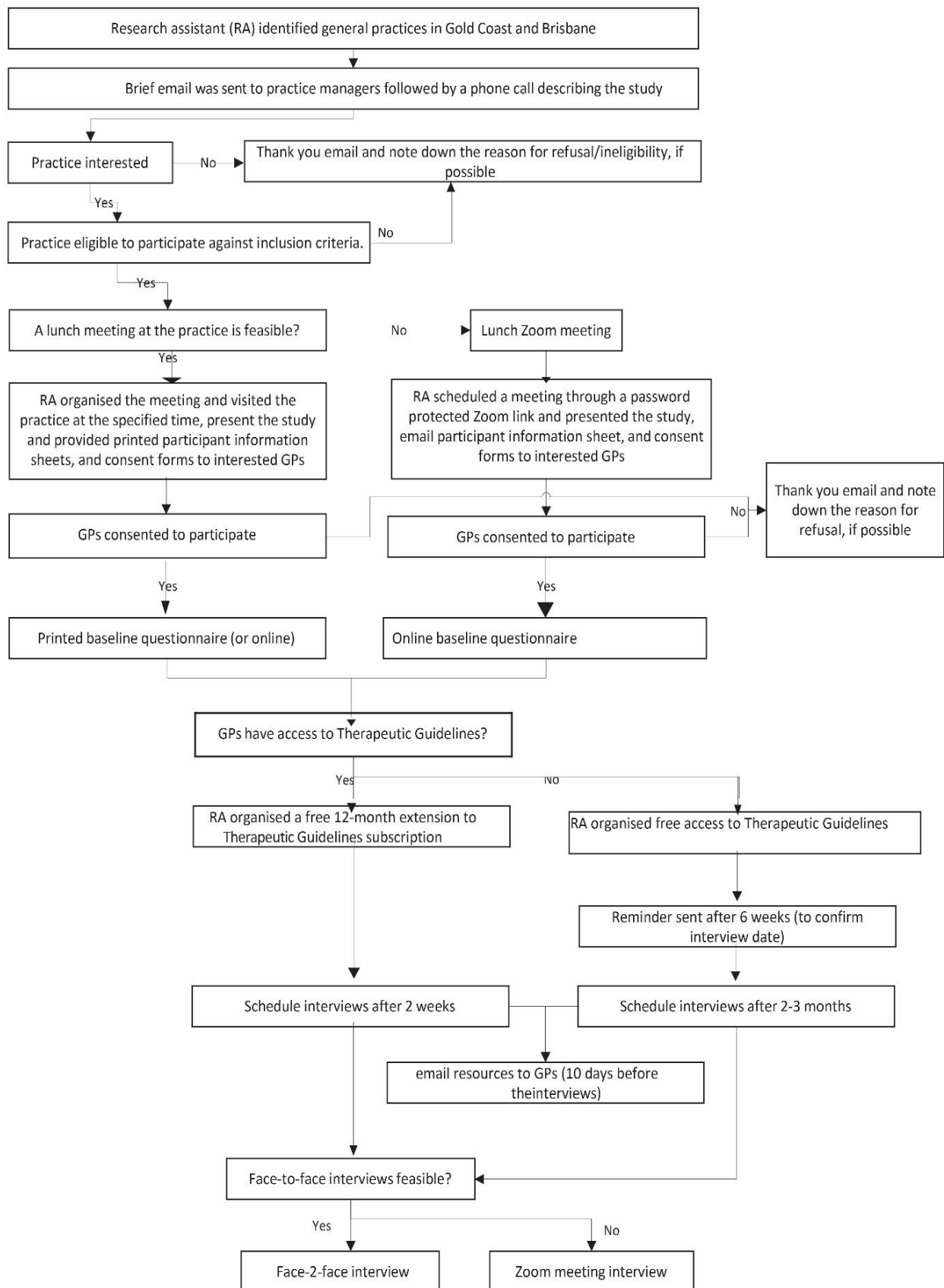
Exploring general practitioners' perception of the value of natural history information and their awareness and use of guidelines' resources to support antibiotic prescribing for self-limiting infections: a qualitative study in Australian general practice

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Supplementary file 1: Recruitment strategy



Supplementary file 2: Antibiotic summary table*



Antibiotic prescribing in primary care: Therapeutic Guidelines summary table 2022

This table summarises information in *Therapeutic Guidelines* about the management of common conditions in primary care. For detailed and up-to-date information, including **second-line treatment options** and management of **special patient groups** (eg penicillin hypersensitivity, renal impairment), see *Therapeutic Guidelines*.

This table should be used in conjunction with **clinical judgement**. Prescribers should consider the **harm–benefit profile** of a drug in each patient (eg consider potential drug interactions).

Antibiotics that are **overused** in primary care include **amoxicillin+clavulanate, cefalexin, cefaclor, roxithromycin and erythromycin**.

Indication	First-line therapy	Notes
acute rhinosinusitis	symptomatic treatment	Antibiotic treatment is required rarely—most cases are viral. See <i>Therapeutic Guidelines</i> for more information and resources to support discussion with the patient or carer.
acute otitis media	symptomatic treatment for most cases	80% of cases spontaneously resolve without antibiotic treatment. Advise the carer to return if symptoms do not improve within 72 hours. Consider a delayed prescription for antibiotic therapy. Treat the following groups: infants younger than 6 months; children younger than 2 years with bilateral infection; children who are systemically unwell (eg lethargic, pale; fever alone is not sufficient); children who have otorrhoea; Aboriginal or Torres Strait Islander children; children at risk of complications (eg immunocompromised children). See <i>Therapeutic Guidelines</i> for the dose of amoxicillin . See <i>Therapeutic Guidelines</i> for resources to support discussion with the patient or carer.
acute pharyngitis/tonsillitis	patients <i>not</i> at high risk of acute rheumatic fever: symptomatic treatment for most cases patients at high risk of acute rheumatic fever: phenoxymethylpenicillin 500 mg (child: 15 mg/kg up to 500 mg) orally, 12-hourly for 10 days	Most cases are viral. In patients <i>not</i> at high risk of acute rheumatic fever, even if infection is bacterial, antibiotic treatment is of limited benefit. See <i>Therapeutic Guidelines</i> for resources to support discussion with the patient or carer. In patients at high risk of acute rheumatic fever, antibiotic treatment is recommended for all patients because the increased risk of acute rheumatic fever and resultant rheumatic heart disease outweighs the risk of harms from potentially unnecessary antibiotic treatment. See <i>Therapeutic Guidelines</i> for assessment of risk of acute rheumatic fever.
acute bronchitis	symptomatic treatment	Antibiotic treatment is not indicated—over 90% of cases are viral. See <i>Therapeutic Guidelines</i> for resources to support discussion with the patient or carer.
mild infective exacerbation of COPD	amoxicillin 500 mg orally, 8-hourly for 5 days	Antibiotic treatment has little benefit for patients managed in the community with less severe COPD: for every 100 patients treated with antibiotics, only 8 patients will be better by 4 weeks because they took antibiotics. Consider a delayed prescription for antibiotic therapy. See <i>Therapeutic Guidelines</i> for more information and resources to support discussion with the patient or carer.
community-acquired pneumonia in adults: low-severity (mild)	amoxicillin 1 g orally, 8-hourly. If the patient has significantly improved after 2 to 3 days, treat for 5 days. If the clinical response is slow, treat for 7 days	Assess the patient's pneumonia severity, comorbidities and social circumstances to decide whether to admit the patient to hospital; see <i>Therapeutic Guidelines</i> . See <i>Therapeutic Guidelines</i> for risk factors for infection caused by atypical bacteria. Patient review within 48 hours is essential. If patient follow-up within 48 hours may not occur, consider using initial combination therapy with doxycycline instead; see <i>Therapeutic Guidelines</i> . If the patient is not improving after 48 hours of monotherapy, see <i>Therapeutic Guidelines</i> .
pneumonia in residents of aged-care facilities: oral therapy	amoxicillin 1 g orally, 8-hourly. If the patient has significantly improved after 2 to 3 days, treat for 5 days. If the clinical response is slow, treat for 7 days	Consider whether a viral infection could be the cause of symptoms. See <i>Therapeutic Guidelines</i> for indications for parenteral therapy. If infection caused by atypical bacteria (eg <i>Legionella</i> species) is suspected, see <i>Therapeutic Guidelines</i> . Patient review within 48 hours is essential; see <i>Therapeutic Guidelines</i> if the patient is not improving.

Indication	First-line therapy	Notes
localised odontogenic infection	dental treatment	Prescribe analgesia and refer the patient to the dentist. Explain that antibiotic treatment without dental intervention will not be effective. If dental treatment will be delayed or the infection is spreading, see <i>Therapeutic Guidelines</i> .
acute cystitis in nonpregnant women	trimethoprim 300 mg orally, daily for 3 days	Half of cases in nonpregnant women younger than 65 years resolve within 7 days without antibiotic treatment. See <i>Therapeutic Guidelines</i> if the patient is a resident of an aged-care facility or has risk factors for multidrug resistant bacteria. Take a urine sample for culture and susceptibility testing if empirical therapy is not effective. Do not use ciprofloxacin, norfloxacin or fosfomycin unless susceptibility testing rules out all alternative antibiotics—see <i>Therapeutic Guidelines</i> .
acute cystitis in pregnancy	nitrofurantoin 100 mg orally, 6-hourly for 5 days	Take a urine sample for culture and susceptibility testing before starting treatment, and repeat 1 to 2 weeks after treatment is completed. Avoid using nitrofurantoin close to delivery—see <i>Therapeutic Guidelines</i> .
bites and other wounds caused by teeth	amoxicillin+clavulanate 875+125 mg (child 2 months or older: 22.5+3.2 mg/kg up to 875+125 mg) orally, 12-hourly for 5 days	Check the patient's tetanus immunisation status. Treatment may not be required if the wound is not infected—see <i>Therapeutic Guidelines</i> .
erysipelas without systemic symptoms	phenoxymethylpenicillin 500 mg (child: 12.5 mg/kg up to 500 mg) orally, 6-hourly for 5 days	Initial intravenous therapy is needed if the patient has 2 or more systemic symptoms—see <i>Therapeutic Guidelines</i> .
cellulitis without systemic symptoms	phenoxymethylpenicillin 500 mg (child: 12.5 mg/kg up to 500 mg) orally, 6-hourly for 5 days OR (if penetrating injury or associated ulcer or abscess) flucloxacillin 500 mg (child: 12.5 mg/kg up to 500 mg) orally, 6-hourly for 5 days	<i>Streptococcus</i> species are the most common cause of nonpurulent, recurrent cellulitis and spontaneous, rapidly spreading cellulitis. If the wound was exposed to fresh or salt water or there is a risk of MRSA, see <i>Therapeutic Guidelines</i> . Initial intravenous therapy is needed if the patient has 2 or more systemic symptoms—see <i>Therapeutic Guidelines</i> . See <i>Therapeutic Guidelines</i> for periorbital, orbital and peritonsillar cellulitis.
impetigo: localised sores (nonendemic settings)	mupirocin 2% ointment or cream topically to crusted areas, 8-hourly for 5 days	Use soap and water topically three times a day to soften crusts. For management of impetigo in endemic settings, see <i>Therapeutic Guidelines</i> .
impetigo: multiple or recurrent sores (nonendemic settings)	flucloxacillin 500 mg (child: 12.5 mg/kg up to 500 mg) orally, 6-hourly for 7 days	Stop therapy earlier if the infection has resolved. If treatment is unsuccessful, see <i>Therapeutic Guidelines</i> . Eradication of staphylococcal carriage may be indicated; see <i>Therapeutic Guidelines</i> . For management of impetigo in endemic settings, see <i>Therapeutic Guidelines</i> .
acute mild diabetic foot infection	flucloxacillin 500 mg orally, 6-hourly	See <i>Therapeutic Guidelines</i> if the patient has systemic symptoms, chronic diabetic foot infection, has recently received antibiotics, or has risk factors for MRSA infection.
lactation-associated mastitis	flucloxacillin 500 mg orally, 6-hourly. If symptoms and signs resolve rapidly, 5 days of therapy may be sufficient; otherwise continue treatment for 10 days	For patients without systemic symptoms, increased breastfeeding and gentle expression of milk from the affected breast for 24 to 48 hours may resolve symptoms without antibiotic treatment. If this fails to resolve symptoms, and in all patients with systemic symptoms, antibiotic treatment is recommended to minimise the risk of abscess. Advise the patient to continue with breastfeeding and gentle milk expression. Consider lactation support.

COPD = chronic obstructive pulmonary disease; MRSA = methicillin-resistant *Staphylococcus aureus*

***This is an updated version of the summary table that was shown to GPs during the interviews.**

Supplementary file 3: Example of a shared decision making discussion box



Shared decision making for acute bacterial rhinosinusitis

To engage in shared decision making with patients and carers:

- Reassure the patient or carer that acute bacterial rhinosinusitis is usually self-limiting. Complications are rare and the use of antibiotics for acute bacterial rhinosinusitis does not prevent complications.
- Ask about the patient or carer's expectations for management of acute bacterial rhinosinusitis.
- Explain that there are two treatment approaches:
 - Symptomatic therapy alone with follow-up if symptoms do not improve in 5 days, or earlier if symptoms worsen. A delayed prescription for antibiotic therapy can be offered if the patient will not be able to return.
 - Symptomatic therapy plus an immediate prescription for antibiotic therapy.
- Explain that symptoms of acute bacterial rhinosinusitis usually resolve or improve within 7 to 14 days without antibiotic therapy. Acknowledge that symptoms impact day-to-day functioning and that this is frustrating, but symptomatic therapy is most useful for managing this.
- Discuss the limited benefits of antibiotic therapy, even when a bacterial cause is likely.
 - If antibiotics are prescribed, the rate of symptom improvement is increased at days 3 and 7, but at day 10, there is no difference in improvement between patients treated with or without antibiotics.
- Discuss the potential harms of antibiotic therapy.
 - Adverse effects of antibiotics include diarrhoea, rash or more serious hypersensitivity reactions.
 - Antibiotics disrupt the balance of bacteria in the body (the microbiome). While the consequences of this are not fully understood, it can cause problems ranging from yeast infections (eg thrush) to more serious infections (eg *Clostridioides difficile* [formerly known as *Clostridium difficile*] infection).
 - Antibiotics can cause bacteria in the body to become resistant to antibiotics so that future infections are harder to treat. Multidrug-resistant bacteria (known as 'superbugs') can be spread between people, affecting other family members and the community.
 - For every 100 patients treated with antibiotics for acute bacterial rhinosinusitis, 12 patients will experience an antibiotic adverse effect.
- Ask about the preferences, values and concerns of the patient or carer, and answer any remaining questions.
- Make a joint decision about whether to use symptomatic therapy alone or combine symptomatic therapy with antibiotic therapy; if a decision is made to use antibiotic therapy, see eTG complete for treatment recommendations.
- Discuss criteria for patient follow-up and reassessment. Ask the patient to return in 5 days if symptoms do not improve, or earlier if symptoms worsen (particularly fever) or if symptoms suggestive of complicated infection occur.

Supplementary file 4: Example of a decision Aid

AUSTRALIAN COMMISSION
ON SAFETY AND QUALITY IN HEALTH CARE

Middle ear infection: should my child take antibiotics?

- This decision aid can help you decide whether to use antibiotics when **your child** has a middle ear infection.
- It is designed to be used with your doctor to help you make a **shared decision** about what is best for you or your child.



What causes middle ear infection?

- It can be caused by a viral or bacterial infection. It is hard for your doctor to tell which it is.
- It is also called 'acute otitis media'. Acute means it is a short-term infection.

How long does the earache last?

Symptoms (such as earache) usually get better in 2 to 7 days, without antibiotics.

What are the treatment options?

There are 2 options that you can discuss with your doctor:

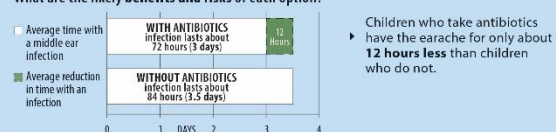
1. Not taking antibiotics

This means letting the infection get better by itself.

Symptoms, such as pain and fever, can be treated with over-the-counter medicines. They can be used with either option.

2. Taking antibiotics

What are the likely benefits and risks of each option?

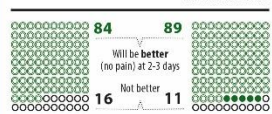


These figures show what is likely to happen to children with middle ear infection who **do not** take antibiotics and those who **do**. Each circle is one child. We can't predict who will get better sooner or who will have problems.

Possible benefits

- gets better by 2-3 days
- gets better by 2-3 days due to antibiotics
- not better by 2-3 days

100 children who **don't** take antibiotics 100 children who **do** take antibiotics



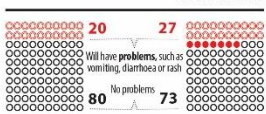
With antibiotics, **5 more children** will be better after 2-3 days.

After about **4 days** most children will be better anyway - without antibiotics.

Possible risks

- has problems
- has problems due to antibiotics
- no problems

100 children who **don't** take antibiotics 100 children who **do** take antibiotics



With antibiotics, **7 more children** will have problems like vomiting and diarrhoea. Other antibiotic downsides are:

- the cost of buying them
- remembering to take them
- the risk of **antibiotic resistance** (see next page)

Where do these estimates of benefits and risks come from?

- They come from the most up-to-date medical evidence of benefits and risks about what works best. This is a review of 13 studies, and over 3,400 children, that looked at antibiotic use in children with middle ear infection.
- The quality of this research evidence is ranked as high. This means that further research is very unlikely to change these estimates.

Why might antibiotics be used?

Your doctor may suggest antibiotics if you are more likely to get complications, such as for Aboriginal and Torres Strait Islander children and children who are under 2 years of age.

What is antibiotic resistance?

- Using antibiotics means the bacteria can develop resistance to the antibiotic.
- This means that **antibiotics may not work if your child needs them in the future** to treat a bacterial infection.
- A person who has recently used antibiotics is more likely to have resistant bacteria in their body.



Are there other things I can do to manage a middle ear infection?

- Pain and fever are best treated with over-the-counter **paracetamol and/or ibuprofen**. Do not give more than the maximum recommended dose. Read the dose information on the packet.
- Aspirin should **NOT** be used with children who are younger than 16 years.

When should you see a doctor and get further help?

If your child with a middle ear infection has any of these signs:

- Very drowsy
- Fast or difficult breathing, wheezing, or shortness of breath
- Cold or discoloured hands and/or feet with a warm body
- A high fever (over 38.5°C)
- Pain in the arms and/or legs
- Unusual skin colour (pale or blue) around the lips
- A rash that does not fade when the skin is pressed
- Pain and tenderness of the bone behind the ear
- Blood or discharge from the ear

Questions to consider when talking with your doctor

- Does my child need antibiotics?
- What happens if my child doesn't take antibiotics?
- Do I know enough about the benefits and risks of:
 - taking antibiotics?
 - not taking antibiotics?
- Am I clear about which benefits and risks matter most to me?
- Do I have enough information and support to decide?

References:
Vireekumar RR, Sanders S, Glasziou PP, Del Mar CB, Rovers MM. Antibiotics for acute otitis media in children. Cochrane Database Syst Rev 2015;6:CD009219. www.cochrane.org

The information in this decision aid is provided for general information only. It is not intended as medical advice and should not be relied upon as a substitute for consultations with a qualified health professional who can determine you or your child's individual medical needs.

Updated: November 2016. Updated due: November 2018. Decision Aids funded by the Australian Commission on Safety and Quality in Health Care and developed by Professor Tammy Hoffmann, Professor Chris Del Mar, and Mr Peter Cosseter - Centre for Research in Evidence-Based Practice, Bond University.

Supplementary file 5: Interview topic guide

Note: This document provides example interview topics that will be addressed. In keeping with qualitative methods, we expect that this topic guide will undergo continual evolution before and during the study in response to emerging learnings and that additional probing questions may be asked in real time to clarify participant responses and ensure understanding.

Baseline questionnaire

To begin with, we have a few questions about you. For each, I will read the question and the response options, and you can indicate which apply.

First, how old are you?

18-39 years 40-59 years 60 years and over

What is your gender?

Female Male Unspecified

For how many years have you worked as a GP?

Less than 5 years 5 – 9 years 10 – 14 years 15 years or more

For GPs who had access to Therapeutic Guidelines (eTG or hard copy) prior to this study, for about how many years have you used it? *

Less than 5 years 5 – 9 years 10 – 14 years 15 years or more

*This question is not applicable for GPs who have been given the eTG to use for approximately 2-3 months prior to interview.

Great. We can now progress to the interview. I am switching on the recorder now.

Interview questions

Thank you for agreeing to participate in this interview. For the next few questions, I would like your views on the current (2019) Therapeutic Guidelines Antibiotic chapter and the additional resources provided online. There are no right or wrong answers. I am just interested in your perceptions and views.

1. Firstly, are you familiar with interventions or strategies to improve antibiotic prescribing?
Prompts: which ones? How do you implement them in your practice? E.g., delayed prescribing, shared decision making

2. Do you use the eTG website? (**Prompt:** Reasons for not using it?)
 - a) If yes, how often do you access the eTG website?
 Very frequently (> once/week) Frequently (weekly)
 Sometimes (> once/month) Rarely (monthly)
 - b) And how often do you access the eTG antibiotic chapter?
 Very frequently (> once/week) Frequently (weekly)
 Sometimes (> once/month) Rarely (monthly)
 Never (**Prompt:** Reasons for not using it?)

Prompts (if using the antibiotic chapter): How do you feel about the antibiotic chapter? what triggers your use of it?

3. Before this study, had you accessed/used any of the additional features provided in the eTG antibiotic chapter? (e.g., **summary table for antibiotic prescribing in primary care and resources such as patient decision aids and decision boxes**)?

[then the researcher will present the GP with a printed copy of these materials to review for few minutes before asking the following questions. An image will be added for each tool next to the questions, if the interview was done remotely]

A- Antibiotics summary table

- Were you aware of the **Antibiotics summary table prior** to this study?
 - If so, have you used it?
 - If so, did you find it useful? Prompt: in what way?
 - If not yet used, do you think it might be useful? Prompt: how/in what way?
- Will/did the **table** help you to have discussions about antibiotic use (and non-use) with your patients? Prompt: if yes, in what way?
- Is there content you would like added into, or emphasised in, the **table**?
- What do you think of the layout/structure/presentation of the **table**?
- What do you like about the **table**?
- What do you not like about the **table**?

Let me show you another version of the table *[Researcher will show the GP a modified version of the Antibiotic summary table]*

- What do you think about the modifications?
- What do you **like/not like** about the **table**?

One of the pieces of information that is emphasised in the modified summary table is the natural history of some of the conditions.

- Were you previously aware of the natural history of the conditions for which antibiotics are not the first line of treatment?
 - If yes, do you typically mention natural history information in your discussion with patients (e.g., “sore throats, on average, get better on their own after about 3 days”)?
 - If so, do you find it useful? Prompt: in what way? Do you think it can help to manage patients’ expectations about the need for antibiotics? If no, why not?
 - If you were not previously aware of the natural history information, do you think it might be useful to incorporate into your discussions with patients?
 - Prompt: how/in what way?
- Would you like to know the natural history of more conditions (i.e., those not covered in the table -beyond acute infections. For example, acute musculoskeletal conditions)?
 - If so, are there particular conditions that you would find this information useful for?
- Any further feedback or suggestions?

B- Decision boxes

- Were you aware of the **Decision boxes** prior to this study?

- If so, have you used it?
- If so, did you find it useful? Prompt: in what way?
- If not yet used, do you think it might be useful? Prompt: how/in what way?
- Will/did **Decision boxes** help you to have discussions about antibiotic use (and non-use) with your patients? Prompt: if yes, in what way?
- Is there content you would like added into, or emphasised in, the **Decision boxes**?
- What do you think of the layout/structure/presentation of the **Decision boxes**?
- What do you like about the **Decision boxes**?
- What do you not like about the **Decision boxes**?

C- **Decision aids**

- Were you aware of the **Decision aids** prior to this study?
 - If so, have you used it?
 - If so, did you find it useful? Prompt: in what way?
 - If not yet used, do you think it might be useful? Prompt: how/in what way?
 - Will/did the **Decision aids** help you to have discussions about antibiotic use (and non-use) with your patients? Prompt: if yes, in what way?
 - Is there content you would like added into, or emphasised in, the **Decision aids**?
 - What do you think of the layout/structure/presentation of the **Decision aids**?
 - What do you like about the **Decision aids**?
 - What do you not like about the **Decision aids**?
4. Do you think the resources provided are easily accessible? (prompt: if not, how could this be improved)
 5. For GPs who were given access to eTG, what has been your experience in using the guidelines?
 6. Which of the resources are you most likely to use? why? Are there other resources that you currently use? What? And why?
 7. Do you have suggestions about any other resources that may assist you with clinical decision-making about antibiotic use or with your discussions with patients?
 8. Do you have any other comments about antibiotic prescribing or stewardship that you would like to add?