Healthcare Improvement Scotland | SIGN Makes sense of evidence

SIGN 50

A guideline developer's handbook

First published 2008
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NHS SCOTLAND

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1 Contents

1 Introduction

1.1 Why use guidelines?

Clinical practice guidelines set out clear and easy-to-follow recommendations for practice that support healthcare professionals in making evidence-based decisions and empower patients to take an informed role in their care. By bringing research evidence to the fore, they influence public policy and are fundamental to improving healthcare.

1.2 Why does it matter how guidelines are developed?

Clinical guidelines must be trusted and their recommendations reliable. To do this they must be developed using robust methodologies that promote interventions of proven benefit and limit the use of ineffective treatments. Working with a multidisciplinary guideline development group in a structured way promotes professional ownership and development. Guidelines align closely with the principles of Realistic Medicine and good-quality care. Informed, shared decision making is key to the practice of realistic medicine, and guidelines provide a platform to listen to what matters most to patients and use the best available evidence to inform the discussion.

By providing clear recommendations for clinical practice based on structured searches for the most up-to-date evidence followed by rigorous assessment and synthesis, and careful consideration of lived experience, equity, antiracism and delivery context, guidelines aim to change and improve clinical practice. Guideline recommendations facilitate more meaningful conversations between people and their healthcare professionals that help people make informed choices about their treatment and care options based on what matters most to them.

1.3 How can guidelines help make best use of our resources?

Sustainability and ethical use of resources are of primary concern to the NHS. The Lancet described climate change as the 'greatest global health threat facing the world in the 21st century, but it is also the greatest opportunity to redefine the social and environmental determinants of health.'[1] The world's population is experiencing the effects of global warming and extreme weather events. Infectious diseases are spreading, food security is threatened, there is heightened global economic uncertainty and the direct effects of these are felt by families and individuals.[1] It is the responsibility of all healthcare professionals to consider sustainability in healthcare and we are working towards principles for including evidence about sustainability in healthcare in guideline development.

Guidelines help prevent harm and waste through overuse and overtreatment, which can free up resources currently used without benefit to clinical outcomes to address underprovision of care. Guidelines can also contribute at service or population level, where for example tackling unwarranted variation is essential to improving healthcare outcomes.

Unwarranted variation is variation in practice or patient outcomes that can't be explained by need or by explicit patient or population characteristics or preferences. Variation in practice is unlikely to be justified when a national guideline provides a clear recommendation that a treatment or investigation is superior in terms of desired patient outcomes. Guidelines can also help explore and compare the environmental impact of interventions.

By providing 'Once for Scotland' national guidelines, we can reduce waste and improve quality eliminating duplication of effort in developing multiple local guidelines. Recognising the maturity of guideline development agencies worldwide and considering whether recent, high-quality guidelines from other organisations can be adopted or adapted for the NHS in Scotland we can reduce the resources required, and time taken to develop national guidelines.

1.4 How are guidelines developed?

The accepted criteria for validity of guidelines were first set out as the 'essential elements of good guidelines' by the US Institute of Medicine in 1990.[2] These recommended 'attributes of good guidelines' included validity, reliability, clinical applicability, clinical flexibility, clarity, multidisciplinary process, scheduled review and documentation. The recommendations were underpinned by the twin themes of credibility and accountability: 'The link between a set of guidelines and the scientific evidence must be explicit, and scientific and clinical evidence should take precedence over expert judgement.' These attributes continue to form the basis of SIGN methodology.[2]

1.4.1 Complying with international standards

We are committed to transparency about the methods and processes used to develop SIGN guidelines to promote trust in our guidelines and instil confidence that the potential biases of guideline development have been addressed adequately and that the recommendations are both valid and feasible for practice.

SIGN was part of the collaboration that created an evidence-based tool to appraise guidelines[3] and we remain faithful to the international standard for guideline developers as set out in AGREE II (Appraisal of Guidelines for Research and Evaluation; www.agreetrust.org). The sections in SIGN 50 that address each AGREE II criterion are identified below.

AGREE II criteria		SIGN 50 section
Scope and purpose		
1	The overall objective(s) of the guideline should be specifically described.	4.1
2	The health question(s) covered by the guideline should be specifically described.	4.4
3	The population (patients, public, etc) to whom the guideline is meant to apply should be specifically described.	9.3
Stakeholder involvement		
4	The guideline development group should include individuals from all relevant professional groups.	3.1
5	The views and preferences of the target population (patients, public, etc) should be sought.	3.2, 4.1
6	The target users of the guideline should be clearly defined.	9.3
Rigour of development		
7	Systematic methods should be used to search for evidence.	5.2
8	The criteria for selecting the evidence should be clearly described.	4.3, 6.2
9	The strengths and limitations of the body of evidence should be clearly described.	6.3–6.7
10	The methods for formulating the recommendations should be clearly described.	7.1–7.4
11	The health benefits, side effects and risks should be considered in formulating the recommendations.	7.1.2
12	There should be an explicit link between the recommendations and the supporting evidence.	7.2.1, 7.2.2
13	The guideline should be externally reviewed by experts prior to publication.	8
14	A procedure for updating the guideline should be provided.	12

AGREE II criteria		SIGN 50 section
Clarity of presentation		
15	The recommendations should be specific and unambiguous.	9.1
16	The different options for management of the condition or health issue should be clearly presented.	9.2
17	Key recommendations should be easily identifiable.	7.7
Applicability		
18	The guideline should describe facilitators and barriers to its application.	11.3.1
19	The guideline should provide advice and/or tools on how the recommendations can be put into practice.	11.3.2
20	The potential cost implications of applying the recommendations should be considered.	4.4.2, 6.4.4, 6.7
21	The guideline should present monitoring and/or auditing criteria.	9.3
Editorial independence		
22	The views of the funding body should not influence the content of the guideline.	13.4
23	Competing interests of guideline development group members should be recorded and addressed.	13.5

1.4.2 Aim of this handbook

This handbook outlines the key elements of the development process common to all SIGN guidelines and provides a reference tool for members of SIGN guideline development groups as they work through the development process.

The handbook also aims to support others involved in guideline development to use processes that comply with best practices and meet quality standards and SIGN 50 could be used by practitioners as a starting point for their own guideline development.

1.5 Using our guidelines

SIGN guidelines have primacy in Scotland and should be considered by clinicians when assessing and treating their patients.[4,5]

Guidelines can help achieve better treatment outcomes and care for patients and local ownership of the implementation process is crucial to success in changing practice. While

SIGN is responsible for developing national guidelines and ensuring they can be implemented in NHSScotland, their implementation into practice is the responsibility of each NHS board.

SIGN guidelines are an aid to clinical judgement and are not intended replace it. Guidelines do not provide the answers to every clinical question, nor guarantee a successful outcome in every case. The ultimate decision about a particular clinical procedure or treatment will always depend on each individual patient's condition, circumstances and wishes and the clinical judgement of the healthcare team.

As there has been ongoing discussion about the legal status of clinical guidelines; to help clarify this, all SIGN guidelines carry the following statement of intent:

> This guideline is not intended to be construed or to serve as a standard of care. Standards of care are determined on the basis of all clinical data available for an individual case and are subject to change as scientific knowledge and technology advance and patterns of care evolve. Adherence to guideline recommendations will not ensure a successful outcome in every case, nor should they be construed as including all proper methods of care or excluding other acceptable methods of care aimed at the same results.
>
> The ultimate judgement must be made by the appropriate healthcare professional(s) responsible for clinical decisions regarding a particular clinical procedure or treatment plan. This judgement should only be arrived at through a process of shared decision making with the patient, covering the diagnostic and treatment choices available. It is advised, however, that significant departures from the national guideline or any local guidelines derived from it should be documented in the patient's medical records at the time the relevant decision is taken.

2 Selecting guideline topics

2.1 What is the purpose of topic selection?

The purpose of topic selection is to ensure that the guidelines created are relevant, evidence-based and address the most pressing needs of the target audience. To make best use of resources, our guidelines should address a specific healthcare need. There should be an expectation that change is possible and desirable and that by following the guidelines there is potential to improve the quality of care and patient outcomes[6,7]. There must also be robust evidence of effective practice on which to base guideline recommendations.

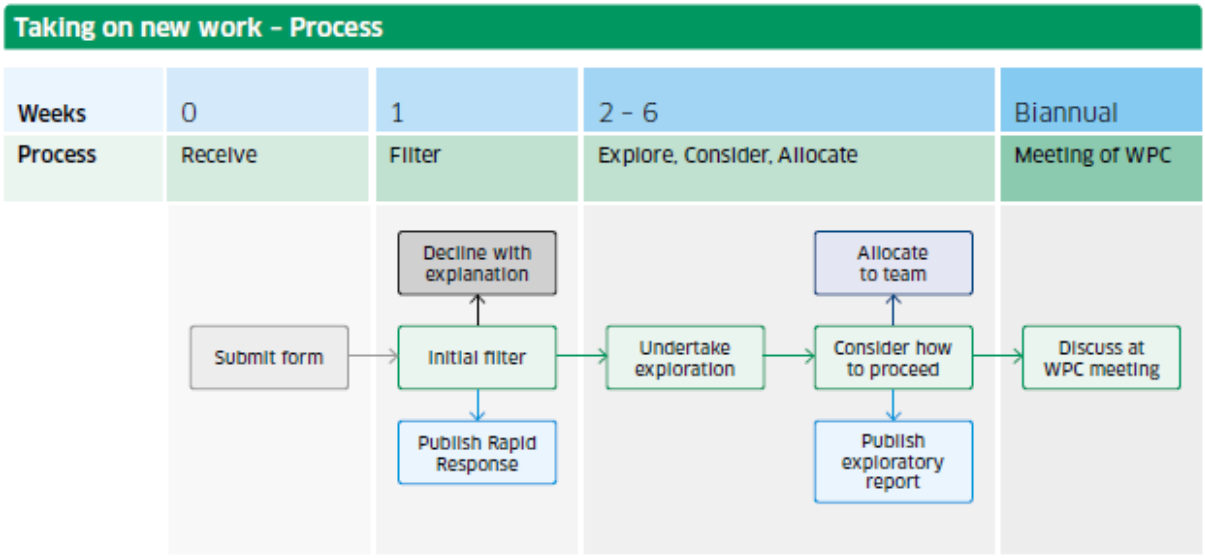
2.2 Proposing a topic

Any group or individual may propose a guideline topic to SIGN. Proposals from patients, carers, voluntary organisations and members of the public are welcome. These proposers are supported by the SIGN Patient Involvement Adviser and SIGN Public Partners to complete the application. Healthcare professionals are sought to give a clinical perspective on the proposal.

Topics are proposed by completing the online submission form. Proposals are considered through the Healthcare Improvement Scotland Evidence and Digital Directorate topic referral process, which is summarised in Figure 2-1. Topic proposals under consideration are listed on the SIGN website.

The form is designed to provide us with information to help us decide how best to deal with the request. It focuses on the topic, issue or question that needs to be addressed and asks for information about the current context in Scotland, uncertainties in the evidence base or variation in current practice. It also asks about the overall aim of the requested guideline and what health and well-being benefits it would bring to patients.

Figure 2-1: The procedure for application and selection of new topics



2.3 Topic selection process

There is a lack of evidence to guide the choice of criteria and methods for prioritising topics, although the criteria used by guideline development organisations are broadly similar.[7]

2.3.1 Filtering topics

Topic proposals are filtered against set criteria by the Evidence and Digital Directorate Senior Management Team. At this stage, work may be declined, explored further or prioritised for a rapid response.

For the topic to be progressed, the following criteria need to be satisfied:

- Is the request clear and focused?
- Does the request fit within Evidence and Digital remit?
- Are the timeframes associated with the request proportional?
- Is there support for the request beyond an individual (or manufacturer)?
- Does the topic appear to have potential to improve health and care services?

2.3.2 Exploring topics

For every request accepted at this stage of the process, an exploration of the topic area is carried out to enable further consideration. The topic exploration covers a description of the problem being addressed, information about the population of interest, and an overview of the quality, quantity and currency of potentially relevant evidence. No attempt is made to focus on specific questions at this stage. The search aims to identify guidelines, Health Technology Assessments (HTAs), Cochrane reviews and other systematic reviews that exist in the topic of interest by searching several different sources. Further conversations with the proposer inform the exploration. The topic exploration is summarised in suggested next steps in the process.

2.3.3 Selecting topics

Following completion, each topic exploration is considered by the Evidence and Digital Directorate Senior Management Team. Decisions will be dependent on the following criteria:

- Does the work align with current national and organisational priorities? Consider:
    - Scottish Government policies, action plans and strategies
    - Healthcare Improvement Scotland Annual Delivery Plan and Strategy
- Is our support likely to have an impact and make a difference to health and social care provision? Consider:
    - burden of disease
    - supported for the topic from relevant and influential decision-making networks, groups or collaborations
    - resource and costs
- Is the level of uncertainty relating to evidence and implementation such that it could be usefully addressed by us? Consider:
    - quantity and quality of available evidence and data

- Are we the most appropriate organisation to undertake the work? Consider:
    - Does the work fall within our remit?
    - Do we have the required skills within our teams?
    - Are other organisations' teams better placed to carry out the work?
- Does the work have important implications for people, health inequalities or sustainability? Consider:
    - clinical need and treatment options for people, different groups of people, production and consumption of healthcare.

After considering the topic one of the following options will apply:

1. No further work is required and an exploratory report is published, for example, if the question has been addressed by another source, or there is insufficient evidence to develop an evidence-based product.
2. The work is allocated to a team, for example, SIGN to update an existing guideline.
3. The topic is referred to our Work Programme Committee, for example, if the topic needs significant resources or time for development and requires to be considered and prioritised against other proposed topics.

2.3.4 Prioritising topics

The Work Programme Committee takes an overview and makes recommendations for additions to the programme using the criteria set out in section 2.3.3. The Work Programme Committee will indicate whether new topics should take priority over existing work programme commitments.

2.4 Accepting topics onto the SIGN work programme

SIGN Council is responsible for approving guideline topic proposals that have been recommended through the topic selection process as suitable candidates for the SIGN guideline development programme.

3 Stakeholder involvement

3.1 The guideline development group

There is international agreement that guideline development groups should be multidisciplinary in their composition, with representation from all relevant professional groups, and participation of people with lived experience and appropriate third-sector organisations.[8,9] This facilitates ownership of both the guideline development process and the resulting recommendations. The guideline development group aims to make implementable, evidence-based recommendations using their clinical and professional experience, taking the lived-experience perspective into account.

At the start of a new guideline development project the SIGN team, in discussion with all relevant bodies, brings together a group that:

- is multidisciplinary, with all relevant clinical specialties represented alongside lived-experience input
- is relevant to current care practice, with a balance between members actively involved in the day-to-day delivery of health care with topic experts and academics where appropriate. Ideally, membership should represent the range of care or treatment settings related to the clinical condition (eg primary, secondary and tertiary care centres)
- encompasses the range of skills and expertise required for the specific project. Specialists other than health and care professionals may be recruited, when necessary, for example, teachers
- includes stakeholders from diverse backgrounds, ie those listed in PROGRESS-PLUS (Place of residence, Race/culture/ethnicity/language, Occupation, Gender and sex, Religion, Education, Socioeconomic status, Social capital, Age, Sexual orientation and Disability)[10]
- is geographically representative, including participants from across Scotland both from urban centres and rural locations.

Meeting this aim requires an iterative process of seeking nominations, issuing invitations and refining membership depending on the interests and availability of individuals whose participation is sought.

3.2 Involving people with lived experience in guideline development

The National Institute for Health and Care Research (NIHR) defines public involvement in research as research being carried out 'with' or 'by' members of the public rather than 'to', 'about' or 'for' them. It is an active partnership between patients, carers and members of the public with researchers that influences and shapes research. This includes people with lived experience.[11]

The term lived-experience representative is used throughout this handbook as a term to describe patients, service users, carers, members of the public and those who represent or support them in the third sector.

Many national organisations and experts recognise the importance and value of involving people

with lived experience in the development of guidelines to help meet the needs of the population, foster healthcare choices and ensure guidelines are acceptable for use.[9,12] The potential contribution of people with lived experience has been recognised for some time, as well as the difficulties in making that contribution effective.[13]

People with lived experience may have different perspectives on health and social care processes, priorities and outcomes from those of professionals. The involvement of people with lived experience in guideline development is therefore important to ensure that guidelines are more tailored and responsive to people living with conditions. The purpose of involving people with lived experience is to ensure that the guideline addresses issues that matter to them and that their perspectives and preferences are reflected in the guideline. People with lived experience can bring an 'expert' insight into guidelines because of their experience of living with a condition. This ensures guidelines are more effective at meeting the needs of a wide range of people living with a condition.

A wide range of other issues can be drawn out by lived-experience representatives to help ensure a guideline addresses the needs of those affected by a condition. Some examples include the influence of religion or belief on compliance with treatment, a recommended diet or medication, or the use of a different approach to sexually transmitted infection screening for people in prison or who are homeless.[14-20]

3.2.1 Recruitment to guideline development groups

We recruit a minimum of two lived-experience representatives to guideline development groups by inviting nominations from the relevant third-sector organisations in Scotland.[12] The opportunity to participate on guideline development groups is also advertised through Volunteer Scotland. This gives people who are not affiliated with organisations the opportunity to participate in guideline development, ensuring that guidelines are informed by a broad range of experiences and diverse needs. Direct consultation with people with lived experience (eg through a focus group) may also provide a source of possible future lived-experience representatives.

3.3 Effective guideline development group working

In putting together a guideline development group, SIGN is aware of the many psychosocial factors, including the problems of overcoming professional hierarchies, that can affect small group processes. Grimshaw states 'To ensure that guidelines achieve their full potential…requires a programme of research and development that accords at least as much thought to the psychology of group dynamics as the science of systematic reviews.' Research into the progress and functioning of SIGN's guideline development groups has shown the impact of professional or status differences on members' contributions to group discussions. A clear relationship between the perceived status of a group member and their level of contribution to group discussions was identified.[13,21] Power dynamics can occur because of age, gender, ethnicity, culture and socioeconomic status, which largely operate at the unconscious level through stereotypes.[22]

Guideline development groups vary in size depending on the scope of the topic under consideration but generally comprise between 15 and 25 members. There is necessarily a trade-off between the number of organisations or specialties that should be represented on the guideline development group and achieving a manageable group size for effective decision making. An example of the mix of skills in a typical guideline group is shown in Figure 3-1. Although their areas

of expertise will vary, members of the guideline development group have equal status on the group.

The life span of each guideline development group depends on the specific methodology used. It varies from around 6 months for a minor revision, 12–18 months for an update or adoption of a published guideline and 24–30 months for a new project. Groups meet on average once every two to three months, although they may form subgroups which meet more frequently. The frequency of meetings will also depend on the methodology used and timescales.

Figure 3-1: Membership of SIGN 169: Perinatal mental health development group

Co-Chairs:
Consultant Perinatal Psychiatrist, Lanarkshire
Perinatal Nurse Consultant, Lothian

Group members:
Advanced Clinical Pharmacist, Highland
Advanced Clinical Pharmacist, Lothian
Child Psychotherapist, Fife
Clinical Psychologist, Forth Valley
Consultant Clinical Psychologist, Greater Glasgow and Clyde
Consultant Nurse in Perinatal Mental Health, Grampian
Consultant Nurse in Perinatal Mental Health, Greater Glasgow and Clyde
Consultant Obstetrician, Fife
Consultant Perinatal Psychiatrist, Ayrshire and Arran
Consultant Perinatal Psychiatrist, Greater Glasgow and Clyde
Consultant Psychotherapist, Fife
Family Nurse, Fife
General Practitioner, Glasgow
Health Visitor, Forth Valley
Lived-Experience Representative, Aberdeenshire
Lived-Experience Representative, Aberdeenshire
Lived-Experience Representative, Tayside
Mother and Baby Unit Nursery Nurse, Greater Glasgow and Clyde
Occupational Therapist, Lanarkshire
Perinatal Mental Health Social Worker, Lothian
Perinatal Nursery Nurse, Lothian
Specialist Midwife in Perinatal Mental Health, Grampian
Specialist Midwife in Perinatal Mental Health, Highland

3.5 Role and responsibilities of guideline development group members

3.5.1 Guideline development group Chair

The role of the guideline development group Chair is crucial to guideline development. The Chair must ensure that the group works collaboratively and achieves its aim of delivering a high-quality guideline on time and budget following robust methodology and process.[23] Chairs of guideline development groups must be sensitive to group dynamics and ensure that all members of the group feel able to, and do, contribute fully to the guideline development process. A guideline development group Chair needs to be aware of, and constantly attentive to, small group dynamics (eg how the group interacts and communicates, decision-making processes and chairing strategies). The Chair must be prepared to overcome potentially serious difficulties by careful negotiation.[13,21,24]

The Chair must be aware of declared interests and, with the support of the Programme Manager, and SIGN Senior Management Team if necessary, actively manage interests (see section 13.5).

3.5.2 Guideline development group members

Guideline development group members must make a full commitment to the group and the tasks involved in guideline development and are responsible for indicating areas of concern to the Chair. They should also bear in mind that they represent both a geographical region and a specialty or professional group and must be prepared to consult with colleagues to ensure that the widest possible range of views is considered while maintaining confidentiality around the content of discussions undertaken within the group. Guideline development group members are asked to contribute to discussion and decision making in group meetings and work as required between meetings to ensure timely delivery of each stage of guideline development. Key tasks are to:

- work with the group to identify key issues and formulate clinical questions for review
- read relevant literature papers, review evidence tables and draft recommendations
- take responsibility for delivering the content of specific sections of the guideline
- review the full content of the guideline for accuracy and clinical relevance
- speak at the national open meeting
- advise on responding to stakeholder comments on the draft guideline
- alert SIGN, after publication, to any new developments or published trials that could render the guideline recommendations out of date.

3.5.3 Lived-experience representatives

Because their areas of expertise vary, members of the guideline development group have equal status on the group. A key role for lived-experience representatives is to ensure that patient views and experiences inform the group's work. This includes:

- ensuring that key questions are informed by issues that matter to people living with conditions
- identifying outcomes they think are important for each key question
- considering the extent to which the evidence presented by group members has measured and taken into account these outcomes

- identifying areas where the preferences and choices of people living with conditions may need to be acknowledged in the guideline
- making sure that the degree to which the evidence addresses the concerns of people living with conditions is reflected in the guideline
- helping to write the 'Provision of information' section of the guideline, including identifying sources of further information
- raising awareness of the issues that are important to people living with conditions at the national open meeting by preparing a presentation (with support from SIGN) and speaking at this meeting
- assisting SIGN with the identification of third-sector organisations and individuals to invite to the national open meeting
- helping to ensure that the guideline is sensitively worded
- identifying people with lived experience to take part in the peer review process
- assisting SIGN with the collection of lived-experience views (eg by helping to prepare questions for focus groups)
- helping SIGN with consultation arrangements
- assisting the group with the use of clear, sensitive and inclusive language
- raising awareness of the SIGN guideline with their own networks.

No formal qualifications are needed but it may be helpful if lived-experience representatives have some of the following:

- experience of the guideline condition (eg as someone who has, or has had the condition, or a carer or relation of someone who has or has had the condition)
- an understanding of the experiences and needs of a wider network of people living with conditions (eg as a member of a support group)
- time to commit to the work of the group (eg attending meetings, background reading, commenting on drafts)
- a willingness to become familiar with medical terms and phrases
- a willingness to feed in the views of groups of people not represented on the guideline group
- the ability to put views across clearly, constructively and sensitively, considering other people's responsibilities, views and expertise
- the ability to be objective
- good communication and teamwork skills.

3.5.4 SIGN team

The SIGN team supporting each guideline development must ensure that clinical knowledge and expertise are appropriately applied to the interpretation of the evidence base and that all group members can actively contribute to drafting guideline recommendations. The SIGN Programme Manager helps the Chair to identify potential barriers to successful group work and to plan and progress the guideline development project. They also act as a facilitator at group meetings. Expert support is provided by Information Scientists and Health Services Researchers in Healthcare Improvement Scotland's Research and Information Service (see section 13.2).

3.5.6 Support for lived-experience representatives

We support lived-experience representatives by:

- delivering 'Introduction to SIGN' training
- offering telephone and email support
- inviting new lived-experience representatives to join the SIGN Patient and Public Involvement Network
- providing clear guidance on their roles and responsibilities within the group
- ensuring opportunities to attend Healthcare Improvement Scotland training events for the public are open to lived-experience representatives

The Chair of each guideline development group is asked to support patient representatives by:

- ensuring lived-experience representatives are fully involved in the group
- ensure the group is open-minded to the contribution of lived-experience representatives
- addressing the group if contributions by lived-experience representatives are not acknowledged appropriately
- meeting them before the first guideline group meeting to allow lived-experience representatives to become familiar with the Chair and have the opportunity to ask questions about the guideline
- welcoming and encouraging contributions from lived-experience representatives.

4 Scope and purpose

4.1 Determining the scope of the guideline

The scope of the guideline provides an overview of what will and will not be covered in the guideline and identifies the key clinical issues that should be included. It is important to limit the guideline scope to topic areas where there is genuine uncertainty and where implementation of evidence-based recommendations will improve patient care and reduce variation in practice. The scope ensures that equality issues are identified and addressed. It also helps determine what methodology will be used to develop the guideline, the resources required and the timeframe for development. The scope is based on the topic proposal and is used to develop the key questions.

The draft scope is based on the guideline topic referral (see section 2.2), the topic exploration carried out during topic selection (see section 2.3.2) and the previous edition if a published SIGN guideline is being updated. The scope covers:

- aim
- remit
- uncertainties
- patient group(s)
- inclusion and exclusion criteria
- target audience
- setting, and
- lived-experience views.

4.1.1 Gathering lived experience

The aim of engaging organisations and charities that represent or lobby for patients is to gather information on the issues they think the guideline should address, which influences the remit and key questions underpinning the guideline.

We collect input from third-sector organisations who are members of the Patient and Public Involvement on a Topic Engagement Form. These third-sector organisations may provide existing information they have or gather new data to share their perspectives. The third-sector organisations and people with lived experience meet with the Chair and SIGN team at the scoping stage.

4.1.2 Direct feedback from people using services

Where published evidence is scarce and inadequate feedback from third-sector organisations has been received, the views of people with lived experience of conditions may be sought through direct contact with service users. Engagement techniques include focus groups with people with lived experience of conditions in different regions of Scotland and attending support group meetings.

Focus groups can be carried out and the findings used to complement the scientific evidence. Views are sought from a broad group of people to reflect the diversity of Scotland's population, taking into account age, sex, ethnicity, etc. Special efforts are made to include those who are seldom heard and may be less likely to join a local or national organisation. SIGN does this by working with professionals, local community groups and schools who can help identify people to take part. Groups are run as workshops with a specific focus and require expert facilitation. A note-based analysis of discussions is carried out and a summary of the findings is prepared.

4.1.3 Determining the scope for updating a guideline

Scoping for the need to update a guideline is carried out three years after publication (see section 12.2). Scoping determines whether the aims and remit of the guideline need to be changed, and which parts of the guideline need to be updated, focusing on areas of uncertainty and new evidence that will change or support new recommendations.

4.1.4 Finalising the scope

The draft scope is discussed and agreed at a meeting of a wide group of stakeholders with an interest in the topic. The scope is signed off by SIGN Senior Management Team (see section 13.2.2) and published on the SIGN website.

4.2 Equality Impact Assessment

An Equality Impact Assessment (EQIA) is carried out as part of the scoping for guideline development to ensure protected characteristics highlighted in the Equality Act 2010 are taken into consideration through all stages of the development process and recommendations do not adversely impact any of the protected characteristic groups.

Equality and diversity issues are identified through a literature search and feedback from third-sector organisations representing patients and people with lived experience and other relevant organisations or bodies that relate to the protected characteristics in the Equality Act 2010.

If issues are identified, they should be addressed by:

- consideration of any particular groups to target for further focus groups to inform the guideline, or to ask for feedback at consultation and in considering appropriate representative membership of the guideline group in relation to the equality and diversity issues identified
- presenting issues to the guideline development group for consideration when finalising the scope and setting the key questions. Any further areas for consideration suggested by group members should also be addressed and logged on the EQIA report
- consideration of any particular support required to encourage feedback on the consultation draft from seldom-heard groups.

The EQIA report should be updated in response to feedback from Healthcare Improvement Scotland's Equality, Inclusion and Human Rights Manager, and if any further issues are identified or additional mitigating action occurs throughout the guideline's development. Throughout the development of the guideline, the group refers to the EQIA report to ensure that the recommendations in it are being followed. At the editorial stage, the EQIA report is reviewed by the editorial team along with the draft guideline.

4.3 Identifying published guidelines

Developing evidence-based clinical practice guidelines is a time and resource-intensive process. It also requires considerable specialist input. Many good-quality guidelines are produced by other agencies. To avoid duplication of effort and make best use of our resources we consider guidelines produced elsewhere at the first step of our evidence review.

Guidelines must be shown to have followed an acceptable methodology before they can be considered for use by SIGN guideline developers.

Published guidelines and guidelines in development are identified through a systematic search in line with the scope within a specified time frame (typically three years or less). Identified guidelines are appraised using the AGREE II tool to agreed thresholds, appropriate for the topic under consideration. Consensus has shown using the following domains are sufficiently robust:[25]

- Domain 2 'stakeholder involvement' (3 items)
- Domain 3 'rigour of development' (8 items), and
- Domain 6 'editorial independence' (2 items).

4.4 Defining key questions

Key questions are developed by the guideline development group through collaboration between healthcare professionals and people with lived experience, with professional input from the Programme Manager and Research and Information Service Team, to ensure the questions reflect the views and priorities of people with lived experience and healthcare professionals. The team facilitates the group through a formal or informal prioritisation process to align the key questions with the scope, the resource capacity of the guideline development group and SIGN team and the timelines for completing the work.

When updating a guideline, the discussion will focus on whether the previous key questions have been sufficiently answered not to warrant inclusion in the update, which questions should be included as there is evidence to support an update or new recommendation and whether new questions are needed.

SIGN guideline development groups break down the guideline remit into a series of structured key questions using the PICOS format as shown below.

Population to which the question applies
Intervention being considered
Comparator(s) which are relevant
Outcome(s) of interest
Setting(s) of interest

The **population** to be covered by the literature searches should be defined in detail including such factors as age group, sex and whether people have or are at risk of a particular condition(s).

The potential for any equity issues where some subgroup(s) of the population may have particular needs concerning the topic under review, as identified in the EQIA (see section 4.2), should be considered in collaboration with the guideline development group. Key questions may address the differential effects of interventions or approaches in particular population subgroups.

The **interventions** of interest should be specified. Interventions include treatments involving medications or medical devices, diagnostic tests and could include management approaches, exposures or risk factors.

Appropriate **comparators** will depend on the clinical and ethical context and may include placebo, care as usual or a specific existing therapy.

Outcome(s) of interest must be specified as part of key questions. Outcomes are the key measures of importance to patients and healthcare professionals upon which treatment decisions, and thus recommendations, would be based. A small number of outcomes should be prioritised. For example, outcomes for pain treatments could be reduction in pain and tolerability of adverse effects, changes in mood and quality of life.

For some questions, the care **setting** such as primary care, community, acute or emergency settings should be described.

An example of a PICO question would be 'In patients with chronic non-malignant pain what is the effectiveness of muscle relaxants compared with placebo or other interventions on pain scores (30% reduction and 50% reduction), functional ability, quality of life, adverse drug reactions or dependency (physiological or psychological)?'.

For some questions which concern identifying needs, concerns, views and experiences, and would be addressed by qualitative evidence, interventions comparators and outcomes will be replaced with **phenomena of interest** and **context** (PICo). An example of this form of question would be 'What are people with dementia, their families, carers and healthcare professionals' views and experiences of grief management approaches throughout all stages of dementia and after death?'.

4.4.1 Presenting lived-experience findings

Common themes that emerge from engagement approaches are presented to the guideline development group. The group is asked to consider these issues when it drafts its key questions. Once a first draft of the key questions has been prepared, the Information Scientist and the Public Involvement Adviser compare the questions with the issues highlighted through the consultative process and highlight any that have not been included in the key questions. The results of this comparison are presented to the group, and they are asked to consider whether the questions should be revised. Guideline development groups are not obliged to take on board all the issues raised through the lived-experience consultative process, but they are expected to give explicit reasons if they choose to omit topics that have arisen from this source.

4.4.2 Health economics

Health economics input should be focused on the key questions where it would be most useful. The decision on which key questions should have health economic input is based on discussions between the health economist and the guideline development group. The health economist gives an introduction to health economics highlighting the criteria that should be considered when selecting which (if any) key questions should include an assessment of cost effectiveness. The criteria for including health economics input are key questions:

- covering treatments with a significant resource impact
- that are likely to involve opportunities for significant disinvestment or resource release
- that may lead to the need for significant service redesign
- where it is felt that evidence of cost effectiveness would aid the implementation of a recommendation.

4.5 Using published key questions

Time and resources can be saved by considering the key questions set by other guideline development groups.

The key questions used to develop any guidelines within scope and of acceptable quality after AGREE II appraisal (see section 4.3) are presented to the guideline development group for consideration when setting and prioritising their key questions (see section 4.4).

4.6 Determining the development methodology

If relevant guidelines (of sufficient quality and currency) are identified it may be possible to adopt the guideline or guideline recommendations or adapt them to be applicable to the NHS in Scotland (see section 5).

If all or some of the key questions cannot be answered by the identified guidelines, these questions will be addressed by conducting an evidence review (see section 6).

4.6.1 Developing review protocols

A review protocol is developed for each key question using a systematic review application. The review protocol outlines the scope and methods of the systematic review.[26] It is a record of how the key questions will be answered and the process that the SIGN and Research and Information Service teams and the guideline development group will follow. The review protocol includes the following:

- title
- start date
- contact information
- review question, PICOS, inclusion and exclusion criteria
- main outcomes of interest
- types of studies included
- search inclusions and exclusions
- selection of studies and data extraction
- risk of bias assessment
- strategy for data synthesis
- type of review
- review team members
- collaborators
- conflicts of interest
- funding sources
- keywords
- details of final publication.

5 Adopting or adapting recommendations

5.1 Why use guidelines from other organisations?

The aim of using existing guideline recommendations to address key questions is to avoid duplication and make the best use of financial resources and guideline development group members' time. It recognises high-quality guidelines now produced by other agencies that may apply to NHS Scotland. Recommendations may answer the key question and be adopted, answer the key question with adaptations or not address the key question. If the recommendation does not answer any key questions, it will be excluded. An evidence review is carried out for unanswered questions (see section 6). The guideline adaptation process was informed by the WHO handbook for guideline contextualisation,[27] The ADAPTE Collaboration methodology and discussions from SIGN process mapping workshops.[28]

5.2 Identifying recommendations

Relevant recommendations from guidelines within scope and of acceptable quality after AGREE II appraisal are retrieved. The recommendations that most closely match the key questions set by the guideline development group and described in the review protocol are prioritised for extraction. Recommendations broadly in line with the question, but with wording that incorporates additional aspects of the topic are included for consideration by the guideline development group. Duplicates and near-duplicate recommendations are grouped with a focus on including the most up-to-date guidelines and the most applicable to the Scottish healthcare context.

A consensus voting process, with a wide group of stakeholders, on the shortlisted recommendations using electronic questionnaires, with the level of consensus set at 70 % or more, covers the following voting response items:

1. Is the recommendation as written acceptable and feasible for adoption by NHS Scotland (yes/no)?
2. If yes, **adopt** the recommendation
3. If no, is the recommendation acceptable and feasible for adoption with adaptations to the Scottish context (without changing the scope or intention of the original recommendation) (yes/no)?
4. If yes, **adopt** with adaption to context
5. If no, is the recommendation acceptable and feasible to the Scottish context by changing the scope or intention of the original recommendation, eg to include new local evidence, to extrapolate to a different population, to include locally available interventions (yes/no)?
6. If yes, **adapt** the recommendation
7. If no, **exclude** the recommendation

5.3 Adopting or adapting the recommendations

If the recommendation is to be adopted no further work is required for its inclusion in the guideline.

If the recommendation is to be adapted, the SIGN and Research and Information Services teams reconsider the evidence underpinning the recommendation to understand whether it can be used to adapt the recommendation to answer the key question.

If the underpinning evidence does not support an adaptation, an evidence review will be carried out (see section 6).

6 Systematic evidence review

6.1 Why carry out a systematic review?

Systematic reviews of published evidence form the basis for the development of SIGN guideline recommendations.

Cochrane notes that:

> A systematic review attempts to identify, appraise and synthesise all the empirical evidence that meets prespecified eligibility criteria to answer a specific research question. Researchers conducting systematic reviews use explicit, systematic methods that are selected with a view aimed at minimising bias, to produce more reliable findings to inform decision making.

Guideline development group members are closely involved with the SIGN team, providing clinical expertise throughout the systematic literature review, and taking ownership of the process of considered judgement to develop recommendations based on the best quality evidence (see section 7).

6.2 Identifying and selecting the evidence

When the review protocols have been finalised (see section 4.6.1) they form the basis of search strategies developed by Information Scientists to identify relevant literature.

We use a standard set of search filters to identify the most appropriate evidence to address each key question, and can include:

- systematic reviews and meta-analyses
- randomised controlled trials
- observational studies
- qualitative studies
- diagnostic studies
- economic analyses.

A range of databases relevant to each key question may be searched:

- Cochrane library
- Cochrane central register of Controlled trials (CENTRAL)
- Medline
- Embase
- CINAHL
- ERIC
- PsycINFO
- Internet sites relevant to the topic (patient organisations and professional societies)
- clinical trials registries.

The period that the literature search covers will depend on the nature of the clinical topic under consideration and will be discussed with the guideline group. For a rapidly developing field, a five-year limit to the search may be appropriate, whereas in other areas a much longer time frame might be necessary.

The results of the literature search are dual sifted in stages according to the parameters set out in the review protocol (see section 4.6.1). The first stage excludes records for any studies which, from the title and abstract, are very clearly not directly relevant to the key question or are not available in English language. Study abstracts are used to assess if studies are likely to be in alignment with the PICOS parameters of the key question.

In the final selection stage, inclusion and exclusion criteria are applied to the full study reports. These criteria are developed from the key question and allow studies to be excluded based on specified factors such as geographical or healthcare context, study methodologies or numbers of participants.

6.3 Critical appraisal of the literature

Critical appraisal of the methodological quality of all potential sources of evidence is carried out. This is based on criteria that focus on aspects of the study design that research has shown have a significant effect on the risk of bias in the results reported and conclusions drawn. Critical appraisal checklists are used to guide the appraisal process. As the quality criteria differ by study type, separate checklists are available for each study type including systematic reviews, randomised controlled trials, observational studies and diagnostic studies. Checklists deliver a balance between methodological rigour and practicality of use. Current checklists and accompanying notes are available on the SIGN website.

The assessment process involves a degree of subjectivity. For example, an acceptable level of loss to follow up and the likely impact of this on the reported results from a study will depend on the clinical context and the judgement of the individual reviewers. Dual appraisal is undertaken to minimise the chance of bias and to ensure consistency.

6.3.1 Critically appraising for racial bias

It is not uncommon for researchers to mistakenly attribute the social construct of race as a biological factor. Any racial bias in conducting research will impact the study's validity, reliability and relevancy. Current critical appraisal tools do not address racial bias. Therefore, we use supplementary antiracism critical appraisal tools to ensure that critical appraisers consider a) any under-representation of minoritised ethnic groups in studies, especially where minoritised populations see higher rates of disease occurrence, and b) the studies' use of ethnicity data to interpret disparities in outcomes, including speculation of biological race, the misinterpretation of genetic ancestry as race, and any lack of investigation into social determinants of health, including systemic, institutional and interpersonal forms of racism.[29]

6.4 Summarising and presenting a body of evidence

It is a fundamental principle that each recommendation should be based on a systematic review of the literature. Sections 6.2 and 6.3 set out how individual studies are identified and assessed for methodological rigour. The next step in the guideline development process is to examine the **body of evidence** associated with each specific key question.

6.4.1 Systematic reviews

For many key questions, published systematic reviews, often with meta-analyses or network meta-analyses, will be identified where the quality of the included studies has been appraised. In these cases, the guideline development groups are provided with the systematic reviews and summary of findings tables, if available, relating to different outcomes from the systematic review.

In some topic areas, there may be many published systematic reviews and the steps taken to limit the number identified are set out in the review protocol (see section 4.6.1). Where there are multiple existing reviews, an evidence table summarising the findings of each of the reviews is provided. In some cases, we may create an 'index review' for the group to focus on, considering quality, currency and match to the parameters of the key question.

6.4.2 Primary studies

Where there are no published systematic reviews of suitable methodological quality to answer a key question, we conduct systematic reviews of primary studies. Findings are summarised in evidence tables, which include a methodological evaluation of each study and data describing findings for each comparison and outcome.

An example of an evidence table can be found in Annex 1.

6.4.3 Qualitative and mixed-methods evidence

When possible, qualitative reviews are carried out using meta-aggregation for data synthesis. Guidance from the Joanna Brigg's Institute JBI manual for evidence synthesis on using meta-aggregation for reviews of qualitative studies is available. Mixed-methods reviews follow either a convergent integrated or convergent segregated approach to data synthesis and integration, depending on the review question(s). Guidance from the JBI manual for evidence synthesis on conducting mixed methods systematic reviews is available. Findings are presented as a narrative evidence summary.

6.4.4 Health economic evidence

Findings from the economic literature search and critical appraisal are presented as a narrative evidence summary. Where high-quality published health economic studies are not available and the key question is of particular significance, health economic modelling may be undertaken to derive information to be used when making recommendations.

6.5 Assessing the quality of evidence

SIGN follows the principles of the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach to evaluating the quality of a body of evidence as a basis for developing recommendations. The following aspects are considered and comments are recorded on part A of the considered judgement form. An example of a considered judgement form can be found in Annex 2.

6.5.1 Risk of bias

This aspect considers how reliable the findings of the studies, which make up the body of evidence, are, based on methodological assessment of the individual studies (see section 6.3).

6.5.2 Consistency

Consistency, also known as homogeneity, examines the extent to which studies in a body of evidence point in the same direction of effect. Sometimes it is very clear that evidence is consistent, but at other times it is not. Some published meta-analyses provide measures of statistical heterogeneity which quantify and allow exploration of the level of inconsistency across study findings. There may be clinical reasons to explain this, such as variability in study populations.

6.5.3 Directness

Directness assesses the extent to which studies are relevant to the target population in NHSScotland. This may also be described as applicability or external validity. Guidelines should indicate where the studies used as evidence were conducted, if not by listing all the countries involved, at least indicating which parts of the world the evidence came from. For example:

> "The main work on this topic has been carried out in Europe and the UK."

> "Most of the evidence in this area comes from the US-based Framingham study."

Studies carried out in the UK are likely to be directly applicable to the target population for a SIGN guideline. For studies carried out elsewhere consideration must be given to what factors, if any, might influence the relevance of the findings to our target population.

Examples of factors that can influence the applicability of evidence include:

- variations in baseline risk
- differences in the genetic makeup of the population
- differences in culture or lifestyle between populations or subpopulations
- differences in how care is delivered, or the availability of technologies or resources
- different outcomes measured in studies to those that the guideline development group see as being of critical importance
- differences in how the intervention(s) studied are administered in Scotland
- use of indirect (surrogate) outcomes
- indirect rather than direct comparison of outcomes.

The last two points relate to different forms of indirectness. Surrogate outcomes reflect a situation where it is difficult or impossible to accurately measure the effect of an intervention on the patient-important outcome. In that case, an alternative outcome that can be shown to be related to the outcome may be measured instead. An example of this is in osteoporosis where studies often report the impact of interventions on bone mineral density, when in fact the outcome of interest is the degree of fracture risk. Increased bone density is associated with a reduced risk of fracture, hence its use as a measure of treatment effect.

The second issue arises when there are no head-to-head comparisons of different options for treatment. For example, there is no comparison of A versus B, but there are trials of A versus C and B versus C. In this situation, indirect treatment comparison meta-analysis may be available. In some cases, network meta-analyses (also known as mixed treatment comparisons) are available bringing together both direct and indirect evidence.

6.5.4 Precision

Precision relates to the level of statistical certainty around the effect size from studies of interventions or exposures. In both meta-analyses and primary studies precision around an effect estimate is usually presented as 95 % confidence intervals, with narrow confidence intervals indicating greater precision.

Trial results are commonly reported in terms of relative effect or relative risk. Wherever possible, estimates of absolute risk or benefit should also be used along with the appropriate confidence intervals.

6.5.5 Publication bias

Publication bias is where only a proportion of study results have been published, usually the most positive ones. It is not usually possible to establish the presence or absence of publication bias, and reviewers can only indicate if it is likely or unlikely. Published systematic reviews should include an assessment by the authors of the likelihood of publication bias. SIGN searches do not cover unpublished material.

6.6 Assessing the quality of qualitative and mixed-methods evidence

SIGN follows the Joanna Brigg's Institute (JBI) approach to appraising the quality. Guidance from the JBI manual for evidence synthesis on conducting mixed methods systematic reviews is available. The following aspects are considered and comments are recorded on part A of the considered judgement form:

- volume and reliability of evidence
- consistency of conclusions
- publication bias.

An example of a considered judgement form can be found in Annex 2.

6.7 Assessing the quality of health economic evidence

In assessing the overall body of economic evidence, it is necessary to consider whether there is sufficient published literature to help inform the recommendation. The quantity, quality and consistency of evidence are considered. If there appears to be insufficient published literature, then economic modelling may be required to inform decision making if the key question is of particular significance.

In some instances, high-quality published studies may reach different conclusions, so it may be necessary to weigh the importance and relevance of one study against the other. The health economist presents a summary of the evidence identified for each relevant key question to the guideline development group at the start of the considered judgement.

7 Evidence to recommendation

7.1 Considered judgement

One of the factors likely to influence a practitioner's decision to implement a recommendation is the degree of confidence that they have in it; that is how certain they are that following the recommendation will produce the expected improvement in outcome for their patients. Not only does this certainty relate to the degree of confidence in the size of effect of an intervention in relation to specific important outcomes, but it also encompasses other issues such as patient preferences and the availability of resources to support the introduction of a new intervention. For this reason, the guideline development group must consider both the overall quality of the supporting evidence and the other factors that might influence the strength of the recommendation.

In the introduction to their landmark book, David Sackett and his coauthors defined evidence-based medicine as:[30]

> "…the integration of best research evidence with clinical expertise and patient values."

Once the research evidence is gathered clinical expertise and patient values, among other things, need to be applied to the body of evidence to arrive at a recommendation that is in line with the evidence, is likely to be implemented and is acceptable to patients.

Fundamental to this approach to guideline development is transparency. It is important to be clear about what was done at each stage of the process and produce a structured summary that reviewers or guideline users can check when they are considering the implementation of the guideline. The following aspects are each considered and comments are recorded in part B of the considered judgement form (see Annex 2). This process is based on the Evidence to Decision tool developed as part of the Developing and Evaluating Communication strategies to support Informed Decisions and practice based on Evidence (DECIDE) project, which is in turn based on the work of the GRADE group.[31,32]

7.1.1 How sure are we that any given option will work?

The guideline development group relies on the summarised evidence produced at the previous stage in the process (see section 6). The factors described in the following sections are then considered in part B of the considered judgement form (see Annex 2) to allow recommendations to be formed from the evidence.

This table can be taken from a summary of findings or an alternative format presenting non-pooled results. The guideline development group should focus on (for each outcome):

- outcome
- impact
- number of studies
- quality or certainty of the body of evidence.

7.1.2 Balancing benefits and harms

Fundamental to making any recommendation is the need to ensure that any benefit to the patient outweighs, preferably by a substantial margin, any risks or harms associated with the treatment.

To make such judgements, the guideline development group has to have a clear understanding of how substantial the expected benefits of an intervention are likely to be in practice. They also need to consider how substantial the downsides are. These may range from physical side effects to an increased risk of developing additional health problems.

The evidence supporting benefits will often come from stronger study designs than those supporting harms. This makes judgements more difficult, but it is nonetheless essential to explicitly consider the size of effect for both sides of the balance. A detailed presentation of the evidence from an evidence table or narrative summary (see section 6.4) is essential when making such decisions.

Once the size of all effects has been established, a judgement must be made as to whether the benefits outweigh the harms. This is not just a clinical judgement but must consider patient values (see section 7.1.4) if a realistic assessment is to be achieved.

7.1.3 How do patients value the different outcomes?

For a recommendation to be implemented effectively, the outcomes must be sufficiently valued by patients for them to be willing to adhere to the treatment. The science of assessing patient values and preferences, however, remains largely undeveloped.[33] When developing guideline recommendations, the focus should be on questions where the application of values is likely to affect outcomes and should rely on practical and achievable methods.

In the case of venous leg ulcers, for example, there is strong evidence that using compression stockings is an effective treatment, and the higher the compression the better the results. Compression stockings have various drawbacks, however, and some patients either cannot or will not tolerate the highest levels of compression. It then becomes a question of balancing these preferences against the risk of larger or longer-lasting ulcers. A recommendation based entirely on trial evidence without considering patient preferences is unlikely to be widely adhered to, and therefore ineffective.

Assessing patient values and preferences can focus on the extent to which they are likely to follow a recommended course of action, though there is some evidence that wider social values can play a part in such decisions.[34] The first step should be to consult lived-experience representatives on the guideline development group and through them, as well as third-sector organisations, we can access a broader range of opinions and insights from others with lived experience. If time and resources allow, a literature search can be carried out looking specifically for information on patient values concerning the question being addressed.

If the acceptability of a recommendation to patients is seen as critical to its effective implementation, and no clear idea of patient views has been identified by the above methods, it may be necessary to run a series of focus groups to establish patient values and preferences.

7.1.4 Equity and equality

Health equity is defined as the absence of unfair, avoidable or remediable differences among population groups, whether these groups are defined socially, economically, demographically, or geographically or by other dimensions of inequality (eg sex, gender, ethnicity, disability or sexual orientation).[35]

Under the Equality Act 2010 all public bodies in Scotland are required to take into account the needs of equality groups. The protected characteristics covered by the Act are:

- age
- disability
- gender reassignment
- marriage and civil partnership
- pregnancy and maternity
- race
- religion or belief
- sex and gender
- sexual orientation.

Guideline groups are therefore required by law, as well as good practice, to consider whether any recommendations they make will have a differential impact on any of these groups.

Health inequalities are most commonly associated with socioeconomic inequalities but can also result from a wide range of other factors, including, reasons relating to a person's protected characteristics; access to education; access to employment; access to adequate housing and location in which a person lives; and, individuals' circumstances and behaviours, such as their diet, alcohol consumption, drug use, smoking and exercise.

Some aspects of equality issues have been addressed earlier in this handbook (see sections 4.2, 4.4 and 6.4). At this stage in the process, it may be necessary to analyse the evidence for specific subgroups of the population to see if and how it differs from the main results. If there are substantial differences, it will be necessary to make separate recommendations for these subgroups taking these differences into account.

Apart from issues of social equity, subgroups may need to be considered for clinical reasons such as specific comorbidities, or issues around polypharmacy where separate recommendations may be required for these groups.

7.1.5 Costs and benefits

There are two aspects to the consideration of costs and benefits when making recommendations.[36,37]

The first relates to cost effectiveness of a single proposed intervention and involves assessing the incremental cost of applying the new intervention compared to current practice and relating it to the net benefit of the intervention. If it is clear from the available evidence that one clinical strategy is both more effective and less costly, then this strategy should be recommended. However, it is often the case that one strategy is more effective but also more costly than the alternatives. If one intervention is more effective than another, the guideline development group will have to decide whether the increased cost associated with this intervention represents good value for money. Similarly, when an alternative is less effective and less costly, the guideline development group will also have to decide whether disinvestment represents good value for money.

The second issue relates to the resources required to implement a recommendation across the NHS in Scotland. This may not be an issue in a lot of cases but where very expensive treatments or interventions requiring substantial investment in equipment, or changes to working practices are involved an assessment of the cost impact can help with guideline implementation

In this second case, the cost assessment may not influence specific recommendations directly but should be produced along with the guideline to inform decision makers who need to allocate resources within individual health boards. If the potential cost is very high and may not be achievable in the short term, a 'next best' option may be recommended in the guideline. The guideline should, however, always identify the most cost-effective option, with the 'next best' as an interim option only.

7.2 Making recommendations

Guidelines provide recommendations that balance the benefits and harms of investigations and interventions, with the aim of reducing the burden and harm that patients experience from overinvestigation and overtreatment.

It is not possible for SIGN to advise or direct a guideline group as to the conclusions they should reach. All that can be asked is that the group considers all the issues and uses a transparent process to reach their conclusion.

Usually, the guideline development group forms recommendations through a process of informal consensus facilitated by the SIGN Programme Manager. Since the recommendations are explicitly linked to the body of consistent evidence, agreement is generally reached. When it is not possible to reach consensus in this way, an independent interpretation of the evidence may be sought. In addition, the Programme Manager may seek advice from the SIGN Senior Management Team (see section 13.2.2) depending on the nature of the disagreement. The Senior Management Team will discuss how to progress the issues with the Programme Manager, Chair, members of the guideline development group

and external experts as appropriate. The outcomes of these discussions are recorded in the supporting documentation for the guideline, for example in the considered judgement form (see Annex 2) and meeting minutes, and in the guideline itself if necessary.

Balancing all the issues described above is a matter of considerable complexity and presents a challenge to any guideline group. High-quality evidence from well-conducted studies should lead to a strong recommendation but relating the trial populations to the target population of a guideline and considering issues of cost and patient acceptability may lead to a recommendation that is much weaker than first thought. Equally, there will be circumstances where the evidence is flawed but there are few or no downsides to treatment and the clinical importance of the topic is such that a strong recommendation is justifiable.

Particularly where considerations of equity or comorbidity are involved, the guideline development group may have to make more than one recommendation; one for each subgroup discussed.

7.2.1 Strong versus weak

The outcome of a GRADE decision-making process is to produce a recommendation that is rated as either strong or weak (which we refer to as 'conditional'). 'Strong' or 'conditional' recommendations are based on the potential benefit and harm to the patient and the quality of the underlying evidence.

For 'strong' recommendations that 'should' be carried out we can be confident that, for the vast majority of people, the intervention will do more good than harm, and for 'conditional' recommendations that should be 'considered', the intervention will do more good than harm for most patients.[31,32] The 'consider' recommendation facilitates more meaningful conversations between people and their healthcare professionals that help people make informed choices about their treatment and care options based on what matters most to them.[38]

A strong recommendation is made where:

- the evidence is of high quality (see section 6)
- estimates of the effect of an intervention are precise (ie there is a high degree of certainty that effects will be achieved in practice)
- there are few downsides of therapy
- there is a high degree of acceptance among patients.

A conditional recommendation is made where:

- there are weaknesses in the evidence base
- there is a degree of doubt about the size of the effect that can be expected in practice
- there is a need to balance the upsides and downsides of therapy
- there are likely to be varying degrees of acceptance among patients.

7.2.2 Forms of recommendation

In all situations, however, the overall judgement of the guideline development group can only lead to one of the five possible conclusions shown in Table 6-2, each related to a particular form of recommendation.

Table 7-1: Forms of recommendation

Judgement	Recommendation
Undesirable consequences clearly outweigh desirable consequences	Strong recommendation against
Undesirable consequences **probably** outweigh desirable consequences	Conditional recommendation against
Balance between desirable and undesirable consequences is closely balanced or uncertain	Recommendation for research **and possibly** conditional recommendation for use restricted to trials
Desirable consequences **probably** outweigh undesirable consequences	Conditional recommendation for
Desirable consequences clearly outweigh undesirable consequences	Strong recommendation for

Recommendations must be clearly differentiated from other text in the published guideline by presenting as a single paragraph in bold text. A capital 'R' is used alongside to emphasise that the associated text is a recommendation.

> **R** **Patients with larger tumours may be considered for oncoplastic surgery instead of mastectomy.**

7.2.3 Justifying the recommendation

Whatever the conclusion, the published guideline and supporting documentation should contain a justification for the recommendation highlighting the supporting evidence and the factors that have been considered when arriving at a conclusion.

Where decisions are particularly complex, such a justification may be quite lengthy. In these cases, the full justification can be included in supporting material with a shortened version included in the published guideline.

7.3 Good practice points

Good Practice Points (GPP) are intended to assist guideline users by providing short pieces of advice that may not have an evidence base, but which are seen as essential to good clinical practice. They should appear alongside an associated recommendation and cannot be standalone recommendations.

Examples of acceptable GPPs

- Healthcare professionals should refer to the WHO medical eligibility criteria for contraceptive use prior to offering contraceptive advice to women with diabetes.
- Healthcare professionals should signpost patients to self-management resources, identified and recommended by local pain services, at any point throughout the patient journey.

7.4 Consensus recommendations

Formal consensus method can be used to develop recommendations when there is:

- no evidence or the evidence base is too poor to support a recommendation
- conflicting evidence
- there is a pressing need for a recommendation based on safety and risk or a rationale for how it would improve care or outcomes
- a poor-quality guideline (according to AGREE II)(see section 5)
- only evidence available from another consensus guideline.

If the only evidence is another recommendation based on expert opinion, making a recommendation based on this should be taken on a case-by-case basis, taking account of the consequences of the recommendation (see section 5).

A consensus recommendation should be accompanied by a recommendation for research and a commitment to review it regularly considering any new published evidence.

7.5 'What matters to you?' statements

During the considered judgement process the Topic Engagement Form is used as the basis for 'What matters to you?' discussions, where the acceptability and feasibility of recommendations are explored with the guideline group, including third-sector representatives and representatives with lived experience. Questions to inform discussion include:

- What is it like to live with the condition?
- What are the priorities and preferences of patients, carers and family members?
- What are the advantages and disadvantages of accepting the recommendations?

'What matters to you?' statements summarising the preferences of people with lived experience and third-sector organisations representing them are presented in the guideline alongside the recommendations.

7.6 Recommendations for research

An important secondary outcome of the guideline development process is highlighting gaps in the evidence base. The review of a guideline is an opportunity to discover whether any of the gaps in the evidence base have been filled.

7.7 High-impact recommendations

The guideline group may identify a small number of recommendations, that if prioritised for implementation, would have a high impact on patient outcomes, for example, recommendations leading to a major change in practice. These recommendations appear in the main text and the high-impact recommendations section of the guideline (see section 9.3).

GPPs (see section 7.3) should not appear among the high-impact recommendations unless directly linked to a graded recommendation.

A consensus-based recommendation may be included as a high-impact recommendation.

8 Consultation

8.1 Consulting on draft guidelines

We seek feedback on a draft version of a newly developed guideline from the wider health and social care community through:

- open consultation
- peer review.

The benefits of consultation are two-fold:

1. The guideline development group obtains valuable feedback and suggestions for additional evidence that group members might consider, or alternative interpretation of that evidence, and the feasibility of implementing the proposed recommendations.
2. The wider community can contribute to and influence the form of the final guideline, generating a sense of ownership over the guideline across geographical and disciplinary boundaries.

8.1.1 Open consultation

The draft guideline is made available on the SIGN website for a month and widely publicised to professional and patient representative groups most likely to have an interest in the topic. Individuals or corporate, commercial, professional or societal groups can submit comments. Comments are only accepted if accompanied by a declaration of interests from the reviewer.

For published guidelines that are undergoing a minor change (see sections 12.3–12.5) the revised section of the guideline is sent directly to appropriate expert reviewers *(*see section 8.1.3, 8.1.4) rather than being made available on the website.

All feedback is compiled into a consultation report for consideration by the guideline development group (see section 8.1.5).

8.1.2 National open meeting

If the guideline is on a new topic or a guideline update results in a significant change in practice, we may hold a national open meeting, either in person or virtually, during the open consultation. For small updates to guidelines, or guidelines developed using published guidelines, no meeting is held.

The guideline development group presents its preliminary conclusions and draft recommendations and encourages further feedback through discussion at the meeting, on social media and through online consultation. The meeting provides an opportunity for two-way learning. Delegates are made aware of the latest evidence and proposed recommendations, and the guideline development group gains insight into how the draft guideline is interpreted. It allows for any controversial areas to be highlighted and discussed

and provides an opportunity to identify any recommendations that may require additional resources or support to implement.

SIGN national open meetings are widely publicised to healthcare professionals and others interested in the guideline topic, including people with lived experience, from across Scotland and are free of charge. Efforts are made to ensure that all equality groups with a potential interest in the topic are represented.

8.1.3 Peer review

All SIGN guidelines are reviewed in draft form by referees, who are not members of the guideline development group, selected for their expertise and to reflect the multidisciplinary nature of the guideline. The draft is also sent to at least two lay reviewers to obtain comments from the perspective of people with lived experience. Reviewers are asked to comment primarily on the comprehensiveness and accuracy of interpretation of the evidence base supporting the recommendations in the guideline.

Comments from peer reviewers will not be considered unless an accompanying declaration of interests has also been submitted. The comments received from peer reviewers are compiled in the consultation report and discussed by the guideline development group (see section 8.1.5).

8.1.4 Consulting people with lived experience

Consulting with a wider group of people ensures that our guidelines and other documents are accessible to everyone.

Patients, service users, carers and third-sector organisation representatives are encouraged to attend the national open meeting which is held to discuss draft guidelines (see section 8.1.2).

Patients, service users, carers and third-sector organisation representatives are invited to take part in the peer review stage of each guideline and specific guidance for them has been produced.

8.1.5 Consultation report

All submissions from the open consultation and peer review are compiled in a consultation report, which lists the reviewers' names, designations and any conflicts of interests. The guideline development group addresses each comment and makes changes to the draft guideline, or records reasons for no change in the report. The consultation report is published alongside the guideline.

8.2 Editorial review

As a final quality control check before publication, the guideline and the consultation report are reviewed by the SIGN Editorial Group, consisting of the SIGN Chair, Programme Lead, Director of Evidence and representatives of SIGN Council. The Editorial Group ensures that each point raised at consultation has been addressed adequately and that any risk of bias in the guideline development process has been minimised.

9 Publication

9.1 Accessibility

The easier a guideline is to read, the less time people need to spend on it. The simpler it is to understand, the more likely it is they will take away something valuable from it.

Public sector (internal and external) websites and apps must meet the Web Content Accessibility Guidelines accessibility standard and the law requires all content published after 23 September 2018 must be available in an accessible format (including portable document formats; PDFs).

While written primarily for health and care professionals, guidelines should be written in unambiguous language and define all terms precisely. When writing our guidelines we follow the Evidence and Digital Directorate 'Principles of accessible content' using concise, plain language and an active voice to make actionable statements. Plain language versions of guidelines for patients and the public are covered in section 10.

9.2 Presentation

The most appropriate format for presenting guidelines and recommendations will vary depending on the target group(s), the subject matter and the intended use of the guideline. Ideally, end users should be consulted on methods of presentation and the usability of the format.

Having a well-developed and defined template for the guideline can facilitate the development process, enabling guideline development groups to plan at the outset what type of information will be required and what format the content will take.

SIGN guidelines are presented in short manageable sections with complex information summarised in lists and tables for easy access.

By following the model for systematic review and formation of guideline recommendations outlined in sections 4, 5, 6 and 7, guideline development groups will find that most of the required information will be produced in a structured, accessible format, ready to slot into the guideline template.

9.3 Content of the guideline

Each SIGN guideline has an introduction, outlining the need for the guideline, including evidence of variation in practice and the potential for the guideline to improve patient care. There is also a summary of the lived-experience perspective. The remit of the guideline is defined, detailing definitions, the patient population, including common comorbidities and target users of the guideline. The key clinical questions covered in the guideline are set out in an Annex. A statement of intent makes clear the purpose of the guideline.

Within the main body of the guideline the structure should, as far as possible, reflect the development process that the guideline development group has followed, (ie for each section):

- a clear statement of the issue under consideration
- an explanation of the treatment options available
- a summary of the conclusions drawn from the critical appraisal of the evidence (the evidence statement, annotated with the quality of evidence and key references). This should justify the recommendation to follow; that is, the evidence for improved patient outcome resulting from the recommended action or for harms or contraindications relating to treatment options (see section 7)
- the recommendations and any practical points (eg resource or geographical considerations to be taken up in the discussion of local guidelines for implementation), or treatment options for which there is no evidence (the last should be stated clearly).

Resource implications of implementing the key recommendations and key points for audit are included as part of an implementation strategy for the guideline (see section 11*)* alongside tools identified or developed by the guideline development group that will aid implementation (see section 11).

Brief details of the systematic review on which the guideline recommendations are based are also provided, with full details of the main search strategy available on the SIGN website. Stakeholder involvement is demonstrated through listing the guideline development group members, specialist peer reviewers and others commenting at the consultation stage of guideline development, and the SIGN Editorial Group.

9.3.1 Provision of information

All SIGN guidelines include a 'Provision of information' section, which gives examples of the information patients and carers may find helpful at the key stages of the patient journey. The information in this section is provided for use by health professionals when interacting with patients and carers and for guiding the production of locally produced information materials. The issues highlighted in this section are informed by:

- lived-experience views gathered earlier in the development process (see sections 3.2 and 4.1)
- discussion with lived-experience representatives on the development group
- discussion with a wider group of people with lived experience of the guideline topic
- input from other guideline development group members.

In cases where there are strong and diverse views among patients, focus groups may be used to identify the most widely needed information that patients require.

This section also provides details of appropriate helplines, support groups and reading materials.

9.4 Publishing the guideline

All SIGN guidelines and supporting materials are available free of charge from the SIGN website.

Guidelines are published as interactive toolkits on the Right Decision Service website and mobile app. The toolkits provide a summary of the recommendations from the guideline and may include other information such as care pathways, algorithms, calculators and links to other reliable sources of information.

Guidelines are also available in PDF format and the search strategy, register of interests declared by the guideline development group, and consultation report are published alongside the guideline. Other supporting materials may include:

- implementation resources, eg patient pathways, costing tools
- patient resources, eg booklets, sample leaflets
- learning resources, eg slide sets, online tutorials.

10 Plain language versions of guidelines

10.1 Accessibility

Plain language versions of guidelines are documents that 'translate' guideline recommendations, and their rationales, originally produced for health professionals into a form that is more easily understood and used by patients and the public.

By writing information from guidelines in an accessible format, we are empowering people to take part in decisions about their treatment and care. They are intended to:

- help people understand what the latest evidence says about diagnosis, treatment and taking care of themselves
- encourage people to be fully involved in decisions about the management of their condition
- point out any areas where things aren't clear.

10.2 Development

A group made up of healthcare professionals, people with lived experience and a public partner from Healthcare Improvement Scotland develops the plain language version. This helps ensure our information is easy to access, friendly and clear for everyone.

The group asks the following questions to decide which recommendations can help people with firsthand experience and their families be more involved in decision making:

- can they help people understand their condition better?
- do they show people the interventions with the most proven benefits?
- do they suggest lifestyle changes and ways to manage the condition?
- do they point out treatments without evidence, and is it helpful for people to know this?

10.3 Content and presentation

The content and presentation of the patient booklets are based on strategies developed during SIGN's participation in the DECIDE collaboration.[39,40]

Plain language versions include:

- a summary of the condition
- a summary of tests, treatments and procedures we recommend
- how professionals can support people to help themselves
- further sources of information
- how guidelines are produced.

Plain language versions of guidelines are written directly to people with lived experience using a question-and-answer format. As they are a translation of the guideline, they only include the recommended procedures and interventions. Sometimes extra information is added to help people understand the recommendations better. These simple versions also point people to other sources of information like third-sector organisations.

10.4 Consultation

Consultation with a wider group of people ensures that the plain language version is accessible to everyone. Members of the SIGN Patient and Public Involvement Network are invited to comment on draft documents such as plain language versions of guidelines, patient sections of guidelines and other literature aimed at patients, their families and carers.

When consulting on plain language versions of guidelines, it is important to use a range of methods suited to the intended audience. For example, when consulting with children and young people, a discussion group may be more effective than written consultation. The purpose of consultation on plain language versions is to ensure the patient version is:

- readable
- relevant
- useful
- written in a sensitive way.

10.5 Publishing plain language versions of guidelines

Plain language versions of guidelines are free on the SIGN website as PDFs. We also print hard copies for dissemination in NHSScotland and for people with firsthand experience that request them. They might also come in other forms like apps in the Right Decision Service (see section 9.4), video animations or audio. We pick the format based on the topic and who it is for. We talk to people who have experience of the topic to choose the best format.

As part of SIGN's commitment to the equality agenda of NHSScotland, plain language versions of guidelines can be produced in languages other than English upon receipt of requests from users. Languages covered include those community languages identified by Scottish Government, Gaelic, or British Sign Language (BSL). Large print versions can also be made available.

11 Getting recommendations into practice

11.1 How can we get recommendations into practice?

To achieve our aim of changing and improving clinical practice it is important not only to develop valid guidelines using rigorous methodology but also to ensure the implementation of the evidence-based recommendations. As one of a range of tools to help healthcare professionals and organisations improve clinical effectiveness and patient outcomes, guidelines can help practitioners improve shared clinical decision making, increase team working, expand their evidence-based knowledge and reduce variation in practice. They can also enable professionals to keep up to date and to assess their own clinical performance against the recommendations for best practice.

11.2 Dissemination

Guidelines must be made as widely available as possible to facilitate implementation. Our focus is on electronic distribution and all SIGN guidelines are available, free of charge, through the Right Decision Service as toolkits and from the SIGN website. Plain language publications are available in this way and also distributed in hard copy free of charge throughout NHSScotland.

Dissemination of SIGN guidelines in NHSScotland is organised within each NHS board by local distribution coordinators, who are responsible for disseminating guidelines across their board. Notification of new guidelines is also sent to the Royal Colleges in Scotland, the chairs of NHS boards, the chief executives of NHS boards, the chief scientist's office, other guideline development organisations, postgraduate college deans and voluntary organisations listed in the guideline.

11.3 Implementation

11.3.1 Identifying barriers to implementation

There are two types of barriers to the implementation of guidelines: those internal to the guideline itself, and the external barriers relating to the clinical environment and particular local circumstances. We address the internal barriers by developing guidelines according to a robust methodology, described in detail in the earlier sections.

Potential external barriers to guideline implementation include:

- Structural factors (eg budget constraints, significant service redesign required)
- Organisational factors (eg inappropriate skill mix, lack of facilities or equipment)
- Peer group (eg local standards of care not in line with desired practice)
- Individual factors (eg knowledge attitudes, skills)
- Patient perceptions and treatment preferences

- Professional-patient interaction (eg problems because of language or social origin, mental health issues)
- Disadvantaged patient populations (eg poverty, homelessness). Disadvantaged populations are known to have poorer health and healthcare and external barriers to implementation contribute to inequalities in healthcare.

For successful implementation, and to achieve the aim of reducing variation in practice, external barriers need to be assessed, and implementation strategies developed to address them.[35,41]

11.3.2 Implementation support strategies

Implementation of guidelines is a local responsibility. Most clinical governance support teams in NHS boards have audit and clinical effectiveness facilitators with some resources to help local implementation.

Each guideline development group develops tools or signposts useful resources that will support implementation. An implementation resource is any tool or activity that contributes towards putting the recommendations into practice. They are generally targeted towards recommendations that will have the maximum impact on patient care and can include:

- **Algorithms and care pathways** describe the typical journey of care and provide a visual representation of a group of recommendations. They can be a useful tool for people wishing to implement a change in practice and can be used for educational purposes.
- **Resource implication tools** Where a key recommendation is likely to result in significant resource changes a resource implications calculator or costing tools can help NHS boards identify the potential costs and savings of implementation.
- **Datasets** can support the implementation of key recommendations. Wherever possible SIGN works with other agencies to support the incorporation of recommendations in national datasets and audit tools.
- **Electronic decision support tools** Incorporating recommendations into local electronic decision support systems is an efficient way to assist implementation.
- **Other tools** such as posters highlighting key recommendations, audit proforma, easily accessible and editable lists of the recommendations, slide sets and case studies may also be developed with each guideline and made available on the SIGN website.

12 Keeping guidelines up to date

12.1 Why update published guidelines?

As medical practice continues to develop and new options for managing conditions become available, guidelines inevitably fall behind current evidence for best practice. They must therefore be kept under review and updated when necessary.[7,42-44]

The currency of guidelines is categorised in a traffic light system on the SIGN website in the following way:

- current (within three years of publication or over three years old and revalidated)
- over three years old and not revalidated
- over seven years old and not revalidated

A full review of a guideline after a fixed period is not always appropriate as new evidence is published at different rates in different fields. It also imposes a workload for future years that may not be achievable in practice. Updates can apply either to sections of guidelines or, in some circumstances, to individual recommendations. Processes must be in place to address all these possible options.[45]

12.2 Scoping for the need to update

SIGN considers whether or not published guidelines need to be reviewed after three years and all SIGN guidelines carry a statement indicating that they will be considered for review three years after publication.

A literature review is carried out to establish if there are previous or ongoing projects in Healthcare Improvement Scotland on the same topic. Searches also cover other UK guidelines, the Cochrane Library for systematic reviews, NIHR for HTA and ECRI (originally founded as Emergency Care Research Institute) for evidence reports. A report is prepared, supplemented by comments received since publication of the guideline, outlining the potential impact of any new evidence on the recommendations in the guideline. During consultation, the group responsible for developing the guideline, or a wider group of healthcare professionals, is asked to consider the potential impact of the new evidence on the guideline. The report and recommendations on the need to update the guideline are fed into the Evidence and Digital Directorate topic referral process (see section 2.3).

The outcome of the report will be one of four options:

- **Revalidate** if no evidence was identified that would change recommendation
- **Update** if there is new evidence that would change recommendations in some areas of the guideline
- **Request a proposal** for a new guideline if the new evidence would change many of the existing guidelines recommendations
- **Withdraw** the guideline if the new evidence renders it unsafe or obsolete.

12.3 Updating a guideline

If the scoping process carried out three years after publication confirms the need for an update (see section 12.2), the process for carrying out the update is largely the same as that described elsewhere in this handbook. The principal difference is that the update will focus on those sections of the original guideline that have been identified, through the scoping, as needing updating. The same methodological principles apply, although the nature of the sections being reviewed may necessitate a different composition from the original guideline group. If, for example, a section on surgical interventions is a major part of an update, the guideline group is likely to include more surgeons and theatre staff than pharmacists or allied health professionals.

The guideline group must decide whether or not the proposed changes are sufficiently significant to justify the need for a national meeting. If a national meeting is not held, the first draft of the guideline is published on the SIGN website for a fixed period, during which time potentially interested parties will be alerted to its presence and invited to submit comments (see section 8.1.1).

12.4 Requests for a change to a published guideline

All comments received on published SIGN guidelines, information on important new evidence in the field, or evidence of impacts on equality groups is considered, either for immediate response or for more detailed consideration on review of the guideline. Individuals commenting on published guidelines are invited to complete a small change proposal form, which can be downloaded from the SIGN website.

Once received small change proposals are processed through the Evidence and Digital topic referral process (see section 2.3).

Small change requests are considered against the following criteria:

- new evidence substantially changes a small number of recommendations in the guideline (corresponding to no more than two related key questions), or
- a specific issue such as a new drug therapy or a national issue, such as a new government policy, will give rise to a new key question.

12.5 Making a small change to a guideline

When a guideline needs a small change (see section 12.4), the process for this is largely the same as that described for updating a guideline (see section 12.3), although the scope of the update is much narrower and the timescale shorter. The level of involvement of a guideline development group and the extent of consultation will depend on the nature of the changes to the guideline.

12.6 Recording updates to a guideline

Any updates to the guideline made in the period before the scheduled review are recorded in the update report, which can be found in the supplementary material section for the guideline on the SIGN website. The update report provides details of any requests from stakeholders to update the guideline (or other triggers, such as a change in drug marketing authorisation), the decision on whether the update is warranted, when the update was published and the nature of the update.

12.7 Living guidelines

The process for updating a living guideline is largely the same as that described elsewhere in this handbook. The main difference is that a living guideline is developed on a rolling programme of regular updates. The frequency of updating will depend on the rate at which new evidence is emerging.

Each update focuses on those areas of the current guideline where new evidence has been identified. The same methodological principles apply and literature searches are based on a series of existing key questions. Searches seek to update and build on the evidence base used in the original guideline and subsequent updates. New questions may arise from topic engagement with people with lived experience and the third sector or new developments identified during the process of scoping the update (see section 4).

Once searches are completed, if new evidence has been identified to change a recommendation or to add a new topic, the text and recommendations of the guideline are revised. The updates are summarised in the published guideline. The other processes used will be the same as those used for a new guideline. A possible exception is, as with an update, the need for a national meeting.

Currently, we do not have any living guidelines in development.

12.8 Withdrawing guidelines

Sometimes it is necessary to consider withdrawing guidelines that are outdated or no longer relevant. Proposals to withdraw guidelines are submitted initially to SIGN Senior Management Team (see section 13.2.2), with final approval from SIGN Council (13.2.1).

Once it has been agreed to withdraw a guideline, all versions of the text and any associated material will be removed from the SIGN website. The list of published guidelines will be amended to show the guideline as withdrawn, with a note of the reason for withdrawal.

Guidelines may be withdrawn for any of the following reasons:

- superseded by a more recent or more comprehensive guideline
- evidence that the guideline is fully complied with by NHSScotland, and has become accepted practice
- emergence of new treatments or preventive measures that render the guideline irrelevant.

13 What is SIGN?

13.1 What do we do?

The Scottish Intercollegiate Guidelines Network (SIGN) was established in 1993 by the Academy of Royal Colleges and their Faculties in Scotland, to develop national evidence-based clinical guidelines for Scotland.[46,47] SIGN is a multidisciplinary body where collaboration between representatives of professional bodies, patients and the public, brings together collective experience ensuring guidelines in different fields are consistently developed to a high standard.

13.2 Organisation of SIGN

Since its establishment SIGN has been a collaborative initiative; a multidisciplinary network of other healthcare professionals, including all the medical specialties, nurses and midwives, pharmacists, dentists, allied health professionals, social workers, lived-experience representatives and public partners.

13.2.1 SIGN Council

SIGN Council is a multidisciplinary body, with input from representatives of health and social care professions, lived-experience representatives and public partners. SIGN Council members ensure that the guidelines SIGN produces reflect the priorities and needs of the NHS and people in Scotland and that the methodology and processes employed reflect best practice. SIGN Council determines the overall direction of SIGN's development, methodology and editorial policy and plays a key role in shaping the SIGN guideline programme. Members of SIGN Council are actively involved in aspects of the guideline development process, including the composition of guideline development groups.

Members of SIGN Council are nominated by their Royal College or professional body or committee. They represent their specialty or discipline in a wider sense and consult with other specialist societies in their field. To ensure due regard for diversity, equality, demography, geography and experience it is agreed with the Faculty of the Academy of Royal Colleges, Scotland that the SIGN Senior Management Team appoints a Council member from one of up to four nominations. Public partners are identified from an open call for interested individuals. The current membership and Terms of Reference for SIGN Council are on the SIGN website.

13.2.2 SIGN Senior Management Team

The SIGN Senior Management Team consists of the SIGN Council Chair and Vice-Chair(s), senior members of the SIGN team, a senior member of the Research and Information Service Team and the Director of Evidence and Digital and provides a strategic monitoring and advisory role for SIGN. Together with the SIGN team, they are responsible for the

implementation of decisions taken by SIGN Council and any subgroups, and for delivering the guideline programme on time and budget.

13.2.3 SIGN team

The SIGN team has been part of NHSScotland since 2005. All staff are employed by Healthcare Improvement Scotland and SIGN forms part of the Evidence and Digital Directorate alongside other teams providing advice and guidance for NHSScotland: the Standards and Indicators team, the Scottish Antimicrobial Prescribing Group (SAPG), the Scottish Health Technologies Group (SHTG), and the Scottish Medicines Consortium (SMC).

The SIGN team consists of professional support staff who support guideline development groups throughout the development process. The SIGN team works closely with teams in the Evidence and Digital Directorate, particularly the Research and Information Service Team. Expert input is also provided by health economists.

13.3 Governance and accountability

The SIGN team is accountable to the Director of Evidence and Digital through Healthcare Improvement Scotland management structures.

Clinical governance and assurance to the HIS board for SIGN's activities is taken through the HIS Quality and Performance Committee, where SIGN is represented by the Director of Evidence and Digital.

SIGN retains editorial independence in relation to the guidelines it produces.

Significant risks or issues are escalated to the HIS Executive Team or Board by the Director of Evidence and Digital.

The Scottish Government Directorate for General Health and Social Care accepts under the Clinical Negligence and Others Indemnity Scheme (CNORIS), the responsibility for prospective and retrospective liability from the date on which SIGN became legally incorporated into NHSScotland.

13.4 Funding

Core funding from Healthcare Improvement Scotland supports the SIGN Chair and Team and expenses associated with individual guideline development projects. Guidelines may be funded through additional external sources.

Members of SIGN guideline development groups are volunteers and do not receive any payment for their participation, although independent practitioners are entitled to claim locum payments and travel expenses. Patient representatives can claim travel, subsistence, childcare or carer expenses and any other reasonable out-of-pocket expenses to enable them to take part in guideline development group meetings. The expenses of other members of SIGN guideline development groups are met by their employing NHS boards, under an agreement with the Scottish Government Directorate for Health and Social Care.

13.5 Influence of financial and other interests

It has been recognised that financial interests in, or close working relationships with, commercial companies, including pharmaceutical, medical devices or technology companies, and intellectual or other interests may have an influence on the interpretation of evidence from clinical studies. SIGN uses the Healthcare Improvement Scotland (Evidence and Digital Directorate) Policy on Declaration of Interests and manages conflicts of interest according to the policy.

SIGN requires that all those involved in the work of guideline development declare all financial and non-financial interests, whether direct or indirect, annually for as long as they are actively working with the organisation.

This includes all the following:

- SIGN Council and subcommittee members and deputies
- SIGN staff
- speakers at SIGN events
- guideline development group members
- peer reviewers.

By being explicit about the influences to which contributors are subjected, SIGN acknowledges the risk of bias and makes it possible for guideline users or reviewers to assess for themselves how likely it is that the conclusions and guideline recommendations are based on a biased interpretation of the evidence.

Signed copies are retained by the SIGN Executive and are available on the SIGN website.

Full details of the declarations of interest policy are available on the SIGN website.

14 Development of the handbook

14.1 Introduction

SIGN published its first methodology handbook, 'Clinical guidelines: criteria for appraisal for national use' in 1995, setting out the draft criteria by which it would appraise clinical guidelines for recommendation for national use in Scotland. 'SIGN Guidelines: An introduction to SIGN methodology for the development of evidence-based clinical guidelines' was published in 1999 to reflect developments in the SIGN methodology. The current manual was first published in 2008 and has undergone minor revisions in 2011, 2014, 2015 and 2019.

Development of this handbook was supported by the SIGN team and Healthcare Improvement Scotland staff members. All people involved in the production of this handbook have declared all relevant interests.

14.2 Consultation

The handbook was reviewed in draft form by members of SIGN Council. All members of SIGN Council make yearly declarations of interest. A register of interests is available on the SIGN Council Membership page of the SIGN website www.sign.ac.uk

14.3 Editorial review

As a final quality control check, the handbook was reviewed by SIGN Senior Management Team

Dr Roberta James	SIGN Programme Lead; Co-Editor
Duncan Service	SIGN Evidence Manager; Co-Editor
Professor Angela Timoney	Chair of SIGN Council
Professor Lesley Colvin	Vice-Chair, SIGN Council
Dr Heather Gray	Lead Health Services Researcher, Evidence and Digital, Healthcare Improvement Scotland
Dr James Morton	Vice-Chair, SIGN Council
Dr Safia Qureshi	Director, Evidence and Digital, Healthcare Improvement Scotland

14.4 Acknowledgements

SIGN is extremely grateful to Robin Harbour, who was instrumental in developing SIGN methodology and revising this methodology handbook in his role as Lead Methodologist with SIGN from 1996 to 2014.

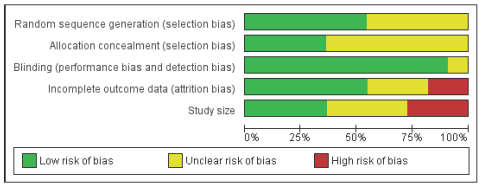
14.5 Review and updating of this handbook

This handbook was issued in 2025. SIGN 50 is a 'living' publication, continually revised to reflect developments in SIGN methodology. For this reason, the definitive version of this handbook is published on the SIGN website. Comments on either the content or presentation of this document are welcome and should be sent to SIGN, email: sign@sign.ac.uk

Annex 1

Evidence table

Key question: 1g Clinical effectiveness of paracetamol for management of acute migraine

Derry, S and Moore, RA Paracetamol (acetaminophen) with or without an antiemetic for acute migraine headaches in adults *(Cochrane Database of Systematic Reviews: 2013 4 CD008040)*			
Study type / evidence level	Study Details / limitations	Patient characteristics	Interventions
Systematic review/meta-analysis **Evidence level: 1++**	*Countries:* not reported *Centres*: mostly specialised migraine clinics or primary care practices *Setting:* not reported *Funding sources*: not reported *Dropout rates:* reported, apart from 1 study. Approx 10-25% *Study limitations*: searched to February 2013 No CoI reported	*Total no. patients:* 2,942 *Patient characteristics:* adults ≥18yrs with migraine (variable population cohorts including some with 'classic' migraine, some ± aura, some with episodic migraine). In good general health (excluding significant comorbidities) *Inclusion criteria:* randomised, double blind, placebo- or active-controlled studies. Crossover studies if ≥24hrs between treatments. Moderate/severe baseline intensity definition of migraine = ihs diagnostic criteria, with any frequency, duration, type. *Exclusion criteria:* studies with <10 participants in each arm, studies not reporting dichotomous data for at least one outcome.	Acetaminophen (paracetamol) with or without an anti-emetic
Notes:		*Author's Conclusions:* Paracetamol 1000 mg alone is statistically superior to placebo in the treatment of acute migraine, but the NNT of 12 for pain-free response at two hours is inferior to that of other commonly used analgesics. Given the low cost and wide availability of paracetamol, it may be a useful first choice drug for acute migraine in those with contraindications to, or who cannot tolerate, non-steroidal anti-inflammatory drugs (NSAIDs) or aspirin. The addition of 10 mg metoclopramide gives short-term efficacy equivalent to oral sumatriptan 100 mg. Adverse events with paracetamol did not differ from placebo; serious and/or severe adverse events were slightly more common with sumatriptan than with paracetamol plus metoclopramide.	
Outcome Measures / Results	*Primary outcomes:* • Pain free at 2hrs, without use of rescue medication • Reduction in headache pain at 2hrs (pain reduced from moderate/severe to none) without use of rescue medication NB - Data for pain-free and headache relief at earlier time points were collected when reported and relevant. *Secondary outcomes:* • Sustained pain-free during 24hrs - pain-free within two hours, with no use of rescue medication or recurrence of moderate to severe pain within 24hrs • Sustained pain reduction over 24hrs - headache relief at two hours, sustained for 24hrs, with no use of rescue medication or second dose of study medication • Adverse events: participants with any adverse event during 24hrs postdose; serious adverse events; adverse events leading to withdrawal	Eleven studies (2,942 participants, 5,109 attacks) compared paracetamol 1000 mg, alone or in combination with an antiemetic, with placebo or other active comparators, mainly sumatriptan 100 mg. Few compared paracetamol, with or without an antiemetic, with either placebo or the same active comparator, when taken either at onset of pain (while pain intensity was usually mild) or once pain intensity was moderate or severe. Consequently, few studies could be combined, and there were few data available for meta-analysis. **1. Pain-free at 2 hours** (primary outcome) Three studies (n=717) showed 1000mg paracetamol was more effective than placebo in achieving pain free response at 2 hours (19% v 10%; relative benefit 1.8, NNT=12) **2. Headache relief at 2 hours** (secondary outcome) Three studies (n=717) showed 1000mg paracetamol was more effective than placebo in achieving headache relief at 2 hours (56% v 36%; relative benefit 1.6, NNT=5) Two studies (n=1140) showed no significant difference between 1000mg paracetamol plus 10mg metoclopramide versus 100mg sumitriptan (39% v 42%; relative benefit 0.93) **3. Headache relief at 1 hour** (additional outcome) Two studies (n=635) showed no significant difference between 1000mg paracetamol and placebo in achieving headache relief at 1 hour (39% v 20%; relative benefit 2.0, NNT=5.2) Adverse event rates were similar between paracetamol and placebo. No serious adverse events occurred with paracetamol alone, but fewer serious and/or severe adverse events occurred with the combination therapy than with sumatriptan (RR 0.50, 95% CI 0.30 to 0.83; NNH 32).	

Annex 2

Considered judgement	
Key question: 1 g Paracetamol for management of acute migraine	
A: Quality of evidence	
1. How reliable are the studies in the body of evidence? *If there is insufficient evidence to answer the key question go to section 9.*	
Comment here on any issues concerning the quantity of evidence available on this topic and its methodological quality. Please include citations and evidence levels.	**Evidence level**
Derry S, Moore RA. Paracetamol (acetaminophen) with or without an antiemetic for acute migraine headaches in adults. Cochrane Review 2013 11 RCTs identified on paracetamol vs placebo, paracetamol plus antiemetic vs placebo or triptan. Not all studies reported on all comparisons or outcomes.	**1++**
2. Are the studies consistent in their conclusions? *Comment here on the degree of consistency demonstrated by the evidence. Where there are conflicting results, indicate how the group formed a judgement as to the overall direction of the evidence.*	
The studies identified used different doses and different comparators, but where a relative effect size was calculated, all were consistent in showing benefit for paracetamol over comparators, except for paracetamol 1000 mg plus metoclopramide 10 mg versus sumatriptan 100 mg where there was no significant difference in headache relief at 2 hours.	
3. Are the studies relevant to our target population? *For example, do the studies:* • *include similar target populations, interventions, comparators or outcomes to the key question under consideration?* • *report on any comorbidities relevant to the target population?* • *use indirect (surrogate) outcomes* • *use indirect rather than direct comparison of outcomes*	
Yes. Includes mix of patients with migraine and patients with migraine with aura with moderate/severe baseline pain intensity. Most studies specified that participants were required to be "in good general health" or excluded those with significant comorbidities. This may mean that the population studied may differ from the general public who choose to self-medicate with over-the-counter paracetamol. Participants were mostly recruited from migraine clinics or primary care, which might lead to under-representation of individuals with milder headaches.	
4. Are there concerns about publication bias? *Comment here on concerns about all studies coming from the same research group, funded by industry etc*	
No	

Annex 2 (continued)

B: Evidence to recommendations
5. Balancing benefits and harms Comment here on the potential clinical impact of the intervention/action – eg magnitude of effect; balance of risk and benefit.
What benefit will the proposed intervention/action have? Describe the benefits. Highlight specific outcomes if appropriate.
Compared with placebo the relative benefit of paracetamol 1000 mg for pain freedom at two hours is 1.8 (95% CI, 1.2 to 2.6), NNT 12 (3 studies, 717 participants). For headache relief at 2 hours, the relative benefit was 1.6 (1.3 to 1.8), NNT 5. There was no difference in benefit for pain free at two hours, or headache relief at two hours with paracetamol 1000 mg compared with the NSAID etodolac. In two studies with 1,140 patients, a combination of paracetamol 1000 mg plus metoclopramide 10 mg had similar efficacy to sumatriptan 100 mg for headache relief at two hours (39% of participants reported relief using para/metoclopramide vs 42% sumatriptan). Only one study reported on pain-free and headache relief at 24 hours in patients using paracetamol 1000 mg vs placebo or rizatriptan 10 mg. This reported 16% of participants who received paracetamol had a sustained pain-free response compared with 8% receiving placebo and 23% receiving rizatriptan. For headache relief response rates were 42% for paracetamol, vs 15% and 53%, respectively. No comparative effect sizes were calculated. Additional analyses show that for relief of migraine-associated symptoms of nausea, photophobia and phonophobia, about 10% to 15% more participants achieved relief within two hours with paracetamol than with placebo, with NNTs of 7 to 11. There was no significant difference between paracetamol 1000 mg plus metoclopramide 10 mg and sumatriptan 100 mg for relief of "light/noise sensitivity" at two hours.
What harm might the proposed intervention/action do? *Describe the benefits. Highlight specific outcomes if appropriate.*
No serious adverse events were reported with paracetamol alone. Any adverse effects reported were mild and transient. The proportion of participants experiencing any adverse events with paracetamol 1000 mg plus metoclopramide 10 mg was 28% compared with 47% in those using sumatriptan 100 mg (RR 0.61, 95% CI 0.53 to 0.71); NNTp 5.5 The proportion of participants experiencing serious adverse events with paracetamol 1000 mg plus metoclopramide 10 mg was 3% compared with 6% in those using sumatriptan 100 mg (RR 0.50, 95% CI 0.30 to 0.83); NNH 32
6. Impact on patients *Is the intervention/action acceptable to patients and carers compared to comparison? Consider benefits vs harms, quality of life, other patient preferences (refer to patient issues search if appropriate).* *Are there any common comorbidities that could have an impact on the efficacy of the intervention?*
Medication is well tolerated, easy to obtain and familiar to patients.
7. Feasibility *Is the intervention/action implementable in the Scottish context? Consider existing SMC advice, cost effectiveness, financial, human and other resource implications.*
Cheap, over-the-counter medication. Could be a good first option for people with acute migraine. NNT of 12 is higher than for some NSAIDS but it is better tolerated.

Annex 2 (continued)

8. Recommendation

What recommendation(s) does the guideline development group agree are appropriate based on this evidence?

'Strong' recommendations should be made where there is confidence that, for the vast majority of people, the intervention/action will do more good than harm (or more harm than good). The recommendation should be clearly directive and include 'should/should not' in the wording.

'Conditional' recommendations, should be made where the intervention/action will do more good than harm, for most patients, but may include caveats eg on the quality or size of the evidence base, or patient preferences. Conditional recommendations should include 'should be considered' in the wording.

Paracetamol should be considered for abortive treatment for patients with acute migraine, particularly those who are unable to take NSAIDs.	**Recommendation strength** Conditional

Briefly justify the strength of the recommendation

For the IHS preferred outcome of pain-free at two hours, paracetamol 1000 mg was better than placebo, with an NNT of 12, when baseline pain was moderate or severe. Around 1 in 5 participants achieved this outcome with paracetamol compared with 1 in 10 with placebo. For headache relief at one hour and two hours, paracetamol was also better than placebo, with NNTs of 5 when baseline pain was moderate or severe. Over half of participants achieved relief at two hours with paracetamol, compared with about 1 in 3 with placebo.

Adverse events were poorly reported, but there was no evidence of an increase in the number of participants experiencing any adverse events with paracetamol 1000 mg compared with placebo, and no serious adverse events were reported with paracetamol alone.

Cochrane review authors note that NNTs of 8 for the outcome pain-free at two hours (13% benefit over comparator), and 6 for headache relief at two hours (17% benefit over comparator), are the working limits of clinical utility in this condition.

Downgraded for insufficient data for analyses (2 studies provided 90% of data for main analysis), small studies, not all outcomes included, four studies did not specify migraine diagnostic criteria, individual studies underpowered to detect differences in adverse effects.

9. Recommendations for research

List any aspects of the question that have not been answered and should therefore be highlighted as an area in need of further research.

- Studies are needed to investigate further whether the addition of an antiemetic, such as metoclopramide, to paracetamol can improve either pain relief or migraine-associated symptoms, and also to investigate potential benefits of different dosing strategies such as treating when pain is still mild or multiple dosing regimens.
- Studies should assess whether efficacy at early time points is sustained.
- Head-to-head studies with active comparators, particularly other over-the-counter medications, would allow direct comparison between treatments. Ideally these studies would include a placebo comparator for internal validity.

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