

# Gout: diagnosis and management

NICE guideline

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The recommendations in this guideline represent the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, professionals and practitioners are expected to take this guideline fully into account, alongside the individual needs, preferences and values of their patients or the people using their service. It is not mandatory to apply the recommendations, and the guideline does not override the responsibility to make decisions appropriate to the circumstances of the individual, in consultation with them and their families and carers or guardian.

All problems (adverse events) related to a medicine or medical device used for treatment or in a procedure should be reported to the Medicines and Healthcare products Regulatory Agency using the [Yellow Card Scheme](#).

Local commissioners and providers of healthcare have a responsibility to enable the guideline to be applied when individual professionals and people using services wish to use it. They should do so in the context of local and national priorities for funding and developing services, and in light of their duties to have due regard to the need to eliminate unlawful discrimination, to advance equality of opportunity and to reduce health inequalities. Nothing in this guideline should be interpreted in a way that would be inconsistent with complying with those duties.

Commissioners and providers have a responsibility to promote an environmentally sustainable health and care system and should [assess and reduce the environmental impact of implementing NICE recommendations](#) wherever possible.

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This guideline replaces TA164 and ESNM23.

## Overview

This guideline covers the diagnosis and management of gout. It includes recommendations on diagnosing gout, managing flares, long-term management of gout and referral to specialist services.

## Who is it for?

- Healthcare professionals providing NHS-commissioned services
- Commissioners of health and social care services
- People with gout, their families and carers, and the public

# Recommendations

People have the right to be involved in discussions and make informed decisions about their care, as described in [NICE's information on making decisions about your care](#).

[Making decisions using NICE guidelines](#) explains how we use words to show the strength (or certainty) of our recommendations, and has information about prescribing medicines (including off-label use), professional guidelines, standards and laws (including on consent and mental capacity), and safeguarding.

## 1.1 Diagnosis and assessment

### Symptoms and signs

- 1.1.1 Suspect gout in people presenting with any of the following:
- rapid onset (often overnight) of severe pain together with redness and swelling, in 1 or both first metatarsophalangeal (MTP) joints
  - tophi.
- 1.1.2 Consider gout in people presenting with rapid onset (often overnight) of severe pain, redness or swelling in joints other than the first MTP joints (for example, midfoot, ankle, knee, hand, wrist, elbow).
- 1.1.3 Assess the possibility of septic arthritis, calcium pyrophosphate crystal deposition and inflammatory arthritis in people presenting with a painful, red, swollen joint.
- 1.1.4 If septic arthritis is suspected, refer immediately according to the local care pathway.
- 1.1.5 Consider chronic gouty arthritis in people presenting with chronic inflammatory joint pain.

- 1.1.6 In people with suspected gout, take a detailed history and carry out a physical examination to assess the symptoms and signs (see [recommendations 1.1.1 and 1.1.2](#)).

For a short explanation of why the committee made these recommendations and how they might affect practice, see the [rationale and impact section on symptoms and signs of gout](#).

Full details of the evidence and the committee's discussion are in [evidence review B: what signs and symptoms indicate gout as a possible diagnosis?](#)

## Diagnosis

- 1.1.7 Measure the serum urate level in people with symptoms and signs of gout (see [recommendations 1.1.1 and 1.1.2](#)) to confirm the clinical diagnosis (serum urate level of 360 micromol/litre [6 mg/dl] or more). If serum urate level is below 360 micromol/litre (6 mg/dl) during a flare and gout is strongly suspected, repeat the serum urate level measurement at least 2 weeks after the flare has settled.
- 1.1.8 Consider joint aspiration and microscopy of synovial fluid if a diagnosis of gout remains uncertain or unconfirmed.
- 1.1.9 If joint aspiration cannot be carried out or the diagnosis of gout remains uncertain, consider imaging the affected joints with X-ray, ultrasound or dual-energy CT.

For a short explanation of why the committee made these recommendations and how they might affect practice, see the [rationale and impact section on diagnosis](#).

Full details of the evidence and the committee's discussion are in [evidence review C: what are the most accurate and cost-effective approaches to diagnosing gout, in particular serum urate level compared with joint aspiration?](#)

## 1.2 Information and support

1.2.1 Provide tailored information to people with gout and their family members or carers (as appropriate) at the time of diagnosis and during subsequent follow-up appointments. Explain:

- the symptoms and signs of gout
- the causes of gout
- that the disease progresses without intervention because high levels of urate in the blood lead to the formation of new urate crystals
- any risk factors for gout they have, including genetics, excess body weight or obesity, medicines they are taking, and comorbidities such as chronic kidney disease (CKD) or hypertension
- how to manage gout flares and the treatment options available
- that gout is a lifelong condition that benefits from long-term urate-lowering therapy (ULT) to eliminate urate crystals and prevent flares, shrink tophi and prevent long-term joint damage
- where to find other sources of information and support such as local support groups, online forums and national charities.

See also the [recommendations on diet and lifestyle](#).

1.2.2 Follow the [recommendations in NICE's guidelines on patient experience in adult NHS services](#) and [shared decision making](#).

For a short explanation of why the committee made these recommendations and how they might affect practice, see the [rationale and impact section on information and support](#).

Full details of the evidence and the committee's discussion are in [evidence review A: patient information](#).



## 1.3 Managing gout flares

### Treatment for gout flares

- 1.3.1 Offer a non-steroidal anti-inflammatory drug (NSAID), colchicine or a short course of an oral corticosteroid for first-line treatment of a gout flare, taking into account the person's comorbidities, co-prescriptions and preferences.

In June 2022, this was an off-label use of oral corticosteroids. See [NICE's information on prescribing medicines](#).

- 1.3.2 Consider adding a proton pump inhibitor for people with gout who are taking an NSAID to treat a gout flare.

- 1.3.3 Consider an intra-articular or intramuscular corticosteroid injection to treat a gout flare if NSAIDs and colchicine are contraindicated, not tolerated or ineffective.

In June 2022, this was an off-label use of corticosteroid injections. See [NICE's information on prescribing medicines](#).

- 1.3.4 Do not offer an interleukin-1 (IL-1) inhibitor to treat a gout flare unless NSAIDs, colchicine and corticosteroids are contraindicated, not tolerated or ineffective. Refer the person to a rheumatology service before prescribing an IL-1 inhibitor.

- 1.3.5 Advise people with gout that applying ice packs to the affected joint (cold therapy) in addition to taking prescribed medicine may help alleviate pain.

For a short explanation of why the committee made these recommendations and how they might affect practice, see the [rationale and impact section on managing gout flares](#).

Full details of the evidence and the committee's discussion are in [evidence review D: pharmacological and non-pharmacological interventions for managing gout flares](#).

## Follow-up after a gout flare

1.3.6 Consider a follow-up appointment after a gout flare has settled to:

- measure the serum urate level
- provide information about gout and how to self-manage and reduce the risk of future flares (see the [section on information and support](#))
- assess lifestyle and comorbidities (including cardiovascular risk factors and CKD)
- review medications and discuss the risks and benefits of long-term ULT.

For guidance on adherence to medicines, see [NICE's guideline on medicines adherence](#). For guidance on investigations for CKD, see [NICE's guideline on chronic kidney disease](#). For guidance on cardiovascular risk factors, see [NICE's guideline on cardiovascular disease](#). For guidance on shared decision making, see [NICE's guideline on shared decision making](#).

For a short explanation of why the committee made this recommendation and how it might affect practice, see the [rationale and impact section on follow-up after a gout flare](#).

Full details of the evidence and the committee's discussion are in [evidence review M: follow-up for people with gout after a gout flare](#).

## 1.4 Diet and lifestyle

- 1.4.1 Explain to people with gout that there is not enough evidence to show that any specific diet prevents flares or lowers serum urate levels. Advise them to follow a healthy, balanced diet.
- 1.4.2 Advise people with gout that excess body weight or obesity, or excessive alcohol consumption, may exacerbate gout flares and symptoms.

For guidance on maintaining a healthy weight see [NICE's guidelines on preventing excess weight gain](#) and [obesity: identification, assessment and management](#).

For a short explanation of why the committee made these recommendations and how they might affect practice, see the [rationale and impact section on diet and lifestyle](#).

Full details of the evidence and the committee's discussion are in [evidence review I: diet and lifestyle modifications for managing gout](#).

## 1.5 Long-term management of gout

### Management of gout with urate-lowering therapies

- 1.5.1 Offer ULT, using a [treat-to-target strategy](#), to people with gout who have:
- multiple or troublesome flares
  - CKD stages 3 to 5 (glomerular filtration rate [GFR] categories G3 to G5)
  - diuretic therapy
  - tophi
  - chronic gouty arthritis.

- 1.5.2 Discuss the option of ULT, using a treat-to-target strategy, with people who have had a first or subsequent gout flare who are not within the groups listed in recommendation 1.5.1 (see recommendation 1.5.4 on when to start ULT).
- 1.5.3 Ensure people understand that ULT is usually continued after the target serum urate level is reached, and is typically a lifelong treatment.
- 1.5.4 Start ULT at least 2 to 4 weeks after a gout flare has settled. If flares are more frequent, ULT can be started during a flare (see the [section on preventing flares when starting or titrating ULT](#)).

For a short explanation of why the committee made these recommendations and how they might affect practice, see the [rationale and impact section on management of gout with urate-lowering therapies](#).

Full details of the evidence and the committee's discussion are in:

- [evidence review E: which people with gout should be offered a urate-lowering therapy?](#)
- [evidence review F: timing of urate-lowering therapy in relation to a flare in people with gout.](#)

## Treat-to-target strategy

- 1.5.5 Start with a low dose of ULT and use monthly serum urate levels to guide dose increases, as tolerated, until the target serum urate level is reached.

For a short explanation of why the committee made this recommendation and how it might affect practice, see the [rationale and impact section on treat-to-target strategy](#).

Full details of the evidence and the committee's discussion are in [evidence review J: treat-to-target management](#).

## Target serum urate level

- 1.5.6 Aim for a target serum urate level below 360 micromol/litre (6 mg/dl).
- 1.5.7 Consider a lower target serum urate level below 300 micromol/litre (5 mg/dl) for people with gout who:
- have tophi or chronic gouty arthritis
  - continue to have ongoing frequent flares despite having a serum urate level below 360 micromol/litre (6 mg/dl).

For a short explanation of why the committee made these recommendations and how they might affect practice, see the [rationale and impact section on target serum urate level](#).

Full details of the evidence and the committee's discussion are in [evidence review K: best serum urate level target to use when treating-to-target in gout?](#).

## Urate-lowering therapies

- 1.5.8 Offer either allopurinol or febuxostat as first-line treatment when starting treat-to-target ULT, taking into account the person's comorbidities and preferences.
- 1.5.9 Offer allopurinol as first-line treatment to people with gout who have major cardiovascular disease (for example, previous myocardial infarction or stroke, or unstable angina).
- 1.5.10 Consider switching to second-line treatment with allopurinol or febuxostat if the target serum urate level is not reached or first-line treatment is not tolerated, taking into account the person's comorbidities and preferences. See [recommendation 1.5.5](#) for guidance on treat-to-target strategy.

For a short explanation of why the committee made these recommendations and how they might affect practice, see the [rationale and impact section on urate-lowering therapies](#).

Full details of the evidence and the committee's discussion are in [evidence review G: urate-lowering therapies for the long-term management of gout](#).

## Preventing gout flares when starting or titrating urate-lowering therapy

- 1.5.11 Discuss with the person the benefits and risks of taking medicines to prevent gout flares when starting or titrating ULT.
- 1.5.12 For people who choose to have treatment to prevent gout flares when starting or titrating ULT, offer colchicine while the target serum urate level is being reached. If colchicine is contraindicated, not tolerated or ineffective, consider a low-dose NSAID or low-dose oral corticosteroid.

In June 2022, this was an off-label use of NSAIDs and oral corticosteroids. See [NICE's information on prescribing medicines](#).

- 1.5.13 Consider adding a proton pump inhibitor for people with gout who are taking an NSAID or a corticosteroid to prevent gout flares when starting or titrating ULT. Take into account the person's individual risk factors for adverse events.

In June 2022, this was an off-label use of NSAIDs and corticosteroids. See [NICE's information on prescribing medicines](#).

- 1.5.14 Do not offer an IL-1 inhibitor when starting or titrating ULT to prevent gout flares unless colchicine, NSAIDs and corticosteroids are contraindicated, not tolerated or ineffective. Refer the person to a rheumatology service before prescribing an IL-1 inhibitor.

For a short explanation of why the committee made these recommendations and how they might affect practice, see the [rationale and impact section on preventing gout flares when starting or titrating ULT](#).

Full details of the evidence and the committee's discussion are in [evidence review H: colchicine, NSAIDs, corticosteroids and IL-1 inhibitors for the prevention of gout flares during the initiation or titration of urate-lowering therapy](#).

## Monitoring serum urate level

- 1.5.15 Consider annual monitoring of serum urate level in people with gout who are continuing ULT after reaching their target serum urate level.

For a short explanation of why the committee made this recommendation and how it might affect practice, see the [rationale and impact section on monitoring serum urate level](#).

Full details of the evidence and the committee's discussion are in [evidence review L: optimum frequency of monitoring](#).

## 1.6 Referral to specialist services

- 1.6.1 Consider referring a person with gout to a rheumatology service if:

- the diagnosis of gout is uncertain
- treatment is contraindicated, not tolerated or ineffective
- they have CKD stages 3b to 5 (GFR categories G3b to G5)
- they have had an organ transplant.

For a short explanation of why the committee made this recommendation and how it might affect practice, see the [rationale and impact section on referral to specialist services](#).

Full details of the evidence and the committee's discussion are in:

- [evidence review N: referral to specialist services](#)
- [evidence review O: surgical excision of tophi](#).



# Recommendations for research

The guideline committee has made the following recommendations for research.

## Key recommendations for research

### 1 Pharmacological management of gout flares

In people with gout (including people with gout and chronic kidney disease [CKD]), what is the clinical and cost effectiveness of colchicine compared with corticosteroids for managing gout flares?

For a short explanation of why the committee made the recommendation for research, see the [rationale section on managing gout flares](#).

Full details of the evidence and the committee's discussion are in [evidence review D: pharmacological and non-pharmacological interventions for managing gout flares](#).

### 2 Preventing gout flares

In people with gout (including people with gout and CKD), what is the clinical and cost effectiveness of non-steroidal anti-inflammatory drugs (NSAIDs) or corticosteroids for preventing gout flares when starting or titrating urate-lowering therapy (ULT)?

For a short explanation of why the committee made the recommendation for research, see the [rationale section on preventing gout flares when starting or titrating ULT](#).

Full details of the evidence and the committee's discussion are in [evidence review H: colchicine, NSAIDs, corticosteroids and IL-1 inhibitors for the prevention of gout flares during the initiation or titration of urate-lowering therapy](#).

### 3 Target serum urate level

What is the best and most cost-effective target serum urate level when using a treat-to-target strategy to treat gout, including in people with CKD?

For a short explanation of why the committee made the recommendation for research, see the [rationale section on target serum urate level](#).

Full details of the evidence and the committee's discussion are in [evidence review K: best serum urate level target to use when treating-to-target in gout?](#).

### 4 Follow-up after a gout flare

What is the clinical and cost effectiveness and patient acceptability of different approaches to follow-up, including provision of patient information and managing gout flares?

For a short explanation of why the committee made the recommendation for research, see the [rationale section on follow-up after a gout flare](#).

Full details of the evidence and the committee's discussion are in [evidence review M: follow-up for people with gout after a gout flare](#).

### 5 Monitoring gout

In people with gout (including people with gout and CKD), what is the most clinically and cost-effective frequency of serum urate level monitoring when target serum urate level is reached?

For a short explanation of why the committee made the recommendation for research, see the [rationale section on monitoring serum urate level](#).

Full details of the evidence and the committee's discussion are in [evidence review L: optimum frequency of monitoring](#).

## Other recommendations for research

### When to start urate-lowering therapy

What is the clinical and cost effectiveness of starting ULT during a flare compared with starting ULT once a flare has settled?

For a short explanation of why the committee made the recommendation for research, see the [rationale section on management of gout with urate-lowering therapies](#).

Full details of the evidence and the committee's discussion are in [evidence review F: timing of urate-lowering therapy in relation to a flare in people with gout](#).

# Rationale and impact

## Symptoms and signs of gout

[Recommendations 1.1.1 to 1.1.6](#)

### Why the committee made the recommendations

Although evidence is limited, the symptoms and signs of gout reported in studies are generally in line with the committee's clinical experience. The committee agreed that if a person has only 1 symptom or sign this is not enough to diagnose gout, but gout should be suspected if they have a combination of symptoms and signs.

The committee agreed that gout should be strongly suspected if a person presents with rapid onset pain together with redness and swelling in 1 or both first metatarsophalangeal (MTP) joints, especially if symptom onset occurs overnight. The presence of tophi suggests longstanding, untreated gout.

Symptoms and signs in other joints (such as the knee, wrist, ankle, midfoot joints, finger interphalangeal joints or elbow) may be caused by gout. The committee noted that the possibility of other diagnoses should also be assessed when people present with red, swollen and painful joints.

### How the recommendations might affect practice

The recommendations may be useful for non-specialist clinicians, but are not expected to lead to significant changes in practice.

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## Diagnosis

[Recommendations 1.1.7 to 1.1.9](#)

## Why the committee made the recommendations

There is no clinical evidence on diagnosing gout by taking a history, doing a physical examination or measuring serum urate level. There is evidence on imaging techniques, including ultrasonography, dual-energy CT (DECT) and plain radiography. The committee based their recommendations on the available evidence for diagnosing gout and their experience of current practice.

In clinical practice, gout is typically diagnosed by a GP taking a detailed history, doing a physical examination and measuring serum urate levels with a blood test. Most people with gout have hyperuricaemia (serum urate level of 360 micromol/litre [6 mg/dl] or more) but many people with hyperuricaemia do not have gout. If the serum urate level is below 360 micromol/litre but gout is strongly suspected, an additional serum urate level measurement should be done at least 2 weeks after the acute flare has settled. This is because serum urate levels can be lower when a person is experiencing a gout flare.

When diagnosis is uncertain, joint aspiration and microscopy of synovial fluid can be used to diagnose gout. This is usually done in secondary care. The committee noted that joint aspiration is the 'gold standard' test to diagnose gout when the diagnosis remains uncertain. If the affected joint is small, it may be difficult or impossible to aspirate the joint. When joint aspiration cannot be done or diagnosis of gout remains uncertain, plain X-ray imaging can be used to detect any long-term damage to the affected joints. The committee noted that ultrasound or DECT may also be used to diagnose gout, although DECT is not widely available in the UK. Evidence on plain X-ray and DECT is limited. There is evidence on ultrasonography for diagnosing gout, but the committee found it difficult to interpret its overall accuracy because so many different signs associated with gout were reported. However, the committee agreed ultrasound is more sensitive than plain X-ray and is commonly used to confirm or refute the diagnosis.

## How the recommendations might affect practice

The recommendations generally reflect current practice and are not likely to result in changes.

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## Information and support

[Recommendations 1.2.1 and 1.2.2](#)

### Why the committee made the recommendations

There was moderate- to high-quality evidence for this topic, which included findings on:

- patient knowledge of the causes of gout and of dietary advice
- long-term impact of gout
- tailored information for women
- online sources of information
- information or education preferences.

The committee agreed that the evidence represents the information that people with gout need. They thought that information provided at the time of diagnosis and at follow-up appointments should be tailored to the needs of the person with gout and the stage of their care pathway. However, there are many incorrect beliefs about the causes and treatment of gout, and people who have gout. The committee therefore included information on symptoms and signs and the risk factors for gout in the recommendations. They also made it clear that people should know that diet and lifestyle changes are not enough, and that long-term urate-lowering therapy (ULT) is usually needed for this lifelong condition.

### How the recommendations might affect practice

The recommendations should improve the information provided by healthcare practitioners to people with gout. They are unlikely to impact on the current services provided because information can be given at the time of diagnosis or at follow-up appointments already scheduled.

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## Managing gout flares

### Recommendations 1.3.1 to 1.3.5

### Why the committee made the recommendations

The evidence shows no difference between non-steroidal anti-inflammatory drugs (NSAIDs), colchicine and corticosteroids for most outcomes, including pain and joint tenderness or swelling. The committee noted that in current practice an NSAID or colchicine would usually be prescribed first before corticosteroids and agreed that there is no strong evidence showing that any 1 treatment is more effective when used before any other. They concluded that the current practice of offering either an NSAID, colchicine or a corticosteroid, based on comorbidities, other medications being taken and the person's preferences, should be continued. The committee noted many people have contraindications to NSAIDs, for example, people with chronic kidney disease (CKD) or cardiovascular disease. There is no evidence on whether a corticosteroid or colchicine is more effective or better tolerated in these groups. The committee therefore decided to make a recommendation for research on pharmacological management of gout flares.

The committee agreed that intra-articular and intramuscular corticosteroids are sometimes used in practice and agreed they should be considered if NSAIDs and colchicine are contraindicated, not tolerated or ineffective. There is no evidence supporting 1 route of administration over the other.

Interleukin-1 (IL-1) inhibitors show a clinical benefit compared with corticosteroids for pain and quality of life outcomes. However, IL-1 inhibitors are very expensive and other medicines are adequate alternatives. The committee concluded that IL-1 inhibitors would not be a cost-effective use of NHS resources for most people with gout flares. If response to treatment has been inadequate, or NSAIDs, colchicine and corticosteroids are contraindicated or not tolerated, the person should be referred to rheumatology services before prescribing an IL-1 inhibitor.

Evidence from 1 small study shows that cold therapy reduces pain. Although the evidence is limited, the committee recommended using ice alongside pharmacological treatments because in their experience this helps ease pain and inflammation.

## How the recommendations might affect practice

The recommendations generally reflect current practice and are not likely to result in changes.

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## Follow-up after a gout flare

[Recommendation 1.3.6](#)

### Why the committee made the recommendation

In current practice, little or no follow-up is offered to people after a gout flare. The committee noted that a follow-up appointment after a gout flare provides an opportunity to review medication and discuss the option of long-term ULT. The healthcare practitioner can also provide information about gout and how to reduce the risk of future flares, and assess any comorbidities and lifestyle factors that may impact how the person self-manages their gout. Based on their clinical experience, the committee agreed that follow-up appointments after a gout flare would allow people to have a better health-related quality of life in the long term. This is because they will likely have fewer subsequent gout flares as a result of starting ULT sooner. People will also be better equipped to manage their gout flares and have more information on how to minimise their risk of recurrent flares. The committee thought that the benefits of follow-up appointments would outweigh the costs and that it is likely to be a cost-effective strategy, but there is not enough evidence to confirm this.

There is no evidence on which follow-up strategies are most effective, including the frequency and duration of follow-up, and which healthcare professionals should lead the follow-up and in what settings. The committee made a [recommendation for research on follow-up after a gout flare](#).

### How the recommendation might affect practice

This recommendation is likely to be a change in practice for many and will affect a large proportion of people with gout. Follow-up appointments after a gout flare provide an opportunity for people to start ULT and reduce gout flares. Therefore, this recommendation is expected to be cost saving or at least cost neutral.



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## Diet and lifestyle

[Recommendations 1.4.1 and 1.4.2](#)

### Why the committee made the recommendations

The committee discussed the diverse dietary interventions for gout, which included dietary advice, cherry extract and vitamin C. They noted that all studies had small numbers of participants and short follow-up periods. The committee agreed it would be difficult to implement dietary interventions in practice and concluded that there is not enough strong evidence to support any specific diet. They also wanted to avoid giving conflicting advice because many people with gout have comorbidities and may have already had dietary advice for these conditions.

The committee acknowledged that people with gout often seek dietary advice because they believe there is a link between diet and gout. They noted that in current practice the healthcare professional and the person with gout often discuss diet and lifestyle. The committee agreed that people with gout should be advised that there is not enough evidence to support any specific diet to manage gout and they should follow a healthy, balanced diet. People should also be advised that excess weight, obesity or excessive alcohol consumption may exacerbate gout flares.

### How the recommendations might affect practice

The recommendations generally reflect current practice and are not likely to result in changes.

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## Management of gout with urate-lowering therapies

[Recommendations 1.5.1 to 1.5.4](#)

## Why the committee made the recommendations

The committee agreed that evidence on which people should be selected for long-term management of gout with ULT is limited because there are only 3 studies of moderate to high quality. The evidence shows that people with chronic renal failure and people using diuretics are more likely to have gout flares, and that people with tophi and swollen or tender joints have more disability through damage to joints.

Gout is characterised by severe pain, therefore pain reduction is an important outcome of treatment. People with gout experience the most pain during flares. Reducing the frequency of flares along with reducing joint swelling, inflammation, and joint tenderness, can reduce pain and improve the person's comfort. The committee reinforced the benefits of ULT for reducing serum urate levels and reducing gout flares in the long term. The committee noted that opportunities to offer ULTs to people with gout early in their disease may be missed, but acknowledged that there was a lack of evidence for this. Therefore, the committee recommended discussing and considering the option of ULT with all people having a first or subsequent gout flare. Once the target serum urate level is reached people with gout will usually remain on ULT. The committee agreed that the importance of long-term treatment should be discussed with the patient. The committee highlighted that ULT use in current practice varies and there is low uptake of ULTs.

The recommendations are likely to result in an increased number of people having ULT. A costing analysis in [evidence review E](#) assessed the costs of current and future practice. This included increased uptake of ULT, a greater proportion of people having ULT with febuxostat, and using a treat-to-target strategy. The analysis showed that future practice is less costly than current practice. The committee acknowledged that a costing analysis is not as robust as a health economic model. They noted additional supporting evidence in [evidence review G](#) showing that treatment with ULTs is cost effective compared with no treatment. They also noted additional supporting evidence in [evidence review J](#) showing that a treat-to-target strategy is cost effective. The committee were confident that treatment with ULTs will be less costly and more effective than no treatment.

The committee agreed that evidence on when to start ULT is very limited because there are only 2 small studies and both included people with a current gout flare. The committee noted that in current practice ULTs are started 2 to 4 weeks after a flare has settled to prevent exacerbating the flare. This is because in previous practice people started treatment with 300 mg allopurinol, which can exacerbate a flare more than starting treatment with 100 mg and up-titrating. The committee suggested that exacerbation of

flares may be less of a concern when starting ULT at a low dose and increasing the dose gradually. The committee discussed that starting ULT at least 2 to 4 weeks after a flare has settled means that people who have very frequent flares may not have a sufficiently long flare-free period in which to start ULT. However, the committee also noted that the person may be in too much pain during a gout flare to understand information about ULTs and the importance of treatment adherence.

Based on their experience, the committee recommended that people with gout who choose ULT should ideally start treatment after a flare, but people who have frequent flares can start during a gout flare. Because the evidence is very limited the committee decided to make a [recommendation for research on when to start ULT](#).

## How the recommendations might affect practice

The recommendations for ULT are likely to result in a change in clinical practice and have a significant resource impact given the prevalence of gout and the current limited uptake of ULTs. A lower incidence of flares resulting from more people starting ULT will likely result in long-term cost savings. The recommendation on when to start ULT generally reflects current practice and is unlikely to result in change.

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## Treat-to-target strategy

[Recommendation 1.5.5](#)

### Why the committee made the recommendation

Two randomised controlled trials evaluated treat-to-target strategies using ULTs. Both studies compared ULT with usual care, which was any available option chosen by the healthcare provider, such as continuing the current dose of allopurinol or febuxostat, or no treatment.

The evidence shows that a treat-to-target strategy increases the frequency of flares at 1 year compared with usual care, but reduces frequency of flares at 2 years. The committee agreed that starting ULT and increasing the dose could set off a flare, so the number of flares might initially increase in the first year but decrease by the second year

when the dose is stabilised. The high use of febuxostat in 1 study was also noted and was thought to not reflect current practice.

Health economic analysis shows that a treat-to-target management strategy is cost effective and therefore the committee recommended it.

Overall, the committee agreed that the evidence supports a treat-to-target strategy based on the benefits shown for quality of life outcomes, frequency of flares in the longer term, and the cost-effectiveness results.

## How the recommendation might affect practice

The number of people with gout who have a treat-to-target strategy varies in current practice. The committee acknowledged that care is sub-optimal and people with gout are more likely to have usual care. The recommendation will likely increase the number of people using a treat-to-target strategy and therefore change practice.

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## Target serum urate level

[Recommendations 1.5.6 and 1.5.7](#)

### Why the committee made the recommendations

There is no evidence on the best target serum urate level when using a treat-to-target strategy.

The committee discussed the clinical benefits and costs associated with target serum urate levels below 300 micromol/litre (5 mg/dl) and 360 micromol/litre (6 mg/dl). They agreed that reaching a serum urate level below 360 micromol/litre is more achievable for people with gout. They also agreed that it is unknown whether a lower target is more beneficial, although clinical improvement may be seen more quickly after achieving a lower target. The committee agreed a target of below 360 micromol/litre reflected current practice within primary care. Achieving a target serum urate level below 360 micromol/litre would also have a lower cost than achieving a target serum urate level below 300 micromol/litre because reaching a lower target is likely to need more appointments

and higher doses.

The committee noted that a target serum urate level of below 300 micromol/litre would be more appropriate for people with more severe gout because they have a higher level of crystal deposition, and response to treatment takes longer. A lower target level will help crystals dissolve more quickly and support clinical improvement. This includes people still having gout flares despite reaching a target serum urate level below 360 micromol/litre or people who have tophi or chronic gouty arthritis.

The committee discussed that gout is frequently undertreated and this may be because of uncertainty about the optimum target serum urate level. They noted the different levels recommended by the British Society for Rheumatology and European League Against Rheumatism. The committee agreed further research in this area is needed and made a recommendation for research on target serum urate level.

## How the recommendations might affect practice

For people having ULT, usual practice is to reach a target serum urate level below 360 micromol/litre, therefore the recommendations are not likely to result in changes.

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## Urate-lowering therapies

[Recommendations 1.5.8 to 1.5.10](#)

### Why the committee made the recommendations

There is evidence on ULTs from 17 randomised controlled trials, including on first- and second-line treatment, CKD status, and allopurinol or febuxostat dosage. The evidence mainly shows that febuxostat and allopurinol reduce serum urate levels to target compared with placebo. For first-line treatment, febuxostat reduces the frequency of flares compared with allopurinol and reduces serum urate levels compared with allopurinol and placebo. The committee noted that important outcomes are frequency of flares and cardiovascular adverse events, however not all trials report these. Allopurinol has fewer adverse events such as withdrawal and gastrointestinal issues compared with placebo.

A costing analysis comparing allopurinol and febuxostat for 1 year of treatment with a treat-to-target strategy shows that there are minimal cost differences between allopurinol and febuxostat. The committee thought the evidence showed little difference between allopurinol and febuxostat as first-line treatments for gout so they recommended both drugs. The committee thought that shared decision making is important when choosing treatment and that people with gout should be made aware of the differences between drugs. Febuxostat is easier to titrate than allopurinol because there are only two available doses and it is only taken once a day. The evidence shows that the target serum urate level is more frequently achieved with febuxostat than allopurinol, however, it also causes more flares and therefore more people would also need treatment to prevent flares. Most of the trials compared febuxostat with sub-optimal doses of allopurinol (up to 300 mg). Allopurinol doses up to 300 mg are often too low to achieve the target serum urate level and many people with gout would need higher doses to manage their condition.

The committee recommended that people with major cardiovascular disease should have allopurinol as first-line treatment because of the [Medicines and Healthcare products Regulatory Agency \(MHRA\) guidance on febuxostat](#) within this population. They noted that this recommendation may change in the future.

There were only 2 studies on second-line treatment. The evidence does not strongly favour 1 treatment, so the committee recommended that both allopurinol and febuxostat could be considered as second-line treatments. This recommendation is dependent on target serum urate level not being reached or when first-line treatment is not tolerated. The committee also noted the importance of taking into account comorbidities and patient preferences when switching to a second-line treatment.

An increase in the number of people taking ULT is likely to lead to an increase in monitoring serum urate levels, using prophylaxis and treating flares. However, a treat-to-target ULT strategy has been shown to be cost effective, so offering people ULT is clinically effective and highly likely to be cost effective compared with offering no treatment.

## How the recommendations might affect practice

The recommendations are a change in practice because currently people have allopurinol as first-line ULT. These recommendations are not expected to result in a substantial resource impact because the cost of allopurinol and febuxostat are similar.

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## Preventing gout flares when starting or titrating ULT

[Recommendations 1.5.11 to 1.5.14](#)

### Why the committee made the recommendations

The committee noted that the evidence is limited as there are only 3 studies and they all compared colchicine with an IL-1 inhibitor, placebo and no treatment. The evidence shows that colchicine reduces the frequency of gout flares when starting ULT compared with placebo and no treatment, but has some gastrointestinal adverse events compared with placebo. The committee discussed that in current practice, colchicine and NSAIDs are most frequently offered to people with gout to prevent flares. There is no evidence supporting the use of NSAIDs, so the committee agreed colchicine should be offered to people with gout during the start and titration of ULT to prevent gout flares. Although there is no evidence on preventing flares during the titration of ULT, the committee agreed that colchicine can also be used to reduce the risk of flares after up-titration of ULT.

The committee noted that colchicine may not be appropriate for some people with gout because of tolerability, comorbidities such as CKD or prescriptions such as statins. The committee agreed that an NSAID or corticosteroid should be considered for people when colchicine is contraindicated, not tolerated or ineffective. Although no evidence was found for either NSAIDs or corticosteroids, the committee agreed an alternative treatment is needed to prevent flares, which can cause severe pain. The committee noted their experience that NSAIDs are well tolerated by people with gout. Because no evidence was found for NSAIDs or corticosteroids the committee also decided to make a [recommendation for research on preventing gout flares](#). Evidence from 1 study shows that canakinumab reduces the frequency of flares, however the committee noted that IL-1 inhibitors are rarely prescribed to people with gout. Use of IL-1 inhibitors requires close monitoring and they are currently only prescribed in secondary care. The committee concluded there was insufficient evidence to recommend IL-1 inhibitors over other routine treatments currently used within clinical practice unless colchicine, NSAIDs and corticosteroids are contraindicated, not tolerated or ineffective.



## How the recommendations might affect practice

The recommendations generally reflect current practice and are not likely to result in changes.

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## Monitoring serum urate level

[Recommendation 1.5.15](#)

### Why the committee made the recommendation

There was no evidence on the optimum frequency of monitoring serum urate level in people having ULT.

The committee agreed that one reason to continue monitoring a person's serum urate level when the target serum urate level has been reached is to prevent it increasing, which can occur with age or because of changes in lifestyle, comorbidities or medications. The committee noted that people may stop treatment if they feel better, but continuing ULT as prescribed is important because serum urate levels can increase quickly once ULT is stopped. The committee discussed that in current practice the frequency of serum urate level monitoring is highly variable. Patients usually make appointments with their GP in response to gout flares and a health professional would measure their serum urate level in that appointment. However, the committee agreed this was not sufficient as the goal of monitoring is to prevent gout flares rather than manage them. Patient support and monitoring is usually based on individual factors after discussion with the patient.

The committee highlighted the importance of monitoring and noted that without monitoring, people may have poor medication adherence which increases serum urate levels. This can lead to poorer long-term outcomes for people and impact their health-related quality of life, and may also be associated with additional costs to the NHS.

There was no available evidence to estimate how many flares would be avoided with annual monitoring. The committee noted that there may be better medication adherence with annual monitoring and that more people might remain at their target serum urate level.



Overall, the committee agreed that annual monitoring is likely to be a cost-effective strategy and therefore they made a recommendation to consider it. The committee also made a [recommendation for research on monitoring gout](#).

## How the recommendation might affect practice

In people with gout who are having ULT, annual monitoring once target serum urate levels are reached may result in a change in clinical practice.

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## Referral to specialist services

[Recommendation 1.6.1](#)

### Why the committee made the recommendation

#### Referral to specialist gout services

No relevant evidence on referral to specialist gout services was identified. The committee were not aware of any published referral criteria for gout. They acknowledged that referral to a specialist was likely based on the complexity of care needed by the patient, and the gout knowledge and skillset of the GP caring for them. The committee noted that the diagnosis and treatment of people with gout is mainly managed within primary care.

The committee discussed when referral to a rheumatologist would be considered and made recommendations based on their experience. This included:

- when diagnosis is uncertain and joint aspiration or imaging is needed, because this would usually be done in secondary care
- if the person cannot tolerate medication, or has any allergic reaction or difficulty taking allopurinol or febuxostat
- when response to treatment has been inadequate, including difficulty in controlling gout symptoms with ULT.

The committee acknowledged that a specialist would prefer to examine people with gout

who have comorbidities and complex needs and have a face-to-face consultation instead of relying on their history and test results. Treating gout in people with CKD can be challenging, particularly in people with severe CKD (stages 4 to 5 or glomerular filtration rate [GFR] categories G4 to G5). However, the committee also recognised that stage 3 (GFR category G3) CKD comprises a wide clinical spectrum and that some people with stage 3 (GFR category G3) CKD and gout may also need referral, often because of difficulties in treating gout in this population. The committee discussed that including people with stage 3 (GFR category G3) CKD within the recommendation could increase the numbers of people being referred, because this represents a large population. They agreed that people with CKD stage 3b (GFR category G3b) are more likely to need specialist input to achieve optimal management of their gout.

People with gout who have had an organ transplant will usually be referred to a specialist because treatments for transplant rejection may exacerbate hyperuricaemia and may interact with treatments for gout and renal dysfunction.

### **Referral for surgical removal of tophi (no recommendation)**

There is no relevant evidence on surgical removal of tophi. The committee discussed that tophi develop very slowly over years and typically occur in the toes, fingers, elbows or attachment of the Achilles tendon to the heel bone. The committee agreed that surgical removal of tophi is an uncommon procedure, and surgery is only offered to people whose gout is impacting their quality of life because of pain or restriction in movement.

The committee discussed that tophi are seen in people with uncontrolled gout and persistent high urate levels, and they tend to develop in older people. They agreed that with targeted treatment to reduce serum urate levels, tophi will dissolve or reduce over time, and in their experience referral to orthopaedic surgery would rarely be needed.

The committee agreed not to make a recommendation because any decision to refer for consideration for surgery would be made on an individual basis.

Doing research in this area would be difficult because of the limited number of people that have tophi removed. The committee concluded that research is not feasible and is also low priority given the few people who have this surgical procedure.

## **How the recommendation might affect practice**

Referral to rheumatology services is variable within current practice. The recommendation may lead to an increase in referrals to specialist services.

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## Context

Gout is a type of arthritis caused by monosodium urate crystals forming inside and around joints, resulting in sudden flares of severe pain, heat and swelling. Any joint can be affected but gout is most common in distal joints, such as big toes, knees and ankles, and fingers.

Between 2 and 3 in every 100 people in the UK have gout. It usually occurs in men over 30 and women after menopause, and is more common in men than women. Long-term complications of gout include joint damage and renal stones. Almost 25% of people with gout have chronic kidney disease (CKD) stages 3 to 5 (glomerular filtration rate [GFR] categories G3 to G5).

Gout is most often managed in primary care without specialist rheumatological input. Flares are usually treated with non-steroidal anti-inflammatory drugs, colchicine or corticosteroids. However, most people have further flares. They can be prevented by taking medicines to reduce serum urate levels (such as allopurinol or febuxostat).

However, only one-third of people with gout have these medicines and they are used effectively (lowering serum urate level to the target) by only one-third of people who take them. People with CKD also often have contraindications to medicines used to manage gout.

Diagnosing gout and differentiating gout from other types of arthritis is not always straightforward and the best method of diagnosis is often unclear. There is a need to improve the diagnosis and management of gout and the quality of life for people with gout.

## Finding more information and committee details

To find NICE guidance on related topics, including guidance in development, see the [NICE topic page on arthritis](#).

For full details of the evidence and the guideline committee's discussions, see the [evidence reviews](#). You can also find information about [how the guideline was developed](#), including [details of the committee](#).

NICE has produced [tools and resources to help you put this guideline into practice](#). For general help and advice on putting our guidelines into practice, see [resources to help you put NICE guidance into practice](#).

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## Accreditation

