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Patient experience of gout flare resolution

A return to normality: A descriptive qualitative interview study exploring the patient experience of gout flare resolution

Running head: Patient experience of gout flare resolution

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ABSTRACT

Objectives

While the definition of a gout flare is well established, the state of gout flare resolution has not yet been defined. This study aimed to explore patients' experiences and perceptions of gout flare resolution.

Methods

Semi-structured interviews were conducted with 24 people with gout, guided by open-ended questions exploring their experiences of gout flare resolution. To facilitate discussion, participants were shown graphs depicting changes in pain intensity during a hypothetical flare. Prompts relating to key flare features, including pain, swelling, warmth, and medication use, were used as appropriate. Data were analysed using a descriptive approach to thematic analysis to prioritise participants' voices and experiences.

Results

Four themes, closely tied to an overarching concept of a return to normality, were generated: (1) return to personal baseline pain – where most participants required a pain score of 0/10, while the remaining considered resolution to occur at low-to-moderate pain levels; (2) return of function; (3) restoration of emotional wellbeing; and (4) disappearance of joint swelling, warmth and redness.

Conclusions

Flare resolution is experienced as a return to normality, encompassing relief from pain, return of mobility, restored wellbeing and the disappearance of other inflammatory features, such as swelling, warmth and redness. Incorporating these insights into the development of a patient-

centred definition for flare resolution may support more meaningful, patient-centred approaches to measuring and managing gout flares.

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SIGNIFICANCE AND INNOVATIONS

- It is unclear how the state of gout flare resolution should be defined in clinical research.
- People with gout experience flare resolution as a return to normality, which includes relief from pain, return of mobility, restored emotional wellbeing and the disappearance of other inflammatory features.
- Incorporating these domains into a resolution definition, weighted against each person's baseline status, may provide a more holistic and patient-centred assessment of flare resolution.

Gout is commonly experienced as intermittent episodes of severe joint pain and inflammation, known as gout flares, which typically last between one and two weeks ¹. These flares are interspersed with inter-critical periods during which symptoms are minimal or absent ².

Gout flares are a hallmark of the disease and a central concern for people with gout due to their associated pain, functional impairment, and disruption to daily life ³⁻⁶. Although a validated definition of gout flare has been established ^{7,8}, uncertainties remain regarding the most appropriate way to measure and report flares in clinical research. These uncertainties are reflected in the wide variation in methods used to capture flare frequency and characteristics in clinical trials ^{9,10}.

Contributing to these uncertainties is the major knowledge gap in how the state of gout flare resolution should be defined. Clarifying this state is important not only for short-term studies evaluating treatments for flares, but also for long-term studies in which flare frequency and duration are key outcomes. Understanding how patients experience and perceive the state of gout flare resolution may help inform more meaningful and patient-centred definitions for use in both clinical practice and research. This study aimed to explore the patient experience of gout flare resolution.

PATIENTS AND METHODS

Study design

A qualitative design was employed to explore participants' experiences and perspectives of gout flare resolution. A descriptive approach was taken to prioritise participants voices and lived experiences in a low-inference manner ¹¹. This provided a detailed account of their experiences of flare resolution without extensive theoretical interpretation. Our study used

reflexive thematic analysis within a contextualist, experiential stance, treating participants' accounts as representations of their lived experiences, while recognising that knowledge is co-constructed by participants and researchers^{12,13}. Reporting of this study follows the consolidated criteria for reporting qualitative research (COREQ) checklist¹⁴ (Supplementary File 1).

Participants

Participants were recruited using purposive sampling to ensure a range of experiences across demographics, disease duration, and flare severity. Recruitment was conducted through databases of people with gout who had participated in previous research at the Clinical Research Centre, University of Auckland, New Zealand and had consented to being contacted for future studies. Potential participants were invited via email or phone. People were eligible to participate if they met the ACR/EULAR 2015 gout classification criteria¹⁵, were aged over 18 years and were English speaking. Potential participants were excluded if they had cognitive impairment that would preclude understanding of the interview questions or experienced other forms of inflammatory arthritis. Number of prior gout flares was not used as a sampling criterion to ensure a broad range of disease experiences. An a-priori sample size of 25 participants was set, based on the anticipated information power provided by the focused research aim, specificity of the recruited participants, richness of the data generated through the interviews, and the use of a rigorous analysis method¹⁶. All participants provided written informed consent. Ethical approval was obtained from the Auckland Health Research Ethics Committee on 19th April 2024 (AH27449).

Data collection

Data were collected through semi-structured interviews between May and November 2024. All interviews were conducted by AH (female, New Zealand European doctor with >25 years' research experience). Some participants had prior contact with the interviewer as a doctor in a gout clinical trial. To minimise potential power imbalances, she emphasised her role as a researcher, used open prompts, and invited correction/clarification during the interviews. All interviews were conducted in-person at the Clinical Research Centre, Auckland, New Zealand. An interview guide was used to explore participants' experiences of gout flare resolution (**Supplementary File 2**). The state of resolution was framed to participants as the point "when a gout flare/attack finishes". While the primary focus was on participants' perceptions of the state of resolution, discussing the process leading to resolution was also invited to capture the context and factors influencing how participants defined the point at which a flare has ended. Questions were identified from a content analysis of methods used to report gout flare outcomes in randomized clinical trials⁹ and from previously reported data collected from daily flare diaries⁴, as well as based on the research team's clinical expertise. Questions around items within the Gaffo gout flare definition⁷ were included: pain score at rest and during activity, joint swelling, joint warmth, as well as flare or pain medications. Prompts were provided by the interviewer to encourage conversation as needed. Throughout the interviews the interviewer recognised how her position may have influenced the question framing and probing. During the interviews, a hypothetical gout flare scenario was also presented to participants in the form of two graphs, showing time (0-14 days) on the *x*-axis and pain intensity (0-10) on the *y*-axis (**Figure 1**). One graph represented pain during activity, and the second, pain at rest. These graphs were derived from the indomethacin arm of a published clinical trial comparing prednisolone and indomethacin for treatment of gout flares¹⁷. The purpose of this scenario was to encourage discussion around the point at which participants felt the hypothetical flare had resolved.

Given the focused aim, interview guide, scenario graphs, and information-rich sample, adequate thematic coverage was anticipated with a modest interview length and sample size. All interviews were conducted in a private room with only the participant and interviewer present. Interviews were digitally audio-recorded and transcribed verbatim into Microsoft Word by AH. All participants were given the opportunity to review and approve their transcripts as a form of member checking to enhance accuracy and credibility. At the study visit, participant demographic characteristics were also obtained, including age, sex, ethnicity (via open-ended self-report), height and weight. Gout disease characteristics were also recorded, including disease duration, flare history, serum urate, subcutaneous tophi, and medication use. All gout disease characteristics were self-reported, apart from serum urate (obtained through medical records). Gout flare history was assessed by asking “How many gout attacks have you had in the past six months?”, therefore reflecting participants’ own flare definitions.

Data analysis

This analysis used reflexive thematic analysis (RTA) guided by the steps outlined by Braun and Clarke¹² with an emphasis on participants’ lived experience rather than latent interpretation. In RTA, themes are actively constructed by the research team through reflexive engagement with the data, and are articulated around a central organising concept that integrates multiple codes. Throughout all phases of the analysis, the researchers maintained a reflexive journal to document assumptions, reflections and ideas or patterns that were noticed in the data. This audit trail contributed to ensuring trustworthiness and rigour of the analytic process¹⁸. Two researchers were involved in the initial inductive coding of the transcripts (SS, AH). Following a process of familiarisation, in which the interview transcripts were read multiple times to gain an overall understanding of the data, coding was completed using the comment function in Microsoft Word. Coding decisions were discussed and agreed between

the two researchers. A final set of 515 codes was then transferred to miro.com (an online collaborative platform). Following coding, iterative theme development was undertaken by grouping codes into broader categories to identify recurring patterns. The themes were reviewed with the wider research team for coherence and relevance to the study aim. The final themes were defined and named to reflect participants' perspectives. A conscious effort was made to ensure the analysis remained close to the data through the use of a descriptive approach, aiming to represent participants views in their own words ¹¹.

RESULTS

Participants

Invitations were sent to 27 people with gout, of which three declined. Twenty-four participants were interviewed. Interviews lasted between 8 and 23 minutes. Participants were between 30 and 77 years old and most were male (79%). There was also diversity across ethnicity, body mass index and clinical features of gout (**Table 1**).

Themes

Four themes were generated, closely tied to an overarching concept of **a return to normality**: (1) return to personal baseline pain; (2) return of function; (3) restoration of emotional wellbeing; and (4) disappearance of swelling, warmth and redness.

1. Return to personal baseline pain

Pain was the most prominent symptom shaping participants' perceptions of gout flare resolution. Participants were highly attuned to the sensation of pain which became central to their self-assessment and understanding of resolution.

"And I'll listen to see in that part of the body if it is still painful or ... because that is the barometer. That is my understanding of when I have got gout – is pain". (P004)

For most participants, gout flare resolution equated to a complete absence of pain (i.e., a pain score of 0/10).

"I always go down to feeling no more pain. That's what I experience". (P007)

However, resolution was not universally dependent on the complete absence of pain. Most participants (n=16, 67%) felt the hypothetical flare scenario graphs did not represent resolution, stating that pain needed to reach 0/10. The remaining participants considered the hypothetical flare resolved at non-zero pain levels. Their perceptions of acceptable pain levels ranged from mild discomfort (1-2/10) to low-moderate pain (3-5/10). These views were influenced by several contextual and subjective factors. For example, participants who lived with persistent background pain, had experienced severe flares, were not taking urate lowering therapy, or had tophi, often viewed low-level pain as normal post-resolution. For these participants, reaching a pain score of 0/10 was unrealistic, and resolution was instead defined by a return to their personal baseline.

"It would go down to 1 or 2. It was... you always knew there's a background level of-, its pain mainly in the big toe ... it's always there and that is the same for me, it's constant most of the time". (P014)

People with gout who felt they had a high pain tolerance from having gout for a long period of time, also felt their pain levels did not need to reach 0/10 to necessitate resolution. For these participants, flares were perceived to resolve sooner.

"I've learnt to live with that over the longer period so you build up a tolerance and so my pain tolerance is generally a little bit higher because I just get used to it. I know I can live with a little bit of... even if I am limping a little bit I can live with that". (P005)

The experience of pain in the context of flare resolution was also influenced by other activities and life commitments participants were engaged with. For some, activity was a distraction to pain, and it was not until participants rested that they realised their flare had not resolved. For these participants, the absence or reduction of rest pain was a more important indicator of flare resolution.

"Like you think there's no pain cause you feel OK all day then you go to bed at night and then you feel it's still twingy, it's still sore". (P016)

For others, the absence or reduction of pain during activity was a better indicator of resolution, particularly when rest pain was expected (e. g., athletes who experienced post-exercise rest pain), or if activity exacerbated pain that was absent during rest.

"I was using my feet for being an athlete and activity is more important for me... if that makes sense. I need to use them. I need that pain to be 0 during activity for it to be over... At rest, if I can do what I have to do, do activity, the rest, it's part of, for us as an athlete, rest is of course going to be in pain after a hard session, so I'm having different definition of pain". (P001)

"At rest, it's generally, if it's immobile, it's fine. It's there in terms of the ache in the joint, but it's not...there's no pain, but as soon as you try and do something you know, it becomes problematic. The pain level goes up, yeah". (P012)

The fluctuating pain levels between rest and activity often made it challenging to pinpoint the exact point of resolution. However, while the trajectory was not always linear, many described a recognisable process to resolution, which begun once the peak pain had passed.

"I mean what I also experienced is that the decline wasn't sudden, it just didn't suddenly stop. It was a gradual reduction". (P013)

Pain management strategies were also closely tied with the link between pain and resolution. Some participants adjusted their pain-relief medications once the peak pain of a flare was over and the process to resolution had begun. This was either by switching from stronger medications (e.g., prednisone, diclofenac) to milder options (e.g., paracetamol, ibuprofen), or by tapering their existing doses.

"I will stop taking prednisone as soon as the inflammation is gone and I'm not walking with a limp, then I sort of feel like I don't need to take prednisone. I'll just start on the paracetamol." (P010)

"Like when the flares was too much I take three prednisone and two voltaren. Until it going down then I take one, one." (P007)

For nine (38%) participants, a flare was considered resolved when they could stop taking pain-relief altogether, viewing cessation of medication as a marker that the flare had resolved.

“I think I was doing this until I can think that it's done, it's gone, the pain is gone and the inflammation is gone so I was taking the diclofenac until I'm having certainty that those things had settled down.” (P001)

2. Return of function

Gout flare resolution was experienced by participants as a return of function; the ability to do usual daily routines and other activities that existed prior to their gout flare.

“You just get better and then back to ... back into life” (P021)

Similar to pain reduction, the return of function was a gradual process which began once the peak pain of the flare had passed and the process to flare resolution had begun.

*“And then it would just get to a point where I could... like it wasn't as sore to walk on. Yeah. And then eventually I could just, like, walk normally”
(P019)*

Once symptoms became more manageable, some participants were able to resume everyday tasks despite discomfort or limping. For others, this increased mobility was enough to define the state of flare resolution and was more important than return to baseline pain.

“When I'm on my feet, after a flare up I still have that little limp. You know, I'm still getting around doing things, even just driving” (P010)

Return of function was also dependent on routines and activities which were meaningful to each individual. These included the ability to return to work, sleep comfortably, wear shoes, and the ability to walk "normally", better, faster, and for longer periods without the use of assistive devices or help from others.

"When I know that it's, it's gone, you know, and then obviously everything's back to normal with my feet. I'm able to walk properly. I can even put a shoe on without any irritation type thing you know". (P010)

"It's for me, it's just, it's quite obvious that when I climb off the bed, I don't need to hold on to anything first thing in the morning and I can just... getting up without holding anything from the bed". (P007)

The ability to resume usual activities was also dependent on the return of normal joint function, including flexibility and a sense that the joint had "healed".

"I can move the joint and I can do an exercise, like twisting my knee and twisting my ankle like what I usually do." (P008)

3. Restoration of emotional wellbeing

Gout flare resolution was accompanied by improved emotional wellbeing, including feelings of relief and rejuvenation.

"After three days, I'm feeling way better and it also makes you feel way better emotionally as well. You feel way better in yourself." (P012)

"It's almost like I'm rejuvenated too. Everything's good sort of thing. Yeah. Other than the stiffness, it's like great. Energy back again". (P022)

When a flare had resolved, participants reported no longer worrying about their gout. They were no longer hesitant about exercising and were able to return to work, and other day-to-day activities without gout being on the back of their mind.

"Yeah, it affects me in the sense that OK I can get back to work now because I'm not thinking about it, I don't have to think about it. I've

allowed it to have its..., it's had its moment. Quiet time, it's rested. Okay it's not gonna bother me in terms of, my minds not going to be focussed on that. I can focus on my work". (P004)

4. Disappearance of swelling, warmth and redness

The disappearance of other cardinal signs of inflammation, including swelling, and less frequently, warmth and redness, accompanied the state of flare resolution for some. However, the importance of these signs in defining flare resolution was less prominent and variable across participants.

Swelling was a key indicator for some, especially when it aligned with the return of function or the ability to wear shoes again, while others found it less noticeable when compared to other flare symptoms.

"Usually it would be the swelling would be down by the time I would class [consider] it would be over. So they'll be, by touching it, touching the area, and no swelling is when I would class [consider] it's over". (P002)

"Because I notice when it's sore and I have a look and go, oh yeah, it's swollen. But I haven't really noticed when... it stopped". (P006)

For those with chronic gouty arthritis or tophi, the reduction in swelling during the process to resolution could look different to those without these clinical features.

"Yeah, that's a couple or three days for the swelling to go down... Yeah, well, whatever normal looks like on this hand, yeah". (P022)

Warmth was less frequently discussed in relation to flare resolution, although some noted it resolved early and subtly. For one participant, the absence or reduction in heat marked the resolution of their flares.

"When the heat had gone, like when there was less heat. Cause I remember it was just so hot, I think I'd say that was when the flare was over". (P017)

The absence of redness was also secondary to other flare symptoms but still noted as part of the state of resolution.

"The redness? ...not that I was monitoring it or anything you know? It was just a pain I was monitoring more". (P023)

Other physical changes accompanying the disappearance of the inflammatory symptoms, such as skin wrinkling and exfoliation, were also interpreted as signs of resolution.

"The other sign that I've picked up too is that with me is my skin gets very dry in that area where it flamed up... to the point, sometimes the skin will peel. It will just literally peel like a sunburn almost". (P010)

DISCUSSION

The findings from this study indicate that gout flare resolution is characterised by a return to normality, representing a return to each individual's personal baseline. While pain reduction was central, resolution also involved resuming daily activities, emotional relief, and the disappearance of swelling, warmth and redness. This study also provided insights into the process of flare resolution from maximal joint inflammation to full resolution.

These findings challenge the assumption that the state of flare resolution can be universally defined by complete absence of pain. While 0/10 pain is often considered to mark resolution,

one third of the participants experienced resolution when mild to moderate pain remained, suggesting “zero pain” may be unrealistic for some. This aligns with evidence that ongoing pain after flare resolution is common, especially among those with severe or frequent flares, tophi, or comorbidities ¹⁹. For these individuals, return to baseline pain may be more appropriate in defining flare resolution.

Underlying structural joint damage and/or ongoing low-grade inflammation in the presence of monosodium urate crystals may also contribute to persistent pain ²⁰. Those with tophaceous gout also describe a higher disease burden and ongoing joint pain, even during intercritical periods ²¹. In those whose pain levels fluctuated between rest and activity, or pain did not return to zero, pinpointing the exact moment of resolution was also difficult. This variability further emphasises the reported challenge of defining clear flare onset and resolution timepoints ^{4,22}, which may compromise the accuracy of assessing flare frequency and duration in clinical trials.

The crucial distinction for some participants was between functionality and pain. Many experienced resolution when they could undertake meaningful daily activities despite tolerating minor limitations or low-level pain. People with gout can experience ongoing physical impairments even outside of flares, including altered gait mechanics, reduced muscle strength, and joint motion deficits ²³⁻²⁵. Although measures of impairment and disability improve following the resolution of gout flares, they do not completely normalise ²⁶. These findings suggest that even when a flare has resolved, some people may not return to a functionally normal state, but rather their physical baseline.

Symptoms affecting mobility and comfort, such as pain and swelling, were more central to participants' definitions of flare resolution than other signs like redness and warmth. This aligns with previous research showing pain intensity as the dominant flare characteristic ^{3,6}.

This suggests that the sensory subtlety of warmth and redness, or their function as purely visible or thermal signs rather than immediate barriers to movement, may lead to their lower prominence in the assessment of flare resolution.

In our study, flare resolution also encompassed restoration of emotional wellbeing. Emotional responses such as withdrawal, irritability, and anxiety are well-documented during flares⁵ and are closely tied to pain and the inability to engage in daily activities. As the flare subsides, these emotional effects typically diminish, reflecting the link between physical and psychological recovery.

Resolution is clearly not a fixed numerical threshold, but a subjective, context-dependent experience defined by returning to a personal, functioning baseline. Although resolution could be defined as falling below the Gaffo-defined flare threshold (e.g., fewer than 3 of the 4 criteria) for a specified period of time, coupled by a patient-report of the flare being over, our data also show that return of function and restoration of emotional wellbeing are central to the patients sense of ‘normal’ and may therefore provide a more holistic and patient-centred definition. Although outcome measures exist to assess these domains²⁷, their application to determining flare resolution warrants exploration. One way to operationalise this in clinical trials, could be through a dual resolution criterion in which resolution is defined either by reaching absolute symptom-free thresholds (e.g., no pain, no other inflammatory symptoms, and no functional or emotional limitations) or by returning to the participant’s intercritical baseline across these domains. Baseline values could be estimated using the mean/median of daily ratings collected during a predefined flare-free run-in period. Given that just over one third of participants described stopping flare-specific medication as a key marker that the flare had resolved, trials evaluating therapies intending to accelerate flare resolution, may consider the additional recording of anti-inflammatory medication cessation as a further indicator of flare resolution. However, as this was not universally endorsed by all

participants, it should be considered secondary to symptom improvement rather than as an independent indicator.

This study included a representative sample of Māori and Pacific participants, reflecting the disproportionate burden of gout experienced by these ethnic groups in New Zealand²⁸⁻³⁰, and strengthening the transferability and relevance of the findings to those most affected in this setting. The overarching “return to normality” concept was evident across participants regardless of ethnicity. However, given the disease severity in Māori and Pacific Peoples, return to personal baseline may be particularly meaningful. While this study was not designed to explore cultural interpretations, culturally specific understandings of health, pain, and recovery may influence how resolution is experienced and judged. Kaupapa Māori and Pacific methodologies could further explore how cultural values shape experiences of flare resolution.

A key strength of this study is the diversity of the participant sample, including six with tophaceous disease, and four who were nearing resolution of a current flare. However, participants had volunteered for prior gout research, which may limit generalisability to people outside research settings. Almost all participants were taking urate lowering medication at the time of the interview, so results may not reflect the experiences of those not on urate lowering therapy. However, the stories and symptoms they recounted included those related to earlier flare experiences that occurred before initiating therapy. While the ethnic composition of participants in this study strengthens relevance to populations most affected by gout in New Zealand, transferability to other international populations with high prevalence of severe gout may be limited due to different structural, healthcare, and sociocultural contexts that may shape the experience of flare resolution. Although the hypothetical gout flare graphs did not reach zero pain and were therefore less relatable for

some participants, they reflected published flare progression patterns¹⁷ and effectively prompted discussion on what constitutes an acceptable pain threshold.

In conclusion, the integration of these patient-centred insights into the development of definitions for gout flare resolution has the potential to enhance both clinical practice and research. A definition that accounts for pain, function, and emotional wellbeing, together with other inflammatory signs, weighted against each persons' baseline status, may support more meaningful, individualised assessment of gout flare resolution.

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TABLES

Table 1. Participant demographic and clinical characteristics (n = 24)

Age, years	Mean (SD)	51.1 (11.6)
	Range	30 – 77
Sex, n (%)	Female	5 (21%)
	Male	19 (79%)
Ethnicity ^a , n (%)	Asian	1 (4%)
	European	8 (33%)
	Māori	5 (21%)
	Pacific Peoples	11 (46%)
Body mass index, kg/m ² , mean (SD)		35.6 (7.1)
Gout disease duration, years	Mean (SD)	17.2 (11.4)
	Range	1 – 40
Number of flares in previous six months	Mean (SD)	6.8 (6.1)
	Range	0 – 24
Current gout flare ^b , n (%)		4 (17%)
Subcutaneous tophi, n (%)		6 (25%)
Serum urate, mean (SD)	mmol/L	0.38 (0.10)
	mg/dL	6.39 (1.68)
Urate lowering therapy, n (%)		23 (96%)
Usual gout flare medications, n (%)	Prednisone	13 (54%)
	Colchicine	19 (79%)
	NSAIDs	12 (50%)
	Other analgesic	2 (8%)

NSAIDs = non-steroidal anti-inflammatory drugs. ^aEthnicity was self-defined using the Statistics NZ standard classification (Level-1 groups) where “Asian” included Chinese, Indian, Southeast Asian, and Other Asian, and “Pacific Peoples” included Samoan, Cook Islands Māori, Tongan, Niuean, Tokelauan, Fijian, and Other Pacific Peoples. Participants who reported multiple ethnicities are counted in each relevant group. ^bThese participants were nearing resolution of a current gout flare episode.

FIGURE LEGENDS

Figure 1. Hypothetical flare scenario representing pain during activity (A) and pain during rest (B). Adapted with permission from Annals of Internal Medicine, Rainer et al., 2016¹⁷; permission conveyed through Copyright Clearance Centre, Inc

Figure 1:

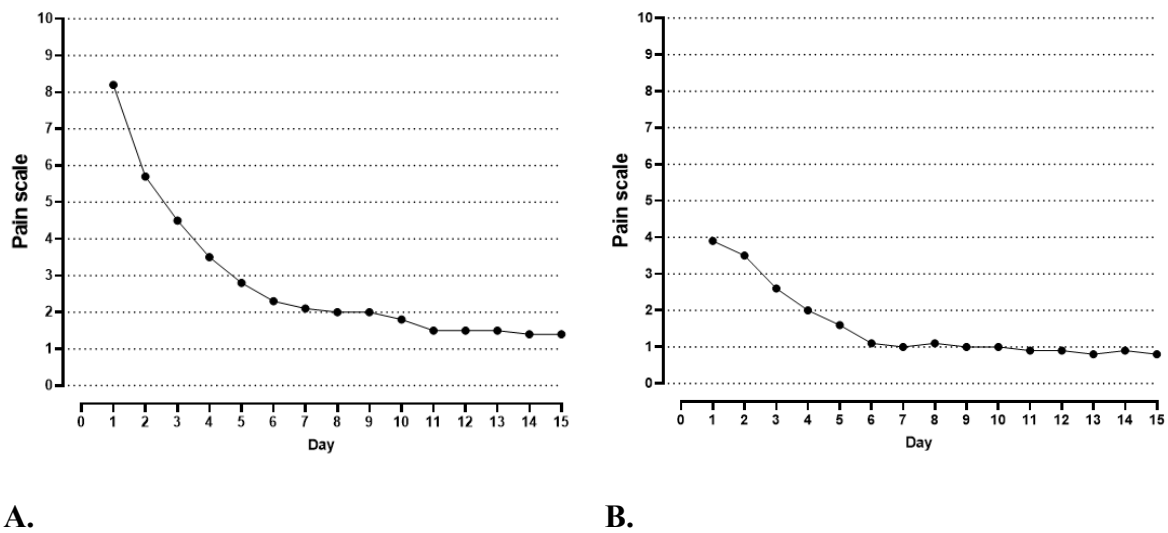


Figure 1. Hypothetical flare scenario representing pain during activity (A) and pain during rest (B). Adapted with permission from Annals of Internal Medicine, Rainer et al., 2016¹⁷; permission conveyed through Copyright Clearance Centre, Inc.

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