# A Glossary of Signs and Symptoms of Giant Cell Arteritis

**Authors**

Medha L. Soowamber[1], Milena Bond[2], Zahi Touma[3], Carol Langford[4], Catalina Sanchez-Alvarez[5], Andy Abril[6], Sibel Zehra Aydin[7], Frank Buttgereit[8], Dario Camellino[9], Maria C Cid[10], Peter C Grayson[11], Bernhard Hellmich[12], William Lichliter[13], Tanaz A Kermani[14], Nader A Khalidi[15], Sarah L Mackie[16, 17], Eric L Matteson[18], Mehrdad Maz[19], Peter A Merkel[20], Paul A Monach[21], Lorna Neill[22], Cristina Ponte[23,24], Carlo Salvarani[25,26], Wolfgang A. Schmidt[27], Peter M Villiger[28], Kenneth J Warrington[29], Madeline Whitlock[30], Sofia Ramiro[31,32], Christian Dejaco[2,33]

Affiliations

1. Mount Sinai Hospital, Toronto, Ontario, Canada.
2. Department of Rheumatology, Hospital of Bruneck (ASAA-SABES), Teaching Hospital of the Paracelsius Medical University, Brunico, Italy.
3. Schroeder Arthritis Institute, Krembil Research Institute, University Health Network, University of Toronto, Toronto, Ontario, Canada.
4. Department of Rheumatic and Immunologic Diseases, Cleveland Clinic, USA.
5. Division of Rheumatology, Mayo Clinic, Rochester MN, USA and courtesy appointment at the division of Rheumatology, University of Florida, Gainesville FL, USA.
6. Rheumatology, Mayo Clinic, Jacksonville, Florida, USA.
7. Rheumatology, University of Ottawa Faculty of Medicine, Ottawa Hospital Research Institute, Ottawa, Ontario, Canada.
8. Department of Rheumatology and Clinical Immunology, Charité Universitätsmedizin Berlin, Berlin, Germany.
9. Division of Rheumatology, "La Colletta" hospital, Azienda Sanitaria Locale 3 Genovese, Arenzano, Italy.
10. Department of Autoimmune Diseases, Hospital Clínic, University of Barcelona, Institut d'Investigacions Biomèdiques August Pi i Sunyer (IDIBAPS), Barcelona, Spain.
11. National Institutes of Health/NIAMS, Bethesda, Maryland, USA.
12. Department of Internal Medicine, Rheumatology, Pulmonology, Nephrology and Diabetology, Medius Kliniken Kirchheim/Teck, University Tübingen, Kirchheim-Teck, Germany.
13. Patient, Vienna, Austria.
14. Rheumatology, David Geffen School of Medicine, University of California, Los Angeles, California, USA
15. St. Joseph's Healthcare Hamilton, McMaster University, Ontario, Canada.
16. Leeds Institute of Rheumatic and Musculoskeletal Medicine, University of Leeds, Leeds, UK.

17. Leeds Biomedical Research Centre, Leeds Teaching Hospitals NHS Trust, Leeds, UK.
18. Division of Rheumatology, Mayo Clinic College of Medicine and Science, Rochester, Minnesota, USA.
19. Division of Allergy, Clinical Immunology, and Rheumatology, Department of Medicine, University of Kansas Medical Center, Kansas City, Kansas, USA.
20. Division of Rheumatology, Department of Medicine, Division of Epidemiology, Department of Biostatistics, Epidemiology, and Informatics, University of Pennsylvania, Philadelphia, PA, USA.
21. VA Boston Healthcare System, Boston, MA.
22. Patient Charity Polymyalgia Rheumatica and Giant Cell Arteritis Scotland, Nethy Bridge, UK.
23. Rheumatology, Unidade Local de Saúde de Santa Maria, Lisbon, Portugal
24. Rheumatology Research Unit, Instituto de Medicina Molecular, Faculdade de Medicina, Universidade de Lisboa, Lisbon, Portugal.
25. Unit of Rheumatology, Azienda Unità Sanitaria Locale-IRCCS, Reggio Emilia, Italy.
26. Department of Surgery, Medicine, Dentistry and Morphological Sciences with Interest in Transplant, Oncology and Regenerative Medicine, University of Modena and Reggio Emilia, Modena, Italy.
27. Rheumatology, Immanuel Krankenhaus Berlin, Berlin-Buch, Berlin, Germany.
28. Rheumatology and Clinical Immunology, Medical Center Monbijou, Bern, Switzerland.
29. Division of Rheumatology, Department of Medicine, Mayo Clinic, Rochester, MN, USA.
30. Rheumatology, Southend University Hospital, Southend, UK.
31. Department of Rheumatology, Leiden University Medical Center, The Netherlands.
32. Department of Rheumatology, Zuyderland Medical Center, The Netherlands.
33. Department of Rheumatology, Medical University of Graz, Graz, Austria.

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**Abstract**

**Objective:** To create consensus-based definitions of signs and symptoms of giant cell arteritis (GCA) for use by healthcare professionals, primarily in research settings.

**Methods:** Core definitions of signs and symptoms of GCA were extracted from 11 randomized controlled trials of GCA previously reviewed in a systematic literature review conducted in the context of the development of response criteria for GCA. This information was supplemented by definitions from other sources, such as rheumatology textbooks.

A 2-round Delphi was performed within an international task force (32 members from 11 countries). The first round aimed to obtain consensus on the descriptive terms defining each sign or symptom while round 2 rated the importance of these terms. Based on the Delphi, preliminary definitions were developed. In four online meetings, results of the Delphi were reviewed, and a consensus was achieved on final definitions.

**Results:** Twenty-nine signs and symptoms of GCA were reviewed. Six signs or symptoms of GCA had previously been defined in the literature. A high level of agreement was reached on the definition of 23 signs and symptoms with the following 12 considered characteristic of GCA: headache, temporal artery abnormalities, scalp tenderness, scalp necrosis, jaw claudication, tongue claudication, tongue necrosis, amaurosis fugax, permanent vision loss, fever, limb claudication, and blood pressure inequality.

**Conclusion:** A glossary of definitions for 23 signs and symptoms of GCA was developed through a consensus process involving international experts. Applying these definitions should harmonize patient enrollment and patient populations of studies on GCA.

*What is already known on this topic – summarise the state of scientific knowledge on this subject before you did your study and why this study needed to be done*

The paucity of standardized definitions for clinical manifestations of giant cell arteritis (GCA) leads to variable interpretations in research settings. Thus, there is an unmet need to establish uniform definitions of signs and symptoms of GCA to ensure standardized patient enrollment into clinical trials and characterization of patients in clinical studies.

*What this study adds – summarise what we now know as a result of this study that we did not know before*

This study defined 23 signs and symptoms of GCA of which 12 were considered characteristic of GCA and are as follows: headache, temporal artery abnormalities, scalp tenderness, scalp necrosis, jaw claudication, tongue claudication, tongue necrosis, amaurosis fugax, permanent vision loss, fever, limb claudication, and blood pressure inequality.

*How this study might affect research, practice or policy – summarise the implications of this study*

These 23 definitions can complement inclusion criteria in clinical trials and other clinical studies, allow precise application of classification criteria, and lay the groundwork for developing response criteria for GCA.

## 1. Introduction

Giant cell arteritis (GCA) is a large vessel vasculitis and the most common form of vasculitis in adults over the age of 50.[1,2] There are no standardized definitions of the clinical manifestations of GCA in the literature. Classification criteria related manuscripts usually include definitions of individual parameters (for example, classification criteria for spondyloarthritis), while the classification criteria for GCA do not comprehensively include definitions for all signs and symptoms.[3-5] This lack of standardized definitions might lead to inconsistency in application in research settings. Furthermore, the diagnostic and therapeutic landscapes of GCA are rapidly expanding.[6,7] Inconsistent definitions of GCA features hinder the validity of the data and the inclusion of a homogeneous group of patients into clinical trials, thereby affecting the results and limiting the comparability of studies.

An international task force supported by the European Alliance of Associations for Rheumatology (EULAR) and the American College of Rheumatology (ACR) was established to develop response criteria for GCA. For the development of these criteria, a multi-step approach is followed that includes but is not limited to a systematic literature review and a Delphi exercise to evaluate candidate descriptors in the response criteria.[8] During the Delphi, features of GCA (for example, jaw claudication) were defined to allow consistent interpretation when doing this exercise. While defining those signs and symptoms of GCA, it was noted that there were no standardized definitions in the literature. Therefore, it was decided to create a glossary of signs and symptoms of GCA. This glossary is intended to be used in research settings by healthcare professionals as a resource to facilitate the recruitment of patients into clinical trials by standardizing the definitions of commonly used features of GCA.

## 2. Methods

### *2.1. Initial development of the definitions of signs and symptoms of giant cell arteritis*

An international task force endorsed by EULAR and ACR to develop new response criteria for GCA conducted the current glossary project.[8] The 32 task force members consisted of 28 rheumatologists, one internist, one health professional in rheumatology, and two patient research partners from 11 countries (Austria, Canada, France, Germany, Italy, Netherlands, Portugal, Spain, Switzerland, United States of America, United Kingdom).

Two patient research partners were involved in each step of this study including but not limited to the Delphi study and consensus meetings.

Seven members (CAL, CD, ZT, SR, MS, MB, and CS-A) formed the Steering Committee, three of which are fellows (MS, MB, and CS-A). Using the systematic literature review (SLR) conducted in

the context of the response criteria for GCA project as a basis, the fellows extracted definitions of the signs and symptoms of GCA from 11 randomized controlled trials (RCTs) (**Supplementary Table S1)**.[8] To ensure comprehensiveness, this information was supplemented by definitions from other sources, including rheumatology textbooks,[9-11] the 2022 ACR/EULAR classification criteria for GCA,[4] the ACR 1990 classification criteria for GCA,[12] and a Delphi exercise prepared as part of the GCA response criteria project (which was different from the Delphi described below) (see **Figure 1**).

For each sign and symptom of GCA, keywords or features (termed "descriptors" in this paper) were extracted from each definition (for example, "new onset") by two of the fellows (MS and MB). Descriptors that were frequently mentioned in the above sources (for example, "new onset," was mentioned in most RCTs) were incorporated into the potential new definition, while the other descriptors that were infrequently mentioned were kept as potential options. A model was created with a basic phrase that includes the common descriptors of the signs and symptoms of GCA that cannot be changed and several descriptors that can be added to make the definition comprehensive (see **Supplementary Figure S1**). The information retrieved during this step was used as a basis for the subsequent Delphi exercise.

### *2.2. Delphi*

The preliminary descriptors for each sign and symptom of GCA were refined via a 2-round Delphi performed among the task force members.

During round 1, participants were asked to select the descriptors that most appropriately matched each feature of GCA. Participants were also allowed to propose new descriptors.

Any descriptive term with ≥70% consensus was added to the definition of the respective sign/ symptom. Descriptors with <30% agreement were excluded. Descriptors with 30-70% agreement were reassessed in a second Delphi survey. The goal of round 2 was to rate the importance of the descriptors that most appropriately matched the features of GCA. The rating was as follows: 0-3 = not important, 4-6 = important, and 7-9 = critically important. See **Supplementary Figure S2**.

Based on the results of the two Delphi rounds, a preliminary definition of each feature of GCA was developed by the steering committee, as follows: those descriptors rated as critically important by ≥70% of participants were included in the preliminary definition. The rest of the descriptors were shown to task force members during subsequent meetings (below). The

preliminary definitions were discussed and refined by the steering committee via e-mail and in online meetings until a final proposal was achieved, which was then presented to the task force. Based on the Delphi results, the steering committee identified fundamental overarching principles essential for contextualizing and interpreting the definitions of the features of GCA. These were also proposed to task force members.

### *2.3. Consensus meetings*

The results of the Delphi exercise and preliminary definitions were presented to the task force members during four online meetings. See online **Supplementary Figure S3**.

During the meetings, task force members discussed the Delphi results and the proposed definitions. Consensus among task force members was achieved through an online live voting process. Agreement was reached if at least 70% of participants concurred on a definition. If consensus was not achieved, the definition under consideration was re-discussed. In the second round, consensus was accepted if >67% of the members voted in favor of the revised definition, and in the third round, >50% was accepted.

Finally, each task force member anonymously indicated the level of agreement (LoA) via an online survey (LoA, 0–10 numeric rating scale with 0=do not agree and 10=fully agree). The mean and standard deviation (SD) of the LoA, as well as the percentage of task force members with an agreement ≥8, are presented.

## 3. Results

A total of 29/32 (92%) and 27/32 (84%) task force members participated in rounds 1 and 2 of the Delphi exercise, respectively. Attendance by members at online meetings was >75% (meeting 1, 81%; meeting 2, 87%; meeting 3, 87%; meeting 4, 78%).

### 3.1 Overarching principles and definitions of signs/symptoms of giant cell arteritis

The task force formulated two overarching principles forming a framework for all the definitions of signs and symptoms of GCA (**Table 1**).

Twenty-nine signs and symptoms were reviewed. Six were not defined because they had an accepted definition in the literature (polymyalgia rheumatica,[13] stroke,[14] transient ischemic attack,[15] myocardial infarction,[16] digital ulcers,[17] fatigue[18]). During online meetings, out of the 23 signs and symptoms left to define, 12 were considered characteristic for GCA while 11 were regarded as self-explanatory or not highly specific for GCA. Three online meetings were dedicated

to defining those 12 signs and symptoms of GCA and one online meeting was used for the remaining 11 signs and symptoms.

The 12 signs and symptoms of GCA with their definitions are listed in **Table 1** (including LoA) and discussed below. All statements obtained a high level of agreement, ranging from 8.7 to 9.9. The remaining 11 definitions of the symptoms considered self-explanatory or not highly specific for GCA are reported in **Table 2** (including LoA), while the respective discussion points are included in **Supplementary Table S2**.

**Table 1. Overarching principles and definitions of 12 signs and symptoms of giant cell arteritis**

| **Overarching Principles** | | **LoA (0-10) Mean (SD)** | **% with LoA ≥8** |
|---|---|---|---|
| 1. | All the definitions from this glossary refer to signs or symptoms not better explained by other clinical conditions (that is, they are primarily attributed to GCA). | 9.8 (0.5) | 100 |
| 2. | The glossary should not serve to prevent patients who do not completely fit these definitions from receiving the necessary diagnostic procedures or therapies. | 9.9 (0.4) | 100 |
| | | | |
| **Signs or symptoms of GCA** | **Definitions** | | |
| Headache | New-onset pain localized to the head, not typical of headaches the patient previously experienced. The pain is usually persistent, continuous, and not easily alleviated by analgesics. | 9.4 (0.8) | 96.4 |
| Temporal artery abnormalities | Any of the following features of a temporal artery: thick, firm, tender, or with a diminished or absent pulse. | 9.6 (0.6) | 100 |
| Scalp tenderness | Pain/discomfort on touching the scalp, occurring on one or both sides, often elicited by brushing or combing hair. | 9.7 (0.5) | 100 |
| Scalp necrosis | Ischemic damage to the scalp marked by altered color and compromised integrity of the skin. | 9.5 (0.8) | 96.4 |
| Jaw claudication | Pain, fatigue, or discomfort in jaw muscles occurring when chewing and resolving shortly after chewing stops. | 9.6 (0.7) | 100 |
| Tongue claudication | Pain, fatigue, or discomfort in the tongue when chewing or talking, that resolves after chewing or talking stops. | 9.5 (0.8) | 100 |
| Tongue necrosis | Ischemic damage to the tongue marked by altered color and compromised integrity of the mucosa. | 9.3 (1.0) | 92.9 |
| Amaurosis fugax | Transient loss of vision in one or both eyes, without associated ocular pain, that is usually sudden and resolves within minutes or rarely hours. | 9.3 (1.09) | 96.4 |
| Permanent loss of vision | Sudden and irreversible, partial, or complete, loss of sight in one or both eyes. | 9.7 (0.6) | 100 |

| | | | |
|---|---|---|---|
| Fever | Temperature ≥38° C (100.4 F). | 8.7 (1.6) | 78.6 |
| Limb claudication | Pain, fatigue, or discomfort in limb muscles that occurs with use and is relieved by rest. | 9.17 (1.5) | 89.3 |
| Blood pressure inequality | A difference of ≥20 mmHg in systolic blood pressure between contralateral limbs. | 9.4 (0.9) | 92.9 |

Numbers in the columns 'LoA' indicate the mean and SD (in parenthesis) of the LoA (assessed on a scale from 0=no agreement to 10=full agreement), and the proportion of task force members with a score of at least 8/10.
LoA, level of agreement; SD, standard deviation, GCA, giant cell arteritis

**Table 2: Definitions of 11 additional signs and symptoms of giant cell arteritis**

| Additional signs or symptoms of GCA | Definitions | LoA (0-10) Mean (SD) | % with LoA ≥8 |
|---|---|---|---|
| **Abdominal angina** | Recurrent pain or discomfort in the abdomen, usually occurring or worsening after eating, considered due to vascular insufficiency. | 9.3 (1.1) | 89.3 |
| **Anorexia** | Diminished desire to eat. | 9.2 (1.4) | 89.3 |
| **Blurry vision** | A visual disturbance in which objects appear unclear, making it difficult to see things sharply. *Typically sudden in onset.* | 9.3 (1.3) | 92.9 |
| **Carotidynia** | Pain or tenderness over one or both carotid arteries. | 9.8 (0.5) | 100 |
| **Diplopia** | Transient or persistent visual disturbance in which an object is seen partially or fully in duplicate. | 9.6 (0.7) | 96.4 |
| **Dry cough** | A type of cough not accompanied by expectorated phlegm, mucus or blood. | 9.6 (0.8) | 96.4 |
| **Hearing loss** | Partial or complete inability to hear sounds in one or both ears. *Typically rapidly progressive.* | 9.1 (1.2) | 92.9 |
| **Odynophagia** | Pain or discomfort with swallowing. | 9.7 (0.7) | 100 |
| **Peripheral arthralgia** | Pain or discomfort in the joints of the extremities. | 9.3 (1.4) | 92.9 |
| **Pulse abnormalities** | Pulse that is difficult to detect or feels faint when palpating arteries in the extremities. | 9.0 (1.2) | 89.3 |
| **Weight loss** | Reduction of body weight of at least 5%. | 8.4 (2.4) | 78.6 |

Numbers in the columns 'LoA' indicate the mean and SD (in parenthesis) of the LoA (assessed on a scale from 0=no agreement to 10=full agreement), and the proportion of task force members with a score of at least 8/10.
GCA, giant cell arteritis, LoA, level of agreement; SD, standard deviation

## Overarching principles

*Overarching principle 1: All the definitions from this glossary refer to signs or symptoms not better explained by other clinical conditions (that is, they are primarily attributed to GCA).*

The first principle emphasizes that the definitions provided in the glossary are specifically tailored to recognize signs or symptoms of GCA. This principle clarifies that these definitions are most

relevant when other clinical conditions cannot better explain the symptoms, ensuring that the focus remains on identifying GCA-related signs and symptoms.

All signs or symptoms described generally represent a new occurrence (i.e., not chronic). Additionally, signs and symptoms that self-resolve or resolve with conventional treatments (e.g. headache responding to acetaminophen) are generally not attributable to GCA.

*Overarching principle 2: The glossary should not serve to prevent patients who do not completely fit these definitions from receiving necessary diagnostic procedures or therapies.*

The second principle ensures that the glossary definitions do not hinder access to appropriate diagnostic procedures and treatment for patients whose symptoms may not fully align with the defined signs or symptoms. This principle acknowledges the variability in how diseases present and emphasizes the importance of clinical flexibility and discretion. It underlines that the glossary serves as a guide, mainly for research, advocating for comprehensive patient care regardless of predefined signs or symptoms.

## Definitions of signs and symptoms of GCA

### Headache

*Definition: New-onset pain localized to the head, not typical of headaches the patient previously experienced. The pain is usually persistent, continuous, and not easily alleviated by analgesics.*

The concepts of new-onset (previously not experienced by the patient) and atypical headache were commonly noted for patients included in clinical trials[21-26] as well as in the ACR 1990 classification criteria for GCA.[12] However, aside from a few research papers,[23,25] the medical literature offered limited additional information to further characterize a GCA-related headache. These two concepts were thus included in the initial potential headache definition and other descriptors extracted from the literature and textbooks were added as options for the task force members to choose from (**Supplementary Figure S1**).

Task force members agreed that the definition should aim to characterize the type of headache that makes a healthcare provider concerned about GCA rather than defining any type of headache. The headache definition had to strike a balance between avoiding oversimplification akin to other headache definitions and not being overly restrictive, which can limit inclusion of patients in clinical trials; it should thus provide some flexibility.

In contrast to the International Headache Society (IHS) definition of GCA-related headache,[27] which emphasizes the inclusion of other symptoms of GCA (e.g., scalp tenderness), it was decided that such an association should not be incorporated in the definition. The task force was reluctant to combine different features of GCA into a single definition, maintaining a distinct concept of GCA-related headache specifically for research purposes and independent of the presence of other symptoms of GCA.

Discussion about the appropriateness of including a specification regarding headache characteristics such as inflammation (e.g., heightened intensity during the night or in the early morning) was also discussed. However, to maintain broad inclusivity, it was decided to omit such specifications due to the heterogeneous nature of headaches across patients and disease courses.

There was a debate about whether to include the lack of response to treatment (i.e., no or little improvement of headache by analgesics) as there might be a subgroup of patients who do not, or cannot, take analgesics. The addition of the adverbs "usually" and “not easily” in the definition was intended to accommodate such exceptions, while the definition also aimed to include descriptors typically associated with a GCA-related headache, such as "persistent" and "continuous." Though new onset is mentioned, the task force agreed that the definition can also be extended to a patient who is relapsing if the character of headache is referencing to the initial presentation of GCA.

**Temporal artery abnormalities**

*Definition: Any of the following features of a temporal artery: thick, firm, tender, or with a diminished or absent pulse.*

Distinct features of temporal artery abnormalities that were agreed upon include thickness, firmness, tenderness and a diminished or absent pulse. Tenderness is pain elicited by touching the temporal artery. When discussing the difference between thickness and firmness, thickness was felt to incorporate the concept of being dense and not completely compressible, while firmness would be synonymous to hard or cord-like. “Any” was intentionally added to have the flexibility of only having one abnormality such as diminished pulse, and therefore increase sensitivity, but the more abnormalities present, the higher the likelihood of being related to GCA. Particular care was taken in the wording of pulse palpation: "absent pulse" was chosen to convey a lack of prior knowledge regarding the temporal artery's condition, in contrast to "loss of pulse," which implies previous awareness. The interpretation of the temporal artery pulse should be considered in the absence of a prior temporal artery biopsy, as the latter may alter the pulse characteristics. When assessing the temporal artery for signs of GCA, the examiner should have

adequate experience with the anatomy of the temporal artery and with GCA to ensure that the appropriate amount of pressure is applied for evaluating tenderness, firmness, and pulse characteristics. The task force did not include bruits as a possible abnormality of the temporal artery because auscultation of this artery is rarely conducted in clinical practice and has not been mentioned as a possible descriptor in the literature (in contrast to bruits of extra-cranial arteries to indicate vessel stenosis).

**Scalp tenderness**
*Definition: Pain/discomfort on touching the scalp, occurring on one or both sides, often elicited by brushing or combing hair.*

The term "discomfort" was introduced as an option to encompass nuances related to tenderness when touching the scalp, ranging from mild discomfort to pain. Hyperesthesia was also discussed but finally not added, as the task force believed that pain/discomfort touching the scalp catches the essence of the definition. Similar to headache, the definition included the adjective “often” to allow room for exceptions.

**Scalp necrosis**
*Definition: Ischemic damage to the scalp marked by altered color and compromised integrity of the skin.*

There was initial discussion on whether it should be defined given it is such a rare occurrence but on the other hand, it is a very specific feature of GCA and was thus included.[28] Ischemia means diminished or absent blood flow. Gangrene, a possible consequence of ischemia was initially included in the definition of scalp necrosis but ultimately omitted, given its definition is restricted to the end-stage result of an ischemic process. The term "ischemic damage" provides greater flexibility in the definition given that it encompasses altered color and integrity of the skin, as well as gangrene. The task force also emphasized that a change of color alone is not enough for this process of ischemic damage to happen. Usually, the subcutaneous tissue also undergoes damage. It would be exceptional that necrosis occurred without also damaging the skin.

**Jaw claudication**
*Definition: Pain, fatigue, or discomfort in jaw muscles occurring when chewing and resolving shortly after chewing stops.*

The challenge was formulating a definition that effectively differentiated jaw claudication from other pathologies such as temporomandibular joint disorders. The task force agreed that the essence of the definition is that jaw claudication happens with prolonged (usually minutes) chewing and resolves once chewing stops. It does not typically occur with the first bites, nor with the initiation of chewing. The task force decided against including the word “prolonged” into the

definition given that its interpretation could be heterogenous with no specific cut-off in the literature. Discussing the meaning of "prolonged" as part of the definition would introduce substantial complexity. It is important to note that GCA patients can express several jaw-related symptoms, but jaw claudication was chosen to be defined given its high diagnostic specificity.[29] Jaw muscle was added rather than simply jaw to emphasize that this phenomenon happens in the muscles of mastication and not elsewhere. Fatigue and discomfort were added to the definition because jaw claudication is not always perceived as pain by patients.

**Tongue claudication**
*Definition: Pain, fatigue, or discomfort in the tongue when chewing or talking, that resolves after chewing or talking stops.*

The task force aimed for this definition to align with the same conceptual framework as that of jaw claudication. Therefore, the essence of the meaning of claudication was kept, where the tongue pain, fatigue, or discomfort happens with activity (chewing or talking) and resolves once the activity stops.

**Tongue necrosis**
*Definition: Ischemic damage to the tongue marked by altered color and compromised integrity of the mucosa.*

The task force wanted this definition to mirror the same underlying principles as that of scalp necrosis. The fundamental concept of necrosis was maintained by utilizing the phrase "ischemic damage" characterized by changes in color and compromised mucosal integrity.

**Amaurosis fugax**
*Definition: Transient loss of vision in one or both eyes, without associated ocular pain, that is usually sudden and resolves within minutes or rarely hours.*

In defining amaurosis fugax, the task force advocated for inclusivity by specifying that this GCA feature can involve one or both eyes. Although predominantly unilateral, the less frequent bilateral presentation was retained for the benefit of a larger audience, aiming to be as inclusive as possible when recruiting patients for trials. The central debate revolved around the necessity of explicitly specifying the painlessness of vision loss itself. Cranial GCA is typically characterized by a headache, amaurosis fugax, and painless loss of vision in general (i.e., patients do not experience any pain in the eye).[30] Moreover, the task force wanted to highlight another crucial characteristic of this symptom, which is its reversibility in a short time frame in most cases.[30] However, for the sake of inclusiveness, the rare circumstance where amaurosis resolves within hours is also reported in the definition.

**Permanent vision loss**
*Definition: Sudden and irreversible, partial or complete, loss of sight in one or both eyes.*

The task force advocated for the explicit inclusion of the sudden onset and irreversibility of this feature. Vision loss in GCA is an ischemic complication occurring in 15-35% of patients, almost exclusively before the start of treatment with glucocorticoids, and it may be preceded by amaurosis fugax but may also occur as the first manifestation of disease.[30-32] Visual loss encompasses a wide spectrum of visual impairment: while some individuals may notice specific areas of visual defects, such as blind spots or scotomas, affecting their ability to perceive objects in certain areas of their visual field, others may suffer more severe impairment or blindness, importantly impacting their daily activities and quality of life.[33] Most task force members argued against the necessity of specifying the ischemic cause in the definition, contending that the assumption of relevance to GCA covers all potential causes, as specified in the overarching principles.

**Fever**
*Definition: Temperature of ≥38° C (100.4 F).*

There was extensive discussion about whether this term warranted definition, as a few task force members deemed it self-explanatory. While fever is defined by the Centers for Disease Control and Prevention (CDC) as measured temperature of ≥38°C,[34] some experts expressed concerns that a proportion of patients with GCA may have a temperature that is only slightly higher than their baseline body temperature yet abnormal for that patient, and that these low-grade temperatures might differ between individuals.

To capture the concept of low-grade fever, proposals discussed were two above-normal measurements or an elevation of at least 0.5°C above the patient's usual baseline temperature. The debate extended to whether patients are even aware of their normal temperature and whether they regularly measure it. However, no agreement on these aspects was reached. The minimum consensus among the task force was, therefore, to adopt the definition of fever used by the CDC as a temperature of ≥38°C and not to formulate a definition for low-grade fever. Nevertheless, all task force members acknowledged that a patient with active GCA may have a body temperature that is slightly higher than their usual baseline but not exceeding 38°C.

**Limb claudication**
*Definition: Pain, fatigue, or discomfort in limb muscles that occurs with use and is relieved by rest.*

Limb claudication occurs in patients with extra-cranial vessel involvement, may affect upper and lower limbs, and symptoms may vary from mild to severe based on the degree of vascular involvement and concomitant factors, such as (pre-existent) atherosclerosis, heart failure, or

anemia. The reported definition emphasizes the muscular site of the symptoms and notes that limb claudication is typically triggered by prolonged movements (of at least several seconds to minutes) and rapidly reverses with rest. These characteristics help distinguish it from other non-ischemic conditions such as osteoarthritis, muscle injury, or tendinopathy.

**Blood pressure inequality**
*Definition: A difference of ≥20 mmHg in systolic blood pressure between contralateral limbs.*

While the task force voted for a ≥20mmHg difference in systolic blood pressure between contralateral limbs, respective cut-offs varied markedly in the literature.[35-37] This choice of the task force was influenced by the recently published classification criteria for Takayasu arteritis, which proposed the same cut-off for blood pressure difference.[38] The task force also stressed the importance of clarifying that the comparison of blood pressures should be between the two upper or the two lower limbs, not between one upper and one lower limb. Finally, accurate measurement of blood pressure is key, and guidelines on proper blood pressure measurements (for example, the American College of Cardiology and American Heart Association guidelines on blood pressure measurement [39]) should be followed.

**Discussion**
To the authors' knowledge, this glossary reflects the first collaborative effort to establish comprehensive definitions for fundamental symptoms and signs of GCA. The task force agreed on 23 definitions for a more precise application of classification criteria and outcome assessments in clinical trials, including remission, relapse, and response to treatment. Despite these definitions being consensus-based, there was substantial agreement among both experts and patient representatives.

No definition alone is assumed to possess the requisite sensitivity and specificity to diagnose a patient with GCA in clinical practice. Instead, these definitions are intended to be incorporated in inclusion criteria for research studies, standardize the application of classification criteria (even though this effort was not part of the classification criteria project), and serve as a basis for the development of the new criteria for response to treatment in GCA. Although not primarily intended for use in clinical practice, these definitions and the detailed accompanying qualifying discussions by the task force members provide useful information about the nuances of clinical features commonly associated with GCA to health care providers who may have less experience with this disease.

Obtaining clarity and homogeneity of definitions has been an exercise performed by several groups to facilitate the development of classification criteria in the field of rheumatology. For example, the third phase of the development of the classification criteria for systemic lupus erythematosus was dedicated to an in-depth examination and refinement of definitions.[40] Similarly, a glossary of definitions was incorporated in several classification criteria (for example, spondyloarthritis) to improve the validity and reliability of the final classification system.[3,5] Previous definitions were mostly based on literature review and consensus by the working group, while this GCA glossary included multiple rounds of refinement through iterative processes, encompassing two Delphi rounds and four consensus meetings of an international task force. In contrast to classification criteria, however, this glossary for GCA concentrated solely on clinical signs and symptoms as definitions of imaging and biopsy findings in GCA have already been described.

One potential limitation of this study is the lack of comprehensive definitions in the literature for certain signs and symptoms of GCA (e.g., limb claudication), while several definitions are available for other features (e.g., headache). Consequently, the absence of initial components could have hindered the definition-building process. Therefore, a few definitions were proposed and discussed by the task force members based on clinical expertise (e.g., tongue necrosis). Another limitation of this study is that the generation of definitions was based on a SLR focused on RCTs measuring treatment response and disease activity changes in GCA. While a dedicated SLR would have been appropriate, the task force believed it would be redundant since all relevant GCA trials had already been identified.[41-51] Since RCTs include descriptions of GCA signs and symptoms as part of the inclusion criteria, they were considered the most important data source. To enhance completeness for the generation of definitions, multiple resources, including GCA classification criteria, were also incorporated.

In conclusion, an international group of specialists in GCA formulated a glossary of definitions for 23 signs and symptoms occurring in GCA through a consensus process. These definitions are designed for research purposes. Applying these definitions should facilitate uniform characterization of the features of GCA and harmonize the patient populations enrolled into clinical trials in GCA and outcome assessment.

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