

Literature Review

Polymyalgia Rheumatica: A Comprehensive
Review of Current Knowledge

2025

Data Summary

This document was developed for a CDC-sponsored project, Building Capacity for Polymyalgia Rheumatica Education and Awareness, (CDC-RFA-DP23-0067).



Literature Review Overview

To better understand PMR and the challenges patients face, we conducted a **literature review**. A literature review examines existing research to identify what is known and where gaps remain. Using the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) guidelines, we developed a structured approach to ensure a thorough and transparent review, focusing on key areas such as symptoms, diagnosis, treatment, quality of life, and long-term outcomes.

To read more about our methods, [view the abstract here](#).

Methods

We started by asking key questions about PMR's symptoms, its impact on different populations, and the best ways to diagnose and treat it. To find relevant studies, we searched PubMed and Embase using terms like "polymyalgia rheumatica" and "giant cell arteritis," focusing on clinical trials while excluding preclinical research. After screening **319 studies**, we selected **127** that met strict criteria, such as clear methods and reliable findings. Our team independently reviewed summaries and full texts, excluding studies with small sample sizes or unclear conclusions. Most included studies examined treatments, while fewer addressed diagnosis, prognosis, or health disparities.

Findings

Our review revealed that PMR and giant cell arteritis (GCA) are frequently studied together due to their overlapping symptoms and treatments. This highlighted key challenges, including the need for improved diagnostic tools and safer treatment options to reduce long-term steroid use. PET scans and ultrasounds showed promise for better diagnosis, while tocilizumab emerged as a potential steroid-sparing treatment. We also identified a significant gender imbalance in study participants **(5,740 females vs. 2,545 males)**, emphasizing the need for further research into hormonal, genetic, and social factors influencing these conditions.

Polymyalgia Rheumatica (PMR) Diagnosis

> The Role of Imaging

Most studies (79%) on PMR diagnosis focus on imaging tests.

> FDG PET/CT Scans

Most commonly used imaging test for PMR.

Highly accurate in ruling out PMR (82%–99.8% specificity).

> Ultrasound and Doppler Scans

Show strong accuracy (65.7%–99.1% specificity).

Helpful in detecting inflammation and blood vessel changes.

MRI and Ultrasound for Shoulder Inflammation:

MRI found bursitis (joint inflammation) in 100% of PMR patients.

Ultrasound detected bursitis in 94% of cases.

Giant Cell Arteritis (GCA) Diagnosis

> Key Symptoms

Headaches, jaw pain while chewing (jaw claudication), and vision problems.

> Blood Test Markers

Elevated CRP and ESR levels are common in GCA patients.

> Imaging Tests for Diagnosis

PET/CT, MRI, and Ultrasound are highly accurate for detecting GCA.

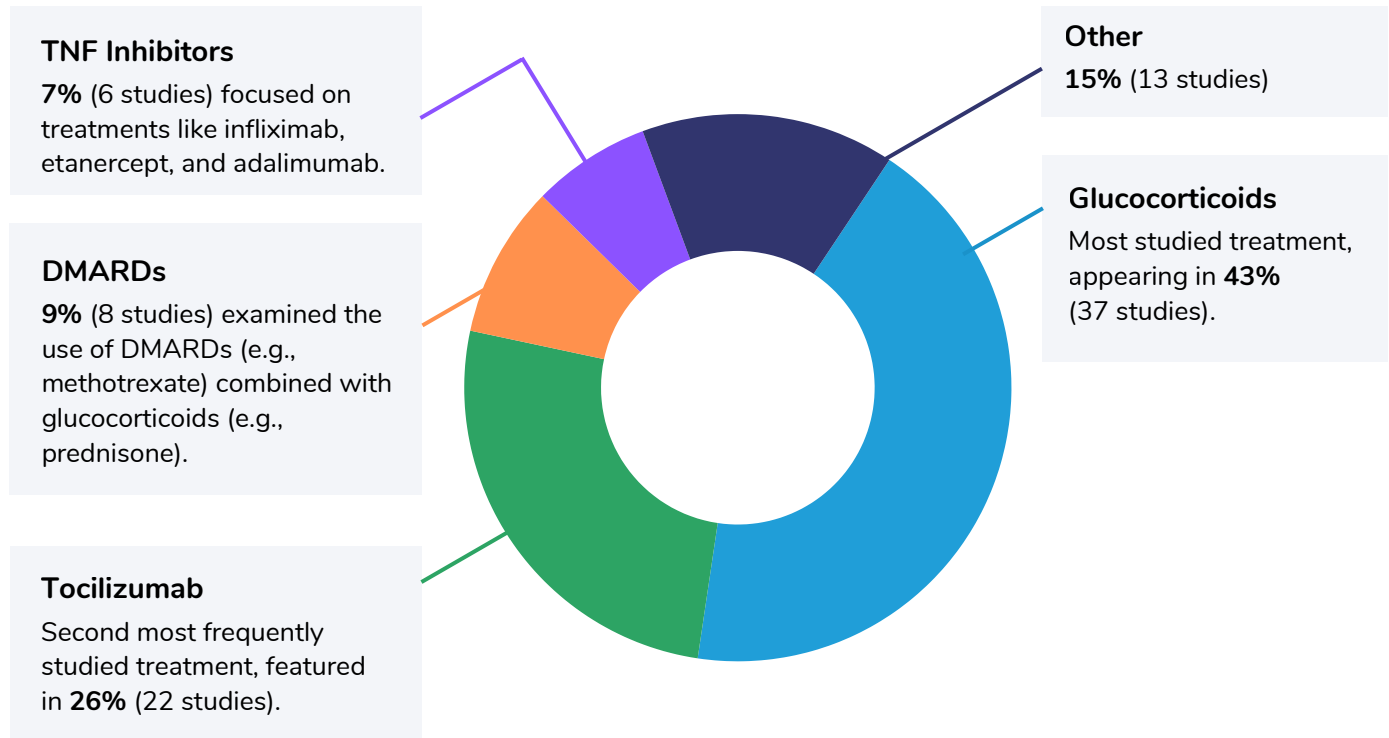
PET/CT is particularly useful for identifying inflammation in both large and small arteries.

MRI can detect artery inflammation even in patients already on steroids.

Ultrasound's "halo sign" is a strong indicator of GCA and may reduce the need for a temporal artery biopsy (TAB).

Summary of Treatment Studies

Among the 127 studies reviewed in full, **86 focused on treatments** for PMR, GCA, or both conditions.



Upper respiratory infections were commonly reported as adverse events in several studies, particularly with treatments involving monoclonal antibodies, TNF blockers, IL-6 receptor inhibitors, and glucocorticoids. Metabolic disturbances, such as hyperglycemia and poor diabetic control, were reported as adverse events associated with treatments, particularly involving glucocorticoids in four studies.

A complete bibliography of all studies referenced in the literature review is available for review [here](#).

Key Takeaways



Higher Research Focus on GCA

The larger study enrollment for GCA compared to PMR may indicate a higher perceived disease burden, more severe complications (such as vision loss and strokes), and a more definitive diagnostic process. This could explain why GCA receives greater research attention and larger study samples.



Gender Disparities in Disease and Research

Female participants significantly outnumber male participants in PMR and GCA studies. Further research is needed to explore potential hormonal, genetic, or social factors influencing these disparities.



Viral and Environmental Triggers in Disease Onset

The association between viruses (such as HPIV-1 and Epstein-Barr virus) and GCA, particularly in biopsy-positive cases, suggests that infections might play a role in disease initiation, not just in PMR, but across autoimmune and inflammatory conditions. Additionally, smoking has been identified as a significant risk factor for GCA, particularly in women, reinforcing the need for preventive strategies.



Advancements and Limitations in Diagnosis

The discussion highlights evolving diagnostic strategies for GCA, including imaging modalities such as PET/CT, MRI, and ultrasound. While temporal artery biopsy (TAB) remains the standard, emerging technologies like FF-OCT (Full-Field Optical Coherence Tomography) could improve diagnostic accuracy. However, current limitations, such as biomarker variability and the impact of glucocorticoid treatment on test sensitivity, suggest the need for more standardized diagnostic approaches. Additionally, there is a notable lack of studies examining differences in PMR and GCA by race, insurance type, and geographic region. This gap limits understanding of how these factors may influence disease presentation, management, and outcomes.



Gaps in Treatment and Prognosis Research

The variability in ESR and other biomarkers in response to corticosteroid treatment emphasizes the need for more reliable disease activity markers. Research gaps in the long-term impact of treatments, including their effects on bone health and comorbid conditions, indicate the necessity of longitudinal studies to optimize management strategies for PMR and GCA. Studies on Patient Reported Outcomes (PROs) were limited and identified as a research gap.

Data Query

Addressing Gaps in Polymyalgia
Rheumatica (PMR) Research

2025

Data Summary

This document was developed for a CDC-sponsored project, Building Capacity for Polymyalgia Rheumatica Education and Awareness, (CDC-RFA-DP23-0067).

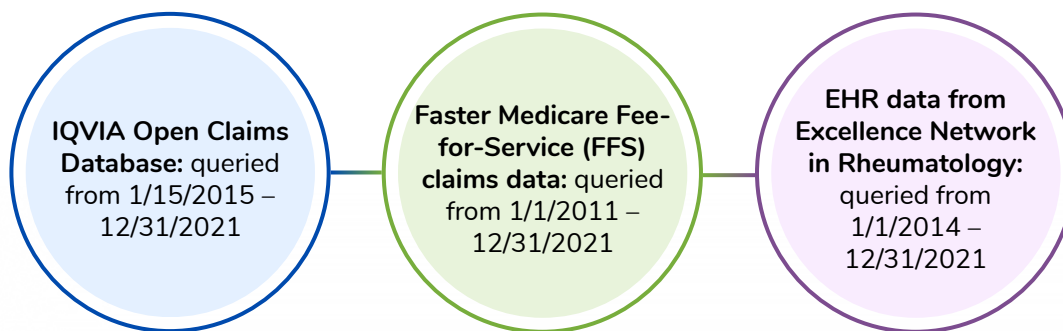


Data Query Overview

We conducted a **data query** to better understand how common PMR is, both on its own and along with GCA, and to look at the types of medications prescribed based on insurance claims and health records. A data query is a request to find specific information in a database. It's like asking a computer a question to get the exact data you need. To read more, [view the abstract here](#).

Methods

For this analysis, data was gathered from **three** different sources over specific timeframes:



Data Analysis Overview

For our analysis, we created **two groups**: one for patients diagnosed with PMR alone, and another for those diagnosed with both PMR and GCA. The following criteria were used to **include** records:



Age: Participants were 50 years or older at the time of diagnosis.



IQVIA Dataset: We checked the previous 180 days to confirm that patients had no earlier diagnosis of PMR or PMR + GCA.



Medicare FFS & EHR Data: At least one medical visit had to occur 12 months before the first PMR diagnosis or a new consultation code had to appear before the diagnosis.

Records were **excluded** if:



Demographic data (such as age or sex) was incomplete or inconsistent.



There was evidence of a prior PMR or GCA diagnosis before the first PMR diagnosis code.

Medication Treatment Definitions

Treatments for PMR and GCA were investigated. These are the treatments that were included in the query. It includes a single treatment or combination treatment.



Drug use: any oral GC use, Methotrexate (MTX), Tocilizumab (TCZ), Sarilumab (SAR), or combination (GC + MTX, GC+TCZ, GC+SAR, GC+MTX+ (TCZ or SAR))



Treatment initiation: first dispense of any of the above medications post index date



Two-drug combinations: two of the above drugs dispensed within a three day period



Three-drug combination regimens: dispensed date of first drug to dispense date of last drug needs to occur within a seven-day period

Results

Demographic Characteristics and Prevalence Patterns

- Total of **1,166,672** patients diagnosed with PMR; **41,600** patients diagnosed with PMR + GCA
 - Though cohort design is mutually exclusive, overlaps can exist among patient populations.
- Disease distribution is greatest in those over 70 years old compared to other age categories
- More women than men were diagnosed with PMR and PMR + GCA
- Prevalence of PMR and PMR + GCA was consistent throughout the 3 databases

NOTE: Prior studies may show different findings because of changes to ICD codes in 2015.

Prescribing and Medication Usage Patterns – IQVIA Data

- **Mean*** and median number of days to first treatment after index diagnosis were similar between patients with PMR and PMR + GCA across most agents
 - Mean days to treatment initiation for methotrexate was shorter than that of glucocorticoids, while median days were similar
 - Mean and median days to treatment initiation shorter for glucocorticoids + methotrexate than for either drug alone
 - Mean days for treatment initiation for patients taking glucocorticoids or methotrexate was mostly longer in females and those < 50 years old

*The **mean** number of days from first treatment after diagnosis means, on average, how many days did people wait from the day they received their diagnosis to pick up their prescription at the pharmacy.

Results

Prescribing Patterns and Medication Usage Patterns – Medicare Data

- In the two years following the index date, U.S. Medicare patients had median cumulative doses of GCs of 1,480 mg and 2,266 mg for PMR and PMR with GCA, respectively.
- Approximately **67.8%** of patients in both cohorts discontinued GCs two years after index date
- Patients with PMR + GCA had a higher median proportion of days covered by GC use through year 2 compared to patients with PMR (**43.0% vs. 34.0%**)
- PMR + GCA patients also utilized tocilizumab more compared to PMR patients (**14.1% vs. 1.6%**)

Prescribing Practices and Medication Usage Patterns – EHR Data

- Around **70%** of patients in both cohorts continued GCs two years after the index date
- Proportion of patients with PMR using methotrexate was greater than that of patients with PMR + GCA (**28% vs. 23%**)
- More than half of patients diagnosed with PMR + GCA used Tocilizumab

Prescribing Practices and Medication Usage Patterns – All Data Sources

Adjunctive treatment with methotrexate plus sarilumab, tocilizumab, or combination therapy were less frequently used in this cohort across all three data sources.

Educational Needs Assessment

Addressing Gaps in Polymyalgia
Rheumatica (PMR) Research

2025

Data Summary

This document was developed for a CDC-sponsored project, Building Capacity for Polymyalgia Rheumatica Education and Awareness, (CDC-RFA-DP23-0067).



Needs Assessment Overview

We conducted a 31-question multiple-choice **educational needs assessment** to better understand public health professionals' knowledge of polymyalgia rheumatica (PMR) and its related condition, giant cell arteritis (GCA). This type of survey helps identify levels of awareness and areas where further education is needed. Our goal was to explore key topics related to PMR, including gaps in knowledge, opportunities for education, and ways to improve support for those affected by these conditions.

Survey questions were divided amongst seven key topic sections to evaluate participants' holistic knowledge of PMR:

[Section 1: Eligibility and Familiarity with PMR](#)

[Section 2: Definition and Etiology](#)

[Section 3: Epidemiology](#)

[Section 4: Diagnosis](#)

[Section 5: Treatment](#)

[Section 6: Treatment Risks and Prognosis](#)

[Section 7: Patient Satisfaction and Patient-Reported Outcomes](#)

Two additional optional sections, [Section 8: Demographics](#) and [Section 9: Preferred Learning Styles](#), were asked to identify trends by type of respondent and highlight potential strategies for later education dissemination.

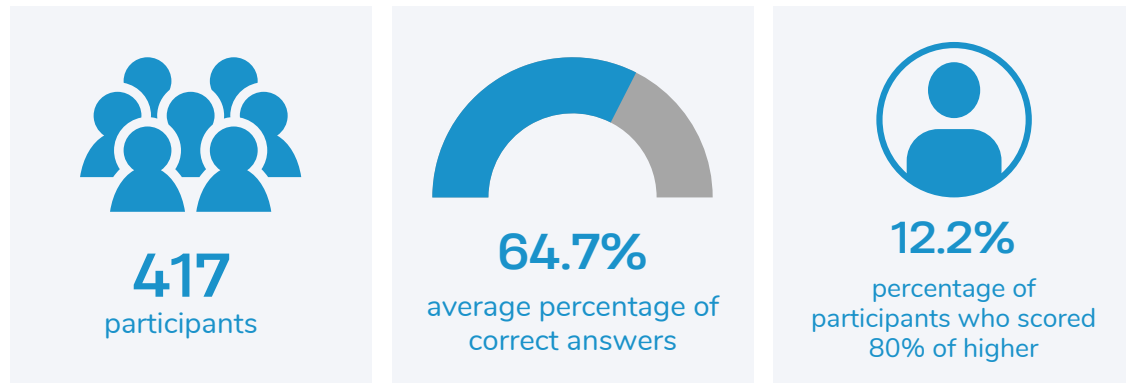
A Note About Needs Assessments

A needs assessment is not intended to define what a learner should know but rather to identify what they don't know. Some questions asked to participants may appear challenging, especially for those in less clinical public health settings. This was intentional. The goal is to highlight strengths and knowledge gaps, not to test competency.

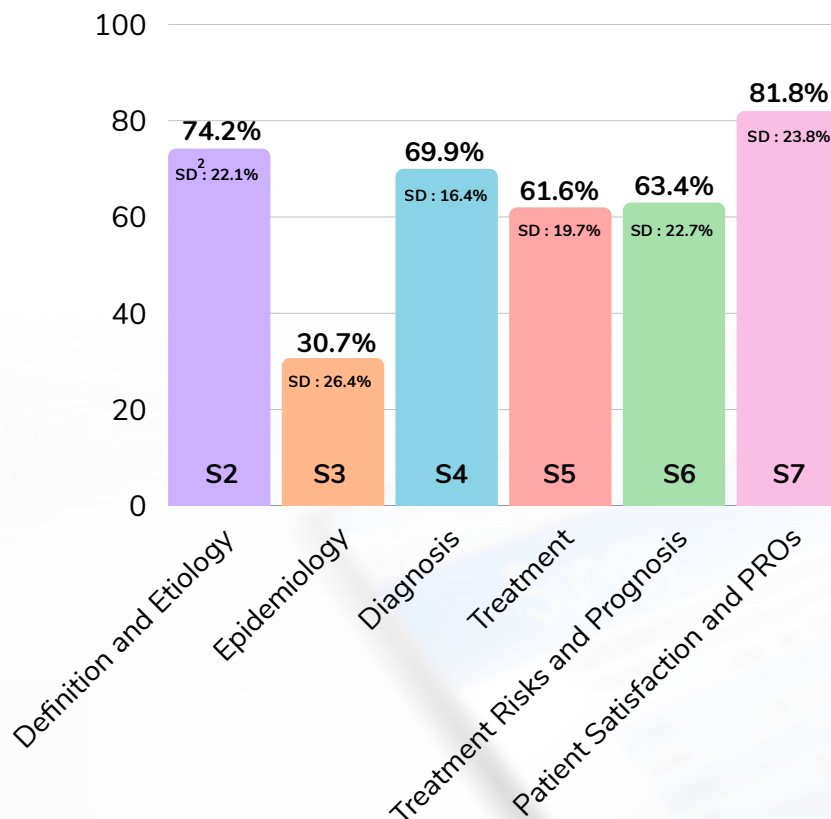
If you'd like to view all the questions included in the needs assessment, or take the needs assessment yourself, click [here](#).

Results

A total of 1,009 participants began the survey, of which **417** met the inclusion criteria, meaning that they both worked in public health or healthcare and had some prior knowledge of PMR. Eligible participants included people who work in healthcare at all levels including doctors, nurses, and health administrators. It also included people who work at health departments, researchers, and scientists. The average score of participants was **64.7%** (SD: 13.1%) 12.2% of participants received a score of 80% or better.



Average Score by Section¹



- **Section 3: Epidemiology** had the lowest average score at 30.7%.
- **Section 7: Patient Satisfaction and PROs** had the highest average score at 81.8%.

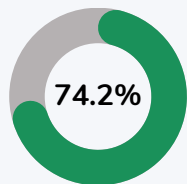
1. **Section 1: Eligibility and Familiarity with PMR**, covered survey eligibility and was not scored.
2. **Standard Deviation (SD)**: Standard deviation is a measure of how spread out the numbers in a set are. If the standard deviation is small, most numbers are close to the average. If it's large, the numbers vary a lot from the average. It helps us understand how consistent or scattered the data is.

Findings: Strengths

Participants demonstrated a strong understanding of the following topics and questions:

Section 2: Definition and Etiology

This section evaluated participants' knowledge of symptoms associated with the development of PMR, risk factors, and the role infections play in PMR onset.



Average score across all questions: **74.2%**
14.7% higher than the average score

Highest Performing Questions:

Question: Which of the following is considered a primary factor in the development of PMR?

Possible Answers	Percentage Selected
Autoimmune response	82.25%
None of the above	9.6%
High-fat diet	3.1%
Bacterial infection	2.9%
Physical trauma	2.2%

Question: What role do infections play in the potential causes of PMR?

Possible Answers	Percentage Selected
Infections may trigger an autoimmune response leading to PMR	88.7%
Infections have no role in the development of PMR	8.4%
Infections directly cause the disease by infecting muscle tissue	1.9%
Infections may prevent the disease by boosting immunity	1%

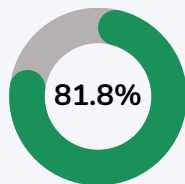
Discussion: The high scores suggest a foundational understanding of PMR's autoimmune nature and the role of infections as a contributing factor. However, **nearly 1 in 5 participants** could not identify the autoimmune response correctly, indicating a need for targeted education to strengthen comprehension among all public health professionals.

Findings: Strengths

Participants demonstrated a strong understanding of the following topics and questions:

Section 7: Patient Satisfaction and PROs

This section evaluated participants' understanding of clinical outcome and patient-reported measures to assess PMR treatment effectiveness and quality of life.



Average score across all questions: 81.8%
26.4% higher than the average score

Highest Performing Questions

Question: In addition to blood tests, what can healthcare providers do to measure the effectiveness of PMR treatment?

Possible Answers	Percentage Selected
Use patient-reported outcome measures (PROMs) to evaluate how the patient is doing	93%
Only evaluate observations of family members regarding the patient's condition	3.4%
Monitor prescriptions and medication refill logs	3.1%
No additional measures are necessary beyond blood tests	0.5%

Question: Which of the following domains would you use to measure patient satisfaction?

Possible Answers	Percentage Selected
Effectiveness of treatment and patient-reported quality of life	86.3%
Patient-reported quality of life alone (e.g., SF-36)	11.5%
Effectiveness of treatment alone	1.7%
No additional measures are necessary beyond blood tests	0.5%

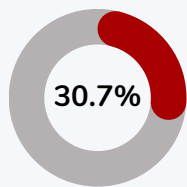
Discussion: The responses highlight strong participant knowledge about evaluating treatment outcomes and patient satisfaction. This strength underscores an opportunity to leverage the established value of patient voices and feedback in future educational efforts.

Findings: Gaps in Knowledge

The following describes topics and questions where participants had **lower than average (64.7%)** scores. These may be areas where more educational support is needed.

Section 3: Epidemiology

This section evaluated participants' knowledge of PMR prevalence and incidence in the United States.



Average score across all questions: **30.7%**
52.6% lower than the average score

Lowest Performing Questions

Question: Approximately how many people are estimated to have PMR in the U.S. currently?

Possible Answers	Percentage Selected
300,000 to 600,000 people	43.4%
50,000 to 100,000 people	30.2%
700,000 people to 1 million people	18.2%
Over 1 million people	8.2%

Question: Approximately how many people are newly diagnosed with PMR in the U.S. each year?

Possible Answers	Percentage Selected
5,000 to 10,000 new cases per year	52.3%
20,000 to 30,000 new cases per year	29.3%
50,000 to 70,000 new cases per year	12.7%
Over 100,000 new cases per year	5.8%

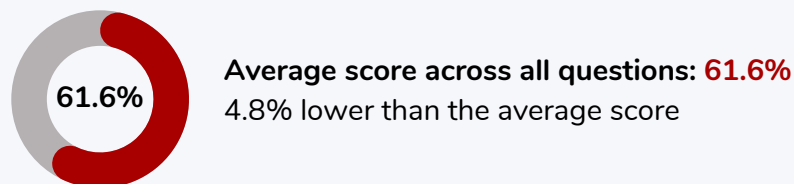
Discussion: Significant limitations in knowledge exist around PMR prevalence estimates. Participants **underestimate** the actual prevalence and incidence. There is a need for further educational efforts in PMR epidemiology, specifically related to awareness of disease population impact.

Findings: Gaps in Knowledge

The following describes topics and questions where participants had **lower than average (64.66%)** scores. These areas may be where more educational support is needed.

Section 5: Treatment

This section evaluated participants' knowledge of PMR treatments, methods to monitor treatment effectiveness, and steps to take if treatment is ineffective or condition is refractory.



Lowest Performing Questions

Question: What is the approximate proportion of PMR patients who continue to experience symptoms despite receiving standard treatment?

Possible Answers	Percentage Selected
About 20-40% of patients	42.5%
About 10-20% of patients	38.4%
More 50% of patients	13.7%
About 5% of patients	5.5%

Question: What is the first-line treatment for PMR?

Possible Answers	Percentage Selected
Corticosteroids, such as prednisone, typically for several months to a year	44.4%
Nonsteroidal anti-inflammatory drugs (NSAIDs) alone for several months	27.1%
Disease-modifying antirheumatic drugs (DMARDs) like methotrexate for several months to a year	25.9%
Antibiotics for 4 to 6 weeks	2.6%

Discussion: Given that **under half** of the participants responded correctly to these questions, the results illustrate the importance of knowledge dissemination in PMR treatment. Education focusing on prevalence of recurring PMR symptoms and treatment options for its initial onset could help further inform care delivery efforts.