# Understanding Community Perspectives on Disease Management: A Social Media Analysis of Gout Care Strategies

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## BACKGROUND

To comprehensively understand the impact of disease management strategies, it is essential to understand the patient perspective. A proprietary artificial intelligence analytics engine and open-source methodologies were applied to posts and comments on social media in online communities dedicated to gout. Gout is a chronic inflammatory arthritis characterized by painful joint flare-ups secondary to uric acid (UA) accumulation. Gout has been associated with negative impacts on physical, emotional, and mental health.[1,2] Virtually all subspecialty groups recommend a proactive "treat-to-target" strategy to reduce serum urate levels; however, a large proportion of US patients with gout are not on urate-lowering therapy or are on too low of a dose and are therefore following a "treat-to-no symptoms" strategy. Here, we aimed to characterize gout community perspectives on various management approaches to gout care.

## METHODS

We evaluated 2 online social media communities using a proprietary analytics engine, *Krystie* (Fig. 1), which extracts and evaluates social media conversations using natural language processing. A topic modeling approach was implemented to identify the most frequent conversation themes across groups. All management topics were subject to sentiment analysis, in which posts/comments were scored from –1 (most negative) to +1 (most positive) using a pretrained sentiment tagger. A final exploratory analysis identified the number of questions in each topic.
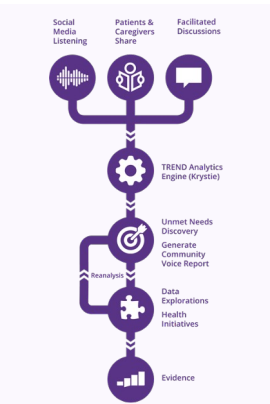


**FIGURE 1. TREND APPROACH**

## RESULTS

### FIGURE 2. CURRENT DATA SOURCES

| | | | |
|---|---|---|---|
| **Gout Support Group of America** | **15,000+** MEMBERS | **50,000** POSTS & COMMENTS | **2021-2023** DATE RANGE |
| **r/gout** | **9,000+** MEMBERS | **125,000+** POSTS & COMMENTS | **2011-2023** DATE RANGE |

Data for the current project included 2 social media sources: a private Facebook group, The Gout Support Group of America; and a public subreddit, r/gout. Details for each group are presented in Figure 2 above.

### FIGURE 3. GOUT TOPICS ACROSS SOCIAL MEDIA
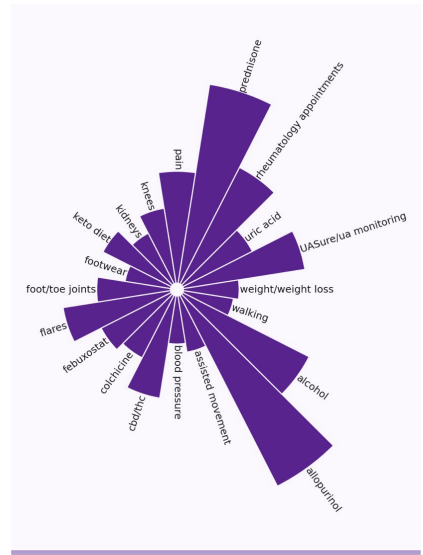


Topic modeling yielded 20 topics that had at least 300 total posts/comments. This approach clustered terms that appeared in similar contexts and shared similar meanings to generate topics. Figure 3 is a topic wheel that illustrates the most frequent topics in gout conversations. Most topics were related to disease management. The largest topic was *allopurinol*, with 1,500+ posts/comments. *UASure/ua monitoring* included 900+ posts/comments, and the smallest topic was *footwear*, with 316 posts/comments.

### FIGURE 4. POLARITY OF GOUT TOPICS



*P < .01, **P < .001
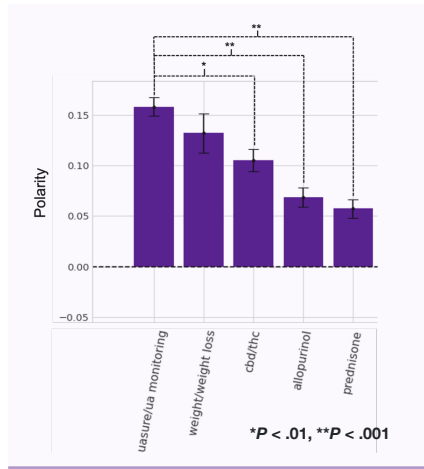
Polarity analysis, which measures positivity/negativity in posts and comments, showed the most positive management topics, in rank order, to be *uric acid monitoring*, *weight loss*, *cbd/thc*, *allopurinol*, and *prednisone*. Each post/comment in a topic is given a polarity score from –1 (most negative) to 1 (most positive). Statistically significant differences were found between mean topic polarities as determined by 1-way ANOVA (F[4,10543] = 16.74, P = .0001). *UASure/ua monitoring* conversation polarity was significantly higher (mean [SD], 0.15 [0.24]; P = .008, Tukey post hoc test) than that of *cbd/thc* conversations, as well as *allopurinol* and *prednisone* conversations but not *weight/weight loss* conversations.

### FIGURE 5. QUESTIONS IN GOUT TOPICS
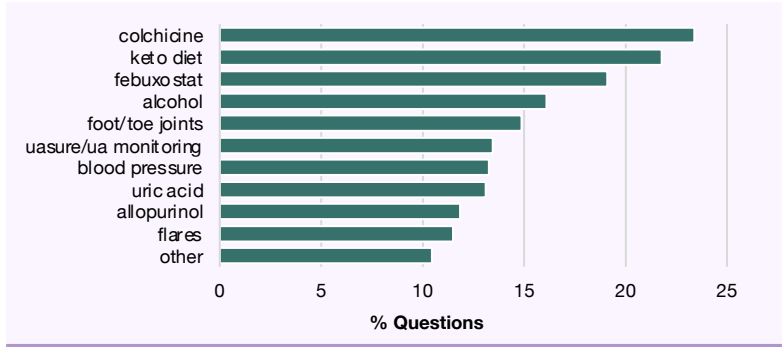


In an exploratory analysis, we evaluated the number of posts/comments per topic that included questions. The topics that included the most questions were *colchicine*, *keto diet*, and *febuxostat*, with 23%, 22%, and 19% of posts/comments including questions, respectively.

## CONCLUSIONS

In a comparison of the top 5 most positive management topics, *UASure/ua monitoring* achieved the highest mean polarity, which was significantly higher than that for other management techniques (*cbd/thc*, *allopurinol*, *prednisone*). Although the functional impact of polarity differences is not easily appraised, these contrasts could suggest that gout community members tend to have more positive experiences with UA monitoring than with reactive management interventions such as prednisone. Further work is needed to continue an investigation of the patient perspective on gout management, which could be an important factor in patients having greater autonomy and participation in controlling their disease.

## DISCLOSURES

# Understanding Community Perspectives on Disease Management: A Social Media Analysis of Gout Care Strategies

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**Background:**
To comprehensively understand the impact of disease management strategies, it is essential to understand the patient perspective. Gout is a chronic inflammatory arthritis characterized by painful joint flare-ups secondary to uric acid accumulation. Virtually all subspecialty groups recommend a proactive "treat-to-target" strategy to reduce serum urate levels, but many individuals living with gout adhere to a "treat-to-no symptoms" strategy. Here, we aimed to characterize gout community perspectives on various management approaches to gout care.

**Methods:**
We evaluated 2 online social media communities using a proprietary analytics engine that evaluates social media conversations using natural language processing. Sources included a private Facebook group, The Gout Support Group of America (15,000+ members), which had 50,000 posts/comments from 2021 to 2023; and a public subreddit, r/gout (9,000+ members), with 125,000 posts/comments from 2011 to 2023. The engine used a topic modeling approach to identify the most frequent conversation themes across groups. Topics related to disease management were then tagged. All management topics were subject to sentiment analysis in which posts/comments were scored from −1 (most negative) to 1 (most positive) using a pretrained sentiment tagger. A final exploratory analysis identified the number of questions in each topic.

**Results:**
Topic modeling yielded more than 30 topics that had at least 300 total posts/comments. Fourteen topics related to disease management (others related to disease burden, etc.). Polarity analysis showed the most positive management topics, in rank order, to be *uric acid monitoring*, *weight loss*, *cbd/thc*, *allopurinol*, and *prednisone*. Statistically significant differences were found between topic polarities as determined by 1-way ANOVA [$F(4,10543) = 16.74$, $P = .0001$]. A Tukey post hoc test revealed that *uric acid monitoring* conversation polarity was significantly higher [mean [SD], 0.15 (0.24); $P = .008$] than *cbd/thc* conversations, as well as *allopurinol* and *prednisone* conversations but not *weight loss* conversations. Exploratory

analysis showed that about 40% of all posts/comments in *disease management* topics included questions, compared with 20% in *disease burden* topics.

**Conclusions:**
Using a proprietary analytics engine, we identified the most prevalent topics of conversation across 2 online gout communities. In comparing the top 5 most positive management topics, *uric acid monitoring* achieved the highest mean sentiment. Though the functional impact of sentiment differences is not easily appraised, these contrasts could suggest that gout community members tend to prefer uric acid monitoring over reactive management approaches such as prednisone. *Disease management* topics were composed of about 40% questions (vs 20% for *disease burden* topics), suggesting that increased awareness of various management strategies could benefit community members. Further work is needed to continue investigation of the patient perspective on gout management, which could be an important factor for patients having greater autonomy and participation in controlling their disease.

**Disclosures:**
The study was funded by Horizon Therapeutics, plc. B.L. and K.D. are employees of and hold stock in Horizon. C.P. is a speaker for Horizon. N.L.E. is a consultant of Horizon. M.F., M.C., C.D., M.P., and E.R.W. are employees of and hold stock in TREND Community. TREND Community's clients are pharmaceutical and biotechnology companies including, but not limited to, Horizon Therapeutics plc.

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