

**Introduction:** Patients are increasingly turning to Large Language Models (LLMs) to better understand their musculoskeletal conditions, especially when patient education materials exceed the AMA-recommended 6th-grade reading level. After surgery, patients may use LLMs to reinterpret complex postoperative instructions. This study evaluated whether commercially available LLMs can improve the readability, understandability, and overall clarity of postoperative instructions for patients undergoing tibial plateau fixation.

**Methods:** Postoperative instructions from a single orthopedic trauma service were input into ChatGPT-5, Claude, and Google Gemini with the prompt: "Please rewrite the following content for a [6th or 4th] grade reading level." Readability was assessed using standard readability indices. Understandability and actionability were measured using PEMAT-P. A fellowship-trained trauma surgeon reviewed outputs for safety.

**Results:** Original instructions had an average readability of grade 8.8 and a PEMAT score of 64.7%. When prompted for a 6th-grade level, Gemini produced grade 6.47 text, while ChatGPT and Claude produced lower reading levels (ChatGPT 5.88; Claude 5). For 4th-grade conversion, Gemini again produced text near the 6th-grade level (5.56), while ChatGPT (4.55) and Claude (4.45) met the target. Claude's PEMAT-P scores for both grade levels were below the acceptable  $\geq 70\%$  threshold (61.11%). For 6th-grade conversions, Gemini produced the highest PEMAT-P score (77.88), slightly outperforming ChatGPT (72.22%). All LLM outputs were judged safe by the trauma surgeon.

**Conclusion:** ChatGPT and Gemini produced more understandable, actionable, and safe postoperative instruction conversions than Claude. LLMs may help patients reshape complex postoperative information into more accessible formats, supporting clearer communication and improved follow-up for individuals with limited health literacy.