

AI-ASSISTED SIMPLIFICATION OF PLASMA CELL DYSCRASIAS AND MYELOID NEOPLASMS CLINIC NOTES TO IMPROVE PATIENT UNDERSTANDING AND SATISFACTION: A PROSPECTIVE PILOT STUDY

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INTRODUCTION

Large Language Models (LLMs) offer a means to convert complex clinical notes into patient-centric narratives to improve outcomes.

AIM

Assess feasibility, safety, readability, and patient reported impact of LLM-converted clinic notes (AI notes) on patient understanding and satisfaction.

METHOD

- Prospective single center pilot study at Moffitt Cancer Center.
- A HIPAA-compliant LLaMA 3.1 70B model prompt engineered and iteratively adapted using synthetic notes to convert clinic notes.
- Targets: Flesch-Kincaid (FK) readability grade ≤ 9 , Patient Education Materials Assessment Tool (PEMAT) Understandability and Actionability $\geq 70\%$, and zero high-risk, ≤ 2 low-risk errors; noncompliant notes regenerated.
- Three physician error review; inter rater reliability via intraclass correlation coefficient (ICC).
- Patient understanding and treatment satisfaction were assessed on 0–10 Likert scales before and after AI note review using survey responses.
- Scores compared with one-sided paired Wilcoxon signed-rank tests since the metrics and survey outcomes were not normally distributed given small sample size.
- Follow up patients with plasma cell dyscrasias or myeloid neoplasms. Thirty enrolled; 24 completed surveys. Median age 68.5 years; 67% female; median time since diagnosis 60 months.

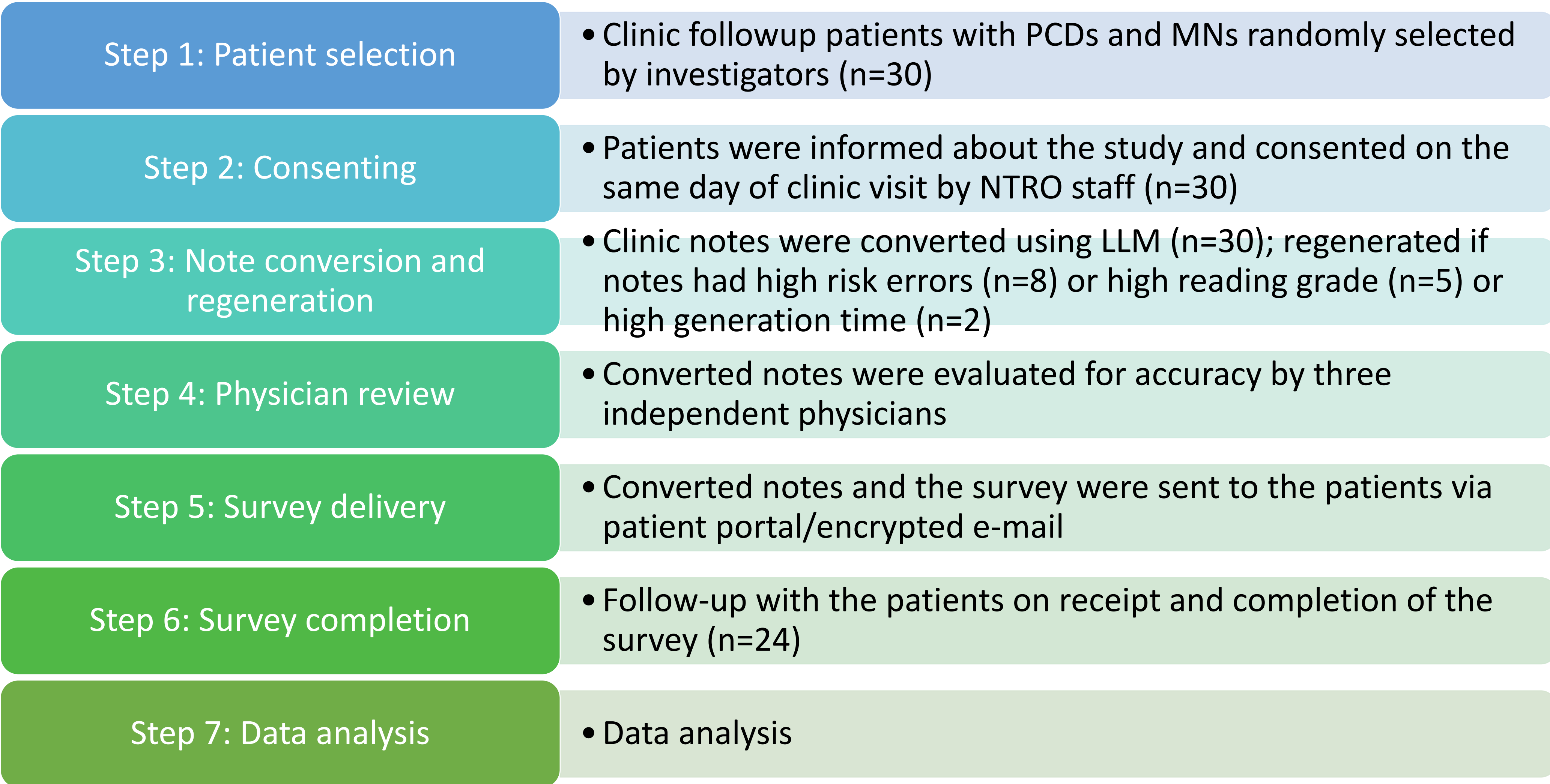


Figure 1. Process diagram of the study.

RESULTS

- AI notes (n=30): higher PEMAT Understandability (+23 points) and Actionability (+40 points), both $p<0.01$, similar readability to original notes (median FK difference -0.19 ; $p=0.9$) and were more concise (median $-1,543$ tokens; $p<0.01$) (**Table 1**).
- Half of the AI notes met safety criteria on first attempt (median 1.5 attempts).
- Overall low error rate (0.53 ± 0.67 per note) with 27% notes error free on first attempt; high risk errors limited to omissions (27%); no hallucinations.
- Good physician agreement on error counts (ICC=0.76).
- Patients reported improved understanding ($p=0.01$) and satisfaction ($p=0.02$) (**Figure 2**).
- Among those with baseline scores ≤ 8 (25%), median improvements: +2 understanding ($p=.03$), +2.5 satisfaction ($p=0.06$).
- All patients reported scores ≥ 8 post AI note review.

Outcome	Comparison	<i>p</i> value†	Mean Difference	Median Difference	One-sided 95% CI	<i>N</i>
Note Metrics						
PEMAT Understandability (%)	AI note – Original note	<0.001	+26.2	+23.0	[23.0, ∞)	30
PEMAT Actionability (%)	AI note – Original note	<0.001	+38.9	+40.0	[40.0, ∞)	30
Flesch–Kincaid Grade Level	AI note – Original note	0.899	−0.33	−0.19	[−0.62, ∞)	30
Note Length (tokens)	AI note – Original note	1.000	−1506.1	−1543.0	[−1916.0, ∞)	30
Patient Reported Outcomes						
Patient Understanding (0–10)	Post – Pre	0.013	+0.67	0.0	[0.0, ∞)	24
Patient Satisfaction (0–10)	Post – Pre	0.022	+0.63	0.0	[0.0, ∞)	24
Patient Understanding (baseline ≤ 8)	Post – Pre	0.031	+2.14	+2.0	[0.0, ∞)	7
Patient Satisfaction (baseline ≤ 8)	Post – Pre	0.063	+2.33	+2.5	[0.5, ∞)	6

Table 1. Paired Comparison of Original vs AI-Converted Notes and Patient-Reported Outcomes

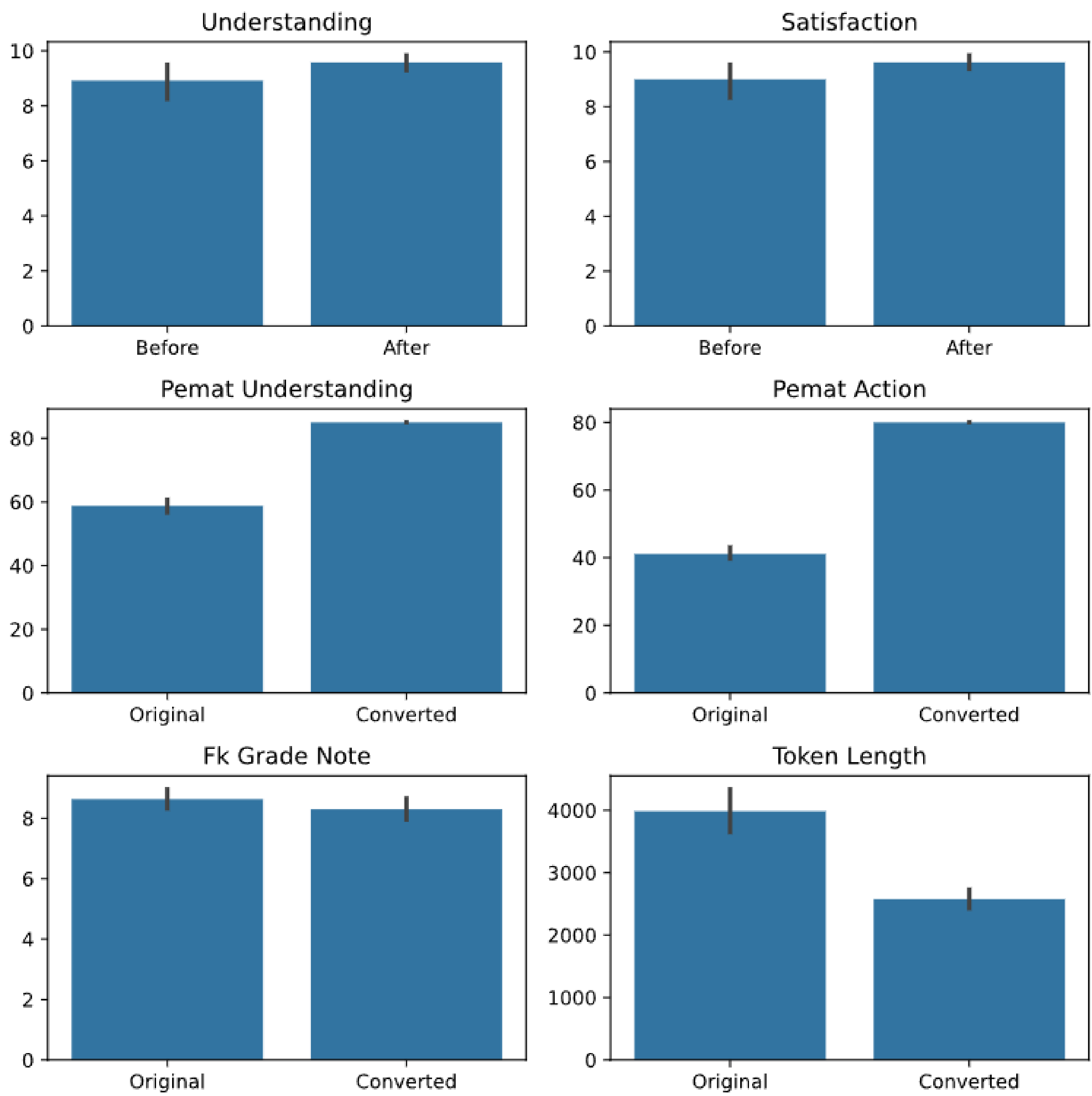


Figure 2 . Bar plots comparing original and AI note across patient understanding, patient satisfaction, PEMAT (Understanding/Actionability), FK grade level, and token length.

CONCLUSIONS

- LLMs can be leveraged to generate accurate, patient-centric clinic notes that enhance actionability of oncology information and potentially improve patient understanding and satisfaction.
- Future efforts will aim to scale the approach and reduce errors.

CONTACT INFORMATION

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