

Generative AI to Draft Patient Portal Messages at Stanford Medicine



About Stanford Medicine

Stanford Medicine is an academic medical center providing advanced patient care, pioneering research, and medical education. A collaboration between the Healthcare AI Applied Research Team (HEA₃ RT) Clinical Informatics, and IT teams drives the development of AI use cases at Stanford.



The problem

Stanford has seen a significant increase in the volume of patient portal messages, especially since the COVID-19 pandemic. This surge has substantially increased clinician workload and has been a contributing factor to burnout. Leadership saw the potential of generative AI to help with routine communications but needed real-world evidence of its effectiveness, safety, and impact on clinician burden before committing to a broader, more significant investment.



The solution

A multidisciplinary team developed and deployed a HIPAA-compliant tool that integrates directly with Epic. This tool utilizes GPT-4 to automatically generate draft replies to patient portal messages and maintains a "human-in-the-loop" design to ensure that the clinician always has final control over the communication.



The approach

HEA₃ RT, in collaboration with clinical and IT, conducted a 5-week pilot program involving 162 clinicians from primary care and gastroenterology to directly inform decisions about scaling the tool. A rigorous, mixed-methods approach was used to assess the tool's impact, which included:

- **Quantitative analysis:** Track adoption, utilization, and measure changes in clinician task load and work exhaustion using validated instruments.
- **Qualitative analysis:** Review survey responses for user experiences, AI draft feedback, and improvement ideas.
- **Safety measures:** Implement a shared governance structure for rapid learning; review low-edit-distance messages for risks and clinical appropriateness.



The success

The pilot successfully provided rapid insights and evidence, leading Stanford to expand the tool across all ambulatory specialties and demonstrating how rigorous research can directly advance clinical operations.

- ✓ **Strong adoption:** The tool saw a 20% average utilization rate, with even higher adoption in subgroups like nurses and clinical pharmacists.
- ✓ **Reduced burnout:** Clinicians reported significant improvements in task load and emotional exhaustion, indicating a reduction in cognitive effort
- ✓ **Actionable feedback:** Users found the tool valuable for reducing cognitive load and provided constructive feedback for refining the AI's tone, brevity, and accuracy.
- ✓ **Rapid and timely Insights:** The project went from pilot to publication in under nine months, with actionable insights available just weeks after the pilot to enable swift decision-making.