

Carpal Tunnel Surgery Information: Comparison of AI generated information with Google search for common patient questions

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INTRODUCTION: The integration of artificial intelligence (AI) in medicine is marking a significant shift in patient care and education. The emergence of machine learning (ML) tools and large language models (LLM) like ChatGPT and Google Bard have the potential to enhance patient knowledge and assist in decision-making processes. Our study focuses on the role of such AI tools in providing accurate and reliable information for patients exploring carpal tunnel surgery options. Specifically, we aim to compare the efficacy of ChatGPT and Google Bard against Google Web Search, the predominant search engine in the U.S., in delivering relevant and accurate information.

METHODS: We collected the top 10 questions and answers from Google's "People also ask" section, using "carpal tunnel release" as a search term, and conducted a similar query on ChatGPT using versions 3.5 and 4 (with WebChat GPT and KeyMate AI plugins), and Google Bard (Figure 1). Repetitive or irrelevant questions were excluded. Google Search and ChatGPT 4 versions provided sources while ChatGPT 3.5 and Google Bard do not. The sources were verified using the Health on the Net Foundation criteria. All responses were also examined for accuracy by two board-certified orthopedic hand surgeons blinded to the source of answers. They were graded on a scale as follows: 1 (incorrect), 2 (mixed correct and incorrect), 3 (correct but not comprehensive), 4 (comprehensive and correct). Ultimately, grading categorization for accuracy was divided into two groups: grades 1 and 2 as inaccurate, and grades 3 and 4 as accurate. Cohen's Kappa coefficients were used to determine interobserver reliability for the answer assessment.

RESULTS: Our study showed that AI tools delivered substantial knowledge of carpal tunnel release and were better than the traditional Google search (Table 1). Only one Google search answer was deemed accurate (10%) whereas, ChatGPT 3.5, ChatGPT 4 with Webchat, ChatGPT with KeyMate AI, and Google Bard were 70%, 70%, 100%, and 90% accurate respectively. As to comprehensiveness of answers, no Google search or Google Bard answers met that standard (grade 4), whereas 20% of ChatGPT 3.5, 20% of ChatGPT4 with Webchat, and 50% of ChatGPT with KeyMate AI were deemed comprehensive by both surgeons. The most common sources for Google search and both ChatGPT 4 versions were academic and non-profit websites. The interobserver reliability between the two evaluators resulted in a Cohen's kappa coefficient of 0.691, a standard error of 0.115, 95% confidence interval 0.465 to 0.916. This kappa value, falling between 0.61 and 0.80, indicates substantial agreement.

DISCUSSION AND CONCLUSION: LLMs have promise as an information source for patients with more accurate information than a traditional Google search. However, reliability and comprehensiveness of answers need further validation. The tool's capability to provide trustworthy information must align with the objectives of both physicians and patients

Google Search	During open carpal tunnel release surgery, the transverse carpal ligament is cut, which releases pressure on the median nerve and relieves the symptoms of carpal tunnel syndrome. An incision is made at the base of the palm of the hand. This allows the doctor to see the transverse carpal ligament.
ChatGPT 3.5	Carpal tunnel release is a surgical procedure performed to treat carpal tunnel syndrome. During the surgery, the transverse carpal ligament, which forms the roof of the carpal tunnel in the wrist, is cut or divided. This releases pressure on the median nerve, which passes through the carpal tunnel, relieving the symptoms associated with carpal tunnel syndrome such as pain, tingling, and numbness in the hand and fingers.
ChatGPT4 Webchat	In a carpal tunnel release, the procedure involves accessing the wrist's transverse carpal ligament through small incisions. The goal is to expand the carpal tunnel, which in turn alleviates pressure on the median nerve. This surgery is performed to address symptoms of carpal tunnel syndrome, such as pain, numbness, tingling, and weakness in the hand and thumb, all of which are caused by compression of the median nerve.
ChatGPT4 KeyMate AI	Carpal tunnel release is a surgical procedure used to treat and potentially alleviate the painful condition known as carpal tunnel syndrome. Here's a detailed explanation of the procedure: Procedure: During a carpal tunnel release, a surgeon cuts through the ligament that is pressing down on the carpal tunnel, specifically the transverse carpal ligament. This action creates more space for the median nerve and tendons passing through the tunnel, which typically results in pain relief and improved function. Types of Surgery: There are two primary methods for carpal tunnel release: Open Release: In this traditional method, the surgeon makes an approximately 2-inch incision on the wrist and uses surgical instruments to cut the carpal ligament and enlarge the carpal tunnel. Endoscopic Carpal Tunnel Release: In this method, the surgeon makes two half-inch incisions, one on the wrist and one on the palm. A camera attached to a narrow tube is inserted into one incision, guiding the surgeon as they use instruments to cut the carpal ligament through the other incision.
Google Bard	A carpal tunnel release is a surgical procedure that is used to relieve pressure on the median nerve in the wrist. During a carpal tunnel release, the surgeon makes an incision in the palm of the hand and cuts the carpal ligament, which is a band of tissue that helps to hold the median nerve in place. This allows the median nerve to have more space to pass through the carpal tunnel.

Figure 1: Responses from all models for Question 1: "What happens during a carpal tunnel release?"

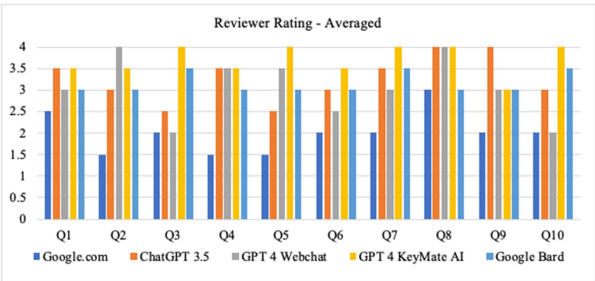


Table 1: Reviewer Grading Responses - Averaged