

ChatGPT for the Standardized Operative Notes in Plastic Surgery

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Dear Editor,

ChatGPT (Open AI, San Francisco, CA, USA) was released on November 30, 2022. It is a conversational AI model developed by OpenAI. It is based on the GPT (Generative Pretrained Transformer) architecture that responds conversationally to all human text inputs [1]. This powerful tool is being explored to be used in full capacity in various fields of life. In the medical field, it can not only enhance medical practice by conversationally providing complex information but also can potentially be used for writing medical documents of medicolegal significance (*e.g.* discharge summaries, *etc.*) [2]. Good quality operative notes with adequate details are important information to maintain continuity of care between medical teams, serve as a source of information for future reference, for medical reimbursement, and above all, this document has legal implications.

Like other medical professionals and AI enthusiasts, I was keen to know about the possible contributions of ChatGPT to medical documentation. So, I inquired about ChatGPT itself, the following:

PROMPT:

What role can ChatGPT play in the standardization of operative notes in surgery?

ChatGPT:

As a language model AI, chatGPT can play a crucial role in standardizing operative notes in surgery by providing a consistent and standardized language for documenting surgical procedures. It can assist surgeons in writing operative notes that follow the standard terminology and format. By using ChatGPT, surgeons can ensure that all the relevant information is recorded and documented correctly, avoiding ambiguity and reducing the possibility of misinterpretation of information.

Additionally, ChatGPT can also provide real-time assistance during surgeries, allowing the surgeon to quickly document key information while they are operating. This can be especially useful in high-pressure situations where the surgeon needs to focus on the surgery but still wants to make sure the operative notes are accurate.

It was interesting to note from the above response by this AI model, that ChatGPT understands the key points required in an operative note, as highlighted in the above response, that writing operative notes *via* ChatGPT will provide standardization of medical terminologies in notes, accuracy, real-time assistance to the surgeons. All these features will ultimately increase the quality of operative notes as these details can be missed when writing manual notes, without any template. As reported in previous studies [3]. To my curiosity, I further asked ChatGPT to elaborate:

PROMPT:

What role can ChatGPT play in the standardization of operative notes in surgery? Please elaborate top 5 crucial roles.

ChatGPT:

1. Data Collection and Analysis: ChatGPT can be trained to understand and analyze large amounts of operative notes data to identify patterns, discrepancies, and areas for improvement in standardization.
2. Natural Language Processing: By leveraging the NLP capabilities of ChatGPT, it can assist in converting unstructured data present in operative notes into structured format, making it easier to analyze and standardize.
3. Content Suggestion and Validation: ChatGPT can suggest standardized content based on previously recorded operative notes and can validate the content of new notes to ensure conformity with established standards.
4. Terminology Standardization: ChatGPT can be trained to recognize and standardize medical terminology used in operative notes to eliminate confusion and improve communication between medical professionals.
5. Automated Reporting: ChatGPT can assist in the generation of automated reports based on standardized operative notes, reducing the manual effort required and improving the accuracy of the reports.

Highlighting the importance of ChatGPT and its capabilities, I decided to test the medical knowledge and the possibility of drafting an operative note by ChatGPT, I prompted the AI model:

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PROMPT:

Write me an operative note for a 70-year-old man who had undergone free anterolateral thigh flap reconstruction of the oral cavity after excision of buccal mucosa squamous cell carcinoma.

ChatGPT:

^bOperative Note: Free Anterolateral Thigh Flap Reconstruction of the Oral Cavity

^aDate of Operation: [Insert Date]

^aTime of Operation: [Insert Time]

Anesthesia: General Anesthesia

Patient: [Insert Patient Name], 70-year-old male

^dDiagnosis: Buccal Mucosa Squamous Cell Carcinoma

Preoperative Preparation:

- The patient was thoroughly informed about the procedure and its benefits and risks.
- All necessary investigations, including complete blood count, coagulation profile, and chest x-ray were done and found to be within normal limits.
- A consent form was signed by the patient or his legal guardian.
- A preoperative fasting of 6 hours was observed.
- The patient was prepped and draped in a sterile manner.

^eOperative Procedure:

- A skin incision was made over the anterolateral thigh and the skin paddle was elevated subcutaneously, preserving the perforators.
- The vastus lateralis muscle was divided and the nerve and vessels were coagulated and divided.
- The skin paddle was then inset into the oral cavity after excision of the buccal mucosa squamous cell carcinoma.
- The skin paddle was secured with interrupted sutures.
- ^fThe donor site was closed with subcuticular sutures.

^gPostoperative Management:

- The patient was transferred to the postoperative care unit in a stable condition.
- Vitals were monitored regularly.
- The pain was managed with appropriate medications.
- Antibiotics were administered as per the protocol.
- The patient was advised to maintain adequate hydration and nutrition.

Conclusion: The free anterolateral thigh flap

reconstruction of the oral cavity after excision of buccal mucosa squamous cell carcinoma was performed successfully, and the patient tolerated the procedure well. The patient was stable postoperatively and was ready for discharge.

ⁱSignatures:

Surgeon: [Insert Surgeon’s Name]

Anesthesiologist: [Insert Anesthesiologist’s Name]

This operative note was compared with the criteria mentioned in the Royal College of Surgeons’ good practice guidelines [4]. On comparison, 7 details were missing from the automated operative note when compared to the RCS checklist and the majority of these missing information varies from case to case and needs to be specified by the operating team’s member for every individual surgery. Overall, ChatGPT operative note score was 58.8 %, which is crucially low and indicates sub-optimal standards for operative notes (**Table 1**).

Moreover, specifically regarding reconstructive procedures like free flap, certain details need to be documented. These details include marking of the flap, dimensions of the flap, ischemia time, name and side of recipient vessels used in anastomosis, *etc*. Based on the above observations, these details along with other special details need to be mentioned manually by the operating team member.

Table 1: The following table provides a quick glimpse of missing components from AI-generated surgical procedure notes.

RCS Operative Notes Checklist	Presence in ChatGPT Drafted Operative Note
- Date and time	Present ^a
- Elective/emergency procedure	Not mentioned
- Names of the operating surgeon and assistant	Not mentioned
- Operative procedure carried out	Present ^b
- Incision	Present ^c
- Operative diagnosis	Present ^d
- Operative findings	Present ^d
- Any extra procedure performed and the reason why it was performed	Not mentioned
- Details of tissue removed, added, or altered	Present ^e
- Identification of any prosthesis used, including the serial numbers of prostheses and other implanted materials	Not mentioned
- Details of closure technique	Present ^f
- Anticipated blood loss	Not mentioned
- Antibiotic prophylaxis (where applicable)	Not mentioned
- DVT prophylaxis (where applicable)	Not mentioned
- Detailed postoperative care instructions	Present ^g
- Any problems/complications	Present ^h
- Signature	Present ⁱ
Score:	10/17

Hence, ChatGPT can be considered as an initial step in the drafting of an operative note but the addition of key information, revision, and checking by the surgeons is still required for finalization of the note. Moreover, since this is an artificial intelligence chatbot, it cannot take full responsibility or ownership of the documented text.

The release of ChatGPT is considered to be, ‘the beginning of the AI wars, as now, Google has recently launched its new experimental conversational AI service, named “Bard” [5]. Based on the promising features of chatbots of ChatGPT in medical writing, it will be interesting to know what “Bard” has to offer for the medical field.

This AI model has sound knowledge about patterns of medical documentation, and it can be used as an adjunct tool only. Operative notes generated by ChatGPT can save time, but it requires to be reviewed and tailored as per case-to-case scenario. Moreover, multiple other ethical issues need to be addressed before using ChatGPT for operative note writing like; legal liability of the AI-generated document, accountability, professional autonomy, and patient’s data security. In conclusion, the potential for AI chatbots in medical documentation is promising, but a considerable journey lies ahead before their safe integration into healthcare.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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Declared none.

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