respondents were majority non-Hispanic (78.6%) white (66.8%) women (59.5%) in the role of faculty/independently practicing physicians (65.8%). Only 12.3% of respondents identified as Hispanic/Latino, followed by 8.6% Black/African American, and <1% each American Indian/Alaskan Native and Native Hawaiian Pacific Islander. Approximately one third of respondents were first-generation low-income (FGLI) and/or LGBTQIA+ identifying (34.2%). Half of respondents were a program Chief/Chair or Program Director, with 71% of respondents working in an academic setting.

Faculty were significantly less likely to deem lack of surgeon diversity as a top 3 weakness (χ^2=19.278, p<.001) compared to trainees, yet they did identify it as a top 3 threat to the specialty (χ^2=20.639, p<.001). Black/African American, FGLI, and LGTQIA+ respondents were significantly more likely to deem lack of surgeon diversity as a top 3 weakness (p<.001 for all) and a top 3 threat (p<.05 for all).

When comparing academic and non-academic surgeons, the former were more likely to deem collaboration with other specialists as a strength (χ^2=13.276, p<.001) and perception of plastic surgery by other specialties as a threat (χ^2=4.546, p=.035), while non-academic surgeons were more likely to identify improvement in patient quality of life (χ^2=7.325, p=.006) as a strength and scope of practice creep by non-physicians as a threat (χ^2=7.242, p=.011).

All three training levels identified technical ability and collaborative/team player among the top five most important qualities of an excellent plastic surgeon.

CONCLUSION: Demographic minority groups and trainees are more likely to identify lack of surgeon diversity as a weakness and a threat to the future of the specialty. Furthermore, different strengths and threats emerged based on practice in an academic or non-academic setting. Regardless of training level, technical competence and collaborative skill are highly valued.

Augmented Reality in Plastic and Reconstructive Surgery: What It Is, How Far It's Come, and the Limitations Impacting Further Adoption

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BACKGROUND: Augmented reality (AR) is the process of visually overlaying digital information on top of the physical world and can include interactions between the digital display and physical world. Within the field of plastic and reconstructive surgery (PRS), AR can utilize patient imaging to aid preoperative surgical planning, intraoperative image guidance, as well as patient and resident education. Previous reviews of AR in PRS have been limited in not addressing the underlying technological shortcomings of AR nor fully evaluating physician usability limitations. In this review, we discuss both current uses as well limitations that need to be addressed as development moves forward.

METHODS: A review of relevant literature was conducted. Electronic databases were screened using keywords including "augmented reality," "mixed reality," and "plastic surgery." Studies were individually assessed for quality using technological usability heuristics.

RESULTS: A total of 90 studies were reviewed. Several studies used the phrase "augmented reality" interchangeably with other imaging and guidance modalities, especially other types of extended reality, such as mixed reality (MR) or virtual reality (VR). Of the applied AR device studies, primary usage fell into one of three categories: preoperative surgical planning, intraoperative surgical guidance, or surgical education. A wide range of devices within the AR umbrella were utilized, with studies most commonly citing the HoloLens (Microsoft LLC, Redmond, Wash.). Across several plastic surgical subspecialties, AR has demonstrated practicality and success in surgical planning and education but minimal intraoperative usage due to device specific limitations or issues with physician usability. The most cited technical issues hampering widespread adoption were software difficulties distinguishing soft tissue and need to streamline artificial marker registration. Meanwhile, physician usability issues included limited field of vision, insufficient battery life and dim viewing conditions.

CONCLUSION: The utility of augmented reality in plastic surgery is an exciting and nascent field of study. While there have been many initial attempts to develop relevant technology, significant limitations remain that constrain AR's ability to be used as an autonomous intraoperative guidance system. Promoting engineering-physician partnerships will

allow for prioritization of key physician usability issues critical for AR's success in the operating room.

Rethinking Visualizations in Plastic Surgery: Open-Source Artificial Intelligence Can Accelerate Cosmetic and Reconstructive Operative Techniques and Reports

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INTRODUCTION: Artificial intelligence (AI) describes the field of computer learning that relies on extensive data sets and has accelerated in its capabilities through a transition to open source code. We reviewed widely used current AI softwares surrounding smart speech-to-text transcriptions,1 computer-generated images from text,2 and conversational Chat programs,3 to illustrate how open-sourced AI (OpenAI) can be incorporated into the plastic surgeon's toolkit now, and how it may change the field in the future.

METHODS: We trialed the following OpenAI interfaces: (1) Stable Diffusion and (2) DALL-E, both text-to-image applications; (3) Clip, an image-to-text program, and (4) ChatGPT, a conversational Chat AI software. Inputs included operative descriptions from plastic surgeon operative notes, de-identified images from plastic surgery case reports, and verbal descriptions discussing operative techniques. AI-generated outputs were evaluated for accuracy to true anatomy and steps in the surgical procedure.

RESULTS: Current OpenAI systems can generate semi-accurate depictions of surgical procedures using phrases from operative reports. Stable Diffusion has the benefit of "image-to-image" mode, in which users can command the program to edit an existing image via a text prompt. This process allows for more accurate image adjusting via iteratively composing an image.

To convert intraoperative images and videos into operative notes, we found that CLIP and ChatGPT can generate captions for inputted images.4 However, the program is pre-trained on public image databases which are currently limited in relevant content for surgical purposes. More development is needed before these programs can describe more specialized images. With a broader training database, OpenAI can be expanded to caption intraoperative images.

CONCLUSION: Open source, web-based applications can generate and edit accurate operative and anatomical figures. As researchers refine AI image and video generation, plastic surgeons can use AI to make operative reports more image- and video-based and accelerate the operative report writing process.

REFERENCES:

1. Whisper.ai I. Whisper.ai. Updated 2022. Accessed 02/25/23, https://whisper.ai/
2. Online SD. Stable Diffusion. Accessed 02/25/23, https://stablediffusionweb.com/
3. OpenAI. ChatGPT. Updated 02/13/23. Accessed 02/25/23, https://chat.openai.com/chat
4. Mokady R, Hertz A, Bermano AH. ClipCap: CLIP Prefix for Image Captioning. 2021;doi:10.48550/arxiv.2111.09734

The Surprising Effect of Silicone Shells on the Growth of Primary Benign and Malignant Cells

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PURPOSE: Breast implant safety is a prominent topic within reconstructive surgery. The recognition of the role played by the breast implant shell in the development of Breast Implant Associated Anaplastic Large Cell Lymphoma (BIA-ALCL) has spurred further intense investigation into the interactions between the breast implant shell and the cells commonly found around them. Although most previous studies examined cells directly seeded onto the shells, herein we investigated the direct and indirect interactions between silicone implant shells (textured and smooth) and both primary benign and triple negative breast cancer (TNBC) cells.

METHODS: MDA-MB-231 TNBC cells and HFF-1 human foreskin fibroblast cells were cultured in media containing 10% fetal bovine serum and 1% penicillin/streptomycin. Adenovirus transfected genetically-modified