

## **A Systematic Review of Patient Satisfaction and Mohs Micrographic Surgery: Techniques for Improvement**

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#### Introduction

Mohs Micrographic Surgery (MMS), one of the most intricate procedural styles in the field of Dermatology, aims to rid patients of cancerous conditions while maximizing the conservation of healthy tissue. The precise layer-by-layer approach truly augments both cosmetic results and overall success rates. The procedure relies not only upon surgical skill but also coordination of the interprofessional team to ensure the best outcomes for patients. Given the sensitive nature of MMS procedural sites, optimizing the well-being of patients pre-, peri-, and postoperatively is of the utmost importance. Alleviating patient fears as well as fostering an increased understanding of the procedure itself lie at the heart of overall patient satisfaction. Techniques to improve peace of mind, such as preprocedural educational materials, intraoperative music, and postprocedural enhanced wound care, have been explored to date. Though further research is certainly warranted, synthesizing existing literature will allow for the most comprehensive plan of action for future MMS patients. This systematic review seeks to uncover and analyze the most well-received methods in patient satisfaction utilized in MMS.

#### Methods

A literature review was conducted through PubMed and included a keyword search using: "Mohs" and "patient satisfaction" as qualifiers. Studies including standardized, objective patient satisfaction tools were of particular interest. The review included a total of 23 studies chosen from pre-designated inclusion and exclusion criteria. These points of distinction are identified below.

#### **Inclusion Criteria:**

- Original research articles
- Articles assessing patient satisfaction in Mohs micrographic surgery
- Articles reporting techniques for improvement in MMS
- Studies published in English

Exclusion Criteria:

- Review articles
- Editorials
- Conference abstracts
- Case reports
- Studies not focused on patient satisfaction or without clear interventions for improvement
- Studies with insufficient data for extraction and analysis

A standardized data extraction form was used to collect relevant information from the included studies, such as study characteristics, patient demographics, and satisfaction outcome measures. A narrative analysis was then conducted to determine the most effective techniques to improve patient satisfaction.



### Outcomes

**Figure 3**. Statistically significant (p<0.05) preoperative, intraoperative, and postoperative interventions for patient satisfaction

# **Midazolam for** Anxiolysis in **Healthy Patients** (p=0.007) Personalized **Music During** Surgery (p<0.01) **Topical Antibiotics For Postoperative** Wound Care (p<0.001)

## **Discussion and Conclusion**

Key findings of the systematic review regarding MMS techniques for improvement are as follows:

- Multimedia videos were well-received by new MMS patients, with existing patients showing a preference for the narrative format.
- A 10-minute VR experience post-first Mohs layer removal significantly reduced feelings of fear and nervousness.
- Personalized music during MMS enhanced patients' perceptions.
- Postoperative interventions, such as specific wound dressings, showed better healing outcomes, while others like antibiotics offered better comfort and satisfaction.

This synthesis highlights several key interventions that can be made prior throughout the entirety of the MMS process. While certain results were statistically significant, many others were clinically significant as explained further in the individual studies. Because patient satisfaction is measured through various different scales, an additional analysis is warranted through a more standardized approach. Incorporating similar techniques into regular dermatologic practice may further increase the benefits of MMS.

## References

- Aleisa A, Veldhuizen IJ, Rossi AM, Nehal KS, Lee EH. Patient Education on Scarring Following Mohs Micrographic Surgery: Patient Preference for Information Delivery. Dermatol urg. 2022 Nov 1:48(11):1155-1158. doi: 10.1097/DSS.000000000003557. Epub 2022 Aug 23. PMID: 36342247 Asgari MM, Warton EM, Neugebauer R, Chren MM. Predictors of patient satisfaction with Mohs surgery: analysis of preoperative, intraoperative, and postoperative factors in a ospective cohort. Arch Dermatol. 2011 Dec;147(12):1387-94. doi: 10.1001/archdermatol.2011.319. PMID: 22184760; PMCID: PMC3620041
- Academy of Dermatology (2020), doi: https://doi.org/10.1016/j.jaad.2020.07.106.
- opical triple antibiotic in dermatologic surgical procedures including Mohs micrographic surgery. J. Eur. Acad. Dermatol. Venereol., 35: 247-255. https://doi.org/10.1111/jdv.16965 Beroukhim K, Goldberg LH, Tarantino IS, Kimyai-Asadi A. The effect of intraoperative pain on patient satisfaction during Mohs micrographic surgery. J Am Acad Dermatol. 2022 Oct;87(4):848-849. doi: 10.1016/j.jaad.2021.10.025. Epub 2021 Oct 22. PMID: 34695530
- Biro M, Kim I, Huynh A, Fu P, Mann M, Popkin DL. The use of 3-dimensionally printed models to optimize patient education and alleviate perioperative anxiety in Mohs micrographic surgery: A randomized controlled trial. J Am Acad Dermatol. 2019 Dec;81(6):1339-1345. doi: 10.1016/j.jaad.2019.05.085. Epub 2019 Jun 1. PMID: 31163232; PMCID: PMC7031844. Condie D, West L, Hynan LS, Srivastava D. Patient Satisfaction With Mohs Surgery for Melanoma In Situ. Dermatol Surg. 2021 Feb 1;47(2):288-290. doi:
- 0002281. PMID: 31809345. Dabiri G, Tiger J, Anderson H, Iwamoto S. Patient Satisfaction After Mohs Surgery is not Dependent on Seeing Post-Mohs Defect Prior to Repair. J Clin Aesthet Dermatol. 2015
- 9. Delcambre M, Haynes D, Hajar T, Golden S, Bar A, Latour E, Leitenberger JJ. Using a Multimedia Tool for Informed Consent in Mohs Surgery: A Randomized Trial Measuring Effects on Patient Anxiety, Knowledge, and Satisfaction. Dermatol Surg. 2020 May;46(5):591-598. doi: 10.1097/DSS.00000000002213. PMID: 31634258. Gohari S, Gambla C, Healey M, Spaulding G, Gordon KB, Swan J, Cook B, West DP, Lapiere JC. Evaluation of tissue-engineered skin (human skin substitute) and secondary intention healing in the treatment of full thickness wounds after Mohs micrographic or excisional surgery. Dermatol Surg. 2002 Dec;28(12):1107-14; discussion 1114. doi:
- 10.1046/j.1524-4725.2002.02130.x. PMID: 12472488. Hafiji J, Salmon P, Hussain W. Patient satisfaction with post-operative telephone calls after Mohs micrographic surgery: a New Zealand and U.K. experience. Br J Dermatol. 2012 Sep;167(3):570-4. doi: 10.1111/j.1365-2133.2012.11011.x. Epub 2012 Jul 19. PMID: 22524509. Hawkins SD, Koch SB, Williford PM, Feldman SR, Pearce DJ. Web App- and Text Message-Based Patient Education in Mohs Micrographic Surgery-A Randomized Controlled Trial. Dermatol Surg. 2018 Jul;44(7):924-932. doi: 10.1097/DSS.000000000001489. PMID: 29406486.
- 13. Higgins S, Feinstein S, Hawkins M, Cockburn M, Wysong A. Virtual Reality to Improve the Experience of the Mohs Patient-A Prospective Interventional Study. Dermatol Surg. 2019 Aug;45(8):1009-1018. doi: 10.1097/DSS.00000000001854. PMID: 30883476; PMCID: PMC7493461 14. J. Mann and others, Home viewing of educational video improves patient understanding of Mohs micrographic surgery, Clinical and Experimental Dermatology, Volume 47, Issue 1, 1 January 2022, Pages 93–97, https://doi.org/10.1111/ced.14845
- 15. Lee EB, Ford A, Clarey D, Wysong A, Sutton AV. Patient Outcomes and Satisfaction After Mohs Micrographic Surgery in Patients With Nonmelanoma Skin Cancer. Dermatol Surg. 2021 Sep 1;47(9):1190-1194. doi: 10.1097/DSS.00000000000000106. Erratum in: Dermatol Surg. 2021 Dec 1;47(12):1682. PMID: 34148996. 16. Majd A, Akbari A, Zloty D. Quantification of Erythema Associated With Continuous Versus Interrupted Nylon Sutures in Facial Surgery Repair: A Randomized Prospective Study. Dermatol Surg. 2020 Jun;46(6):757-762. doi: 10.1097/DSS.00000000002145. PMID: 31490310. Morganroth PA, Gelfand JM, Jambusaria A, Margolis DJ, Miller CJ. A randomized, double-blind comparison of the total dose of 1.0% lidocaine with 1:100,000 epinephrine versus 0.5% lidocaine with 1:200,000 epinephrine required for effective local anesthesia during Mohs micrographic surgery for skin cancers. J Am Acad Dermatol. 2009 Mar;60(3):444-52.
- doi: 10.1016/j.jaad.2008.08.001. PMID: 19231641. 18. Newsom E, Lee E, Rossi A, Dusza S, Nehal K. Modernizing the Mohs Surgery Consultation: Instituting a Video Module for Improved Patient Education and Satisfaction. Dermatol Surg. 2018 Jun;44(6):778-784. doi: 10.1097/DSS.0000000000001473. PMID: 29642110; PMCID: PMC6794002 19. Persichetti GB, Walling HW, Ceilley RI. Personalized music enhances patient perception of the Mohs surgery experience. Dermatol Surg. 2009 Feb;35(2):265-7. doi:
- 10.1111/j.1524-4725.2008.34422.x. PMID: 19215268. 20. Ravitskiy L, Phillips PK, Roenigk RK, Weaver AL, Killian JM, Hoverson Schott A, Otley CC. The use of oral midazolam for perioperative anxiolysis of healthy patients undergoing
- Mohs surgery: conclusions from randomized controlled and prospective studies. J Am Acad Dermatol. 2011 Feb;64(2):310-22. doi: 10.1016/j.jaad.2010.02.038. PMID: 21238825. Sobanko JF, Da Silva D, Chiesa Fuxench ZC, Modi B, Shin TM, Etzkorn JR, Samimi SS, Wanat KA, Miller CJ. Preoperative telephone consultation does not decrease patient anxiety before Mohs micrographic surgery. J Am Acad Dermatol. 2017 Mar;76(3):519-526. doi: 10.1016/j.jaad.2016.09.027. Epub 2016 Dec 4. PMID: 27923500
- Vance S, Fontecilla N, Samie FH, Patel V, Lewin JM. Effect of Postoperative Telephone Calls on Patient Satisfaction and Scar Satisfaction After Mohs Micrographic Surgery. Dermatol Surg. 2019 Dec;45(12):1459-1464. doi: 10.1097/DSS.000000000001913. PMID: 30908363 Veldhuizen IJ, Lee EH, Kurtansky NR, van Hensbergen LJ, Dusza SW, Hölscher MC, van der Hulst RRWJ, Ottenhof MJ, Pusic AL, Hoogbergen MM. To see or not to see: Impact of
- viewing facial skin cancer defects prior to reconstruction. Arch Dermatol Res. 2021 Dec;313(10):847-853. doi: 10.1007/s00403-021-02187-1. Epub 2021 Jan 30. PMID: 33515277. Xu S, Atanelov Z, Bhatia AC. Online patient-reported reviews of Mohs micrographic surgery: qualitative analysis of positive and negative experiences. Cutis. 2017 Feb;99(2):E25-E29. PMID: 28319637.
- 25. Yonan Y, Ochoa S. Impact of Smoke Evacuation on Patient Experience During Mohs Surgery. Dermatol Surg. 2017 Nov;43(11):1363-1366. doi: 10.1097/DSS.000000000001195 PMID: 28562439.



Bednarek R, Jonak C, Golda N, Optimal timing of postoperative patient telephone calls after Mohs micrographic surgery: A randomized controlled trial, Journal of the American Benedetto, A.V., Staidle, J.P., Schoenfeld, J., Benedetto, E.A. and Benedetto, P.X. (2021), Comparing the use of a novel antibiotic-free film-forming topical wound dressing versus a