

# Factors Affecting Follow-Up Adherence Following Mohs Micrographic Surgery for Non-Melanoma Skin Cancer

Sumrah Jilani, BS; Nina D'Amiano, BA; Jeremy Ellis, BS; Anjali D'Amiano, BA; Elena Wei, BA; Katherine G. Thompson, MD; Jeffrey F. Scott, MD, MHS

Medical Student Research Symposium

Johns Hopkins University School of Medicine, Baltimore, Maryland, USA

## BACKGROUND

- Non-melanoma skin cancer (NMSC) is the most common type of cancer, often treated with Mohs micrographic surgery (MMS)
- It is essential to monitor for post-operative complications, recurrences, & new lesions after surgery
- Our practice recommends patients follow up every six months for first two years after diagnosis
- Limited studies currently on patient follow-up adherence in this setting

## STUDY OBJECTIVE

- Determine what factors may impact level of patient follow-up adherence
- Identify possible associations with patient health outcomes.

## METHODS

- Study Design:** Retrospective chart review
- Setting:** Academic medical center
- Population**
  - Adult patients treated with MMS for NMSC at JHH Cutaneous Surgery & Oncology Unit
  - Oct 2016 – Oct 2017
  - Excluded patients who follow with outside general dermatologist
- Data Collection**
  - Chart Review of Dermatology Procedure & Office Visit Notes
- Main Outcomes**
  - Number of Follow-Up Visits
  - Follow-Up Adherence Rate
  - Subsequent Skin Cancer Diagnoses
- Data Analysis**
  - Negative binomial models
  - Grouped logistic regression
  - Multivariate regression analyses

## RESULTS

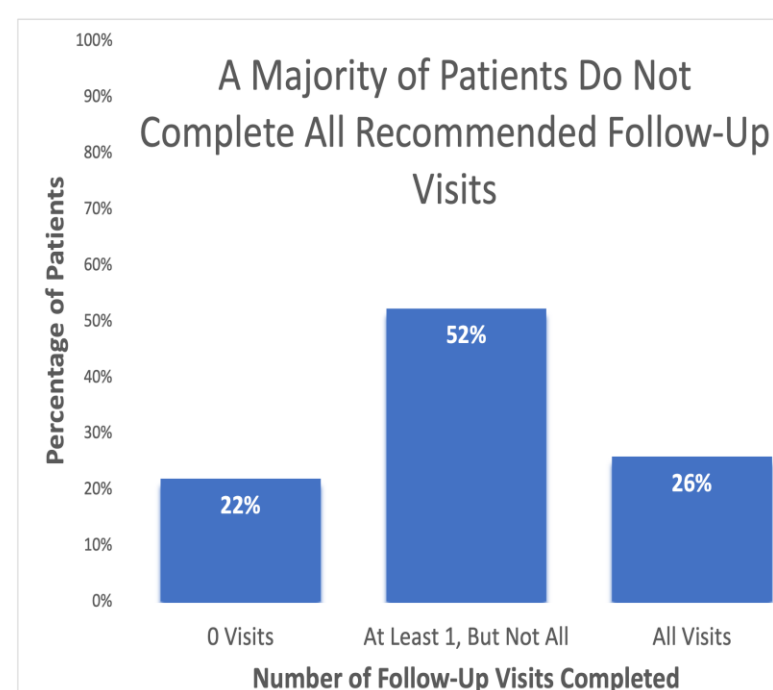


Fig 1. 26% of patients complete all expected follow-up visits at the correct intervals, while 22% of patients complete 0 visits within 2 years.

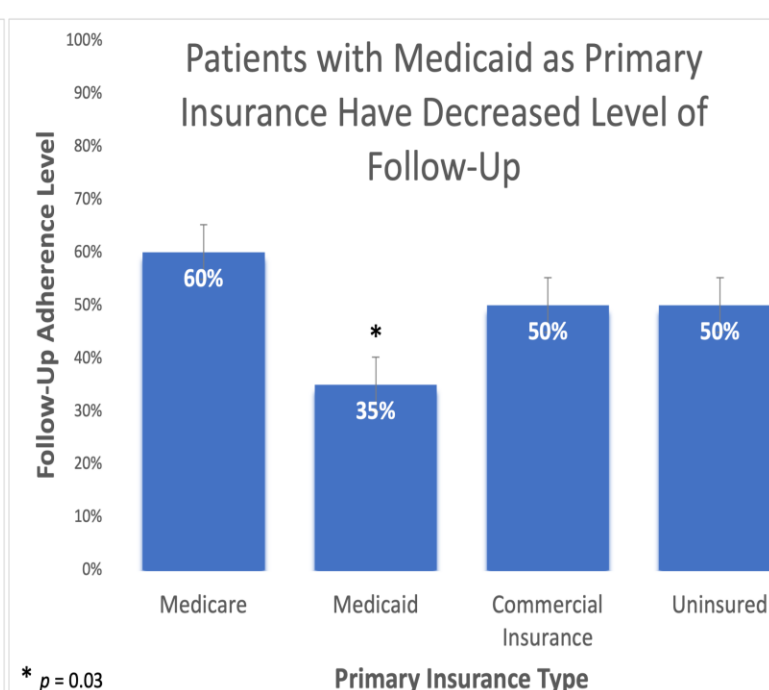


Fig 2. Level of follow-up adherence compared across patients based on primary insurance type. \* p = 0.03

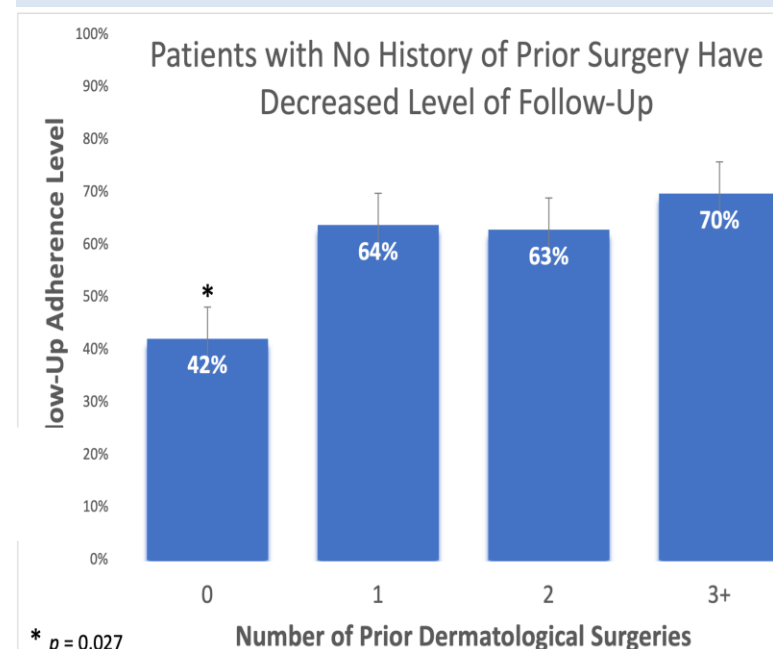


Fig 3. Level of follow-up adherence compared across patients based on number of prior tumor removal surgeries the patient has experienced. \* p = 0.027

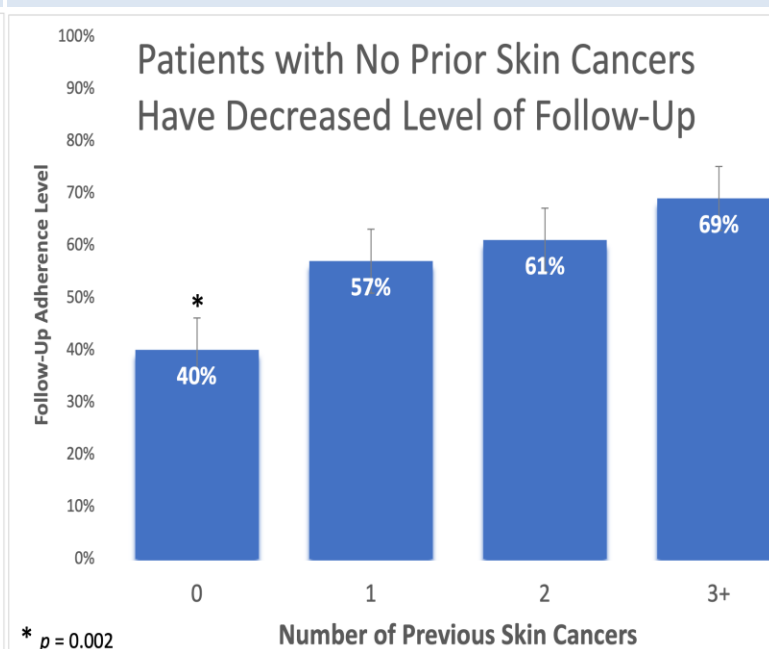


Fig 4. Level of follow-up adherence compared across patients based on number of skin cancers diagnosed with prior to current treatment. \* p = 0.002

### Predictors of Follow-Up Adherence Rate

Predictor	IR	SE	[95% CI]	p-value
# of Previous Skin Cancers	1.17	0.06	1.05 1.30	<b>0.004</b>
First Time Surgery	0.62	0.08	0.48 0.82	<b>0.001</b>
# of Prior Surgeries	1.14	0.07	1.02 1.28	<b>0.027</b>
Hx of Localized Tumor	1.60	0.33	1.07 2.39	<b>0.023</b>
Medicaid as Primary Insurance	0.43	0.06	0.26 0.68	<b>0.030</b>

Table 1. This table highlights all variables that significantly predicted level of follow-up adherence in patients based on grouped logistic regression analyses.

### Predictors of Subsequent Skin Cancer Diagnosis

Predictor	OR	SE	[95% CI]	p-value
<b># of Previous Skin Cancers</b>				
1	2.79	0.83	1.56 4.98	<b>0.001</b>
2	4.74	1.61	2.44 9.21	<b>0.000</b>
3+	9.94	2.47	6.10 16.19	<b>0.000</b>
First Time Surgery	0.25	0.05	0.17 0.37	<b>0.000</b>
<b># of Prior Surgeries</b>				
1	1.67	0.43	1.01 2.77	<b>0.044</b>
2	2.71	0.96	1.35 5.42	<b>0.005</b>
3+	6.69	1.49	4.32 10.36	<b>0.000</b>
Immunosuppressed	2.52	0.62	1.55 4.10	<b>0.000</b>
<b>Age</b>				
50 - 59	0.37	0.16	0.16 0.88	<b>0.025</b>
60 - 69	0.56	0.22	0.26 1.21	0.139
70 - 79	0.56	0.22	0.26 1.19	0.129
≥ 80	0.83	0.35	0.37 1.88	0.660
Comorbidity Index Score	1.12	0.05	1.03 1.22	<b>0.007</b>
History of Localized Tumor	1.75	0.47	1.04 2.96	<b>0.037</b>

Table 2. This table highlights all variables that significantly predicted future skin cancer diagnoses in patients based on negative binomial models.

**Secondary Analyses:** No significant associations were found between follow-up adherence and sex, ethnicity, immunosuppressive status, anticoagulative status, tumor size, histology, defect size, or repair type/size.

## CONCLUSIONS

- A majority of patients treated with MMS for NMSC do not complete all recommended six-month follow-up visits
- Almost half of patients who do follow up have at least one new skin cancer identified.
- Most significant risk factors for not completing all follow-up visits:
  - No history of prior skin cancers
  - No history of prior surgery for tumor removal
  - Medicaid as primary insurance
- Experience with prior skin cancers and/or surgeries → more likely to follow-up.
- History of previous skin cancers, surgery, immunosuppression, more comorbidities, or history of localized tumors → new diagnoses more likely.

## LIMITATIONS

- Our study is limited to patients who follow up within the JHH health system
- No direct patient input due to nature of retrospective study
- Some lack of follow-up may be due to factors related to the physician/clinic scheduling rather than patient choice

## IMPLICATIONS

- Lack of follow-up may indicate potential gaps in care (e.g. inadequate patient education, lack of transportation, financial hardship, etc.) preventing patients from returning to clinic.
- New protocols should be designed to increase patient education if above risk factors are identified.
- Clinicians should discuss and address potential barriers to follow-up with patients at first visit.