

Immunohistochemistry Utilization in Medicare Beneficiaries by Mohs Surgeons from 2012-2017

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INTRODUCTION

Based on surveys by Robinson¹ in 2001 and Trimble and Cherpeli² in 2013, Immunohistochemistry (IHC) utilization in Mohs micrographic surgery (MMS) has been rising. Although these surveys provided important subjective data regarding IHC use in MMS, there is a paucity of objective data describing its current utilization patterns. The objective of this study is to characterize IHC utilization during MMS by Mohs surgeons in the treatment of Medicare beneficiaries from 2012-2017.

The 2012-2017 Medicare Provider Utilization and Payment Data, www.certificationmatters.org, www.npidb.org, and www.mohscollege.org/surgeon-finder served as the primary data sources. Mohs surgeons were defined as dermatologists with at least 150 annual claims for Current Procedural Terminology (CPT) code 17311. In order to further specify IHC use in the setting of MMS, we excluded Mohs surgeons who were also board-certified in dermatopathology and/or associated with a dermatopathology taxonomy code. The annual number of IHC services per day was identified by CPT codes 88342 or G0461, taking into consideration scenarios where multiple CPT units for a given excision may have been claimed.

Between 2012-2017, 156 Mohs surgeons (75% fellowship trained ($n = 117/156$)) reported 29,294 IHC services and 336,118 stage 1 Mohs claims. In this time frame, the percentage of Mohs surgeons utilizing IHC increased by 1.7% ($n = 42$), the annual

number of IHC services increased by 2,600 cases, and the annual number of stage 1 Mohs claims increased by 27,430 claims (Table 1). Using a linear regression analysis, there was a significant increase in the number of Mohs surgeons utilizing IHC ($P=.016$) and a significant increase in the annual number of stage 1 Mohs claims ($P=.010$). While there was also a positive trend in the annual number of IHC services, the linear regression analysis approached, but did not meet significance ($P=.075$). Adjusting for volume of MMS, the median percentage of annual IHC services per stage 1 Mohs claims was similar between 2012-2017, at 5.2% (IQR; Interquartile range, 2.2-6.6%) in 2012 and 4.3% (IQR, 2.9-8.2%) in 2017 (Table 1). Lastly, across the US, there was no significant geospatial clustering of Mohs surgeons who utilized IHC (Moran's $I = .131$, $P=.101$) (Figure 1).

FIGURE 1. Geographic representation of the number of Mohs surgeons utilizing immunohistochemistry during Mohs micrographic surgery in Medicare beneficiaries, 2012-2017.

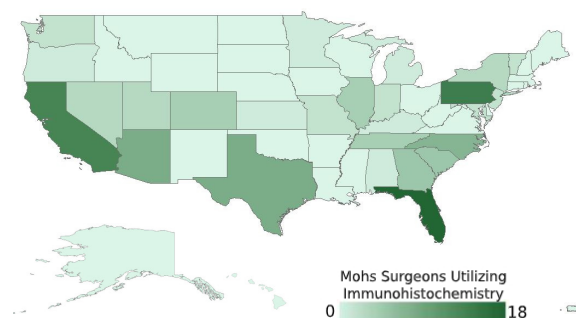


TABLE 1.

Immunohistochemistry (IHC) Utilization Patterns by Mohs Surgeons, 2012-2017						
	2012	2013	2014	2015	2016	2017
Percentage of Mohs surgeons utilizing IHC	4.6% ($n = 56/1221$)	4.7% ($n = 60/1282$)	4.6% ($n = 63/1358$)	5.0% ($n = 72/1432$)	6.00% ($n = 90/1501$)	6.3% ($n = 98/1556$)
Annual number of unique IHC services	3,736	4,258	3,940	4,314	6,710	6,336
Annual number of CPT 17311 stage 1 Mohs claims	37,955	40,268	40,782	45,396	57,169	62,143
Annual number of CPT 17313 stage 1 Mohs claims	7,135	7,560	7,860	9,053	10,420	10,377
Median percent of annual unique IHC services per stage 1 Mohs claims	5.2% (IQR, 2.2-6.6%)	4.3% (IQR, 3.3-7.0%)	5.1% (IQR, 3.2%-10%)	5.4% (IQR, 3.1-12.4%)	4.6% (IQR, 3.0-6.9%)	4.3% (IQR, 2.9-8.2%)

CPT, Current Procedural Terminology; IHC, Immunohistochemistry; IQR, Interquartile range

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In contrast to previous survey-based studies estimating IHC utilization rates amongst Mohs surgeons ranging from 12-21.7%,^{1,2} our study notes a more modest rate between 4.6% (2012) and 6.3% (2017). Despite there being a significant increase in the number of Mohs surgeons utilizing IHC, and the increase in the number of IHC services approaching significance, the low absolute values of both of these variables suggests that only a minority of Mohs surgeons, 75% of whom are fellowship trained, are utilizing IHC and even within this minority, the utilization of IHC is not frequent, as 90% of those who use IHC, use it in less than 21% of MMS cases.

In Trimble and Cherpeli's 2013 survey,² a subset of Mohs surgeons indicated that the most common reasons for not using IHC were time consumption, costs, and lack of education. In recent years, limiting factors such as time and reliability have been improved by rapid protocols, and cost has been decreased with cost-effective reagents.³ As IHC in MMS expands to the treatment of additional tumors, it may be an increasingly important technique, particularly in the setting of melanoma and melanoma in-situ with increasing rates of these tumors over the past decade.⁴ While our data notes a slow but steady increase in the number of Mohs surgeons utilizing IHC, in the future, the development of a curriculum in interpreting IHC stains may be of particular benefit to overcome education as a limiting factor in IHC utilization and can additionally serve as a resource when IHC stains are tested on the Mohs certification examination. As 75% of Mohs surgeons who utilize IHC in our study are fellowship-trained, dedicated education during fellowship may represent an important factor for growth in the utilization of IHC.

DISCLOSURES

The authors have no conflicts.

REFERENCES

1. Robinson JK. Current histologic preparation methods for Mohs micrographic surgery. *Dermatol Surg.* 2001;27(6):555-560.
2. Trimble JS, Cherpelis BS. Rapid immunostaining in Mohs: current applications and attitudes. *Dermatol Surg.* 2013;39(1 Pt 1):56-63.
3. Cohen DK, Goldberg DJ. Mohs Micrographic Surgery: Past, Present, and Future. *Dermatol Surg.* 2019;45(3):329-339.
4. Foundation TSC. Skin Cancer Facts & Statistics. The Skin Cancer Foundation. <https://www.skincancer.org/skin-cancer-information/skin-cancer-facts/>. Published 2020. Accessed May 20, 2020.

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