

RESEARCH LETTER

Current Curriculum on Reflectance Confocal Microscopy: A National Survey of Dermatology Faculty and Residents

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Reflectance confocal microscopy (RCM) is a non-invasive imaging modality used in dermatology since the 1990s.^{1,2} As its diagnostic accuracy and precision grew throughout the past decades, it gained Category 1 Current Procedural Terminology (CPT) codes (96931-96936) by Centers for Medicare and Medicaid Services in 2016.³ This has allowed reimbursement for dermatologists and dermatopathologists to procure, read and interpret images of various skin lesions.

Highlighting its growing utility, a recent citation search on PubMed.gov using “reflectance confocal microscopy skin” revealed 1 result in 1994 to 30 in 2010 to 116 citation results in 2016. We surveyed dermatology residency programs to explore the exposure trainees have to RCM. To our knowledge, this is the first study quantifying use of RCM in academic training programs.

This observational study was exempt per Institutional Board Review. The nine question survey, designed by a dermatology resident and attending, was distributed to the national email Listserv of the Association of Dermatology Professors (APD). (Figure 1) This email group is composed of faculty members including program directors and chairs. Within the email, faculty, fellows and residents were invited to anonymously

participate. It was up to the discretion of the faculty member to distribute or forward the invitation on to his or her residents. The survey was open for 8 weeks with recruitment emails sent at week 0 and 4. Survey design, distribution and analysis were similar to previously published studies assessing dermatology residency curriculum.⁴ Descriptive statistics were used to characterize the survey responses.

Figure 1: Survey Questions.

1. What state is your training program in?
2. What is your role? <ul style="list-style-type: none"> • Program director • other faculty • resident/fellow
3. How is reflectance confocal microscopy included within resident curriculum? <ul style="list-style-type: none"> • Directly: faculty or industry led didactic that results in understanding of and experience in reading images. • Indirectly: resident-led or self-learned through reading, videos, seminars, etc. • Not-at-all: to best of your knowledge, RCM is not taught or learned in any meaningful capacity • Other:
4. If answered “directly”, “indirectly” or “other” above, how often is reflectance confocal microscopy taught by either a faculty, fellow, resident or industry member?

<ul style="list-style-type: none"> • <1-3 times per week • 1-3 times per week • >1-3 times per week
<p>5. How often is conventional dermatopathology (ie. traditional H&E slides) taught by a faculty, fellow, resident or industry member?</p> <ul style="list-style-type: none"> • <1-3 times per week • 1-3 times per week • >1-3 times per week
<p>6. Does your program have clinical or research faculty who use RCM on a routine basis?</p> <ul style="list-style-type: none"> • yes • no • unknown • other
<p>7. Is reflectance confocal microscopy reimbursable in your area?</p> <ul style="list-style-type: none"> • yes • no • unknown • other
<p>8. In the next 5 years, do you foresee a need to directly incorporate RCM into resident curriculum?</p> <ul style="list-style-type: none"> • yes • no • unknown • other
<p>9. Comments</p>

During the 8-week period, 70 responses (40 residents, 29 faculty, 1 unspecified) were collected and outlined in Table 1. The response rate amongst faculty was 6.6% (29/439). The resident response rate is unclear as there is no way to estimate how many residents the recruitment email was ultimately forwarded to.

Approximately 54% of respondents answered that RCM is not taught or learned

Table 1: Survey responses.

	%
Demographics	
Faculty	42
Residents/Fellows	58
How is RCM included within Resident Curriculum?	
Directly: faculty or industry led didactic leading to understanding of and experience in reading images	29
Indirectly: resident-led or self-learned through reading, videos, seminars	13
Not-at-all: RCM not taught or learned in meaningful capacity	54
Other	4
If answered "directly", "indirectly" or "other" above, how often is reflectance confocal microscopy taught by either a faculty, fellow, resident or industry member?	
<1-3 times per week	91
1-3 times per week	9
>1-3 times per week	0
How often is conventional dermatopathology (ie. traditional H&E slides) taught by a faculty, fellow, resident or industry member?	
<1-3 times per week	7
1-3 times per week	77
>1-3 times per week	16
Does your program have clinical or research faculty who use reflectance confocal microscopy on a routine basis?	
Yes	40
No	47
Unknown	13
Is reflectance confocal microscopy reimbursable in your area?	
Yes	22
No	9
Unknown	70
In the next 5 years, do you foresee a need to directly incorporate RCM into resident curriculum?	
Yes	46
No	20
Unknown	33

in a meaningful capacity. For those who received indirect or direct training in RCM, it was taught on average <1-3 times per week vs. an average 1-3 times per week for traditional dermatopathology. Nearly 40% of

responses indicated that RCM is routinely used by faculty within clinical and research settings. About half of respondents stated a need to incorporate RCM within residency curriculum. The majority of respondents (70%) did not know if RCM was reimbursable.

As RCM's use becomes standardized and streamlined into clinical use,^{5,6} there may be a need to systematically train residents in the acquisition and interpretation of its images. This national survey is one of the first to characterize RCM's current integration into residency education. The results suggest that despite a lack of formalized training, there is cautious optimism towards the modality's usage in dermatologic practice. While the majority of responders envisioned a need to incorporate RCM into residency curriculum within 5 years, one-third of respondents were currently undecided about its importance. Within the comments section of the survey, some respondents cited the time involved as an obstacle to RCM's integration into daily work flow.

Highlighting the current use of RCM, 40% of responses indicated that faculty routinely integrate RCM into clinical and research settings. Despite this popularity, there remains room for growth and education. Only 22% of respondents knew that RCM was potentially reimbursable. The current reimbursement structure for RCM is based on a per-lesion basis (effective 1/1/2017). Similar to traditional biopsy and pathology; RCM payment best approximates the time and effort that goes into acquiring and interpreting each lesion and is similar to that of traditional biopsy and pathology payments. As more dermatologists adopt RCM, the US Centers for Medicare and Medicaid Services will be able to redefine and match reimbursement with time involved.⁵

Given the low faculty response rate, this study could be susceptible to a response bias where those interested in RCM may have responded favorably. Therefore, while the results suggest an enthusiastic trend, we are cautious to generalize to the greater academic population at this time. Our hope is that this and future studies can provide insight into the need for a standardized RCM curriculum.

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