Biopsy, Refer, or Observe? Standardizing Skin Lesion Risk Stratification Among Internal Medicine Residents in Underserved Settings

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BACKGROUND

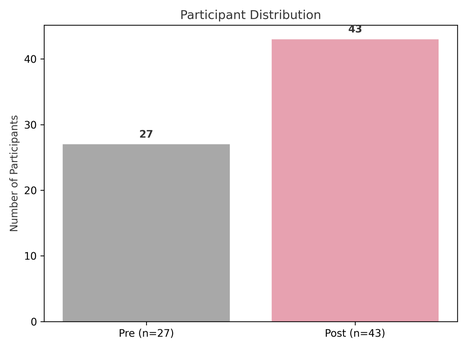
Internal medicine physicians frequently evaluate skin lesions, yet structured training in dermatoscopy and lesion risk stratification remains inconsistent. Diagnostic uncertainty contributes to unnecessary referrals, benign biopsies, and delayed malignancy detection, particularly in underserved settings.

THE NATIONAL GAP

- Skin cancer remains the most common U.S. malignancy
- Dermatology access is limited in underserved regions
- IM physicians frequently triage suspicious lesions
- Training in dermatoscopy and structured risk assessment is inconsistent

KEY OUTCOMES
27 Residents Assessed at Baseline
43 Residents Evaluated Post-Intervention
88.9% Post-Intervention Diagnostic Accuracy
+11% Improvement in Biopsy/Referral Confidence
Structured Algorithm Introduced
Scalable & Reproducible Model

PARTICIPANT DISTRIBUTION

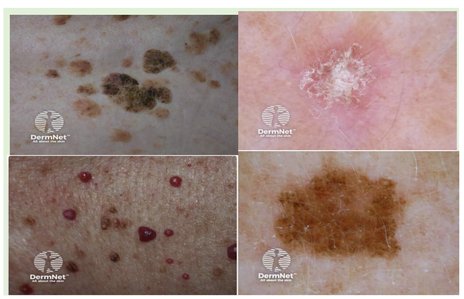


BASELINE ASSESSMENT

Resident distribution:
- PGY-1: 63%
- PGY-2: 25.9%
- PGY-3: 14.8%

Dermatoscope exposure:
- 77.8% never used a dermatoscope
- 11.1% occasionally
- 11.1% frequently

Confidence distinguishing benign vs malignant lesions:
Mean = 3.33 / 5
Reported barriers:
- 88.9% lacked confidence in biopsy technique
- 66.7% lacked dermatoscope training
- 44.4% unfamiliar with malignant features
- 51.9% time constraints

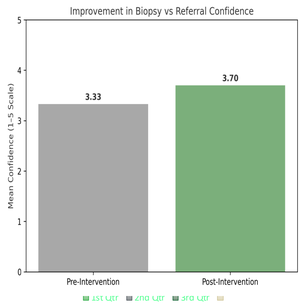


INTERVENTION

A structured, algorithm-based educational session incorporating:
Pattern recognition framework
- "Calm" pattern (symmetric, stable) → likely benign
- "Chaos" pattern (asymmetry, irregular borders, color variation) → suspicious

Red flag triage criteria
- Rapid growth
- Ulceration or bleeding
- Non-healing lesion
- Immunosuppression
- High-risk anatomical sites

Introduction to dermatoscopy fundamentals
Low-cost. Reproducible. Curriculum-ready.



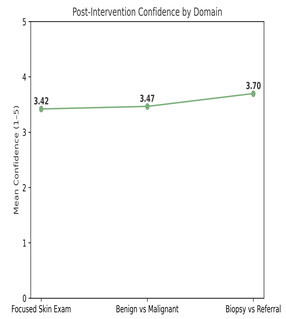


CHART LABEL

CHART LABEL

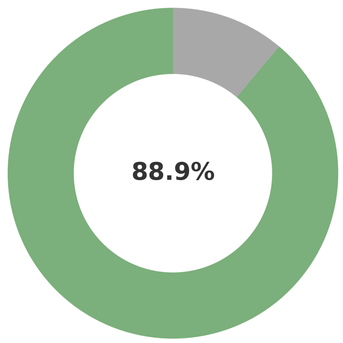
RESULTS (Post-Intervention, n = 43)

Knowledge performance:
Mean score = 7.12 / 11
Median = 7
Range = 3–8
Overall diagnostic accuracy: **88.9%**

Confidence improvement:
Biopsy vs referral confidence increased from 3.33 → 3.70
(+11% relative improvement)

Residents supported incorporation of structured dermatologic education into the IM curriculum.

Post-Intervention Diagnostic Accuracy



DISCUSSION

This intervention:
- Standardized lesion risk stratification
- Improved diagnostic confidence
- Addressed resident-identified educational gaps
- Created a reproducible teaching model
- Is scalable to residency programs nationally

By strengthening frontline triage, this model supports earlier malignancy detection and more appropriate specialty utilization.

CONCLUSION

A concise, algorithm-driven dermatologic training intervention improved confidence and standardized lesion triage among internal medicine residents. Integrating structured skin lesion risk stratification into residency curricula represents a feasible systems-level quality improvement strategy with national applicability.