Skin Scores: A Review of Clinical Scoring Systems in Dermatology

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RESIDENT **PEARLS**

- Mortality from Stevens-Johnson syndrome/toxic epidermal necrolysis can be estimated by calculating the SCORTEN at the end of days 1 and 3 of hospitalization.
- The Psoriasis Epidemiology Screening Tool (PEST) assists with triaging which patients with psoriasis should be evaluated for psoriatic arthritis by a rheumatologist.
- The ALT-70 score is helpful to support one's diagnosis of cellulitis or pseudocellulitis.
- The Mohs appropriate use criteria (AUC) score 270 different clinical scenarios as appropriate, uncertain, or inappropriate for Mohs micrographic surgery.

Scoring systems are emerging in dermatology to help guide clinical decision-making. This article discusses 4 scoring systems that help prognosticate cases of Stevens-Johnson syndrome/toxic epidermal necrolysis, screen for psoriatic arthritis, differentiate cellulitis from pseudocellulitis, and determine the appropriateness of Mohs micrographic surgery (MMS).

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The practice of dermatology is rife with bedside tools: swabs, smears, and scoring systems. First popularized in specialties such as emergency medicine and internal medicine, clinical scoring systems are now emerging in dermatology. These evidence-based scores can be calculated quickly at the bedside—often through a free smartphone app—to help guide clinical decision-making regarding diagnosis, prognosis, and management. As with any medical tool, scoring systems have limitations and should be used as a supplement, not substitute, for one's clinical judgement. This article reviews 4 clinical scoring systems practical for dermatology residents.

SCORTEN Prognosticates Cases of Stevens-Johnson Syndrome/Toxic Epidermal Necrolysis

Perhaps the best-known scoring system in dermatology, the SCORTEN is widely used to predict hospital mortality from Stevens-Johnson syndrome/toxic epidermal necrolysis. The SCORTEN includes 7 variables of equal weight—age of 40 years or older, heart rate of 120 beats per minute or more, cancer/hematologic malignancy, involved body surface area (BSA) greater than 10%, serum urea greater than 10 mmol/L, serum bicarbonate less than 20 mmol/L, and serum glucose greater than 14 mmol/L—each contributing 1 point to the overall score if present.[1] The involved BSA is defined as the sum of detached and detachable epidermis.[1]

The SCORTEN was developed and prospectively validated to be calculated at the end of the first 24 hours of admission; for this calculation, use the BSA affected at that time, and use the most abnormal values during the first 24 hours of admission for the other variables.[1] In addition, a follow-up study including some of the original coauthors recommends recalculating the SCORTEN at the end of hospital day 3, having found that the score's predictive value was better on this day than hospital days 1, 2, 4, or 5.[2] Based on the original study, a SCORTEN of 0 to 1 corresponds to a mortality rate of 3.2%, 2 to 12.1%, 3 to 35.3%, 4 to 58.3%, and 5 or greater to 90.0%.[1]

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Limitations of the SCORTEN include its ability to overestimate or underestimate mortality as demonstrated by 2 multi-institutional cohorts.[3,4] Recently, the ABCD-10 score was developed as an alternative to the SCORTEN and was found to predict mortality similarly when validated in an internal cohort.[5]

PEST Screens for Psoriatic Arthritis

Dermatologists play an important role in screening for psoriatic arthritis, as an estimated 1 in 5 patients with psoriasis have psoriatic arthritis.[6] To this end, several screening tools have been developed to help differentiate psoriatic arthritis from other arthritides. Joint guidelines from the American Academy of Dermatology and the National Psoriasis Foundation acknowledge that ". . . these screening tools have tended to perform less well when tested in groups of people other than those for which they were originally developed. As such, their usefulness in routine clinical practice remains controversial."[7] Nevertheless, the guidelines state, "[b]ecause screening and early detection of inflammatory arthritis are essential to optimize patient [quality of life] and reduce morbidity, providers may consider using a formal screening tool of their choice."[7]

With these limitations in mind, I have found the Psoriasis Epidemiology Screening Tool (PEST) to be the most useful psoriatic arthritis screening tool. One study determined that the PEST has the best trade-off between sensitivity and specificity compared to 2 other psoriatic arthritis screening tools, the Psoriatic Arthritis Screening and Evaluation (PASE) and the Early Arthritis for Psoriatic Patients (EARP).[8]

The PEST is comprised of 5 questions: (1) Have you ever had a swollen joint (or joints)? (2) Has a doctor ever told you that you have arthritis? (3) Do your fingernails or toenails have holes or pits? (4) Have you had pain in your heel? (5) Have you had a finger or toe that was completely swollen and painful for no apparent reason? According to the PEST, a referral to a rheumatologist should be considered for patients answering yes to 3 or more questions, which is 97% sensitive and 79% specific for psoriatic arthritis.[9] Patients who answer yes to fewer than 3 questions should still be referred to a rheumatologist if there is a strong clinical suspicion of psoriatic arthritis.[10]

The PEST can be accessed for free in 13 languages via the GRAPPA (Group for Research and Assessment of Psoriasis and Psoriatic Arthritis) app as well as downloaded for free from the National Psoriasis Foundation's website (https://www.psoriasis.org/psa-screening/providers).

ALT-70 Differentiates Cellulitis From Pseudocellulitis

Overdiagnosing cellulitis in the United States has been estimated to result in up to 130,000 unnecessary hospitalizations and up to $515 million in avoidable health care spending.[11] Dermatologists are in a unique position to help fix this issue. In one retrospective study of 1430 inpatient dermatology consultations, 74.32% of inpatients evaluated for presumed cellulitis by a dermatologist were instead diagnosed with a cellulitis mimicker (ie, pseudocellulitis), such as stasis dermatitis or contact dermatitis.[12]

The ALT-70 score was developed and prospectively validated to help differentiate lower extremity cellulitis from pseudocellulitis in adult patients in the emergency department (ED).[13] In addition, the score has retrospectively been shown to function similarly in the inpatient setting when calculated at 24 and 48 hours after ED presentation.[14] Although the ALT-70 score was designed for use by frontline clinicians prior to dermatology consultation, I also have found it helpful to calculate as a consultant, as it provides an objective measure of risk to communicate to the primary team in support of one diagnosis or another.

ALT-70 is an acronym for the score's 4 variables: asymmetry, leukocytosis, tachycardia, and age of 70 years or older.[15] If present, each variable confers a certain number of points to the final score: 3 points for asymmetry (defined as unilateral leg involvement), 1 point for leukocytosis (white blood cell count ≥10,000/μL), 1 point for tachycardia (≥90 beats per minute), and 2 points for age of 70 years or older. An ALT-70 score of 0 to 2 corresponds to an 83.3% or greater chance of pseudocellulitis, suggesting that the diagnosis of cellulitis be reconsidered. A score of 3 to 4 is indeterminate, and additional information such as a dermatology consultation should be pursued. A score of 5 to 7 corresponds to an 82.2% or greater chance of cellulitis, signifying that empiric treatment with antibiotics be considered.[15]

The ALT-70 score does not apply to cases involving areas other than the lower extremities; intravenous antibiotic use within 48 hours before ED presentation; surgery within the last 30 days; abscess; penetrating trauma; burn; or known history of osteomyelitis, diabetic ulcer, or indwelling hardware at the site of infection.[15] The ALT-70 score is available for free via the MDCalc app and website (https://www.mdcalc.com/alt-70-score-cellulitis).

Mohs AUC Determines the Appropriateness of Mohs Micrographic Surgery

In 2012, the American Academy of Dermatology, American College of Mohs Surgery, American Society for Dermatologic Surgery Association, and American Society for Mohs Surgery published appropriate use criteria (AUC) to guide the decision to pursue Mohs micrographic surgery (MMS) in the United States.[16] Based on various tumor and patient characteristics, the Mohs AUC assign scores to 270 different clinical scenarios. A score of 1 to 3 signifies that MMS is inappropriate and generally not considered acceptable. A score 4 to 6 indicates that the appropriateness of MMS is uncertain. A score 7 to 9 means that MMS is appropriate and generally considered acceptable.[16]

Since publication, the Mohs AUC have been criticized for classifying most primary superficial basal cell

carcinomas as appropriate for MMS[17] (which an AUC coauthor[18] and others[19,20] have defended), excluding certain reasons for performing MMS (such as operating on multiple tumors on the same day),[21] including counterintuitive scores,[22] and omitting trials from Europe[23] (which AUC coauthors also have defended[24]). As with any clinical scoring system, the Mohs AUC has limitations; the creators acknowledge that ". . . these criteria should not be interpreted as setting a standard of care, or be deemed inclusive of all proper methods of care nor exclusive of other methods of care reasonably directed to obtaining the same results, even for those indications scored as inappropriate."[16] The Mohs AUC app (https://www.aad.org/members/aad-apps/mohs-auc) is free and allows users to enter tumor and patient characteristics to determine the score for their specific scenario.

Final Thoughts

Scoring systems are emerging in dermatology as evidence-based bedside tools to help guide clinical decision-making. Despite their limitations, these scores have the potential to make a meaningful impact in dermatology as they have in other specialties.

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