This column is the second in a two-part series on the Ottawa ankle rules with the “Buffalo” rule. In the last issue we provided an overview of the development of this algorithm and described the tool’s validity and reliability.

Over the past 12 years, the Ottawa ankle rules (OAR) have been refined. A landmark alteration to the rules was made in 1998 with the addition of the Buffalo rule (BR). The primary goal of developing this medical algorithm was to reduce costs associated with unnecessary radiographs for nonfractured ankles. Emergency medicine and other specialties such as family practice and orthopedics have adopted these rules, yet there has been little to no recognition of them in athletic therapy. Given that these rules were designed to help clinicians determine when an ankle injury should be referred for radiograph, it is imperative that all clinicians be educated about this algorithm and how to implement it in their evaluations of ankle injuries. Hence, the purpose of this report is to provide a systematic review on how the OAR/BR can be applied in the clinical setting. In addition to discussing the procedures for implementation, we also address commonly encountered issues during application in an attempt to prevent future mistakes. Finally, we discuss the effectiveness of the OAR/BR to provide justification for incorporating them into regular practice.

OAR/BR Applications

Exclusion Criteria

The OAR/BR are designed for use in determining the need for radiograph in acute ankle injuries. Before using the rules one must identify any conditions present that meet the exclusion criteria. It is imperative that the exclusion criteria be learned and understood before one uses the algorithm because the algorithm is not appropriate for use when any of the listed exclusions are present. The exclusions of the OAR/BR are if an athlete/patient (a) is pregnant, (b) has an isolated injury of the skin, (c) previously has been evaluated or referred from an outside hospital, (d) incurred the injury more than 10 days before the evaluation, or (e) has an obvious deformity of the ankle or foot.

Another exclusion criterion of the OAR that has been eliminated was if the athlete or patient were younger than 18 years of age. This age restriction was changed after Leddy and colleagues concluded that the tool is effective when used on patients less than 18 years old.

If none of the exclusion criteria are present during an ankle examination, the step-by-step procedures of the OAR/BR are followed. If one excluding factor is found, however, the rules cannot be employed, and a usual and customary ankle-injury evaluation should proceed.
Step-by-Step Procedures

There are four major steps that should be followed when implementing the OAR/BR: palpation, ability to walk at the time of injury, ability to walk at the time of evaluation, and decision for referral.

**Step 1: Palpation.** The clinician should palpate for tenderness along several anatomical landmarks including the midline distal 6 cm of the medial and lateral malleolus, base of the fifth metatarsal, and the navicular (Figure 1).  

**Step 2: Ability to Walk Immediately After the Injury.** Ask the athlete if he or she was able to walk four steps immediately after the injury. Stiell and colleagues specified that successful ambulation consisted of four unassisted steps, regardless of limping. This specification was made in order to eliminate any confusion over the definition of successful ambulation.

**Step 3: Ability to Walk at Time of Evaluation.** If there is no tenderness with palpation in the specific areas described in Step 1, ask the athlete to try to bear weight and walk four steps unassisted.

**Step 4: Decision for Referral, if Indicated.** A positive indication for a referral for radiography is if there is palpable tenderness at any of the Step 1 landmarks or if the athlete is unable to bear weight both at the time of injury and after injury. A negative evaluation means that no radiograph is indicated. When there is no tenderness in the areas outlined in Step 1 and the person is able to bear weight immediately after or at the time of the evaluation, radiographic imaging is not necessary. The decision tree for the OAR/BR is depicted in Figure 2.

**Issues With Implementation**

Based on experience with implementing the OAR/BR in the high school setting, several issues were addressed for clarification and ease of use. Common pitfalls such as misinterpretation of the rules, misconceptions involving certain medical

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**Figure 1** The palpation areas for the Ottawa ankle rules with the Buffalo rule. Please note the area on both malleoli is just the midline on the bone. The dotted line and striped areas indicate the area of palpation.

**Figure 2** Outline of the Ottawa ankle rules procedures for making a decision on referral for radiograph.