

## Evaluating the Patient with an Ankle or Foot Injury

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### Clinical Question

When should radiographs be obtained in patients with an ankle or foot injury?

### Evidence Summary

The Ottawa Ankle and Foot Rules<sup>1</sup> are validated clinical decision rules. The process by which the Ottawa rules were developed and validated serves as a model for researchers in developing decision support tools for other clinical problems.<sup>1</sup> Use of these rules can save time and money by helping physicians and their patients avoid unnecessary radiographs of the ankle or foot.

The Ottawa rules have a parallel structure. Each begins with a question to assess the site of the patient's pain followed by an evaluation of function (based on the ability to bear weight for at least four steps immediately after the injury and again in the emergency department), and a focused physical assessment for the presence of localized bone tenderness. Radiographs should be obtained in patients who have pain in the relevant site accompanied by inability to walk four steps or bone tenderness as described above.

How accurate are the Ottawa rules for ankle and foot injuries? A recent meta-analysis<sup>2</sup> identified 32 validation studies (27 were included in the analysis) involving 15,581 adult patients. With use of the Ottawa rules, the probability of a false negative (presence of fracture but no recommendation for radiographs) was extremely low (0.3 percent). The rules also have been validated in children. In a study<sup>3</sup> of 670 children who presented with acute ankle injury, the Ottawa rules were 100 percent sensitive for fracture (no false negatives).

One drawback to the Ottawa rules is the fairly low

specificity, which generally is around 30 to 40 percent.<sup>2,3</sup> Consequently, radiographs will be recommended for many patients who do not have a fracture. Although not ideal, the rules are still considerably more selective than the typical practice of obtaining radiographs in every patient with acute ankle or foot pain after an injury.

All validation studies on the Ottawa rules for ankle and foot injuries have been conducted in emergency departments. Therefore, there has been some question about whether these rules can be used in the outpatient setting. One small study<sup>4</sup> examined the performance of family physicians working part-time in a community hospital emergency department and found good sensitivity (97 percent) for use of the Ottawa rules by these physicians. With proper training and use of a decision support tool (*see accompanying patient encounter form*), family physicians can achieve similar sensitivity results in the outpatient setting.

### Applying the Evidence

A 24-year-old man presents with a twisted ankle that occurred while he was playing basketball. He cannot recall if he everted or inverted his ankle. He was able to bear weight in the gym and limped while bearing weight as he walked to his friend's car. He ambulates with difficulty but is able to bear weight in the physician's office as he walks to the examination room. On examination, he complains of pain in the ankle and has tenderness to percussion of the lateral malleolus. Does he need a radiograph of the ankle?

*Answer:* Because the patient has ankle pain and tenderness to percussion of a malleolus, a radiograph should be obtained even though the patient is able to bear weight.

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### REFERENCES

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2. Bachmann LM, Kolb E, Koller MT, Steurer J, ter Riet G. Accuracy of Ottawa ankle rules to exclude fractures of the ankle and mid-foot: a systematic review. *BMJ* 2003;326:417.
3. Plint AC, Bulloch B, Osmond MH, Steill I, Dunlap H, Reed M, et al. Validation of the Ottawa Ankle Rules in children with ankle injuries. *Acad Emerg Med* 1999;6:1005-9.
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This guide is one in a series that offers evidence-based tools to assist family physicians in improving their decision-making at the point of care.

## Ankle or Foot Injury Encounter Form

Patient's name: \_\_\_\_\_ Age: \_\_\_\_\_ Medical record #: \_\_\_\_\_

### HISTORY OF PRESENT ILLNESS

\_\_\_\_\_  
 \_\_\_\_\_

### PHYSICAL EXAMINATION

Right ankle and foot: \_\_\_\_\_ Other: \_\_\_\_\_

Left ankle and foot: \_\_\_\_\_

### DECISION SUPPORT

#### Ottawa Ankle Rule

1.  Pain near the malleoli (A and B below)
2.  Inability to bear weight both immediately and in the emergency department (4 steps)
3.  Bone tenderness at the posterior edge or tip of either malleolus (A and B below)

#### Ottawa Foot Rule

1.  Pain in the midfoot
2.  Inability to bear weight both immediately and in the emergency department (4 steps)
3.  Bone tenderness at the navicular (D below) or the base of the 5th metatarsal (C below)

*A radiograph is indicated for either rule if No. 1 and either No. 2 or No. 3 is checked.*

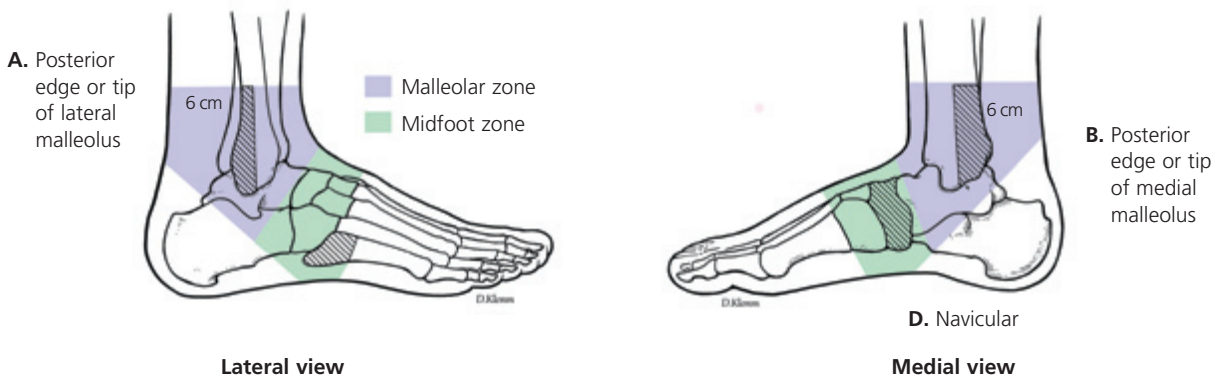


ILLUSTRATION BY DAVID KLEMM

### ASSESSMENT/PLAN

- Radiograph not indicated based on Ottawa Ankle and Foot Rules  
 Radiograph indicated; findings: \_\_\_\_\_

### TREATMENT

#### Immobilization:

- Splint  
 Cast  
 Ice  
 No weight bearing for \_\_\_\_\_ days  
 Refer to: \_\_\_\_\_  
 Recheck in: \_\_\_\_\_ days

#### Pain medication:

- Acetaminophen: \_\_\_\_\_ mg orally \_\_\_\_\_ # \_\_\_\_\_, \_\_\_\_\_ refill (RF)  
 NSAID, \_\_\_\_\_: \_\_\_\_\_ mg orally \_\_\_\_\_ p.r.n. # \_\_\_\_\_, \_\_\_\_\_ RF  
 Oral narcotic, \_\_\_\_\_: \_\_\_\_\_ mg orally \_\_\_\_\_ p.r.n. # \_\_\_\_\_, \_\_\_\_\_ RF  
 Other: \_\_\_\_\_

NSAID = nonsteroidal anti-inflammatory drug.

**PHYSICIAN'S SIGNATURE:** \_\_\_\_\_ **DATE:** \_\_\_\_\_