

Enhancing Clinical Evaluation Skills: Palpation as the Principal Skill

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Context: Recognition and evaluation of injuries/illnesses accounts for the greatest percentage (24%) of an athletic trainer's responsibilities as a clinician. When teaching orthopedic evaluation, we often emphasize history taking and special/ligamentous tests to achieve a diagnosis. Because of its complexity and variability, palpation becomes an underutilized skill in the evaluation process.

Objective: The intent of this article is to provide educators with some nontraditional instructional techniques to assist students' development of palpation skills.

Background: Palpation is used to identify somatic problems, treat those problems, and assess the result of the treatment. Within the examination, palpation identifies the specific tissues associated with an individual's complaint. By correctly identifying the affected tissues, the remainder of the evaluation can be shaped to appropriately address the injured structures. If students are able to comprehend the significance of palpation, they can enhance their evaluation skills.

Description: We describe four lessons (Anatomy of a Penny, Controlling Pressure, Discriminating Changes in Soft Tissues, Integrating Skills with Blindfold Palpation) to help instructors provide a foundation for, as well as to advance and integrate, palpation skills in the evaluation process.

Clinical Advantages: Education programs aim to enhance students' clinical abilities to recognize and evaluate injuries. The methods used to achieve improvement are not driven by accreditation standards, but by instructional technique. Nontraditional instructional methods may assist instructors with enhancing the palpation skills of their students.

Conclusions: Palpation is an integral skill in the evaluation process. With creative instruction, educators can help students advance their skills.

Key Words: critical thinking, analysis, synthesis, nontraditional instruction

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Enhancing Clinical Evaluation Skills: Palpation as the Principal Skill

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Athletic training is a health profession that has grown, matured, and diversified over the course of its short history. Athletic trainers once worked with a very small, focused population of athletes, but with our transformation to working among the physically active, we have expanded employment opportunities.¹ Exposure to varied populations has altered our scope of practice and required us to enhance the educational experience of future professionals. Although some may claim that accredited athletic training education programs are already saturated with competencies and proficiencies, we must use our curricula to expand students' knowledge beyond the foundation and into advanced thinking. Not only must we teach our students to analyze and synthesize information, but we must also enhance our skills as educators and utilize nontraditional teaching techniques to promote better learning.¹ Our purpose is to provide a theoretical rationale for improving palpation and to provide instructional lessons to enhance the teaching of the skill.

BASIS OF LEARNING

Recognition and evaluation of injuries/illnesses accounts for the greatest percentage (24%) of an athletic trainer's responsibilities as a clinician.² Therefore, orthopedic evaluation courses are often one of the first courses provided in education programs. In teaching these classes, we must organize and condense information for students to quickly absorb the foundational knowledge. Then we should work to foster critical analysis so students can appropriately apply their knowledge to specific situations (injuries/illnesses).¹ Yet, this is no easy task, and it requires some instructional creativity as well as a comprehensive curricular plan grounded in critical thinking.

Critical thinking, first coined by John Dewey, recognizes the centrality of independent thought to substantiate learning and implies that learning occurs when one employs higher-order thinking.³⁻⁷ Successful athletic training students need to demonstrate the ability to critically think; however, they must first acquire the foundational knowledge. Once true understanding is achieved, students need to be challenged to apply their knowledge to mock and real experiences. Upon application, students need to analyze and synthesize the feedback from patients to truly transform their learning.^{3,4} It is this ability to apply their knowledge and experience in making discriminating judgments³ that will define a good clinician.

As educators, it is important to provide situations and use instructional techniques that foster higher levels of thinking.⁵ In the medical professions, where analysis leads to differential diagnoses and eventually to a treatment plan, we fail students and patients when we simply require memorization. In other words, knowledge is not enough. Comprehension and application⁶ are crucial to successful clinical practice. When we teach and evaluate simple facts in the classroom but expect comprehension and application in the clinical setting, students are unable to make the connection. We, as educators, should challenge students to engage in higher-

order thinking during their professional studies, especially within their orthopedic evaluation courses as this domain consumes a quarter of their job responsibilities.

UNDERSTANDING THE PURPOSE

When teaching the components of evaluation, history and special tests are two areas that receive great attention. History functions to direct the evaluation and special tests help to confirm or rule out diagnoses. Although each component of the evaluation process serves a purpose, clinicians must prioritize the components to perform during the evaluation. Palpation is often overlooked during this process, which may be a result of failing to understand its fundamental function.

Educators must help students understand the purpose, function, and importance of palpation.⁸ Palpation is utilized for identification of somatic problems, treatment of those problems, and assessing treatment outcomes.⁹ Within the examination, palpation identifies the specific tissues associated with an individual's complaint. By correctly identifying the affected structures/tissues, the remainder of the evaluation can focus on the injured structures. If students are able to comprehend the significance of palpation, their evaluation skills will improve.

When acquiring the skill of palpation, students start in a state of relative ignorance because they maintain only basic anatomical knowledge. With clear direction, students may develop the desire to learn more and eventually acquire the necessary technical skills.¹⁰ Once students have obtained these skills, they must develop the ability to organize their findings and relate them back to the patient's symptoms. Once a student is able to maneuver this process with ease, the act of palpation becomes intuitive.¹⁰ However, processing this information is often the most difficult skill for the student to establish. Learning palpation is like learning to read. At first, each word requires the identification of each letter, its phonetic value, and the linkages between each letter. As a person's ability to read increases, assessment of each word comes with more ease, patterns of words present themselves, and the significance of the sentence as a whole is appreciated. Similarly, as students learn how to palpate, they tend to focus intently on identifying the individual anatomical structures instead of feeling for tissue changes, eliciting pain, and finding other meaningful information. Educators can emphasize palpation fundamentals to enhance critical thinking.

INSTRUCTIONAL TECHNIQUES

Educators should use specific and focused classroom activities to help students develop their palpation skills. These activities should be planned and sequenced to help students advance their knowledge from simply locating a structure to analyzing the tissue and comprehending the injury. The following lesson plans provide a sequence of instruction to help students improve their palpation skills.

LESSON #1: Anatomy of a Penny

An introduction to palpation should include some basic directions on how to palpate and describe what the clinician is trying to identify.

Objectives

1. Understand the purpose of palpation
2. Identify the best technique
3. Differentiate between anatomical structures

Brief lecture (main points)¹¹

- ▶ Palpation is the most commonly employed examination technique used by manual clinicians.
- ▶ There is more information obtained by palpation than any other method.
- ▶ Palpation forms a foundation to guide the other evaluation techniques (range of motion, ligamentous/special tests, etc.).
- ▶ Practice is needed to understand what the “touch” means.
- ▶ The skilled palpator is capable of discriminating between structures tactually and can integrate the information into an evaluation.
- ▶ The most sensitive means of palpating tissue is through the pads of the second and third digits.
- ▶ When palpating, you are comparing bilateral differences in skin texture, temperature, muscle tone and consistency, and tenderness to touch.
 - ◆ Bony landmarks may reveal changes in skin contour and alignment as well as potential abnormalities and tenderness to touch.
 - ◆ It is important to understand how much pressure is necessary. The early learner tends to use too much or too little pressure.

Activity: Palpating a Penny

Supplies:

- ▶ pennies (one per student)
- ▶ 2”x2” squares of paper
- ▶ a hard surface (tables/desks)

Procedures:

1. Ask students to look at the penny and identify 2-3 differences comparing one side to the other.
2. Place the piece of paper over the penny. Try to identify if the penny is heads or tails (Figure 1).
3. To increase difficulty, you may ask the students to palpate the penny through 2-3 pieces of paper, cardstock, felt, etc.

Discussion Questions:

1. What side of the penny was easier to palpate? Why?
2. Describe what you were feeling for.
3. How did knowing the “anatomy” of the penny prior to palpating help you?
4. How does that translate to anatomical structures? What will the differences be when you palpate bone versus ligaments?

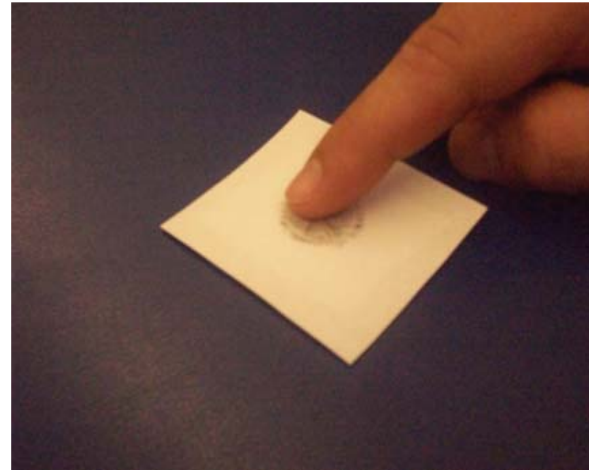


Figure 1. Palpating a penny with a paper cover (Lesson #1).

LESSON #2: Controlling Pressure

The validation of palpation has been hampered by a lack of standardized guidelines¹² and overwhelming variability.^{8-9,13} As such, techniques used to teach palpation should focus on improving reliability within and between practitioners. When trained, students retain information about applying correct pressure for up to one month.¹³ Lessons focused on teaching students about depth of pressure are crucial for analyzing the tissue palpated.

Objectives

1. Understand how to control pressure
2. Understand depth of pressure

Activity A. What is One Pound of Pressure?

Supplies:

- ▶ 2-5 digital scales
- ▶ 2-5 stop watches
- ▶ pencils and paper

Procedures:

1. Work in teams of 3-4.
2. Ask students to place the pads of digits 2-3 on the scale.
 - a. Students should try to achieve the same amount of pressure on three attempts while a teammate records the pressure.
 - b. Students will likely have significant variability between each other and between each trial.
3. Repeat with eyes closed.
4. Bring students together to discuss variability between and within practitioners. Discuss what this means for patients and patient care.
5. Send students back to their teams. Ask students, one at a time, to apply 1 pound of pressure while a teammate times the practitioner (Figure 2).
6. Students should continue practicing to improve their times during each attempt.



Figure 2. Identifying one pound of pressure using a digital scale. (Lesson #2, Activity A)

Discussion Questions:

1. Did the variability between practitioners and attempts surprise you? How so?
2. What were some of the difficulties with controlling pressure?
3. Did people improve with each attempt? Why do you think this happens? What does this mean for you when you practice?

Activity B.

Supplies:

- ▶ phonebooks (1 per pair of students)
- ▶ spool of thread (cut 1-2" pieces of thread for each pair of students)

Procedures:

1. Work in teams of two.
2. Ask one partner to open the phone book and place the thread under the open page (Figure 3).



3. Ask the palpator to use the pads of their fingers to locate the thread.
4. Repeat the task adding more pages between finger pads and thread.

Discussion Questions:

1. How did the task become more difficult with more pages? What did you have to change about your technique to find the thread?
2. How can we relate this to anatomical structures? What are some deep structures that may require more pressure? What are we feeling for with these tissues?

LESSON #3: Discriminating Changes in Soft Tissues

Once students have acquired some basic palpation skills, they are more capable of transferring those skills to patients. However, students often palpate healthy tissue on healthy patients when they practice these skills. Classroom exercises that aim to simulate tissue changes may assure students that they are correctly palpating injured patients in their clinical education experiences.

Objectives

1. Identify what tissue changes feel like
2. Identify methods for identifying changes in soft tissues

Activity: Palpating Licorice (Figure 4)

Supplies:

- ▶ pencils and paper
- ▶ 10-25 pre-made licorice bundles (Pull-n-Peel Twizzlers™ wrapped in Saran Wrap™) simulating a distinct tissue characteristic (eg, normal, grade 1-3 strains, heterotopic ossificans [hard round candy needed])

Procedures:

1. Label the tissue characteristic on the underside of each bundle.
2. Work in teams of 2-3.



Figure 3. Understanding depth of pressure using thread and pages of a phonebook (Lesson #2, Activity B)



Figure 4. Simulating variable soft tissue injuries using licorice (Lesson #3)

3. Ask students to palpate the structures and attempt to identify the deformity.
4. Students should record the different characteristics of each bundle.
5. When everyone has had a chance to palpate, the students should compare their findings with each other and confirm the findings with the labels on the underside of the bundles.

Discussion Questions:

1. How successful were you at correctly identifying the deformity?
2. What were the more challenging deformities to palpate? Do you think this is common? Why or why not?
3. What other tools might you see clinicians at your clinical sites use to identify and treat soft tissue injuries?
 - a. Note that this line of questioning is optional and may be irrelevant based upon the tools used by your clinical instructors.
 - b. It is very important to discuss certifications and credentialing for specific techniques, like Graston®, to avoid the improper use of these tools.
 - i. How do these tools enhance our ability to sense change in tissues?
 - ii. What are the purposes of these tools?

LESSON #4: Integrating Skills with Blindfold Palpation

Once students have acquired the anatomical knowledge and can accurately locate structures and evaluate their findings, they will need to engage in exercises that integrate all of their other clinical skills.

Objectives

1. Enhance sense of touch
2. Improve communication between medical professionals
3. Improve anatomy/palpations

Activity: Blindfold Palpation (lower leg and ankle)

Supplies:

- ▶ blindfolds (one for each student)
- ▶ handout with list of necessary palpations

Procedures:

1. Work in partners with one partner serving as the palpator and the other as the patient.
2. The palpator will palpate the structures of the lower leg and ankle while blindfolded (Figure 5).
 - a. The palpator will receive credit when they announce the structure to their patient.
 - b. The patient will record the structure on the checklist. If the palpator forgets to palpate a structure, the patient is responsible for directing the palpator to the structure without saying the name of the structure.
 - i. Example: if the missed structure is the base of the 5th metatarsal, the patient can say, “Please palpate beyond the distal attachment of the peroneus brevis and toward the common site for a Jones fracture.” The patient cannot say 5th metatarsal, styloid process of the 5th metatarsal, pinky toe, little toe, etc.
 - ii. Example: if the structure missed is the distal attachment of the tibialis anterior, the patient can say, “Please palpate distal to the ankle mortise where the muscle that acts to dorsiflex and invert the foot attaches.” The patient cannot say tibialis anterior, tibialis posterior, etc.
3. Partners should switch once all structures on the list have been palpated.

Discussion Questions:

1. Which structures were easiest to identify while blindfolded? Which were the hardest? Why do you think?
2. How did knowing the anatomy of the lower leg and ankle prior to palpating help you?
3. How did you modify pressure to palpate deeper structures? (Ask partners about depth of pressure: Was it enough? Not enough?)
4. Was anyone able to identify tissue changes in a classmate? Describe.



Figure 5. Blindfold palpations (Lesson #4).

CONCLUSIONS

Recognition and evaluation of injuries/illnesses accounts for the greatest percentage of an athletic trainer's responsibilities as a clinician. In addition, textbooks and other literature emphasize the role of history taking and special/ligamentous tests. However, palpation remains an underutilized tool in the evaluation process. With some creative and sequenced instruction, we can help students advance this integral skill. The lessons provided herein will help instructors transition from teaching a basic understanding of palpation, to understanding pressure and identifying changes in tissues. The final lesson integrates skills and forces students into the higher-order learning necessary for advanced clinical practice.

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