SCOREBUILDERS

SPOTLIGHT *Series*

How to Use Active Learning to Increase your Success

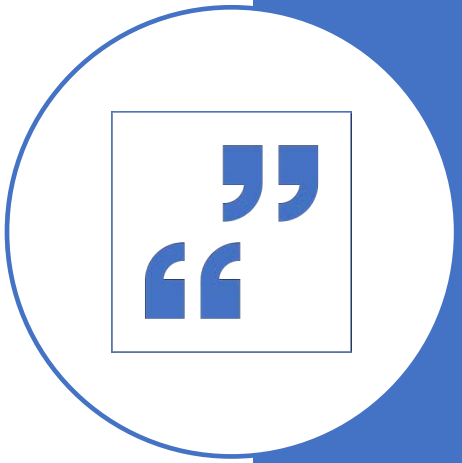
Presented by Holly Daniel, PT

Objectives

- Identify **sources** of active learning
- Identify the **benefits** of active learning
- **Assess** individual mastery using **“talking knowledge”**

Habit 7: “Sharpen the Saw”

- The 7 Habits of Highly Effective People
- First published in 1989
- Written by Stephen Covey
- New York Times Bestseller for 5 years during 1990s



Well-known Latin Principle

“The best way to learn is to teach”

Passive Learning

- Traditional sources of academic review (textbooks, class notes, review books) promote passive learning

Active Learning

- **Engages the student** in the learning process
- **Involves student activities:**

❑ Brain-dumps

❑ Think-Pair-Share

❑ Peer teaching

❑ Case studies

❑ Polling (Clickers, Poll Everywhere, Pear Deck)

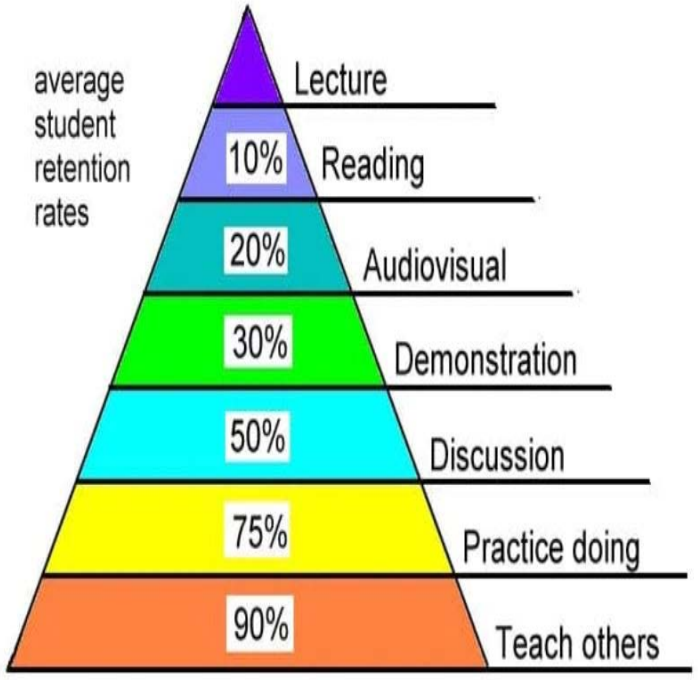
❑ Games (Jeopardy, Climb or KOM)

Other Sources of Active Learning

- Classmates
- Flash Cards
- Apps
- Basecamp
- **Content Prompts**

Benefits of Active Learning

- Encourages risk taking
- Increases active engagement
- Improves critical thinking
- Sparks creativity
- **Increases retention**



Edgar Dale's Pyramid of Learning

Students remember:

- **10%** of what they **Read**
- **20%** of what they **Hear**
- **30%** of what they **See**
- **50%** of what they **See and Hear**
- **70%** of what they **Say and Write**
- **90%** of what they **Say and Do**

CP Content Prompts

- Designed to determine if candidates possess **talking knowledge** of relevant academic content
- Serves as a **reinforcing loop for other resources** emphasizing academic content review
- **Enhances ability to apply academic content** in relevant clinical scenarios

Talking Knowledge Technique

- Involves asking **“Why”?**
- “How”?
- “What”?
- “When”?
- “Where”?

Sample from Integumentary System

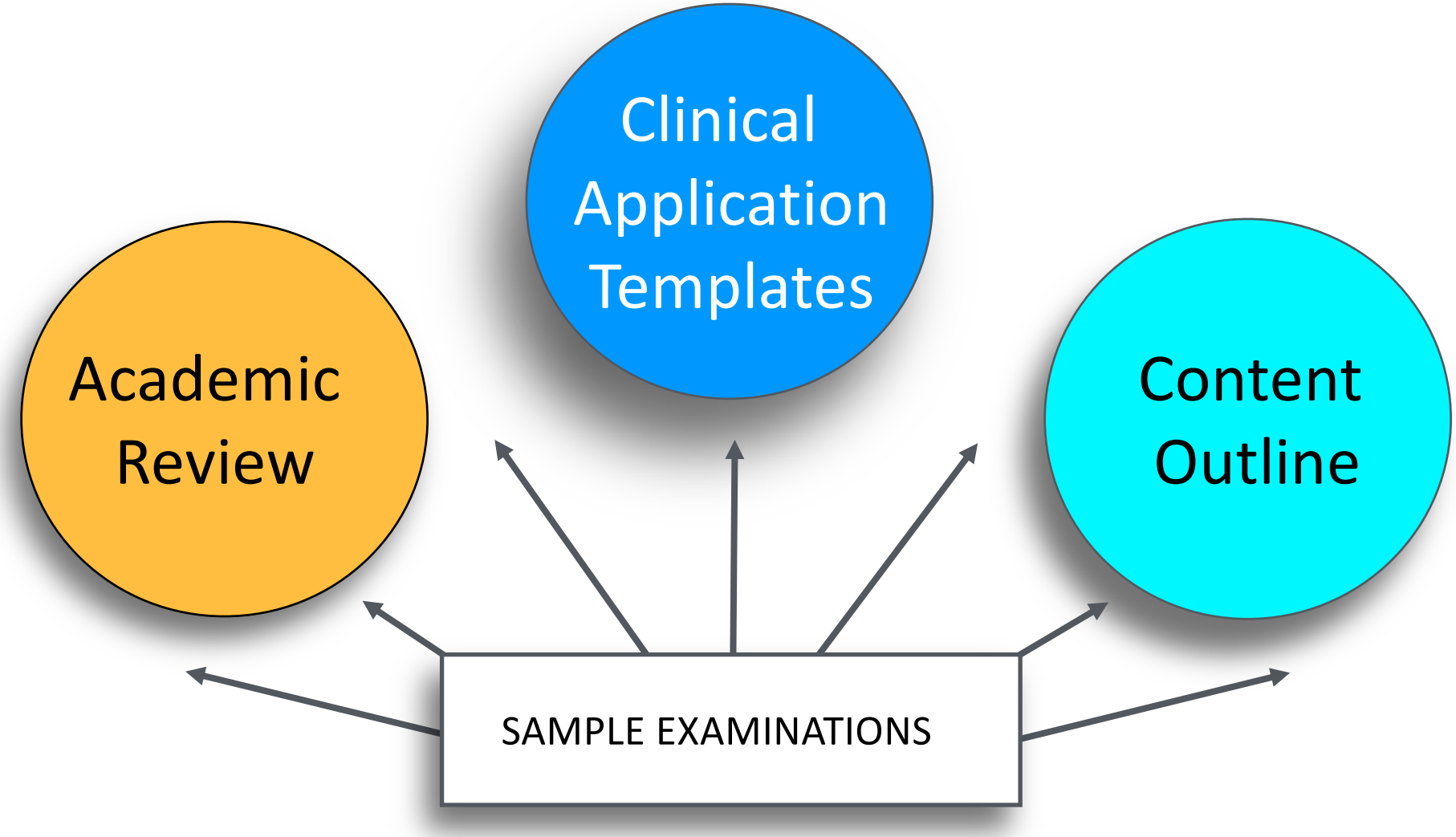
Risk Factors for Developing Wounds

- Arterial insufficiency
- Venous insufficiency
- Infection
- Pressure and shear
- Neuropathy
- Mobility
- Age

How to use **“talking knowledge”** when using a table from a review book

Characteristics of Lower Extremity Ulcers[1,2,4]			
	Arterial Insufficiency Ulcers	**Venous Insufficiency Ulcers**	**Neuropathic Ulcers**
Location	Lower one-third of leg, toes, web spaces (distal toes, dorsal foot, lateral malleolus)	Proximal to the medial malleolus	Areas of the foot susceptible to pressure or shear forces during weight bearing
Appearance	Smooth edges, well defined; lack granulation tissue; tend to be deep	Irregular shape; shallow	Well-defined oval or circle; callused rim; cracked periwound tissue; little to no wound bed necrosis with good granulation
Exudate	Minimal	Moderate/heavy	Low/moderate
Pain	Severe	Mild to moderate	None, however dysesthesia may be reported
Pedal Pulses	Diminished or absent	Normal	Diminished or absent; unreliable ankle-brachial index with diabetes
Edema	Normal	Increased	Normal
Skin Temperature	Decreased	Normal	Decreased
Tissue Changes	Thin and shiny; hair loss; yellow nails	Flaking, dry skin; brownish discoloration	Dry, inelastic, shiny skin; decreased or absent sweat and oil production
Miscellaneous	Leg elevation increases pain	Leg elevation lessens pain	Loss of protective sensation

The Big Picture



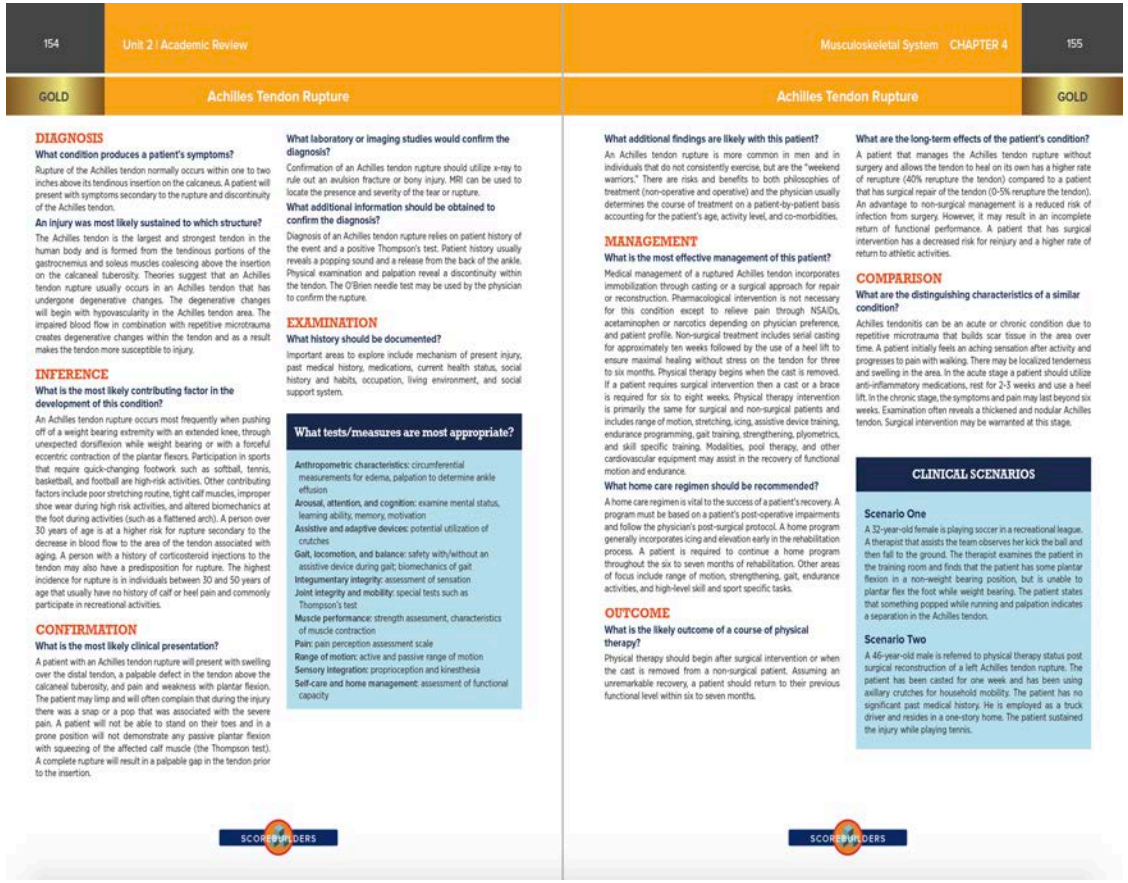
Clinical Application Templates

CAT

GOLD

SILVER

BRONZE



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GOLD Achilles Tendon Rupture

DIAGNOSIS

What condition produces a patient's symptoms?

Rupture of the Achilles tendon normally occurs within one to two inches above its tendinous insertion on the calcaneus. A patient will present with symptoms secondary to the rupture and discontinuity of the Achilles tendon.

An injury was most likely sustained to which structure?

The Achilles tendon is the largest and strongest tendon in the human body and is formed from the tendinous portions of the gastrocnemius and soleus muscles coalescing above the insertion on the calcaneal tuberosity. Theories suggest that an Achilles tendon rupture usually occurs in an Achilles tendon that has undergone degenerative changes. The degenerative changes will begin with hypovascularity in the Achilles tendon area. The impaired blood flow in combination with repetitive microtrauma creates degenerative changes within the tendon and as a result makes the tendon more susceptible to injury.

INFERENCE

What is the most likely contributing factor in the development of this condition?

An Achilles tendon rupture occurs most frequently when pushing off of a weight bearing extremity with an extended knee, through unexpected dorsiflexion while weight bearing or with a forceful eccentric contraction of the plantar flexors. Participation in sports that require quick-changing footwork such as softball, tennis, basketball, and football are high-risk activities. Other contributing factors include poor stretching routine, tight calf muscles, improper shoe wear during high risk activities, and altered biomechanics at the foot during activities (such as a flattened arch). A person over 30 years of age is at a higher risk for rupture secondary to the decrease in blood flow to the area of the tendon associated with aging. A person with a history of corticosteroid injections to the tendon may also have a predisposition for rupture. The highest incidence for rupture is in individuals between 30 and 50 years of age that usually have no history of calf or heel pain and commonly participate in recreational activities.

CONFIRMATION

What is the most likely clinical presentation?

A patient with an Achilles tendon rupture will present with swelling over the distal tendon, a palpable defect in the tendon above the calcaneal tuberosity, and pain and weakness with plantar flexion. The patient may limp and will often complain that during the injury there was a snap or a pop that was associated with the severe pain. A patient will not be able to stand on their toes and in a prone position will not demonstrate any passive plantar flexion with squeezing of the affected calf muscle (the Thompson test). A complete rupture will result in a palpable gap in the tendon prior to the insertion.

What laboratory or imaging studies would confirm the diagnosis?

Confirmation of an Achilles tendon rupture should utilize x-ray to rule out an avulsion fracture or bony injury. MRI can be used to locate the presence and severity of the tear or rupture.

What additional information should be obtained to confirm the diagnosis?

Diagnosis of an Achilles tendon rupture relies on patient history of the event and a positive Thompson's test. Patient history usually reveals a popping sound and a release from the back of the ankle. Physical examination and palpation reveal a discontinuity within the tendon. The O'Brien needle test may be used by the physician to confirm the rupture.

EXAMINATION

What history should be documented?

Important areas to explore include mechanism of present injury, past medical history, medications, current health status, social history and habits, occupation, living environment, and social support system.

What tests/measures are most appropriate?

Anthropometric characteristics: circumferential measurements for edema, palpation to determine ankle effusion
Arousal, attention, and cognition: examine mental status, learning ability, memory, motivation
Assistive and adaptive devices: potential utilization of crutches
Gait, locomotion, and balance: safety with/without an assistive device during gait; biomechanics of gait
Integumentary integrity: assessment of sensation
Joint integrity and mobility: special tests such as Thompson's test
Muscle performance: strength assessment, characteristics of muscle contraction
Pain: pain perception assessment scale
Range of motion: active and passive range of motion
Sensory integration: proprioception and kinesthesia
Self-care and home management: assessment of functional capacity

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Musculoskeletal System CHAPTER 4 155

GOLD Achilles Tendon Rupture

What additional findings are likely with this patient?

An Achilles tendon rupture is more common in men and in individuals that do not consistently exercise, but are the "weekend warriors." There are risks and benefits to both philosophies of treatment (non-operative and operative) and the physician usually determines the course of treatment on a patient-by-patient basis accounting for the patient's age, activity level, and co-morbidities.

MANAGEMENT

What is the most effective management of this patient?

Medical management of a ruptured Achilles tendon incorporates immobilization through casting or a surgical approach for repair or reconstruction. Pharmacological intervention is not necessary for this condition except to relieve pain through NSAIDs, acetaminophen or narcotics depending on physician preference, and patient profile. Non-surgical treatment includes serial casting for approximately ten weeks followed by the use of a heel lift to ensure maximal healing without stress on the tendon for three to six months. Physical therapy begins when the cast is removed. If a patient requires surgical intervention then a cast or a brace is required for six to eight weeks. Physical therapy intervention is primarily the same for surgical and non-surgical patients and includes range of motion, stretching, icing, assistive device training, endurance programming, gait training, strengthening, plyometrics, and skill specific training. Modalities, pool therapy, and other cardiovascular equipment may assist in the recovery of functional motion and endurance.

What home care regimen should be recommended?

A home care regimen is vital to the success of a patient's recovery. A program must be based on a patient's post-operative impairments and follow the physician's post-surgical protocol. A home program generally incorporates icing and elevation early in the rehabilitation process. A patient is required to continue a home program throughout the six to seven months of rehabilitation. Other areas of focus include range of motion, strengthening, gait, endurance activities, and high-level skill and sport specific tasks.

OUTCOME

What is the likely outcome of a course of physical therapy?

Physical therapy should begin after surgical intervention or when the cast is removed from a non-surgical patient. Assuming an unremarkable recovery, a patient should return to their previous functional level within six to seven months.

What are the long-term effects of the patient's condition?

A patient that manages the Achilles tendon rupture without surgery and allows the tendon to heal on its own has a higher rate of rerupture (40% rerupture the tendon) compared to a patient that has surgical repair of the tendon (0-5% rerupture the tendon). An advantage to non-surgical management is a reduced risk of infection from surgery. However, it may result in an incomplete return of functional performance. A patient that has surgical intervention has a decreased risk for reinjury and a higher rate of return to athletic activities.

COMPARISON

What are the distinguishing characteristics of a similar condition?

Achilles tendonitis can be an acute or chronic condition due to repetitive microtrauma that builds scar tissue in the area over time. A patient initially feels an aching sensation after activity and progresses to pain with walking. There may be localized tenderness and swelling in the area. In the acute stage a patient should utilize anti-inflammatory medications, rest for 2-3 weeks and use a heel lift. In the chronic stage, the symptoms and pain may last beyond six weeks. Examination often reveals a thickened and nodular Achilles tendon. Surgical intervention may be warranted at this stage.

CLINICAL SCENARIOS

Scenario One

A 32-year-old female is playing soccer in a recreational league. A therapist that assists the team observes her kick the ball and then fall to the ground. The therapist examines the patient in the training room and finds that the patient has some plantar flexion in a non-weight bearing position, but is unable to plantar flex the foot while weight bearing. The patient states that something popped while running and palpation indicates a separation in the Achilles tendon.

Scenario Two

A 46-year-old male is referred to physical therapy status post surgical reconstruction of a left Achilles tendon rupture. The patient has been casted for one week and has been using axillary crutches for household mobility. The patient has no significant past medical history. He is employed as a truck driver and resides in a one-story home. The patient sustained the injury while playing tennis.

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Sample of Questions from Template

Clinical Application Template Master - Gold

Diagnosis:

What condition produces a patient's symptoms?

An injury was most likely sustained to which structure?

Inference:

What is the most likely contributing factor in the development of this condition?

Confirmation:

What is the most likely clinical presentation?

What laboratory or imaging studies would confirm the diagnosis?

What additional information should be obtained to confirm the diagnosis?

CWA

Sample from Critical Work Activities

- **Nerve Integrity**

  Select and perform tests and measures of:

  - cranial nerve integrity (e.g., facial asymmetry, oculomotor function, hearing)
  - spinal nerve integrity (e.g., dermatome, myotome)
  - peripheral nerve integrity (e.g. sensation, strength)
  - neural provocation (e.g., tapping, tension, stretch)

Conclusion

- **“Talking knowledge”** is a powerful method of assessing your level of understanding and retention of NPTE content

- Use of **active study tools** can be a powerful method to determine readiness for the NPTE

Questions?

Feedback?
Let Us Know!

- We would love to get your general feedback on today's session and ideas for subject matter for future Spotlight Sessions!

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Series

Good Luck and Thanks for Tuning In!

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