

## SYLLABUS

- Name of Course:** Spinal Orthopedic Exam - lecture (DIAG-239)
- Length of Course:** 22 hours (2 hrs lecture/wk), 1.5 credit hours
- Course Description:** This lecture course and the corresponding lab are the first of a two part series in orthopedic examination, with emphasis on orthopedic examination of the spine. The orthopedic examinations for the cervical spine, thoracic outlet, lumbar spine, and sacroiliac regions will be covered in detail.
- Pre-requisites:** TECH-216
- Co-requisite:** DIAG-739
- Course Offered By:** Clinical Sciences Department
- Required Texts:** Spinal Orthopedic Exam class notes (Canvas)
- Recommended Texts:** Cipriano. Photographic manual of regional orthopaedic and neurological tests. 5th ed. Lippincott Williams & Wilkins; 2010.
- Reference Texts:**
- \*Evans. Instant access to orthopedic physical assessment. 2<sup>nd</sup> ed. Mosby; 2009.
  - \*Gerard J, Kleinfield, S. Orthopaedic testing: a rational approach to diagnosis. Churchill Livingstone; 1993.
  - \* Hoppenfeld. Physical examination of the spine and extremities. Appleton-Century-Crofts: 1976.
  - \*Magee. Orthopedic physical assessment. 6<sup>th</sup> ed. Saunders Elsevier; 2013.
  - \*Cailliet. Neck and arm pain. 3<sup>rd</sup> ed. F.A. Davis 1991.
  - \*Cailliet. Low back pain syndrome. 5<sup>th</sup> ed. F.A. Davis; 1995.
  - \*Murphy DR, Conservative Management-Cervical Spine Syndromes. Mcgraw-Hill 2000
- DVDs:**
- \*Thompson M. Orthopedic testing review. 2007.
  - \*Baptista L. Orthopedic exam review. 2004.
  - \*Strutin N. Clinic entrance ortho/neuro exam review, 1993.
- Materials:** none
- Method of Instruction:** Lecture, demonstration.

**Evaluation &  
Grading Criteria:**

A: 90-100  
B: 80-89  
C: 70-79  
F: below 70

Midterm (week 5): 40%  
Final (comprehensive): 60%

**Grades and the Grading System Final Grades** are available online through the CAMS student portal. If there are any questions on grading procedures, computation of grade point average, or the accuracy of the grade report, please contact the Registrar's Office or the Office of Academic Affairs. Grades will be reported and evaluation will be based on the Academic Policies, Procedures, & Services. Please refer to Evaluation Policy (**Policy ID: OAA.0007**)

In order to maintain **Satisfactory Academic Progress**, a student must maintain a 2.0 or better in each and every course. **Any grade less than a C must be remedied by repeating the class.** Please refer to Satisfactory Academic Progress (**Policy ID: OAA.0006**)

**Attendance:** Please refer to Attendance Policy (**Policy ID: OAA.0002**)

**Conduct and**

**Responsibilities:** Please refer to the Personal Conduct, Responsibility and Academic Responsibility Policy (**Policy ID: OAA.0003**)

**Make-up Exams:** Please refer to Make-up Assessment Policy (**Policy ID: OAA.0001**)

**Request for**

**Special Testing:** Please refer to Request for Special Testing (**Policy ID: OAA.0004**)

**Accommodation**

**for Students with Disabilities:**

If you have approved accommodations, please make an appointment to meet with your instructor as soon as possible. If you believe you require an accommodation, but do not have an approved accommodation letter, please see the Academic Counselor Lori Pino in the Office of Academic Affairs. Contact info: [Lpino@lifewest.edu](mailto:Lpino@lifewest.edu) or 510-780-4500 ext. 2061. Please refer to Service for Students with Disabilities Policy (**Policy ID: OAA.0005**)

**Electronic Course Management:**

**Canvas** is LCCW's Learning Management System (LMS). Canvas will be used throughout the quarter during this course. Lectures, reminders, and messages will be posted. In addition, documents such as the course syllabus and helpful information about the class project will be posted. Students are expected to check Canvas at least once a week in order to keep updated. The website address for Canvas is <https://lifewest.instructure.com/login/canvas> Please refer to the Educational Technologies Policy (**Policy ID: OAA.0009**)

## **Procedures for viewing exams:**

The instructor had not authorized distribution of old exams. Any possession of old exams is prohibited. The instructor may either conduct review sessions in class or may meet with a student to review his or her exam during office hours for two weeks following the exam (unless there is a shorter time period until the last scheduled office hour during the last week of classes.) Students may not review mid-term exams during final exam week. The possession of any exam other than during a review session constitutes unprofessional conduct.

## **Course Goals:**

The goal of this course is to prepare the student to be able to perform spinal orthopedic examination procedures and assess spinal ranges of motion, to understand the normal and abnormal results, and assist in developing the analytic skills needed to interpret those results in order to diagnose spine-related disorders.

## **Course Objectives:**

Week 1: Introduction to patient assessment and introduction to cervical spine exam

Discuss the components of patient assessment: HIPPIRONEL.

Introduce the basic concepts of orthopedic examination

\*general principles; values & deficiencies of orthopedic examination

\*"signs" vs "maneuvers" vs "tests"

\*"true" positive vs "false" positive vs "incidental" findings

Discuss assessment of pain severity & the visual analog scale (VAS)

Discuss pain illustrations

Explain the concept of functional assessment & outcome measure measures, and identify examples (general pain, cervical, low back)

Begin the discussion of cervical spine examination:

\*Discuss inspection findings: Bakody's sign, Rust's sign

\*Discuss palpation, percussion, auscultation

\*Cervical ROM

\*Explain the assessment of cervical spine ROM through visualization and instrumentation

\*Discuss the normal ranges utilized by the LCCW Health Center

## Week 2: Cervical spine disorders & orthopedic tests - continued

Discuss cervical DJD (spondylosis)

Discuss cervical connective tissue referred pain (sclerogenic pain)

Discuss cervical radiculopathy

Describe cervical orthopedic exams (procedure, abnormal findings, significance):

- \*cervical compression test & variations
  - \*neutral
  - \*lateral flexion (Jackson's)
  - \*flexion
  - \*extension
  - \*rotation
  - \*maximal cervical compression maneuver
  - \*modified Spurling test
- \*cervical distraction test
- \*shoulder depression test
- \*Valsalva maneuver
- \*Naffziger (jugular compression) test

## Week 3: Cervical spine disorders & orthopedic tests - continued

Discuss cervical spondylotic myelopathy (CSM)

Discuss meningitis

Discuss strain/sprain

Describe cervical orthopedic exams (procedure, abnormal findings, significance)

- \*Lhermitte's sign
- \*Soto-Hall test
- \*Brudzinski sign
- \*Kernig's test
- \*O'Donahue's test

## Week 4: Thoracic Outlet Syndrome (TOS) and TOS orthopedic exams

Describe thoracic outlet syndrome (TOS)

- \*relevant anatomical structures
- \*sites of potential compression
- \*symptoms & signs

Describe/demonstrate the tests for neurovascular bundle compression by the scalenes and/or cervical rib:

- \*Adson's test
- \*modified Adson's test

Describe the tests for neurovascular bundle compression between the clavicle and first rib (costoclavicular space):

- \*Eden's test
- \*Costoclavicular test

Describe the tests for neurovascular compression by the pectoralis minor:

- \*Wright's test
- \*reverse Bakody's test

Describe claudication in the upper extremity and discuss claudication tests

- \*Intermittent Claudication test
- \*Elevated Arm Stress Test
- \*Roos test

Discuss a test to differentiate radial vs ulnar artery vascular insufficiency

- \*Allen's test

Discuss the upper limb tension test (ULTT) / upper limb neurodynamic test (ULNDT)

Week 5 MIDTERM (1st hour) & start Lumbar spine (2nd hour)

## MIDTERM

Intro to LBP

- \*LBP etiology – categories
- \*red flags/warning signs of serious underlying pathology (AHCPR, “Acute Low Back Problems in Adults”, 1994)

Discuss lumbar ROM

Describe lumbar orthopedic tests

- \*Minor's sign
- \*Valsalva maneuver
- \*Nafziger (Jugular compression) test
- \*Milgrim's test
- \*Kemp's test
- \*Neri's Bowing test
- \*Supported forward bending test (Belt test)
- \*Goldthwaite's test

## Week 6: Lumbar spine - continued

Discuss lumbar DJD & facet syndrome  
Discuss lumbar CT referred (sclerogenic) pain  
Discuss lumbar radiculopathy

Discuss lumbar orthopedic tests

- \*SLR
- \*Braggard's test
- \*Bowstring test
- \*Bonnet's test (SLR with internal hip rotation & adduction)
- \*WLR
- \*Fajerstzajn's test
- \*Sitting Lasegue test
- \*Bechterew's test
- \*Slump test
- \*Lindner's test

## Week 7 Sacroiliac joint

Discuss sacroiliac joint problems and referred pain patterns

Discuss tests that help DDx lumbar from sacral sources of low back pain

- \*Goldthwaite's test
- \*Belt test

Discuss tests for sacroiliac dysfunction

- \*Patrick's F-AB-ER-E test & Laguerre test
- \*Gaenslen's test & Lewin-Gaenslen's test
- \*Nachlas test & Ely's sign
- \*Yeoman's test
- \*Ely's heel-to-buttock test
- \*Hibb's test
- \*SI Gapping test (SI Stretch test / SI Distraction test)
- \*Iliac Compression test
- \*Sacroiliac Resisted Abduction test,

Week 8 Hip, pelvis - misc tests  
Thoracic spine

Describe a test for gluteus medius weakness  
\*Trendelenberg test

Describe a test for iliopsoas muscle contracture  
\*Thomas test

Discuss assessment of leg length inequality  
\*tests for "true" versus "apparent" leg length discrepancies

Review scoliosis and kyphoscoliosis and the concepts of functional versus structural spinal curves.

Discuss tests to help differentiate structural and functional scoliosis  
\*Adams test  
\*Side Bending

Discuss test to help differentiate structural and functional kyphosis  
\*Prone Extension test

Describe the significance of  
\*Beever's sign

Describe the Chest Expansion test & the significance of dec. chest expansion.

Describe Schepelman's test

Week 9: Malingering tests (non-organic physical signs)  
Review for lab practical

Describe the concept & implications of malingering, and discuss the malingering tests(non-organic physical signs):  
\*Hoover's test  
\*Burn's Bench test  
\*Mannkopf's, and  
\*Skin Pinch

Discuss pain threshold and tolerance  
\*Libman's pain tolerance test.

Week 10: Lecture wrap-up; lab practical exams

Week 11: Lecture final

Student Learning Outcomes:

1. The student will be able to evaluate their patient's pain severity using the visual analog scale (VAS), and be able to use functional assessment questionnaires (General Pain Disability, Cervical Pain Disability, Revised Oswestry, Roland Morris) to evaluate their patient's current functional capability and document outcomes.  
[PLO: 1, 2, 4, 5, 6, 8]
2. The student will be able to use the HIPPIRONEL sequence to be able to establish the proper sequence of patient assessment procedures for non-traumatic and traumatic cases, and integrate the information obtained from various tests to determine the next logical step in the patient assessment process [PLO; 1, 2, 8]
3. The student will demonstrate the ability to assess cervical and lumbar range of motion through visualization and instrumentation (inclinometer), and be able to evaluate a patient's range of motion using the normal measurements as described in the LCCW Health Center manual [PLO: 1, 2, 4]
4. The student will be able to select appropriate spinal orthopedic exams to evaluate different disorders. [PLO: 1, 2, 4, 8]
5. The student will be able to:
  - a. Verbally describe & physically demonstrate the procedure for each test (performance). [PLO: 1, 4]
  - b. Discuss the mechanism(s) of each test [PLO: 1, 4]
  - c. Describe the normal and abnormal findings for each test [PLO: 1, 4]
  - d. Describe and interpret the significance of abnormal findings for each test.  
[PLO: 1, 4]
6. The student will be able to discuss the major signs, symptoms and mechanisms of injury that suggest the following disorders, and will be able to list the orthopedic tests used to diagnose these disorders. [PLO: 1, 4]
  - \* cervical radiculopathy,
  - \* thoracic outlet syndrome,
  - \*lumbosacral radiculopathy,
  - \* sciatic neuropathy,
  - \*sacroiliac disorders



**Program Learning Outcomes (PLO):** Students graduating with a Doctor of Chiropractic degree will be proficient in the following:

1. **ASSESSMENT AND DIAGNOSIS:** An assessment and diagnosis requires developed clinical reasoning skills. Clinical reasoning consists of data gathering and interpretation, hypothesis generation and testing, and critical evaluation of diagnostic strategies. It is a dynamic process that occurs before, during, and after the collection of data through history, physical examination, imaging, laboratory tests and case-related clinical services.
2. **MANAGEMENT PLAN:** Management involves the development, implementation and documentation of a patient care plan for positively impacting a patient's health and well-being, including specific therapeutic goals and prognoses. It may include case follow-up, referral, and/or collaborative care.
3. **HEALTH PROMOTION AND DISEASE PREVENTION:** Health promotion and disease prevention requires an understanding and application of epidemiological principles regarding the nature and identification of health issues in diverse populations and recognizes the impact of biological, chemical, behavioral, structural, psychosocial and environmental factors on general health.
4. **COMMUNICATION AND RECORD KEEPING:** Effective communication includes oral, written and nonverbal skills with appropriate sensitivity, clarity and control for a wide range of healthcare related activities, to include patient care, professional communication, health education, and record keeping and reporting.
5. **PROFESSIONAL ETHICS AND JURISPRUDENCE:** Professionals comply with the law and exhibit ethical behavior.
6. **INFORMATION AND TECHNOLOGY LITERACY:** Information literacy is a set of abilities, including the use of technology, to locate, evaluate and integrate research and other types of evidence to manage patient care.
7. **CHIROPRACTIC ADJUSTMENT/MANIPULATION:** Doctors of chiropractic employ the adjustment/manipulation to address joint and neurophysiologic dysfunction. The adjustment/manipulation is a precise procedure requiring the discrimination and identification of dysfunction, interpretation and application of clinical knowledge; and, the use of cognitive and psychomotor skills.
8. **INTERPROFESSIONAL EDUCATION:** Students have the knowledge, skills and values necessary to function as part of an inter-professional team to provide patient-centered collaborative care. Inter-professional teamwork may be demonstrated in didactic, clinical or simulated learning environments.
9. **BUSINESS:** Assessing personal skills and attributes, developing leadership skills, leveraging talents and strengths that provide an achievable expectation for graduate success. Adopting a systems-based approach to business operations. Networking with practitioners in associated fields with chiropractic, alternative medicine and allopathic medicine. Experiencing and acquiring the hard business skills required to open and operate an on-going business concern. Participating in practical, real time events that promote business building and quantifiable marketing research outcomes
10. **PHILOSOPHY:** Demonstrates an ability to incorporate a philosophically based Chiropractic paradigm in approach to patient care. Demonstrates an understanding of both traditional and contemporary Chiropractic philosophic concepts and principles. Demonstrates an understanding of the concepts of philosophy, science, and art in chiropractic principles and their importance to chiropractic practice.

## INSTRUCTIONS for SPINAL ORTHO EXAM LAB PRACTICAL

Your exam will consist of identifying & performing three (3) orthopedic exams for a clinical condition, which will be randomly chosen from the following list of 6 conditions:

1. cervical joint disorder (sublux, DJD/spondylosis, etc.)
2. cervical radiculopathy (IVF stenosis, disc herniation)
3. TOS
4. lumbar radiculopathy (IVF stenosis, disc herniation)
5. SI joint disorder
6. lumbar joint disorder (sublux, DJD/spondylosis, etc.)

For each orthopedic exam you choose you must:

- a. name the test (minimal point value)
- b. demonstrate & explain the procedure
- c. explain the positive/abnormal findings or exam results

NOTE: You must clearly state what the patient experiences. The vague statement “reproduction of symptoms” will not be sufficient. You must state the symptoms that were reproduced or exacerbated. Examples:

The patient experiences a reproduction or exacerbation of ...  
...local pain in the cervical (lumbar) spine  
...pain, tingling & numbness down the arm (leg)  
...pain in the SI joint,  
... etc.

Regarding selection of “Appropriate” tests:

1. The tests you chose must be appropriate for the condition. You will NOT receive any credit for an inappropriate test (ex. indicating an SI test when the condition you were given was lumbar radiculopathy, etc.)
2. The tests selected should be representative of the various tests for the condition. Tests should NOT be variations of tests you have already performed, when other good tests are available. (Gaenslen’s and Lewin-Gaenslen’s really are the same test. Rather than doing cervical compression in neutral position, Jackson’s & modified Spurling’s, consider the distraction test, Bakody’s maneuver, Valsalva maneuver, etc.).

You will only receive very minimal credit for performing a test variation when other tests are available.

Examiners will NOT provide any prompts during the exam. You will have 3 minutes to complete your exam.

Please prepare & practice so you will be able to complete your exam in the allotted time, as the time limit is firm.