

## The Essentials of the Chiropractic, Orthopedic and Neurologic Examination



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## What Follows is a Summary of Common Exam Procedures Seen in a Chiropractic Office

*Many Other Tests Exist That  
Aren't Included in This Module*



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## Learning About the Patient Involves Several Steps

- Consultation with patient
- History-taking
- Examination
- Diagnostic testing options



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## The Examination Often Has More Than One Component

- General physical examination\*
- Chiropractic examination
- Orthopedic examination
- Neurologic examination



*It depends on the patient and condition*

\*Covered in a previous module

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## PART Formula Identifies the Minimum Requirements to Report

- **P**ain reported by patient / areas of tenderness found on examination
- **A**symmetry / misalignment of an anatomical structure
- **R**ange of motion findings
- **T**issue changes / muscle tone abnormalities discovered

*Used in documentation for  
Medicare and others*

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## I. The Chiropractic Examination

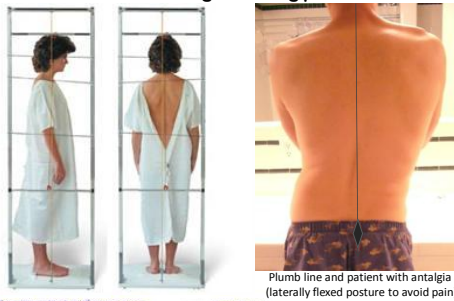
- A variety of methods are used to determine what spinal or other body areas may or may not benefit from chiropractic treatment
- Is not limited to but significantly depends on palpation
- Includes bony structural, soft-tissue, postural and range of motion components



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## Postural Examination

May use observation, a plumb line or a posture grid to assess recent or long-standing postural issues



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Examples of posture variants

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## Examining for Spinal Scoliosis

- It is a lateral curvature of the spine of  $10^\circ$  or more
- Under  $10^\circ$  is considered a normal variant
- May be more than one spinal curve
- 65% idiopathic (from an unidentifiable cause); 15% congenital; 10% due to neuromuscular disease
- Affects 3-5% of the population
- Generally isn't the source of pain
- Graded in four categories; 95% are in the mildest category (Grade I)
- Male / female incidence is equal, but females are 8 times more likely to develop a larger curvature
- Age of onset usually 10-15 years

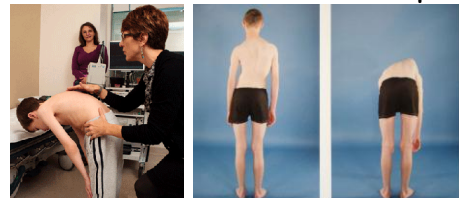


Grade IV Spinal Scoliosis

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## Examining for Spinal Scoliosis

- Patient flexes at waist to  $90^\circ$
- Asymmetrical rib cage "hump" often appears if spinal scoliosis
- Often also one low shoulder and hip



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## Palpation

The process of using one's hands to examine the body



Palpating the spine

Palpating swelling in the knee

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## Joint Palpation

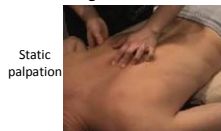
The chiropractor feels for mobility (or lack of it) in bony structures, as well as issues with alignment and symmetry



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## Joint Palpation

- Static palpation - patient is not moving during the exam
- Motion palpation - patient is asked to move while contact is held on two or more bony structures



Static palpation

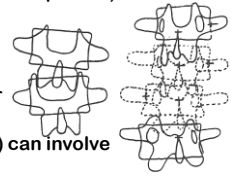


Motion palpation

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## Examining for Joint Mobility

- Hypermobility (more mobility than expected) can involve
  - 2 adjacent segments
  - Multiple joints in one area
  - Entire regions of the spine or other structures
- Hypomobility (reduced mobility) can involve
  - 2 adjacent segments
  - Multiple joints in one area
  - Entire regions of the spine or other structures
  - Often referred to by chiropractors as subluxation, joint fixation or "locked joints"



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## Soft-Tissue Examination

For muscle tone, swelling, masses, temperature changes



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## Percussion

- Tapping an area to listen for sounds and to elicit complaints
- Conditions that inflame bone can cause pain if the structure is percussed (and sometimes when palpated)
- Examples are fracture, infections, and malignancy



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## Leg Length Examination

- A difference in length between the lower extremities can contribute to lower back and lower extremity symptoms
- Examination by observation (at right)
- Examination by measurement
  - A measuring device (below left)
  - With radiography and a scanogram ruler (the most accurate method, but often not worth the radiation)

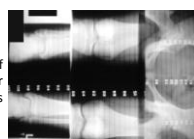


Scanogram ruler



Tape measure

Scanogram of the lower extremities



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## II. The Orthopedic Examination

- Mechanical tests to isolate area(s) of involvement, frequently performed with the chiropractic examination
- Tests vary from one anatomical area to another
- Dozens of orthopedic tests exist, but some are more routinely used than others
- Tests in a chiropractic office for the spine, shoulder, knee, elbow, wrist, ankle, hip, foot
- Tests are usually done in the order of patient's position



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## Range of Motion (ROM)

- Spine and extremities can be measured
- Extremity ROM measurement uses devices seen here (goniometers)



Manual goniometer



Electronic goniometer

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## III. The Neurologic Examination

Frequently performed with the chiropractic examination to confirm or rule out

- Specific nerve involvement
- Neurologic disease



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## Observation is a Major Component of the Neurologic Examination



Hand tremors are present in a number of neurologic conditions



Asymmetry of the face in a stroke patient

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## Cranial Nerve (CN) Evaluation

- Testing function of the 12 pairs of nerves that originate in the brain
- One or more of the CN can be affected by conditions such as tumors, aneurysm and neurologic disease

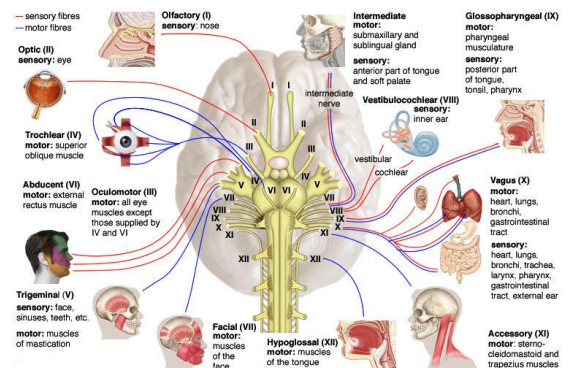


Testing cranial nerves III, IV and VI (eye movement)

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## Cranial Nerve Evaluation

- I (olfactory n.) - smell
- II (optic n.) - vision
- III (oculomotor n.) - light response, eye movement
- IV (trochlear n.) - eye movement
- V (trigeminal n.) - facial sensation
- VI (abducens n.) eye movement
- VII (facial n.) - facial muscles, taste
- VIII (auditory n.) - hearing, balance
- IX (glossopharyngeal n.) - taste, gag reflex
- X (vagus n.) - speaking, swallowing
- XI (spinal accessory n.) - shoulder shrug
- XII (hypoglossal n.) - tongue movement

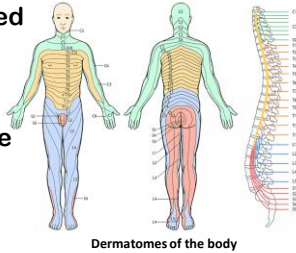


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## Sensory Examination

- Helps identify areas of increased or decreased sensation
- May be correlated with nerve distribution (dermatomes) to confirm where problem is originating from



Dermatomes of the body

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## Sensation: Distinguishing Stimuli

- Sharp: pin or pinwheel



Wartenberg pinwheel

- Soft: cotton swab or soft brush



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## Reflexes

- Involuntary and instantaneous movements in response to a stimulus
- Deep tendon reflexes (DTR's)**, **pathological reflexes** and **superficial reflexes**
- Abnormal response to testing may reveal certain neurologic disorders



Reflex hammers



Testing patellar DTR with reflex hammer



Testing Babinski pathological reflex by scraping plantar area



Testing abdominal superficial reflex with pin

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## Tests for Coordination and Balance

May identify or rule out neurologic disease



Romberg test for balance may indicate ataxia or other neurologic conditions



Finger to nose test for coordination may indicate cerebellar conditions

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## Strength Testing (Motor Function)

- May reveal neurologic deficits
- May reveal functional deficits
- May identify areas that need strengthening
- Can be performed manually or with instruments



Manual strength testing of leg flexion



Digital dynamometer testing of wrist extension

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## Gait Examination

- Gait is observed for possible abnormalities
- Patient may then be asked to attempt various walking maneuvers to rule out neurologic disease (and sometimes nerve root irritation)



Heel-to-toe walk



Heel walk



Toe walk

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## Examples of Abnormal Gait



All raise the possibility of neurologic disease

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## Testing for Carpal Tunnel Syndrome

A condition of the wrist, hand and fingers caused by irritation of one or more nerves at the wrist, often causing pain, tingling or numbness



- **Tinel Sign:** gentle tapping over the anterior wrist may cause pain and or tingling there and or into the hand



- **Phalen's Sign:** holding wrists as shown for 30 to 60 seconds may cause pain and/or tingling there and or into the hand

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## IV. Diagnostic Testing

Exam may identify a need for diagnostic testing

- Blood laboratory studies
- Imaging
- Neurodiagnostic studies
- Other, as needed



Lumbar spine MRI

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## Blood Laboratory Studies ("Labwork," "Labs")

- To confirm or rule out other health care conditions that might either be the cause of the patient's symptoms or might be a factor
- To confirm or rule out certain inflammatory joint conditions such as rheumatoid arthritis, ankylosing spondylitis
- To confirm or rule out connective tissue diseases such as systemic lupus erythematosus (SLE)



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## "Imaging"

Relates to any diagnostic procedure that produces an image of a body part

- Radiography (includes mammography)
- MRI
- CT
- Diagnostic ultrasound
- Nuclear medicine
- PET
- Echocardiography
- Bone mineral densitometry



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## Common Imaging Studies Ordered by Chiropractic Doctors



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## Radiography (X-Ray)

- Best for demonstrating bone
- Shows soft tissue poorly
- Can show some types of misalignment, but less reliably than once thought
- Most chiropractors rely much more heavily on exam findings than x-ray<sup>1</sup>



<sup>1</sup>Triano J., et al. (2013). Review of methods used by chiropractors to determine the site for applying manipulation. *Chiropractic & Manual Therapies* 21:36-21

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## Magnetic Resonance Imaging (MRI)

- Uses radio frequencies to make "slices" instead of x-ray
- Best for soft tissue, brain, muscles, heart, and cancer detection
- Often ordered by chiropractors to rule out disc herniations (ruptures) and spinal stenosis (narrowing of the opening where the spinal cord and/or spinal nerves pass through)



Open access MRI unit



Lumbar spine MRI

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## Computerized tomography (CT)

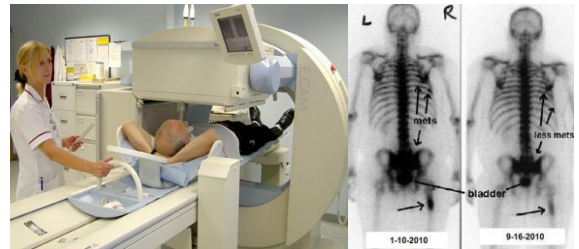
- Also CAT (computerized axial tomography)
- X-ray machine makes circular movements around patient, taking "slices" (images)
- Best suited for viewing bone, lung and chest problems and cancers



CT scan of the cervical spine

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## Nuclear Medicine Bone Scan



- Radioactive substance is injected into patient and the scanner camera detects it in bone
- Chiropractors use it to detect
  - Subtle fractures that are otherwise difficult to see
  - Inflammatory bone conditions
  - Bone cancer



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## Bone Mineral Densitometry (BMD)



This unit is a DEXA (dual-emission x-ray absorptiometry) machine

- A low-power x-ray machine
- Measures density of bone in hip and spine (smaller units measure extremities instead)
- Computer model then predicts possibility of fracture
- Chiropractors order BMD to rule out osteopenia and osteoporosis (conditions where bone minerals are being lost faster than they can be rebuilt)

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## Neurodiagnostic Studies (EMG,\* NCV\*\*)

Electrical tests performed to find diseases that damage muscle tissue or nerves that result in weakness, paralysis, or muscle spasms



\*Electromyography

\*\*Nerve conduction velocity

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