

MODULE 1

PRIORITY DYSFUNCTIONS

- Structure of fractals
- Rules of priority dysfunctions
 - Super basic mode
- Rules of Double UTL

SEQUENCE DYSFUNCTIONS

- Reflexes vs. sequences
- Types of sequences
- Rules of sequences
 - Diagnostics
 - Treatment

SHOULDER BIOMECHANICS

- Osteology
 - Shoulder complex
 - Sternum
 - Clavicle
 - Scapula
 - Humerus
 - Joints of the shoulder
 - Sternoclavicular joint
 - Acromioclavicular joint
 - Coracoclavicular joint
 - Scapulothoracic joint
 - Glenohumeral joint
 - Shoulder neural function
 - Movements of the scapula
 - Scapulohumeral rhythms
 - Shoulder goniometry
 - Movements of the shoulder complex
 - Static vs. dynamic restraints
 - Sequences

KNEE BIOMECHANICS

- Knee goniometry
- Biomechanics of rolling

- Biomechanics of rotation
- Menisci of the knee
 - Superior, peripheral, and inferior surfaces
 - Menisci attachments
 - Passive menisci movements
 - Active menisci movements
 - Rupture of the menisci
 - Causes
 - Types of tears
- Patella
 - Movement mechanics
- Extensor muscles of the knee
- Flexor muscles of the knee
- Rotator muscles of the knee
- Automatic movements of the knee
 - Movements
 - Causes
- Plica
 - Background
 - Characteristics
 - Location
 - Treatment
 - Clinical manifestation
- Lateral knee stability
 - Collateral ligaments
 - Medial collateral ligaments
 - Lateral collateral ligament
- Anterior-Posterior knee stability
 - Periarticular defense system of the knee
 - Cruciate ligaments
 - Anterior cruciate ligament
 - Posterior cruciate ligament
- Synovial membrane
- Bursae
- “Screw-Home” mechanism
- Genicular anastomosis
- Popliteal fossa
- Orthopedic tests
- Sequence dysfunctions

HIP BIOMECHANICS

- Hip goniometry
- Biomechanics of hip joint
 - “Black Crescent”
- Three elementary movements of hip
- Hip ligaments

- Iliofemoral (superior and inferior bands)
 - Location
 - Function through various movements
- Pubofemoral
 - Location
 - Function through various movements
- Ischiofemoral
 - Location
 - Function through various movements
- Ligamentum teres
 - Location
 - Function
 - Circumflex artery
 - Stimulus
- Transverse ligament of hip
 - Location
 - Stimulus
- Sequence dysfunctions

MODULE 2

FOOT AND ANKLE BIOMECHANICS

- Ankle osteology
 - Ankle mortise
 - Lower leg
 - Tibia
 - Fibula
 - Tib-fib fixation
 - Talus
 - Relationship to FHL
 - Movements of subtalar joint
- Tarsal sinus
 - Y-ligament
- Ankle goniometry
 - Anterior compartment
 - Posterior compartment
 - Lateral compartment
- Foot osteology
 - Hindfoot
 - Subtalar joint
 - Midfoot
 - Transverse tarsal joint
 - Tarsometatarsal joints
 - Forefoot
 - Metatarsophalangeal joints
 - Interphalangeal joints
- Arches of the foot

- Longitudinal arch
 - Lateral longitudinal arch
 - Medial longitudinal arch
- Transverse arch
- Windlass mechanism
- Muscles of the foot
 - Intrinsic muscles
 - Extrinsic muscles
- Ligaments of the ankle
 - Anterior proximal tib-fib ligament
 - Posterior proximal tib-fib ligament
 - Anterior/Posterior tib-fib ligament
 - Interosseous ligament between tibia and fibula
 - Lateral ankle ligaments
 - Anterior talofibular ligament
 - Posterior talofibular ligament
 - Calcaneofibular ligament
 - Medial ankle ligaments/"Deltoid ligament"
 - Anterior tibiotalar ligament
 - Posterior tibiotalar ligament
 - Tibiocalcaneal ligament
 - Tibionavicular ligament

ELBOW AND WRIST BIOMECHANICS

- Elbow osteology
 - Humerus
 - Trochlea
 - Capitulum
 - Ulna
 - Radius
- Joints of elbow
 - Humeroulnar joint
 - Humeroradial joint
 - Radioulnar joint
 - Proximal radioulnar joint
 - Distal radioulnar joint
- Nerve innervation
 - Median nerve
 - Ulnar nerve
 - Radial nerve
- Elbow goniometry
- Movements of the elbow
 - Muscle tests for supinator, pronator teres, pronator quadratus, and anconeus
- Elbow kinematics
- Ligaments of the elbow
 - Annular ligament
 - Quadrate ligament

- Ulnar collateral ligament
- Radial collateral ligament
- Interosseous ligament between radius and ulna
- Carpal osteology
- Ligaments of the wrist
 - Anterior carpal ligaments
 - Posterior carpal ligaments

MANDIBULAR AND FACIAL LIGAMENT BIOMECHANICS

- Mandibular ligaments
 - Stylomandibular ligament
 - Anatomy
 - Function
 - Muscle inhibition pattern
 - Sphenomandibular ligament
 - Anatomy
 - Function
 - Muscle inhibition pattern
 - Lateral/Temporomandibular ligament
 - Anatomy
 - Oblique portion
 - Horizontal portion
 - Function
 - Muscle inhibition pattern
- Facial ligaments
 - True retaining ligaments
 - Mandibular cutaneous ligament
 - Anatomy
 - Function
 - Muscle inhibition pattern
 - Zygomatic ligament
 - Anatomy
 - Function
 - Muscle inhibition pattern
 - Orbitomalar ligament
 - Anatomy
 - Function
 - Muscle inhibition pattern
 - False retaining ligaments
 - Parotid cutaneous ligament
 - Anatomy
 - Function
 - Muscle inhibition pattern
 - Masseteric cutaneous ligament
 - Anatomy
 - Function

- Muscle inhibition pattern

AEROBIC-ANAEROBIC DYSFUNCTION

- Aerobic vs. Anaerobic system characteristics
- Neurologic respiratory system
 - Medulla oblongata respiratory nuclei
 - Reflexes of the respiratory system
- Aerobic system
 - Function
 - Symptoms
 - Causes of dysfunction
 - Nutrition
- Anaerobic system function
 - Function
 - Symptoms
 - Causes of dysfunction
 - Nutrition
- Base challenges for testing
 - Aerobic
 - Anaerobic

PAIN AND INHIBITION

- Dermatomes
- Referred nerve pain
- Referred viscera pain
- Muscle referred pain
 - Lower limbs muscles
 - Upper limbs muscles

LUMBAR SPINE BIOMECHANICS

- Biomechanics of the vertebral column
 - Spinal curvatures
 - Three columns theory
- Intervertebral disc ranges of motion
- Internal and external musculature support
- Spinal goniometry
- Water imbibition by the nucleus
- Movement of discs in flexion and extension
- Intervertebral disc prolapse
 - Types of prolapse
 - Locations
- Disc to nerve adhesions
- Lasegue's sign

- Automatic rotation of the vertebral column during lateral flexion
- Pelvis and sacro-iliac joints
 - Symphysis pubis
 - Anterior and posterior anatomy
 - Stimulus
 - Sacro-iliac joints
 - Dynamic vs. static sacrum osteology
 - Sacro-iliac ligaments
- Nutation and counter-nutation
- Lumbo-sacral joint and spondylolisthesis
- Muscles of the trunk
- Sequence dysfunctions
- Spinal ligaments
 - Iliolumbar ligament
 - Anatomy
 - Stimulus
 - Sacrotuberous ligament
 - Sacrospinous ligament
 - Anterior longitudinal ligament
 - Posterior longitudinal ligament
 - Ligamentum flavum
 - Interspinous ligament
 - Supraspinous ligament
 - Intertransverse ligament

THORACIC SPINE BIOMECHANICS

- Axis of rotation
- Costovertebral joints
 - Reinforcing ligaments
- Costotransverse joints
- Movements of the costal cartilages and sternum
- Movements of the intercostal muscles and sternocostalis
 - Sternocostalis
 - Anatomy
 - Stimulus
- Diaphragm
 - Attachments
- Respiratory muscles
 - Primary and accessory
 - Inspiration
 - Expiration
- Mechanism of coughing: closure of the glottis
- Mechanism of the larynx during swallowing
 - Cricoid cartilage
 - Thyroid cartilage
 - Arytenoid cartilage

- Epiglottic cartilage

CERVICAL SPINE BIOMECHANICS

- Cervical spine osteology
 - Sub-occipital segment
 - Atlas
 - Axis
 - Inferior segment
- Atlanto-occipital joint movements
- Atlanto-axial joint movements
- Unco-vertebral/Luschka's joints
- Compensations in the suboccipital vertebral column
- Cervical spine goniometry
- Structure and action of the sternocleidomastoid
- Prevertebral and scalene muscles
- Posterior muscles of the neck
 - Suboccipital muscles
- Cervical ligaments
 - Apical ligament
 - Alar ligament
 - Transverse posterior ligament of atlas
 - Posterior cervical ligament
 - Nuchal ligament

SPINAL COUPLED MOTION

- Automatic rotation of the spine during lateral flexion
- Movement of spinous processes
 - Sub-occipital cervical spine
 - Lower cervical spine
 - Lumbar spine
- Testing
- Treatment