

Five Days to a Fit Back | Traci Schafer-Bacon, P.T.

Sunday – Posture Perfect

Universal message = the WAY everyday activities are performed causes the problem; therefore, posture both static and dynamic need to be addressed. Muscular, neurological and skeletal structures must be considered when developing a plan for prevention, intervention and long term maintenance. Ideal alignment prevents deformities and pain; promotes optimal muscle length; contributes to optimal movements patterns, maintains joint integrity and reduces stress.

McKenzie – symptomatic and mechanical response to rptd mvmt/positions

A. Cardinal Features

Classification of syndromes

Focus on Centralization of symptoms

Treatment Perspective – self management, education – 4 phases
(reduction, maintenance, ROF, prevention)

Progression of forces

Emphasis on rptd mvmts for assessment and mgmt.

Emphasis on pt independence

Avoidance of PT dependency

Use of minimal intervention – least amount of force utilized

Procedures used for immediate pain relief

Neutral Posture key features

S shaped curve including Cerv/Lumb Lordosis and Thor/Sacral kyphosis

Not a fixed curve, but dynamic. Changes with movement and postures.

Sacrococcygeal curve is fixed by position of pelvis by SIJ's

Abnormal curves inc stress on muscles, ligs, bones, discs, joints, nn roots

Long periods in one position produce fatigue, ache, tension

Neutral posture affected by fat, position, loads, shapes of curves, muscle length/tension relationship, CT extensibility, pregnancy

Line of Gravity

Mastoid

Anterior to 2nd sacral vertebra, anterior to L/S junction

Posterior hip

Anterior knee

Anterior ankle

Four Factors that Determine How Strong a Muscle Can Be:

1. Number of muscle fibers that are stimulated
2. Frequency of stimulation
3. Thickness of each fiber (more cross-bridges)
4. Length-Tension Relationship

Abnormal Postures

Flat Back

Forward head, Increased thoracic kyphosis: decreases lung space for deep breathing, PPT, knee hyperextended, hypomobile lumbar

Needs: hamstrings, hip flexor, ab stretch; DNF/quad strength; retraction

Sway Back

Forward head, winged scap, increased thoracic kyphosis, PPT, hyperextended hips and knees, ribs behind hips, depressed chest, neutral feet

Needs: hams/ IO stretch; retraction; hf, EO, back ext, DNF, quad strength

Lordosis/Kyphosis

Forward head, abd scap, increase thoracic kyphosis/lumbar lordosis, flexed hips , APT, hyperextended knees, pf feet

Needs: hams/hf/ant joint capsule stretch; ab/EO/DNF strength

Military Style

Neutral head, scap tilted forward, inc lumbar lordosis, APT, hyperextended knees, outward feet

Needs: Hams/calf stretch; quad facilitation

Trends for needs: hamstring, pec, hf (the compression and anterior shear from psoas is major contributor to LBP) stretch; retraction; DNF, quad, abdominal EO, back extensor facilitation

Monday - Treating Back and Neck Pain

Lumbar Spine – end range evidenced by strain, restricted end range evidenced by pain

50-80% of adults will experience back pain at some point in their life

Back pain is normal, recurring episodes are common

Disc nutrition is increased by the fluid exchange that accompanies reciprocal movements in the sagittal plane; therefore, repeated movements is KEY

Known factors associated with neck and back pain

History of neck pain

Females

Increasing age

Headache

Distress

Heavy or repetitive work , sitting, neck flexion, lumbar flexion

Lumbar Spine Anatomy

Outer annulus is innervated, posterior lateral annulus is weakest with no cover of the PLL

Intradiscal pressure measured in the nucleus increases up to 80% in full flexion

Radial fissure most common – nucleus penetrates through to outer wall creating bulge. Correlation b/n fissures penetrating through annulus and pain is strong

Stenosis – closing of spinal canal or transverse foramen

Flexion

Discs move posterior

Opens IVF/spinal canal/facet joints

Tensions nerve roots, dura and spinal cord

Extension

Discs move minimally anterior

Narrows IVF, spinal canal

Slackens nerve roots, dura and spinal cord

Closes facet joints

Back - Nuclear pressure is reduced by up to 35% in extension

Back - 300% stiffer to flexion forces in early morning

Cervical Spine Anatomy

No discs at OA/AA (Occ-C2)

Atypical C1 and C2 (atlas and axis)

Uncinate processes form uncovertebral joints (saddle shaped) = joints of Luschka. These are best developed at C2-4 and least developed or absent C5-7. These facilitate flexion, extension and rotation and jts develop over time. Form follows function.

Zygapophyseal jts complete the motion segment articulations. Orientation of these jts allow for an ant/pos movement that is much greater than elsewhere in spine

Coupling of motion: lateral flex R/ ROT L

Foramen transversarium in tp's of C1-6 through which vertebral arteries pass

Functionally, c-spine is divided into two distinct regions =

Upper = Occ-C2

Mid and Lower = C3-T1

Discs = thick anterior annulus, tapered laterally; thin posterior annulus

Treatment

Retraction – essential for HA mgmt., precursor to other movements required to effectively treat the neck, accompanying improved shoulder position

End range upper cervical flexion, mid cervical mid range ext, some lower cervical ext

(protrusion – upper cerv end range ext, low cerv mid range flex)

Press-Ups – essential for pain management originating from the disc model.

Addressing lateral component to symptoms: consider hips off center, rotation, side flexion, lateral shift?

Tuesday – Back to Basics Circuit

Supine drawing in X 10, X 10

Slouch / overcorrect

Chair

Ball

REIL

REIS

Active sitting

Passive Sitting with lumbar roll

Q-ped alt arm/leg iso hold X 5 sec X 10 ea

Plank

EO strengthening

Lunge: glute facilitation; hip flexor stretch

Wednesday – Nothin' but Neck Circuit

Slouch / overcorrect

Chair

Ball

Retraction – posture, daily

Scapular retraction – posture, daily

Resisted scapular retraction – EMG lower traps

Supine foam roller stretch for pecs

Resisted Row with theraband

Standing Sahrman : decreases thoracic kyphosis or depressed chest, stretches pecs, IR, latts; engages shoulder flexors, pec major, ant deltoid, mid traps, lower traps, serratus, DNF, abs; improves eccentric lowering by avoiding anterior tilt or abduction of scapula and thoracic flexion. Stand 3 inches from wall, shoulders neutral. After 90 degrees shoulder flexion, extend elbows while completing shoulder flexion motion. No shrugging. Emphasize ER. No low back ext. Hold 5-10 sec. Move primarily in GH jt. Useful in avoiding excessive superior humeral glide because of limited deltoid involvement.

Passive sitting using lumbar roll

Plank – infraspinatus, teres minor, core, DNF

Thursday – Workspace Wisdom and Sleeping Postures

Workspace = not just sitting! Various postures may be required throughout your workday. Posture Breaks are KEY to any prolonged posture.

Sitting - with top of monitor eye level, 18-24” from screen to user. Aim for 90 degree angles. Feet flat. Research showed that with use of lumbar roll in seat positioned ~100 deg favored a better head position.

Prolonged Standing – Suggestions

Lifting mechanics – Appropriate loading of ankles, knees, hips

Carrying mechanics – keep load in close, bend elbows

Commuting – review proper sitting posture

Sleeping – sidelying vs prone vs supine; discuss use of cervical and lumbar night rolls; mattresses; support

Q & A

Terms Defined

McKenzie Method www.mckenziemdt.org

Muscle Hypertrophy requires 4-6 wks to increase cross sectional area using current methods. Improved performance before that time attributed to augmented recruitment

Creep – Progressive deformation of a structure (collagen fibers) under a sustained constant load due to the rearrangement of collagen and proteoglycans and expulsion of water. Upon release of the force, the structure begins to recover but to a lesser extent than initial deformation. Loading needs to be repeated enough to bring about a lasting change. Intermittent load strengthens collagen = ballistic

Postural Set – Difference between initial and final length

Stabilization – QL, TA, multifidus controls flexion of lumbar spine via eccentric contraction, deep erector spinae act to compress and prevent anterior shear, superficial erector spinae act to produce APT, latts create extension force on spine and creates APT

Compression/anterior shear - Iliopsoas contributes to compression and ant shear of lumbar spine. Lie hooklying vs supine to decrease these forces on lumbar.

External Obliques – origin of muscle from rib cage to pelvis consistent with most effective action = PPT. Wall exercise while maintaining PPT,

squat up and down maintaining PPT. Also recruited with serratus and lats activity as in push ups. Also consider sidelying glute med.

Length/Tension Relationship - The optimal length of a muscle fiber that will generate the maximum force

Isotonic = Muscle contracts AND shortens

Isometric = Muscle contracts and does NOT shorten