

COMMON CONDITIONS IN PT CLINICS: Don't be a "McTherapist"

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What's a "McTherapist?" What's "McTherapy?"

- McTherapy (Mik-ther-a-pee)
 - Rehabilitative practice involving the exclusive use of modalities that don't work or have no evidence supporting their use
 - Applying a "cookbook" approach to said conditions
 - Treating only the joint in question and not considering other areas that may be involved
 - Teaching/instructing in exercises that reinforce poor movement patterns

Synonyms: robot, monkey, zombie

How do I avoid being a "McTherapist?"

- Keep up on the evidence
 - APTA "Open Door", PubMed, University libraries
- www.ms-se.com
www.cjbjis.org
www.jospt.org
www.apta.org
www.pubmed.com
PT sites – www.rehabedge.com;
www.myphysicaltherapyspace.com

How do I avoid being a McTherapist?

- "Be an expert at the basics"
 - Where DOES iliopsoas insert??
- Have a rule and a reason for what you're doing
 - Always be asking yourself "WHY?"
- Using only one school of thought to treat patients
 - Have as many tools in the box as you can

How do I avoid being a McTherapist?

- Share ideas, ask questions
- Practice sound manual therapy interventions
- Take advantage of continuing education
- Be a salesman/woman and **EDUCATE** your patients
- You're doing it today!!!

A disclaimer...

- Some interventions discussed aren't necessarily contraindicated, nor are they "bad" BUT...
- It's a problem if that's all that is used or if it's performed incorrectly

Topics

- Ankle Sprains
- PFPS
- ACL tears
- Low Back Pain
- Cervical Pain
- Shoulder pathologies
- Tendinitis/Tendinosis
- Progression of athletes

Evidence-based Medicine

“The conscientious, explicit, and judicious use of current best evidence in making decisions about the care of an individual patient. It means integrating clinical expertise with the best available external evidence from systematic research.”

“Evidence-based practice is the integration of (1) clinical experience and expertise, (2) patient values, and (3) the best evidence (research) into the decision making process for patient care.”

Sackett DL, Straus SE, Richardson WS, et al. Evidence-based medicine. Churchill Livingstone: New York. 2004.

Ankle Sprains: McTherapy

- Theraband exercises
 - Are we thinking about what directions?
- Ice and stim
 - What are our parameters if we use it?
- Balance exercises
 - What's your algorithm to progress?
- Ultrasound
 - How are you applying it?
- Gait
 - Are they limping?

Skilled Therapy

- Normalize gait prior to D/C of assistive device
- Evaluate for posterior talar glide/ant position of lat malleolus
 - Hubbard et al, *JOSPT*, 2006
 - Vicenzino et al, *JOSPT*, 2006
 - Denegar et al, *JOSPT* 2002
 - Collins et al, *Man Ther* 2004
- Evaluate proximal hip strength
 - Bullock-Saxton, *Phys Ther* 1994
 - Bullock-Saxton et al, *Int J Sports Med* 1994
 - Friel et al, *J Ath Train*, 2006

Skilled Therapy

- Do total leg strengthening as part of therapy
- Balance ex's *bilaterally*
- Have a sound algorithm for balance progression

PFPS: McTherapy

- Quad sets, SLR, SLR w/ IR/ER
 - Not validated – Davies et al, *Physio Canada* 2001
- Stretching of quads
 - What about gastroc/soleus? Hip flexors? Hamstrings?
- Ball squats w/ adduction
 - WHY??
 - Coquero et al, *J Electromyography Kines* 2005; Earl et al, *JEK* 2001
 - Song et al, *PT Journal*, 2009
- Ice and stim
 - Why?

Skilled Therapy

- Assess the foot/orthotics
 - Gross, *JOSPT* 2003; Suttive *Phys Ther* 2004
- Assess hip rotation ROM
 - Cliborne et al, *JOSPT* 2007; Carrier et al, *Phys Ther* 2007
- Myofascial release of the ITB
- Proximal hip strengthening
 - Ireland et al, *JOSPT* 2003
 - Niemuth et al, *CJSM* 2005
 - Fredericson, *CJSM* 2000
 - Arokoski et al, *J Rheumatol* 2002
 - Mascal et al, *JOSPT* 2003
 - Wilson et al, *MSSSE* 2006

Skilled Therapy

- Stretching of the quads, hamstrings, calves, hip flexors
 - Piva et al *JOSPT* 2005
- Consider using bracing or taping
 - Aminaka et al, *JOSPT* 2005; Salsich *JOSPT* 2002
- Lumbopelvic manipulation??
 - Cook et al, *JOSPT* 2008; Iverson et al, *JOSPT* 2008
- Teach pain management strategies

ACL Reconstruction Rehab: McTherapy

- Single plane strengthening
 - Is any activity performed only in the sagittal plane?
- Balance exercises on only the involved limb
 - Do they only have one leg?
- “Just following the protocol timeline”
 - When are they REALLY ready??
- No functional testing or algorithm for discharge
 - How do you know??

Skilled Therapy

- Teach the proper QS and SLR w/o a quad lag
- Normalize gait prior to D/C of assistive device
- Balance ex's bilaterally
- Manual therapy to restore rotational kinematics
 - Yoo et al, *AJSM* 2005; Pappannagari et al, *AJSM* 2006
- Objective strength measures prior to progression
- Functional testing measures prior to D/C
- Teach proper landing/jumping/cutting mechanics
- Russian stim??
 - Snyder-Mackler et al, *JBJS* 1995

Low Back Pain: McTherapy

- Massage
 - What specifically?
 - Massage helpful if combined w/ exercise and education
 - Furlan et al, *Cochrane Review* 2003
- Stim and heat/ice
 - Parameters?
- Stretching
 - What specifically?
- “Core” strengthening
 - What's your definition of core?

Skilled Therapy

- Understand subjective complaints and their relation to tissues involved
 - Instability vs. disc vs. degenerative changes
- Teach pain management strategies
- Teach body mechanics/ergonomics
- Screen the hip for SIJ pain
 - Cibulka, *Spine* 1998; Cibulka *Phys Ther* 1992; Warren, *J Man Manip Ther* 2003
- Assess hip rotation ROM
 - Ellison et al, *Phys Ther* 1990; Vad et al, *AJSM* 2004; Mellin, *Spine* 1988; Offierski, *Spine* 1983
- “Look downstairs and upstairs”

SUMMARY OF LOW BACK/CORE

- Hides et al, *JOSPT* 2008
- Hodges & Richardson, *Spine* 1996
- Hodges & Richardson, *Phys Ther* 1997
- Ferreira et al, *Spine* 2004
- Hodges & Richardson, *Arch Phys Med Rehabil* 1999
- Hides et al, *Spine* 2004
- Barker et al, *Spine* 2004
- Van Dillen et al, *JOSPT* 2001
- Hides et al, *Spine* 2006
- Richardson et al, *Spine* 2002
- Teyhen et al, *JOSPT* 2005
- Hides et al, *Spine* 2001

“Cliff’s Notes”

- Decreased CSA of multifidus and TA
- Hollowing/Drawing in better than bracing
- TA activated in “feed-forward” manner in subjects without LBP whereas those w/ LBP have delayed
- TA activated in anticipation of upper/lower limb movements

Cervical Pain: “McTherapy”

- Hot packs, ultrasound over the “knots”, massage
 - It feels good, but what’s it *fixing*?
- Stretching of the UT/levators and pecs
 - Look at Janda’s “Upper Crossed Syndrome”
- Traction

Skilled Therapy

- Screen/treat the thoracic spine and ribs
 - Cleland et al, *Phys Ther* 2007
- Strengthen: deep cervical flexors, interscapular muscles, upper traps
 - Ylinen et al, *J Strength Cond Res* 2006
 - De-Las-Penas et al, *JOSPT* 2008
 - Cleland et al, *JOSPT* 2005 – traction, strengthening, manual tx
 - Falla et al, *Phys Ther* 2007 – deep cervical flexors

Skilled Therapy

- Stretch: pec major/minor, short cervical extensors
 - Johnston et al, *Spine* 2008
 - Workers w/ neck pain had decreased rotation, increased rotation of superficial cervical flexors, increased activity of cervical extensors; UT, extensors and scalenes “couldn’t relax”
- Teach management strategies
- Assess breathing – chest breather or diaphragmatic breather?
- Teach posture, body mechanics, ergonomics

FYI – Neck Pain Clinical Practice Guidelines

- *Use cervical manipulation/mobilization to reduce neck pain and headaches*
- Thoracic spine thrust/non-thrust can be used to reduce neck pain and neck-related arm pain
- Stretch: Scalenes, UT, LS, PMaj/PMIn
- **Strengthening and endurance exercise**
- Upper quarter nerve mobilizations
- Traction
- **Patient education and counseling**

Childs et al. Neck pain...*JOSPT*. 2008; 38(9): A1-A34.

Shoulder Pathologies

- Impingement syndrome
 - Types
 - ****Impingement is symptom, not the disease****
- Instabilities
 - “Circle Concept”
 - Excessive damage in one direction may require damage to restraints on the same and opposite sides of the joint
 - Flatow et al, *Instr Course Lect* 1998
- Concept of “obligate translations”

Shoulder Pathologies

- Obligat Translations
 - Unchecked/unrecognized posterior capsule tightness could lead to unwanted obligate translation in an anterior against a newly plicated capsule and would therefore compromise outcome of treatment for anterior instability Harryman et al, *JBJS* 1990
 - This diverges from our “convex-concave” rule

Shoulder pathologies: McTherapy

- Rotator cuff strengthening
 - What positions? What’s the progression?
- Reinforcing improper mechanics of elevation
 - Normals don’t shrug
- Treating only the shoulder
 - What about the cervical and thoracic spines?
 - Is there a hip/shoulder connection?
 - “Serape effect”

Skilled Therapy

- Assess isolated GH IR – “GIRD”
 - Lintner et al, *AJSM* 2007
 - Skolimowski et al, *Orthop Trauma Rehabil* 2008
 - Borich et al, *JOSPT* 2006
 - Turves et al, *AJSM* 2009
 - Warner et al, *AJSM* 1990
 - Wilk et al, *Orthopaedics* 1993
- Assess/treat thoracic spine and rib mobility
- Assess/treat joint restrictions
- Teach proper posture
- Teach lifestyle modifications

Skilled Therapy

- May need to start in gravity eliminated positions
- Focus on interscapular and posterior rotator cuff
 - “Posterior dominant shoulder”
- Screen the cervical spine!!
- Screen the hips

Tendinopathies: McTherapy

- Ice/heat and/or stim
 - How do we know it's even an "itis"?
- Ionto
 - Again, do we know it's actually inflamed?
- Ultrasound
 - Parameters?
- Cross Friction Massage
 - Why?
- Stretching
- Strengthening
 - What? Other joints may need it?

"Tendon Paradox"

Oxygen consumption is **7.5X lower** in tendons/ligaments than skeletal muscle; low metabolic rate and anaerobic energy generating capacity are needed to carry loads and maintain tension for long periods, thereby reducing risk of ischemia. However, **low metabolic rate** results in **slow healing** after injury Williams, 1986

Skilled Therapy

- Know the difference between tendonosis and tendonitis
- Help the patient remove the aggravating stimulus/teach management strategies
- Assess faulty mechanics
- Assess intrinsic/extrinsic risk factors for injury
- Use eccentric training
- "EdUReP" – Davenport et al, *Phys Ther* 2005

Tendonitis vs. Tendonosis

- *Acute* – sharp, localized pain in the AM or after long rest because lack of activity resulted in fluid stasis, leading to chemical irritation of nerve endings
- *Chronic* – fairly constant, dull, poorly localized ache that worsens with activity

Stage	Diagnosis	Macroscopic Pathology	Histologic Findings	Clinical Signs
0	Healthy	No inflammation	Organized collagen, absent blood cells	Firm tendon, not painful, absent swelling, normal temp
I	Acute tendinitis	Symptomatic tendon degeneration; ↑ cellularity, vascular disruption; inflammation of paratenon	Degenerative changes w/ microtears, inflammatory cells in paratenon, focal collagen disorientation	Acute swelling, pain, local tenderness, warmth, dysfunction
II	Chronic tendinitis	↑ tendon degeneration and vascularity	Greater evidence of microtears, ↑ levels of collagen disorientation in tissue hypercellularity	Chronic pain w/ tenderness, dysfunction, person voluntarily unloads structures
III	Tendonosis	Intratendinous degeneration due to microtrauma, cellular/tissue aging, vascular compromise	↑ cellularity, neovascularization, focal necrosis, collagen disorientation and disorganization	Palpable tendon enlargement, swelling of tissues, ↑ dysfunction w/ or w/o pain, tendon sheath may be swollen
IV	Rupture	Tendon failure	Complete disruption of fibers	Weak and painful muscle testing, inability to move affected joint, + clinical tests for tendon disruption

Nirschl, *Clin Sports Med* 1992

	TENDONITIS	TENDONOSIS
Inflammation?	Yes – macrophages, PML	No
Collagen	Healthy, vascular tissue, parallel orientation	Disarray, neovascularization, necrosis, increased myofibroblasts
Appearance	Shiny, white, and firm	Dull, gray and soft
Structure	Parallel, wavy, tight arrangement	Irregular crimping, loosening, increased waviness, fiber splitting, irregular diameter
Healing	Neutrophils, macrophages, lymphocytes	Angiofibroblastic hyperplasia, abnormal immature vessels, fibrotic lumen

Eccentrics

- In shortening, the faster a muscle contracts, the smaller the tension it can exert Hill, Proc Roy Soc B 1938
- Tension is considerably greater in muscle fibers when lengthened than when shortened Katz 1939, Abbott et al 1951
- During negative work, the O2 consumption rarely rose to more than twice the resting value Katz 1939, Hill 1938, Wilkie 1950

Eccentrics

- Wilkie, *J Physiol*, 1968; Curtin and Davies 1970
 - When a muscle is stretched, the energy requirement, both heat production and rate of ATP breakdown falls substantially
- Abbott BC et al., *J Physiol* 1952
 - Two subjects performed negative work bicycle ergometry and measured O2 uptake
 - Positive work (con) always resulted in more O2 consumption

Eccentrics

- Wasielewski et al., *J Ath Train* 2007
- Norregaard et al., *Scand J Med Sci Sports* 2007
- Shalabi et al, *AJSM* 2004
- Jonsson and Alfredson, *Br J Sports Med* 2005
- Alfredson et al, *AJSM* 1998
- Young et al, *Br J Sports Med* 2005

“Alfredson Protocol” AJSM 1998

- 3x15 3x/day
- 12 weeks
- 1-2 exercises
- Load increases in 5kg increments using a backpack

Exercise Progression: McTherapy

- 3x15 for everything
 - Strength? Hypertrophy? Endurance?
- 3x15 each treatment at each phase of therapy
 - Where are they on the timeline?
- Random progression
- Too much, too soon
- Not having objective measures prior to progressing
 - How can we let them run if they can't perform a single leg heel raise or single leg squat?

Skilled Therapy

- Have a good understanding of: strength, hypertrophy, endurance, and power
 - Ratamess et al, *MSSE* 2009
 - Fleck et al, *MSSE* 2004
- Know that 20x3 is not the same as 3x20
- Simple to complex
- Bilateral to unilateral
- Stable to unstable
- Single plane to multiple plane
- Slow and controlled to fast
- Static to dynamic

Athlete Progression: Skilled Therapy

- The concept of **PERIODIZATION**
- Progressive Overload/SAID Principle
- Types: Linear, Reverse Linear, Undulating
- DAPRE technique – daily adjustments
- DeLorme – progressive loading w/ each set

HOW DO WE PROGRESS AN ATHLETE? WHAT DO WE BASE IT ON? WHAT METHODOLOGY SHOULD I USE?

Progression

- Keep the athletes “FIT”
 - Adjust load, volume of exercise, frequency of workouts, time/rest periods
- Could base it on *muscle fiber type of joint in question* Lovering and Russ, JOSTPT 2008
- Could base it on *gravity eliminated vs. anti-gravity positions*
- Could base it on *sport demands*
- Could *adjust rest periods* based on progression
 - Work:rest ratios when doing agilities

Training Goal: Endurance

- High volume (15 sets) of several exercises
- Repetitions from 15-25 OR for a specific time interval
- Load is 30-50% of 1 RM
- Rest periods are 10-30 seconds

Training Goal: Hypertrophy

- Moderate volume (10-12 sets)
- Load is up to 80% of 1 RM
- Repetitions: no more than 12
- Rest periods are no more than 1 minute OR before full recovery

Training Goal: Strength

- Low to moderate volume (8-10 sets)
- Repetitions: 1-8
- Load is up to 100% of 1 RM
- Rest periods are 1-3 minutes

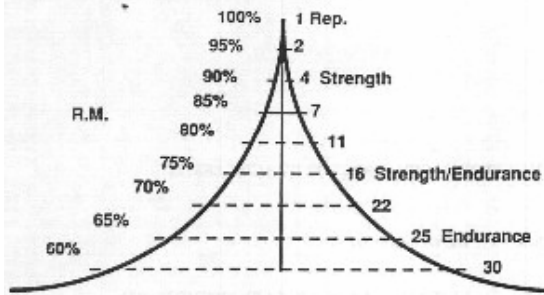
Training Goal: Power

- Low to moderate volume (4-8 sets)
- Load is 30% of 1 RM
- Repetitions: 3-6
- Rest periods: Full recovery

IS DETERMINING 1 RM SAFE FOR REHAB??

YES!!

Oddvar Holten Diagram



Example

- Let's say the athlete can do 10 lbs for 16 reps (75% on scale)
- $10 / .75 = 13.3$ lbs.
- Therefore, the 1 RM for that exercise is roughly 13 lbs.

What about exercise order?

- Depends on your goals/where they are at in the rehab timeline
- Ask yourself "what are we trying to achieve?"
- Example: s/p ACL at 16 weeks

How do I know if they are ready?

- **Strength testing**
 - Single leg squats for time/fatigue
 - Leg press test to fatigue
- **Functional testing**
 - Hop for distance
 - Hop for time
 - Vertical jump – single or double
 - Triple hop
 - Medial/lateral or "cross-over" hop

**Q: HOW DO I BASE
NEW GOALS AND
FUTURE TREATMENT
ON FINDINGS
DURING TEST?**

A: Base it on what tests tell you

- Athlete has decreased single leg hop
 - Maximal strength issue
- Athlete has decreased triple hop distance
 - Strength issue
- Athlete has increased time on timed hop
 - Power/conversion to power issue due to increased latency time

Running/Agility progression

- Forward/back
- Lateral/Shuffle
- Carioca
- 45° cuts
- 90° cuts
- Increase speed, increase volume, decrease rest periods

Return to sport progression

- Pass strength and functional tests FIRST!!
- Individual drills, non-contact
- Individual drills, contact
- Team drills, non-contact
- Team drills, contact
- Scrimmage at 25% of sport demands and increase based on athlete response

The Best...

- Anything working gluteus medius
- Anything working gluteus maximus
- Anything working posterior rotator cuff and scapular stabilizers
- TA Hollowing w/ diaphragmatic breathing
- Sit to stand/squat patterns