

Update on Current, Alternative Treatment Methods in Sports Rehabilitation



Objectives

- Review current trends within the sports rehabilitation setting
- Review past and current literature on these topics or lack thereof
- Discuss safety and efficacy within these new treatment methods.
- Propose use of these treatment techniques within the clinical setting for teenage patients.



Continually evolving profession

- What drives new treatment techniques in rehab?
- How does our evidence keep up with this evolving profession?
- How do we as clinicians discern treatment options for our practice and with our patients?



PR and Social Media

- Cupping
- Dry Needling
- Blood Flow Restriction
- Cryotherapy
- Tape



- Review of evidence
- Professional education
- Tissue healing principles
- Transparency and open communication to providers, patients and families



Opportunity for growth in our profession

- Theorized effectiveness of treatment
- Safety to our patients and facility
- Evidence-guided



Cupping






Suction cupping

Cupping massage

Cupping with active movement



Cupping

-  blood flow
-  Lymphatic circulation
-  pain
-  Hypersensitivity to palpation
-  Post workout soreness



Cupping

Benefits

- Easy to apply
- Inexpensive equipment
- Those that don't tolerate other manual therapy techniques (compressive)
- Independent management

Pitfalls

- Topical changes adults and adolescent
- No standard treatment protocols
- Vacuum monitoring?



Cupping

- What does the research tell us?
 - Charles et al, 2019
 - Beneficial for pain reduction for chronic or acute pain compared to no treatment or other treatments
10 of 16 with significant bias
 - Li et al, 2017
 - Very low methodological quality evidence for treating knee OA



Cupping

- What does the research tell us?
 - Bridgett et al, 2018; Use of cupping in amateur and professional athletes
 - Significant bias
 - Very little randomization
 - No blinding
 - Attrition rates under-reported
 - Often combined with other interventions
 - No control group



Cupping

No explicit clinical recommendations at this time...

FOR OR AGAINST...

More studies...

For conclusivity of efficacy



Is it safe?

- Erythema, edema, ecchymosis
- Similar contraindications as any other manual therapy technique
- >20 min
- Therapist/patient competency



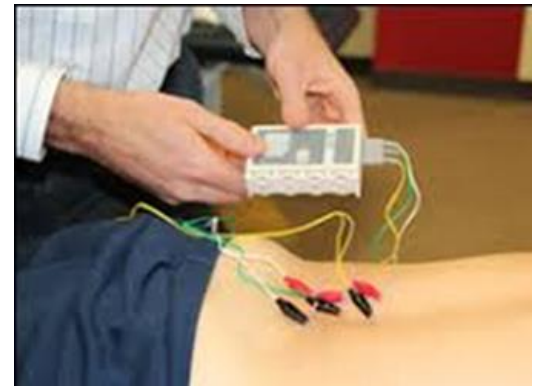
How do we use cupping in the clinical setting?

- Currently not being used at Akron Children's Hospital
- Home education to patients >18 yo
- Consent for <18 yo?



Dry Needling

- Trigger point dry needling
- Neurologic dry needling
- Dry Needling with electrical stimulation



Dry Needling

- ↓ Tissue tension (MTrPs and latent MTrPs)
- ↑ Improve circulation
- ↓ Reduce pain
- Treats both local and central neural responses



Dry Needling

Benefits

- First therapy treatment to directly treat below skin level
- Tolerated better than other manual therapies

Pitfalls

- Phobia to needles
- Therapist training



Dry Needling

- What does the research tell us?

- Gattie et al, 2017

- No treatment/sham – very low-quality to moderate quality evidence

- Systematic Review and Meta-analysis:

- Statistically significant treatment effect of dry needling for improving pain, pressure pain threshold (PPT) and functional outcome scores (FOS) when compared to no-treatment control or sham during immediate-12 week
 - 6-12 mos, treatment effect no longer significant for pain and questionable meaning for FOS. Studies lacking long term outcomes



Dry Needling

- What does the research tell us?

- Gattie et al, 2017

- Other manual therapy techniques–

- Systematic Review and Meta-analysis:

- Moderate evidence for effectiveness of reducing pain and low evidence for improving PPT immediate-12 weeks
 - No effect of dry needling compared to other treatments in re: to FOS



Dry Needling

Continued need for research within our
professional licensing

Promising results...



Is it safe?

- Brady et al, 2014
 - Adverse events (AEs) following trigger point dry needling
 - 39 PTs and 1463 mild AEs were reported in 7,629 treatments of trigger point dry needling. NO SIGNIFICANT AEs were reported
 - Bruising (7.6%), bleeding (4.65%), pain during treatment (3%), pain after treatment (2.2%); uncommon AEs were aggravation of sx's (.88%), drowsiness (.26%), headache (.14%) and nausea (.13%)



How do we use dry needling in the clinical setting?



Blood Flow Restriction



Blood Flow Restriction

- Muscular Strength
- Muscular Endurance
- Hypertrophy (Cellular swelling)
- Pain reduction
- Decreased mechanical load



Blood Flow Restriction

- Blood Flow Restriction therapy is the brief and intermittent occlusion of venous blood flow using a tourniquet while exercising
- Delfi unit is an FDA device listed tourniquet system made specifically for Blood Flow Restriction Applications



Blood Flow Restriction

- ↑ muscle strength, hypertrophy, Function
- ↓ Pain with exercise/Rehab
- ↓ mechanical load on associated tissues (muscle, tendon, bone, and connective tissue)



Blood Flow Restriction

Benefits

- Prevention of muscle atrophy
- Increase in muscle strength and hypertrophy
- Reduce pain during exercise
- Potential for those with orthopedic conditions whom training with higher load is contraindicated

Pitfalls

- No standard treatment protocols
- High RPE
- Cost of equipment



Blood Flow Restriction

Effectiveness of Blood flow Restriction Training

	1 ^{*(ACLR, Rehab)}	2 ^(Pain/strength)	3 ^{*(Rehab)}	4 ^(ACLR)	5 ^(ACLR/Pain)	6 ^(Pain)	7 [*]	8 [*]	9 [*]	10 ^(Post op)
Increase in Muscular Strength	↑	↑	↑	↑	NE	NE	=	↑	↑	↑
Increase in Muscular hypertrophy	↑	NE	↑	↑	NE	NE	↑	↑	↑	↑
Decrease pain	NE	↓	NE	↓	↓	↓	NE	NE	NE	NE
Function	NE	=	NE	↑	NE	NE	NE	NE	NE	NE
Adverse events/ safety	None	None	None	None	None	None	None	None	None	None

1. Barber-Westin S, et al (2019); 2. Giles L, et al (2017); 3. Hughes L, et al (2017)^{MA}; 4. Hughes L, et al (2019)^{ACL}; 5. Hughes L, et al (2019)^{ACL/Pain}; 6. Korakakis V, et al (2018); 7. Lixandrao ME, et al (2018); 8. Loenneke JP, et al (2012); 9. Slys J, et al (2015); 10. Wilkinson BG, et al (2019)

Positive Outcome	No greater effect	Not Examined
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Blood Flow Restriction

- What does the research tell us?
 - Leonneke, 2012; Slyszy, 2016; Hughes, 2017 and Lixandrao 2018; and Barber-Westin, 2019

High quality to moderate quality evidence: Low load resistance training with BFR compared to low load resistance training alone and high load resistance training

- Systematic Review and Meta-analysis:
 - all concluded LL-BRF produces significantly greater strength and hypertrophy compared to low intensity exercise alone



Blood Flow Restriction and Post operative patients

- Wilkinson (2019); Barber-Westin S, et al (2019); Hughes L, et al (2019)
- BFR increases muscle strength and hypertrophy reduces disuse atrophy in postoperative patients
- Post operative patients are ideal candidates for LL-RT with BFR



Blood Flow Restriction and Pain

General AKP (anterior knee pain), PFPS,
Pain with ACL rehab

- Giles L, et al (2017); . Hughes L, et al (2019); . Korakakis V, et al (2018)
 - BFR with LL has been proven to show decreased pain during exercise when compared to LL-RT alone and HL-RT



Is it safe?

- Concerns? Cardiovascular system and hemodynamics, muscle damage, oxidative stress and ischemic reperfusion, and nerve conduction velocity
- BFR has been reviewed in depth and correct implementation has been affirmed to present no greater risk than traditional exercise (Hughes 2017)
- Risk of Rhabdomyolysis 0.008%



How do we use BFR in the clinical setting?

- BFR has been shown to improve strength hypertrophy and may be even more effective at improving function, pain and swelling during early phases of rehab
- Improved patient comfort while decreasing mechanical stress on tissues
- Improve Patient attitude, motivation, and adherence to rehab



BFR clinical Guidelines

- Frequency: 2-3x/week
- Duration: \geq 6weeks
- Intensity 30% 1RM at 80% occlusion (LE)
- Volume: 1-8 exercises



Adjunctive therapies...
Cutting edge treatments...

What do we do with them?

Make sure we consider the
differences of working with healthy
vs. unhealthy bodies



In Summary...

- Consistent message to our patients
- Consistency of treatment
- Adjunct therapy along with alternative methods
- Stick to tissue healing principles and give realistic timeline/expectations on recovery
- Use evidence to drive your practice, not base your practice on....



Thank you!



Akron Children's Hospital