

SAPEP 2023

Programme de physiothérapie
Université de Sherbrooke

Tendinopathies du membre inférieur
Mise à jour pour le clinicien

par Mourad Gharbi M.Pht

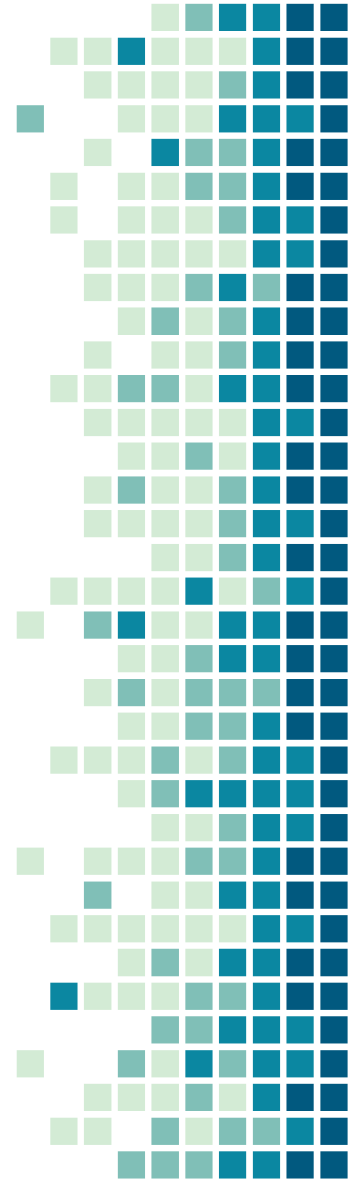


Mise en contexte

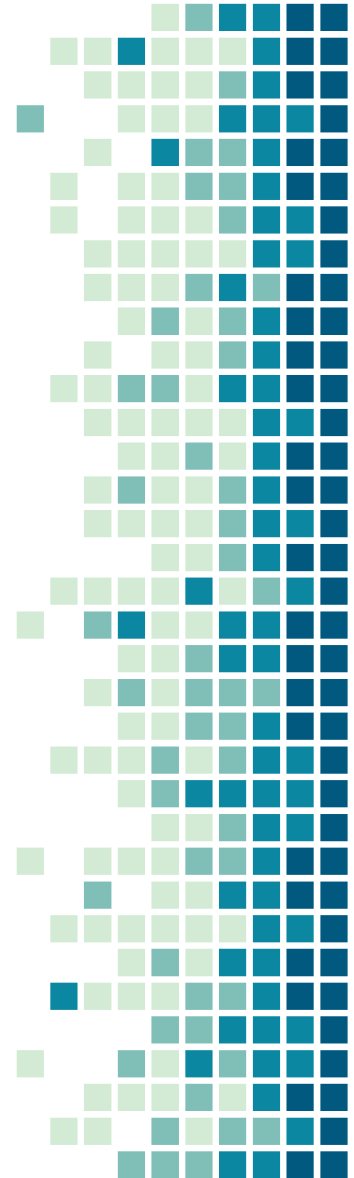
- Un peu d'histoire
- Comment cette formation a été conçue
 - Opinion d'experts via podcasts
 - Peter Malliaras
 - Ebonie Rio
 - Alison Grimaldi
 - Jill Cook
 - Tom Goom
 - Recherche documentaire



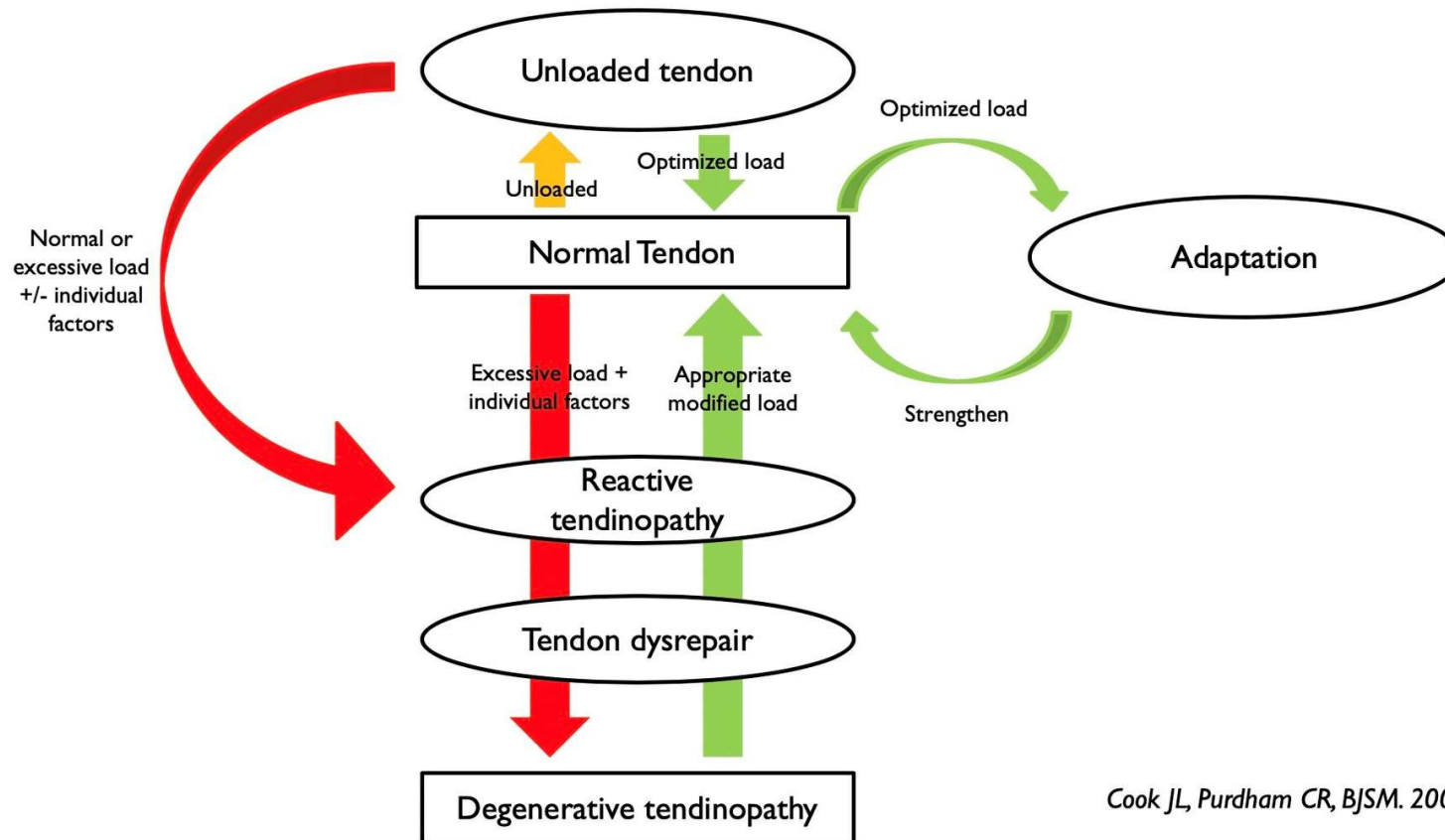
Mon objectif : distiller l'essentiel en 45' !



Approche « Starter Kit »



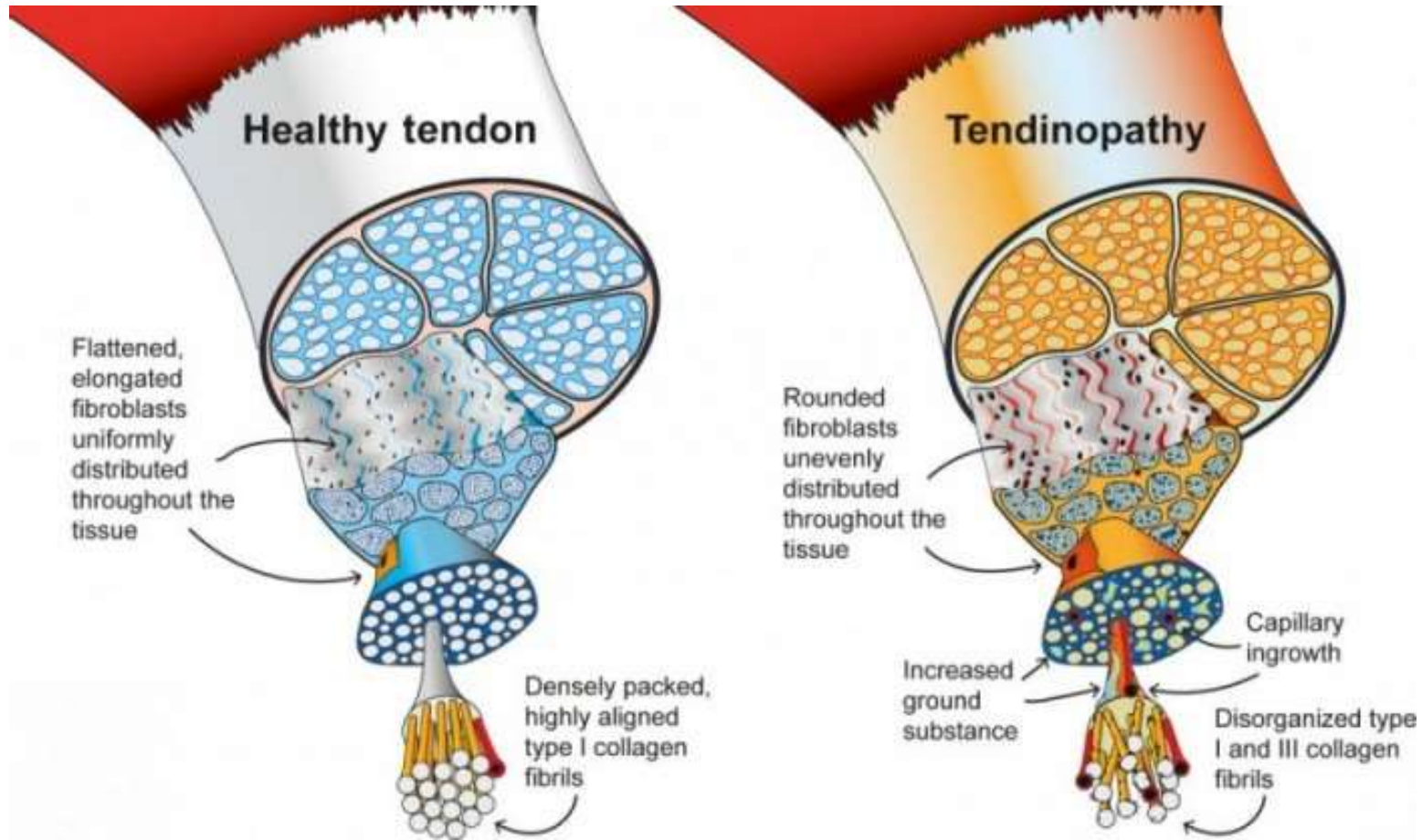
Un résumé du modèle du continuum



Cook JL, Purdham CR, BJSM. 2009.



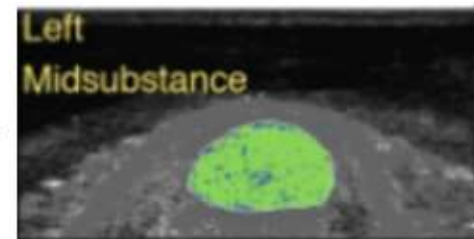
Changements structurels



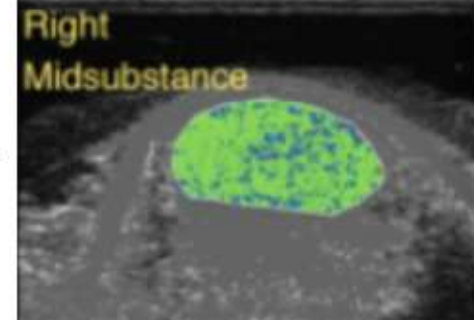
Changements structurels

Normal Tendon	Abnormal Tendon (Tendinopathy)
Flat elongated tenocytes	Increase in activated cells (round tenocytes)
Parallel collagen fibres	Loss of collagen architecture
Smaller proteoglycans	Increase in amount and size of proteoglycans
Minimal vascularity and nerves	Increase in vessels and nerves

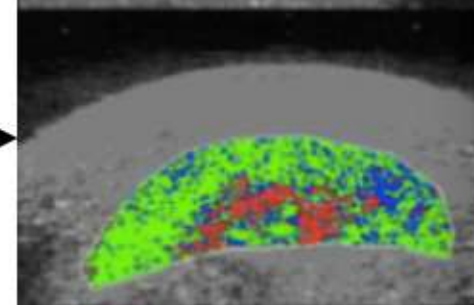
Normal Tendon



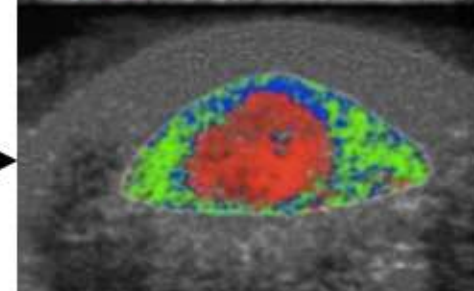
Reactive Tendinopathy

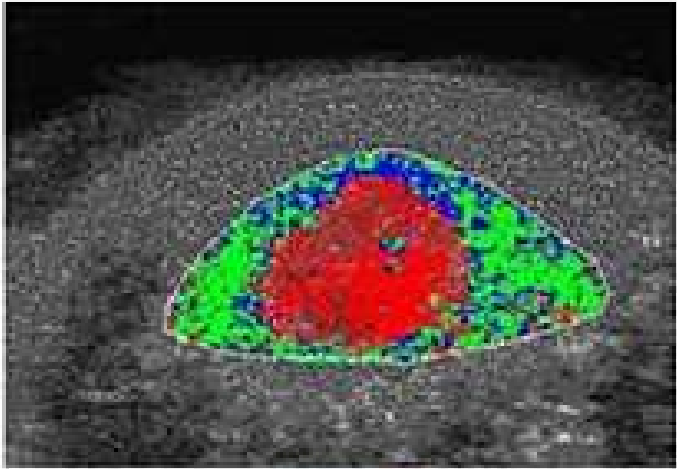


Tendon Dysrepair

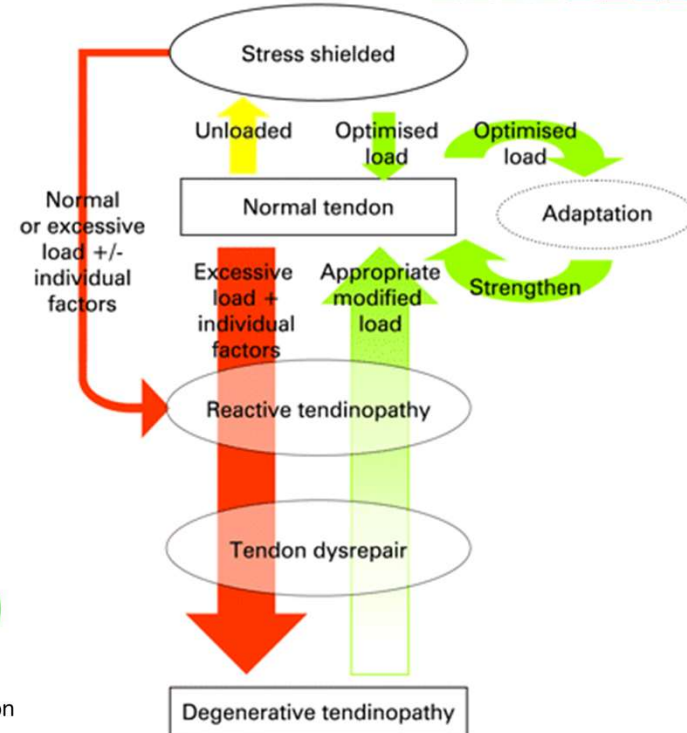
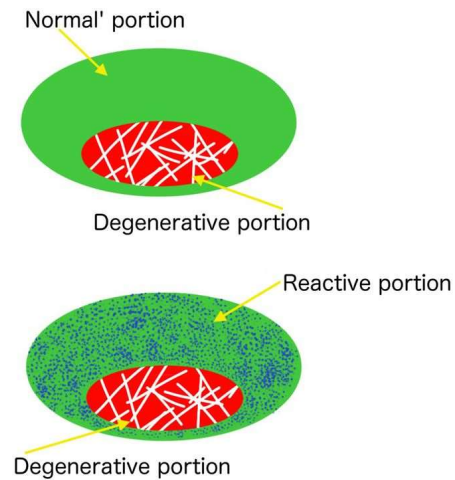
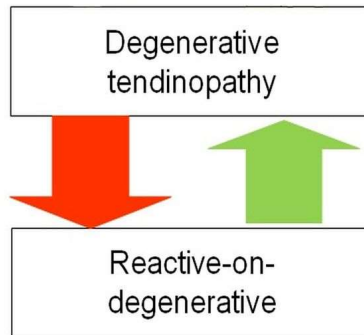


Degenerative
Tendinopathy





Treat the donut,
not the hole

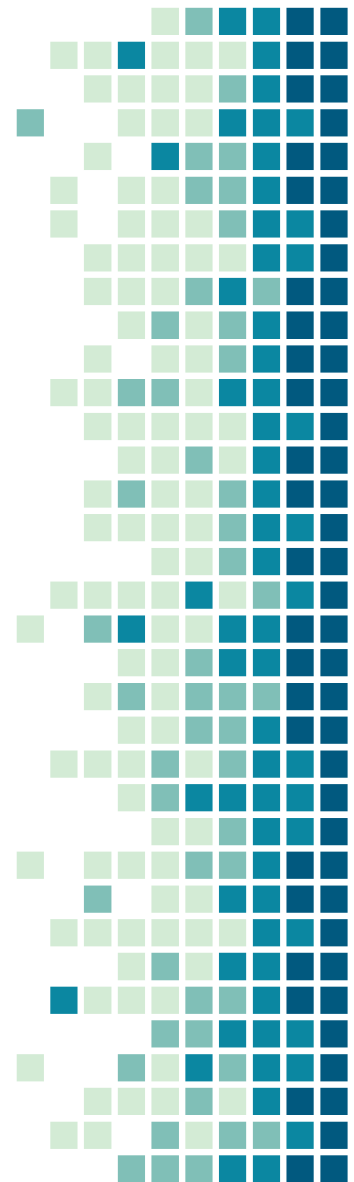


The continuum of tendon pathology (Cook & Purdam, 2009) differs from the previous models as it places activation of tenocytes as the primary etiological event, rather than disruption in the fibrillar matrix. The early cellular and ground substance changes, termed reactive tendon pathology, were proposed to be a pathological adaptation resulting in the tendon increasing in size that in turn reduces stress (force/CSA) (Cook et al., 2004). However, the current study suggests that the thickening of the tendon may have a secondary role in mandating structural homeostasis and ensuring that there are sufficient amounts of AFS to tolerate load without failure. This appears to be the case in the degenerative tendon where substantial areas of disorganized tissue are present.

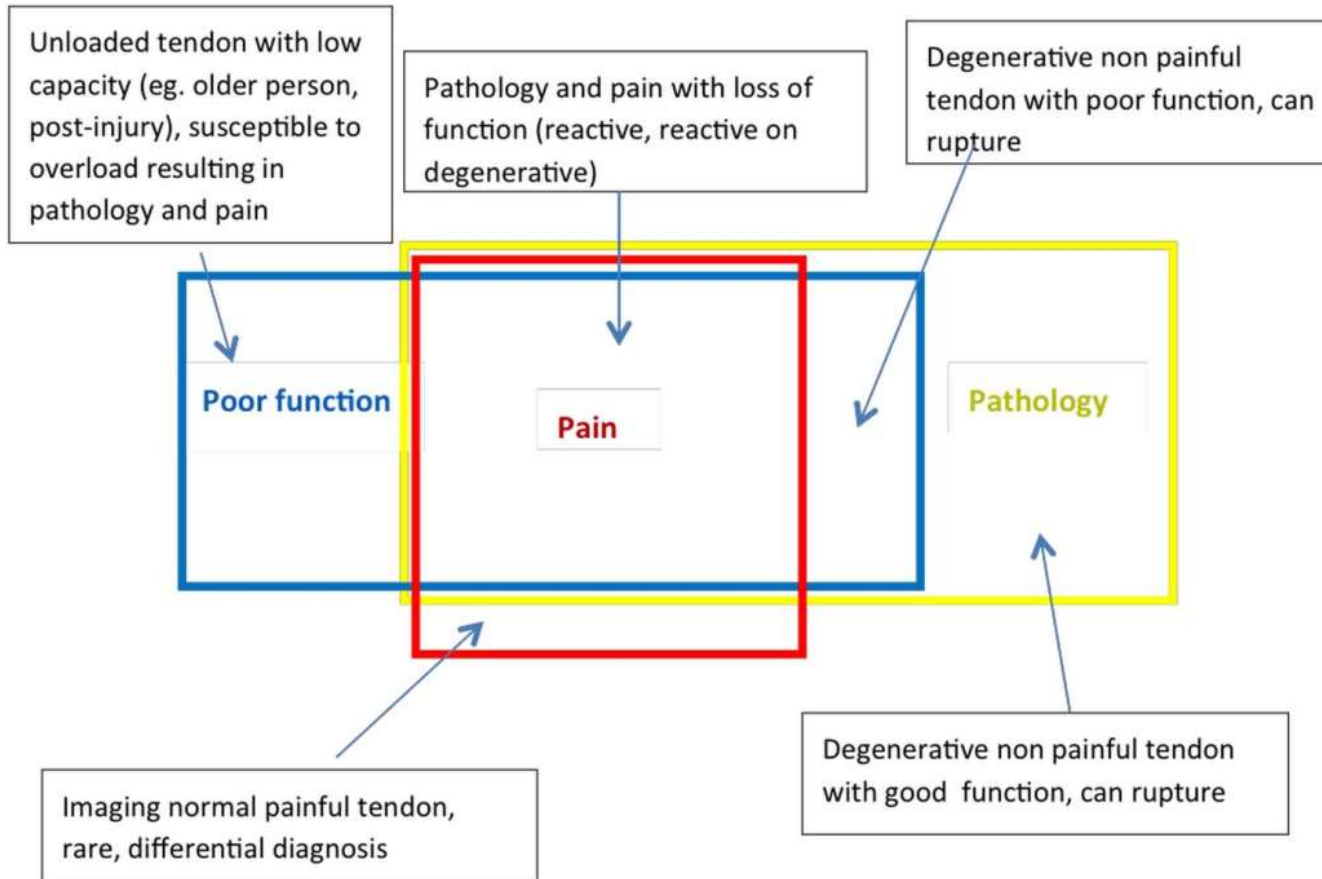
The results of this study might explain how degenerative tendons can still tolerate high tensile load and remain asymptomatic. Malliaras et al. (2010) investigated changes in patellar tendon structure on US monthly over the course of a volleyball season and reported that tendons could vary in appearance from normal to diffusely thick-

Perspective mécanique

Cook 2009, Cook 2016, Docking 2016



Fonction, douleur et pathologie



La tendinopathie en une phrase

Échec du processus d'adaptation à la sollicitation mécanique

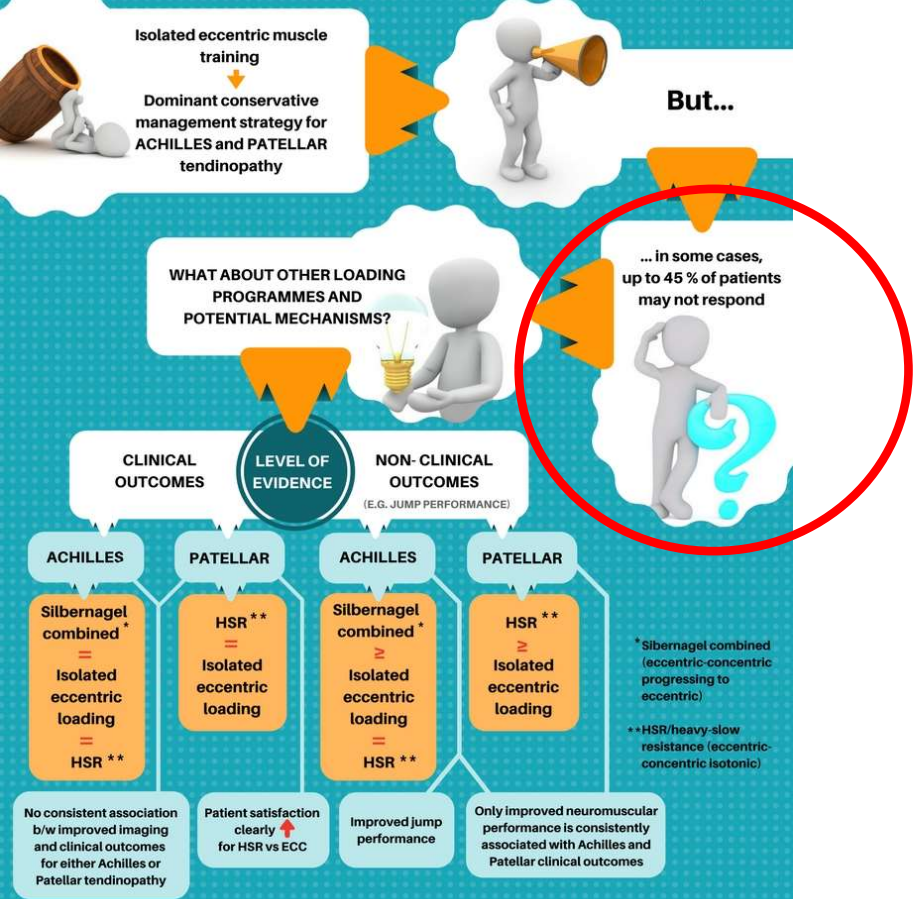
« Failed Healing Response »



Achilles and Patellar Tendinopathy Loading Programmes



Peter Malliaras et al. (2013) Beyer et al. (2015)



Portrait général des protocoles d'exercices



Conclusion

There is **no clear loading favourite**
 The **principles are key** and these include
 progressive, 12 weeks, pain monitoring model

Isométriques progressifs

- Analgésie induite par l'exercice (généralement 60 minutes ou moins).
- Notion de renforcement contestée. Effet sur l'inhibition ?
- « Exercices analgésiques »
- Chargement mécanique sans compression, interaction avec la gaine ou restitution élastique.
- Utile pour éviter le déconditionnement / repos complet.
- **3x30 secondes à 5x45 secondes.**
- **Pause de 2 minutes.**
- **2 à 3 fois par jour.**
- **Tous les jours !**



Isometric Exercise For Acute Pain Relief: Is It Relevant In Tendinopathy Management?

1

Does isometric contraction provide the strongest initial pain relief for tendinopathy?

In general, it appears that **isometric exercise is no better than isotonic exercise** for reducing pain from tendinopathy.



2

Is acute pain relief beneficial for those with longstanding tendinopathy?

Promoting isometrics for immediate pain relief **does not take the slow healing of the underlying pathology into account.**

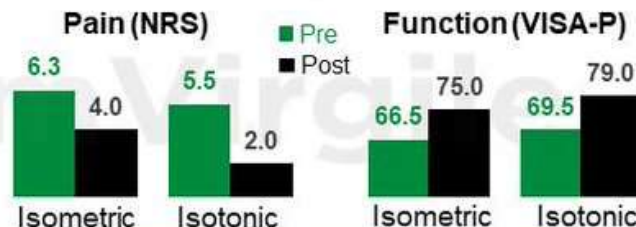
Tendinopathy is a longstanding condition that takes many months to resolve; **focusing on acute pain relief detracts from this important educational message.**

3

Has isometrics proven superior in tendinopathy management?

No. Recent large scale studies suggest that maintained pre- and in-season strengthening and conditioning without any specific bias towards concentric, isometric or eccentric modes reduces the in-season prevalence of shoulder and groin problems by approximately 30-40%.

One study in athletes with patellar tendinopathy found **no differences in pain relief & function outcomes** between isometrics and isotonic training for 4 weeks (*van Ark et al., 2016*):



Tendinopathy management take-home



Isometric exercise should not be ignored, but solid evidence does not exist for its superiority for aiding the management of patients with tendinopathies.

Until further evidence arises, clinicians should feel comfortable and confident prescribing progressive strengthening that fits the individual athlete and progress following current evidence-based principles of load and exercise progression.



Isométriques, plus récemment



[BMJ Open Sport Exerc Med.](#) 2020; 6(1): e000760.

Published online 2020 Aug 4. doi: [10.1136/bmjsem-2020-000760](https://doi.org/10.1136/bmjsem-2020-000760)

PMCID: [PMC7406028](#)

PMID: [32818059](#)

Effectiveness of isometric exercise in the management of tendinopathy: a systematic review and meta-analysis of randomised trials

[Christopher Clifford](#),^{1,2} [Dimitris Challoumas](#),³ [Lorna Paul](#),⁴ [Grant Syme](#),⁵ and [Neal L Millar](#)^{✉2}

Conclusion

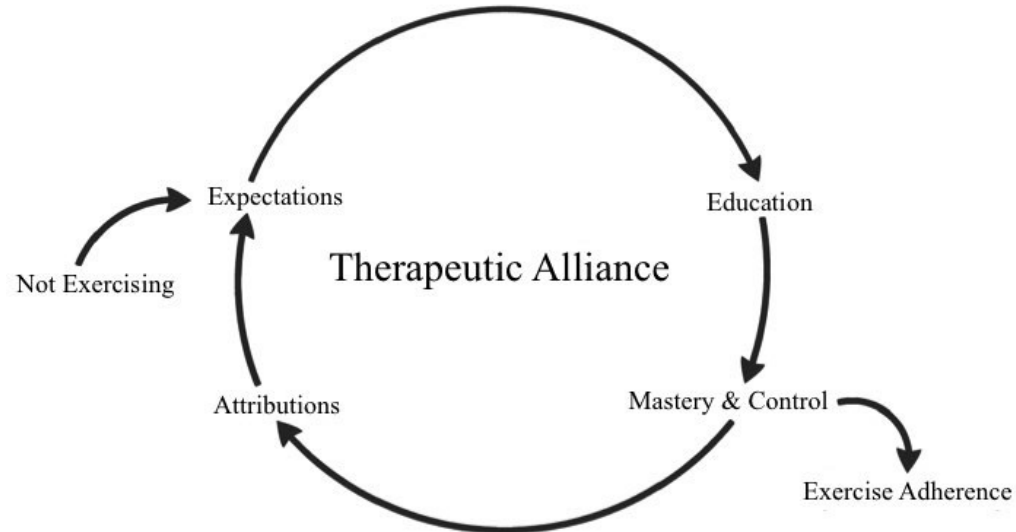
[Go to: ▶](#)

To our knowledge this is the first systematic review to investigate the effectiveness of isometric exercise in the management of tendinopathy. **We found no strong evidence that isometric exercise is superior for immediate or short-term pain relief when compared with isotonic exercise, other treatments or no treatment.** The response to isometric exercise appears to be variable both within and across tendinopathy populations. However, well-designed RCTs with larger sample sizes and long-term follow-up are needed.



Opinion du formateur

- Patients appréhensifs ou kinésiophobiques
- Inhibition du recrutement (tendinopathie patellaire / glutéale).
- Niveau d'irritabilité plus élevé, présence de douleur au repos.
- Tendon sensibilisé / allodymique.
- Alliance fragile ?



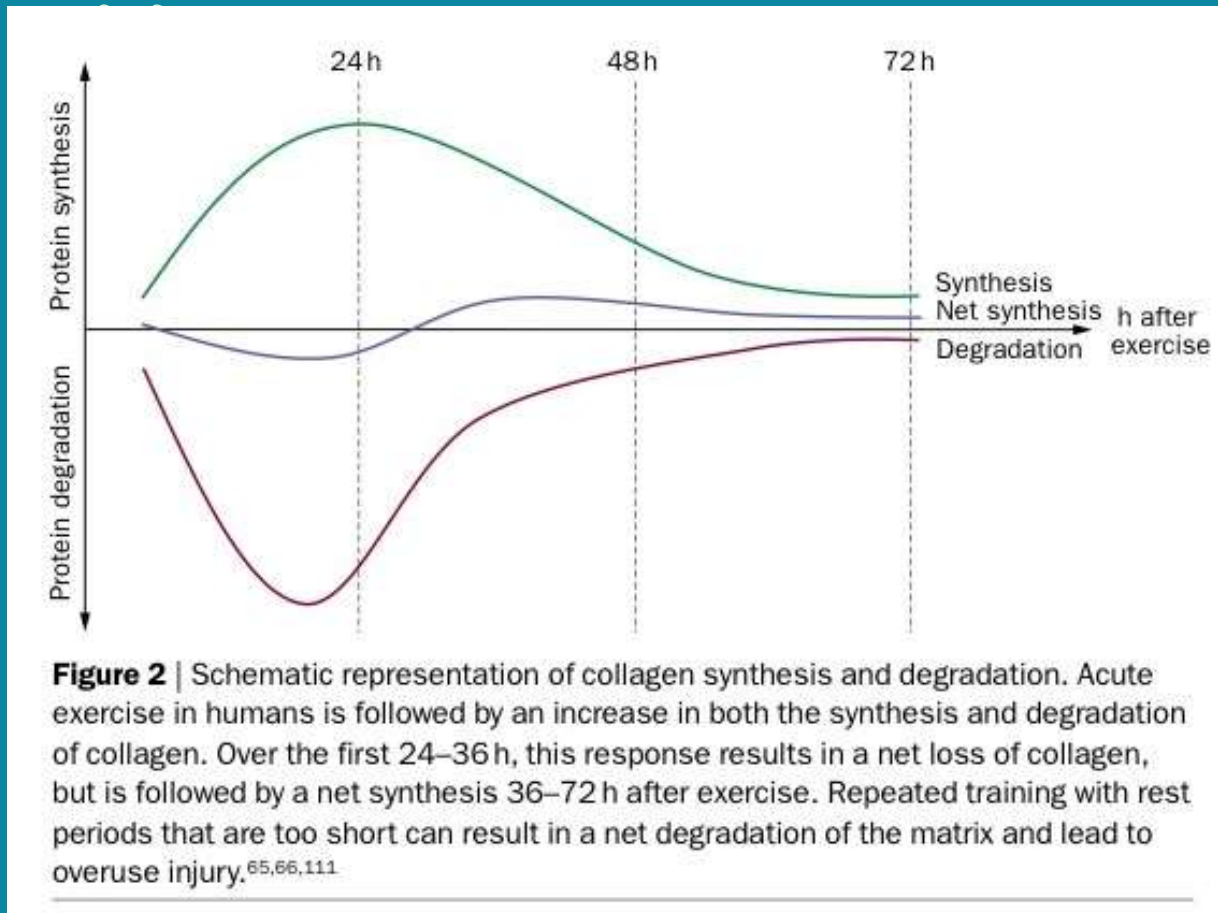
Heavy Slow Resistance



- Cadence de mouvement très lente (3-0-3)
- Entre 10 et 15RM pour les 6 premières semaines.
- Généralement entre 8 et 6RM entre 6 et 12 semaines.
- Durée du programme entre 12 et 26 semaines.
- 3 à 4 séries.
- 2 à 3 fois par semaine.
- Possiblement un avantage pour la satisfaction/compliance patient ?
- Possiblement un avantage pour le remodelage ?
- Opinion du formateur ?



Exercices : Catabolique/Anabolique ?



À quel point “Heavy” faut-il aller ?

- Entre 55% (MSR, moderate slow resistance) et 90% du 1RM
- **Estimation à partir du 5RM**
- À volume d'entraînement égal, pour la tendinopathie patellaire : comparable
- Certaines limitations à ce devis spécifique, demeure intéressant !

TABLE 2
Exercise Protocols^a

	1 wk	2 wk	3 wk	4 wk	5 wk	6 wk	7-12 wk
No. of sets	3	3	3	4	4	4	5
HSR							
% of 1 RM	55	65	70	75	80	85	90
No. of repetitions	15	12	10	8	6	5	4
MSR							
% of 1 RM	55	55	55	55	55	55	55
No. of repetitions	15	14	13	11	9	8	7

^aHSR, heavy slow resistance; MSR, moderate slow resistance; RM, repetition maximum.

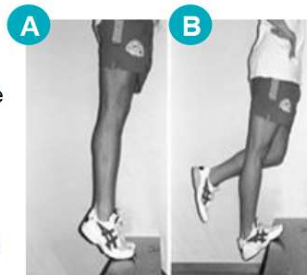


Renforcement excentrique

- Protocole classique d'Alfredson.
- 3 séries de 15 répétitions (genoux fléchis ET en extension).
- 2 fois par jour, 7 jours par semaine.
- 12 semaines.
- Possiblement aussi efficace que « do as much as tolerated »*

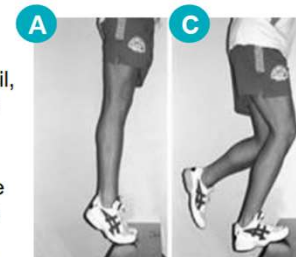
Knee straight - gastrocnemius drop

- Standing on edge of step, raise onto toes using the uninjured leg and hands on banister or rail (A)
- Transfer to single leg, standing on injured leg, and SLOWLY control the weight down so the heel is lowered over the edge of the step (B)
- Transfer weight back onto uninjured leg to lift back up onto toes (A)

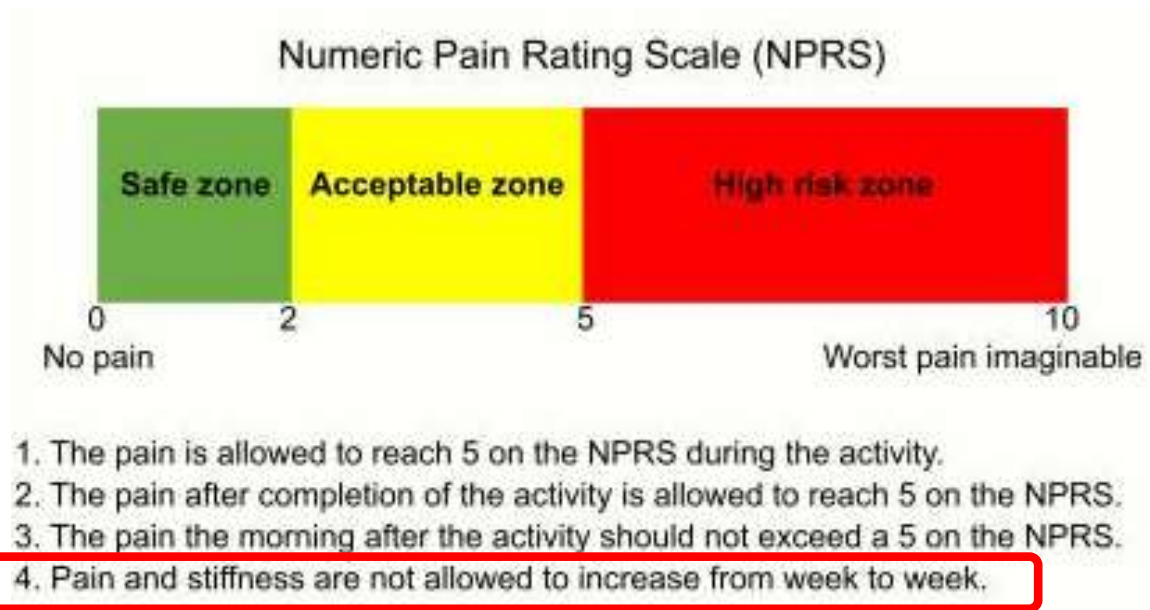


Knee bent - soleus drop

- Standing on edge of step, hands on banister or rail, raise onto toes using the uninjured leg and hands to help in the pushing up phase (A)
- Transfer to single leg, standing on injured leg bending the knee to 45°, and SLOWLY control the weight down so the heel is lowered over the edge of the step maintaining a bent knee (C)
- Transfer weight back onto uninjured leg to lift back up onto toes (A)

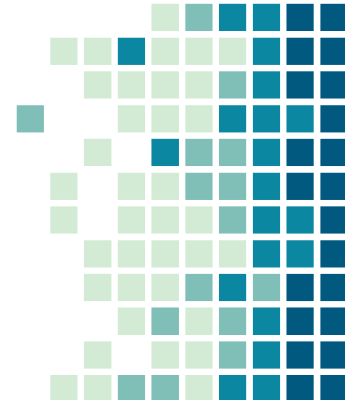


Douleur durant et après les exercices



Exercices et niveau de douleur

- Moins de 2H initialement.
- Douleur modérée (≤5/10)
- Éventuellement moins de 24H.
- Douleur apparaît durant les exercices*
- Considérons le degré de sensibilisation.



SYSTEMATIC REVIEW

Achilles and Patellar Tendinopathy Loading Programmes

A Systematic Review Comparing Clinical Outcomes and Identifying Potential Mechanisms for Effectiveness

Peter Malliaras · Christian J. Barton ·
Neil D. Reeves · Henning Langberg

Table 3 Characteristics of Alfredson, Stanish and Curwin, Silbernagel and HSR programmes

Programmes	Type of exercise	Sets, reps	Frequency	Progression	Pain
Alfredson	Eccentric	3, 15	Twice daily	Load	Enough load to achieve up to moderate pain
Stanish and Curwin	Eccentric-concentric, power	3, 10–20	Daily	Speed then load	Enough load to be painful in third set
Silbernagel	Eccentric-concentric, eccentric, faster eccentric-concentric, balance exercise [30, 41], plyometric [23]	Various	Daily	Volume, type of exercise	Acceptable if within defined limits ^a
HSR	Eccentric-concentric	4, 15–6	3×/week	15–6 RM	Acceptable if was not worse after

reps repetitions, *RM* repetition maximum

^a Moderate (less than 5 of 10 on a visual analogue scale, 10 = worst pain imaginable); subsided by the following day



Activity Traffic Light

Slow - recover

More severe or persistent symptoms or fatigue.

- Reduce provocative activity to manageable level, use calming strategies

Hold - consolidate

Moderate symptoms or fatigue that's starting to linger beyond 24 hours

- Stay at current level or reduce slightly

Go - progress

Mild symptoms & low fatigue levels

- Increase rehab or goal activity



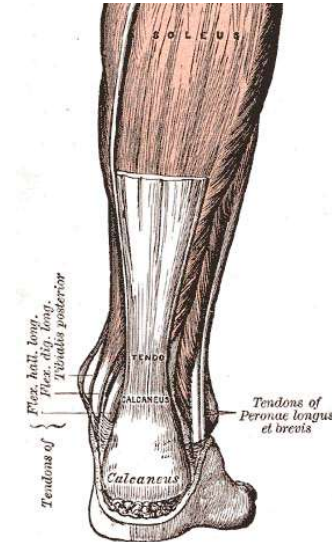
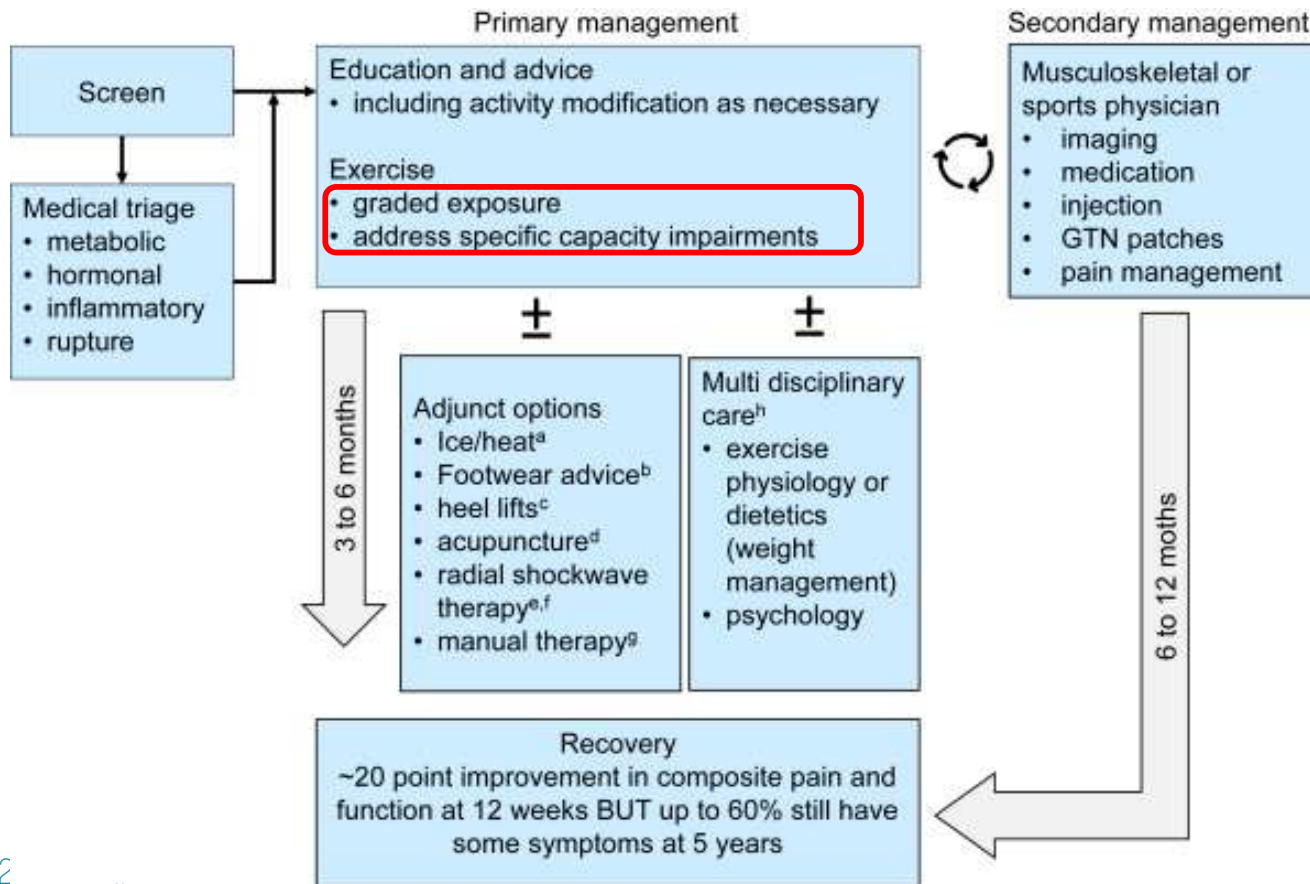
Modification des activités

Pour les cas irritables, il est possible que plusieurs semaines soient nécessaires pour retourner dans le vert après une lumière rouge.

Important de discuter de la possibilité et de la gestion des exacerbations (flare-ups) avant que ça arrive !



Modèle de prise en charge proposé



Éléments clés de l'éducation thérapeutique

Patient-centred approach

- consider individual impact
- empathy and reassurance
- shared decisions considering preferences and lifestyle
- active learning approaches
- understand individual patient goals and motivations

What is wrong with me?

Explain individual risk factors

Explain tendon pathology (important to patients (Mallows et al, 2021²⁷))

- Share data of asymptomatic pathology is common (Docking et al, 2021⁴⁵)

Explain local nociceptive pain but influence of biopsychosocial factors

- Use multimedia resources (eg, www.tamethebeast.org, [Why Things Hurt video](#))
- Use pain models (eg, Mature Organism Model (Gifford, 2013¹⁷⁷))

Explore and address belief that pain may signal tendon damage

- Share data indicating minimal risk of rupture (Yasui et al, 2017⁵)
- Use individual pain/apprehension with loading to reinforce biopsychosocial pain model

What can we do for it?

Explain primary and secondary treatment rationale, benefits and harms

Provide specific strategies for activity modification

- Use step count, volume (eg, time) or intensity (speed) data from smart devices

Facilitate understanding of acceptable pain and adaptive pain behaviours

- Share data showing pain during exercise is safe and acceptable (Smith et al, 2017¹³³)
- Discuss consequences of 'endurance' or 'fear-avoidance' strategies

Provide specific strategies to progress and regress activities and exercise

- Develop agreed criteria that are perceived as realistic

What can I expect?

Explain that 'recovery' means return to activities but possibly with mild pain

- Use data to show meaningful improvement (on average) with primary treatment at 12 weeks (Murphy et al, 2018³³)
- Use data to show that 60% may still have some symptoms at 5 years (Van der Plas et al, 2012³⁸)

Discuss that it will take 6 to 12 months, challenging and hard to stay motivated

- Set meaningful agreed goals
- Provide feedback and monitoring based on individual preferences

Explain that flare-ups are part of the process

- Develop an agreed plan for managing flare-ups



Éducation – autres messages concrets

- 1) Le repos n'améliore pas la tendinopathie, mais peut être temporairement nécessaire.
- 2) L'exercice est le traitement de choix pour les problèmes tendineux.
- 3) Il faut être patient, la tendinopathie s'améliore lentement (12, 26 parfois 52 semaines).
- 4) Les traitements passifs sont rarement efficaces à long terme *
- 5) Il ne s'agit pas d'une maladie inflammatoire, l'inflammation ne joue pas un rôle crucial **
- 6) Les résultats d'imagerie ne prédisent pas fortement l'évolution***
- 7) Les changements dégénératifs sont très fréquents et moins d'un patient sur sept développe de la douleur.
- 8) Les changements dégénératifs sont généralement peu réversibles, on s'occupe du reste du tendon (analogie du beigne) !
- 9) La meilleure prévention des récurrences est une bonne fonction musculaire
- 10) La moitié des gens gardent une « sensibilité » à long terme mais retrouve la fonction.



Récupération – Fonction vs Symptômes

- Chez les patients qui considèrent avoir eu une récupération complète un an après le début de la réadaptation, **moins du quart réussissent avec une batterie de tests fonctionnels** (sauts, force et endurance musculaire) avec index de symétrie supérieur à 90%.
- Lien sur le taux de récurrence ?
- Supporte l'hypothèse de la désensibilisation /adaptation comme mécanisme ?

Clinical Trial > Br J Sports Med. 2007 Apr;41(4):276-80; discussion 280.

doi: 10.1136/bjism.2006.033464. Epub 2007 Jan 29.

Full symptomatic recovery does not ensure full recovery of muscle-tendon function in patients with Achilles tendinopathy

Karin Grävare Silbernagel ¹, Roland Thomeé, Bengt I Eriksson, Jon Karlsson

FULL TEXT LINKS

BMJ Full Text

FREE Full text PMC

ACTIONS:

“ Cite

Lecture suggérée – Neuroplasticité

Review

Tendon neuroplastic training: changing the way we think about tendon rehabilitation: a narrative review

Ebonie Rio ^{1, 2}, Dawson Kidgell ³, G Lorimer Moseley ⁴,  Jamie Gaida ^{1, 5, 6}, Sean Docking ^{1, 2}, Craig Purdam ⁷, Jill Cook ^{1, 2}

- Quelques mots sur la douleur neuropathique et la sensibilisation centrale.
- Particularités de la tendinopathie persistante (30-50%).
- Prévalence semble augmenter avec chronicité et âge.



Opinion du formateur : fonction/douleur

- Expliciter l'importance de regagner la fonction contractile.
- Mettre l'emphasis sur la fonction musculaire comme mécanisme de protection.
- Controverse sur le potentiel de remodelage / imagerie.

Results: The majority of participants in the review were from sporting populations. Meta-analysis revealed that tendon abnormalities on US are associated with future symptoms of both patellar and Achilles tendinopathy (RR=4.97, 95% CI 3.20 to 7.73). Subgroup analysis indicated that tendon abnormalities at baseline were associated with an increased risk of both Achilles (RR=7.33, 95% CI 2.95 to 18.24) and patellar (RR=4.35, 95% CI 2.62 to 7.23) tendinopathy.

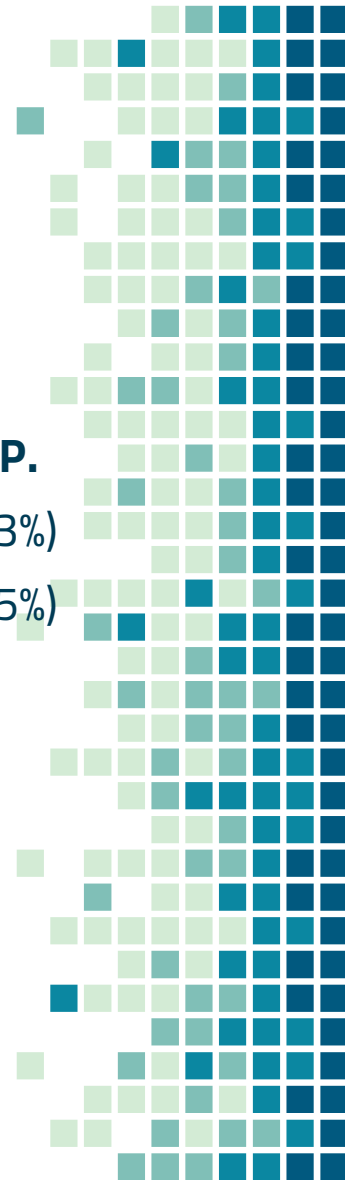
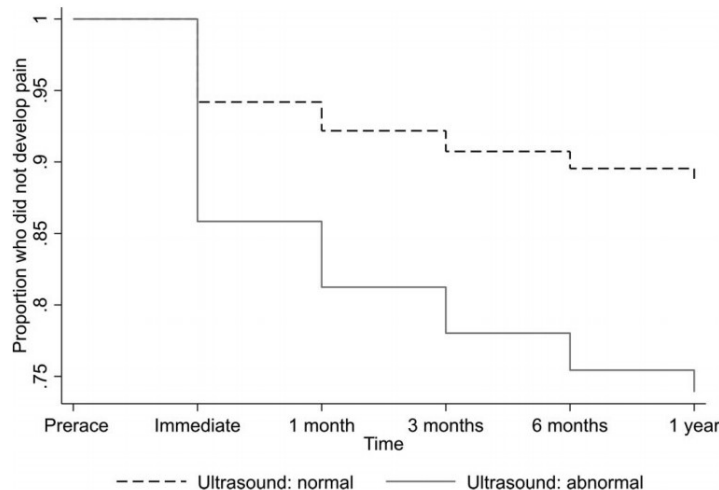
Conclusions: This systematic review and meta-analysis indicates that tendon abnormalities visualised using US in asymptomatic tendons are predictive of future tendinopathy and are associated with at least a fourfold increased risk.

Implications: Identification of at-risk athletes using screening tools such as US may allow preventative programmes to be implemented. However, it is clear that other factors beyond tissue structure are involved in the development of lower limb tendinopathy.



Imagerie – Course à pied

- Population demi-marathon et marathon asymptomatique et sans ATCD.
- 138 patients, évaluation des tendons achilléens et patellaires (4/personne).
- **24% des sujets avaient des anomalies au niveau du TA et 39% au niveau du TP.**
- 34% des TA avec anomalies seront douloureux dans l'année suivante (sain = 13%)
- 23% des TP avec anomalies seront douloureux dans l'année suivante (sain = 15%)



Effet des exercices sur la pathologie

Association Between Clinical and Imaging Outcomes After Therapeutic Loading Exercise in Patients Diagnosed With Achilles or Patellar Tendinopathy at Short- and Long-Term Follow-up: A Systematic Review

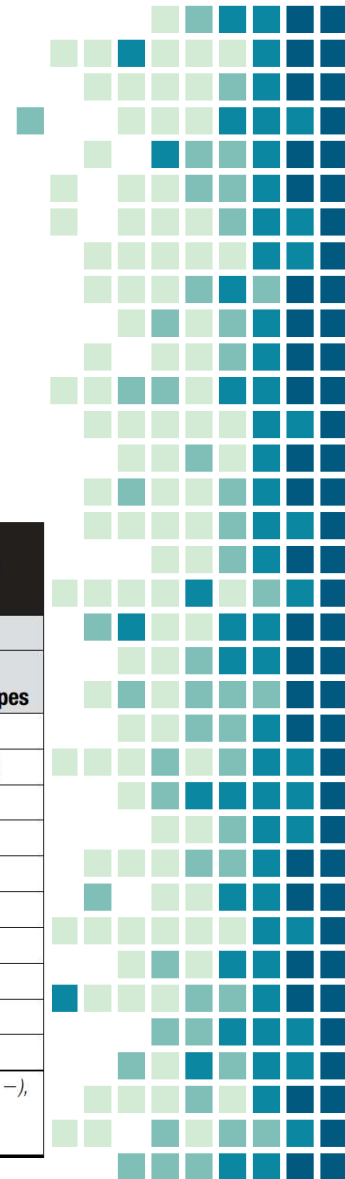


Lucas M Rabello¹, Inge van den Akker-Scheek¹, Michel S Brink², Mario Maas³, Ron L Diercks¹, Johannes Zwerver¹

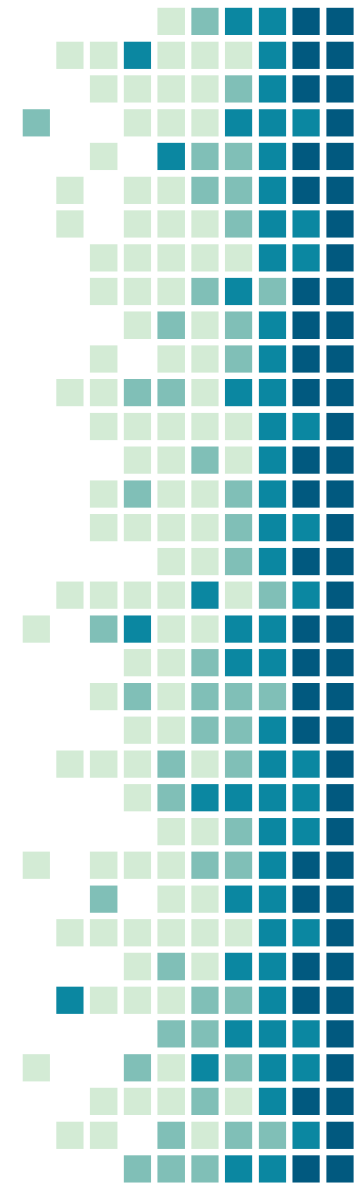
TABLE 5. Association Between Imaging Outcomes and Clinical Outcomes After ECC and HSR Exercises for Patient Diagnosed With AT, During Short-Term (Left Side of Column) and Long-Term Follow-up (Right Side of Column)

Clinical Outcomes	Imaging Outcomes													
	Tendon Thickness		Tendon Abnormalities		Neovascularization		Tendon Volume		Intratendinous Signal		CSA		Echo Types	
ECC exercise														
Questionnaire score	- - -	+/-	-	NR	- -	+ + +	+ +	NR	- -	NR	+ +	NR	-	NR
Pain	- - -	+ +	- -	+ +	- - -	+ +	+	-	+/-	+				
Performance	+/-	+ +	NR	NR	+ + +	+ +	-	-	+/-	+				
Patient satisfaction	+ + +	+ +	+	+ +	+ + +	+ +								
HSR exercise														
Questionnaire	+ +	+ +	NR	NR	+ +	+ +								
Pain	+ +	+ +	NR	NR	+ +	+ +								
Performance	+ +	+ +	NR	NR	+ +	+ +								
Patient satisfaction	+ +	+ +	NR	NR	+ +	+ +								

Positive sign (+), existing association between imaging and clinical outcomes; negative sign (-), no association between outcomes; + + + (- - -), strong evidence; + + (- -), moderate evidence; + (-), limited evidence; +/-, conflicting evidence. NR, no study reported this association.



Tendinopathie patellaire



TP – Programme proposé

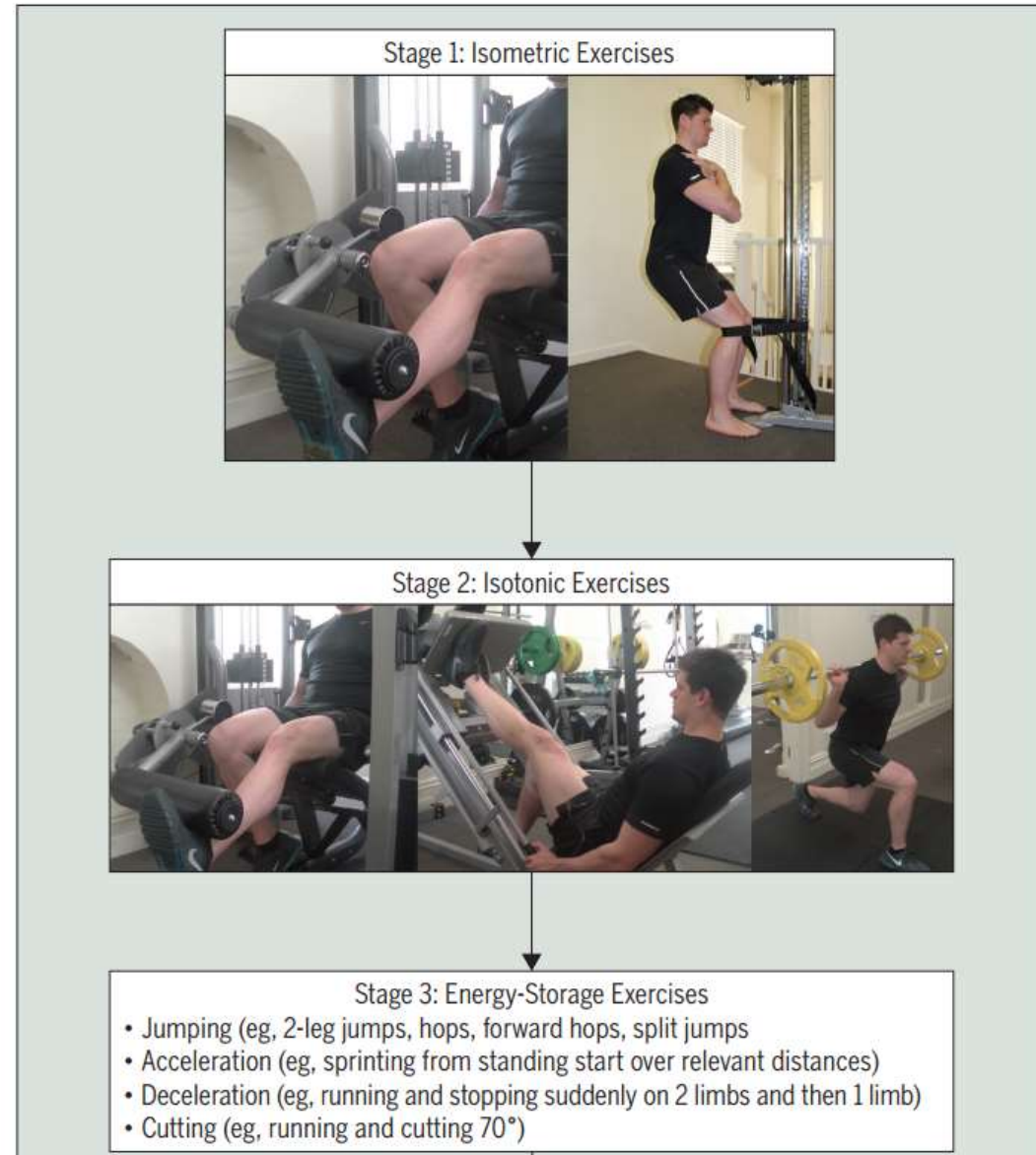
REHABILITATION STAGES AND PROGRESSION CRITERIA		
Stage	Indication to Initiate	Dosage
1. Isometric loading	More than minimal pain during isotonic exercise*	5 repetitions of 45 seconds, 2 to 3 times per day; progress to 70% maximal voluntary contraction as pain allows
2. Isotonic loading	Minimal pain during isotonic exercise*	3 to 4 sets at a load of 15RM, progressing to a load of 6RM, every second day; fatiguing load
3. Energy-storage loading	<p>A. Adequate strength[†] and consistent with other side</p> <p>B. Load tolerance with initial-level energy-storage exercise (ie, minimal pain during exercise and pain on load tests returning to baseline within 24 h)*</p>	Progressively develop volume and then intensity of relevant energy-storage exercise to replicate demands of sport
4. Return to sport	Load tolerance to energy-storage exercise progression that replicates demands of training	Progressively add training drills, then competition, when tolerant to full training

Abbreviation: RM, repetition maximum.
**Minimal pain defined as 3/10 or less.*
[†]For example, around 150% body weight (4 × 8) for most jumping athletes.

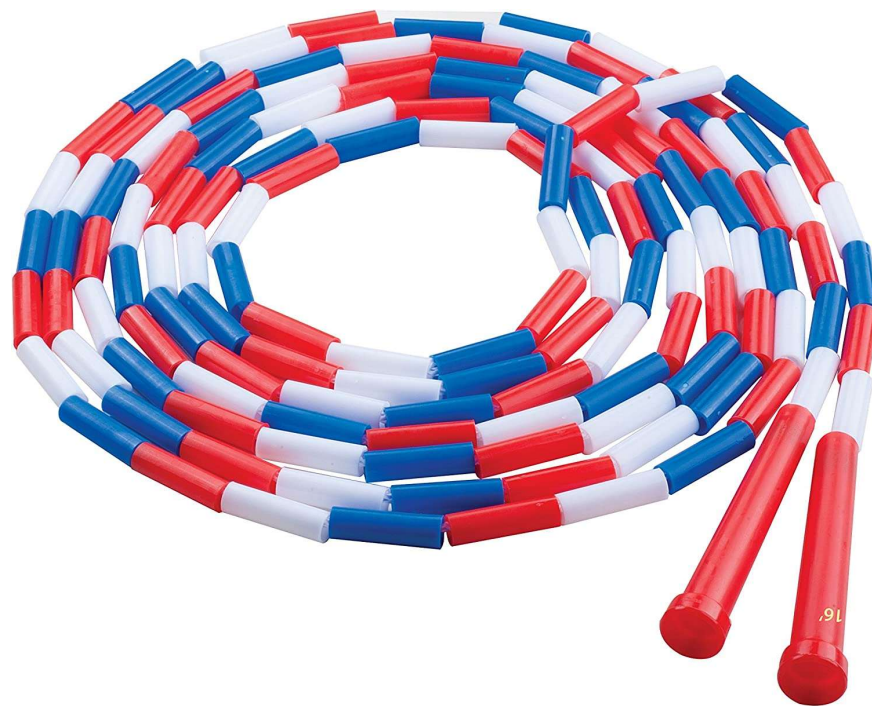


TP – Progressions

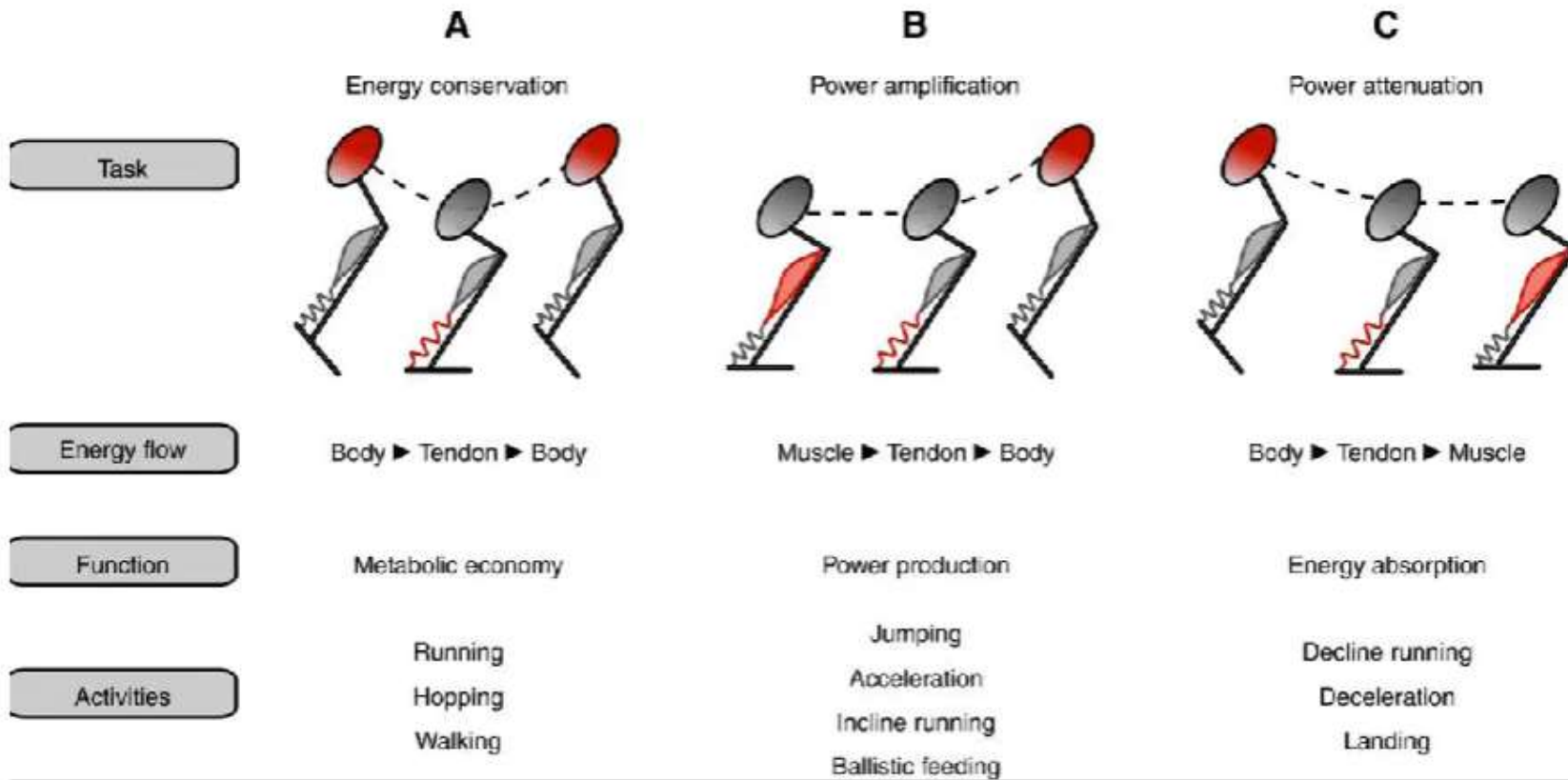
- Alternative du squat décliné



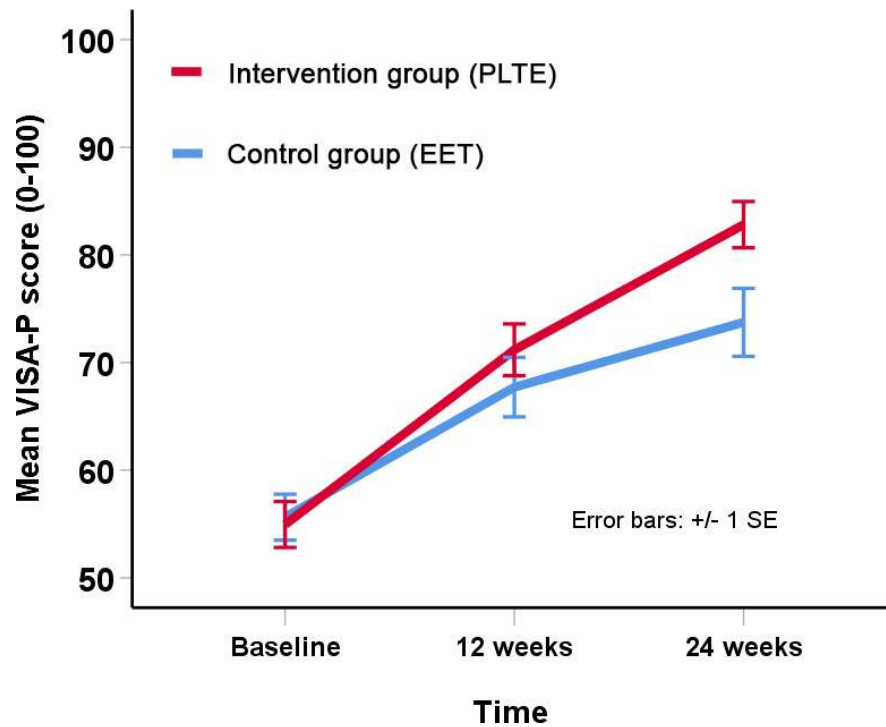
Mon choix de première activité « ESE »



« Energy Storage Exercises »



TP – Excentrique/Conventionnel



Tendance meilleur taux de succès pour le retour aux sports (27% vs 43%)

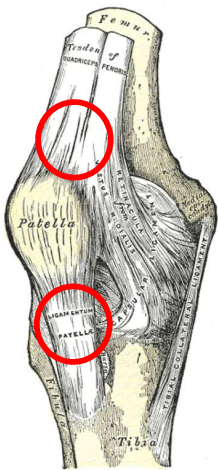


TP – Patellaire ou quadricipitale ?

Distinguishing Quadriceps and Patellar Tendinopathy: Semantics or Significant?

Andrew Sprague, PT, DPT^{1,2}, Scott Epsley, PT³, Karin Grävare Silbernagel, PT, ATC, PhD^{1,2}

Preferentially loading the quadriceps tendon

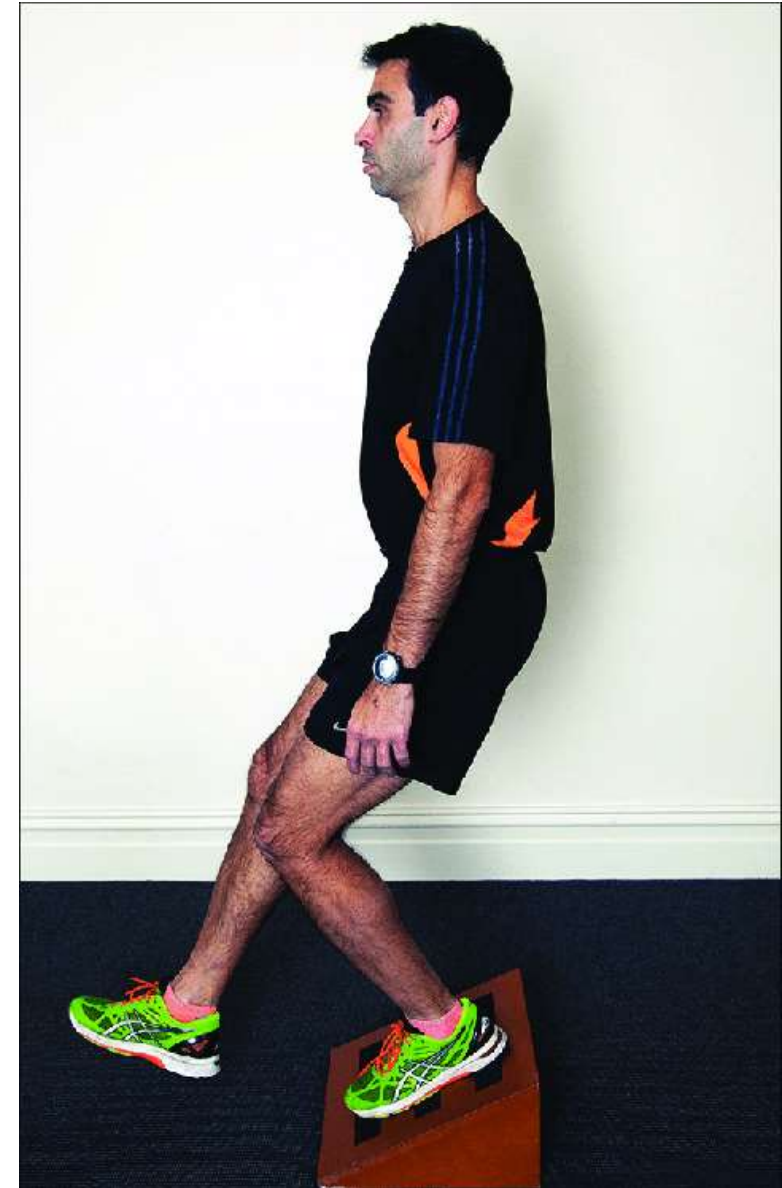
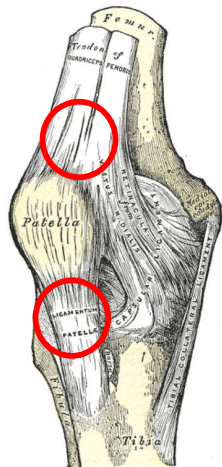


The patellar tendon and quadriceps tendon are not loaded equally throughout knee motion. The quadriceps tendon experiences greater loads than the patellar tendon as the knee moves further into flexion.¹² This relationship is due to an increasing mechanical advantage of the patellar tendon and greater passive tension in the quadriceps muscle as it approaches end-range. This may explain why pain in quadriceps tendinopathy is most pronounced in activities that involve deep knee flexion. **Graduated loading programs for quadriceps tendinopathy should include appropriate loading in deep knee flexion. However, bony abnormalities are common and some patients may experience excess compression from the patella. In highly symptomatic cases, the patient may not tolerate loading in deep knee flexion in the early phases of treatment.**

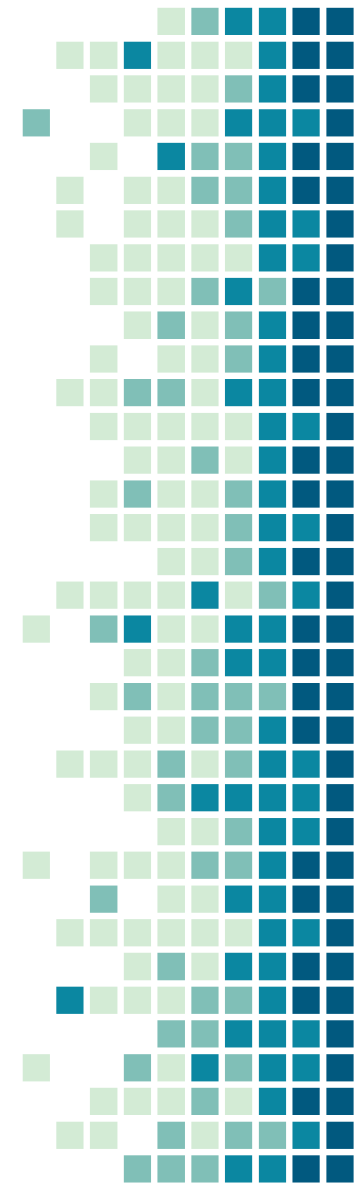


TP – Amplitudes de flexion

- On oublie le « Ne laissez pas votre genou dépasser [...] »
- Avantage à utiliser le renforcement un plan incliné.
- Attention aux patients avec syndrome fémoro-patellaire.
- Cliniquement, mauvais combo si quadricipital et SFP ☹



Tendinopathie glutéale



Tendinopathie glutéale

- Terminologie préférée (opinion d'expert, pourquoi ?).
- Diagnostic différentiel plus délicat.
- Meilleur LR- : Palpation locale de la région trochantérienne.
- Meilleur LR+ :

Appui unipodal x 30 secondes reproduit douleur.

Résisté isométrique douloureux en rotation interne

(à partir de la position FADER)

Résisté isométrique douloureux en abduction (à partir de l'adduction).



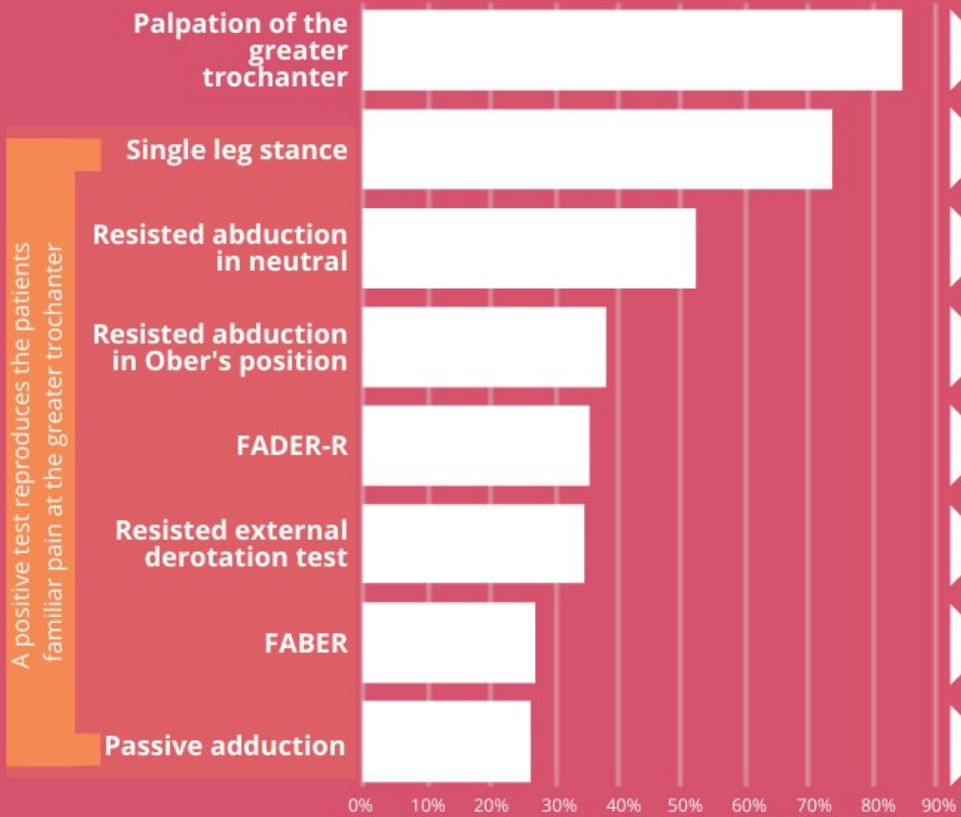
Mon petit biais McKenzie

- Étude EXPOSS (Extremity Pain of Spinal Source), n = 369
- 14% de l'échantillon avait une lombalgie concomitante « non reliée ».
- Patient avec douleur à une articulation périphérique sans évidence de radiculopathie.
- Utilisation des mouvements répétés lombaires pour rule-in / rule-out.
- Utilisation des mouvements répétés lombaires pour traitement.
- **Hanche = Région anatomique dont les symptômes sont les plus susceptibles d'être modulés par les mouvements lombaires (+70%).**



Examen physique

Utilisation of Clinical Tests for Gluteal Tendinopathy/ Greater Trochanteric Pain Syndrome



A positive test reproduces the patients familiar pain at the greater trochanter

Percentage of surveyed physiotherapists. Represents a mean value of all participants from Australia, New Zealand, Ireland & the United Kingdom

Dr. Alison Grimaldi
PHYSIOTHERAPIST, RESEARCHER & EDUCATOR

What the evidence says about diagnostic utility of Clinical Tests for Gluteal Tendinopathy

- Useful for ruling out gluteal tendinopathy when negative (not tender on palpation). Should not be used as a stand-alone test for ruling in (diagnosing) gluteal tendinopathy⁴
- Large increase in likelihood of gluteal tendinopathy when positive but not useful for ruling out the condition when negative⁴
- No clear data available. Minimal compression, so probably not as useful as the resisted tests below
- Moderate increase in likelihood of gluteal tendinopathy when positive but not useful for ruling out the condition when negative⁴
- Moderate increase in likelihood of gluteal tendinopathy when positive but not useful for ruling out the condition when negative⁴
- Moderate increase in likelihood of gluteal tendinopathy when positive but not useful for ruling out the condition when negative⁶
- Small increase in likelihood of gluteal tendinopathy when positive but not useful for ruling out the condition when negative⁴
- Not useful for ruling in or out the condition⁴

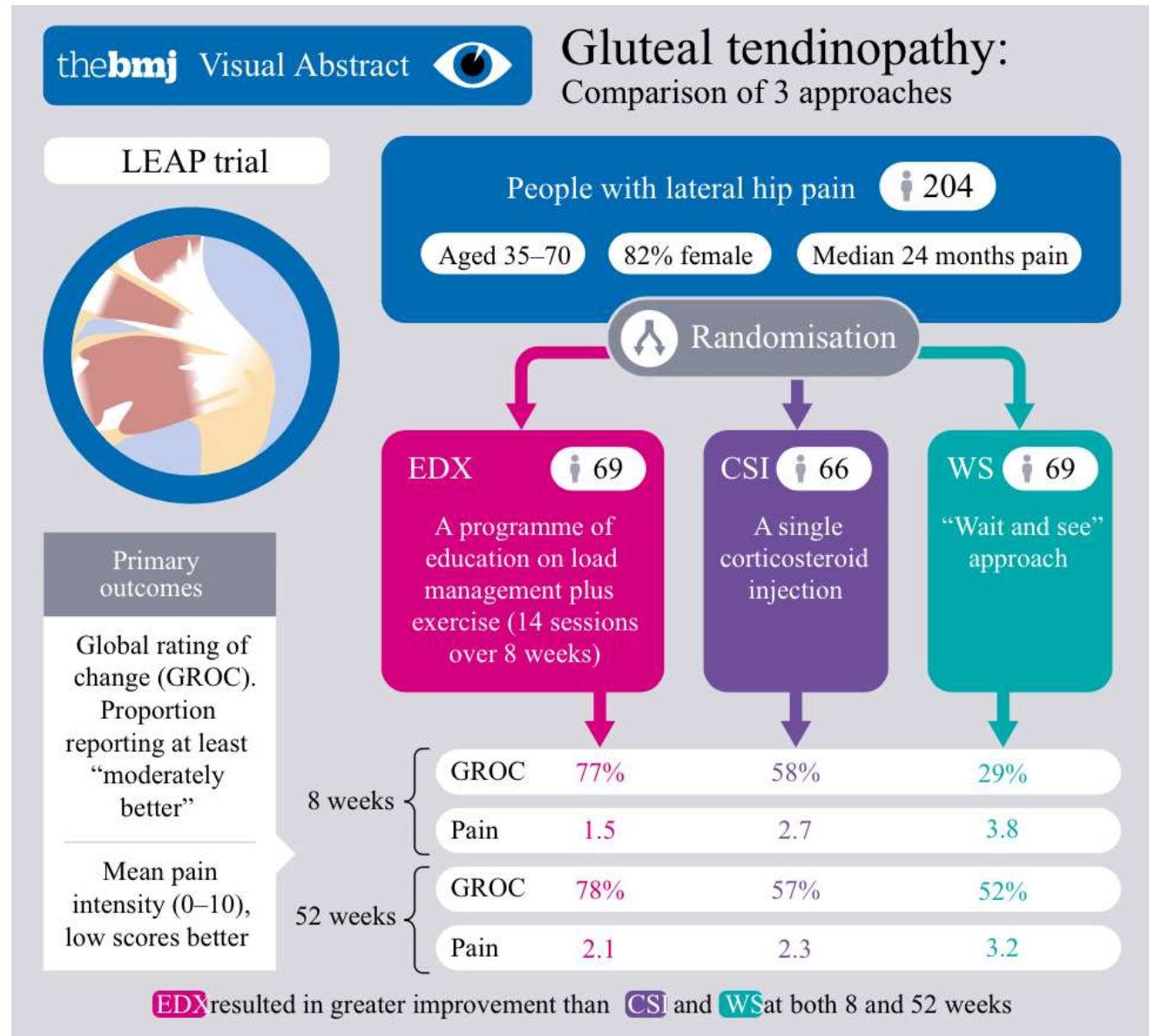
dralisongrimaldi.com/blog/

LEAP Trial

- CSI = Infiltration échoguidée
- EDX = Exercices + Éducation
- WS = Wait and see
- Excellents résultats avec seulement 8 semaines d'EDX.
- Programme complet disponible, allons voir ensemble !
- Dans les ressources complémentaires du cours.

<http://surl.li/gqppo>

Mellor 2018



Tendinopathie achilléenne



Recommendations for

TENDINOPATHY - THOU SHALT LOAD. BUT HOW?

Dr Ebonie Rio @tendonpain

1 Loading helps change tendon mechanical properties, muscle strength, the kinetic chain and the brain, so that we can have a long term effect on tendon pain.

2 TENDON LOAD TYPES

A. Compressive -

A tendon can be squashed against a bone eg proximal hamstring tendon compressing against the ischial tuberosity during hip flexion



C. Tensile -

Store and release energy like a spring for power



B. Shear and friction -

Movement of the tendon sheath on the tendon can cause sheath irritation eg Achilles sheath moves with repeated dorsiflexion/plantarflexion



D. Combinations - of the above loads eg compressive and tensile load, are often more provocative eg hockey players running in hip flexion have a combination of loads on their proximal hamstring tendon



3 Identify and remove provocative loads then apply analgesic and progressive loads. Provocative loads are anything the tendon cannot tolerate and may include different load types early on including compressive, tensile and shear/friction. Try heavy isometric loads (because it doesn't have a compressive, tensile or shear/friction component) for analgesia to avoid complete rest.

BROUGHT TO YOU BY:



clinicaledge.co



@davidkpope

4 GOALS

- Establish your patient's current capacity and their goals
- Small steps are needed to gradually increase load and achieve patient goals
- If the ultimate goal is to be strong and springy, heavy lifting and power training is essential



References:

<http://bjsm.bmj.com/content/early/2015/10/17/bjsports-2015-094849>
@ProfJillCook @Siddocking

Compression
Tension
Friction
(et stratégies)

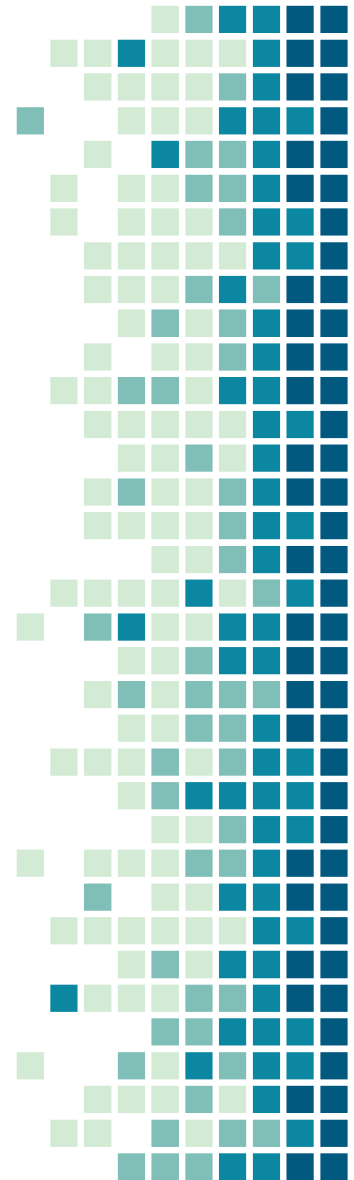


Exemple relatif à
la compression

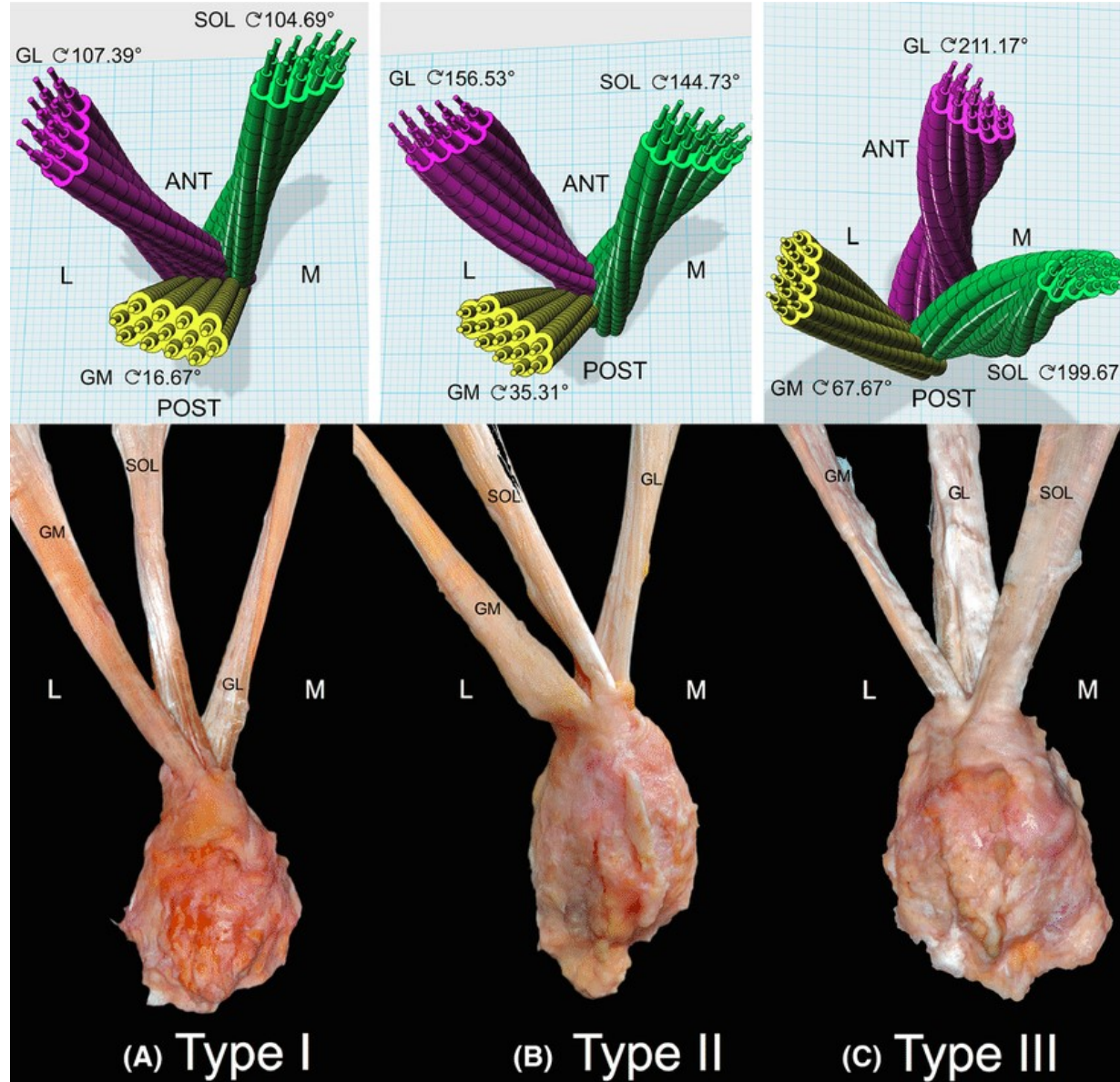
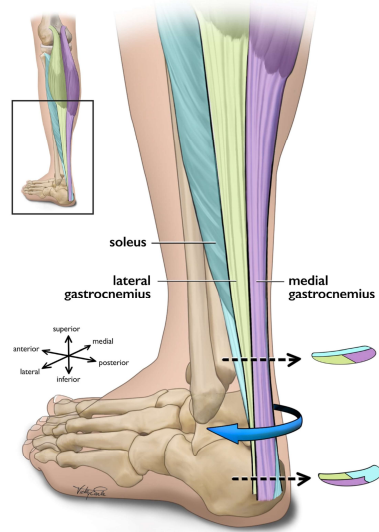
Tendon	Site of compression	Position of compression	Modification	Effectiveness
Achilles insertion	Superior calcaneus	Ankle dorsiflexion	Heel raise	Effective
Tibialis Posterior	Medial malleolus	Anatomically permanent pivot	Orthotics and heel raise	Limited
Long Head of Biceps	Bicipital groove	Shoulder extension		
Supraspinatus	Greater tuberosity	Shoulder adduction		
Proximal Hamstring	Ischial tuberosity	Hip flexion	Limiting sitting/lunging	Moderate
Gluteus Medius and Minimus	Greater trochanter	Hip adduction	Lumbopelvic control, sleep supine	Effective
Adductor Longus/ rectus abdominus	Pubic ramus	Hip abduction/extension	Limit loads in abduction/extension	Moderate
Peroneal Tendons	Lateral malleolus	Anatomically permanent pivot	Heel raise	Limited
Quadriceps	Femoral condyle	Deep knee flexion	Limit loads in deep knee flexion	Moderate
Pectorals	Humeral tuberosity	External rotation		



Régression – Bord de marche



Anatomie – Un lien avec la réponse variable aux exercices ?



Modifications cliniques proposées

- Point de pivot postérieur (calf raise – pompes de mollet dos au mur).
- Stretching généralement non recommandé si composante de compression.
- Renforcement en bord de marche à débiter plus tardivement (6-8 semaines).
- Initialement : charge et volume plus important que ROM.



ACHILLES TENDINOPATHY REHAB PROTOCOL



Reference: Silbernagel et al. JAT 2020

Designed by @YLMSportScience

Phases	Status	Treatment program
<p>~ week 1 to 2</p> <p>Symptom-management</p>	<p>Pain and difficulty with all activities, difficulty performing 10 one-legged heel rises</p>	<p>Progress loading up to 100% body weight with slow motion</p> <p>3x10 once a day</p> <ul style="list-style-type: none"> • Circulation exercise (moving foot up or down) • 2-legged heel rises standing on the floor • 1-legged heel rises standing on the floor • Eccentric heel rises standing on the floor • Sitting heel rises
<p>~ week 2 to 5</p> <p>Recovery</p>	<p>Pain with exercise, morning stiffness, pain when performing heel rises</p>	<p>Increased speed of movement & external resistance</p> <p>3x15 once a day</p> <ul style="list-style-type: none"> • 2-legged heel rises standing on edge of a step • 1-legged heel rises standing on edge of a step • Eccentric heel rises standing on edge of a step • Sitting heel rises • Quick-rebounding heel rises
<p>~ week 3 to 12</p> <p>Rebuilding</p>	<p>Tolerates the recovery phase exercise program well, no pain at the distal tendon insertion, possibly decreased or increased morning stiffness</p>	<p>Continue to progress external resistance & initiate plyometrics</p> <p>3x15 2-3x / week</p> <ul style="list-style-type: none"> • 1-legged heel rises standing on edge of step with added weight • Eccentric heel rises standing on edge of step with added weight • Sitting heel rises • Quick-rebounding heel rises • Plyometrics training (sport specific)
<p>~ month 3 to 6</p> <p>Return-to-sport</p>	<p>Minimal symptoms, some but not daily morning stiffness, can participate in sports without difficulty</p>	<p>Sport-specific loading speed & movement patterns</p> <p>3x15 2-3x / week</p> <ul style="list-style-type: none"> • 1-legged heel rises standing on edge of step with added weight • Eccentric heel rises standing on edge of step with added weight • Quick-rebounding heel rises



Images provided by PresenterMedia

Proposition “Où débiter” après évaluation



- 5 flexions plantaires unipodales ou moins, avec douleur :
- 5 à 10 flexions plantaires unipodales :
- 10 à 15 flexions plantaires unipodales :
- Plus de 15 flexions plantaires unipodales :

- Bipodal assis / au mur ou ISOM.
- Bipodal debout
- Unipodal debout
- Musculation/Unipodal+Charge



Et les étirements ?

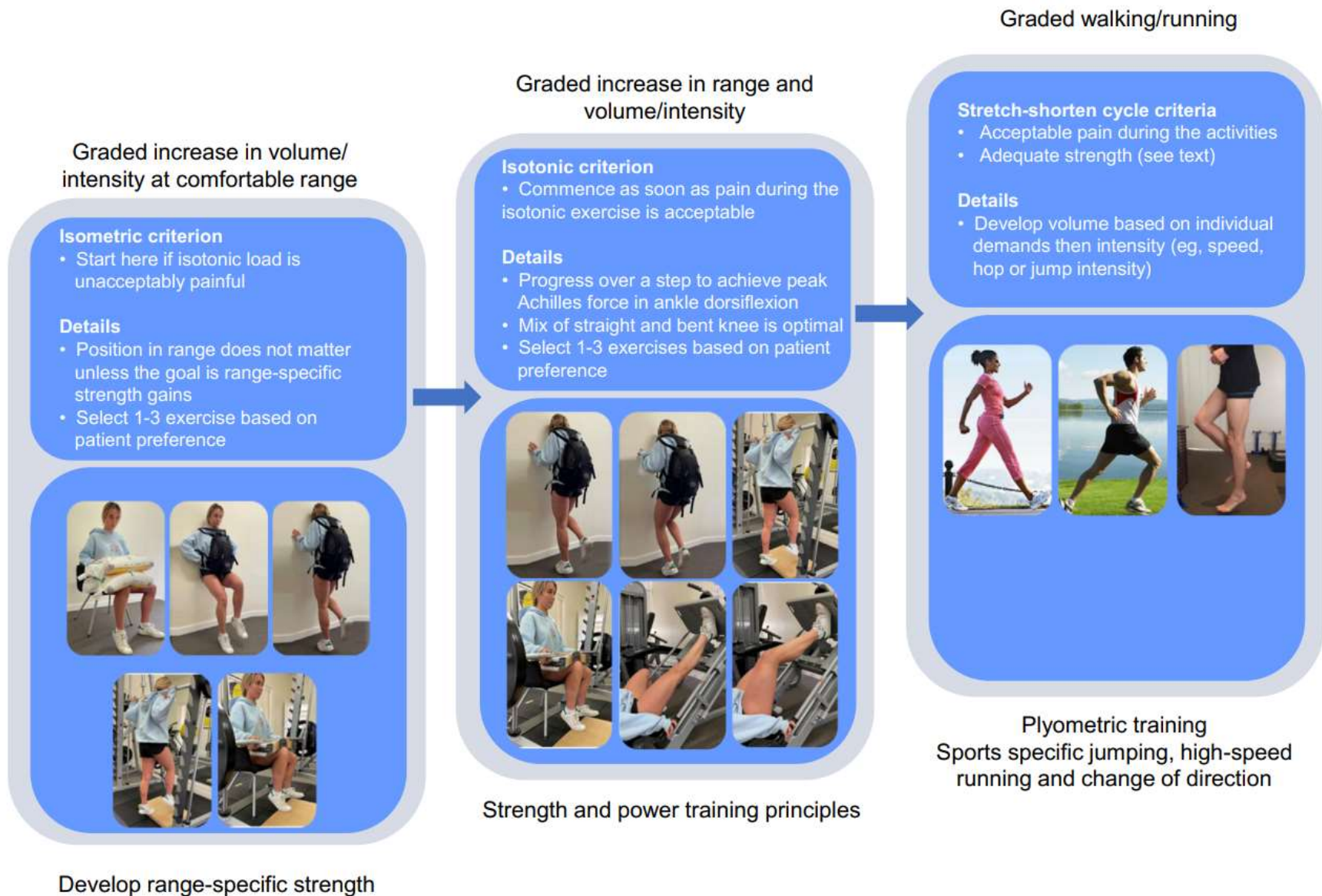
Interventions - Stretching

C Clinicians may use stretching of the ankle plantar flexors with the knee flexed and extended to reduce pain and improve satisfaction with outcome in patients with midportion Achilles tendinopathy who exhibit limited ankle dorsiflexion range of motion.

Diagnostic and therapeutic difference between treating mid-portion and insertional Achilles tendinopathy

Normal tendon attaches to bone through the enthesis organ.³¹ This complex attachment allows compression of the tendon against the upper aspect of the calcaneus to reduce load on the insertion and provide a mechanical advantage to the muscle-tendon unit.⁵⁴

This area of compression proximal to the tendon insertion is where pathology most commonly occurs and compression is maximal in dorsiflexion. Applying the concept clinically, insertional Achilles tendinopathy presents with pain occurring in dorsiflexion based activities but less so in plantarflexion. Thus, stretching the Achilles over a step or completing the original Alfredson program may provoke pain as will running up hills or on soft surfaces such as the beach



Adjuvants au traitement

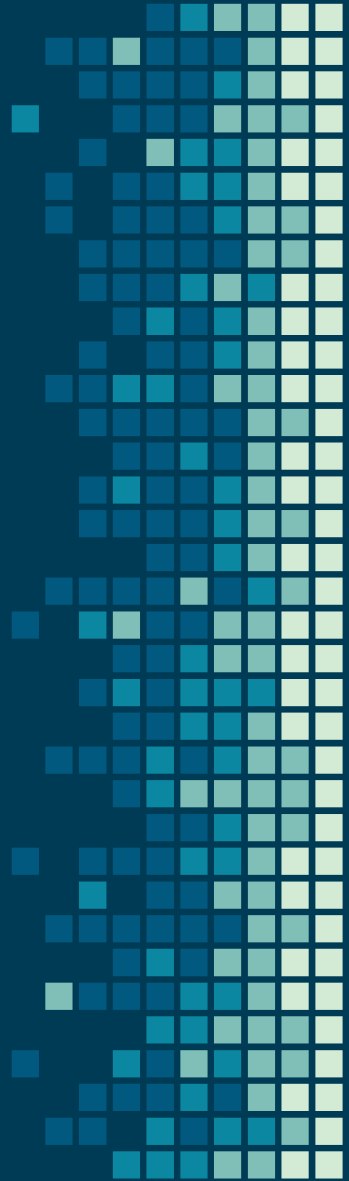
- Thérapie par ondes de choc
- Lasers monochromatiques*
- Iontophorèse avec dexaméthasone
- Taping
- Dry needling / PPAS
- Prolothérapie
- Plasma riche en plaquettes (PRP).
- Nitroglycérine 1.25mG (1/4 de « patch »).
- Talonnette (Heel lift)
- Attelle compressive tendon patellaire



Merci pour votre attention !

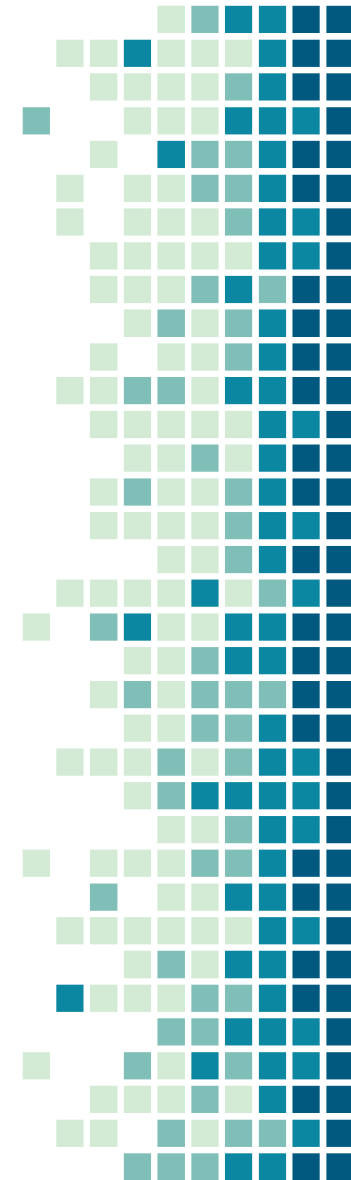
Période de questions

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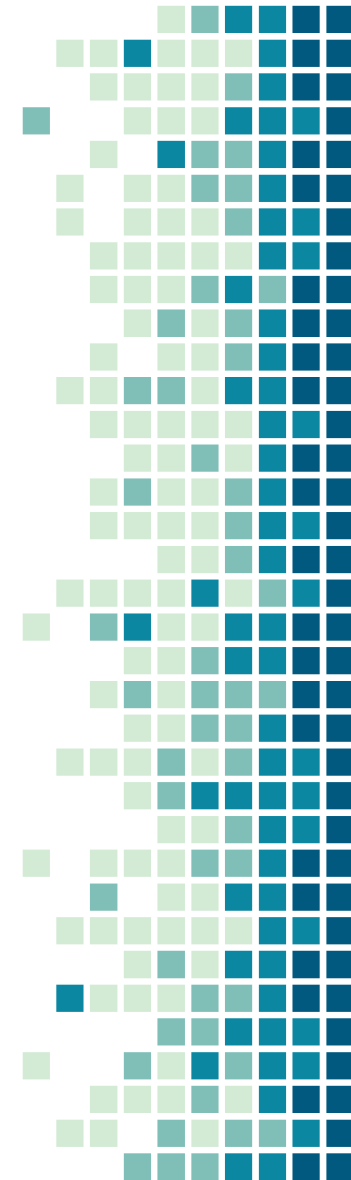
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Podcasts suggérés par le formateur

Jill Cook et le continuum de la tendinopathie , BJSM Podcast

<http://surl.li/gqpbe>

Ebonie Rio et le traitement des tendinopathies du membre inférieur, PTProTalk

<http://surl.li/gqpbv>

Seth O'Neill et le traitement de la tendinopathie achilléenne, Physio Edge

<http://surl.li/gqpgy>

Alison Grimaldi et la prise en charge de la tendinopathie glutéale, JOSPT Insights

<http://surl.li/gqpie>

Tom Goom et la prise en charge de la tendinopathie proximale des ischiojambiers.

<http://surl.li/gqpjl>

