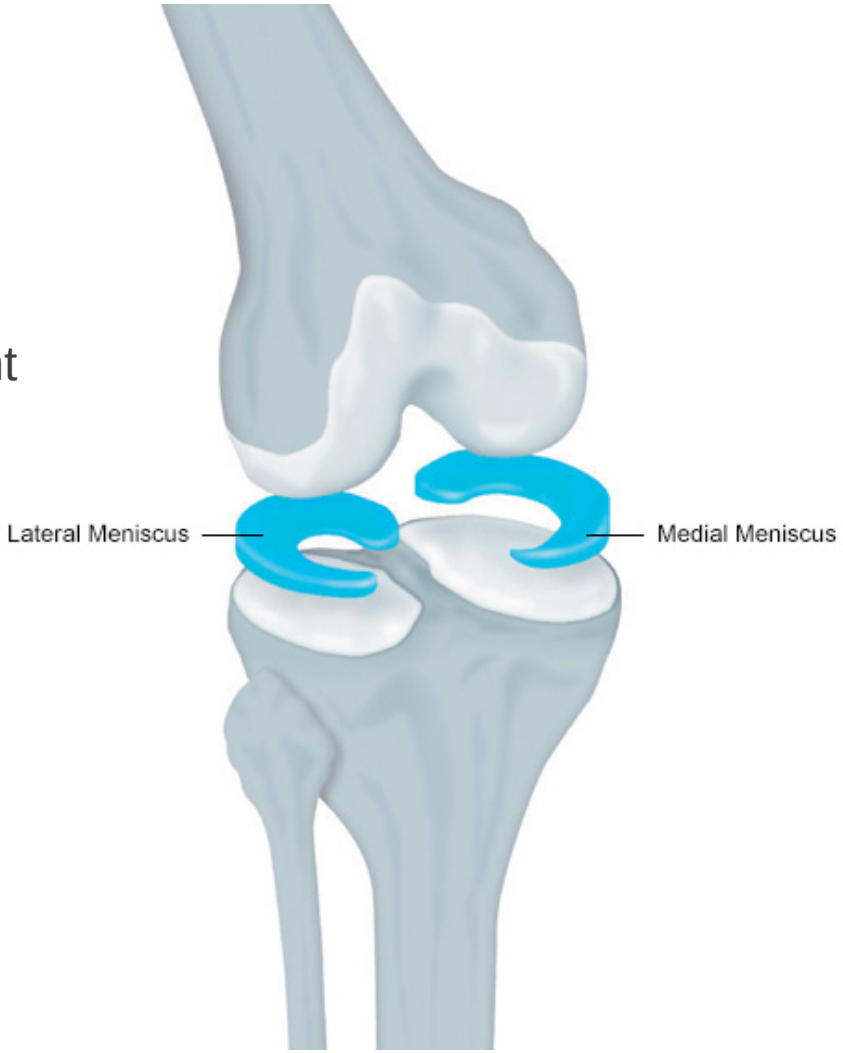
Management of Degenerative Meniscal Tears

Christopher Wallis – B. P&O (CPO-AOPA)
APAC Clinical & Education Manager – OA & IS

APAC OA&IS Webinar 1 – May 3rd 2017

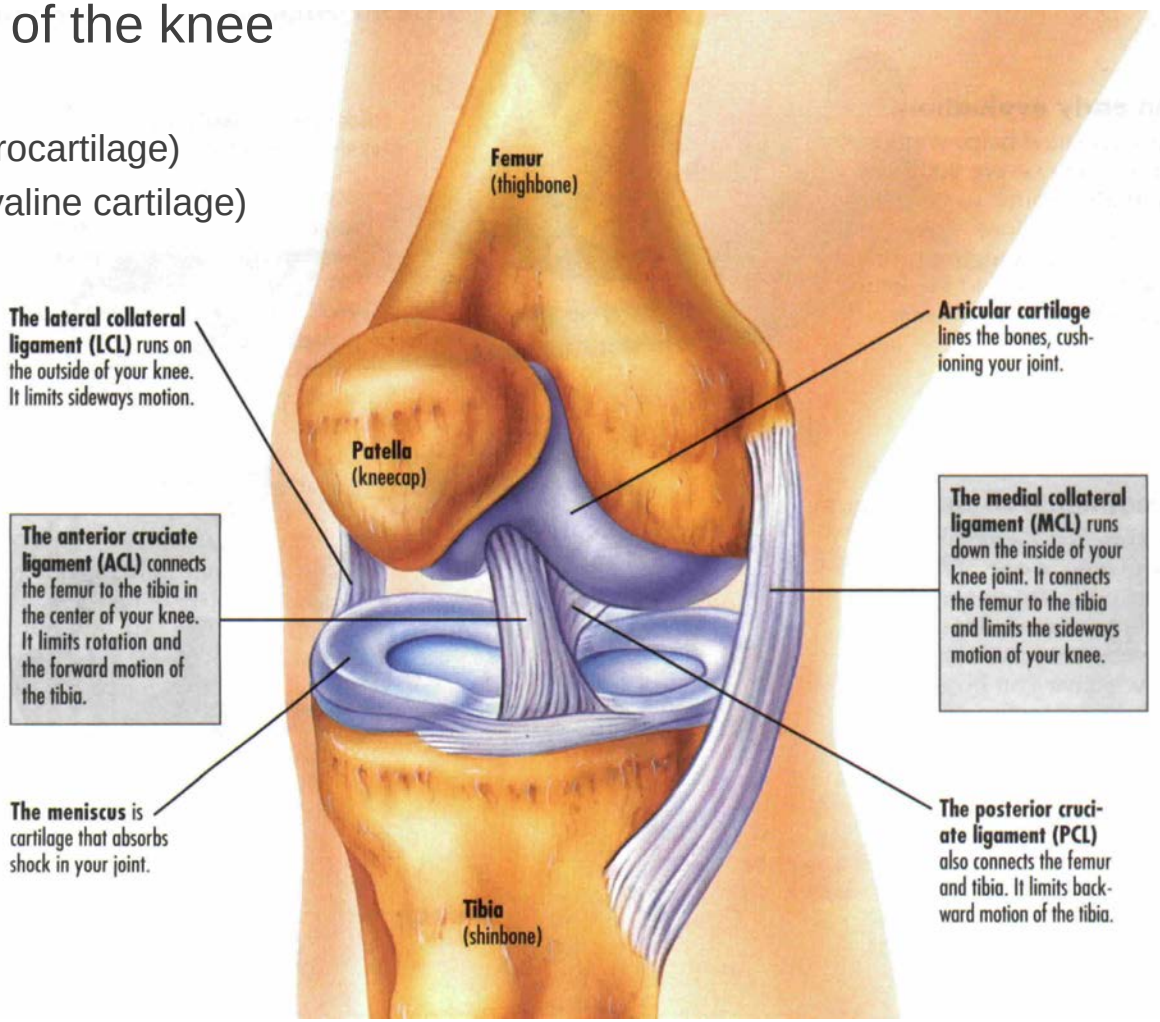
OVERVIEW

- Anatomy
- Function of the meniscus
- Meniscal injuries
- Risk factors, symptoms, treatment
- Changing trends in management/treatment
- Clinical Evidence
- Brace options



KNEE ANATOMY

- Key structures of the knee
  - Cartilage
    - Menisci (fibrocartilage)
    - Articular (hyaline cartilage)



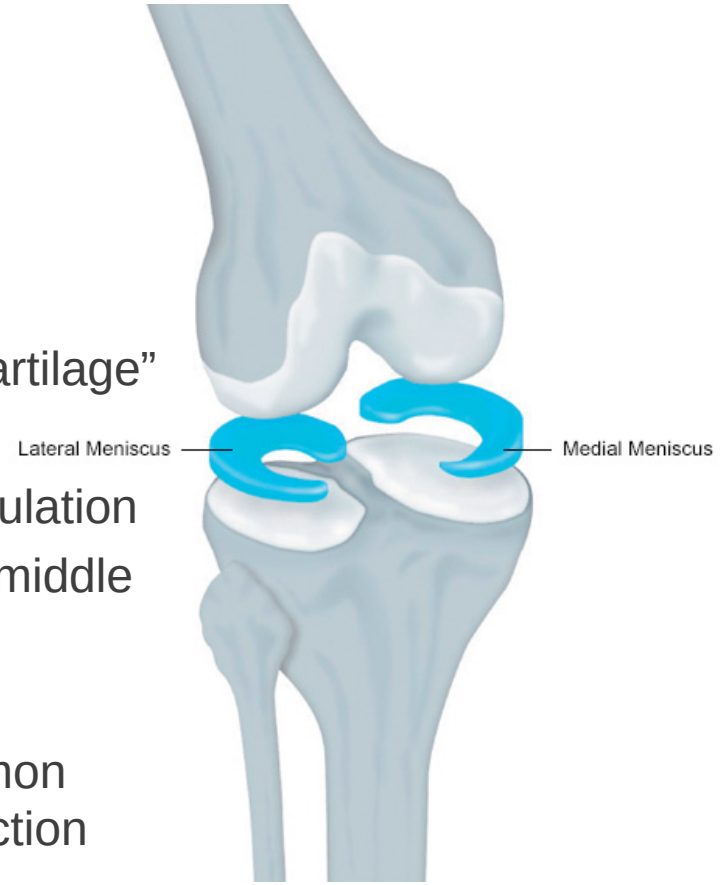
http://healthfavo.com/wp-content/uploads/2013/07/knee-anatomy-diagram.jpg

MENISCAL INJURY

- Injury of the menisci is one of the most prevalent injuries in the human body (medial>lateral)
- Its investigation and treatment includes surgical techniques that are among the most commonly performed orthopaedic procedures worldwide.

  http://www.racgp.org.au/afp/2012/april/meniscal-tear/

- Menisci are c-shaped *fibro-cartilage* discs
- Often meniscal injuries are described as “torn cartilage”



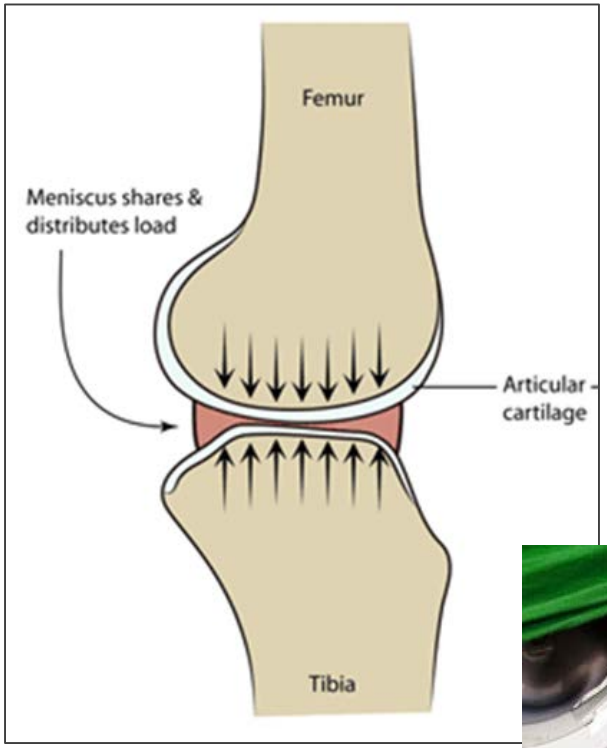
- **Acute/Traumatic** meniscal tears – younger population
- **Degenerative/non-traumatic** meniscal tears – middle age/older population

- Degenerative meniscal tears are the most common aetiology for knee pain, swelling and loss of function

FUNCTION

The menisci have several functions:

- Shock absorber within the knee
- Provide nutrition for articular cartilage
- Reduce friction during movement
- Increase stability & joint congruency – wedge analogy
- Limit extreme flexion and extension
- Proprioceptive function

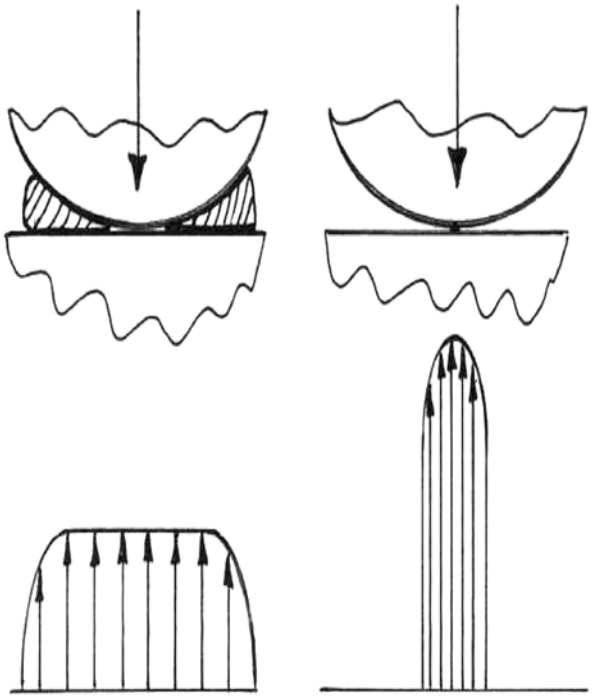


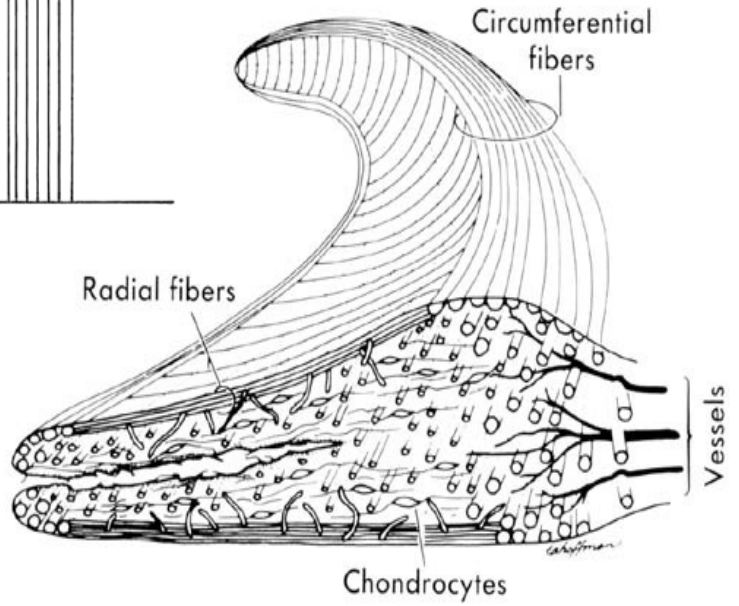
FUNCTION

The menisci have several functions:

- Disperse load and reduce peak pressure
- Convert axial load into circumferential stress

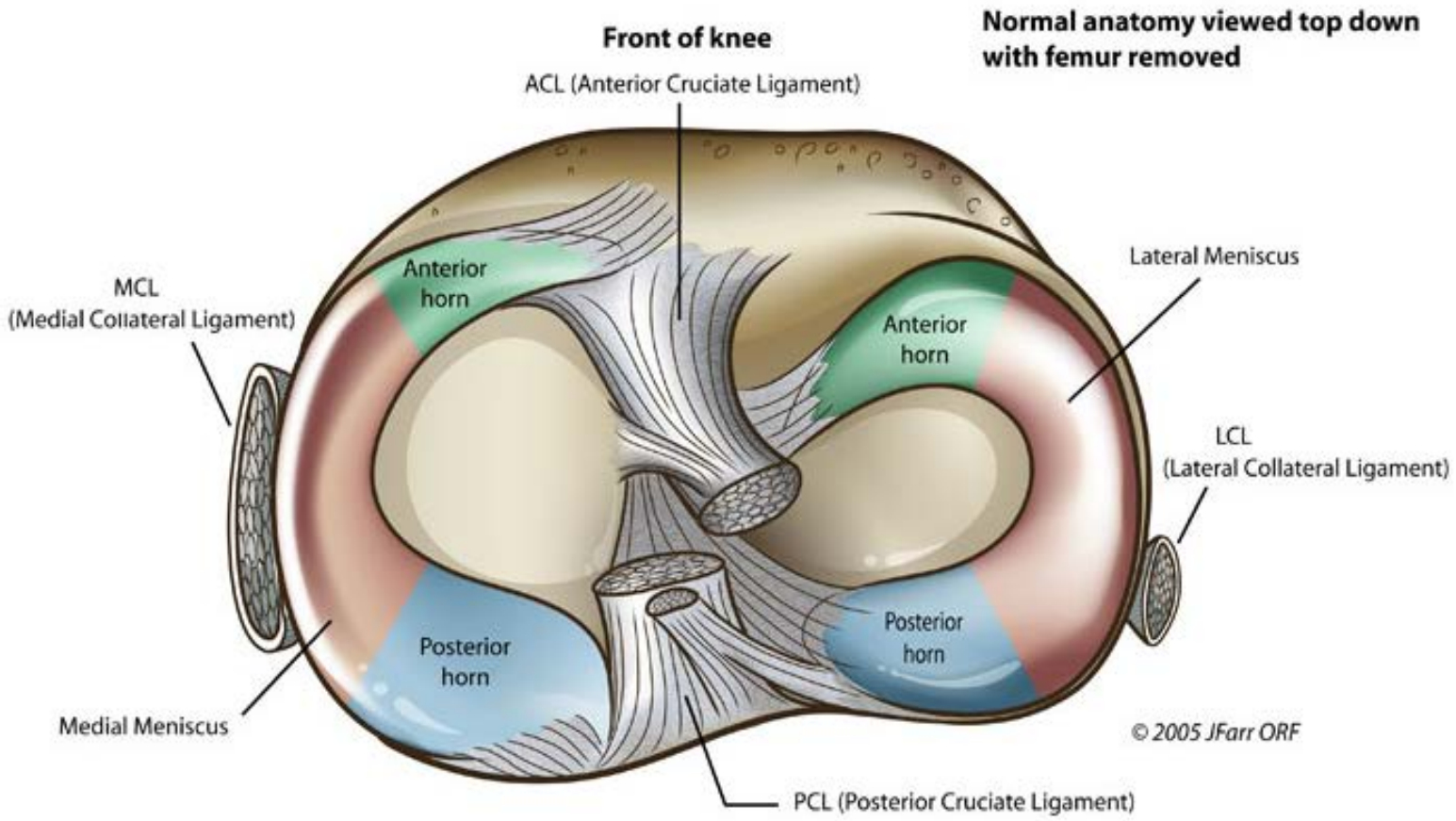
- Menisci bear 40 to 50% of the total load transmitted across joint in extension
- 85% of the compressive load
  is transmitted through the menisci at 90 deg of flexion





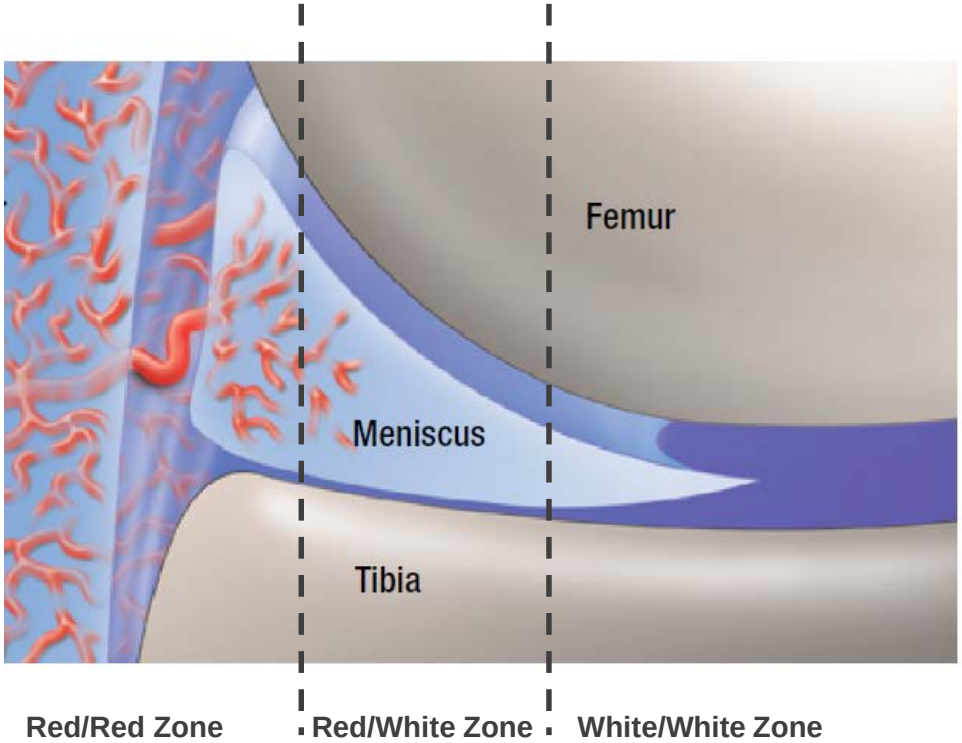
http://www.sensorprod.com/research-articles/white-papers/2005_nop/cross-section-of-the-meniscus01.jpg

ANATOMY

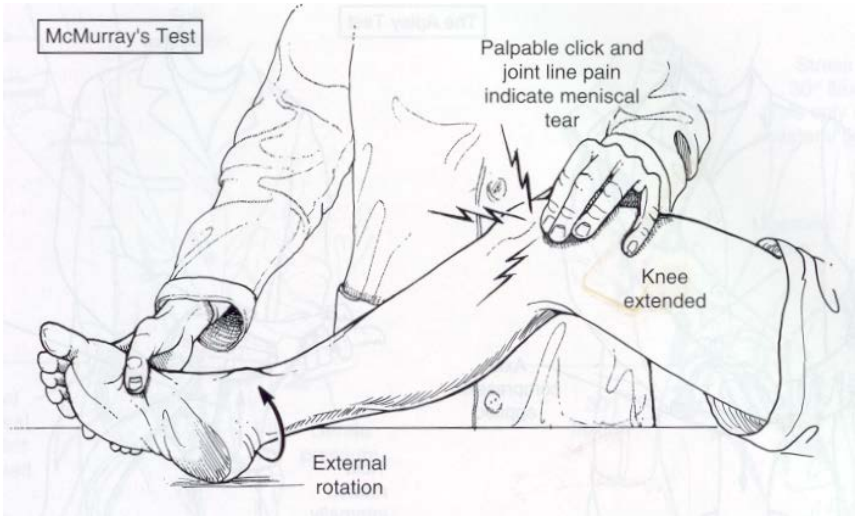

Front of knee
Normal anatomy viewed top down with femur removed
ACL (Anterior Cruciate Ligament)
MCL (Medial Collateral Ligament)
Anterior horn
Anterior horn
Lateral Meniscus
LCL (Lateral Collateral Ligament)
Posterior horn
Posterior horn
Medial Meniscus
© 2005 JFarr ORF
PCL (Posterior Cruciate Ligament)

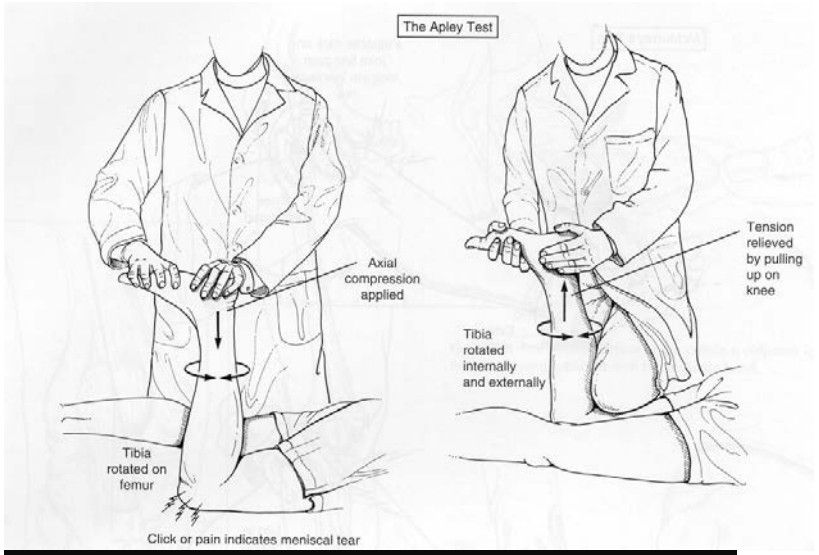
ZONES OF THE MENISCUS

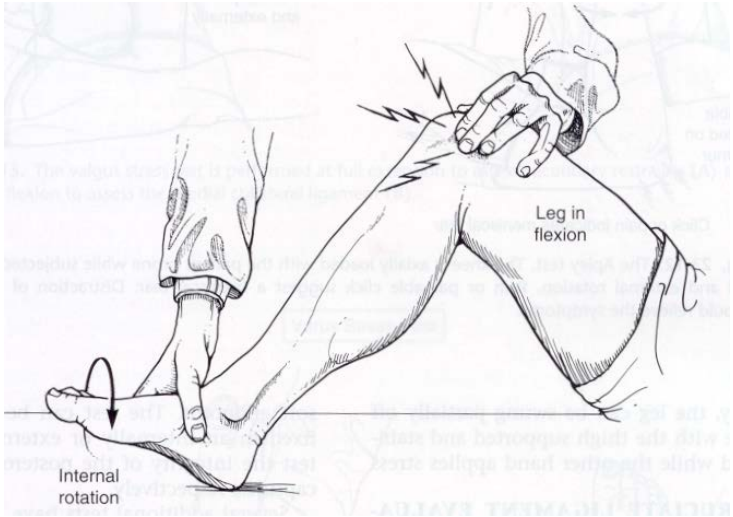
- Tears at the outer edge (red-red zone) tend to heal well because there is a good blood supply
- The inner area (white-white zone) lacks a good blood supply and therefore does not heal well.
- The red-white zone is the transition zone from vascular to avascular zones

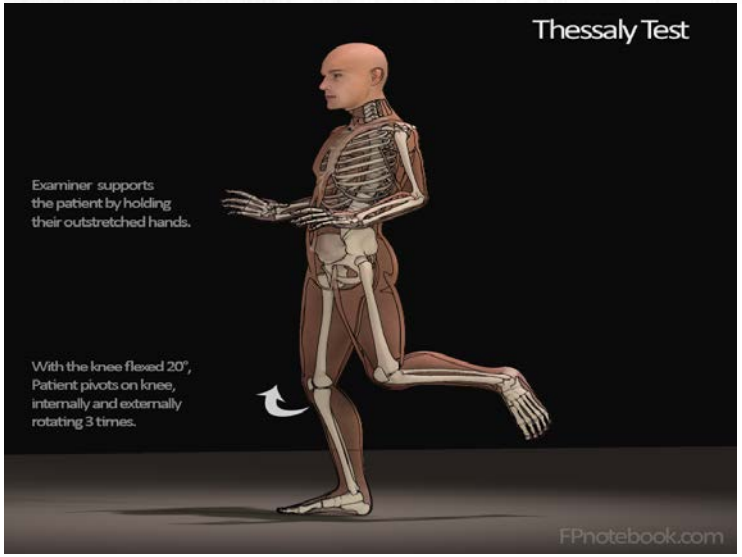


CLINICAL TESTS









http://www.fpnotebook.com/_media/orthoKneeThesaly.jpg

CLINICAL SYMPTOMS OF A MENISCAL TEAR

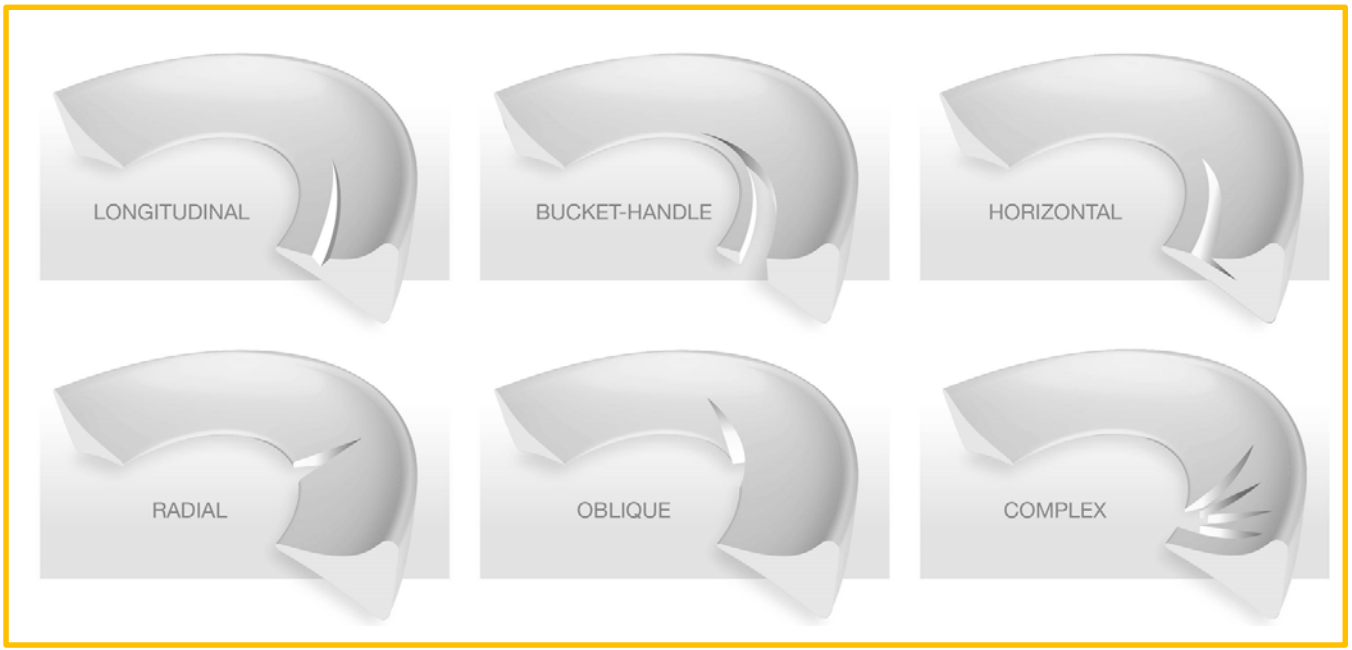
Symptoms of Meniscal tears include:

- Pain – can be severe (especially when twisting or rotating)
- Joint line tenderness (77-86% of patients with a meniscal tear)
- Effusion (~50% of patients presenting with a meniscal tear)
- Joint instability (loss of wedge effect)
- Difficulty in straightening knee fully
- Difficulty on deep knee bending
- Locking of the knee in partial flexion
- Popping sensation

MENISCAL TEARS / LESIONS CLASSIFICATION

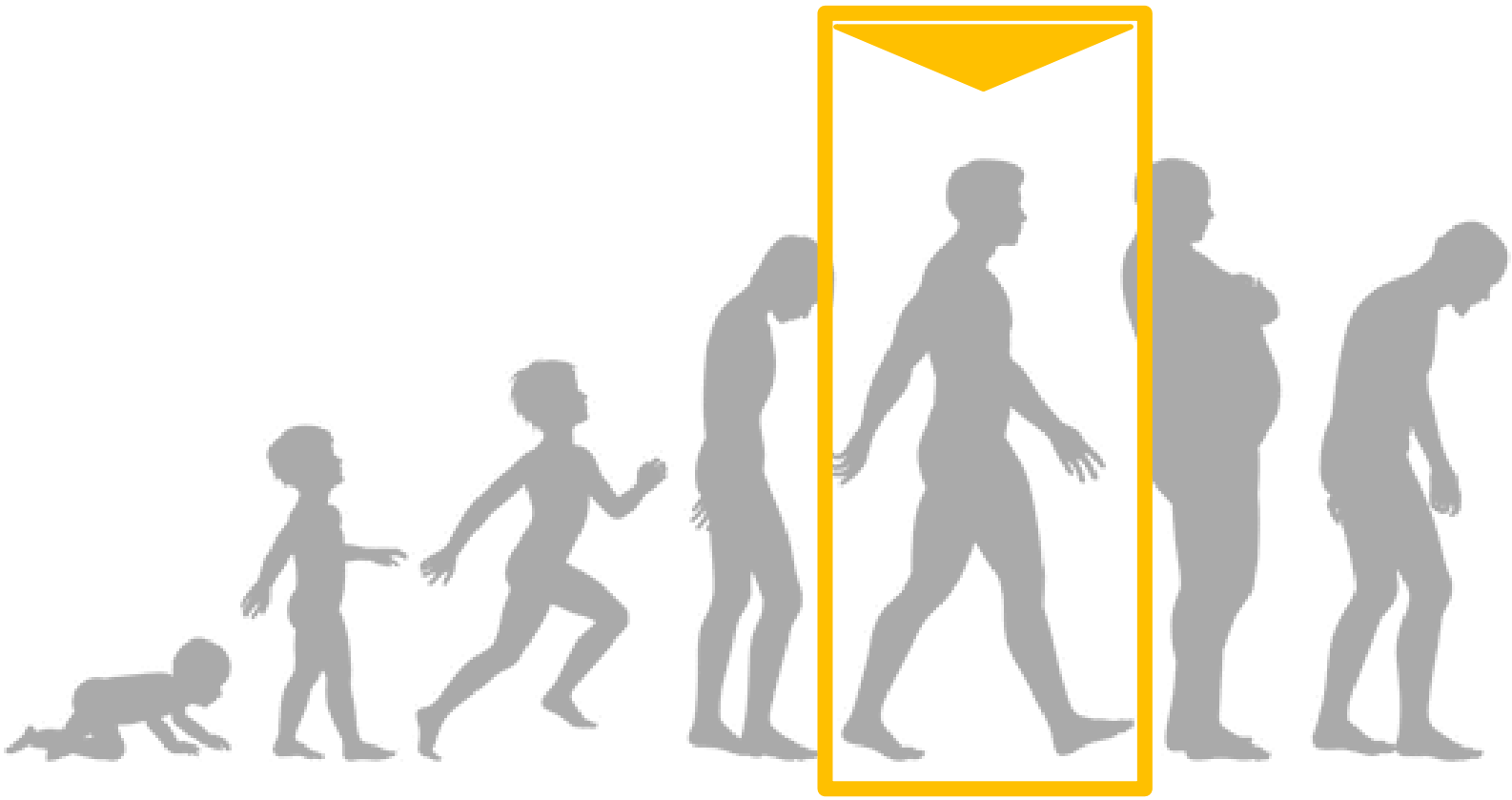
ÖSSUR
LIFE WITHOUT LIMITATIONS

Acute/Traumatic



Degenerative

ACUTE/TRAUMATIC MENISCAL TEARS



ACUTE MENISCAL TEARS

- Risk Factors:
  - Sports
  - ACL Injury
    - Acute
    - Time between ACL injury and reconstruction >12 month
  - Systemic joint laxity
  - Peak age 20-29 years

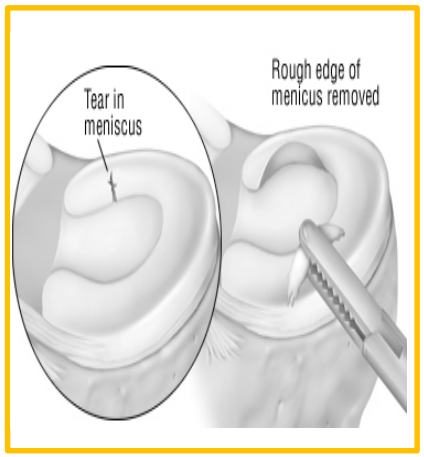
- Incidence:
  - 6:1000
  - 50% of knee injuries that require surgery

Condition/Risk Factor	OR (95% CI)
Acute meniscal tears	
Playing soccer (compared to nonsports participants for at least 12 mo prior to the onset of symptoms)	3.58 (1.87, 6.86)
Playing rugby (compared to nonsports participants for at least 12 mo prior to the onset of symptoms)	2.84 (1.48, 5.45)
Running (compared to nonsports participants for at least 12 mo prior to the onset of symptoms)	1.24 (0.74, 2.07)
Swimming (compared to nonsports participants for at least 12 mo prior to the onset of symptoms)	1.54 (1.09, 2.17)
Other sports (compared to nonsports participants for at least 12 mo prior to the onset of symptoms)	1.60 (1.17, 2.19)

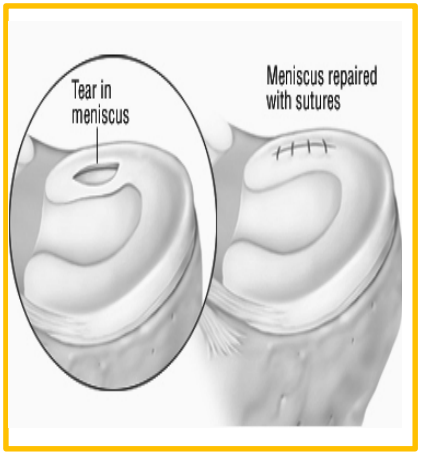
Snoeker et al. Risk Factors for Meniscal Tears: A Systematic Review Including Meta-analysis *J Orthop Sports Phys Ther 2013;43(6):352-367*
Metcalf MH, Barrett GR. Prospective evaluation of 1485 meniscal tear patterns in patients with stable knees. Am J Sports Med 2004;32:675–80. Search PubMed
Makris EA, Hadidi P, Athanasiou KA. The knee meniscus: structure-function, pathophysiology, current repair techniques, and prospects for regeneration. Biomaterials 2011;32:7411–31. Search PubMed
Garrett WE Jr, Swiontkowski MF, Weinstein JN, et al. American Board of Orthopaedic Surgery Practice of the Orthopaedic Surgeon: Part-II, certification examination case mix. J Bone J Surg Am 2006;88:660–7. Search PubMed

ACUTE MENISCAL TEAR - TREATMENT

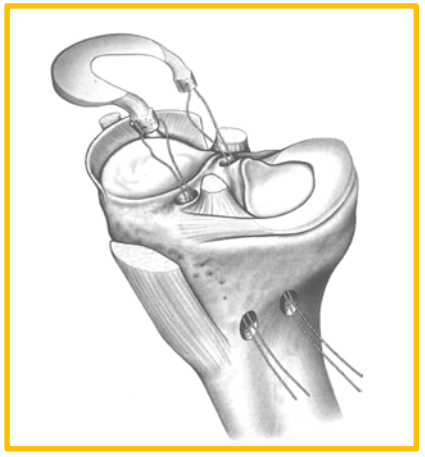
- Treatment will depend on location/zone and type of tear = vascularity and healing potential
- Repair preferred if type, location and vascularity allow
  - "Save the Meniscus"
- Repairs usually require reduced WB (+/- ROM control)
  - Axial load is converted into circumferential stress
  - Weight bearing control is vital as the structural continuity of the fibres has been compromised



Partial Meniscectomy



Meniscal Repair



Meniscal Transplantation

REHABILITATION AFTER MENISCAL REPAIR (EXAMPLE)

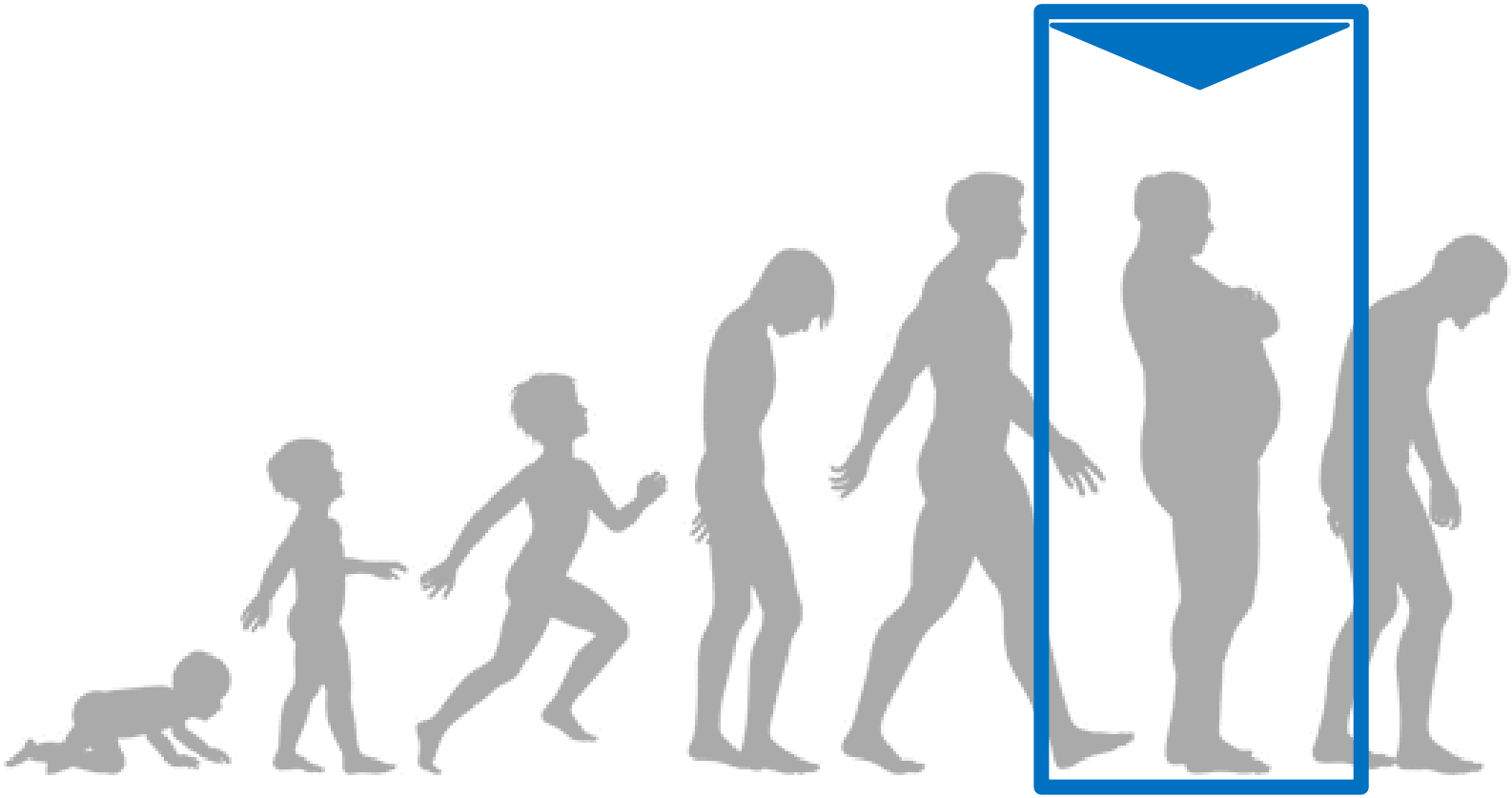
Item	Phase I (Week 0-6)	Phase II (Week 7-14)	Phase III Week 15-22)
Goal	Protect and allow maximal healing	Improve muscle strength to level of daily activities Restore ROM	Optimizing functional capability- prepare to go back to sports
WB	NWB→ PWB→ FWB *Except radial and complex tears*	FWB	FWB
ROM	0-0 0-60 or 0-90 - physio	free	free
Brace	Protection & ROM Limitation (d&n)	Protection while exercise levels are increasing (day)	Protection while training
Physiotherapy	RICE, regain quadriceps control,	Restore full ROM and normal gait	Sports-specific exercises, neuromuscular control

Adapted from Cavanaugh et al. (2012)

ACUTE TEARS - BRACING OPTIONS

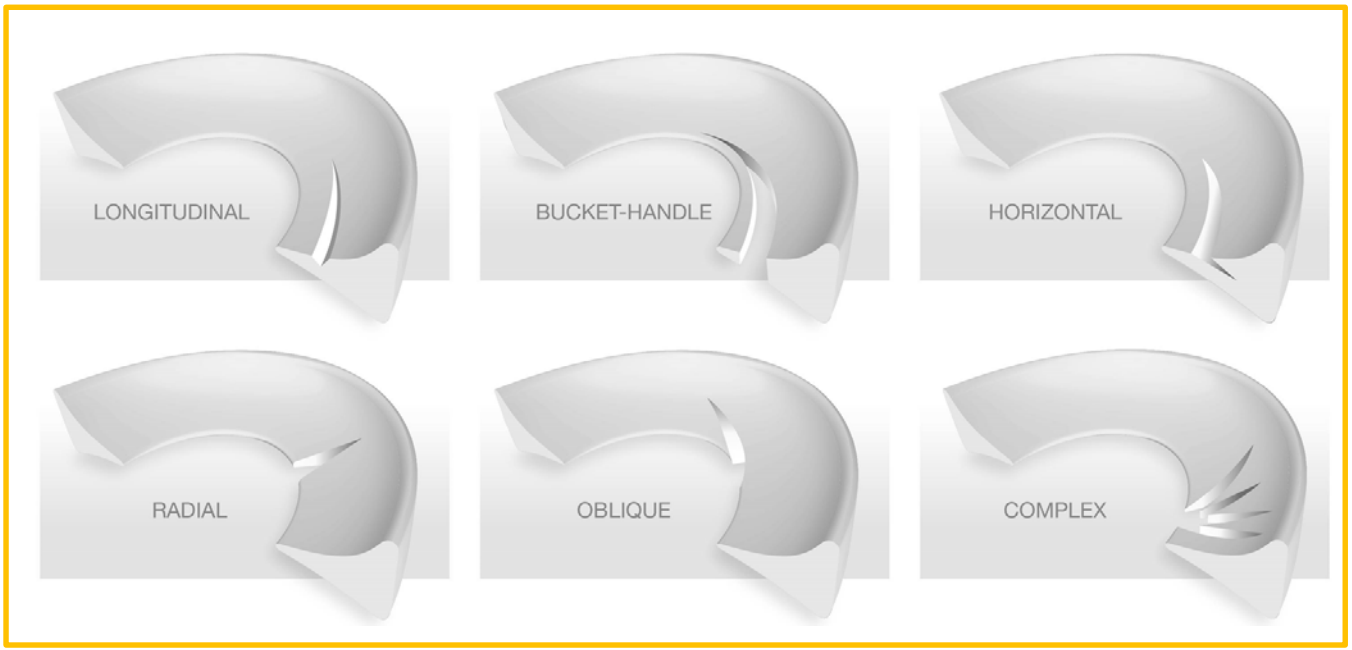
- Meniscal Repair:
  - Protect repaired meniscus from axial load
  - +/-ROM
  - Protected weight bearing
  - Protect during activities
- Rebound Cartilage (ROM control and load reduction)
- Meniscectomy:
  - Maintain joint ROM and strength - physio
  - Modify load activities (protect/preserve joint)
  - Removal of meniscus increases load on articular cartilage
- Unloader One/Unloader Fit

DEGENERATIVE MENISCAL TEARS



MENISCAL TEARS / LESIONS CLASSIFICATION

Acute/Traumatic

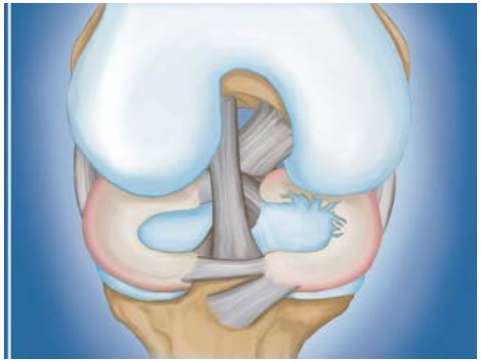


Degenerative

DEGENERATIVE MENISCAL TEARS

Definition:

- Complex tear pattern mainly in the posterior horn / mid-body following prolonged 'wear and tear'
- Degenerative tears are typically seen in middle aged or older people and often accompany knee osteoarthritis



- In isolation, degenerative meniscus is currently thought of as pre or early OA
- Pain occurs spontaneously or following trivial event
- Poor healing due to type and location of tear = white zone (avascular)

DEGENERATIVE MENISCAL TEARS

Prevalence:

- 35% prevalence of degenerative meniscal tears in people over 50 years
- 60% in people of 65 years

FOCUS MARKETS	POPULATION		Degenerative Meniscal Tears*	Mild OA	Moderate OA	Severe OA	TKR
AMERICAS	355.291.465	19.896.322	11.256.504	4.867.493	4.405.614	3.517.386	781.119
EUROPE	180.810.746	10.125.402	9.453.243	2.477.107	2.242.053	1.790.026	295.181
AUSTRALIA	24.420.661	1.367.557	1.014.807	334.563	302.816	241.765	43.957
TOTAL	560.522.872	40.760.153	21.724.554	9.971.680	9.025.463	7.205.813	1.120.257

= 637,379

- Note: these are total numbers rather than symptomatic numbers

DEGENERATIVE MENISCAL TEARS

Risk factors:

Condition/Risk Factor	OR (95% CI)
Degenerative meniscal tears	
Age (>60 y compared to <60 y)	2.32 (1.80, 3.01)
Gender (male compared to female)	2.98 (2.30, 3.85)
Work-related kneeling and squatting (>1 h compared to <1 h per d)	2.69 (1.64, 4.40)
Sitting (>2 h compared to <2 h per d)	0.68 (0.50, 0.92)
Driving (>4 h compared to <4 h per d)	1.37 (0.94, 1.98)
Standing or walking (>2 h compared to <2 h per d)	
Walking (>2 mi compared to <2 mi per d)	1.65 (1.22, 2.24)
Stair climbing (>30 flights compared to <30 flights per d)	2.28 (1.56, 3.31)
Lifting or carrying >10 kg (more than 10 times per wk)	1.89 (1.41, 2.55)
Lifting or carrying >25 kg (more than 10 times per wk)	1.58 (1.15, 2.16)

DEGENERATIVE MENISCAL TEARS SYMPTOMS

Non specific symptoms

- Initially:
  - Pain
  - Locking/pseudo locking (acute block to knee extension)
  - Catching sensation
- Ongoing
  - Pain
  - Swelling
  - Clicking
  - Popping
  - Instability

Severity of pain: VAS 4-6

1Lange AK, Fiatarone Singh MA, Smith RM, Foroughi N, Baker MK, Shnier R, Vanwanseele B. Degenerative meniscus tears and mobility impairment in women with knee osteoarthritis. *Osteoarthritis Cartilage* 2007

Meniscus tears shown to result in decreased walking endurance and balance performance[1]

DEGENERATIVE MENISCAL TEARS TREATMENT

ConservativeTreatment

- Pain relief
  - NSAID
  - Limit activities
  - Keep mobility- prevent stiffness
- Physio+ Exercise
  - Keep ROM
  - Strengthen muscles
  - Improve proprioception

Reduce Pain – Improve Function

3 - 6 MONTHS

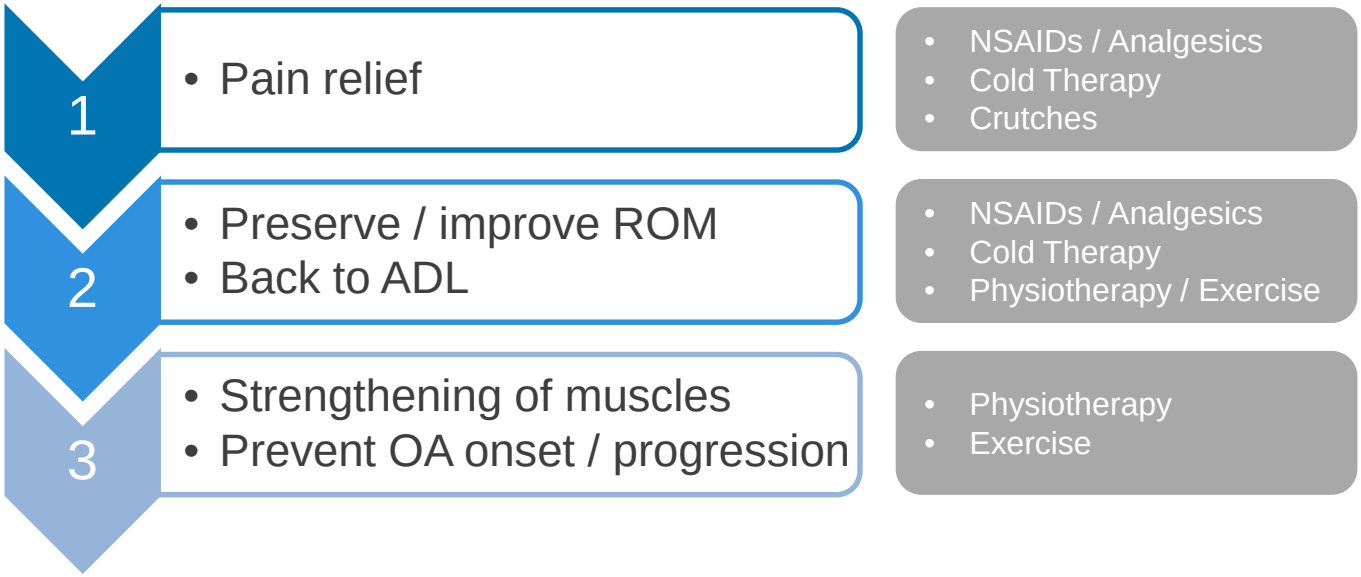
Surgical Treatment

- Surgery:
  - Debridement of unstable meniscal tear
  - Removal of loose bodies
  - ~700.000 procedures/year in US
- Rehabilitation:
  - bicycling, resisted quadriceps exercises, and squats

Reduce Pain – Improve Function

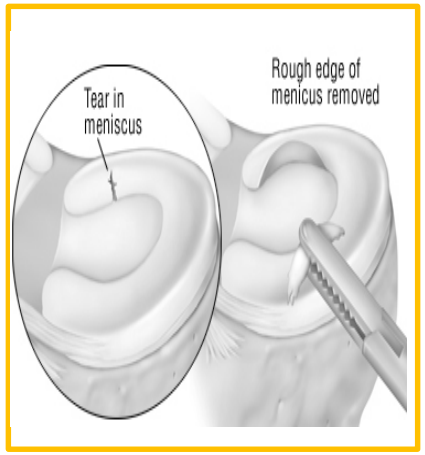
DEGENERATIVE MENISCAL TEARS
CONSERVATIVE TREATMENT

- Treatment overview

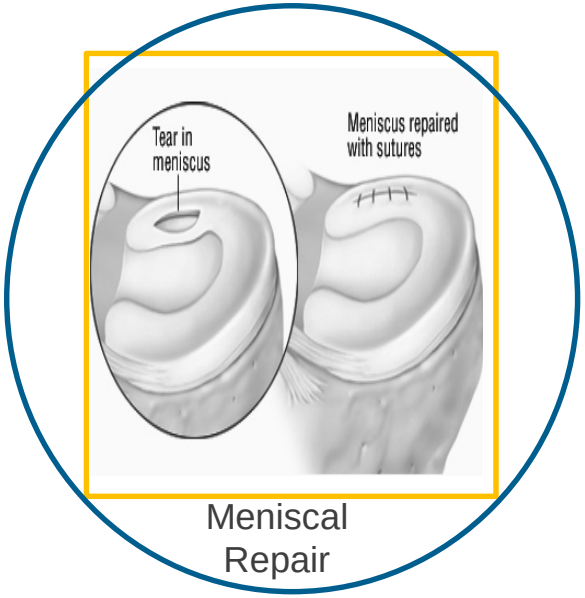


DEGENERATIVE MENISCAL TEARS
SURGICAL TREATMENT

1. • Pain relief
   - NSAIDs / Analgesics
   - Cold Therapy
   - Crutches
2. • Surgery
   - Removal of loose bodies
   - Partial meniscectomy
   - Meniscal repair (if possible)
3. • Rehabilitation
   - Physiotherapy
   - Exercise



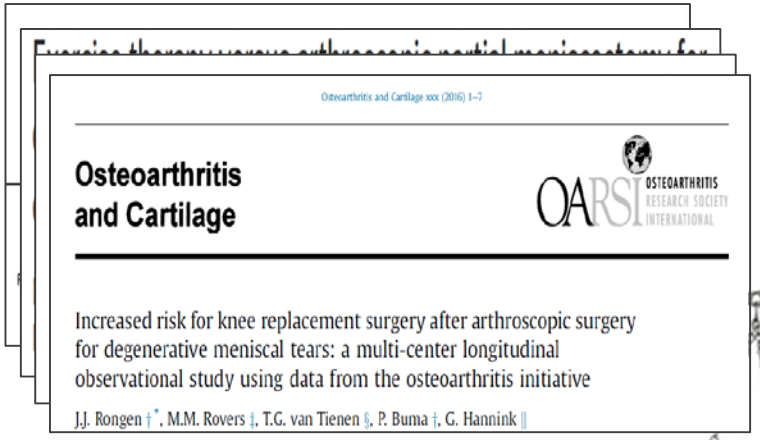
Partial Meniscectomy



Meniscal Repair

DEGENERATIVE MENISCAL TEARS - TREATMENT

Conservative


Osteoarthritis and Cartilage xxx (2016) 1–7

Osteoarthritis and Cartilage

OARSI OSTEOARTHRITIS RESEARCH SOCIETY INTERNATIONAL

Increased risk for knee replacement surgery after arthroscopic surgery for degenerative meniscal tears: a multi-center longitudinal observational study using data from the osteoarthritis initiative

J.J. Rongen †*, M.M. Rovers ‡, T.G. van Tienen §, P. Buma †, G. Hannink ‖

Arthroscopy


THE BONE & JOINT JOURNAL

■ KNEE

The role for arthroscopic partial meniscectomy in knees with degenerative changes

A SYSTEMATIC REVIEW

J. D. Lamplot, R. H. Brophy

Aims

Patients with osteoarthritis of the knee commonly have degenerative meniscal tears. Arthroscopic meniscectomy is frequently performed, although the benefits are debatable.

MENISCECTOMY – 1949 FINDING

Fairbank T.J. JBJS 1949

KNEE JOINT CHANGES AFTER MENISCECTOMY

SUMMARY AND CONCLUSION

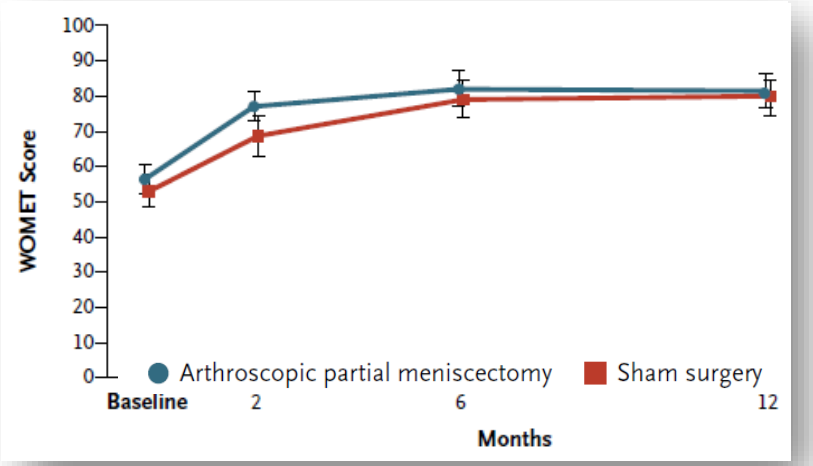
Changes in the knee joint after meniscectomy include ridge formation, narrowing of the joint space, and flattening of the femoral condyle. Investigations suggest that these changes are due to loss of the weight-bearing function of the meniscus. Meniscectomy is not wholly innocuous; it interferes, at least temporarily, with the mechanics of the joint. It seems likely that narrowing of the joint space will predispose to early degenerative changes, but a connection between these appearances and later osteoarthritis is not yet established and is too indefinite to justify clinical deductions.

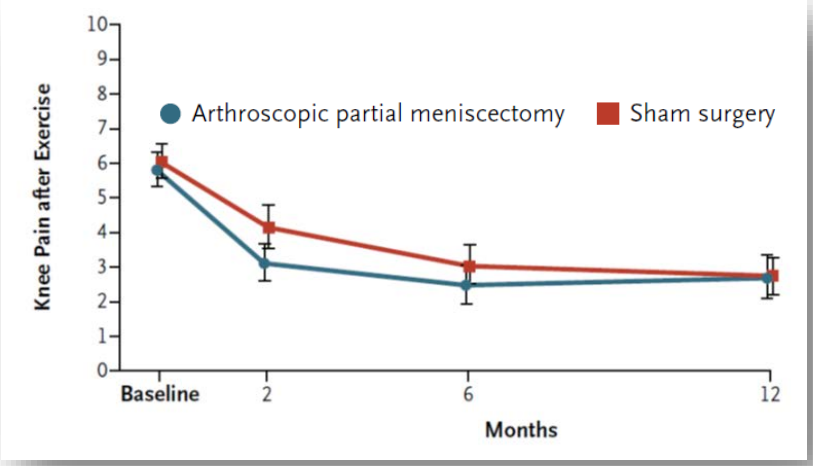
DEGENERATIVE MENISCAL TEARS - TREATMENT

Arthroscopic Partial Meniscectomy versus Sham Surgery for a Degenerative Meniscal Tear

Raine Sihvonen, M.D., Mika Paavola, M.D., Ph.D., Antti Malmivaara, M.D., Ph.D., Ari Itälä, M.D., Ph.D., Antti Joukainen, M.D., Ph.D., Heikki Nurmi, M.D., Juha Kalske, M.D., and Teppo L.N. Järvinen, M.D., Ph.D., for the Finnish Degenerative Meniscal Lesion Study (FIDELITY) Group

In conclusion, the results of this randomized, sham-controlled trial show that arthroscopic partial medial meniscectomy provides no significant benefit over sham surgery in patients with a degenerative meniscal tear and no knee osteoarthritis. These results argue against the current practice of performing arthroscopic partial meniscectomy in patients with a degenerative meniscal tear.





n engl j med 369;26 nejm.org december 26, 2013

DEGENERATIVE MENISCAL TEARS - TREATMENT

The American Journal of Sports Medicine

The Urgent Need for Evidence in Arthroscopic Meniscal Surgery: A Systematic Review of the Evidence for Operative Management of Meniscal Tears

Paul Monk, Patrick Garfjeld Roberts, Antony J.R. Palmer, Lee Bayliss, Reza Mafi, David Beard, Sally Hopewell and Andrew Price

Am J Sports Med published online July 18, 2016

Results: … No difference was found between arthroscopic meniscal debridement compared with nonoperative management as a first-line treatment strategy for patients with knee pain and a degenerative meniscal tear. Some evidence was found to indicate that patients with resistant mechanical symptoms who initially fail non-operative management may benefit from meniscal debridement

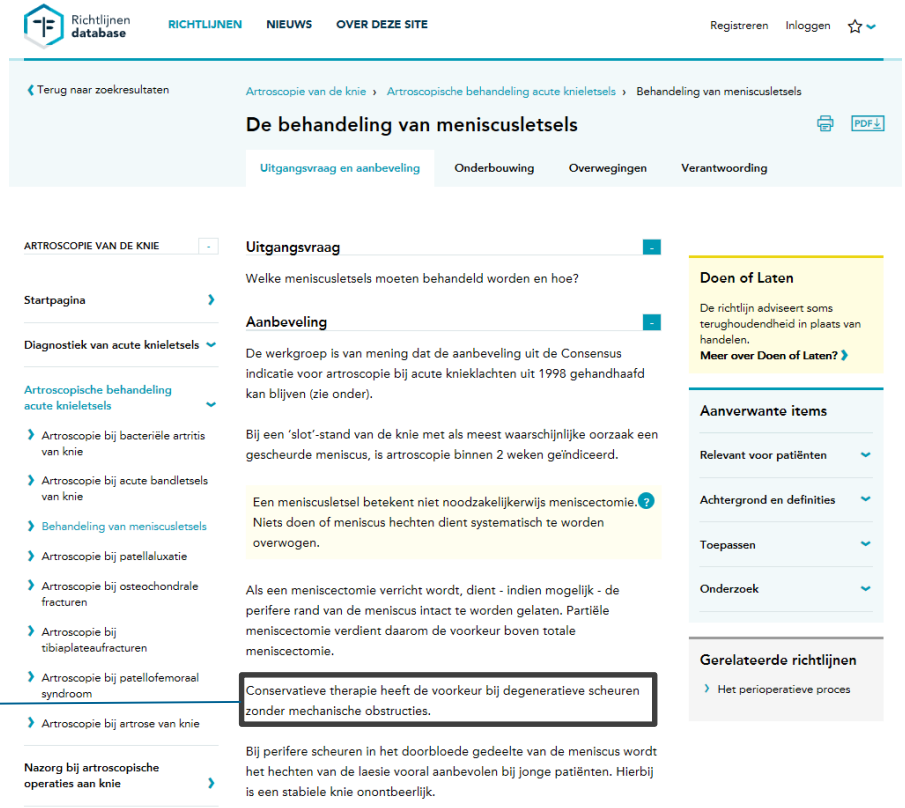
PARTIAL MENISCECTOMY - TREATMENT OUTCOMES

- What else does the evidence suggest?
  - A randomized trial showed that arthroscopic partial meniscectomy combined with physical therapy provides no better relief of symptoms than physical therapy alone in patients with a meniscal tear and knee osteoarthritis[1]
  - Partial meniscectomy is associated with increased risk of incidental radiographic osteoarthritis and worsening cartilage damage in the following year[2]
  - In patients with knee osteoarthritis, arthroscopic knee surgery with meniscectomy is associated with a three fold increase in the risk for future knee replacement surgery[3]
  - Partial meniscectomy patients had a significant loss of knee joint position sense/proprioception at knee flexion angles of 60 and 75°. [4]
  - Patients with symptomatic meniscal tears and degenerative changes in the knee can benefit from arthroscopic meniscectomy, particularly if the osteoarthritis is mild[5]

1 Katz JN, Brophy RH, Chaisson CE, et al. Surgery versus physical therapy for a meniscal tear and osteoarthritis. N Engl J Med 2013;368:1675-84
2 Roemer FW, Kwoh CK, Hannon MJ, Hunter DJ, Eckstein F, Grago J, Boudreau RM, Englund M, Guermazi A. Partial meniscectomy is associated with increased risk of incident radiographic osteoarthritis and worsening cartilage damage in the following yearEur Radiol. 2016 Apr 27. [Epub ahead of print]
3 J.J. Rongen et al. Increased risk for knee replacement surgery after arthroscopic surgery for degenerative meniscal tears: a multi-center longitudinal observational study using data from the osteoarthritis initiative Osteoarthritis and Cartilage xxx (2016) 1-7 [Epub ahead of print]
4 Karahan M, Kocaoglu B, et al. Effect of partial medial meniscectomy on the proprioceptive function of the knee. Arch Orthop Trauma Surg. 2010 Mar;130(3):427-31. Epub 2009 Dec 10.
5 Lamplot JD and Bropy RH The role for arthroscopic partial meniscectomy in knees with degenerative changes – asystematic review THE BONE & JOINT JOURNAL VOL. 98-B, No. 7, JULY 2016

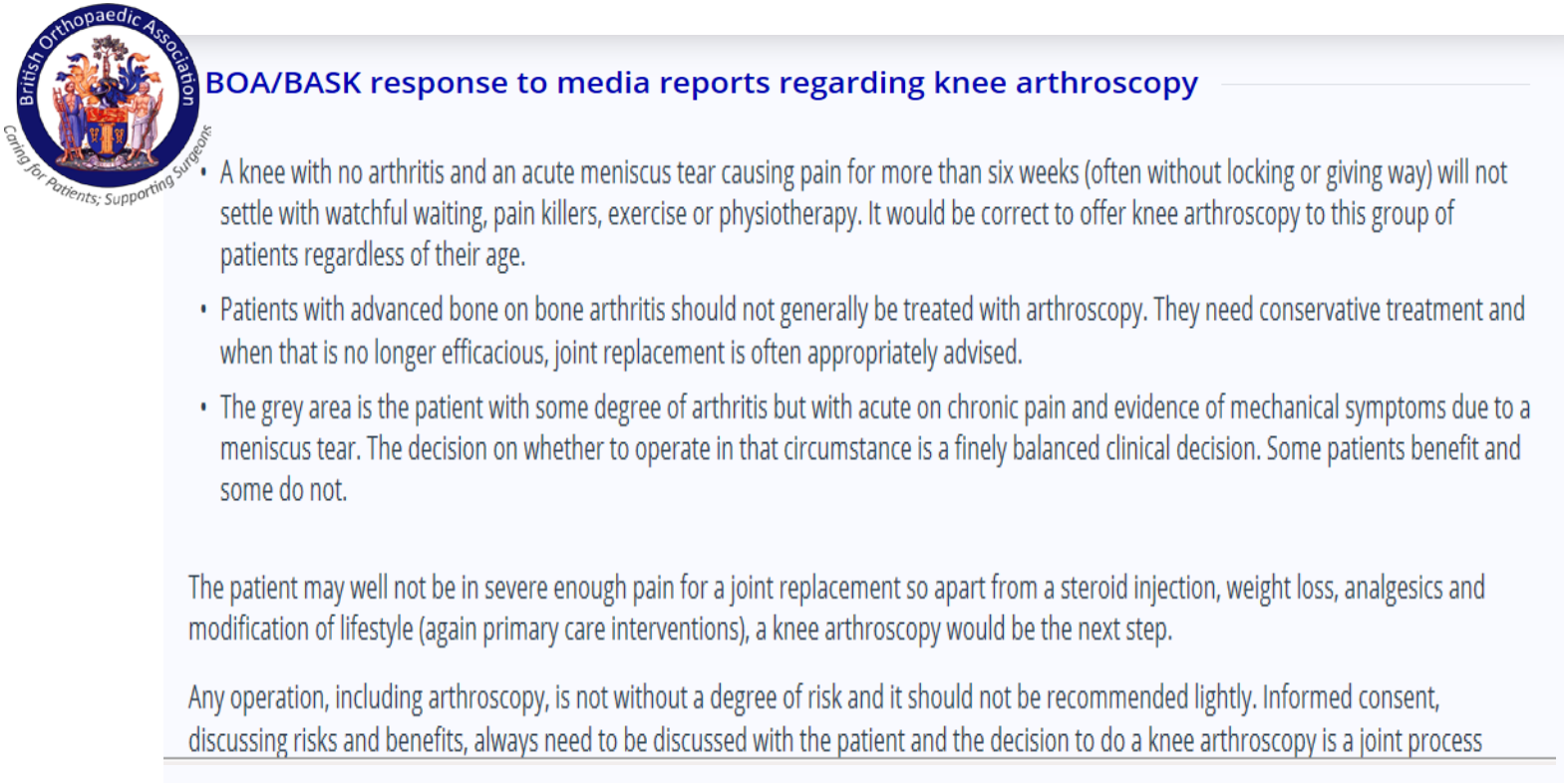
Meniscus Guidelines
Dutch Orthopaedic Society

NEDERLANDSE ORTHOPAEDISCHE VERENIGING | NOV



Conservative treatment preferred with degenerative meniscal tears

Knee Arthroscopy
statement from the Britsh Orthopaedic Association



DEGENERATIVE MENISCAL TEARS – AUST KNEE SOCIETY POSITION STATEMENT

- **Position Statement from the Australian Knee Society on Arthroscopic Surgery of the Knee, including reference to the presence of Osteoarthritis or Degenerative Joint Disease** – October 2016

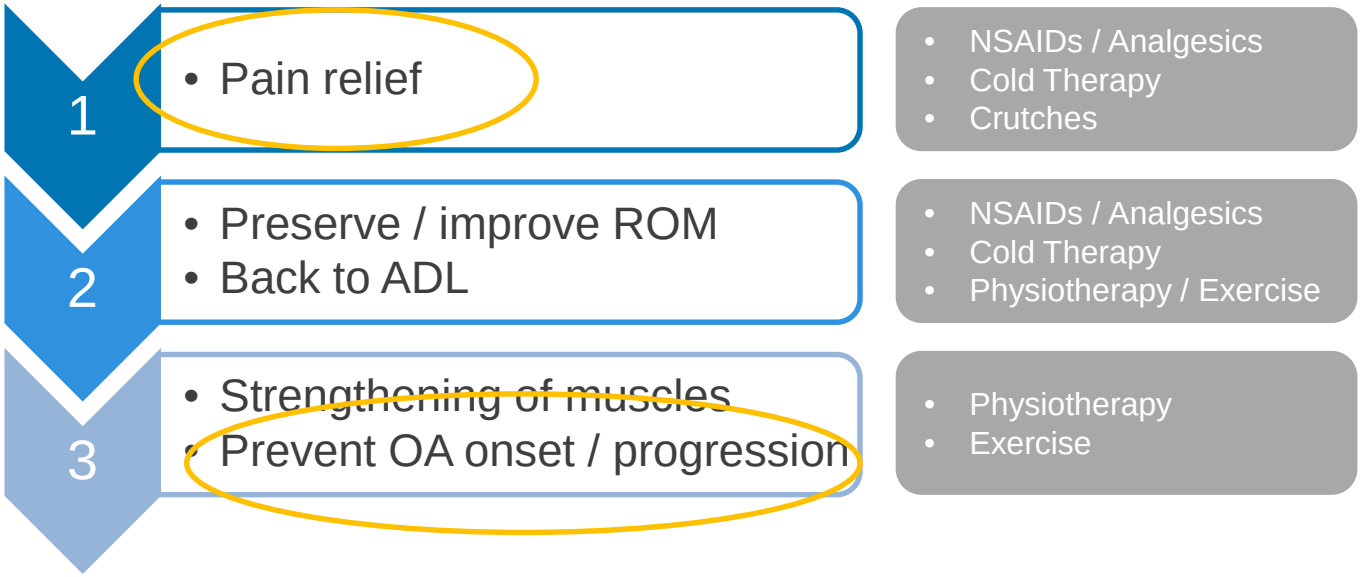
- Arthroscopic debridement, and / or lavage, has been shown to have no beneficial effect on the natural history of osteoarthritis, nor is it indicated as a primary treatment in the management of osteoarthritis. However, this does not preclude the judicious use of arthroscopic surgery, when indicated, to manage symptomatic coexisting pathology, in the presence of osteoarthritis or degeneration. *Partial medial meniscectomy is not indicated as an initial treatment for atraumatic tears of degenerative menisci*, excluding bucket handle tears and surgeon assessed locked or locking knees.

PDF Document

http://www.kneesociety.org.au/documents.html

DEGENERATIVE MENISCAL TEARS
CONSERVATIVE TREATMENT

- Treatment overview

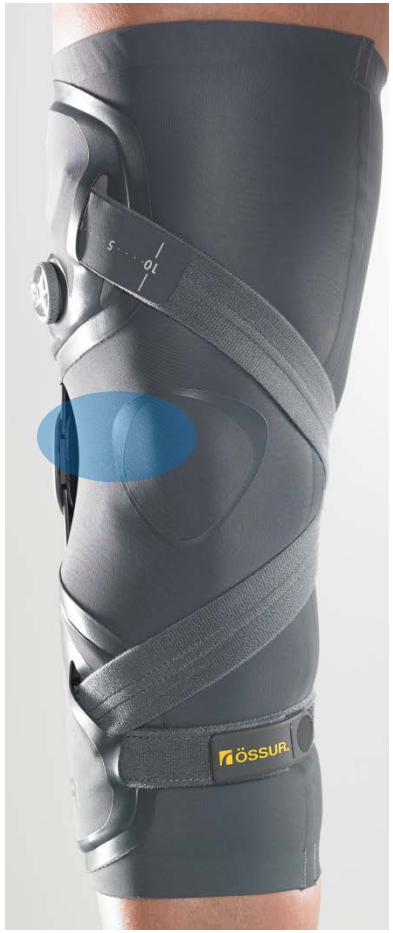


DEGENERATIVE MENISCAL TEARS – BRACING SOLUTION

UNLOADER

Össur's Unloader Braces

3-points of Leverage
DFS Straps & Thigh/Calf shells
Active unloading and even distribution of forces resulting in reduced pain



CLINICAL EVIDENCE – DEGENERATIVE MENISCUS

Objective:

- Evaluating the effects of an unloading brace on patients with degenerative meniscal tears with regards to function and pain

Method:

- Uncontrolled prospective trial with 14 subjects presenting with degenerative meniscus tear, confirmed by MRI
- Assessment at baseline prior to brace fitting and after 1 month, and 2 months of brace use via electronically administered questionnaires consisting of WOMET (Western Ontario Meniscal Evaluation Tool) questionnaire, and VAS pain scales
- VAS pain was measured at rest and before and after performing set activities (walking, stair climbing, and one-legged sitting) with and without the brace.

Inclusion criteria:

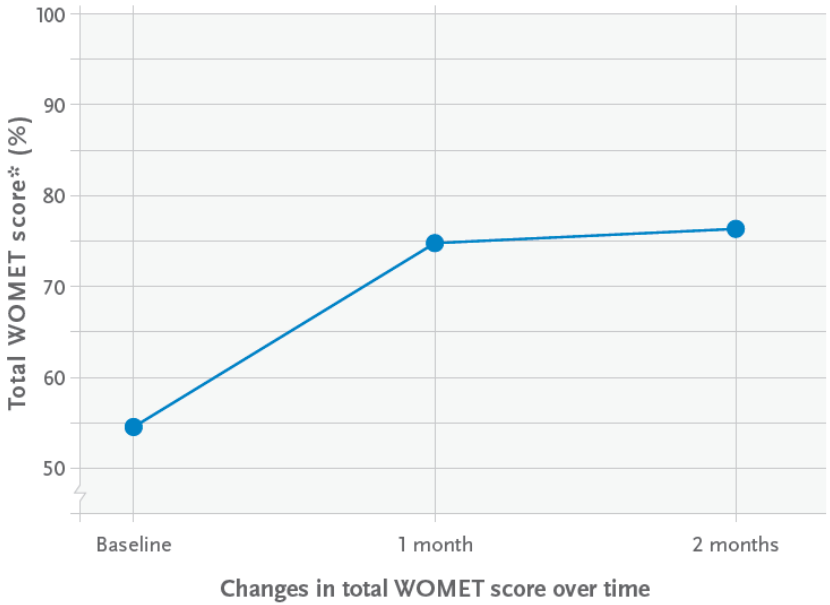
- Age: 35 – 65 years
- medial joint line pain, pain that can be provoked by palpation or compression of the joint line or positive McMurray, and a degenerative tear of medial meniscus identified on a clinically indicated MRI within 3 months prior to enrolment

Exclusion criteria:

- Radiological K&L grade II osteoarthritis or greater
- Symptoms of knee OA as clinically defined by the American College of Rheumatology (ACR)
- Trauma induced onset of symptoms, previous or concomitant ligament injuries to the knee, locking or painful snapping of knee, MRI signs of pathology requiring surgery, the decision to have surgery for the tear within 6 months of enrolment, and other health conditions, body size or diseases that preclude the patient from applying the brace or moving around with it.

DEGENERATIVE MENISCUS – IMPROVED QOL - WOMET

From inhouse study: Individuals with radiographically diagnosed degenerative meniscus



Changes in total WOMET score over time

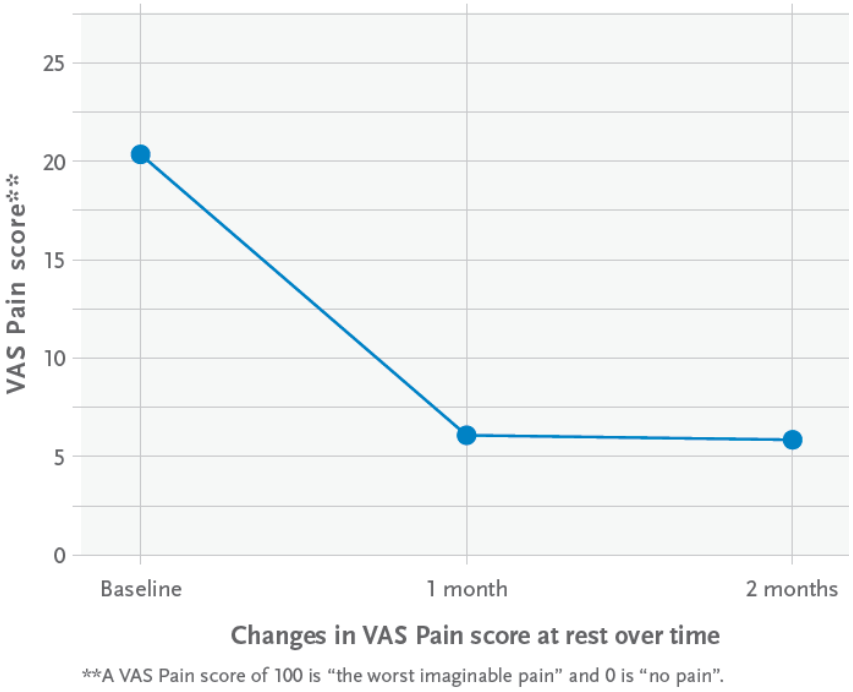
*The total WOMET score has been converted to a percentage where 100% represents a healthy joint with no problems and 0 worst imaginable symptoms.

- WOMET (Western Ontario Meniscal Evaluation Tool) is a meniscus injury specific questionnaire measuring Health related Quality of Life.
- The total WOMET improved with a mean of 22 percentage point (MCID 15)

= confirmed improvement of Quality of Life

DEGENERATIVE MENISCUS – PAIN REDUCTION – VAS

From inhouse study: Individuals with radiographically diagnosed degenerative meniscus



- The VAS pain score measurement at rest reached statistically significant change from baseline to 2 months ($p<0.001$) with a mean reduction of 14.56

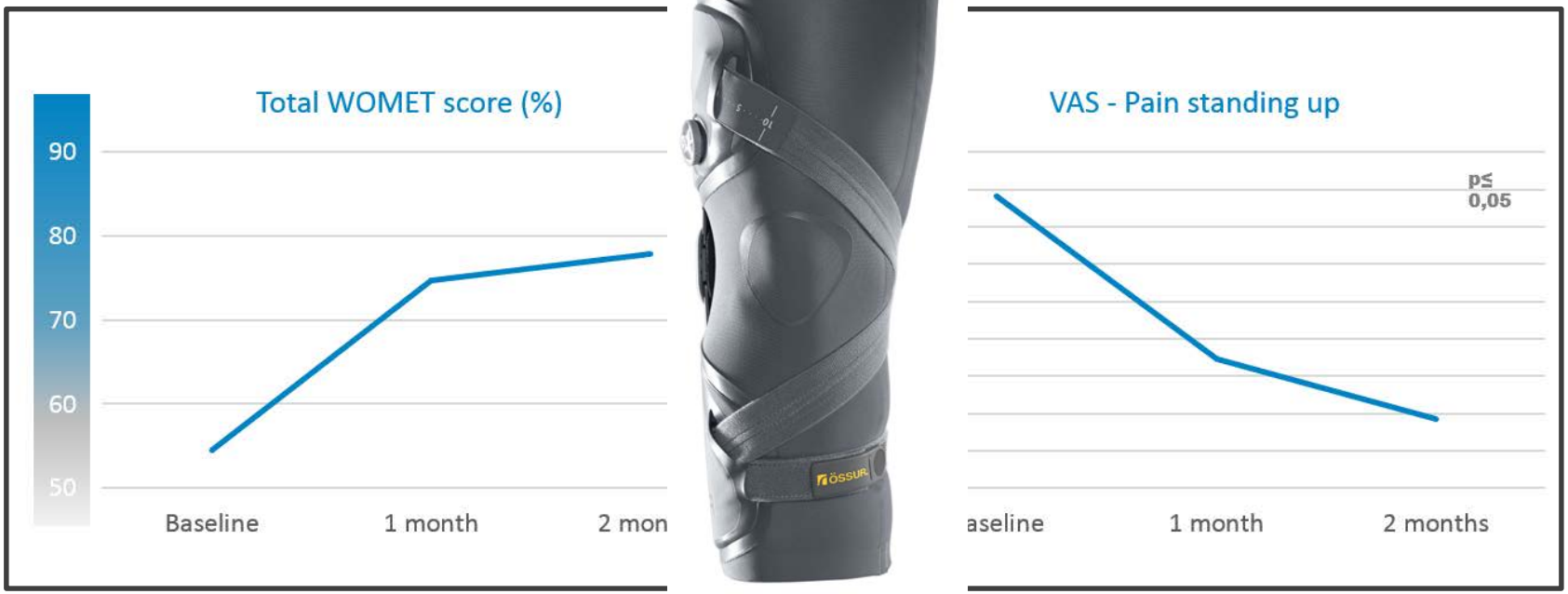
= confirmed pain reduction

VAS score was measured on a scale ranging from 0 to 100. 0 indicates no pain and 100 worst imaginable pain

UNLOADER FIT

EFFECTIVE SOLUTION FOR DEGENERATIVE MENISCAL TEARS

- Source: Össur HF – data on file



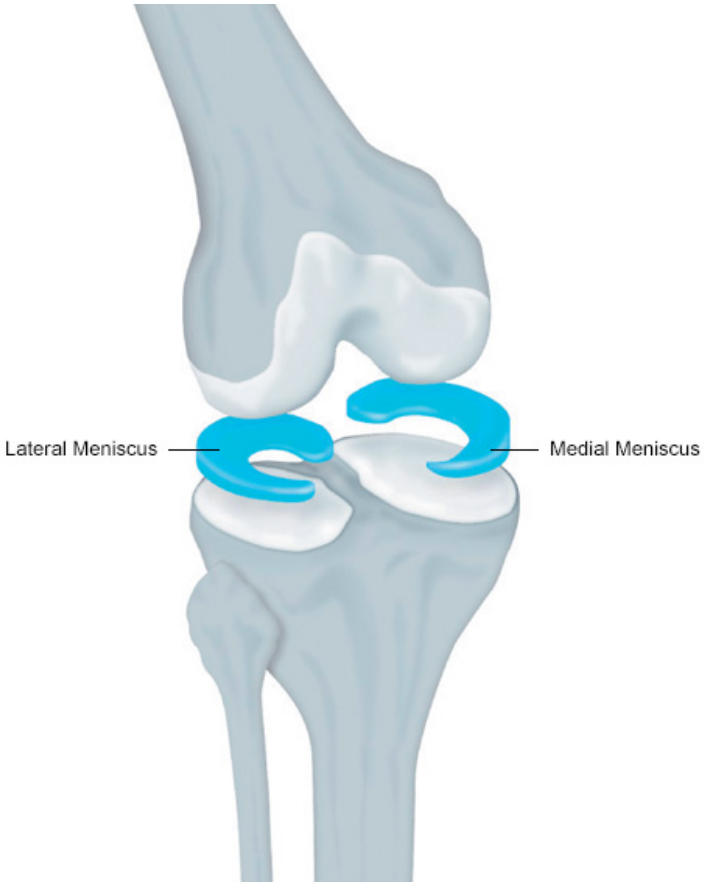
= confirmed improvement of Quality of Life

= confirmed pain reduction

- The Unloader Fit is an effective treatment option for patients with degenerative meniscus tears without locking/blocking.

MENISCAL INJURY

- Loss of meniscus (following degeneration or meniscectomy) results in:
  - Loss of shock absorbency
  - Increased coefficient of joint friction
  - Reduced joint stability
  - Disrupted joint homeostasis
- Above are all contributing factors to degenerative joint disease/OA



UNLOADER

INDICATIONS

Össur's Unloader braces (Unloader One/Unloader Fit) are indicated for:

- Degenerative Meniscus
  - And/Or
- Mild to Severe unicompartmental knee OA
  - Unloader Fit (Mild-Moderate)
  - Unloader One (Mild to Severe)

RADIOGRAPHIC GRADING OF OA
(Kellgren & Lawrence 1957)

Grade	Narrowing of Joint Space	Osteophytes	Sclerosis	Deformation of Joint Contour
0	None	None	None	None
1	Doubtful	Possible	None	None
2	Possible	Definite	None	None
3	Definite	Moderate/Multiple	Present	Possible
4	Marked	Large	Severe	Definite

CLINICAL EVIDENCE - OA

- Meta analysis; Pollo FE et al; J of AAOS, 14:5-11, 2006.
  Validates the Unloader brace design & reveals that knee bracing for OA effectively relieves pain and improves function.

- Prospective RCT; Pollo FE et al; Am J Spts Med, 30(3): 414-421, 2002.
  Adjustable valgus bracing (Unloader) reduced pain and improved function in patients with medial OA.

- Prospective RCT; Hillstrom et. al; Gait & Posture, 11(2):170-171, 2000.
  Valgus bracing with Unloader and neutral position foot orthoses, significantly reduces pain and improves lower extremity biomechanics in patients with varus knee OA.

CLINICAL EVIDENCE - OA

- Prospective RCT. Kirkley A, et al; JBJS, 81(4): 539-547, 1999.
  Patients with varus OA experience a decrease in pain and improvement in disease specific quality of life with the use of an Unloader brace.

- Prospective RCT. Horlick SG, et al; J of Spts Med, 3:251-255, 1993.
  Valgus bracing (Unloader) reduces pain and improves function in patients with medial OA.

  Can be a useful treatment modality to delay surgery

http://www.ossur.com.au/oa-solutions/research

CLINICAL EVIDENCE – OA

- Briggs 2012

Improvement in Quality of Life with Use of an Unloader Knee Brace in Active Patients with OA: A Prospective Cohort Study

Karen K. Briggs, M.P.H., M.B.A.[2] Lauren M. Matheny, B.A.[2] J. Richard Steadman, M.D.[1]

[1] The Steadman Clinic, Steadman Philippon Research Institute, Vail, Colorado
[2] Clinical Research Department, Steadman Philippon Research Institute, Vail, Colorado

Address for correspondence and reprint requests Karen K. Briggs, M.P.H., M.B.A., Clinical Research Department, Steadman Philippon Research Institute, 181 W. Meadow Drive, Suite 1000, Vail, CO 81657 (e-mail: Karen.Briggs@sprivail.org).

J Knee Surg

- Patients had significant improvement in quality of life (SF-12) ($p < 0.05$).
- Patients saw improvement in SF-12 physical component
- There was significant improvement in pain, stiffness, and function (WOMAC) ($p < 0.05$).
- Patients demonstrated a significant decrease in pain and disability.

MENISCAL TEARS - TREATMENT SUMMARY

- Treatment of degenerative meniscal tears can be approached conservatively or surgically
  - Current data suggest that the majority of the patients can be successfully treated without surgery
  - Patients who show mechanical symptoms (blocking/ locking) of the knee shall be considered for surgical treatment (mensicectomy)
- Using Ossur‘s Unloader braces to support rehabilitation of degenerative meniscal tears:
  - Reduces pain and improves QoL (conservative - 2016 Ossur study)
  - Prevent/slow OA onset/progression (conservative or surgical) by offsetting associated increases in peak pressures (i.e. Unloading affected compartment)
- Ossur‘s Unloader One and Unloader Fit are also clinically proven for the conservative management of uni-compartmental knee OA (for which meniscal injuries are a pre-cursor)

SUMMARY


KNEE OSTEOARTHRITIS
FOCUS MARKETS
AMERICAS
EUROPE
AUSTRALIA
TOTAL
119
181
957
257
ports
ic Review of the
d, Sally Hopewell and
90
80
70
60
50
Baseline
1 month
2 months
Baseline
1 month
2 months

CONTACT DETAILS

- Contact your local Ossur staff member to find out more and arrange a product demonstration
- If you have any additional questions:
- Chris Wallis - cwallis@ossur.com

ÖSSUR®
LIFE WITHOUT LIMITATIONS

WE IMPROVE PEOPLE'S MOBILITY