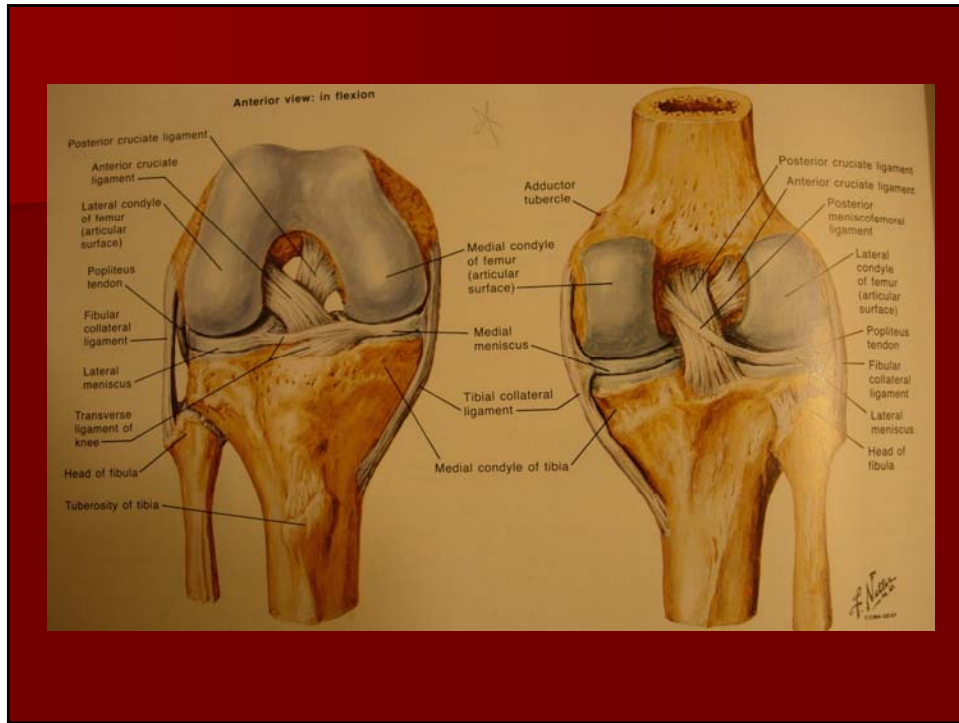


# Meniscal Injury and Treatment

John Pearce MD

No matter how you look at it...  
the meniscus is  
**NOT SEXY!!!**

This presentation is the intellectual property of the author.  
Contact them for permission to reprint and/or distribute.



## Historical

- Functionless
- Integral part of knee protecting cartilage

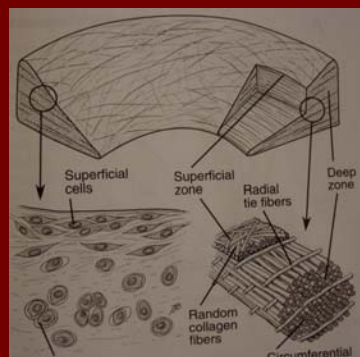
This presentation is the intellectual property of the author. Contact them for permission to reprint and/or distribute.

## Epidemiology

- 850,000/year
- Male to female 2.5/1.0
- Male peak 31-40
- Female peak 11-20
- Medial torn more than lateral
- Acute ACL-lateral
- Chronic ACL-medial
- Mechanism twisting

## Anatomy

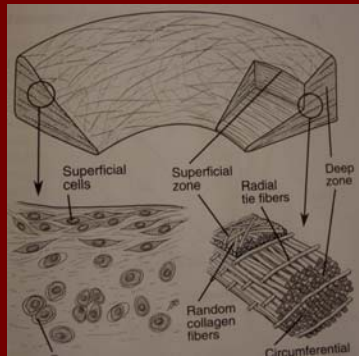
Fibrocartilage with network of interlacing collagen fibers and fibrochondrocytes



This presentation is the intellectual property of the author.  
Contact them for permission to reprint and/or distribute.

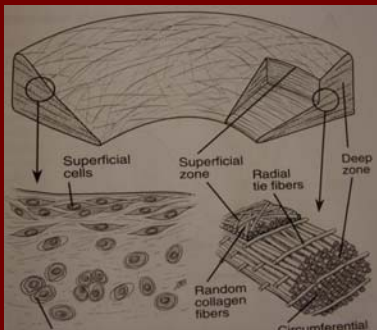
# Biphasic Structure

- Solid- Collagen/matrix
- Fluid- Water/electrolytes



# Three Layers

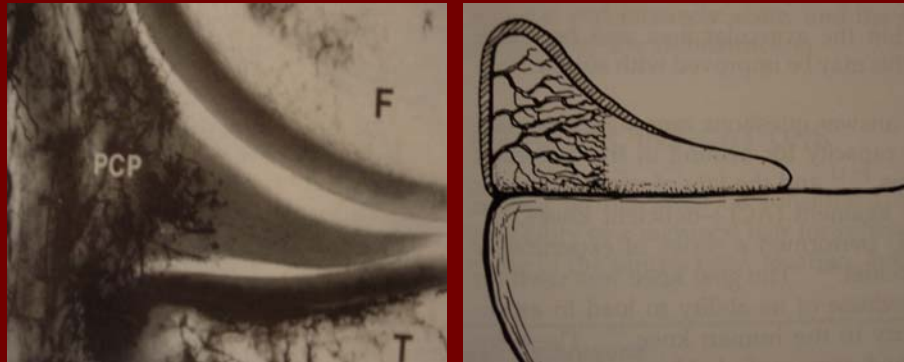
- Superficial: mesh-like pattern woven with fine fibrils
- Surface: randomly oriented collagen fibers
- Middle: collagen fibers form a circumferential pattern



This presentation is the intellectual property of the author.  
Contact them for permission to reprint and/or distribute.

## Blood Supply

- Geniculate arteries
- Supplies 10-30% of the peripheral edge

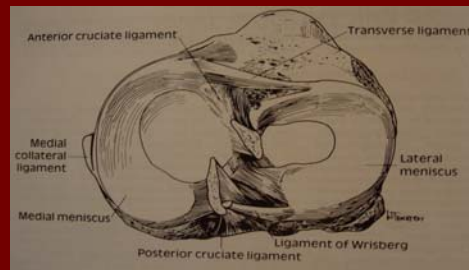


## Nerve Supply

- Periphery of the menisci
- Contributes to joint proprioception
- Found mostly in anterior and posterior horns

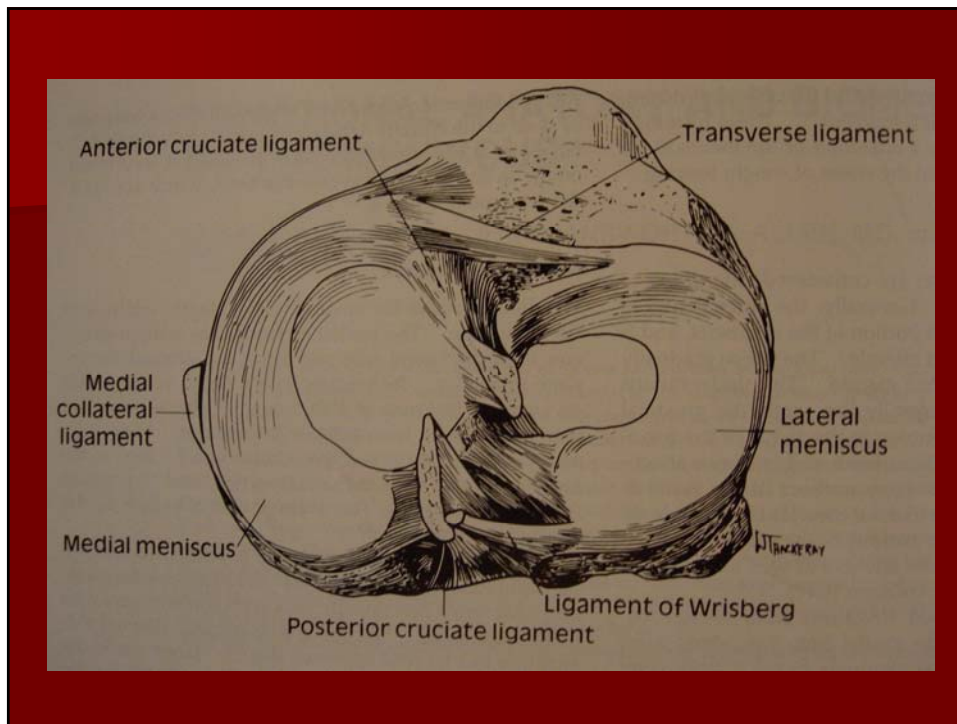
## Medial Meniscus

- Anterior horn: attaches 6-7 mm in front of ACL
- Posterior horn: attaches between lateral meniscus and PCL
- Attached to capsule and MCL
- Excursion 5.1 mm



## Lateral Meniscus

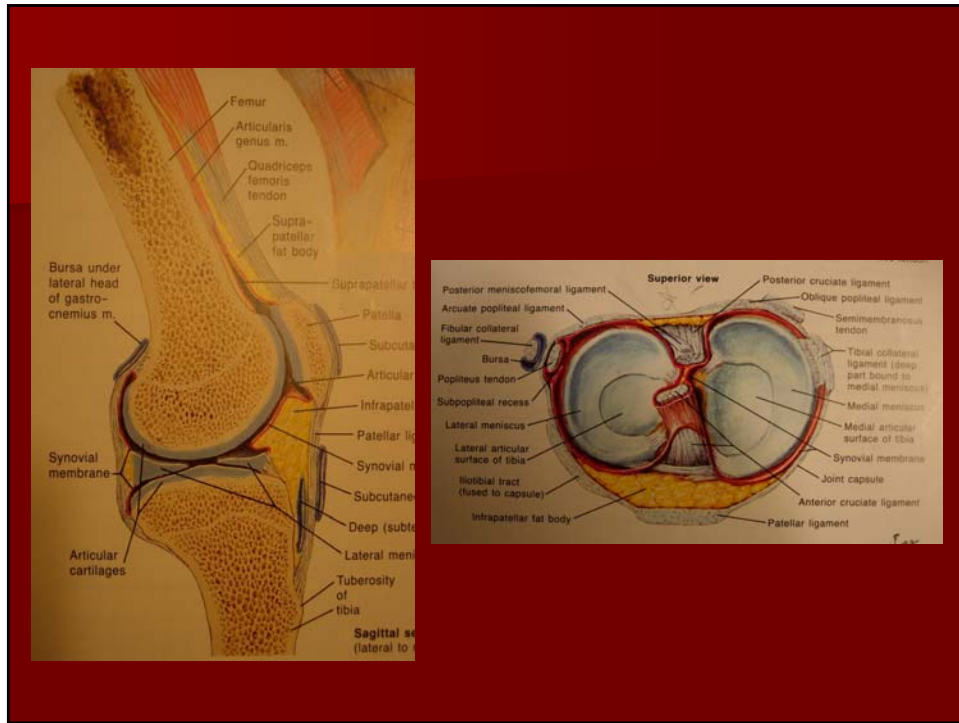
- Anterior Horn: Attached anterior to intercondylar eminence anterior and lateral to ACL
- Posterior Horn: Attached posterior to intercondylar eminence in front of medial meniscus
- Loose peripheral attachment
- Excursion 11.2 mm



## Dynamic Attachments

- Extensor mechanism:  
Translates meniscus anterior
- Semimembranosus:  
Translates medial meniscus posteriorly
- Arcuate ligament and popliteus:  
translates lateral meniscus posteriorly

This presentation is the intellectual property of the author.  
Contact them for permission to reprint and/or distribute.



## Function

- Secondary stabilizers
- Joint congruity
- Lubrication
- Nutrition
- Convert axial load to circumferential stress

This presentation is the intellectual property of the author.  
Contact them for permission to reprint and/or distribute.



# Injury

## History:

Mechanism

Pain

Swelling

Giving way

Locking

Previous injury

Symptoms

since injury

## Physical Exam:

### ■ Observation

Gait and stance

Effusion

Ecchymosis

Previous incisions

- Contralateral Knee
- Effusion 51%
- Joint Line Pain 77-86%
- Compression test with range of motion

- Range of motion
- Ligamentous Exam
- McMurray Test
- Apply Test
- Neurovascular

This presentation is the intellectual property of the author.  
Contact them for permission to reprint and/or distribute.

## Differential Diagnosis

- Extra-Articular
  - Spine or hip
  - Malalignment
  - RSD
- Intra-Articular
  - Articular Cartilage
  - Crystalline Disease
  - Avascular necrosis
  - Patellofemoral

## Diagnostic Tests

Plain X-Rays

MRI



This presentation is the intellectual property of the author.  
Contact them for permission to reprint and/or distribute.

# Treatment

- Non-operative
- Operative
  - Partial Menisectomy
  - Meniscal Repair
- Meniscal Transplant

## ■ Non-Operative Treatment

### – Symptoms

- No effusion
- No pain to palpation or diagnostic testing
- No mechanical symptoms

### – Treatment

- NSAID / Injection
- Slow return to sport
- Continue activity as tolerated unless increased pain, swelling, or locking

## ■ Operative Treatment

### – Symptoms

- Effusion
- Pain with palpation or diagnostic testing
- Mechanical symptoms

### – Treatment

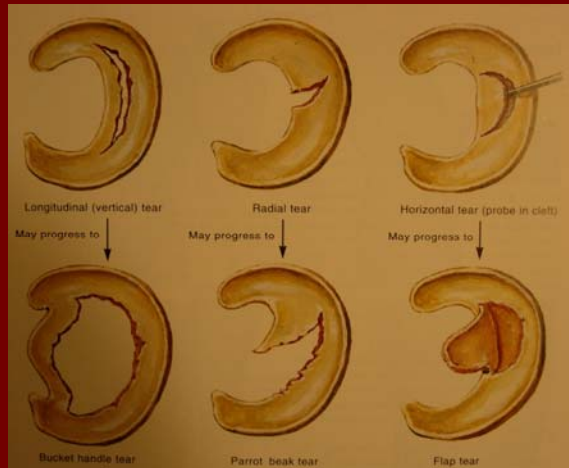
- Total or partial menisectomy
- Repair
- Transplant

## Future Treatment

- Tissue Engineering
- Gene Therapy

## Pattern of Meniscal Tears

- Bucket Handle
- Parrot Beak
- Horizontal
- Complex
- Degenerative



## Stable Tears

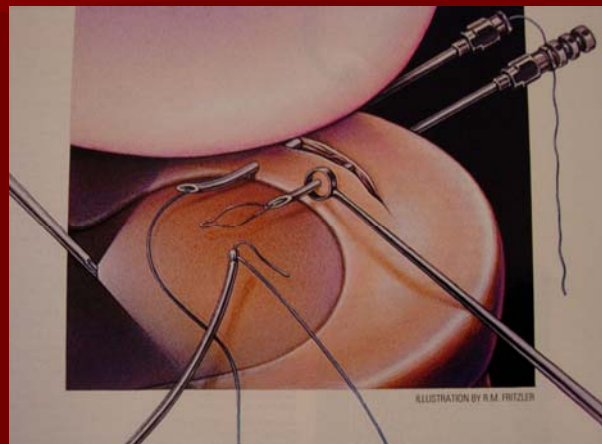
- Partial thickness
- Less than one centimeter in length
- Inter rim can not be displaced more than three millimeters

## Optimal Tears for Repair

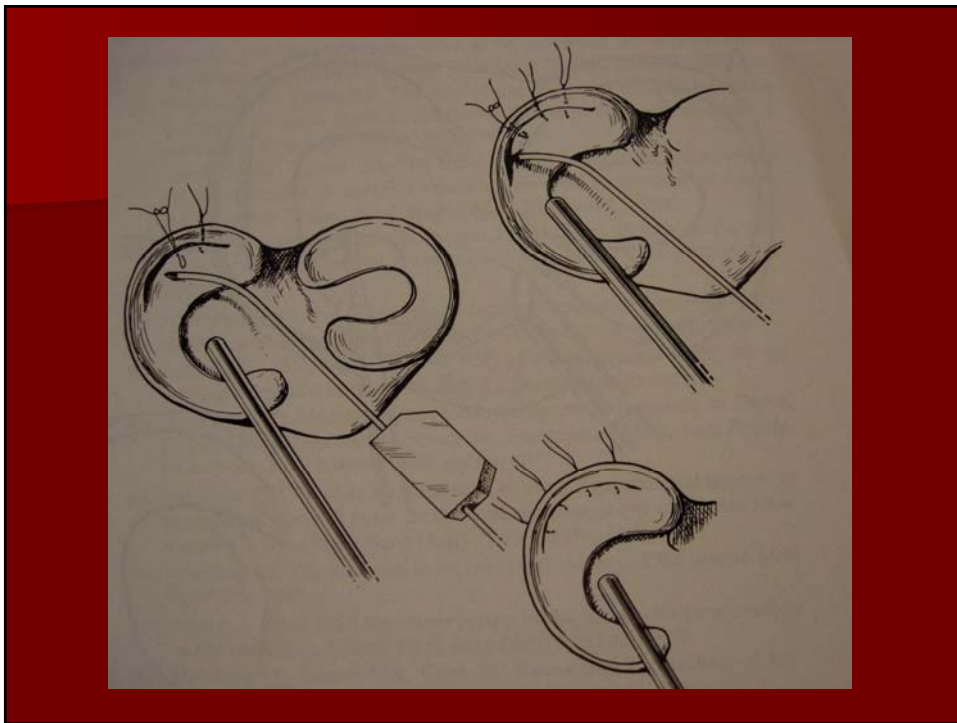
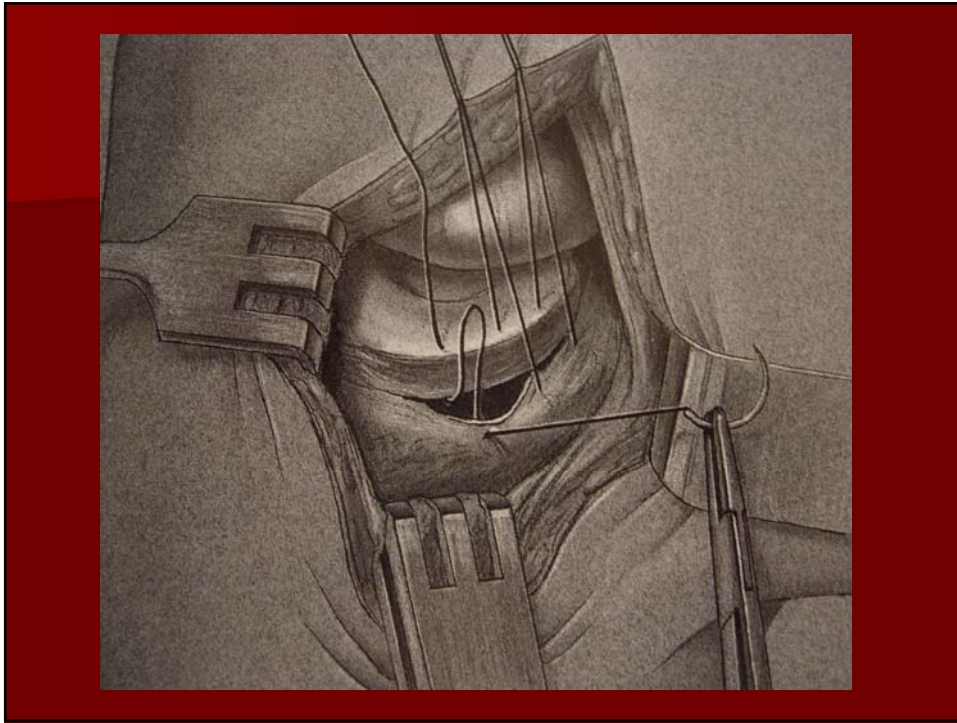
- Peripheral tears within three millimeters of the capsule
- Vertical tears one or two centimeters in length

## Techniques of Repair

- Open
- Outside-in
- Inside-out
- All inside

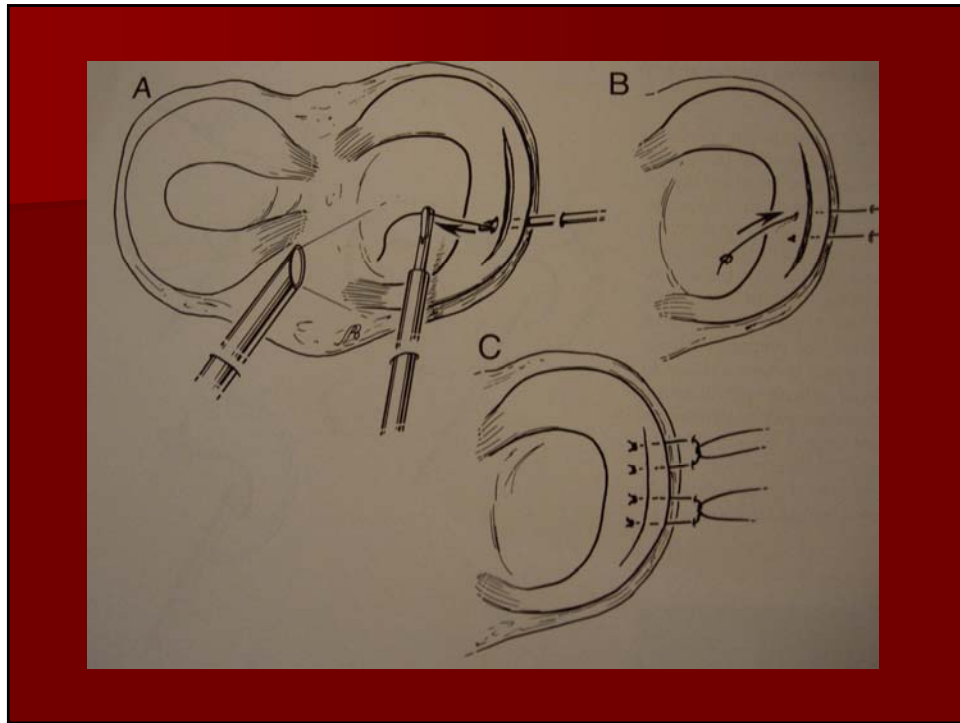


This presentation is the intellectual property of the author.  
Contact them for permission to reprint and/or distribute.



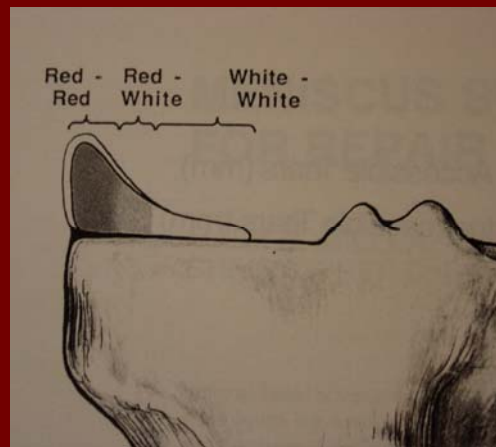
This presentation is the intellectual property of the author.  
Contact them for permission to reprint and/or distribute.





## Viability of Repair

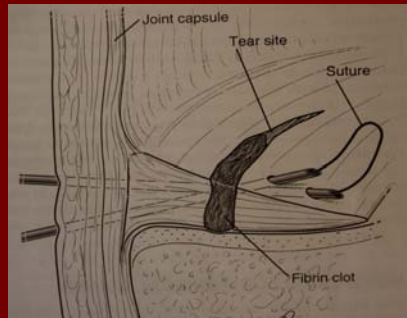
- Length of Tear
- Tear Pattern
- Location of tear



This presentation is the intellectual property of the author.  
Contact them for permission to reprint and/or distribute.

## Integrity of Repair

- Meniscal preparation
- Anatomical reduction
- Maintenance of reduction



## Rehabilitation

- Ice
- Range of motion/ immobilization
- Strengthening
- Weight Bearing
- Sport Specific rehabilitation
- Return to Play

# Complications

- Infection
- Hemarthrosis
- Arthrofibrosis
- Failure of Repair
- Neurovascular Injury
- Thrombophlebitis

# Conclusions

The meniscus may not be sexy, but it plays an extremely important role in the function of the knee