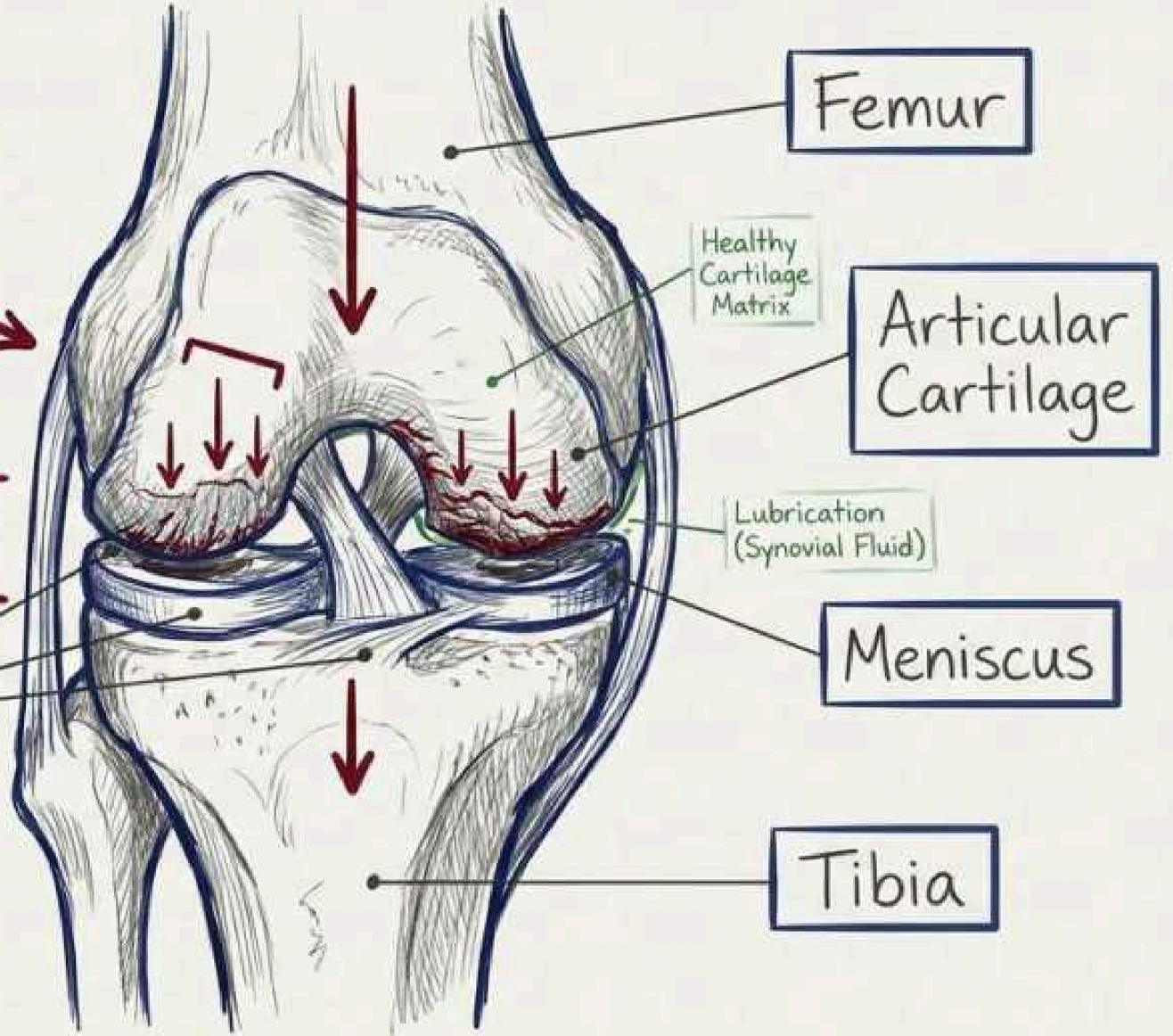
MED 533 B Lecture 2: Osteoarthritis

Pathophysiology, Diagnosis, and Management

1

$$\vec{F} = m \cdot \vec{a}$$

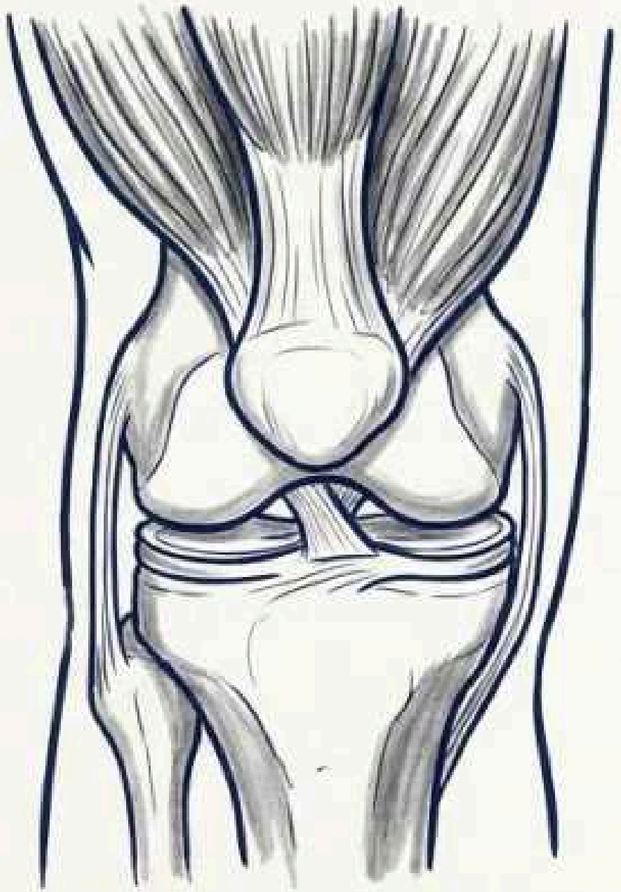
$$P = \frac{F}{A}$$



A Disease of the Whole Joint

¶ 2.1

~~Wear and Tear~~



Healthy Joint



Osteoarthritic Joint

Muscle weakness

Frayded, eroded
Cartilage breakdown

Bone thickening
&
Osteophyte formation

Mild synovitis
Muscle weakness

The Pathogenic Equation of Osteoarthritis

¶2.2

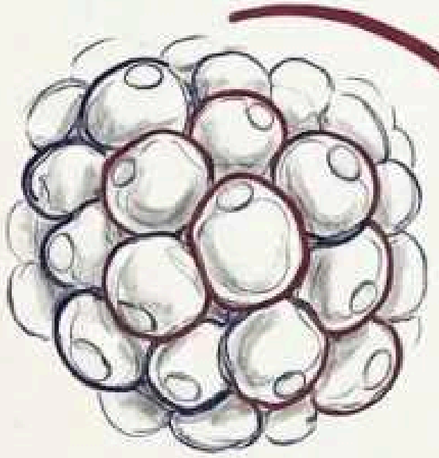
OA Risk = Systemic Factors × Biomechanical Load

Systemic Factors

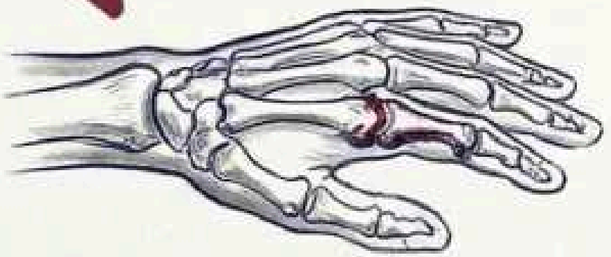
Age

Female sex

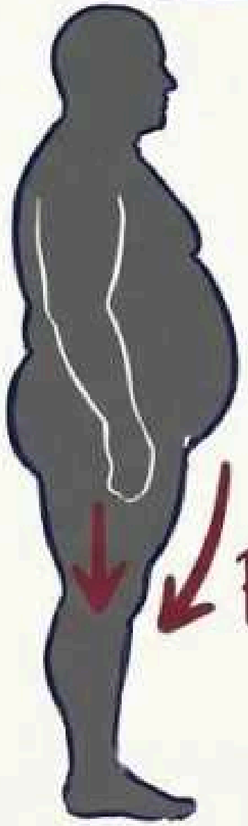
Genetics



Adipokines: Fat tissue biochemically raises risk even in non-weight-bearing joints.

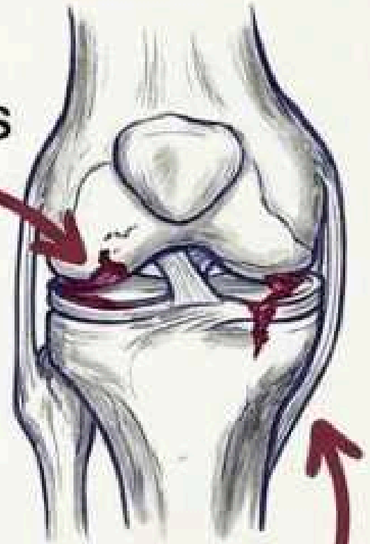


Biomechanical Load



$P = \frac{F}{A}$

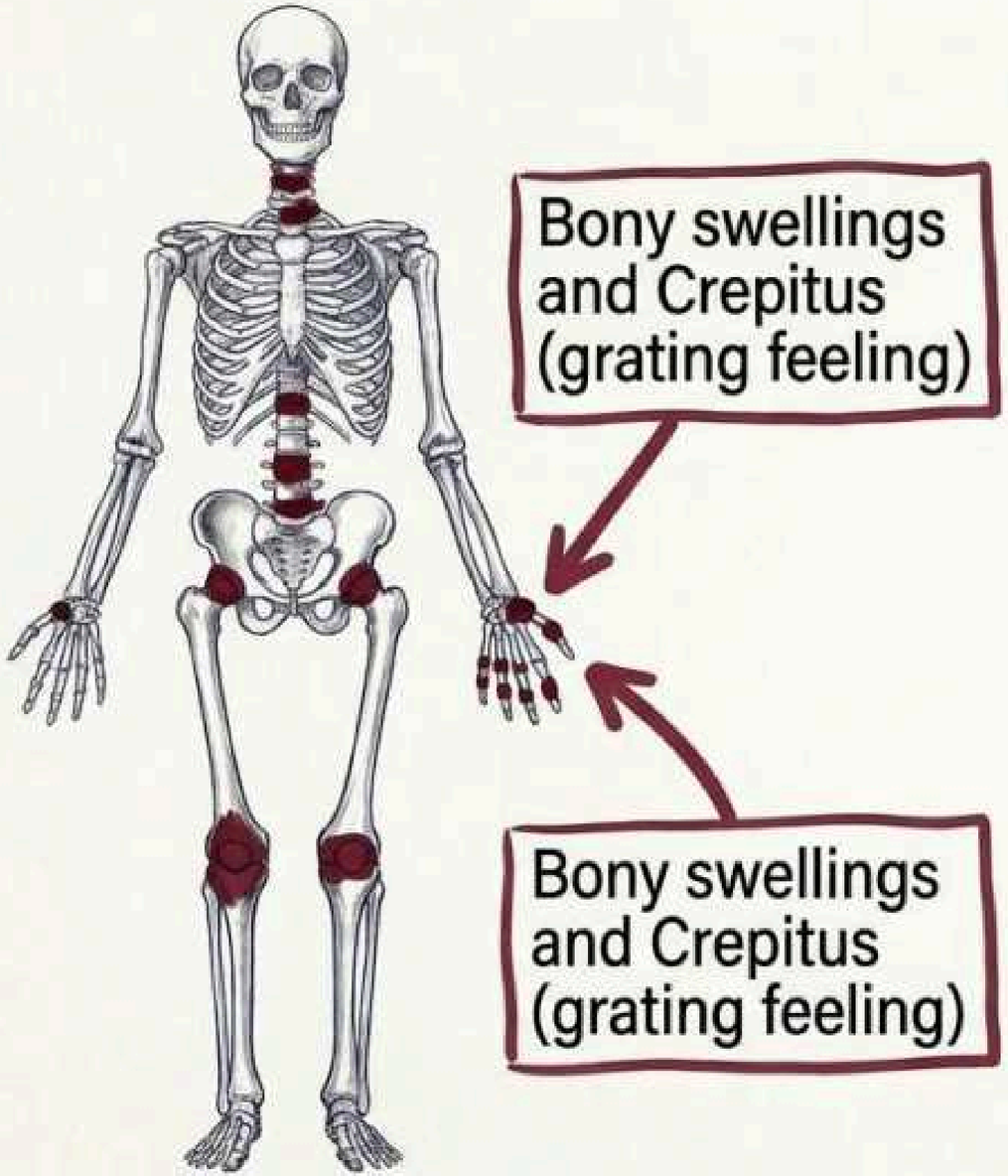
Previous Injury

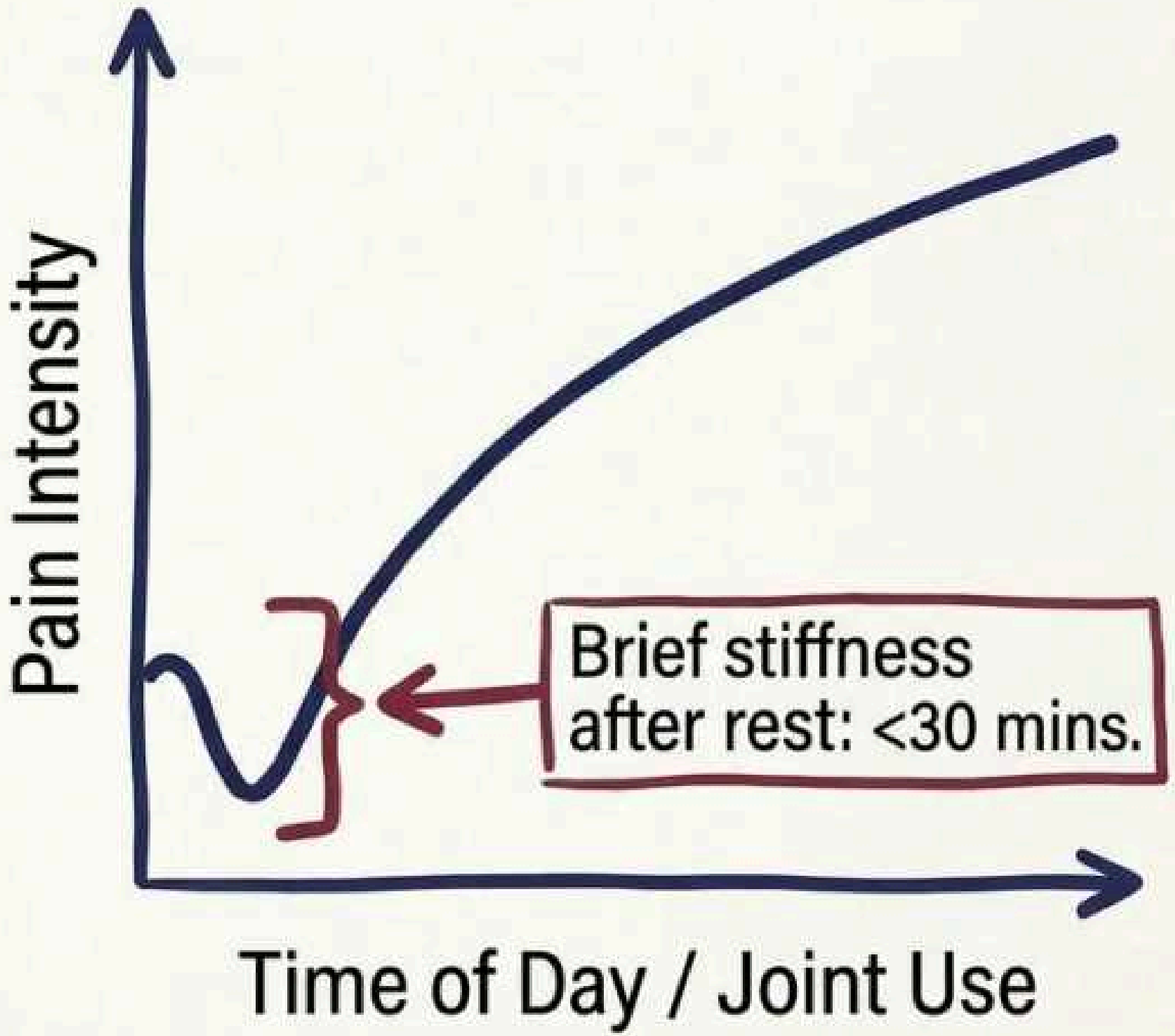


Occupational Heavy Loading or Kneeling

Clinical Presentation and Symptom Rhythm

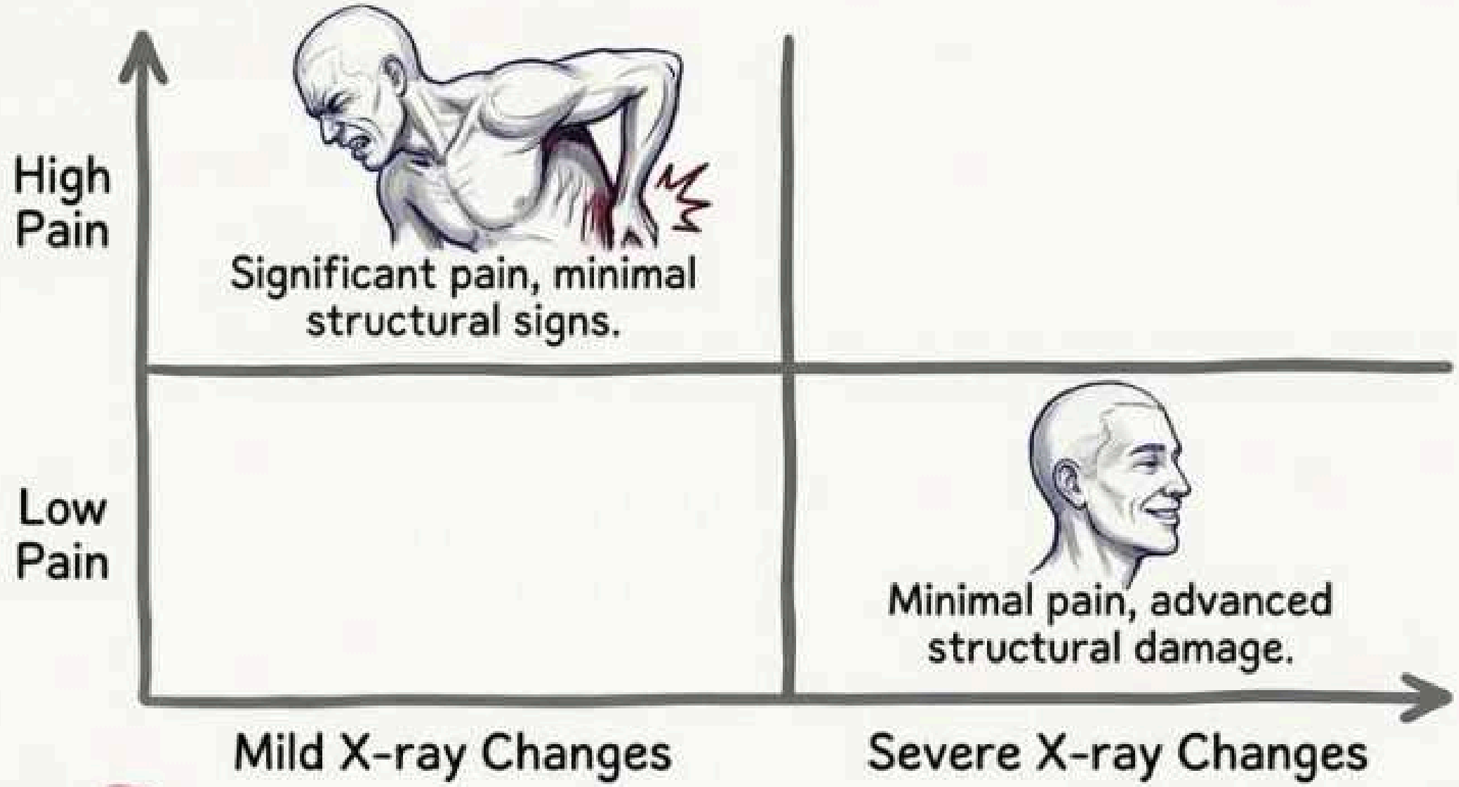
¶2.3

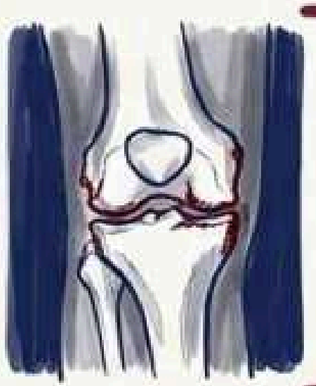




The Diagnostic Mismatch

¶ 2.4





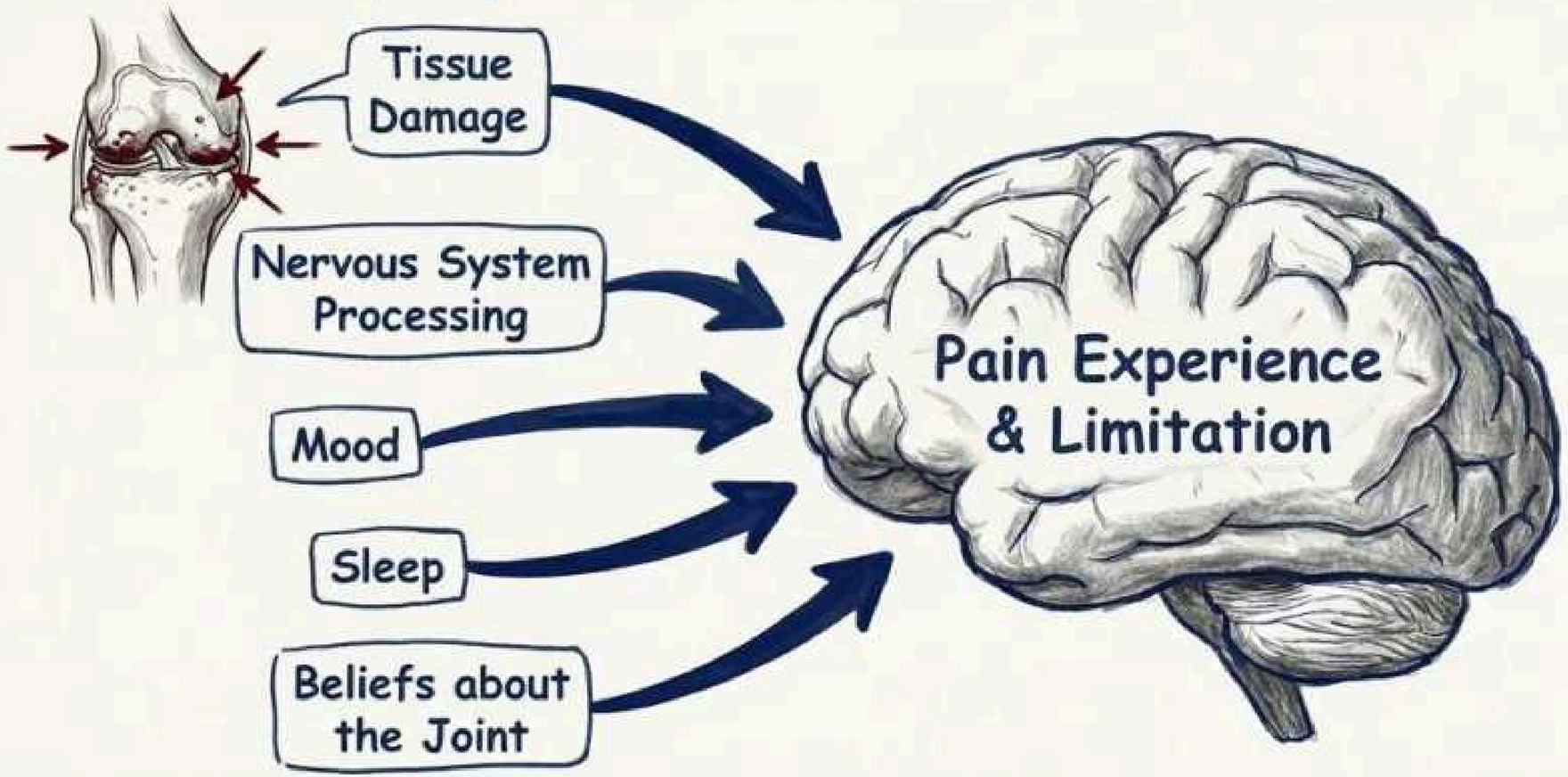
Diagnosis is Clinical
(Age + Symptoms + Exam)



Blood tests are NORMAL — used only to exclude other conditions.

The Biopsychosocial Pain Network

¶ 2.5

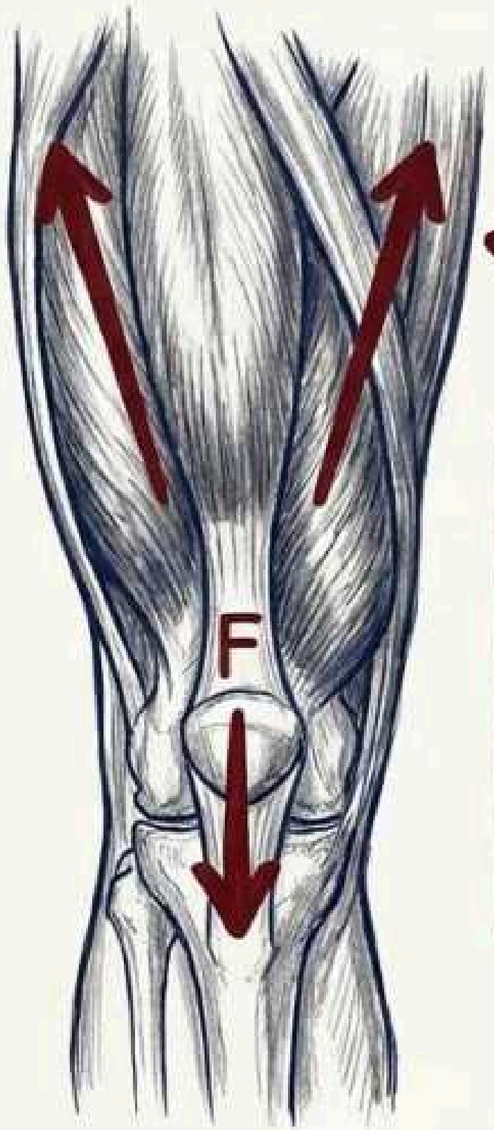


Pain ≠ Just Damaged Tissue. Treating OA requires addressing systemic, neurological, and psychological inputs.

The Foundational Treatment Pyramid

¶ 2.6





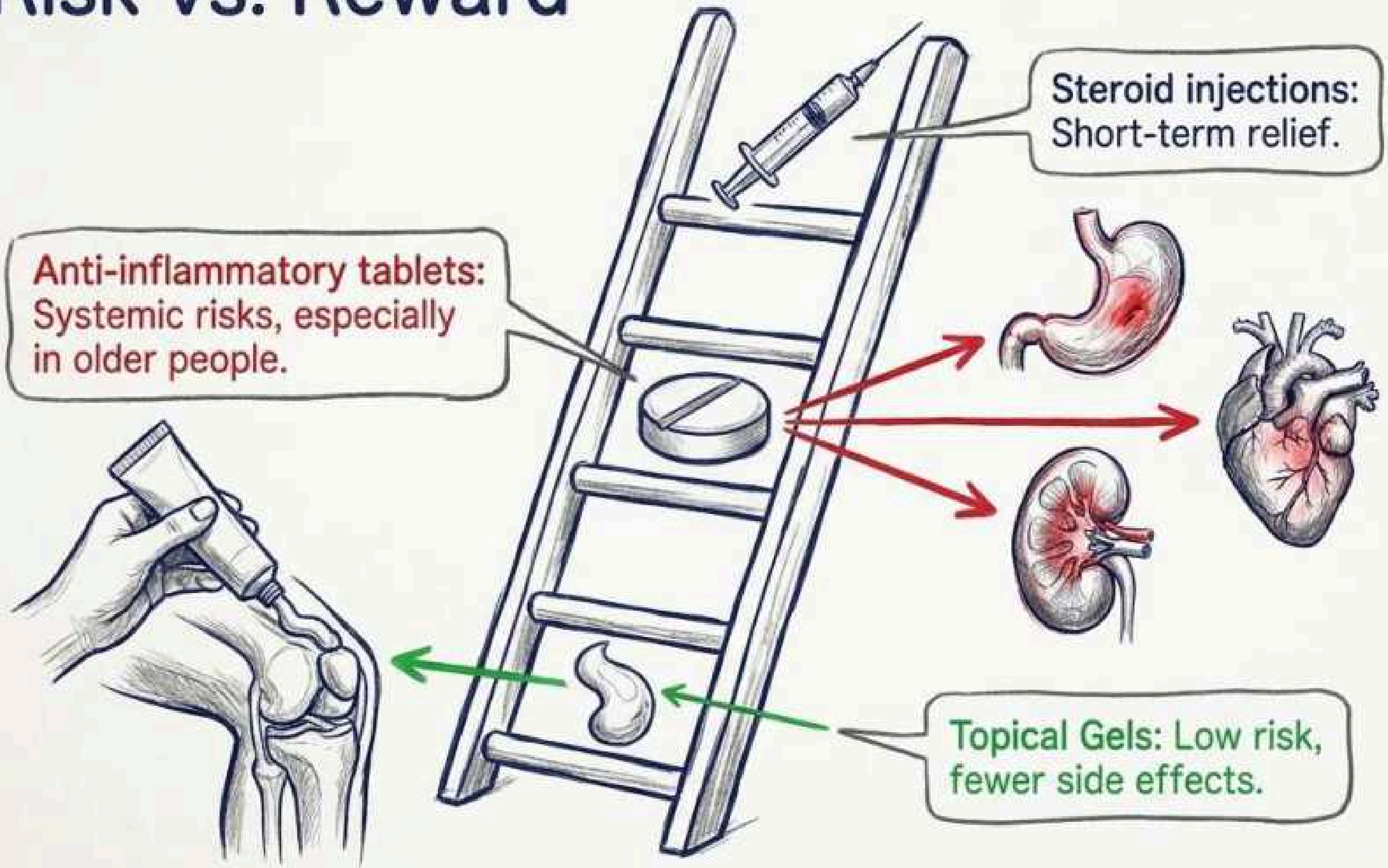
Exercise reduces pain as much as drugs.
It is safe and does NOT wear joints out faster.



Even modest weight loss substantially reduces knee pain.

Pharmacological Spectrum: Risk vs. Reward

¶ 2.7



Excluded Zone



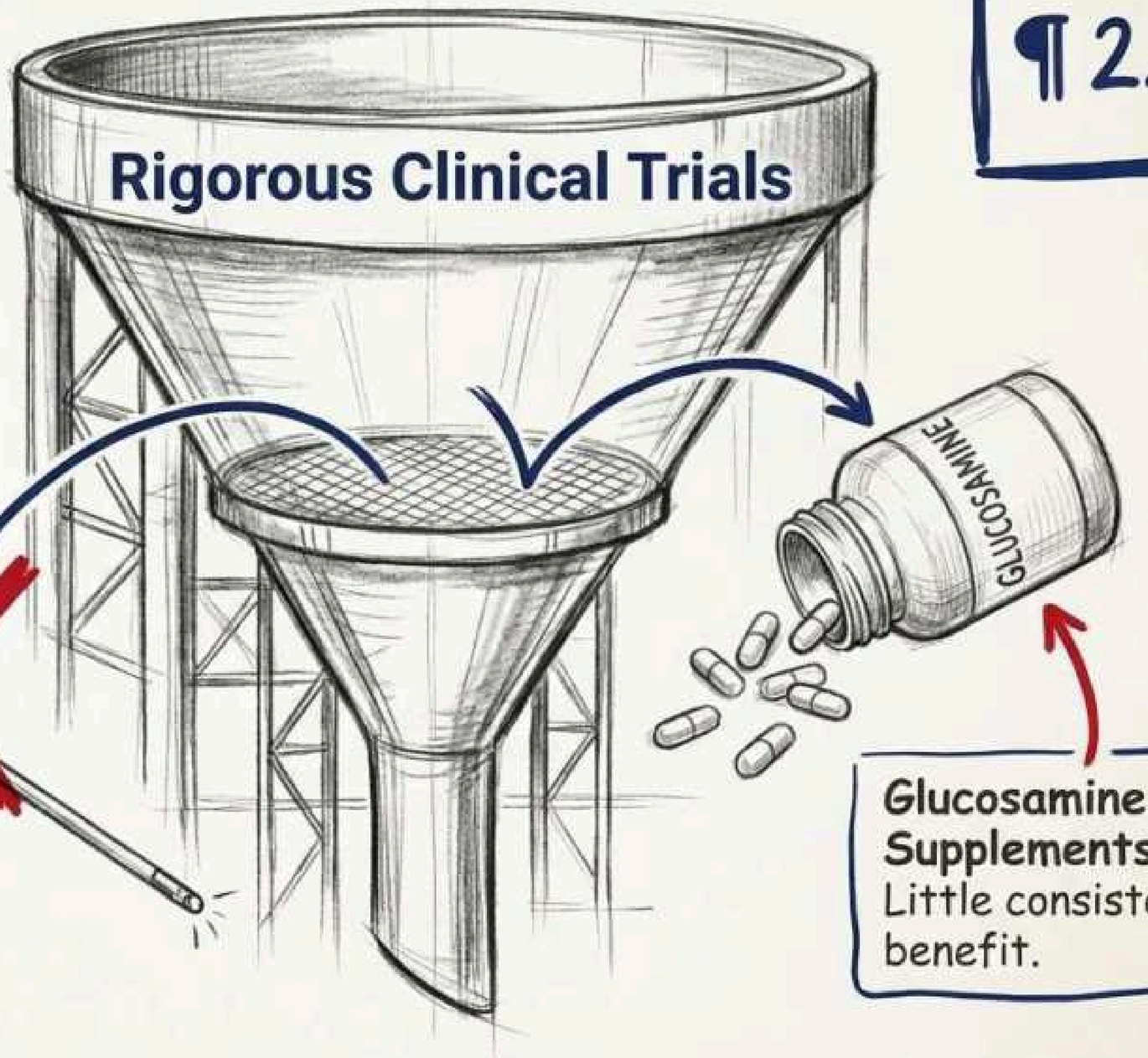
Paracetamol
(little effect in trials)



Strong Opioids
(not recommended)

The Evidence Filter: Debunked Treatments

¶ 2.8

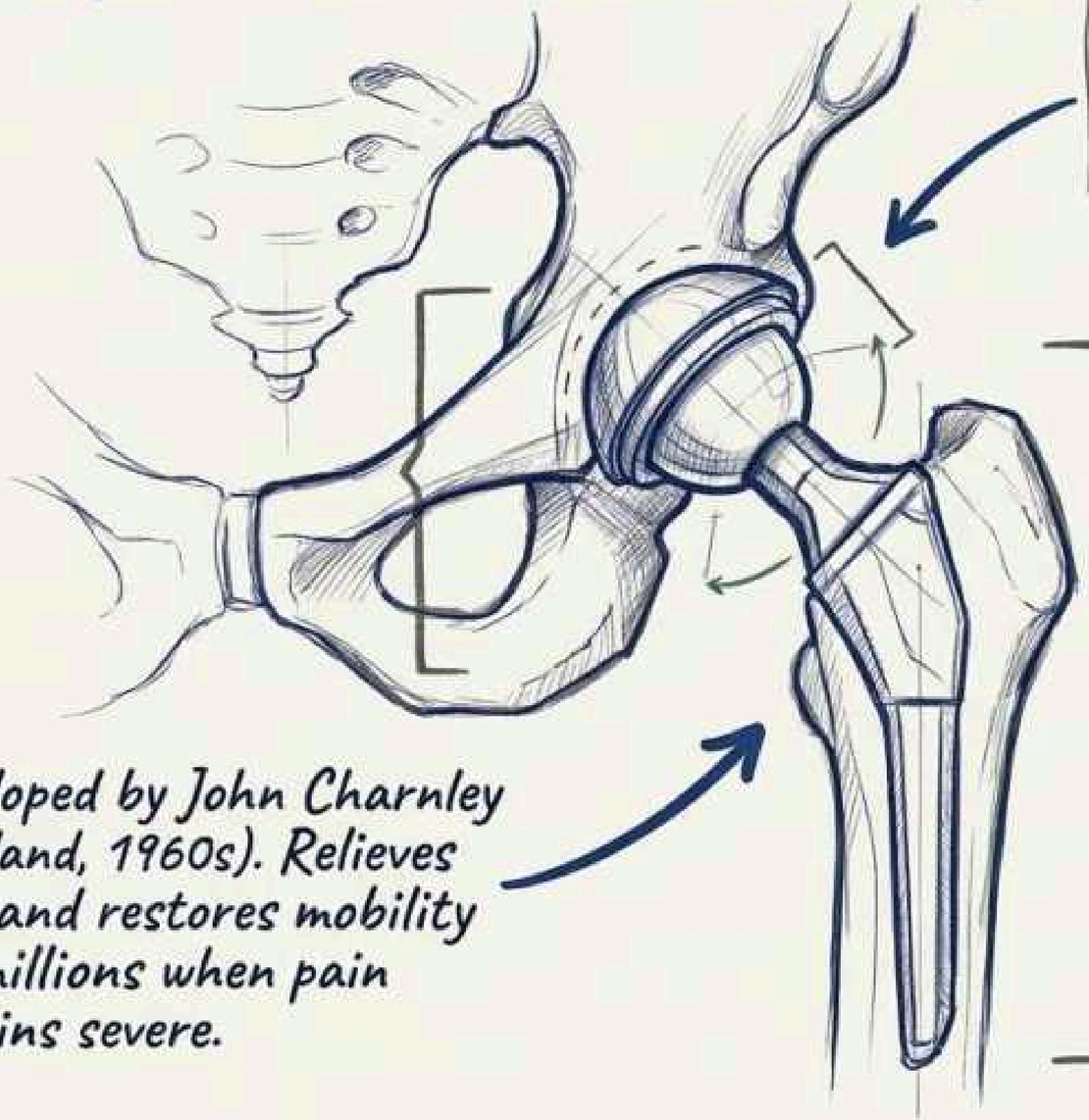


Arthroscopic Surgery: Sham-surgery trial (2002) proved washout/trimming is no better than placebo. No longer recommended.

Glucosamine Supplements: Little consistent benefit.

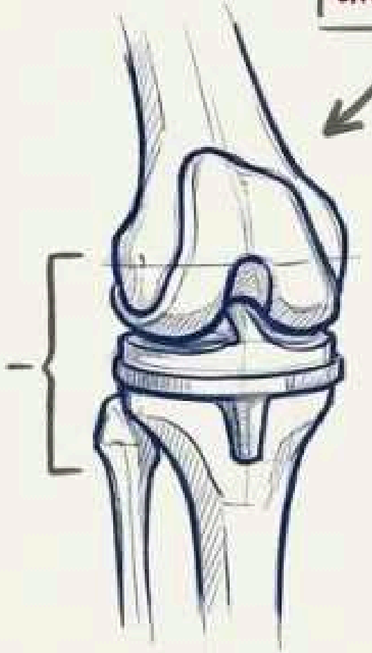
Surgical Restoration: The Operation of the Century

¶2.9

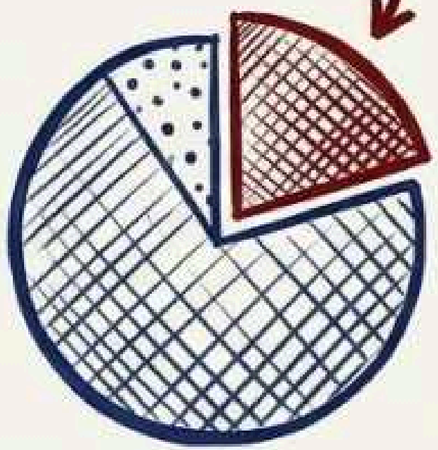


Developed by John Charnley (England, 1960s). Relieves pain and restores mobility for millions when pain remains severe.

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Knee replacements are highly successful, but carry a larger dissatisfied minority.



Synthesis: The Osteoarthritis Paradigm

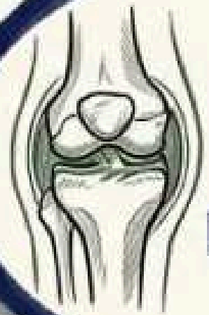
¶ 2.10

Clinical Diagnosis

Symptoms track poorly with structural X-ray changes.

Foundation

Exercise & Weight Loss drive treatment.



Whole Joint Disease

End-Stage

Joint replacement transforms severe cases.

Next Lecture: Arthritis driven by the Immune System.