

Restoring Stability: A Patient's Guide to Knee Reconstruction

Understanding ACL & Multiligament Surgery

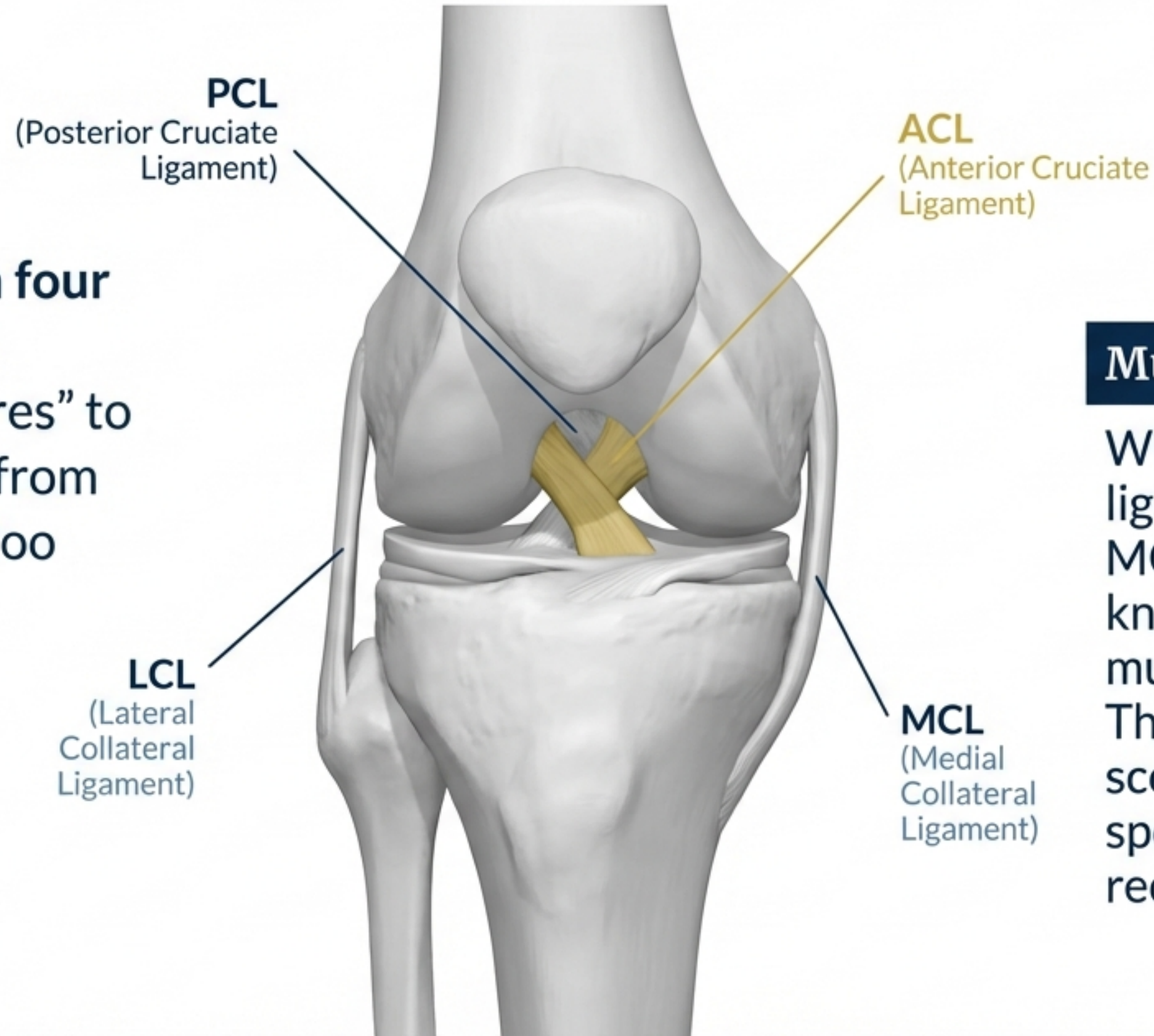
Prepared by your Orthopedic Surgeon. This guide explains your diagnosis, the surgical techniques used to repair it, and the choices we will make together to get you back on your feet.

Goal: Return to painless function.



The Anatomy of Stability

Your knee relies on **four primary ligaments** acting as “guide wires” to prevent the bones from sliding or rotating too far.



Multiligament Injury

When two or more ligaments (e.g., ACL + MCL) are torn, the knee loses stability in multiple directions. This is a complex scenario requiring specialized reconstruction.

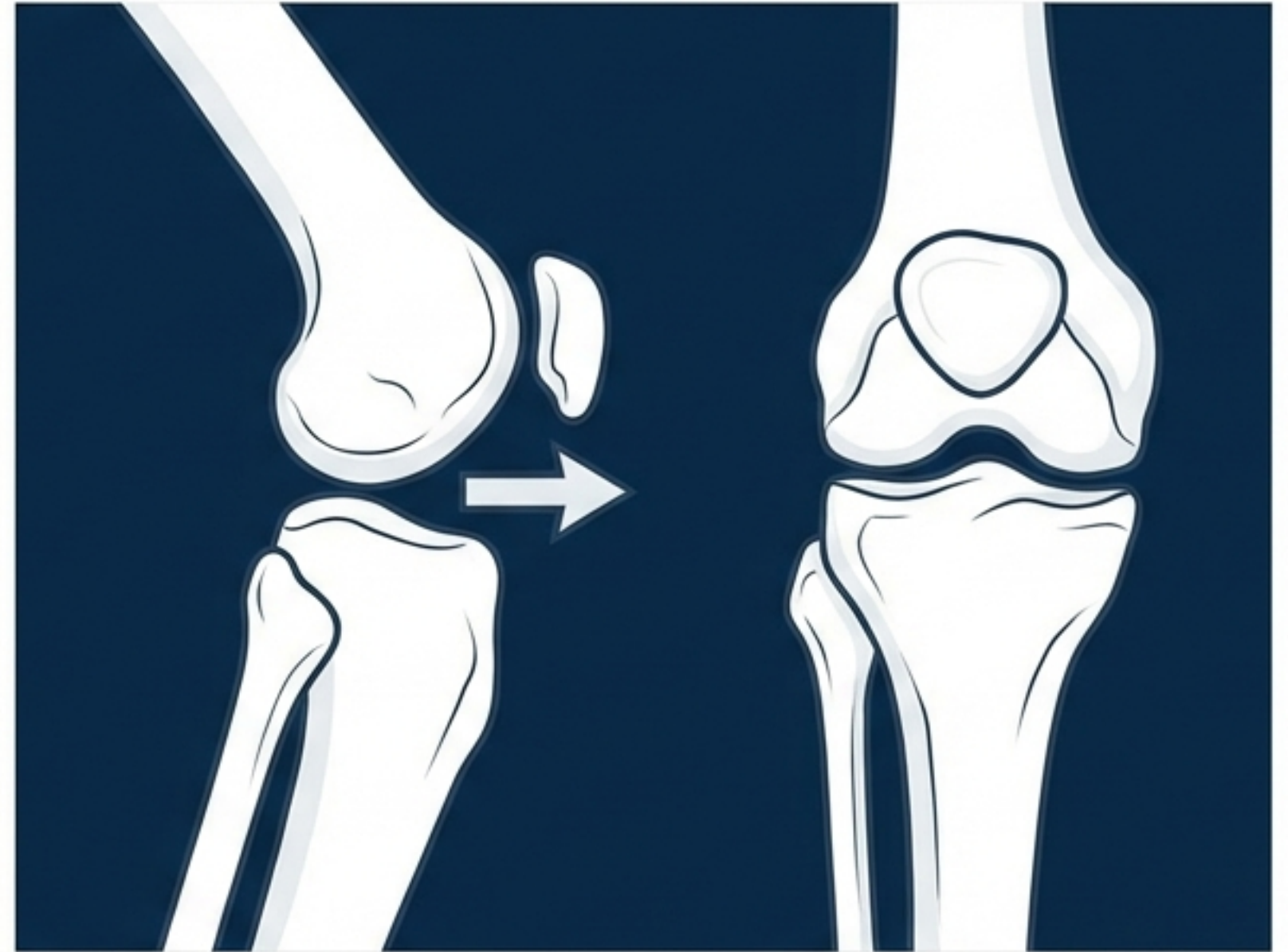
Understanding the Disruption

The Mechanism:

ACL tears often result from twisting or pivoting (low velocity). Multiligament injuries often stem from high-energy impact (traffic accidents, falls) or hyperextension.

The Consequence: The Consequence.

Ruptured ligaments do not heal on their own because they fray like a rope in water. We must rebuild them.



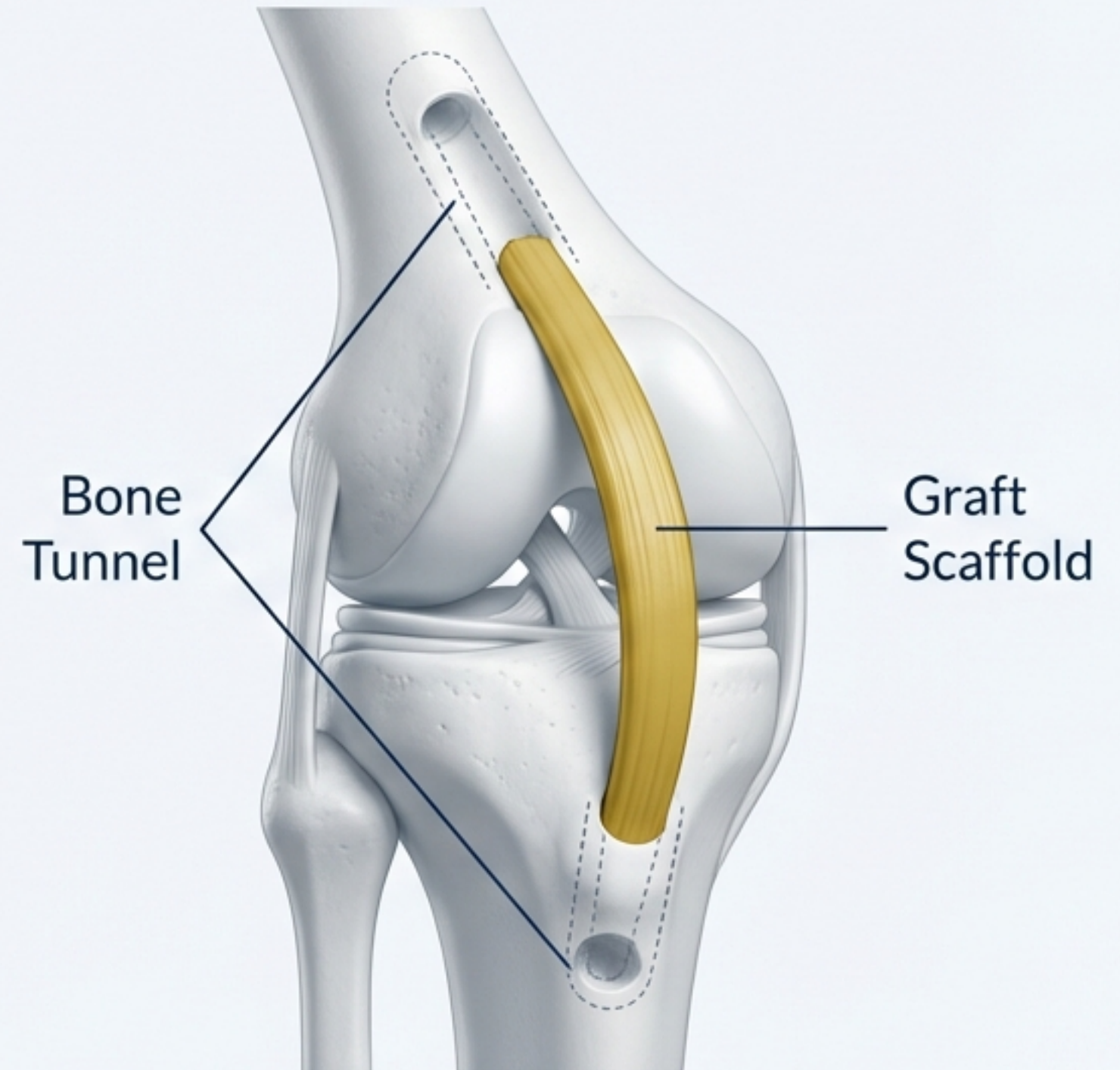
Dislocated alignment showing loss of structural support.

The Solution: Reconstruction, Not Just Repair

The Concept: We remove the damaged tissue and replace it with a **Graft**—a piece of tendon that acts as a scaffold.

The Process:

1. **Harvest:** We take donor tissue (from you or a donor).
2. **Placement:** We drill precise tunnels in the femur and tibia.
3. **Integration:** Your body accepts this graft, re-vascularizes it, and transforms it into a living ligament over 6–12 months.



The Blueprint: Choosing Your Graft

The critical decision: Autograft (Self) vs. Allograft (Donor)



Patellar Tendon

Gold Standard for stability. High strength, higher stiffness.



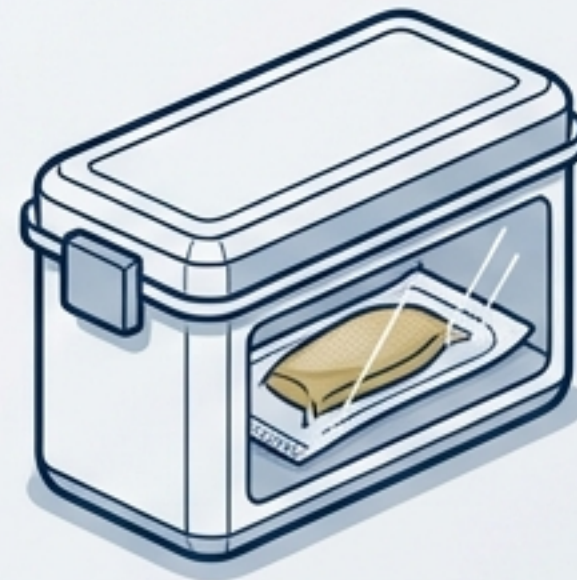
Hamstrings

Less incision pain. Good for recreational athletes.



Quadriceps

The modern powerhouse. High collagen, minimal harvest pain.



Allograft

Donor tissue. No harvest pain, ideal for multiligament revisions.

Option 1: Patellar Tendon (Bone-Tendon-Bone)

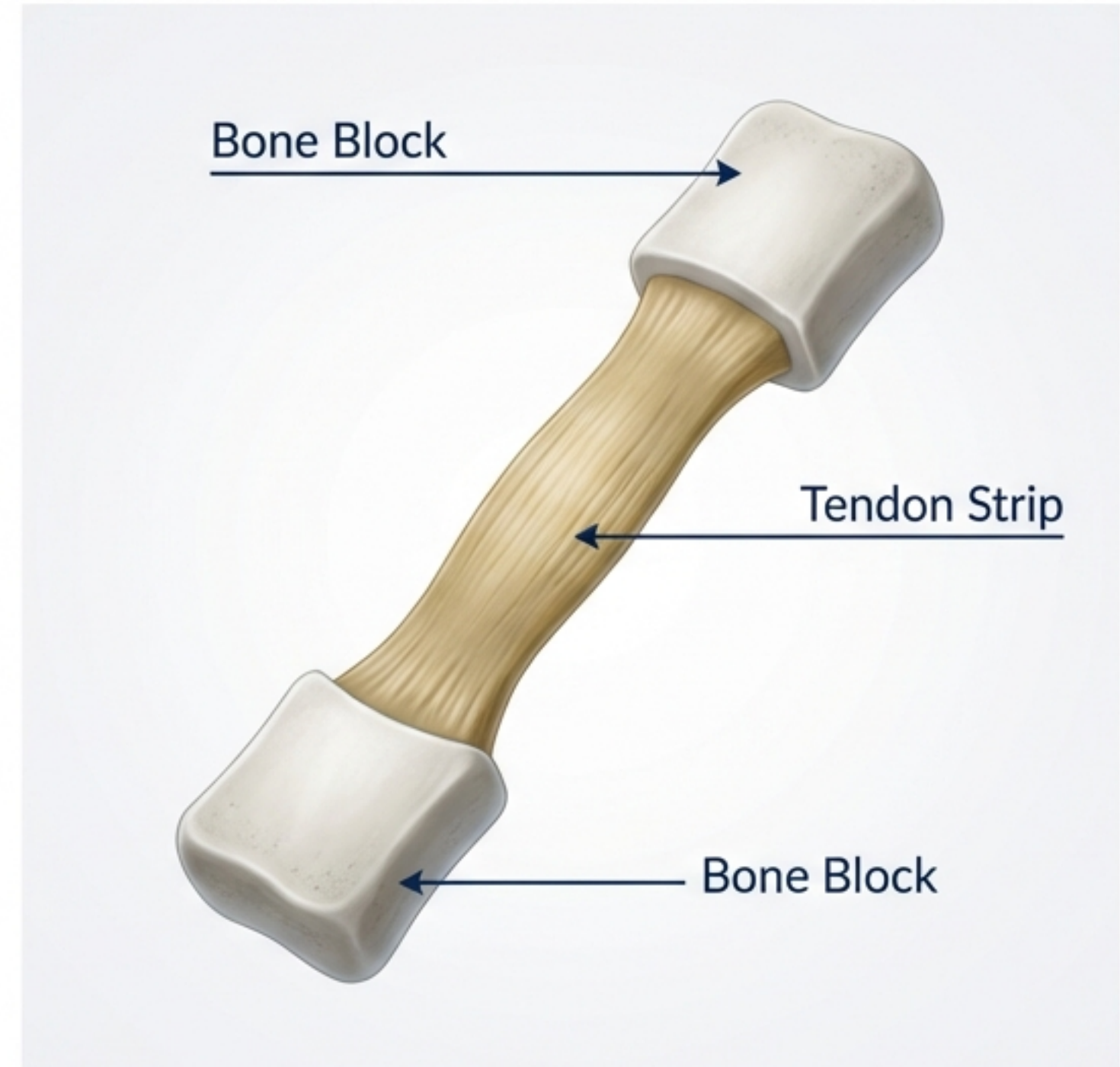
The Source: The central third of the tendon below your kneecap, with small bone plugs at each end.

The Science: High stiffness and load capacity (approx. **2300+ N**).

Pros: 'Bone-to-bone' healing is robust and rigid. Historically the choice for **elite athletes**.

Cons: Higher risk of anterior knee pain and discomfort when kneeling.

Best For: High-demand athletes who do not require kneeling for work.



Option 2: Hamstring Tendons (Flexors)

The Source: Semitendinosus and Gracilis tendons from the inner thigh, folded over to create a thick cord.

The Science: When **quadrupled**, it offers **high strength** but is slightly more elastic.

Pros: Smaller incision, less pain at the front of the knee.

Cons: Slower biological fixation in the bone tunnel. Potential for slight hamstring weakness.

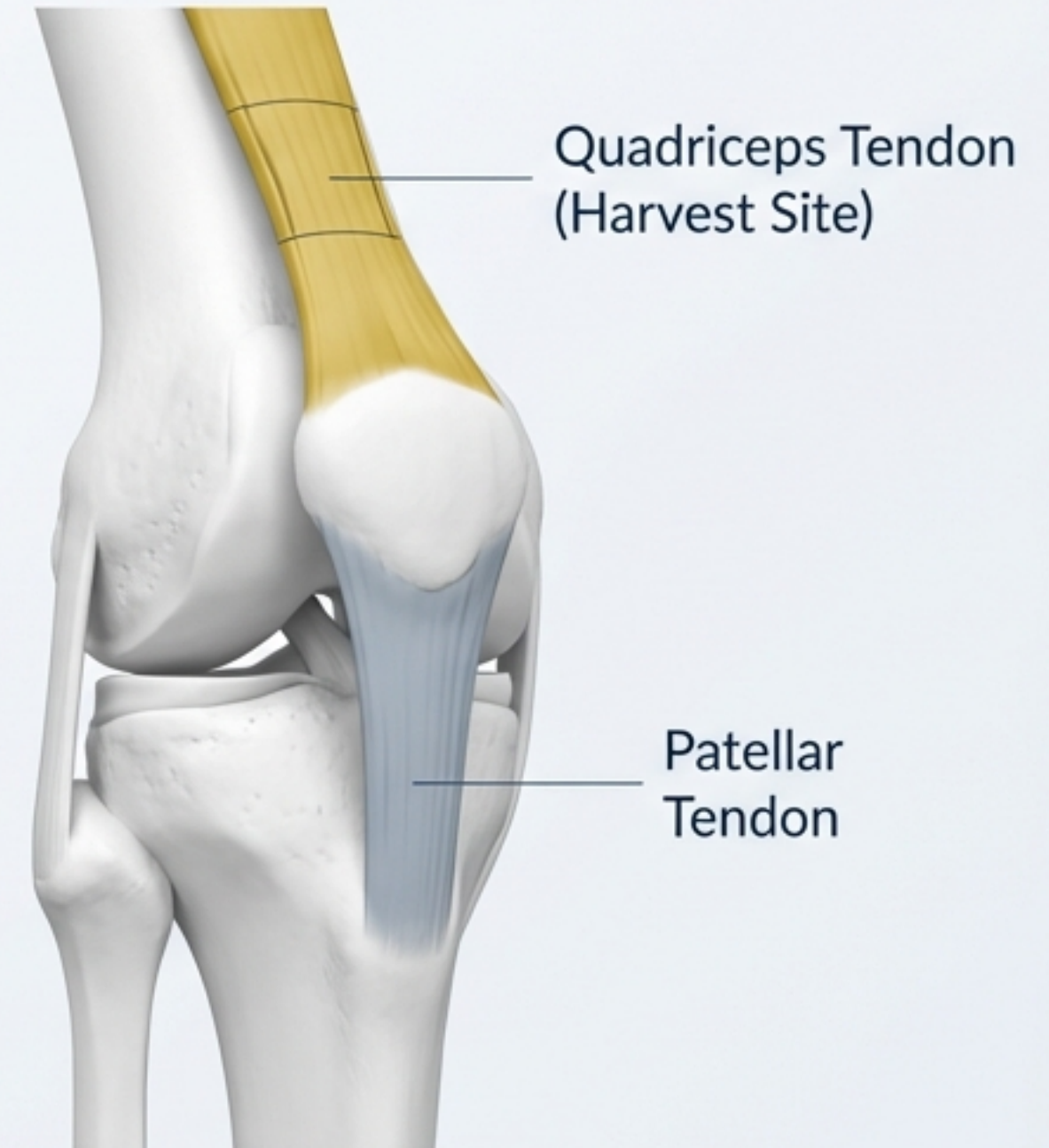
Best For: **Recreational athletes** and patients concerned about **kneeling pain**.



Option 3: Quadriceps Tendon

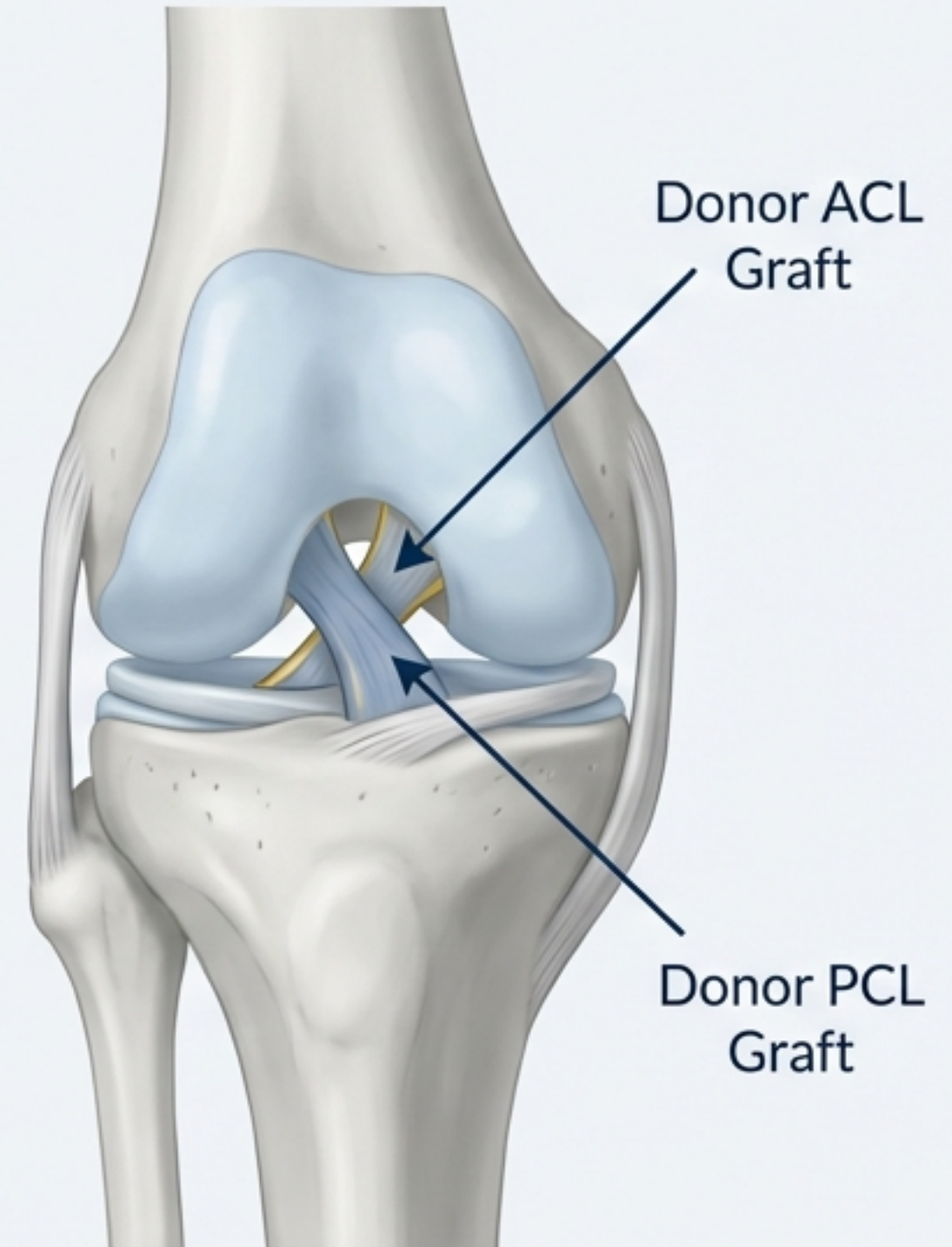
The Graft of the Future

- **The Source:** A thick strip of tendon taken from above the kneecap.
- **The Advantage:** Contains **~20% more collagen** than the patellar tendon. Massive volume and load capacity.
- **Patient Experience:** Minimal harvest site pain. The remaining tendon stays **80% strong** immediately after surgery. Less kneeling pain than patellar tendon grafts.
- **Best For:** A versatile powerhouse for almost all patients.



Option 4: Allograft (Donor Tissue)

- **The Source:** Sterilized tissue from a donor.
- **Pros:** **Zero “harvest pain”**—we don’t cut your own tendons. **Shorter surgery time** and easier early rehab.
- **Cons:** **Higher re-tear risk** in young, high-impact athletes (<25 years).
- **Best For:** **Patients over 40**, revision surgeries, or **Multiligament injuries** where we need **multiple grafts** to rebuild the whole knee.



Graft Comparison Summary

Feature	Patellar Tendon	Hamstrings	Quadriceps	Allograft
Strength	High	High	Very High	Variable
Stiffness	Rigid	Elastic	Moderate-High	Moderate
Incision Pain	Moderate	Low	Low	None
Kneeling Pain	High	Low	Low	None
Ideal Profile	Elite Impact Sport	Active Lifestyle	High Demand	Multi-ligament / >40

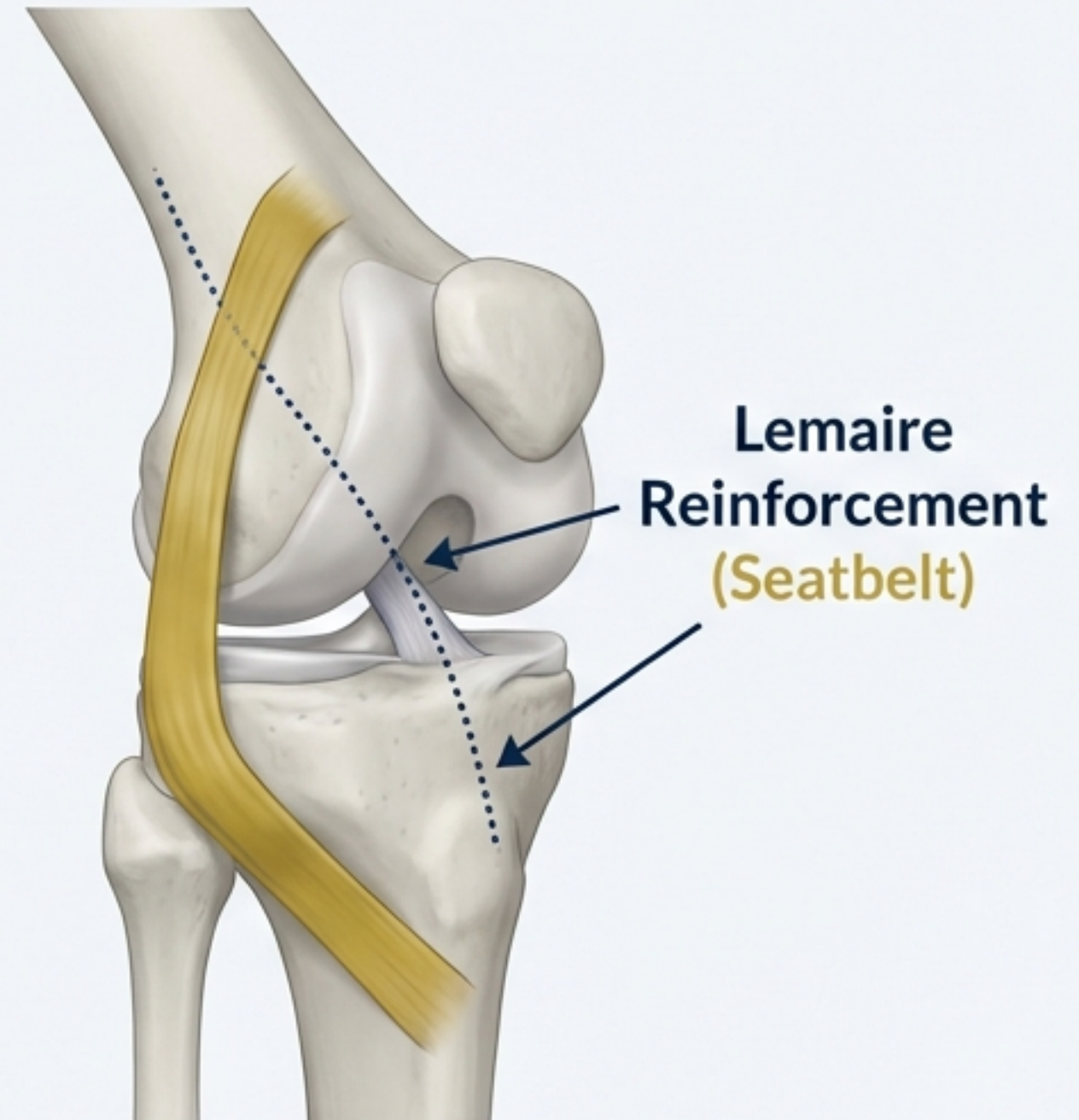
Reinforcing the Repair: The Lemaire Technique

Advanced Stability for High-Risk Knees

The Problem: The “Pivot Shift”—a feeling that the knee is buckling sideways.

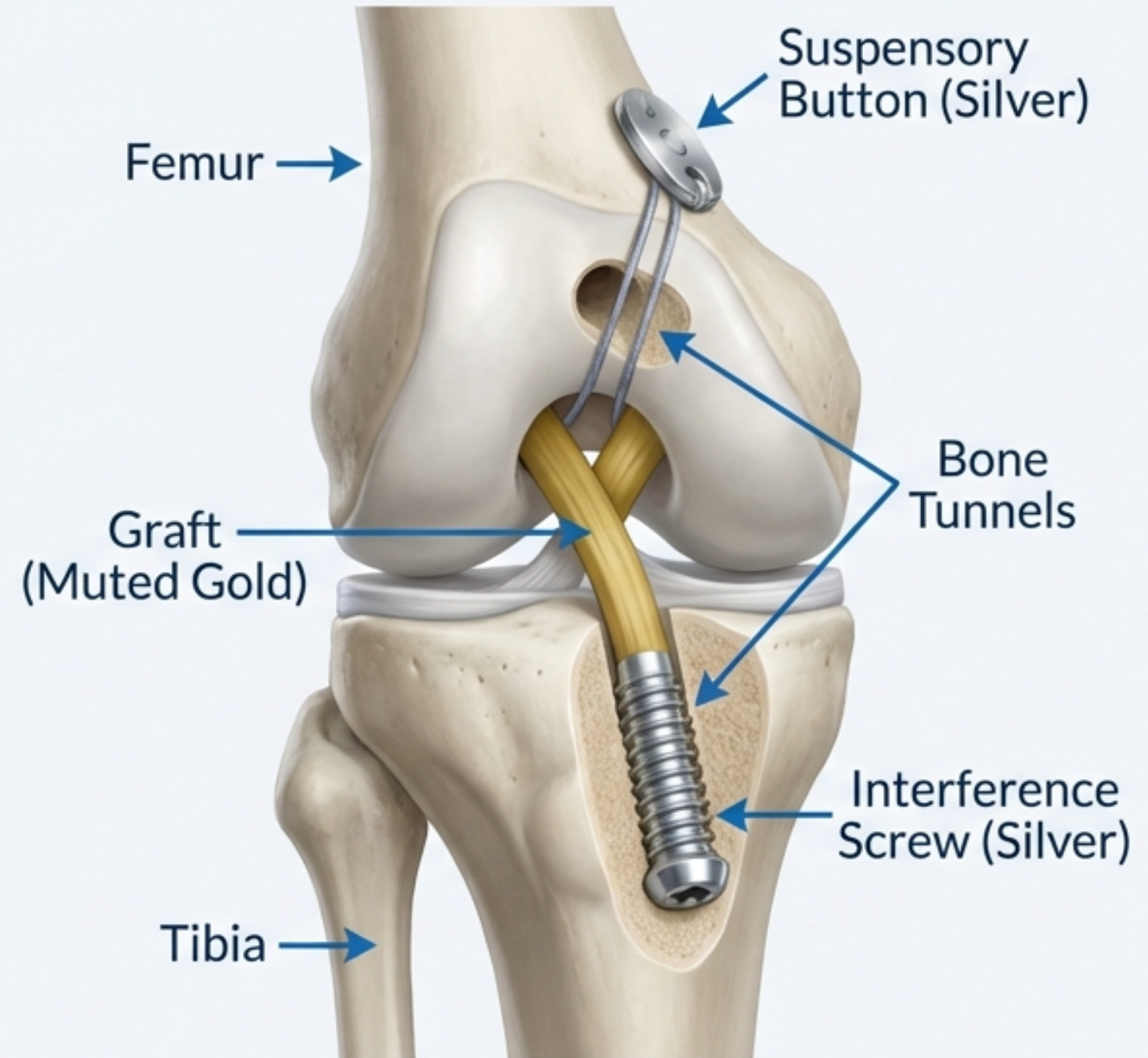
The Solution: We perform a **Lateral Extra-articular Tenodesis**. Think of this as a “seatbelt” on the outside of the knee.

Benefit: It protects the new ACL graft by preventing excessive rotation, significantly reducing the risk of re-rupture.



Anchoring the New Ligament

- **Fixation:** The graft must be securely anchored to the bone to allow healing.
- **Interference Screws:** Act like a wedge, pushing the graft tight against the bone tunnel.
- **Suspensory Buttons:** Small metal anchors that flip on the outside of the bone to hold tension (like a toggle bolt).
- **Biological Union:** Over 6–12 weeks, your bone grows into the graft (osseointegration), making the fixation permanent.



The Road to Recovery: 9-12 Months



0-6 Weeks: Protection

- Reduce swelling.
- Protect the fixation.
- Limited weight-bearing.

6-12 Weeks: Motion

- Regain range of motion.
Danger Zone: Graft is weakest here as it remodels.

3-6 Months: Strengthening

- Build quadriceps and hamstring mass.

6+ Months: Return to Activity

- Agility drills, jumping, and eventual return to sport.

Recovery is a marathon, not a sprint. Biology cannot be rushed.

Keys to a Successful Outcome



Commitment

Rehabilitation is 50% of the success. You must follow the physical therapy protocol.



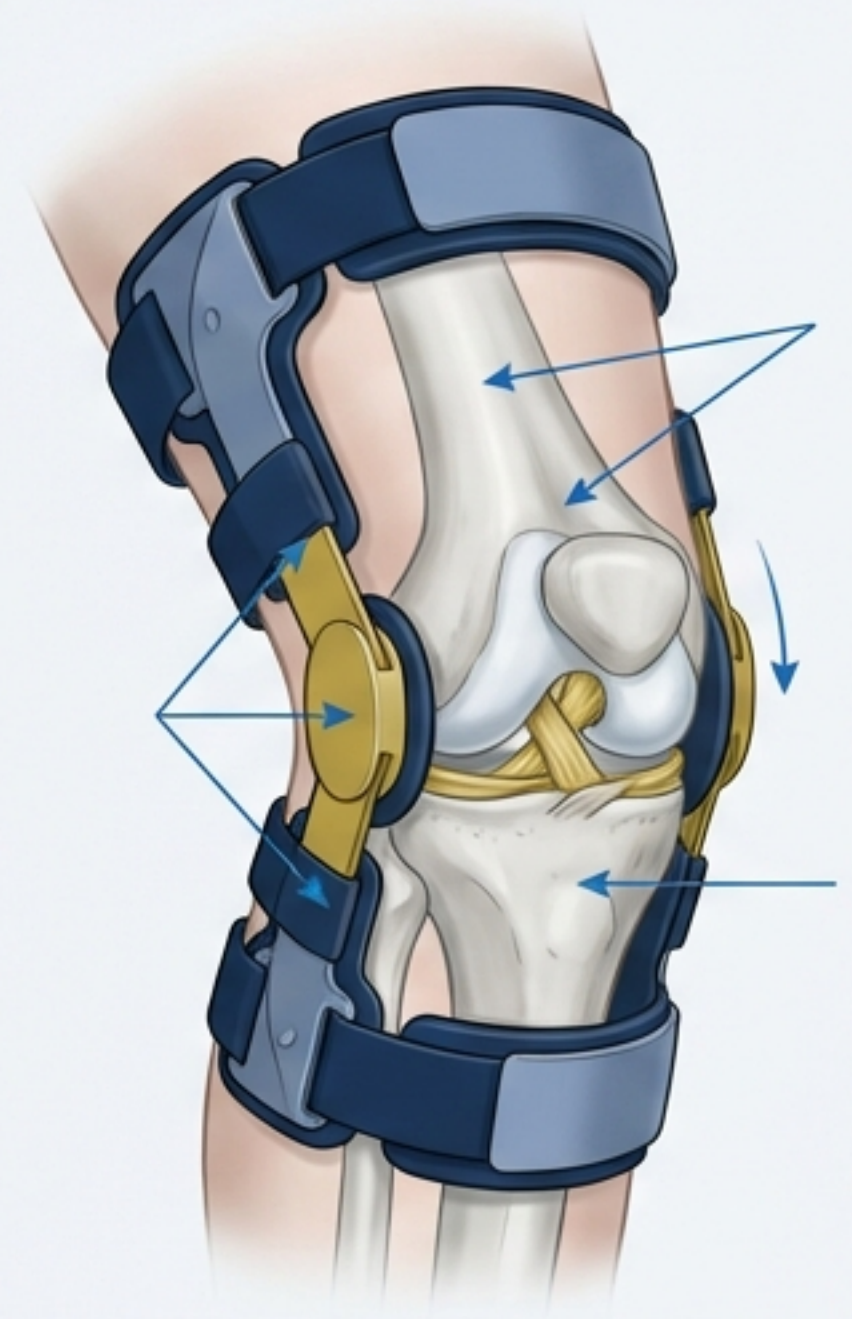
Patience

Feeling good at 3 months does not mean the graft is ready for sports. Do not rush the timeline.



Protection

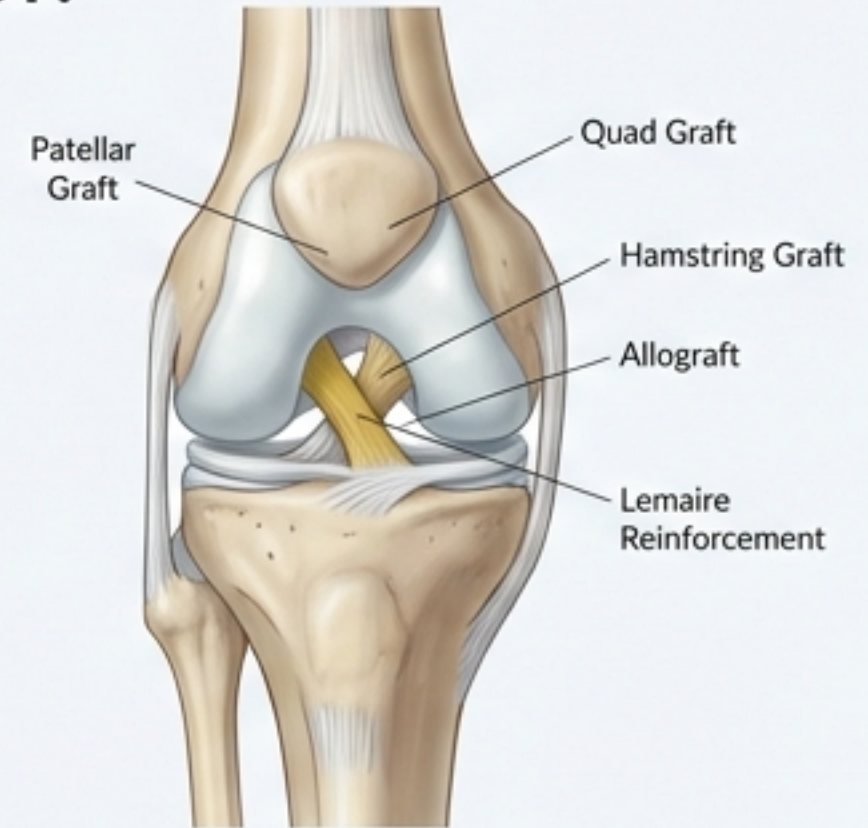
We may use a specialized brace (like a PCL rebound brace) to protect the healing ligaments against gravity.



Your Knee, Your Plan

Every knee is unique. We do not use a “one size fits all” approach. Based on your anatomy, activity level, and specific injury pattern, we will select the optimal combination of:

- 1. Graft Type (Patella, Quad, Hamstring, or Allograft)
- 2. Reinforcement (Lemaire Technique)
- 3. Rehabilitation Timeline



Our goal is to give you a stable, trustworthy knee for the long term.

Please ask questions about which graft is right for you.