KNEE COMPLEX – CLINICAL PUZZLE

1. Young Cricketer with Acute Knee Swelling

19-year-old fast bowler felt a "pop" while landing. Immediate swelling, unable to bear weight. Observation: positive Lachman and anterior drawer, large joint effusion. Real-time: Q angle 18°. Focus: structure of tibiofemoral joint and role of ACL.

Options for Intervention:

A. Immediate open-chain quadriceps exercises

B. Protected weight-bearing with brace + effusion control + closed-chain exercises after 2 weeks

C. Aggressive passive hyperextension stretching

D. Continue bowling with taping only

Structured Reasoning: Compare accuracy (ACL stability), safety (secondary injury), efficiency (return to sport), resources, long/short-term, ethics (career).

Option B protects graft equivalent, safe, evidence-based. Others risk instability.

Best: B for physiological accuracy and long-term stability.

2. Middle-aged Teacher with Medial Knee Pain

45-year-old Mrs. Saroja complains of pain on inner knee while climbing stairs. Observation: valgus stress positive at 30°, McMurray positive, Q angle 22°. Real-time: mild effusion. Focus: menisci and medial–lateral stability.

Options for Intervention:

A. Varus taping + vastus medialis oblique (VMO) strengthening

B. Immediate arthroscopic meniscectomy

C. High-load open-chain knee extension

D. Complete rest for 6 weeks

Structured Reasoning: Evaluate accuracy (meniscal load), safety (progression), efficiency (daily function), ethics (teaching job).

Option A unloads medial compartment, safe, long-term benefit.

Best: A for conservative physiological correction.

3. Elderly Lady Post-TKR with Stiffness

68-year-old Lakshmi, 6 weeks post-total knee replacement, ROM 10°–80°. Observation: tight patellar mobility, weak quadriceps. Focus: patellofemoral joint and locking–unlocking mechanism.

Options for Intervention:

A. Aggressive manipulation under anaesthesia now

B. Patellar mobilizations + quadriceps setting + gradual closed-chain progression

C. Passive extension with weights hanging off bed

D. Avoid all exercises till pain reduces

Structured Reasoning: Accuracy (capsular tightness), safety (fracture risk), efficiency (daily walking), ethics (independence).

Option B safe, graded, restores screw-home mechanism.

Best: B for safety and functional recovery.

4. Teenage Basketball Player with Patellar Tendinopathy

17-year-old player reports pain below patella after jumping. Observation: tender inferior pole, positive decline squat test, Q angle 20°. Focus: patellofemoral joint and muscle function.

Options for Intervention:

A. Immediate eccentric decline squats at full pain

B. Isometric quadriceps holds → progressive eccentric loading on decline board

C. Stretching hamstrings only

D. Complete rest 3 months

Structured Reasoning: Accuracy (tendon load), safety (rupture), efficiency (return to court), ethics (scholarship).

Option B evidence-based (Cook & Purdam model), safe progression.

Best: B for tendon physiology and ethics.

5. Factory Worker with PCL Injury After Fall on Flexed Knee

38-year-old Murugan fell on dashboard, posterior sag sign positive. Observation: posterior drawer ++, no varus/valgus laxity. Focus: posterior stability and axes of knee.

Options for Intervention:

A. Immediate reconstruction

B. Progressive quadriceps strengthening + proprioception + delayed surgery if symptomatic

C. Hamstring strengthening only

D. Long knee brace forever

Structured Reasoning: Accuracy (PCL function), safety (instability), efficiency (work return), ethics (livelihood).

Option B conservative first-line for isolated PCL, safe.

Best: B for physiological and ethical balance.

6. College Runner with IT Band Syndrome

21-year-old long-distance runner has lateral knee pain at 30° flexion. Observation: positive Ober's test, weak gluteus medius, Q angle 19°. Focus: effect of muscle imbalance on patellofemoral and tibiofemoral joint.

Options for Intervention:

A. Foam rolling IT band aggressively

B. Gluteus medius strengthening + hip control training + gradual return to running

C. Local ultrasound and stretching only

D. Stop running permanently

Structured Reasoning: Accuracy (kinetic chain), safety, efficiency (competition), ethics.

Option B addresses root cause, evidence-based.

Best: B for biomechanical correction.

7. Child with Osgood-Schlatter Disease

12-year-old football player reports painful tibial tuberosity bump. Observation: swelling, pain on resisted extension. Focus: growth plate and extensor mechanism.

Options for Intervention:

A. Immediate knee immobilization 6 weeks

B. Activity modification + quadriceps stretching + ice + gradual return

C. Local steroid injection

D. Surgery to remove ossicle

Structured Reasoning: Accuracy (apophysitis), safety (growth), efficiency (play), ethics (development).

Option B self-limiting condition, safe, standard care.

Best: B for age-appropriate management.

8. Post-Meniscectomy Patient with Recurrent Effusion

42-year-old man, 3 months post-partial medial meniscectomy, recurrent swelling after walking. Observation: mild valgus alignment, weak VMO. Focus: functions of menisci and long-term effects

of injury.

Options for Intervention:

A. Repeat arthroscopy and total meniscectomy

B. VMO and core strengthening + weight management + proprioception

C. Intra-articular steroid injection monthly

D. Accept osteoarthritis as inevitable

Structured Reasoning: Accuracy (load distribution), safety (cartilage protection), long-term (OA prevention), ethics.

Option B slows progression, evidence-based.

Best: B for joint preservation.

9. Elderly with Severe OA Knee Waiting for TKR

70-year-old gentleman, grade IV OA, varus deformity 15°, fixed flexion 20°. Focus: pre-operative physiotherapy and Q angle changes.

Options for Intervention:

A. Aggressive hamstring stretching to correct FFD

B. Quadriceps strengthening + gait training + pre-op education + weight loss advice

C. Passive stretching by attendant

D. Bed rest till surgery

Structured Reasoning: Accuracy (prehabilitation), safety (fracture risk), efficiency (post-op recovery), ethics (independence).

Option B improves post-op outcomes, evidence-based.

Best: B for prehabilitation and ethics.

10. Female Teacher with Patellar Maltracking

35-year-old teacher reports anterior knee pain while sitting long. Observation: J sign, lateral tilt, Q angle 23°, hypermobile patella. Focus: patellofemoral joint structure and function.

Options for Intervention:

A. Lateral retinacular release surgery immediately

B. McConnell taping + VMO training + hip external rotator strengthening

C. Quadriceps stretching only

D. Avoid stair climbing forever

Structured Reasoning: Accuracy (dynamic control), safety (non-surgical first), efficiency (classroom duties), ethics.

Option B first-line conservative, high success rate.

Best: B for evidence-based patellar stabilization.