# KNEE VASU PAI

Arthritic history is similar to that of the hip.
Add history of give way and locking, swelling

**INJURY MECHANISM**

When
How
Sequence
Progress
Disability

**IKDC Activity**

**I - Strenuous activity**
(contact sports involving pivoting and cutting)

**II - Moderate activity**
(pivot sports without contact; manual work)

**III - Light activity**
(jogging, running)
**IV - Sedentary activity**

**LOCKING**

- in acute meniscal tear: the knee may intermittently lock, and will not allow full extension;

**Meniscal locking (true locking)**: This is what a physician would consider to be locking. It is the impossibility fully to extend the knee for an appreciable period of time (more than a few minutes). This “passive flexion deformity" is brought on by a mechanical obstacle, which makes the knee stop short of full extension. The cause may be a bucket-handle tear of the meniscus, or a bulky flap that has dislocated forwards in the joint; a loose body or an ACL stump may also be to blame.

**False locking [Patellar catching]** This is what the patient would consider to be locking. It is a momentary "sticking" of the knee, during a flexion-extension

movement, with the knee incapable of flexing or extending beyond that particular point. Catching is relieved as soon as weight is transferred to the other side. Usually, patellar cartilage damage will be found to have caused this fleeting episode of "locking."

**Giving way**

Anterior displacement of the tibia occurs with quadriceps contraction at 15-25 deg of flexion of the knee. This is normally resisted by the ACL)

**"Going out"**: This is the term used by many lay persons to describe what will usually be found to be a torn ACL or a dislocation of the patella.

**"Giving way"**: This term is used to describe the sensation of the knee suddenly failing to provide proper support, especially when walking on uneven ground. The symptom may be due to three mechanisms:

**Interposition**: If, during weight bearing, a third structure (meniscus, synovial membrane, cartilage, etc.) is placed between the opposing cartilage surfaces of the joint, a protective reflex will be triggered. This reflex will make the quadriceps relax and unlock the knee, to allow the joint to clear itself.

**Cartilage damage**: If one or both of the cartilage surfaces are damaged, and the surfaces come into contact, the quadriceps may also be made to relax.

**Muscle weakness**: This may occur in quadriceps wasting, in polio, after surgery, etc.

**SWELLING**

Onset of swelling: Immediate swelling suspect ACL rupture

Delayed [>24 hours] Meniscal tear

**Hemarthrosis**

>70% of patients with acute Hemarthrosis, will have ACL tear;

Typically it develops within two hours of injury

**ADDITIONAL**

**Treatment history:** Medication, Physiotherapy and Surgery

Age; Professional sports man

Double jointed [Ligament laxity]

**Disability**: Running,
Walking on uneven ground,
Cutting and twisting,
Sports; work

## I INSPECTION

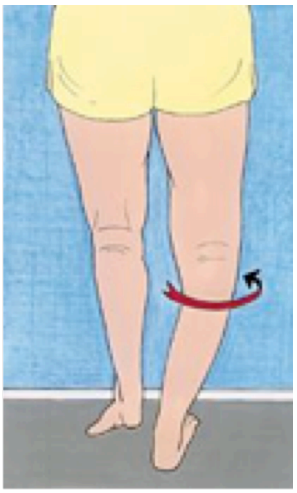
### a. GAIT [OBSERVE]

**Antalgic** Hurries on the affected leg
Stance phase is less
Indicates: Painful joint

**Back knee gait** Hyperextends on stance
Indicates: weakness in the quadriceps

**Varus thrust** Leg goes into more varus on weight bearing
Indicates: Advanced arthritis

**Varus Thrust**



**Stiff knee gait** Less flexion during swing gait
D/D: Arthritis
Arthrofibrosis

**The toeing angle** is the angle between the axis of the foot and the direction in which the subject is walking. Normally, the axis will be seen to point in a slightly lateral direction, enclosing an angle of 10° to 15°. In the normal postural pattern, this angle will be the same on both sides.

**Ask the patient to walk on heel and toes**

**G**ives global indication whether dorsiflexors or plantar flexors weakness

**b. POSTURE** Inspect from Front, lateral and Back

**Front** Varus or valgus deformity

Look for any suprapatellar swelling

Any quadriceps wasting

Any old skin scars

**Lateral** Look for any flexion deformity

**Posterior** Look for any swelling in the popliteal region

Look for any hamstring or calf wasting

Look for any varicose veins

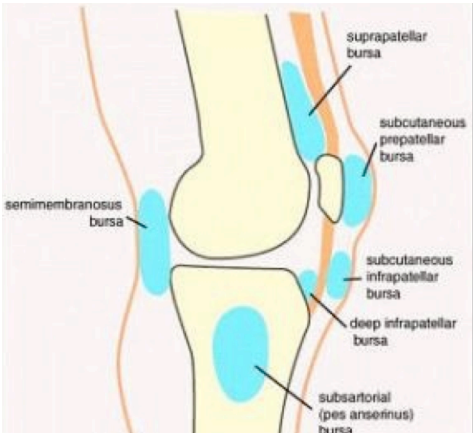
**III SWELLING**

**Generalized** All fossae around patella obliterated

D/D: Effusion

Hemarthosis

**Bursa**




**Localised** Baker's cyst

Semimebranous bursa

Pes anserinus bursa

Housemaid bursa;

Prepatellar bursa

Clergyman's bursa:

Infrapatellar bursa

**IV SITTING**

**a. Position of the patella**

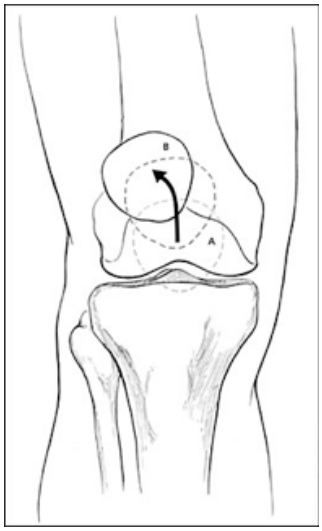
Normal patella faces slightly outwards. When patella faces inwards, patellar squint

**V. Patellar tracking:**

From flexed position, ask the patient to extend. Normally at extension there is slight lateral shift of the patella.

In patellar subluxation, patella deviates laterally [J sign]

**J Sign**



**VI. Extensor mechanism**

Surgeon at the foot end of the bed

Examiner holds the heal and lifts both legs

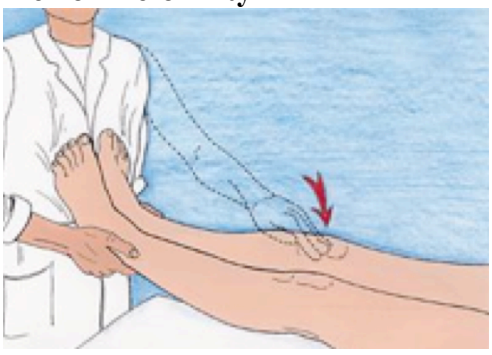
Now ask the patient to hold the leg up

**Flexed deformity**

Patient cannot extend the knee fully

Examiner also cannot extend the knee passively

**Flexion Deformity**



**Extensor lag**

Patient cannot extend the knee fully but

Examiner can extend the knee fully

## II PALPATION

A. **LOCALIZING TENDERNESS**

Both femoral and tibial condyles

Anterolateral and anteromedial joint line

Medial and lateral patella

**Medial meniscus tear**: Knee in Flexion [100º], Pain in the posterior 1/3 of the joint line

**Lateral meniscus tear:** Knee in Flexion at 30º, Pain in the middle third lateral joint line

B. **BULGE SIGN**: Indicates fluid in the joint

Gently stroke upwards along the medial aspect of the patella, pushing fluid towards the top and lateral aspects of the joint.

**Bulge sign**

The last time of the stroke, place the hand over the suprapatellar pouch

No with the dorsum of the fingers, stroke the lateral gutter quickly from above downwards. The fluid, which was milked to the lateral aspect, will be pushed back towards the medial area of the joint, causing the medial skin to bulge out. Test is positive even when fluid is as low as 10 ml

c. **BALLOTMENT**

Slightly flex the knee, which is to be examined. Place one hand on the supra-pateallar pouch to force any fluid to the central part of the joint. Gently push down on the patella with your thumb. If

**Patellar Ballotment**

there is  a sizable effusion, the patella will feel as if it's floating and "bounce" back up when pushed down against femur

## III RANGE OF MOVEMENT

**ROM**

Ask the patient to bend fully flex with hip in 90 º

| | |
|---|---|
| Normal active ROM | -5 to 140º |
| Functional range: | -3 to 120 º |

| | |
|---|---|
| Walk : Heel strike | 15 º |
| Swing  phase | 60 º |
| Getting in and out of chair | 115 º |
| Stairs | 100 º |

b. **CORRECTION OF VARUS AND VALGUS TEST AT 30º FLEXION**

In event of deformity, which gets corrected with varus or valgus stress at 30º indicate that the medial or lateral structures are not tight and a good correction can be achieved without soft tissue release

## IV EXAMINATION IN PRONE POSITION

**a. POPLITEAL SWELLING**

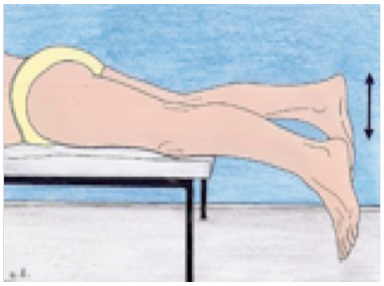
**Baker's cyst**: more prominent in extension than in flexion
Is in the midline
Common in adults

**Semimembranous bursa:** is more medial related to the tendon
More prominent on flexion
Common in children

**Lateral meniscal cyst:** Tense cystic swelling at the lateral joint line
Swelling more on extension and less on flexion
Swelling varies with time

**b. SUBTLE FIXED FLEXION DEFORMITY OF THE KNEE**

Position the patient prone, on a firm table, with the knees supported on the table and the legs protruding beyond the table's edge. One heel is seen to be higher than the other.



The distance between the two heels may be measured. It provides direct evidence of the flexion deformity.

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**DO NOT FORGET**

Examination for distal neurology
Vascular pulses
Hip movement [rotation]
Check spine