# Knee Examination _ Special Tests

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I. Introduction –
   a. Goals of examination:
      i. Establish differential diagnosis
      ii. Identify all involved structures
      iii. Identify all lesions
      iv. Identify factors contributing with disorder
      v. Establish prognosis & treatment plan

      ***Key to Successful Treatment is Recognition of Problem***

   b. Specific Examination Process
      i. Orderly process
      ii. Pain – mechanical
      iii. Anatomy & biomechanics determine pathology
      iv. Identify functional limitations

      ***Function Instability --------Functional Disability***

   ***c. Elements of Exam***
      i. Subjective history
      ii. Inspection & observation
      iii. Palpation
      iv. ROM
      v. MMT
      vi. Special tests
      vii. NV assessment
      viii. Instrumented testing
      ix. Knee scoring assessment

II. Components of Exam:
   a. Subjective history
      i. Chief complaint
      ii. Mechanism of injury
      iii. Did you hear or feel anything?
      iv. Swelling?

1. when
2. how much
3. early – late

v. Pain level
1. location, severity, nature

vi. level of function

vii. previous injuries &/or surgery

b. Inspection & Observation
i. Watch gait pattern
ii. Standing alignment
iii. Joint effusion
iv. Muscular atrophy
v. Quadriceps control
vi. Thrusting gait
vii. Quad avoidance gait
viii. Scars/incisions, etc
ix. Level of mobility
1. level surface, stairs, sit to stand, etc…

c. Palpation
i. Patellar mobility (M-L, S-I)
ii. Temperature
iii. Effusion & swelling
iv. Joint line
1. femoral side
2. meniscus
3. tibial side

v. Collateral ligaments
1. MCL (proximal to distal)
2. LCL (entire structure)

vi. Boney structures:

vii. soft tissue palpation

d. Objective Examination
i. ROM (PROM& AROM)
ii. Accessory motion
iii. Flexibility assessment
iv. Manual Muscle Testing

**v. Special Tests**

1. assessment of ligamentous stability
2. side to side assessment
3. assess translation & end feel
4. relaxed patient & clinician
5. know what your assessing

6. ligamentous assessment:

    a. PCL first
        i. Step off test
        ***Clancy: JBJS '82***
        ii. Gravity test
        iii. Active quad test
        ***Daniel et al: JBJS'88***
        iv. Posterior drawer test

    b. ACL tests
        i. Lachman's test (ACL)
        ii. Anterior drawer at 90 degrees (ACL)
        ***Noyes et al: Clin Orthop '80***
        iii. Anterior drawer with rotation
        iv. Pivot shift
        v. Jerk test
        ***Hughston: JBJS '80***

    c. Collateral ligaments
        i. Valgus stress at 0 deg. (TCL, PMS)
        ii. Valgus stress at 30 deg. (TCL)

        iii. Varus stress at 0 deg (FCL, PLS)
        iv. Varus stress at 30 deg (FCL)

    d. Posterolateral Instability
        i. External rotation at 30 deg
        ii. External rotation at 90 deg
        iii. Extension recurvatum test
        ***Jakob et al: Acta Orthop Scand '81***

7. Meniscus Testing

a. McMurray's
b. Apley compression test
c. Spring test
d. Compression test
e. Palpation

8. Neurovascular Testing
    a. Neurologic assessment
        i. Motor
            - Quads (L2,3,4)
            - Semimembraneous (S1,L5)
            - Biceps Femoris (S1)
            - PF
            - DF
        ii. DTRs
        iii. Sensation:
            - L3 – anterior thigh below knee
            - L4 – crosses anterior knee, medial knee & calf
            - L5 – lateral calf & knee
            - S2 – midline posterior thigh
        iv. Vascular assessment:
            - Dorsalis pedis
            - Capillary refill – big toe

9. Instrumented Knee testing:
    a. Stability assessment – KT testing
        i. KT 1000 or KT 2000
        ii. Side to side comparison
        iii. Anterior & posterior translation

***Daniel et al: AJSM '85***

    b. Muscular Performance
        i. Biodex testing
        ii. 180 & 300 o/sec
        iii. Side to side assessment
        iv. Torque to BW assessment
        v. Unilateral ratios
        vi. Fatigue
        vii. Work values
        viii. Acceleration

***Wilk KE (Phys Ther of the Knee 2nd Ed) Mangine (Ed)***
***Davies GJ : Compendium of Isokinetics***
***Wilk, Soscia,Romeniello: JOSPT '94***

c. Functional Assessment
    i. Hop testing
        - Side to side comparison
        - Single leg hop test
        - Distance
        - Timed
        - Cross over hop

***Noyes, Barber,Mangine: AJSM '91***
***Barber, Noyes,Mangine: Clin Orthop '90***

d. Proprioception Testing
    i. Biodex stability system
    ii. Passive active joint reposition sense

e. Knee Rating System:
    i. Cincinnati (Noyes)
    ii. Lysholm
    iii. International Knee Documentation Committee (IKDC)
    iv. KOS
    v. Pittsburgh (Irrgang)

III. Summary
a. Key points:
    i. Numerous keys to clinical exam
    ii. Subjective a key component
    iii. Knowledge of anatomy & biomechanics
    iv. Think kinetic chain effect
    v. Soft tissue integrity & quality
    vi. Know what your assessing
    vii. Relaxed patient ----relaxed clinician
    viii. Pull it all together

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