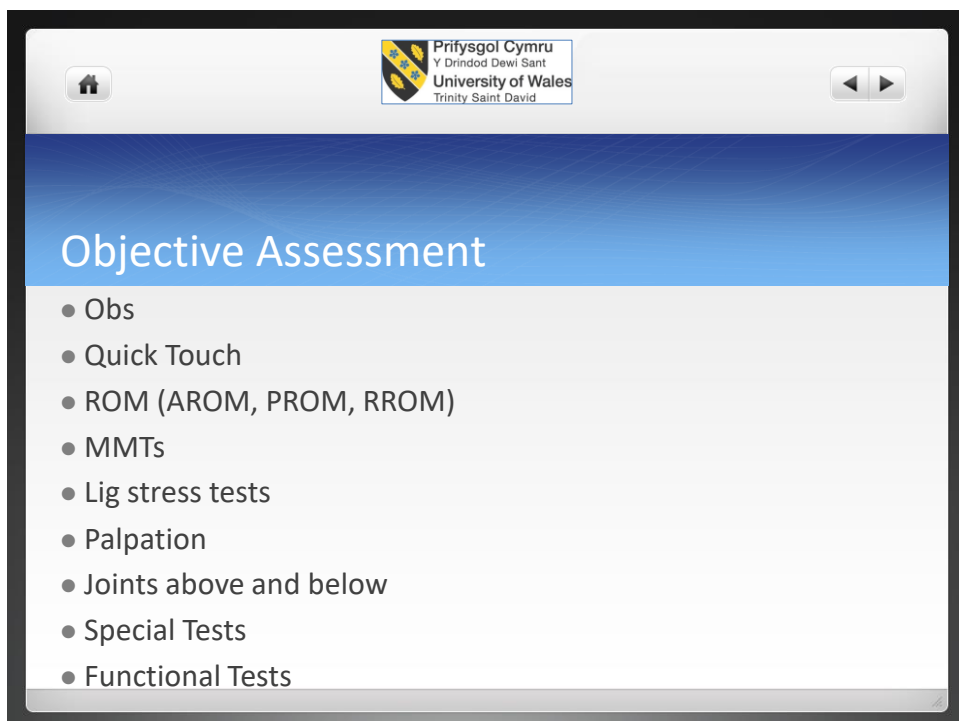
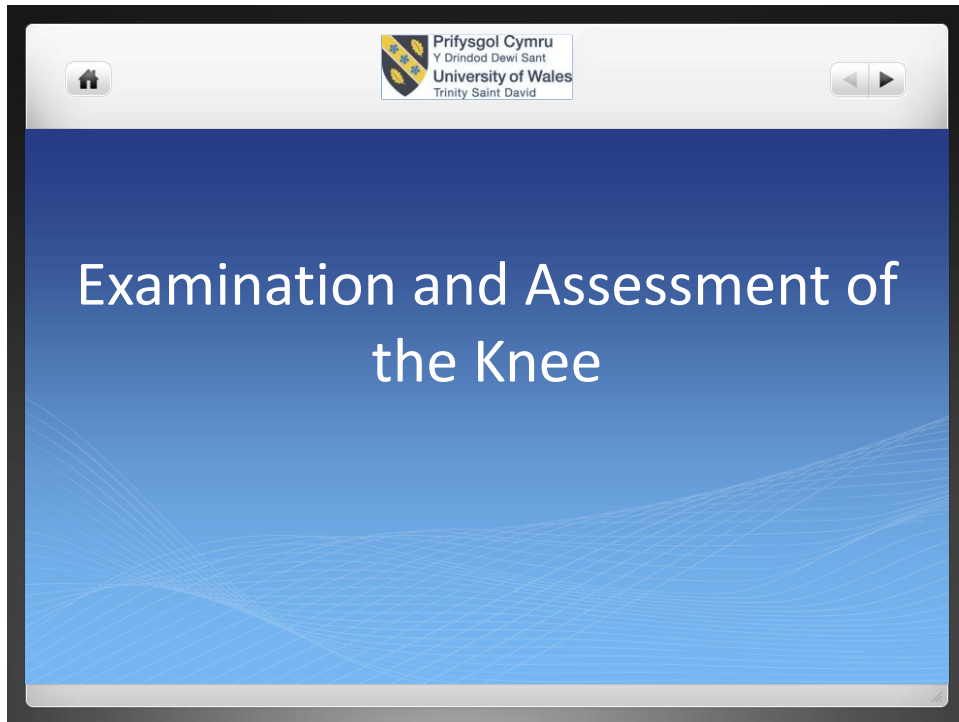










Observations of the Knee

- Patella alignment (alta or baja)
- Varus deformity/ Genu Varum
- Valgus deformity/ Genu Valgum
- Fixed flexion deformity
- Hyperextension







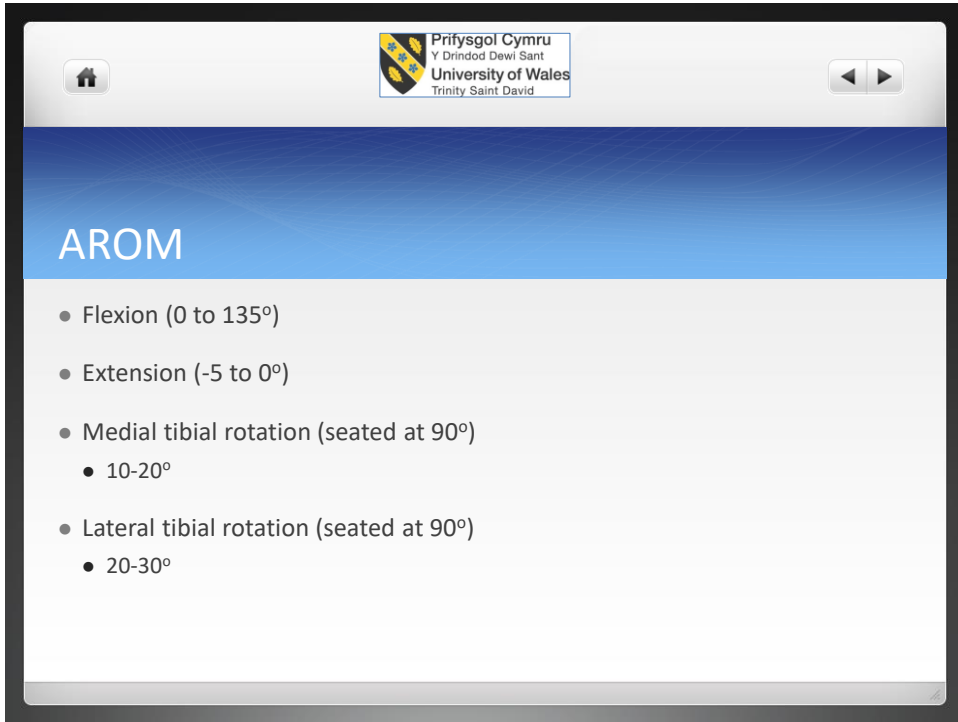






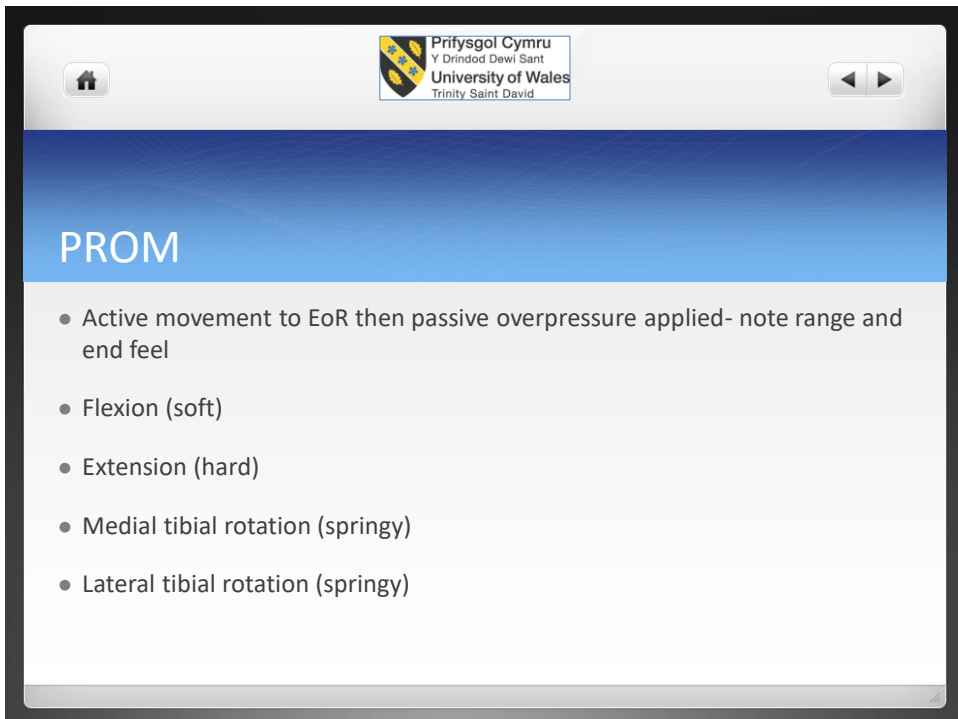

Quick Touch

- Back of the hand
- Bilateral comparison
- Temperature
- Texture



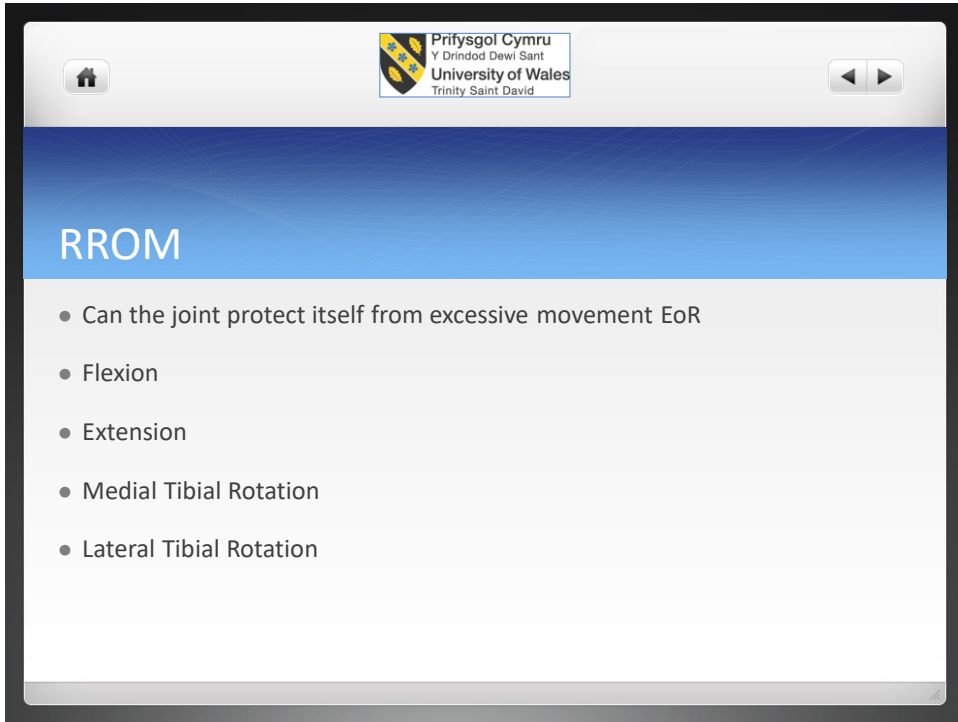
The slide is titled 'AROM' (Active Range of Motion) and is part of a presentation from the University of Wales Trinity Saint David. The header includes the university's name in Welsh and English, along with its logo. The slide lists the following range of motion values:

- Flexion (0 to 135°)
- Extension (-5 to 0°)
- Medial tibial rotation (seated at 90°)
 - 10-20°
- Lateral tibial rotation (seated at 90°)
 - 20-30°



The slide is titled 'PROM' (Passive Range of Motion) and is part of a presentation from the University of Wales Trinity Saint David. The header includes the university's name in Welsh and English, along with its logo. The slide lists the following range of motion values:

- Active movement to EoR then passive overpressure applied- note range and end feel
- Flexion (soft)
- Extension (hard)
- Medial tibial rotation (springy)
- Lateral tibial rotation (springy)

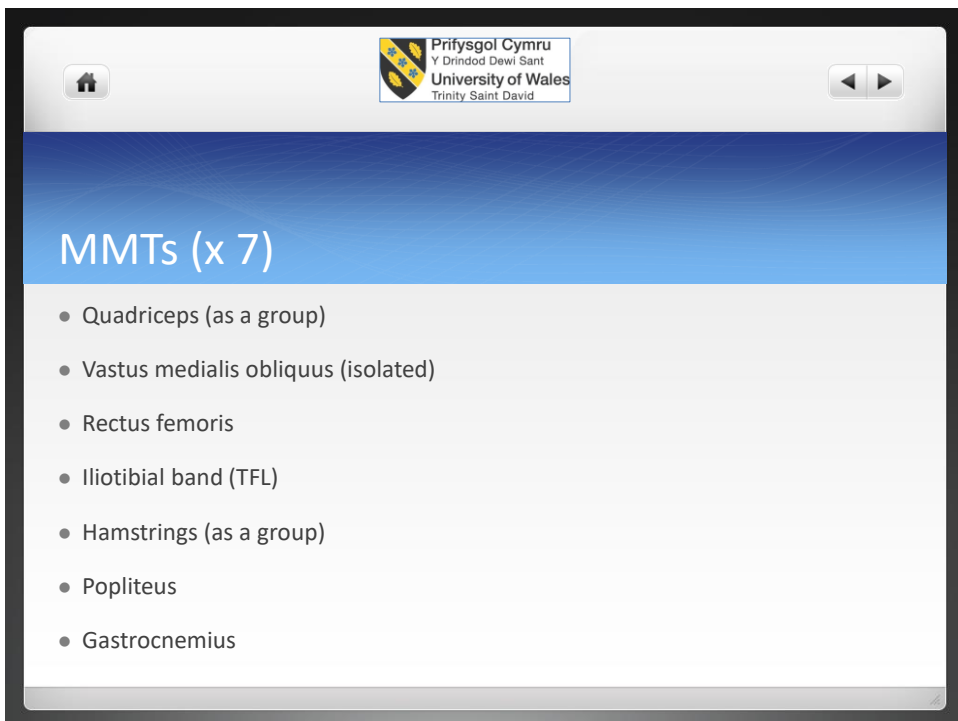


The slide is titled "RRROM" in white text on a blue gradient background. It features a header with the University of Wales Trinity Saint David logo and name in both Welsh and English. A list of five bullet points is displayed on a light gray background.

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RRROM

- Can the joint protect itself from excessive movement EoR
- Flexion
- Extension
- Medial Tibial Rotation
- Lateral Tibial Rotation



The slide is titled "MMTs (x 7)" in white text on a blue gradient background. It features a header with the University of Wales Trinity Saint David logo and name in both Welsh and English. A list of seven bullet points is displayed on a light gray background.

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MMTs (x 7)

- Quadriceps (as a group)
- Vastus medialis obliquus (isolated)
- Rectus femoris
- Iliotibial band (TFL)
- Hamstrings (as a group)
- Popliteus
- Gastrocnemius



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Quadriceps as group

- **Vastus Lateralis**
 - Greater trochanter, Intertrochanteric line, and Linea aspera of the femur
- **Vastus Medialis**
 - continuous line of attachment on the femur, which begins on the front and middle side (anteromedially) on the intertrochanteric line of the femur
- **Vastus Intermedius**
 - arises from the front and lateral surfaces of the body of the femur in its upper two-thirds, sitting under Rectus Femoris
- **Rectus Femoris**
 - anterior inferior iliac spine and the exterior surface of the bony ridge which forms the iliac portion of the acetabulum

Insertion

- Patella via the Quadriceps tendon and Tibial tuberosity via the Patellar ligament



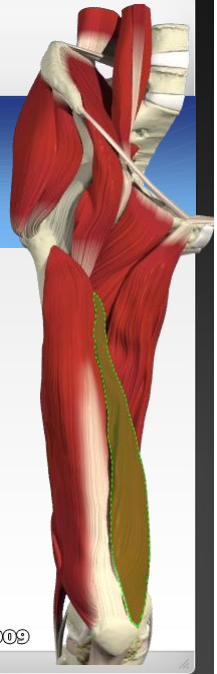


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Vastus Medialis Obliquus

- Continuous line of attachment on the femur, which begins on the front and middle side (anteromedially) on the intertrochanteric line of the femur.
- The fibres converge onto the inner (medial) part of the quadriceps femoris tendon and the inner (medial) border of the patella



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Rectus Femoris

- Origin
 - anterior inferior iliac spine and the exterior surface of the bony ridge which forms the iliac portion of the acetabulum
- Insertion
 - Patella via the Quadriceps tendon and Tibial tuberosity via the Patellar ligament

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Tensor Fascia Latae

Origin

- It arises from the anterior part of the outer lip of the iliac crest; from the outer surface of the anterior superior iliac spine, and part of the outer border of the notch below it, between the gluteus medius and sartorius

Insertion

- Gerdy's tubercle (lateral tubercle of tibia) and lateral retinaculum of patella

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Hamstrings over the knee

Muscle	Origin	Insertion	Nerve
Semitendinosus 2	ischial tuberosity	medial surface of tibia	tibial
Semimembranosus 3	ischial tuberosity	medial tibial condyle	tibial
biceps femoris - long head 1	ischial tuberosity	lateral side of the head of the fibula	tibial
biceps femoris - short head 4	linea aspera and lateral supracondylar line of femur	lateral side of the head of the fibula (common tendon with the long head)	common fibular





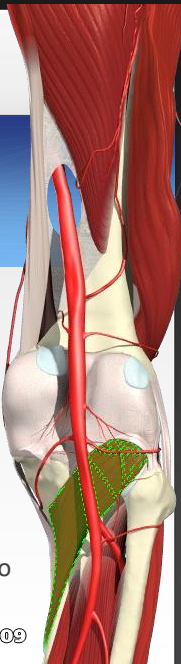


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Popliteus

- Posterior to the knee
- Flexes the knee (weak) and **MEDIALY ROTATES** tibia on the femur
 - Un-locks the **SCREW HOME MECHANISM**
- Origin: outer surface of lateral condyle of femur
- Insertion: posterior surface of tibia above soleal line
- Also has attachment to lateral meniscus drawing it posteriorly to prevent impingement



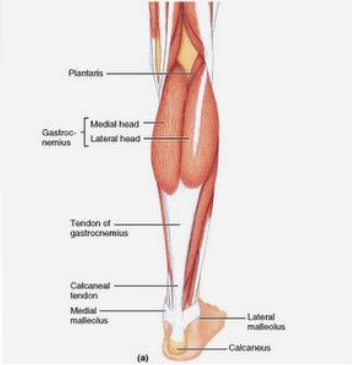


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Gastrocnemius

- Origin
 - Medial head
 - Medial supracondylar ridge and adductor tubercle of femur
 - Lateral head
 - Outer surface lateral condyle of femur
- Insertion
 - Via Achilles tendon to calcaneus
- Action
 - Plantarflexion of ankle and assists knee flexion





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Ligament Stress Tests

- CAUTION!
 - Watch for the Posterior Sag Sign!
 - Give False Positives on ACL Tests AND False negative on PCL test

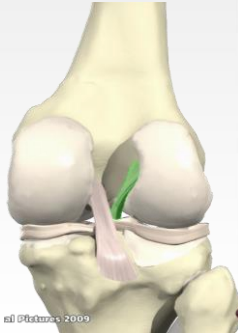


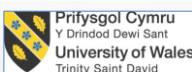


Ligament Stress Tests (x4)

The Anterior Cruciate Ligament

- ACL passes **posteriorly, laterally** and **proximally** from the anterior tibial spine to the medial surface of the lateral condyle of femur
- Spirals medially through 110°
- Anteromedial band – limits flexion
- Posterolateral band – limits extension
- Provides approx 86% anterior tibial restraint and 30% of medial restraint





Ligament Stress Test

- Anterior Drawer Test (90°)
 - ACL stress test
- Normally springy end feel within approx 6mm of anterior translation
- Positive test
 - Pain (up to grade II+)
 - Laxity
- Abnormal/no end feel with large amount of excursion (15mm+)

DDX

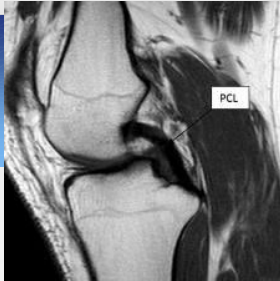
- MCL and posterior capsule provide secondary restraint
- Click? Meniscal

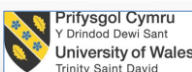




Ligament Stress Test

- Posterior Cruciate Ligament
 - Passes **anteriorly**, **medially** and **proximally** from the posterior intracondylar area of the tibia to the lateral side of the medial femoral condyle
- 2 bundles
 - Anterolateral band – limits flexion
 - Posteromedial band – limits extension
- Provides 94% posterior tibial restraint and 36% of lateral tibial restraint



Ligament Stress Test

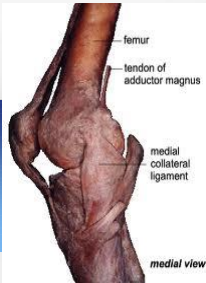
- Posterior Drawer Test
- PCL Stress Test
 - Normal PCL will restrain posterior tibial translation
 - Positive Test
 - Laxity (greater than 9.2mm indicates Grade III)
 - Pain (grade I-II)
- Other structures involved
 - PLCC: Arcuate complex, popliteal oblique ligament AND ITB
 - If suspect PLCC repeat at 30o
 - Laxity at 90o and 30o = PCL and PLCC
 - Laxity at 90o ONLY = PCL in isolation

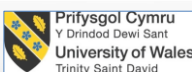




Ligament Stress Test

- Medial Collateral Ligament
 - Medial epicondyle of the femur to the medial condyle and shaft of tibia
 - Flat and broad
 - Superficial fibres extend below the level of the tibial tuberosity (1:3)
 - Deep fibres attach via the capsule to the medial meniscus
 - Covered by Pes Anserinus Tendons (SGT)







Ligament Stress Tests

- Valgus Stress Test
 - 0° and 30°
- Positive Sign
 - Pain over MCL
 - Loss of normal springy end feel
 - Increased laxity
 - 5mm Grade I
 - 5-10mm Grade II
 - 10mm+ Grade III
 - 15o + valgus significant and may suggest secondary damage to ACL and PCL
 - Especially if LAXITY is present at 0o

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Ligament Stress Test

- Lateral Collateral Ligament
 - Round, cord like ligament
 - Superficial (does not blend with capsule)
 - Lateral epicondyle of femur to lateral surface of the head of fibula (anterior to the apex)

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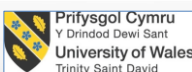
Ligament Stress Test

- Varus Stress Test
 - Normal Varus is approx 7°
- Positive sign
 - Pain (up to grade II)
 - Laxity (8mm is consistent with Grade III)
- Where grade III suspected consider damage to ACL, PCL, PLCC, ITB
- Performed at 0° and 30°
 - PCL will restrain Varus forces in knee extension



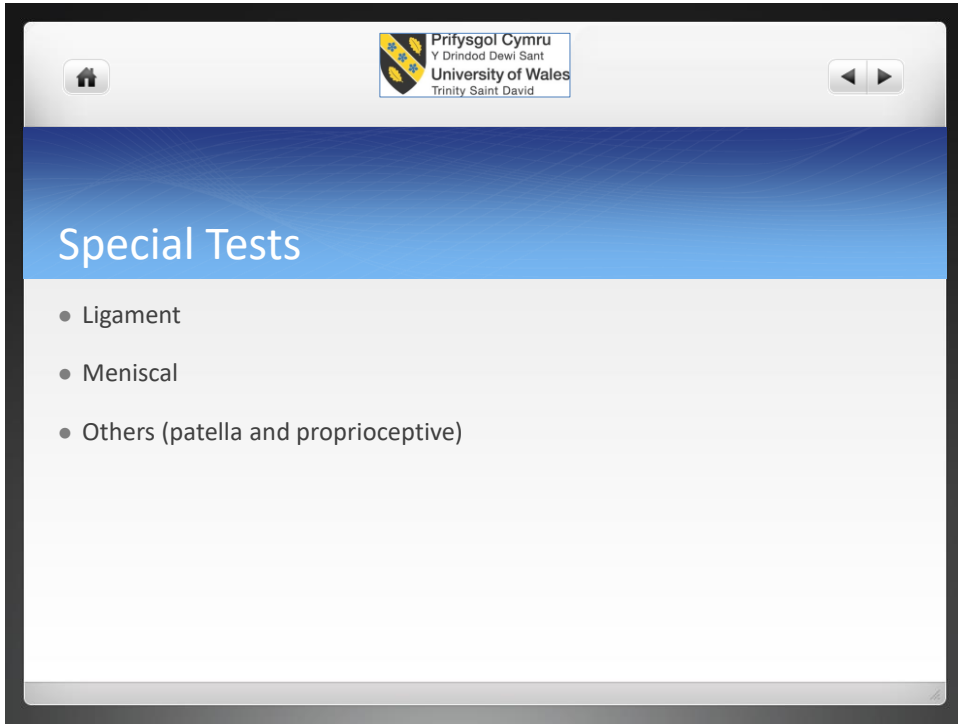
Palpation

- Bony landmarks
 - Head of fibula, anterior tibial border, tibial condyles, Gerdy's tubercle, tibial tuberosity, patella, femur, medial and lateral condyles and epicondyles.
- Other soft tissues
 - LCL, ITB, Biceps Femoris, patella tendon/ligament, MCL, pes anserinus, semi membranous and tendinosus, popliteal fossa, hamstrings belly...



Joints above and below

• Above • AROM • Hip Flexion • Hip Extension	• Below • AROM • Talocrural Plantar and Dorsiflexion
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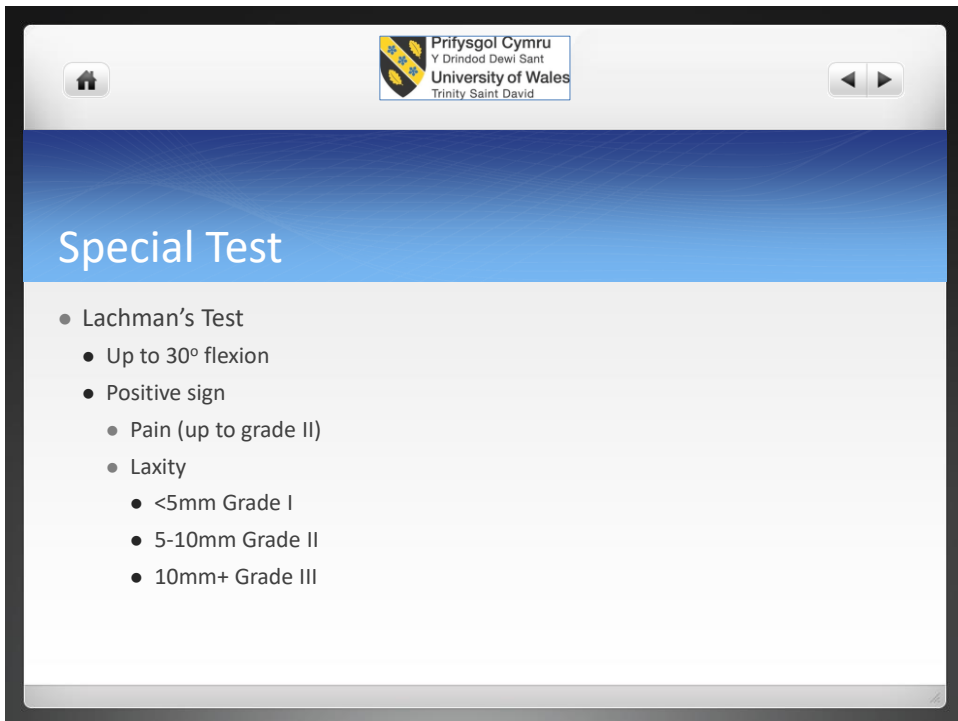


The slide is part of a presentation from the University of Wales Trinity Saint David. It features a header with the university's name in Welsh and English, and its logo. The main title is 'Special Tests'. Below the title, there is a bulleted list of test categories.

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Special Tests

- Ligament
- Meniscal
- Others (patella and proprioceptive)



This slide continues the presentation, focusing on a specific 'Special Test'. It details the procedure for Lachman's Test, including the degree of flexion and the grading criteria for laxity.

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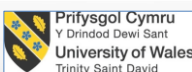
Special Test

- Lachman's Test
 - Up to 30° flexion
 - Positive sign
 - Pain (up to grade II)
 - Laxity
 - <5mm Grade I
 - 5-10mm Grade II
 - 10mm+ Grade III



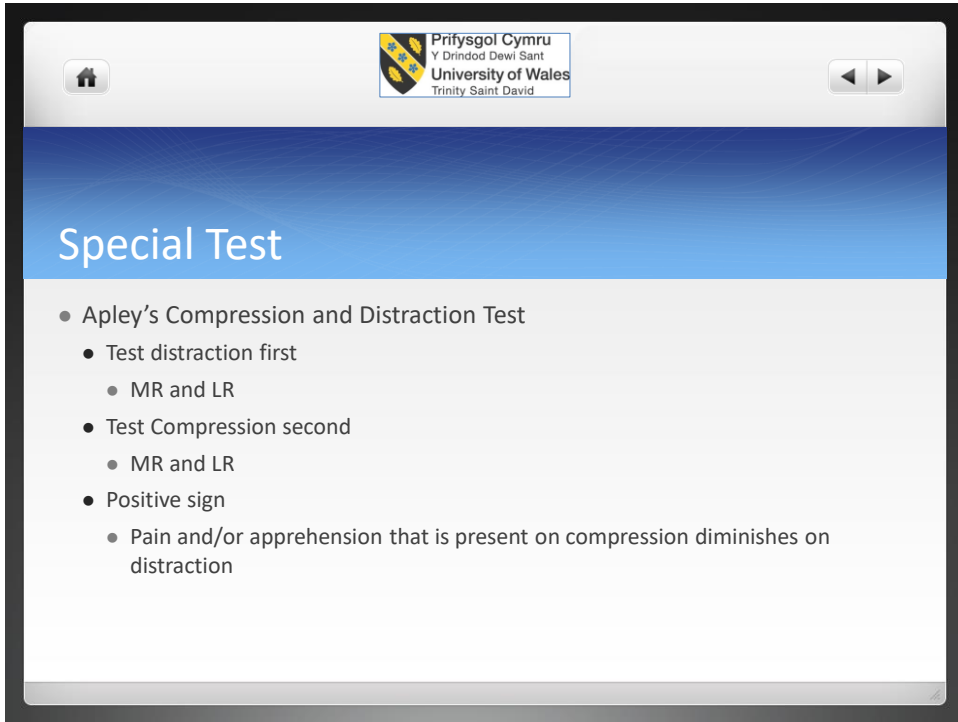
Special Test

- Slocum Test (AMRI and ALRI)
 - Similar to anterior drawer but therapist adds a medial or lateral rotation on prior to drawer
- AMRI: (add LR) pain and laxity
 - <12mm Grade I
 - 12-20mm Grade II
 - 20mm+ Grade III
 - MCL, Medial Joint Capsule, POL and ACL (chronic MM)
- ALRI (add MR)
 - Posterolateral capsule, cruciates, popliteus, LCL and ITB



Special Test

- McMurray's Test
 - Meniscal Injury
 - Full PROM flexion, Full PROM LR (medial meniscus)
 - Move to in to extension
 - Positive sign
 - Pain
 - Click
 - Lock
 - Apprehension
 - Repeat with full PROM MR (lateral meniscus)

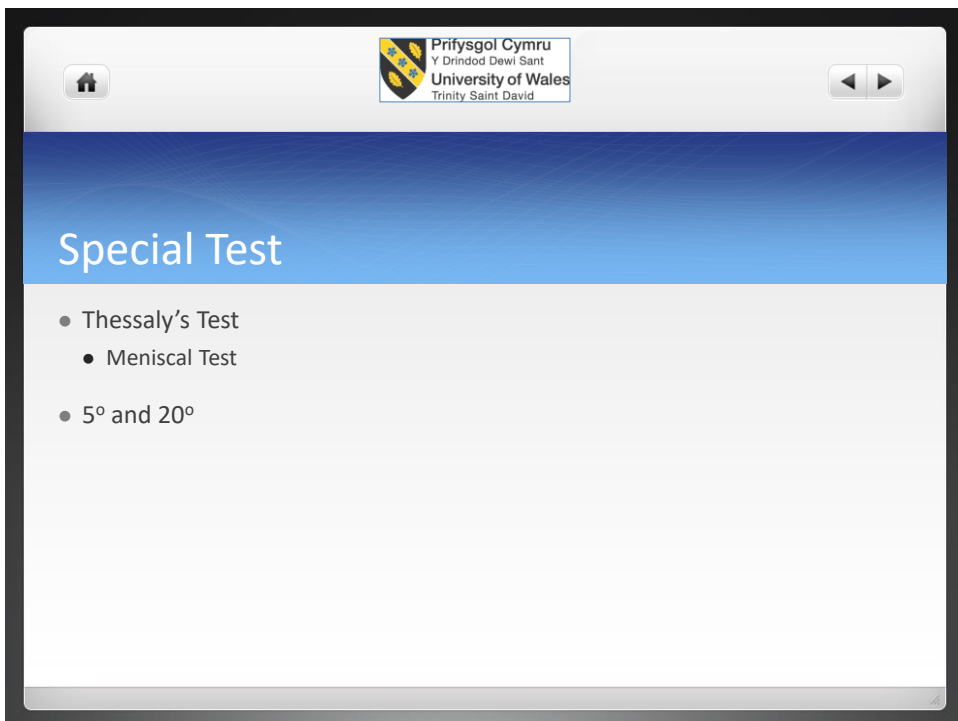


The slide is titled "Special Test" and lists the steps for Apley's Compression and Distraction Test. It includes a header with the University of Wales Trinity Saint David logo and navigation icons.

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Special Test

- Apley's Compression and Distraction Test
 - Test distraction first
 - MR and LR
 - Test Compression second
 - MR and LR
 - Positive sign
 - Pain and/or apprehension that is present on compression diminishes on distraction

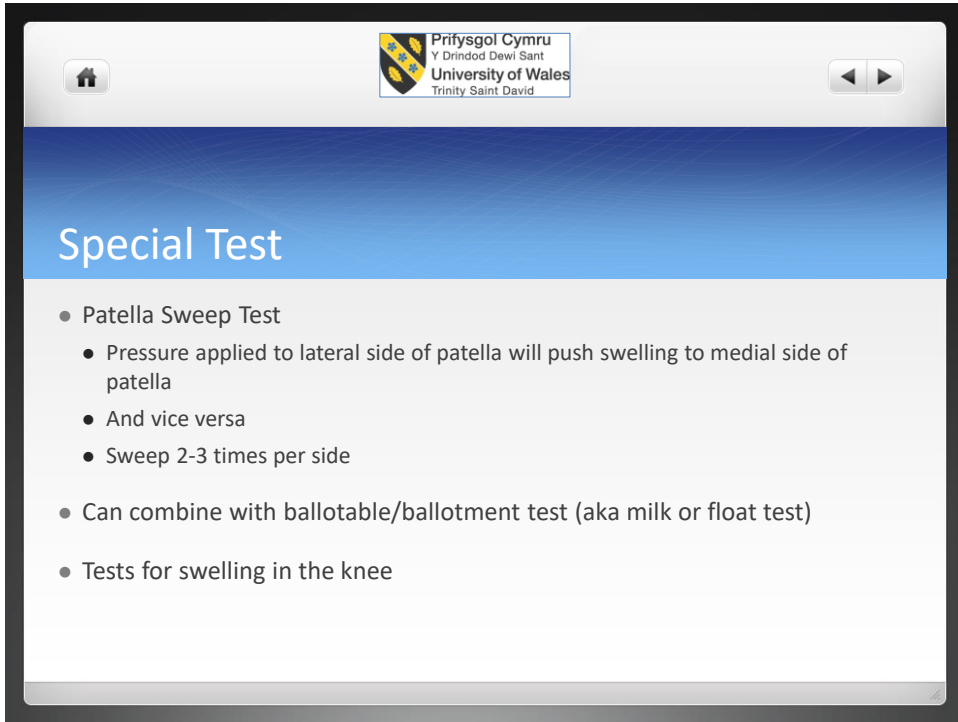


The slide is titled "Special Test" and lists the steps for Thessaly's Test. It includes a header with the University of Wales Trinity Saint David logo and navigation icons.

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Special Test

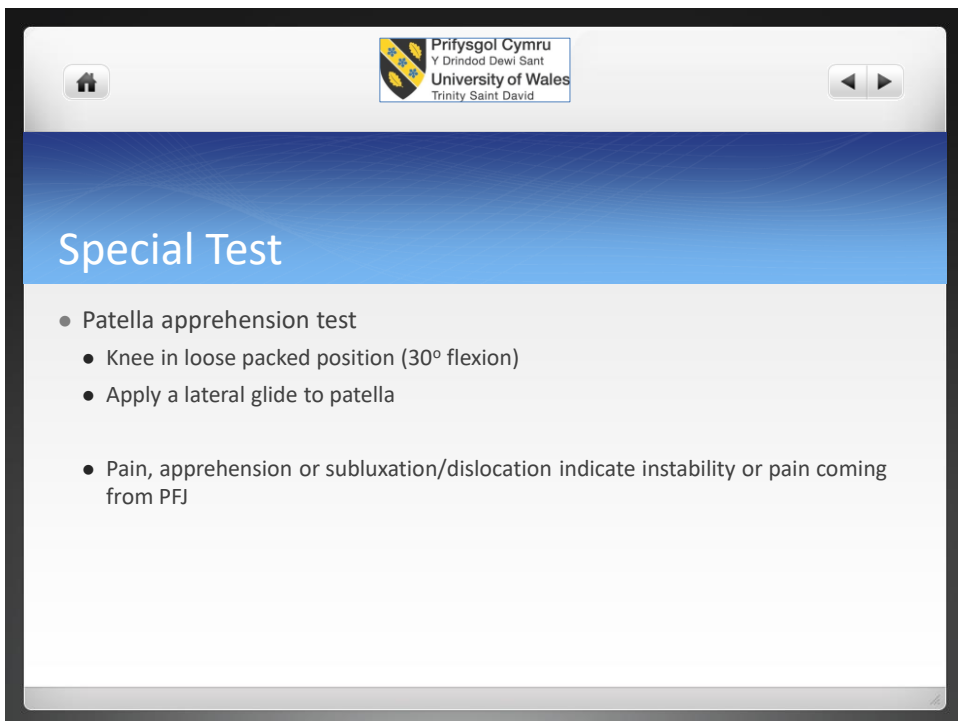
- Thessaly's Test
 - Meniscal Test
- 5° and 20°



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Special Test

- Patella Sweep Test
 - Pressure applied to lateral side of patella will push swelling to medial side of patella
 - And vice versa
 - Sweep 2-3 times per side
- Can combine with ballotable/ballotment test (aka milk or float test)
- Tests for swelling in the knee



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Special Test

- Patella apprehension test
 - Knee in loose packed position (30° flexion)
 - Apply a lateral glide to patella
- Pain, apprehension or subluxation/dislocation indicate instability or pain coming from PFJ





Special Test

- PF Grind Test
- Pain and/or apprehension of PFJ (degenerative changes to articular cartilage)
 - Fix patella and compress, then add inferior/superior/medial/lateral glide to compressive hold
- CAUTION: if enough pressure is applied it will be painful in ALL patients: even those w/o PFJ problems!





Special Tests: Other

Noble Compression Test

- Test for Iliotibial Friction Syndrome
- Pt in supine
- Hip and knee passively flexed to 90o
- Compress over lateral femoral condyle and hold whilst passively extending knee
- Positive Sign
 - Pain at 30o extension
 - Reproduction of symptoms
 - Crepitus

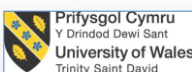




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Functional Tests

- Proprioception
 - DL static balance test
 - Tandem test
 - SL static balance test
- Strength endurance
 - SL calf raise
- Toe Walk
- DL Squatting
- Landing
- Jumping
- SL squat
- Landing
- Hopping



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SHS5062 E&A Knee Protocol

1. Observation • Need to be in shorts. • T-shirts, shoes and socks off • Observe from back, front & both sides. • Should be whole body observation, but paying particular attention to lower limb (knee)	4. Manual Muscle Tests • Quadriceps (as a group) • Vastus medialis obliquus (isolated) • Rectus femoris • Iliotibial band (TFL) • Hamstrings (as a group) • Popliteus • Gastrocnemius	7. Joints above & below • Bilateral comparison • Active movements • Ankle and hip
2. Quick Touch • Bilateral comparison • Back of hand	5. Ligament Stress Tests • Sag sign first • MCL - 0° and 30° • LCL - 0° and 30° • PCL (post drawer) • ACL (ant drawer)	8. Special Tests Ligaments • Ligament stress tests (don't need to repeat if done) • Lachman's • Slocum (AMRI, ALRI) Meniscus • McMurray's • Thessaly • Medial joint line palpation • Apley's Others • Apprehension test (patella) • PF grind test • Patella sweep • Noble Compression Test
3. Range of Movement • Bilateral comparison • AROM • PROM (end range with O/P) • RROM (end range with O/P, client resists O/P) • Flexion • Extension • Medial rotation (in flexion) • Lateral rotation (in flexion)	6. Palpate Head of fibula, Patella Tibial tuberosity, Tibial plateau (joint line), Condyles, Ligaments All associated muscles & tendons	9. Functional Proprioception, calf raise Walking / jogging / running / hopping / skipping / jumping & landing / kicking / twisting / turning