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## Total Knee Replacement – Assessment format

Name:

Age/Sex:

Occupation:

OPD No:

Address:

### 1. Patients brief Summary:

- a. Chief complaints
- b. Surgical History and co morbidities

### 2. Observation

- a. General – ( whole body appearance)
- b. Local – Surgical Incision, Swelling, Colour
- c. Presence of drain tubes \*
- d. Position of limb comfort \*
- e. Posture
- f. Gait

### 3. Examination

- a. Pain
- b. FLAGs
- c. Limb Oedema / Girth measurement(identify possible causes (decreased mobility, DVT, etc.,))
- d. AJROM
  - i. - Extension / Flexion (knee)
  - ii. -Hip and Ankle
- e. PJROM (PF/ TF) (including accessory)
  - i. End feel
  - ii. Factors limiting the movements (Relate to arthro and osteo kinematics)
- f. Muscle length
- g. Strength (MMT) – (Knee Ext/flex/ankle –PF/DF, Hip – Abd / flex / ext/ add)
- h. Isometric Resisted Test\*
- i. Combined movement (Functional) – Hip and knee – Performed in supine, standing and sitting.
- j. Girth measurement (differentiate between swelling / wasting)
- k. PSFS ( patient specific functional scale) – in (OPD)
- l. Balance (Relate with the possible factors (ageing / proprioception / strength)
- m. Functional Movement analysis ( relate with normal pattern, identify the possible structure )
- n. Gait Analysis
  - i. Function / Gait status – Level of independence\*

Note: \*Performed on In-patients

#### 4. ICF

ICF domain	Assessment summary	Measurement used
Body structure	<ul style="list-style-type: none"> <li>- Structure (Lower limb &amp; Upper limb) related to movement</li> <li>- Musculoskeletal structure related to movement. (Swelling /effusion /scar/ Muscle wasting/ Knee &amp; related joint alignments)</li> </ul>	Girth Measurement  Scar grading Posture analysis
Body function	<ul style="list-style-type: none"> <li>- Sensation of pain</li> <li>- Mobility of joint functions</li> <li>- Stability of joint functions</li> <li>- Muscle power functions</li> <li>- Muscle endurance functions</li> <li>- Gait pattern functions</li> </ul>	<ul style="list-style-type: none"> <li>- Sensory evaluation</li> <li>- JROM</li> <li>- Postural control – sway / standing on uneven surface</li> <li>- Gait analysis</li> </ul>
Activity & Participation	<ul style="list-style-type: none"> <li>- Walking</li> <li>- Moving around</li> <li>- Using transportation</li> <li>- Driving</li> <li>- Washing - bath / Toileting</li> <li>- Dressing</li> <li>- Doing housework</li> <li>- Intimate relationships</li> <li>- Community Life</li> <li>- Activities at work</li> <li>- Recreation and leisure</li> </ul>	FIM
Environment	<ul style="list-style-type: none"> <li>- Immediate family</li> <li>- Products and technology for personal use in daily living</li> <li>- Construction and building and technology of buildings for public use</li> </ul>	Access Audit (self-reported)

#### 5. Summary of findings

#### 6. Functional Diagnosis / areas of concern

#### 7. Goals (SMART)

#### 8. Plan of care

## Clinical Reasoning

	<b>Clinical relevance / contributing factors / Hypothesis / Reasoning</b>	<b>Important Information</b>	<b>Special attention</b>
<b>Age</b>	Healing / degenerative changes / balance / strength / mobility		
<b>Chief Complaints</b>	List the reported symptoms (Pain, Mobility, ADLs etc.,)	- Relate with surgery/procedure - Identify Flags	
<b>Surgical history and comorbidities</b>	Reason for surgery Surgical History – Incision / type of implant Relevant medical conditions Presenting complaints (list) Relevant Past history ( Body Function status/ Activity Status) / contributing factors that may influence the exercise planning)	Patellar surgical management  HT/IHD/DM/ osteoporosis / previous trauma  Previous Functional status Activity Status  Assisted devices used for supports, transfers and mobility	
<b>Observation</b>	General – ( whole body appearance)	BMI To understand obesity / overweight contributing to OA, Joint loading	
	Local – Surgical Incision, Swelling, Colour Presence of drain tubes	Healing (stages-inflammatory/remodelling etc.,) Scar (grading)	
	Attitude of Limb (supine/standing) Posture Gait	FFD / Valgus / Varus / Tibia position of comfort adaptation / Patella position	
	Pain ( identity FLAGS, relate to surgical history, tissue healing, medication)	Type , Intensity , duration and frequency	Referrals
	AJROM - Extension / Flexion (knee) -Hip (Abd/Flex/Ext and Ankle (DF/PF)	Movement pattern, quantity, muscle activity, kinematics, protective mechanism) Identify	Perform on plinth not on bed in supine and sitting to

<b>Examination</b>		<ul style="list-style-type: none"> <li>- Lag</li> <li>- Muscle inhibition</li> <li>- Muscle power</li> </ul>	evaluate the muscle activity (torque)
	PJROM (PF/ TF) (including accessory) - Factors limiting the movements (Relate to arthro and osteo kinematics)	Quantity, end feel, Muscle length	
	Muscle length	Sit and reach test	
	Strength (MMT)	Quadriceps Hamstrings Hip (Abd/Flex/Ext and Ankle (DF/PF)	
	Isometric Resisted Test	To observe the activity of muscle	Perform test to rule out tightness of capsule or muscles
<b>Examination</b>	Combined movement (Functional) – Hip and knee – Performed in supine, standing and sitting.	Pattern and contribution to joint range and muscle activity	
	PSFS ( patient specific functional scale) - OPD	Identify the functional limitation	Set patient specific goals
	Girth measurement (differentiate between swelling / wasting) - Limb Oedema (identify possible causes (decreased mobility , DVT, etc.,)	Relate with observation  Test – Homan’s sign	Tests for effusion / Clinical reasoning (correlate with PJROM)
	Balance Relate with the possible factors (ageing / proprioception / strength)	Sitting / standing / perturbation	Balance tests
	Functional Movement analysis  ( relate with normal pattern, identify the possible structure)	<ul style="list-style-type: none"> <li>- Lying to side lying / sitting</li> <li>- Sit to stand</li> <li>- Walking</li> <li>- Stair climbing</li> <li>- Running (if applicable – later stages after 3 weeks)</li> <li>- Stepping ( normal /</li> </ul>	

		over obstacles) - Stair	
	Gait Analysis	Kinematic / Temporal / spatial parameters	
	Function / Gait status – Level of independence (IP)	Total assist/ max/mod/min assist / Independent Movement pattern at knee ( available flexion)  Distance walked  (observe for discomfort during function and gait)	

#### ICF (Knee osteoarthritis and TKR)

ICF domain		Measurement used
Body structure	<ul style="list-style-type: none"> <li>- Structure (Lower limb &amp; Upper limb) related to movement</li> <li>- Musculoskeletal structure related to movement. (Swelling /effusion /scar/ Muscle wasting/ Knee &amp; related joint alignments)</li> </ul>	Girth Measurement  Scar grading  Posture analysis
Body function	<ul style="list-style-type: none"> <li>- Sensation of pain</li> <li>- Mobility of joint functions</li> <li>- Stability of joint functions</li> <li>- Muscle power functions</li> <li>- Muscle endurance functions</li> <li>- Gait pattern functions</li> </ul>	<ul style="list-style-type: none"> <li>- Sensory evaluation</li> <li>- JROM</li> <li>- Postural control – sway / standing on uneven surface</li> <li>-</li> </ul>
Activity & Participation	<ul style="list-style-type: none"> <li>- Walking</li> <li>- Moving around</li> <li>- Using transportation</li> <li>- Driving</li> <li>- Washing - bath/ Toileting</li> <li>- Dressing</li> <li>- Doing housework</li> <li>- Intimate relationships</li> <li>- Community Life</li> </ul>	

	<ul style="list-style-type: none"> <li>- Activities at work</li> <li>- Recreation and leisure</li> </ul>	
Environment	<ul style="list-style-type: none"> <li>- Immediate family</li> <li>- Products and technology for personal use in daily living</li> <li>- Construction and building and technology of buildings for public use</li> </ul>	

**PT Plan of care**

**Pre- op / Prehabilitation**

<b>Mode</b>	<b>Reasoning</b>
Exercise counselling	Gain confidence
Upper limb exercise	Assistance in mobility / crutches
Stretching exercises	Hip flexors/ hamstrings / calf
Exercises to knee/ Hip and ankle	Activation and training for Quads/ hams/ Hip Abd/Extensors / Calf muscles ( aid in re-education during inhibition post-surgery)
Functional education and training	
Mobility	

**Post op**

<b>Treatment</b>	<b>Reasoning / Progression</b>	<b>Progress note</b>
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Gain confidence	Exercise education	
<p>Decrease Pain</p> <ul style="list-style-type: none"> <li>- Cryotherapy</li> <li>- CPM</li> <li>- Positioning</li> <li>- Muscle activation ( active exercise / isometric exercises)</li> </ul> <p>Support /bracing ( to avoid knee contractures/ FFD as patient tends to keep in resting position because of pain)</p>	<p>Understand the underlying causes of pain</p> <ul style="list-style-type: none"> <li>- Inflammatory</li> <li>- Chronic</li> <li>- Structural</li> <li>- Muscle guarding</li> <li>- Effusion</li> </ul> <p>Modalities</p> <ul style="list-style-type: none"> <li>- TENS</li> <li>- Cryotherapy ( once in every 6 hours till 6<sup>th</sup> post op day)</li> </ul>	<p>Pain rating (VAS / NPRS), quality and compliance at each visit.</p>
Oedema control	<ul style="list-style-type: none"> <li>- Compression</li> <li>- Elevation</li> <li>- ST mobilization (If required)</li> </ul>	<ul style="list-style-type: none"> <li>- Active exercises with elevation</li> <li>- Activity modification (elevation in between with active exercises)</li> </ul>
<p><b>Restore ROM</b></p> <p><b>Active extension without lag</b></p> <p>Note: ROM returning to prior level. If they had contracture, they are more likely to have in post op</p>	<p>Increase Range of motion Identify the end feel</p> <p><b>AROM</b> – Identify active structure function (Activation/ Inhibition) IF inhibited start with facilitation techniques ( /EST Isometric exercise)</p> <p><b>Stretching</b> Use techniques based on examination &amp; reasoning</p> <ul style="list-style-type: none"> <li>- Passive structure tightness (use static stretching)</li> <li>- Active structure shortening (use PNF techniques )</li> </ul> <ul style="list-style-type: none"> <li>- Quadriceps sets</li> <li>- Straight leg raise (SLR) with brace</li> <li>- Prone hamstring curls</li> <li>- Supine heel slides,</li> <li>- Supine heel wall slides</li> <li>- Short arc Extension</li> <li>- Sit to stand squats</li> <li>- Supine leg press (on</li> </ul>	<p>Increasing each visit (10-15 days) toward 125 degrees flexion, and 0 degrees extension.</p>

	<p>pillows )</p> <ul style="list-style-type: none"> <li>- Resisted exercises ( minimal weights / 30% EST RM) in available range</li> <li>- Controlled flexion and extension in high Sitting ( support if required)</li> <li>- Static cycle / pedo cycle</li> </ul> <p><b>Modalities</b></p> <ul style="list-style-type: none"> <li>- Electrical Stimulation</li> <li>- COLD PACK</li> <li>- CPM</li> </ul>	
Safe transfers and ambulation with assistive device	<p>Distance ( 50 meters) Observe and train use of knee flexion during gait</p>	<p>Increase incrementally at each visit ( 10- 25%) Add functional training for lower limb ( sit to stand, stepping, stair climbing, over obstacles)</p>
<p>Prevention of Tightness and Contracture</p> <p>Skin / Incisional scar ST – Patellar tendon Joint - PF joint / Capsule</p>	<p>Positioning / brace ( 0 degrees while sleeping / resting in bed</p> <p>Active exercises during sitting Stretching exercises</p> <p>ST mobilization / scar mobilization</p>	<p>Progress to stretching exercises and ST mobilization if tightness of structures are identified</p>
Gait training / Mobility	<p>Weight bearing as tolerated (WBAT) – ( walker / crutches/ canes)</p>	<p>Progress to</p> <ul style="list-style-type: none"> <li>- Normal gait without assistive device</li> <li>- Stair climbing</li> <li>- Gait obstacles</li> </ul>
Home exercise program (HEP)		

### Progress Notes



Components	0- 2 weeks	3-6 weeks	6-12 weeks
<b>Exercise education</b>	<ul style="list-style-type: none"> <li>- Emphasis on Importance of Exercise</li> <li>- Provide education on “hurt (vs) harm</li> </ul>	<ul style="list-style-type: none"> <li>- Emphasis on Importance of strength, balance and function</li> </ul>	<ul style="list-style-type: none"> <li>- Emphasis on precautions and preventive measures</li> </ul>
<b>Pain</b>	<ul style="list-style-type: none"> <li>- Cryotherapy</li> <li>- Positioning of Knee and related joints</li> <li>- Muscle activation (active exercise / isometric exercises)</li> <li>- Support /bracing ( to avoid knee contractures/ FFD as patient tends to keep in resting position because of pain)</li> </ul> <p>Pain must decrease gradually after 24 – 48 hours, indicate if there is increase. Observe for pain pattern during movements. Educate about pain, during exercise</p>	<p>Pain must decrease during rest at this stage.</p> <p>Pain during movement must be identified and patient must be given exercise education.</p> <p>Eg. Pain at the end of flexion may be due to stretch in anterior structures / Qaud (identify and treat the cause)</p>	<ul style="list-style-type: none"> <li>- Pain must decrease at this stage.</li> <li>- Identify pain due to fatigue, educate patient appropriately</li> <li>- Identify structures causing pain (possibly due to tight structure )</li> </ul>
<b>Oedema</b>	<ul style="list-style-type: none"> <li>- Compression</li> <li>- Elevation</li> <li>- ST mobilization (If required)</li> </ul>	<ul style="list-style-type: none"> <li>- ST mobilization</li> <li>- Active exercises of knee with elevation.</li> </ul>	Usually minimal or no swelling at this stage.
<b>Modalities (Pain and oedema management)</b>	<ul style="list-style-type: none"> <li>- <b>CPM –Knee (0-100)</b> (progress to 125)</li> <li>- TENS</li> <li>- Cryotherapy (once in every 6 hours till 6<sup>th</sup> post op day)</li> <li>- Electrical Stimulation (ES)</li> </ul>	<ul style="list-style-type: none"> <li>- ES</li> <li>- Cryotherapy after exercises</li> </ul>	<ul style="list-style-type: none"> <li>- Ultra sound (US) – Flexion contracture/ scar</li> <li>- Moist heat</li> <li>- Contrast bath</li> <li>- Whirl pool bath or pool ( after 6 weeks and incision is completely healed)</li> </ul>

<p><b>Restore ROM</b></p>	<p><b>AROM –</b> Identify active structures limiting ROM and function (Activation/ Inhibition) IF inhibited start with facilitation techniques ( EST / Isometric exercise)</p> <p><b>Stretching</b> Use techniques based on examination &amp; reasoning - Passive structure tightness (use static stretching) - Active structure shortening (use PNF techniques )</p> <p><b>Achieve 0 degrees active extension without lag</b> (100 degrees flexion, and 0 degrees extension – increase to 110 degrees at the end of 2<sup>nd</sup> week) - Quadriceps sets - Straight leg raise (SLR) with brace - Prone hamstring curls - Patellar glides (mobilization) - Supine heel slides, - Supine heel wall slides - Short arc Extension - Sit to stand squats - Supine leg press (on pillows ) - Resisted</p>	<p>JROM – expected 0 – 110 active / passive</p> <p>If not achieved continue exercise as 2 weeks</p> <p>Knee /Hip - Active Exercises Resisted exercises - 1 RM evaluation (Functional – leg press) - Theraband standing total knee extension (TKE) - High sitting exercises (knee extension and flexion) with weights - Hip ( weights at thigh) - Stand to sit / bed transfer training Proprioception and Neuromuscular re-education - Gait / movement/ balance /weight transfers) - Standing balance training – even and uneven surface (wobble board) - Progress to single leg standing ( with short duration progress incrementally) - Add functional training for lower limb (with support if required) (sit to stand, stepping, stair climbing, over obstacles)</p>	<p>Increasing each visit (10-15 days) toward 125 degrees flexion, and 0 degrees extension.</p> <ul style="list-style-type: none"> <li>- Functional movements (re-education)</li> <li>- Lateral and multidirectional movements</li> <li>- Strengthening exercise (1RM 60% to 80%)</li> <li>- Quadriceps, hip and core strengthening</li> <li>- emphasis on use of the affected side during function such as rising from sitting</li> <li>- Stand to sit (independent)</li> <li>- Proprioception training</li> <li>- Progress Functional training for lower limb without support and increased in the repetition and distance (sit to stand, stepping, stair climbing, over obstacles)</li> </ul>
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	<p>exercises (minimal weights / 30% RM) in available range</p> <ul style="list-style-type: none"> <li>- Controlled flexion and extension in high Sitting ( support if required)</li> <li>- Static cycle / pedo cycle</li> </ul> <p>Note: ROM returning to prior level. If they had contracture, they are more likely to have in post op</p>		
<b>Safe transfers and ambulation</b>	<p>With assistive device</p> <ul style="list-style-type: none"> <li>- Distance at patients comfort Weight bearing as tolerated (WBAT) – (walker / crutches/ canes) increase incrementally day by day (based on evaluation)</li> <li>- Observe and train use of knee flexion during gait</li> </ul>	<ul style="list-style-type: none"> <li>- Increase distance incrementally at each visit ( 10%) – Full Weight bearing with no of minimal support</li> <li>- Attain normal kinematics and weight bearing</li> <li>- Temporal and Spatial parameters of gait normalization and training</li> <li>- Stairs with assistance (rail support)</li> </ul>	<ul style="list-style-type: none"> <li>- Normal gait without assistive device</li> <li>- Stairs with reciprocal gait for without support</li> <li>- Independent transfers to and from the bed/ ground</li> <li>- Independent function (BADLS)</li> </ul>
<b>Tightness and Contracture</b>	<p>Positioning / brace ( 0 degrees while sleeping / resting in bed</p> <p>Active exercises during sitting Stretching exercises</p> <p>PF joint mobilization ST mobilization /</p>	<p>Progress to stretching exercises and ST mobilization if tight</p>	<p>ST mobilization Stretching ( static)</p>

	scar mobilization		
<b>Home exercise program (HEP)</b>	HEP written based on patient goals with special precautions	HEP written based on patient goals with special precautions	HEP written based on patient goals with dos and don'ts
<b>Precautions</b>	<ul style="list-style-type: none"> <li>- Watch incision for signs of separation and/or infection.</li> <li>- Keep incision strain at a minimum, watch blanching during flexion to monitor this.</li> </ul>	<ul style="list-style-type: none"> <li>- PROM to be achieved with minimal force</li> <li>- Avoid rapid forced during Gait and functional movements ( sit to stand etc.,)</li> <li>- Incision/ infection issues / scar</li> <li>- Avoid running and jumping</li> </ul>	<ul style="list-style-type: none"> <li>- Lifting more than 10 kgs during functional activities</li> <li>- Body weight (maintenance)</li> </ul>
<b>Progression criteria</b>	<ul style="list-style-type: none"> <li>- Improvement in ROM, muscle function and gait over the first 2 weeks.</li> </ul>	<ul style="list-style-type: none"> <li>- Continuing improvement in ROM (0 degrees and 110 degrees)</li> <li>- No extension lag</li> <li>- Improvement in quadriceps function, gait and activity tolerance</li> <li>- Single crutch or a cane</li> <li>- Walking short distances without an assistive device.</li> <li>- Non-antalgic gait pattern</li> </ul>	<ul style="list-style-type: none"> <li>- Achievement of ROM 0-125</li> <li>- No extensor lag</li> </ul>
<b>Discharge summary</b>	<p>Knee range – 100 degrees achieved</p> <p>Gait – 50 meters with minimal support / No support</p> <p>Stair climbing minimum 4 steps up and down with support</p>	<p>Knee range – 110 degrees achieved</p> <p>Gait – 100 meters with minimum support or 50 meters without support</p> <p>Stair climbing minimum 10 steps up and down</p> <p>HEP – adherence</p>	<ul style="list-style-type: none"> <li>- Achievement of ROM 0-125</li> <li>HEP – adherence</li> </ul>

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<b>Note</b>	If goals are NOT achieved refer to Physical Medicine and Rehabilitation centre (PMRC) -JSSH for further evaluation and rehabilitation.
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