

IV. SCHEDULE OF MEASUREMENTS

Table 2. Measurement Schedule for MOST Grant Cycles 1 and 2.

Measurements & Instruments Questionnaire and Interview Measures	Screening	Baseline	Follow-up Visits				
			15mo	30mo	60mo (Cycle 2 Baseline)	72mo	84mo
SCREENING / DEMOGRAPHICS							
- Age and gender	X ⁴						
- Ethnicity, racial background, level of education		X ⁵					
- Marital status ^a and live alone or with others ^b		X ^{a,b,5}			X ^{b,5}		X ^{a,b,5}
- Employment, current and past		X ⁵		X ⁵	X ⁵		X ⁵
- Household: Ability to pay monthly bills					X ⁵		X ⁵
- Screening exclusion: Inflammatory arthritis	X ⁴						
KNEE SYMPTOMS							
- Knee symptoms, past 12 months and past 30 days	X ⁴	X ⁴	X ⁴	X ⁴	X ⁴	X ⁴	X ⁴
- First knee symptoms, how many years ago							X ⁴
- Knee pain visual 0-100 rating scale, past 30 days		X ⁵	X ^{2,3,5}	X ⁴	X ⁴		X ⁴
- WOMAC knee pain, past 30 days	X ⁴	X ⁵	X ^{2,3,5}	X ⁵	X ⁵		X ⁵
- WOMAC knee stiffness, past 30 days	X ⁴	X ⁵	X ^{2,3,5}	X ⁵	X ⁵		X ⁵
- Initial pain at clinic visit					X ⁴		
- Constant and intermittent pain (ICOAP), past 7 days					X ⁴		X ⁴
- Knee pain map			X ¹		X ⁴		X ⁴
- Knee buckling		X ⁴		X ⁴	X ⁴	X ⁴	X ⁴
KNEE-RELATED FUNCTION AND QOL							
- WOMAC physical function - past 7 days		X ⁵	X ^{2,3,5}	X ⁵	X ⁵		X ⁵
- KOOS function/sports/recreation, past 30 days		X ⁵	X ^{2,3,5}	X ⁵	X ⁵		X ⁵
OTHER JOINT SYMPTOMS							
- Hip symptoms, past 30 days		X ⁵	X ⁴	X ⁴	X ⁴	X ⁴	X ⁴
- WOMAC hip symptoms, past 30 days		X ⁵	X ^{2,3,5}	X ⁵			
- Hip surgery (THR)		X ⁴	X ⁴	X ⁴	X ⁴	X ⁴	X ⁴
Joint pain (homunculus diagrams), past 30 days							
- Body: shoulders, elbows, hips, wrists, hands, knees, ankles, neck		X ⁵	X ^{2,3,5}	X ⁵	X ⁵		X ⁵
- Feet and/or hands		X ⁵			X ⁵		X ⁵
- Back pain and function, past 30 days		X ⁵		X ⁵	X ⁵		X ⁵
GENERAL HEALTH							
- Arthritis diagnosis		X ⁵	X ^{2,3,5}	X ⁵	X ⁵	X ⁴	X ⁵
- SF-12		X ⁵	X ^{2,3,5}	X ⁵	X ⁵		X ⁵
- CES-D (depressive symptoms)		X ⁵		X ⁵	X ⁵		X ⁵
- Cognition (Fillit ^a or Callahan 6-Item Screener ^b)					X ^{a,4}		X ^{b,4}
- Comorbidity Index		X ⁵		X ⁵	X ⁵		X ⁵
- Pittsburg Sleep Quality Index and fatigue, past 7 days					X ⁵		X ⁵
- Medical care and insurance							X ⁵

Table 2 (Continued) Measurement Schedule for MOST Grant Cycles 1 and 2.

Measurements & Instruments: Questionnaire and Interview Measures	Screening	Baseline	Follow-up Visits				
			15mo	30mo	60mo (Cycle 2 Baseline)	72mo	84mo
FUNCTIONAL STATUS AND DISABILITY							
- Mobility: Assistive technology / devices (HAQ)					X ⁵		X ⁵
- Disability: Walk by self without help / walker			X ⁴				
- Limitation of activity due to pain, past 30 days		X ⁴	X ⁴	X ⁴	X ⁴	X ⁴	X ⁴
- Late-life FDI: Disability Component		X ⁵	X ^{2,3,5}	X ⁵	X ⁵		X ⁵
- Physical Activity Scale for the Elderly (PASE), past 7 days		X ⁴					X ^{1,4}
- PF-10 Scale of SF-36					X ⁵		X ⁵
- Stair flights climbed, past 7 days		X ⁴					X ^{1,4}
MEDICATION							
- Medication inventory (Rx and/or non-Rx), past 30 days		X ⁴	X ^{2,3,4}	X ⁴	X ^{4,7}		X ^{4,7}
- Vitamins E and C supplements		X ⁴	X ^{2,3,4}	X ⁴			
- Vitamin D supplements					X ⁴		X ⁴
Selected medications, self-reported							
- Salicylates/NSAIDs/opioids, current use		X ⁵		X ⁵	X ⁵		X ⁵
- Bisphosphonates/estrogens, past 12 months		X ⁴		X ⁴	X ⁴		X ⁴
- Knee injections for arthritis, past 6 months		X ⁵		X ⁴	X ⁴		X ⁴
HEALTH BEHAVIORS AND OA RISK FACTORS							
- Knee injury history		X ⁴	X ^{2,3,4}	X ⁴	X ⁴	X ⁴	X ⁴
- Knee surgery history (for TKR, see Misc. below)	X ⁴	X ⁴	X ^{2,3,4}	X ⁴	X ⁴	X ⁴	X ⁴
- Family history of arthritis		X ⁵					
- Height and weight history		X ⁵					
- Shoe heel height		X ⁴					
- Fracture history (after age 45)		X ⁵					
- Injury, fractures, falls, past 12 months or since last contact			X ^{2,3,4}	X ⁵	X ⁵	X ⁴	X ⁵
- Falling (fear of)					X ⁵	X ⁴	X ⁵
- Activities-specific Balance Confidence Scale (ABC)					X ⁵		X ⁵
- Tobacco use history		X ⁵					
- Tobacco use, current							X ⁵
- Coping Strategies Questionnaire (CSQ) - Pain Catastrophizing subscale elements					X ^{5,6}		X ^{5,6}
- Accelerometer questionnaire (knee pain, sleep, and fatigue during 7-day collection)							X ¹
- Female history – pregnancy history, childbirth, hysterectomy				X ⁵			
MISCELLANEOUS							
Outcomes							
- Knee/hip replacement			X ⁸	X ⁸	X ⁸	X ⁸	X ⁸
- Knee/hip replacement pre-operative diagnosis			X ⁹	X ⁹	X ⁹	X ⁹	X ⁹
- Confirmation of death by public records			X	X	X	X	X

Table

2

(Continued) Measurement Schedule for MOST Grant Cycles 1 and 2.

Measurements & Instruments: Examination Measures	Screening	Baseline	Follow-up Visits					
			15mo	30mo	60mo (Cycle 2 Baseline)	72mo	84mo	
Blood collection, fasting						No clinic visit		
- Serum and EDTA plasma		X ¹¹		X ^{1,11}	X ¹¹			
- EDTA Supernatant		X ¹²						
- Buffy coat for DNA		X ¹³						
Urine collection								
- Second AM void		X ¹¹		X ¹¹	X ¹¹			
Height, standing		X			X			
Weight	X ⁴	X	X ^{2,3}	X	X			X
Leg length		X						
Knee height		X						
Knee laxity		X						
Leg proprioception		X						
Knee flexion contracture		X						
Hand exam		X						
Pain sensitization (i.e. von Frey filaments, pressure algometer)					X			X
Peripheral neuropathy					X			
Vibration perception threshold					X			
Knee range of motion								X
Knee joint examinations								
- Trochanteric bursitis		X ¹	X ²	X ¹				
- Iliotibial band friction syndrome		X ¹	X ²	X ¹				
- Anserine bursa tenderness		X ¹	X ²	X ¹				
- Medial knee fat pad and other tenderpoints		X ¹	X ²	X ¹				
- Hip internal rotation (pain and range of motion)		X ¹	X ²	X ¹				
- Tenderpoint exams		X ¹	X ²	X ¹				
Blood pressure		X		X	X			X
Performance Measures								
- 20-meter timed walk		X		X	X			X
- Chair stands, timed		X		X	X			X
- Balance exams (rapid step ups, maximum step length)					X			
- Isokinetic upper leg concentric strength		X ¹⁰			X ¹⁰			
- Surface EMG, muscle co-activation (during isokinetic strength)					X			
- Plantar Pressure					X			
- Gait assessment (GAITRite)					X			
- Accelerometer (7-day collection)					X ¹		X ¹	
MRI								
- 1.0T MRI (Coronal, Sagittal, Axial)		X ¹⁰	X ^{2,3,10}	X ¹⁰	X ¹⁰		X ¹⁰	
- 1.0T MRI 3-Point Dixon sequence		X ^{1,10}			X ^{1,10}			
- 1.5T MRI (Laxity Ancillary Study)		X ¹		X ¹				
- 1.5T MRI (Gadolinium Ancillary Study)				X ¹				
X-ray								
- Knee (PA and lateral)		X ¹⁰	X ^{2,10}	X ¹⁰	X ¹⁰		X ¹⁰	
- Full-limb		X			X			
DXA Bone Density								
- Hip		X		X ¹			X	
- Whole body		X		X ¹			X	

Footnotes to Table 2 (MOST Grant Cycles 1 and 2).

- ¹ Subset of participants
- ² Subset of participants: 15-month potential cases
- ³ Subset of participants: 15-month controls
- ⁴ Measured by interview
- ⁵ Measured by self-administered questionnaire (SAQ)
- ⁶ Subset of questions
- ⁷ Rx medications only
- ⁸ Self-reported or physician adjudicated by x-ray or surgery records, if available
- ⁹ Pre-op diagnosis derived from surgery records, if available
- ¹⁰ Bilateral or unilateral
- ¹¹ MOST samples available through NIA Aging Research Biobank (<https://agingresearchbiobank.nia.nih.gov/>)
- ¹² EDTA Supernatant samples used for parent study or destroyed (limited shelf life)
- ¹³ DNA extracted from baseline buffy coat samples

Table 3. Measurement Schedule for MOST Grant Cycle 3.

Measurements & Instruments Questionnaire and Interview Measures (measurement methods)	Screening	Baseline (144mo)	Follow-up Visits		
			8mo ⁴ (152mo)	16mo ^{4,5} (160mo)	24mo (168mo)
SCREENING / DEMOGRAPHICS					
- Age and gender	X ¹				
- Education		X ¹			
- Ethnicity, racial background	X ¹				
- Marital status and live alone or with others		X			X
- Current Employment		X			X
- Household: Ability to pay monthly bills		X			X
- Screen: Pregnancy and female history (menstrual history, childbirth, hysterectomy, menopause)	X ¹				
- Screen: Walk without a walker	X ¹				
- Screen: Inflammatory arthritis	X ¹				
- Screen: Cancer / health	X ¹				
- MRI and/or CT eligibility	X ¹	X ²			X
KNEE SYMPTOMS					
- Knee symptoms, past 12 months and past 30 days	X ¹	X	X ⁴	X ⁴	X
- Knee pain visual 0-100 rating scale, past 30 days		X			X
- WOMAC knee pain, past 30 days		X	X ⁴	X ⁴	X
- WOMAC knee stiffness, past 30 days		X	X ⁴	X ⁴	X
- ICOAP (Constant and intermittent pain)		X	X ^{3,4}	X ^{3,4}	X
- Knee pain location		X			X
- Knee buckling		X	X ⁴	X ⁴	X
KNEE-RELATED FUNCTION AND QOL					
- WOMAC physical function - past 7 days		X	X ⁴	X ⁴	X
- KOOS function/sports/recreation, past 30 days		X ¹			X ¹
OTHER JOINT SYMPTOMS					
- Hip symptoms, past 30 days		X			X
- Hip surgery		X	X ⁴	X ⁴	X
JOINT PAIN (homunculus diagrams), past 30 days					
- Body: shoulders, elbows, hips, wrists, hands, knees, ankles, neck		X	X ⁴	X ⁴	X
- Feet and/or hands		X			X
- Back pain and function, past 30 days		X	X ^{3,4}	X ^{3,4}	X
GENERAL HEALTH					
- Arthritis diagnosis		X			X
- SF-12 (health survey)		X			X
- CES-D (depressive symptoms)		X			X
- Modified Charlson Comorbidity Index		X			X
- Pittsburg Sleep Quality Index (PSQI) and fatigue		X ¹			X ¹
- 7-day sleep and fatigue		X			X
- Physical therapy		X			X
- Medical care and insurance		X			X
- Major hospitalizations		X	X ⁴	X ⁴	X

Table 3 (Continued) Measurement Schedule for MOST Grant Cycle 3.

Measurements & Instruments: Questionnaire and Interview Measures	Screening	Baseline (144mo)	Follow-up Visits		
			8mo (152mo)	16mo (160mo)	24mo (168mo)
FUNCTIONAL STATUS AND DISABILITY					
- Helpful aids/devices (Stanford HAQ)		X ²			X ²
- Late-life FDI: Disability Component		X ²			X ²
- Pain DETECT		X			X
- PROMIS function (pain behavior and interference)		X			X
- Physical Activity Scale for the Elderly (PASE), past 7 days		X			
- PF-10 Scale of SF-36		X			X
- Life-Space Assessment		X ²			X ²
MEDICATION					
- Medication inventory (Rx), past 30 days		X			X
- Vitamin D supplements, calcium, magnesium		X			X
Selected medications, self-reported					
- Joint pain medications		X			X
- Salicylates/NSAIDs/opioids, current use		X			X
- Bisphosphonates/estrogens, past 12 months		X			X
- Knee injections for arthritis, past 6 months		X			X
HEALTH BEHAVIORS AND OA RISK FACTORS					
- Knee injury history		X	X ⁴	X ⁴	X
- Knee surgery history (for TKR, see Misc. below)		X	X ⁴	X ⁴	X
- Family history of arthritis		X ¹			
- Weight history		X ¹			
- Fracture history (after age 45)	X ¹				
- Fracture since last contact		X	X ⁴	X ⁴	X
- Falling (fear of)		X			X
- Tobacco use history		X ¹			
- Tobacco use, current		X ²			X
- Coping Strategies Questionnaire (CSQ) - Pain Catastrophizing subscale elements		X			X
- Accelerometer questionnaire (knee pain, sleep, and fatigue during 7-day collection)		X			
MISCELLANEOUS					
Outcomes adjudication					
- Knee/hip replacement		X	X	X	X
- Knee/hip replacement pre-operative diagnosis		X	X	X	X
- Confirmation of death by public records		X	X	X	X

Table 3 (Continued) Measurement Schedule for MOST Grant Cycle 3.

Measurements & Instruments: Examination Measures (methods references)	Screening	Baseline (144mo)	Follow-up Visits			
			8mo (152mo)	16mo (160mo)	24mo (168mo)	
Blood collection, fasting			No clinic visit	No clinic visit		
- Serum and EDTA plasma		X ¹				
- Buffy coat for DNA		X ¹				
- Paxgene		X ¹				
Urine collection		X ¹				
Height, standing		X				
Shoe hardness		X				
Foot length		X				
Weight	X ¹	X ²				X
Hand photo		X				
Hip internal rotation (pain and range of motion)		X				
Blood pressure		X				X
Performance Measures of Function						
- 20-meter timed walk		X				X
- Chair stands, timed		X				X
- Timed Up and Go (TUG) Test		X ²				X ²
- 6 Minute Timed Walk (6MTW)		X				X
Biomechanical Measures						
- Quadriceps power and hip strength		X				
- Gait asymmetry, complexity OPAL		X				
- Force of heel strike		X				
- Objective physical activity (7-day accelerometer data w/ AX3)		X				
- Postural sway (Opal monitor)		X				
Quantitative Sensory Testing						
- Conditioned pain modulation		X				X
- Pressure pain threshold		X				X
- Temporal summation		X				X
- Peripheral neuropathy		X				X
Knee CT (chondrocalcinosis and local BMD)		X				
Knee MRI (1.5T - Extremity)		X		X		
X-ray						
- Knee (PA and lateral)	X ¹	X ²		X		
- Full-limb		X ¹				
Cognitive Assessment: MoCA (>65 yrs)		X ²		X		

Footnotes to Table 3 (MOST Grant Cycle 3).

¹ New Cohort only

² Original Cohort only

³ Subset of questions

⁴ Interim TI collected in participants who had CV at 144M