

## **AGE, GENE/ENVIRONMENT SUSCEPTIBILITY STUDY (AGES)**

AGES is a study of genetic contribution to diseases common in old age conducted in a genetically homogeneous well-characterized cohort of older Icelanders (Icelandic Reykjavic Study)

### **Listing of study variables & measurement of variables**

#### **Vascular system:**

These measures build on the cardiovascular history available from the earlier examinations. They include:

- Blood pressure: supine and standing
- Electrocardiogram: clinical and subclinical ischemic or hypertensive disease, rhythm
- Carotid ultrasound: common carotid intimal-medial wall thickening, and carotid distensibility
- Echocardiography: left ventricular wall thickness, characteristics and ejection fraction
- Coronary artery calcium scoring: correlates with atherosclerotic burden of plaque
- Aortic calcification: from computerized tomography scans of the abdomen and thigh
- Ankle-arm blood pressure: peripheral arterial disease
- Retinal fundus photography: small vessel disease
- Pertinent blood examinations: Fasting total, HDL cholesterol, triglycerides; C-reactive protein; CBC including white blood cell count; creatinine

#### **Neurocognitive system:**

- Cognitive function, including tests of verbal, non-verbal and spatial memory, psychomotor speed and attention on the total sample
- Depression screening: total sample, with more extensive testing for those who are screen-positive
- Magnetic resonance imaging of the brain with multidimensional structural analysis
- Dementia evaluation: A subsample will undergo a neurologic evaluation and an informant interview in the Memory Clinic at Landakot Hospital. This group and a random control group will undergo a second-level cognitive function battery including language, praxis, planning and organization, and visuospatial skills. Standardized information from each stage of evaluation will be assembled for an evaluation team of a neurologist, neuropsychologist, and geriatrician to make a consensus diagnosis of dementia and sub-types.

#### **Musculoskeletal system (osteoporosis and osteoarthritis):**

- Scout film of spine, hip and femur to be read for vertebral fractures and osteoarthritis
- Hand and foot photography
- Spine:
  - Quantitative computerized tomography of L1/2
  - Quantitative measurements of morphometric properties of bone and cortical and trabecular bone areas and densities

- Hip
  - Quantitative computerized tomography of the hip to mid-femur
  - Quantitative measurements of morphometric properties of bone and cortical and trabecular bone areas and densities
- Assessment of hip joint space and quantification of osteophytes
- Bone density of the heel
- Clinical evaluation of the hip and knee.

#### **Body composition and metabolism:**

- Sarcopenia: Computerized tomography measurement of mid-thigh and abdominal muscle mass. Assessment of performance measures will complement these measures
- Obesity: Anthropometric measures of waist and hip circumferences; computerized tomography assessment of abdominal fat depots and all inter- and intramuscular fat in the thigh
- Bioelectrical impedance for total body fat and lean.
- Marrow content (fat, bone and red marrow) measured with dual-energy x-ray density
- Glucose regulation: Fasting glucose

#### **Measures of physical performance:**

- Grip strength
- Isometric strength of the quadriceps
- Walking speed over 6 meters at usual and fast gait
- Timed Get-Up and Go
- Chair stand augmented with balance tests using a portable balance platform
- Spirometry

#### **Laboratory:**

A clinical laboratory is present within the clinic and all blood will be processed within an hour of blood draw. Freezers for storage will be at -70° with one liquid nitrogen storage facility.

- Aliquots of plasma and serum for storage (10 1/2 ml, 7 1 ml of each)
- Whole blood for DNA extraction and buffy coat saved where available
- Cells suspended for later transformation (current protocol)
- Aliquots of urine
- Specimens for clotting factors
- Platelet-rich plasma for mitochondria