WEIGHT

1. Background and Rationale

Weight is measured in kilograms using a standard balance beam scale. Body weight and body mass index (a mathematical function of weight and height) are important determinants of body composition. Weight and weight change are highly correlated with bone mineral density and rates of bone loss in the elderly, and may be associated with risk of disability and decline is physical function, as well as other conditions and endpoints associated with aging.

2. Equipment and Supplies

- Standard balance beam scale that can be read from front and back.

2.1 Maintenance

- When not in use, rest the counterweight (larger weight) in the far right position.
- The top weight should rest in the left or zero position.
- The counterweight should always be lifted carefully before it is moved across the beam. This prevents wear on the notches that could lead to erroneous readings.
- Keep the scale on a level surface and move it as little as possible.

2.2 Calibration

At the beginning of the study, and then yearly, the scale calibration should be checked by a local Department of Weights and Measures. If this is not possible, inform the Mr.OS Coordinating Center.

There are two options for monthly calibration. Choose one method that is appropriate for your site and use that method for the completion of the study.

Monthly calibration, option #1: Scale calibration should be checked monthly against known weights. Each center should have a 50 kg weight (Alternatively: two 25 kg weights or two 50 lb weights) for this purpose. (If these are not certified calibration weights, e.g. body building weights, their exact weight should be determined by the local Department of Weights and Measures.)

- Put both the top and bottom counterweights in the zero position. With no weight on the platform, the beam should "float." Then put the known weights on the scale, and adjust the counterweights until the beam "floats."

- If the beam does not "float" at zero with no weight on the platform, or if the measurement of the known weight is off by more than □□1 kg, the scale may need to be repaired or replaced.

Perform calibration check for linearity once per month. Linearity is checked by weighing a volunteer and recording the weight. With the person still standing on the scale, add 5 kg (10 lb [4.5 kg]) using the test weight; then add 10 kg (25 lb [11.3 kg]); 15 kg (35 lb [15.9 kg]); and finally 20 kg (50 lb [22.7 kg]). The scale should reflect the volunteer's weight plus the added weight within ± 0.2 kg. Record calibration measurements on the calibration form and retain in your records. Carry out the procedure on persons of different weights during the study so that you will accumulate a profile of the linearity of the scale throughout a range of weights.

Monthly calibration, option #2: Please see option #1 for general information.

- Weigh staff volunteer and record weight.

- Place 50 kilogram standard(s) on the scale and record weight. If a 50 kg weight is too heavy, two 25 kg weights or four 12.5 kg weights can be used instead.

- Have staff person stand on the scale with the standard weight, and record measurement.

3. Safety Issues and Exclusions

The measurement of weight using a standard balance beam scale poses no safety concerns or reasons for exclusion.

4. Subject and Exam Room Preparation

Study participants will be encouraged to empty their bladders and/or bowels prior to the measurement.

> **Script:** "The measurement that we are about to take is more accurate if you use the bathroom before we measure you. If you need to use the bathroom it is down the hall."

Weight is measured without shoes or heavy jewelry.

Ideally, the scale should be positioned so that the examiner can stand behind the beam facing the subject, and can move the beam weights without reaching around the subject.

5. Measurement Procedures

1) Before the participant steps onto the scale, lift the counterweight and position it all the way to the right. The top weight should be all the way to the left at the zero position.

   The participant should stand quietly in the center of the platform, facing the balance beam, with their weight equally distributed on both feet, and not touching or supporting themselves on anything.

2) If a participant requires support from a cane while being weighed, weigh yourself with and without the participant's cane, etc., to determine its weight. Subtract the weight of the aid from the participant's weight before recording. In the event that it is necessary for the examiner to support the participant during weighing, provide the minimum support that is safe.

3) Adjust the counterweight, and then the top weight, until the beam is evenly balanced.

4) Weight is recorded to the nearest 0.1 kg.

5) A chart for converting kilograms to pounds should be mounted near the scale, so that participants can be told their weight in pounds.

   Script: "In order to measure your weight, please remove your shoes and heavy jewelry, and empty your pockets. Please step forward onto the center of the scale."

Please note that if it is not possible to obtain weight on the standard balance beam scale, it is acceptable to use a portable digital scale that is used in home visits. This scale must be calibrated before use and the calibration log should be kept up-to-date.

6. Alert Values/Follow-up/Reporting

Weight will be included in the form given to the participant at the time of the visit. This measurement will also be included in the final report to the participant and their physician.

7. Quality Assurance

7.1 Training Requirements

No special qualifications or experience are required to perform this assessment. Training should include:

- Read and study manual
- Attend Mr.OS training session on techniques (or observe administration by experienced examiner)

- Practice on other staff or volunteers (Goal: minimize differences between repeat measurements)
- Discuss problems and questions with local expert or QC officer

7.2 Certification Requirements

- Complete training requirements
- Demonstrate calibration check procedures for scale
- Conduct exam on 2 volunteers:
  - According to protocol, as demonstrated by completed QC checklist

7.3 Quality Assurance Checklist

- ❑ Participant encouraged to use bathroom prior to measurement
- ❑ Examiner stands in front of participant, if feasible
- ❑ Measurement made in clinic gown without shoes, heavy jewelry, or other clothing
- ❑ Records weight to nearest 0.1 kg
- ❑ Ensures that participant stands still in center of platform
- ❑ Tells participant weight in pounds (and kilograms)
- ❑ Scale calibration log up-to-date
- ❑ Calibration linearity log up-to-date
- ❑ Log shows Department of Weights and Measures calibration

8. References

1. Lohman TG, Roch AF, Martorell R, eds. Anthropometric Standardization Reference Manual. Human Kinetics Books, Champaign, Illinois, 1988.

Appendix A: Kilograms to Pounds Conversion Table

kg	lbs	kg	lbs	kg	lbs	kg	lbs	kg	lbs
36.3	80	59.0	130	81.7	180	104.4	230	127.1	280
36.8	81	59.5	131	82.2	181	104.9	231	127.6	281
37.2	82	59.9	132	82.6	182	105.3	232	128.0	282
37.7	83	60.4	133	83.1	183	105.8	233	128.5	283
38.1	84	60.8	134	83.5	184	106.2	234	128.9	284
38.6	85	61.3	135	84.0	185	106.7	235	129.4	285
39.0	86	61.7	136	84.4	186	107.1	236	129.8	286
39.5	87	62.2	137	84.9	187	107.6	237	130.3	287
40.0	88	62.7	138	85.4	188	108.1	238	130.8	288
40.4	89	63.1	139	85.8	189	108.5	239	131.2	289
40.9	90	63.6	140	86.3	190	109.0	240	131.7	290
41.3	91	64.0	141	86.7	191	109.4	241	132.1	291
41.8	92	64.5	142	87.2	192	109.9	242	132.6	292
42.2	93	64.9	143	87.6	193	110.3	243	133.0	293
42.7	94	65.4	144	88.1	194	110.8	244	133.5	294
43.1	95	65.8	145	88.5	195	111.2	245	133.9	295
43.6	96	66.3	146	89.0	196	111.7	246	134.4	296
44.0	97	66.7	147	89.4	197	112.1	247	134.8	297
44.5	98	67.2	148	89.9	198	112.6	248	135.3	298
44.9	99	67.6	149	90.3	199	113.0	249	135.7	299
45.4	100	68.1	150	90.8	200	113.5	250	136.2	300
45.9	101	68.6	151	91.3	201	114.0	251	136.7	301
46.3	102	69.0	152	91.7	202	114.4	252	137.1	302
46.8	103	69.5	153	92.2	203	114.9	253	137.6	303
47.2	104	69.9	154	92.6	204	115.3	254	138.0	304
47.7	105	70.4	155	93.1	205	115.8	255	138.5	305
48.1	106	70.8	156	93.5	206	116.2	256	138.9	306
48.6	107	71.3	157	94.0	207	116.7	257	139.4	307
49.0	108	71.7	158	94.4	208	117.1	258	139.8	308
49.5	109	72.2	159	94.9	209	117.6	259	140.3	309
49.9	110	72.6	160	95.3	210	118.0	260	140.7	310
50.4	111	73.1	161	95.8	211	118.5	261	141.2	311
50.8	112	73.5	162	96.2	212	118.9	262	141.6	312
51.3	113	74.0	163	96.7	213	119.4	263	142.1	313
51.8	114	74.5	164	97.2	214	119.9	264	142.6	314
52.2	115	74.9	165	97.6	215	120.3	265	143.0	315
52.7	116	75.4	166	98.1	216	120.8	266	143.5	316
53.1	117	75.8	167	98.5	217	121.2	267	143.9	317
53.6	118	76.3	168	99.0	218	121.7	268	144.4	318
54.0	119	76.7	169	99.4	219	122.1	269	144.8	319
54.5	120	77.2	170	99.9	220	122.6	270	145.3	320
54.9	121	77.6	171	100.3	221	123.0	271	145.7	321
55.4	122	78.1	172	100.8	222	123.5	272	146.2	322
55.8	123	78.5	173	101.2	223	123.9	273	146.6	323
56.3	124	79.0	174	101.7	224	124.4	274	147.1	324
56.8	125	79.5	175	102.2	225	124.9	275	147.6	325
57.2	126	79.9	176	102.6	226	125.3	276	148.0	326
57.7	127	80.4	177	103.1	227	125.8	277	148.5	327
58.1	128	80.8	178	103.5	228	126.2	278	148.9	328