Clauser's et al. Body Segment Parameters for 2-D Studies[1]

Segment name	Endpoints (proximal to distal)	Seg. mass /total mass (P)	Centre of mass /segment length		Centre of mass to ant. A/P size	Radius of gyr'n /segment len. ($K_{proximal}$)
			($R_{proximal}$)	(R_{distal})		
Hand	stylion to metacarpale III	0.0065	0.1802	0.8198	0.5613	0.6283
Forearm	radiale to stylion	0.0161	0.3896	0.6104	0.4863	0.5030
Upper arm	acromion to radiale	0.0263	0.5130	0.4870	0.5100	0.5949
Forearm & hand	radiale to stylion	0.0227	0.6258	0.3742	0.5240	
Upper extremity	(regression equation)[2]	0.0490	0.4126	0.5874		
Foot	heel to tip longest toe	0.0147	0.4485	0.5515		0.6189
Foot	sphyrion to sole of foot	0.0147	0.4622	0.5378		
Leg	tibiale to sphyrion	0.0435	0.3705	0.6295	0.4247	0.5143
Thigh	trochanter to tibiale	0.1027	0.3719	0.6281	0.5335	0.5090
Leg & foot	tibiale to floor (sole)	0.0582	0.4747	0.5253	0.3325	
Lower extremity	trochanter to floor (sole)	0.1610	0.3821	0.6179	0.6313	
Trunk	chin-neck int. to trochanter[3]	0.5070	0.3803	0.6197		0.5738
Head	top of head to chin-neck int.	0.0728	0.4642	0.5358		0.7850
Head	glabella to occiput	(c. of m. to occiput/head length)			0.3996	
Trunk & head	chin-neck int. to trochanter	0.5801	0.5921	0.4079		
Total body		1.0000	0.4119	0.5881		0.8495

[1] From Clauser, McConville and Young, Weight, volume and center of mass of segments of the human body, AMRL-TR-69-70, 1969 and Chandler, Clauser, McConville, Reynolds and Young, Investigation of inertial properties of the human body, AMRL-TR-74-137, 1975 both Wright-Patterson Air Force Base.

[2] regression equation for arm: length = 1.126 (acromion to radiale distance) + 1.057 (radiale to stylion distance) + 12.52 (all distances in centimetres.)

[3] chin-neck intersection. the point superior to the cricoid cartilage, at the level of the hyoid bone. Marker should be placed level with the intersection but at the lateral aspect of the neck.

Definitions of Landmarks

acromion - point at the superior and external border of the acromion process of the scapula. This point is easier to find if the subject bends laterally at the trunk to relax the deltoid muscle.

glabella - the bony ridge under the eyebrows.

metacarpale III - the distal head of the third metacarpal. (proximal knuckle of the middle finger)

occiput - occipital process.

radiale - point at the proximal and lateral border of the head of the radius. Palpate downward in the lateral dimple at the elbow. Have the subject pronate and supinate the forearm slowly, so that the radius may be felt rotating beneath the skin.

sphyrion - the most distal point of the medial malleolus of the tibia. Place the marker on the fibula at the level of the sphyrion. Do not use the sphyrion fibulare, as it is more distal than the sphyrion.

stylion - styloid process of the radius. The styloid process of the ulna may be used.

tibiale - most proximal point of the medial border of the head of the tibia. Use the tibiale externum, which is equivalent. Palpate the tendon of the quadriceps at the distal end of the patella, and follow the border of the tibia laterally to the frontal border of the lateral collateral ligament. The point is easier to find if the subject unweights the leg and slightly flexes the knee.

trochanter - the most superior point on the greater trochanter of the femur. Difficult to locate in women and people with excessive subcutaneous fat. Have the subject abduct the leg and move the leg forward and backward. Palpate the femur with the index finger, and move upwards gradually until the most superior palpable point on the trochanter is found.