

Hand Grip Strength

Hand grip strength (HGS) is a simple and inexpensive measure of muscular capacity. HGS is traditionally used to assess physical function and is linked to a range of health outcomes. However, increasing evidence suggests low HGS is strongly associated with **poor brain health**¹, which may include accelerated cognitive decline, higher incidence of dementia, and dementia-related mortality.

HGS represents more than a marker of physical capacity; it is a window into vascular health and an early, accessible indicator of poor brain health. As a biomarker for brain health, HGS reflects mitochondrial dysfunction characterized by calcium dysregulation, impaired mitophagy, mitochondrial fragmentation, and increased mitochondrial reactive oxygen species (mtROS)². These mitochondrial abnormalities contribute to key pathological features of poor brain health, including plaque accumulation and neurofibrillary tangles, linking physical frailty with cognitive decline.

HGS is typically measured using dynamometers that are hydraulic, pneumatic, or mechanical. Measuring HGS as a clinical vital sign enables early identification and monitoring of poor brain health risk prior to symptom onset, assisting with the identification of at-risk individuals, promoting timely interventions, and contributing to healthier aging trajectories.

Summary of Hand-Grip Strength Measurements by sex and age group

		Percentile				
Age		10	25	50	75	90
Male	18-24	80	91	105	113	128
	25-29	74	95	109	131	146
	30-34	69	80	102	124	139
	35-39	67	88	110	120	134
	40-44	76	88	101	120	139
	45-49	69	79	90	106	131
	50-54	67	86	99	115	125
	55-59	62	71	85	105	124
	60-64	51	67	89	99	116
	65-69	39	69	81	101	110
	70-74	37	65	80	91	101
75-79	41	57	74	81	96	
80-84	34	47	65	76	84	
Female	18-24	39	49	63	75	84
	25-29	45	56	65	74	88
	30-34	45	53	66	73	82
	35-39	44	54	67	73	84
	40-44	50	58	67	75	82
	45-49	39	56	63	76	83
	50-54	43	54	62	72	78
	55-59	37	46	53	67	71
	60-64	35	42	54	62	70
	65-69	26	43	49	55	69
	70-74	34	43	50	53	61
75-79	28	35	40	49	61	
80-84	32	37	43	48	60	

(1) GeroScience, 44(4), 2007-2024

(2) Frontiers in Aging Neuroscience, 13, 617588