Health Monitor GMON

„INDICATE Health Risks – RATE professionally – REACT prophylacticly"

Explanation to Register Body Values / Muscle Mass

Muscle mass indicates the percentage of muscle in the body. It is determined absolutely in kg or related to the body weight in %. The body needs approximately 50 more calories per day per pound of additional muscle mass. Changing the muscle mass the calories requirements should be monitored and adjusted.

Too less muscle mass means too much body fat! Such a body composition can lead to adverse effects in terms of health, i.e. blood pressure, heart disease and diabetes!

Since muscle is more dense than fat, a muscular body is related to a high value of body mass index – the BMI is ceases to be valid as indicator for health.

Note: The measurement results of muscle mass can be differed using scales from different manufactories, depending on whether the organ tissue (as component of fat-free mass) is included (total muscle mass) or not (skeletal muscle mass).

The skeletal muscle mass corresponds to 56.6% of the fat-free mass or 134% of the mass of intracellular water. [Deurenberg et al., 2004].

There are the following relations [in kg]:

    body weight   = fat mass   + fat-free mass
    fat-free mass = muscle mass (total) + boon mass

Considering fat mass and muscle mass complementary, the classification of muscle mass result from the classification of body fat mass (s. A to D).

The Sarcopenic Index (also skeletal muscle mass index SMI) is calculated by dividing the appendicular skeletal muscle mass (SMM of both arms and legs) by the height squared. Sarcopenia is the degenerative loss of skeletal muscle mass, quality, and strength associated with aging [Beaudart et al., 2014].

For assessment the muscle mass as a description of level of fitness the classification is carry out according to the body height by comparison with a reference population (E).

Changes in muscle mass are assigned with signal colours in the graphic depiction to display the qualitative changes in health risks.

(A) Classification of muscle mass (total) according to age and gender
(B) Classification of muscle mass (total) for children and young people
(C) Asian classification of muscle mass (total) according to age and gender
(D) Asian classification of muscle mass (total) for children and young people
(E) Classification of muscle mass (total) according to body height
(F) Classification of Sarcopenic Index

[Beaudart C et al.] Prevalence of sarcopenia: the impact of different diagnostic cut-off limits. J Musculoskelet Neuronal Interact, Vol. 14 (2014), No. 4, pp 425-431.
[Deurenberg P et al.] Prediction of total body skeletal muscle mass from fat-free mass or intra-cellular water. Int. J of Body Composition Research, Vol. 2 (2004), No. 3, pp 107-113.

Overview about GMON-modules
 general operation instruction, using goals values, other relevant parameters for health

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Explanation to Register Body Values / Muscle Mass

(A/Women) Classification Muscle Mass (total)

Classification	Traffic light colour	20 – 39 years	40 – 59 years	60 – 79 years
very low	red	< 57%	< 56%	< 54%
low	yellow	57% - 63%	56% - 62%	54% - 60%
good	green	63% - 75%	62% - 73%	60% - 72%
increased	yellow	> 75%	> 73%	> 72%

(A/Men) Classification Muscle Mass (total)

Classification	Traffic light colour	20 – 39 years	40 – 59 years	60 – 79 years
very low	red	< 71%	< 68%	< 66%
low	yellow	71% - 76%	68% - 74%	66% - 71%
good	green	76% - 88%	74% - 85%	71% - 83%
increased	yellow	> 88%	> 85%	> 83%

(B/female) Classification of Muscle Mass for Children and Young People

	very low	low	good	increased
Traffic light colour	red	yellow	green	yellow
7 years	< 67%	67% - 71%	71% - 81%	> 81%
8 years	< 66%	66% - 70%	70% - 81%	> 81%
9 years	< 65%	65% - 69%	69% - 80%	> 80%
10 years	< 64%	64% - 68%	68% - 80%	> 80%
11 - 13 years	< 63%	63% - 67%	67% - 80%	> 80%
14 - 16 years	< 62%	62% - 66%	66% - 80%	> 80%
17 years	< 61%	61% - 66%	66% - 80%	> 80%
18 years	< 60%	60% - 65%	65% - 79%	> 79%
19 years	< 59%	59% - 64%	64% - 77%	> 77%

(B/male) Classification of Muscle Mass for Children and Young People

	very low	low	good	increased
Traffic light colour	red	yellow	green	yellow
7 years	< 71%	71% - 76%	76% - 83%	> 83%
8 years	< 70%	70% - 75%	75% - 83%	> 83%
9 years	< 69%	69% - 74%	74% - 83%	> 83%
10 -12 years	< 68%	68% - 73%	73% - 83%	> 83%
13 years	< 69%	69% - 74%	74% - 84%	> 84%
14 years	< 70%	70% - 75%	75% - 84%	> 84%
15 years	< 72%	72% - 75%	75% - 85%	> 85%
16 - 18 years	< 72%	72% - 76%	76% - 86%	> 86%
19 - 20 years	< 72%	72% -76%	76% - 87%	> 87%

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Explanation to Register Body Values / Muscle Mass

(C/Women) Asian Classification of Muscle Mass

Classification	Traffic light colour	18 – 39 years	40 – 59 years	60 years and more
very low	red	< 56%	< 55%	< 54%
low	yellow	56% - 61%	55% - 60%	54% - 59%
good	green	61% - 75%	60% - 74%	59% - 73%
increased	yellow	> 75%	> 74%	> 73%

(C/Men) Asian Classification of Muscle Mass

Classification	Traffic light colour	18 – 39 years	40 – 59 years	60 years and more
very low	red	< 69%	< 68%	< 66%
low	yellow	69% - 74%	68% - 74%	66% - 71%
good	green	74% - 85%	74% - 84%	71% - 80%
increased	yellow	> 85%	> 84%	> 82%

(D/female) Asian Classification of Muscle Mass for Children and Young People

	very low	low	good	increased
Traffic light colour	red	yellow	green	yellow
6 years	< 67%	67% - 71%	71% - 88%	> 88%
7 years	< 66%	66% - 71%	71% - 87%	> 87%
8 years	< 65%	65% - 70%	70% - 86%	> 86%
9 years	< 64%	64% - 68%	68% - 86%	> 86%
10 years	< 63%	63% - 67%	67% - 85%	> 85%
11 years	< 61%	61% - 65%	65% - 83%	> 83%
12 years	< 60%	60% - 64%	64% - 82%	> 82%
13 years	< 58%	58% - 62%	62% - 81%	> 81%
14 years	< 57%	57% - 61%	61% - 79%	> 79%
15 years	< 56%	56% - 60%	60% - 78%	> 78%
16 years	< 55%	55% - 59%	59% - 77%	> 77%
17 years	< 55%	55% - 59%	59% - 76%	> 76%

(D/male) Asian Classification of Muscle Mass for Children and Young People

	very low	low	good	increased
Traffic light colour	red	yellow	green	yellow
6 – 7 years	< 66%	66% - 71%	71% - 89%	> 89%
8 – 11 years	< 66%	66% - 70%	70% - 89%	> 89%
12 –13 years	< 66%	66% - 71%	71% - 89%	> 89%
14 years	< 67%	67% - 71%	71% - 89%	> 89%
15 years	< 67%	67% - 72%	72% - 88%	> 88%
16 years	< 68%	68% - 72%	72% - 88%	> 88%
17 years	< 68%	68% - 73%	73% - 87%	> 87%

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Explanation to Register Body Values / Muscle Mass

(E) Classification of Muscle Mass according Body Height [in cm]:

MM = Factor · Body Height²

	low	**good**	**increased**
Traffic light colour	yellow	green	yellow
female	Factor: < 0.001380	Factor: 0.001380 – 0.001747	Factor: > 0.001747
example (160 cm)	< 35.4 kg	35.4 – 44.7 kg	> 44.7 kg
example (170 cm)	< 39.9 kg	39.9 – 50.5 kg	> 50.5 kg
male	Factor: < 0.001694	Factor: 0.001694 – 0.002147	Factor: > 0.002147
example (170 cm)	< 49.0 kg	49.0 – 62.0 kg	> 62.0 kg
example (180 cm)	< 54.8 kg	54.8 – 69.6 kg	> 66.9 kg

(E) Asian Classification of Muscle Mass according to Body Height [in cm]:

MM = Factor · Body Height²

	low	**good**	**increased**
Traffic light colour	yellow	green	yellow
female	Factor: < 0.001381	Factor: 0.001381 – 0.001571	Factor: > 0.001571
example (160 cm)	< 35.4 kg	35.4 – 40.2 kg	> 40.2 kg
example (170 cm)	< 39.9 kg	39.9 – 45.4 kg	> 45.4 kg
male	Factor: < 0.001626	Factor: 0.001626 – 0.001907	Factor: > 0.001907
example (170 cm)	< 47.0 kg	47.0 – 55.1 kg	> 55.1 kg
example (180 cm)	< 52.7 kg	52.7 – 61.8 kg	> 61.8 kg

(F) Classification of Sarcopenic Index [Muscle Mass (Arms & Legs) / Body Height²]:

	low	**good**
Traffic light colour	yellow	green
female	< 5.50 kg/m²	≥ 5.50 kg/m²
male	< 7.25 kg/m²	≥ 7.25 kg/m²