

The Japan Ground Golf Association conducted health surveys in order to clarify physical characteristics and mobility functions of Ground Golf players; as well as, the general elderly in FY2015. In this paper, we report the summary of the study results.

## Purpose

In this survey, we aimed to clarify the significance and the roles which Ground Golf plays in society, especially from the aspect of health, by conducting academic research on the effect and the influence of Ground Golf on the health of players. In this manner, we aimed to contribute toward further promotion of Ground Golf in the future.





# 2 Participants (Subjects)

Ground Golf players who participated in the grade 1 and 2 leaders training session in FY2015 participated in this study. As a control group that does not play Ground Golf, the elderly people of the same age as Ground Golf players also participated in the survey. The table on the right shows descriptive characteristics of the participants.

Sum 525 (male: 297; female: 22			297; female: 228)
		GG players	Control
Male	Age (yrs)	$73.5 \pm 0.4$	$72.5 \pm 0.5$
	Height (cm)	$163.2 \pm 0.5$	163.8 ± 0.6
	Weight (kg)	$63.6 \pm 0.6$	$64.1 \pm 0.8$
	BMI (kg/m²)	$23.7 \pm 0.2$	$23.7 \pm 0.2$
	Diastolic pressure (mmHg)	147.7 ± 1.7	147.9 ± 1.9
	Systolic blood pressure (mmHg)	82.7 ± 1.1	82.8 ± 1.2
Female	Age (yrs)	$72.9 \pm 0.5$	$73.2 \pm 0.5$
	Hight (cm)	$150.7 \pm 0.5$	151.5 ± 0.5
	Weight (kg)	$52.5 \pm 0.8$	$52.4 \pm 0.6$
	BMI (kg/m²)	$23.0 \pm 0.3$	$22.7 \pm 0.2$
	Diastolic pressure (mmHg)	$144.2 \pm 2.2$	139.5 ± 1.8
	Systolic blood pressure (mmHg)	79.1 ± 1.2	78.7 ± 1.0

Ground Golf (GG) players 266 (male: 175; female: 91)

Control group 259 (male : 122; female: 137)

Average  $\pm$  SD

**CCO** Japan Ground Golf Association

# 3 Survey contents

#### 1) Physical characteristics

Height, Weight, Blood pressure, Body fat, Muscle mass, Bone density, Vital capacity, and Grip strength The state of the measurement by sports doctors and researchers.



- 2) The locomotive syndrome risk test '25-question risk assessment'. We especially evaluated mobility functions, such as: standing up and walking. (Please see the figures below)
- 3) Lifestyle Smoking/frequency (number of cigarettes/cigars/tobacco), Alcohol consumption, Physical activity, Types of physical activity, Ground Golf history, Anxiety on psychological & physical conditions









#### The locomotive syndrome risk test

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#### 1 How to conduct the stand-up test





10cm 20cm 30cm 40cm
If in Step 2 you're able to stand up on one leg...
If you can stand up on both your right and left leg., you've passed. Next try the same thing from lower heights at 10 cm decrements.

2 If you can stand up from a height of 40 cm on both legs, next try it on one leg. Resume the posture of Step 1, and raise either your right or left leg, bending the knee slightly. Stand up without leaning back to gain momentum, and maintain posture for three seconds.



If in Step 2 you're **unable** to stand up on one leg-If you can't stand up on both your right leg and your left leg, you've **failed**. Now try standing up on both legs from lower heights at 10 cm decrements.

#### The two-step test



Maximum length of double stride (distance covered in two steps)



Reference: Japan Locomo Challenge Promotion Conference https://locomo-joa.jp/en/index.pdf



What is locomotive syndrome?



Locomotive syndrome means being restricted in one's ability to walk or lead a normal life owing to a dysfunction in one or more parts of the musculoskeletal system (muscle, bones, joints, cartilage, or the intervertebral discs). The risk of requiring nursing will increase as the conditions progress. In the locomotive syndrome risk test, we evaluated mobility functions through 'the stand-up test', 'the two-step test', and '25-question risk assessment'.

#### 4 **Results**

Ground Golf players had a 40%, or more, lower risk as determined risk level 1 and 2 compared to the general elderly.



Locomotive syndrome risk level 1 Locomotive functions (muscles, bones, joints, nerves, etc.) to support and move the body are beginning to decline.

Locomotive syndrome risk level 2 Decline of locomotive functions (muscle, bone, joint, nerve, etc.) to support and move the body is already advanced.

Reference: All of locomotive syndrome, Kozo Nakamura ·Sakae Tanaka, Japan Medical Association





Decrease in stride leads to A lower walking speed, A slower mobility function, and A increased risk of falling. Maintaining stride in older age is important for prevention of falls!

Ground Golf players feel less anxiety in regards to psychological & physical conditions compared to the general elderly.





## 5 Summary

From this health survey, it clarified that the Ground Golf players have the following characteristics compared with the general elderly.

### Lower risk of being determined as locomotive syndrome risk level 1 & 2 which indicate a decrease in mobility function.

We found that the proportion of people determined as locomotive syndrome risk level 1 or 2, representing the state in which the mobility function is beginning to decline or is already advanced, is small. Therefore, it is considered that the mobility function is maintained by playing Ground Golf.

## "Stride" necessary for fall prevention is maintained.

Stride is related to muscle strength of lower limbs and falling history. In order to take a big step, the muscular strength that supports the body with one foot and one's balance function are necessary. Playing Ground Golf seems to increase the number of steps per day and the amount of physical activity and maintain the strength of the lower limbs. As a result, it preserves the mobility function to stand up and walk.

## Less anxiety on psychological and physical conditions.

Enjoying Ground Golf as a group has positive effects on psychological and physical conditions by increasing opportunities to contact with people and securing time for physical activity.

This survey revealed that enjoying Ground Golf throughout one's lifetime has a possibility to prevent locomotive syndrome and falls. Based on these results, playing Ground Golf on a daily basis may be able to train locomotive functions and maintain mental health, leading to one's "extension of healthy lifespan."

In the future, it is expected that Ground Golf, with 3.6 million players in Japan, will further spread all over the country, supporting healthy longevity society through sports.



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