# Introduction

SVV (Subjective Visual Vertical) is a clinical test that measures the subjective vertical direction, measures the deviation from the actual vertical direction, that is, the gravity direction, and detects gravity sensitivity disorders.
The app is available on iPhone. At the time of inspection, the vertical line is rotated by the remote controller. This application enables SVV testing using an iPhone, a remote controller, and VR goggles.
The Quick Guide provides a concise summary of the essential operations and basic usage, including how to use the remote controller.
Note: This application does not guarantee the operation of VR remotes manufactured by other companies. If the VR remotes malfunctions, please contact the manufacturer for assistance.

The SVV test is performed by placing the iPhone in a VR headset and using a VR remote controller for operation.
This application supports the Elecom JC-VRR04BK (center in the image above) and JC-XR05BK (right in the image above).
On the JC-VRR04BK, the ⏪, ⏯ and ⏩ buttons are used for operation. On the JC-XR05BK, the [A], ⏻ and [X] buttons are used.
Touching the left, center, or right third of the screen is equivalent to pressing the ⏪,⏯,⏩ or [A],⏻,[X] buttons, respectively.

When you press the ⏯ button to start the test, a red line will appear. Pressing the ⏪ or ⏩ button changes the line to blue, and allows you to move it left or right. Adjust the blue line to your perceived vertical position, then press the ⏯ button to confirm. During the test, do not tilt your head forward or backward by more than 10 degrees. If the tilt exceeds this limit, a beep will sound, the line will turn gray, and the confirmation button will become disabled. After confirmation, the line will return to red. Repeat the same operation 10 times to automatically complete the test. If you press the ⏯ button twice in quick succession while the line is red, the test will end at that point.
When the test is complete, the results will be displayed as shown below (this is an example).

```
2025-04-08,17:19, ID:
Head_Tilt,  N, Average, SD
-10<=T<10, 10,  001.79, 2.71



angle,-2.0,1.7,3.0,0.1,-3.8,1.4,-0.8,1.2,-1.8,1.8
sensor,-0.1,-3.4,-2.5,-2.8,-1.6,-1.6,-1.2,-2.2,-0.4,-1.3
SVV,-1.9,5.1,5.5,2.8,-2.2,3.1,0.4,3.4,-1.4,3.1
```

[Save⏪] button : Enter an ID to save the results above.
[ List ] button : View a list of results. You can send the results via email.

# F-SVV User Manual for iPhone (Japanese versions)

【Overview】

- The Subjective Visual Vertical (SVV) test is used to assess deviations between the visually perceived vertical and the gravitational vertical, in order to determine the presence of vestibular dysfunction.

- This chapter explains the basic procedure for realigning a tilted visual indicator using only an iPhone.

【Prerequisites】

① The reference line (hereafter referred to as the “indicator line”) is displayed on a circular white platform, resembling the face of a clock.
② The indicator line is rendered in three colors: red, blue, and black.
③ A red indicator line signifies the initial position prior to the start of the test.
④ A blue indicator line indicates the adjustment phase, during which the line is being moved toward the perceived vertical.
⑤ A black indicator line denotes that the subject’s head is tilted more than ±10° relative to the frontal plane. In such cases, the test cannot be performed.

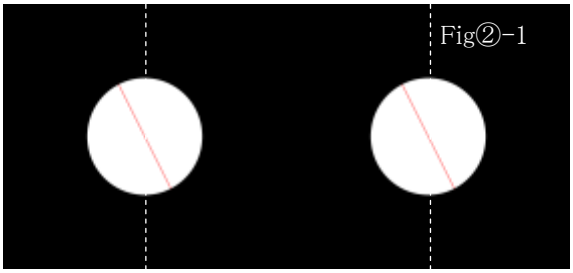
【Quick Start Guide】 - iPhone-Only Operation (Without VR Goggles or Controller) -

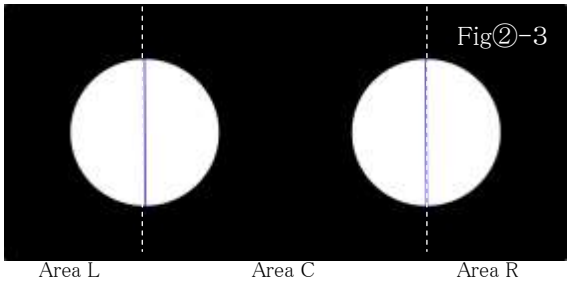
① Tap the icon.

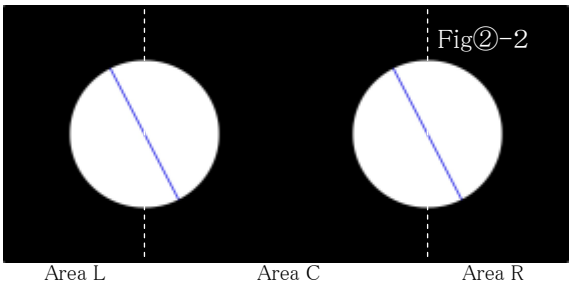

Tap

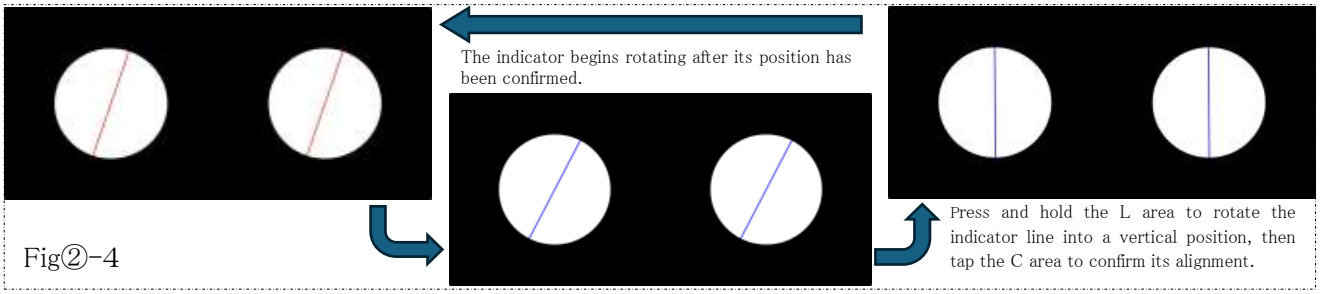

② Tap the START ⏯.

a) The red indicator line oscillates within a ±10° range, rotating alternately in clockwise and counterclockwise directions. (Fig ②-1)
b) While the red indicator line is rotating, tap either the L or R area to stop the line (red → blue). (Fig ②-2)
c) Tap or press and hold the L or R area to adjust the stopped indicator line until it becomes vertical. (Fig ②-3)
d) Tap the C area to confirm the vertical position of the indicator line, then return to step a) and repeat the SVV test 10 times to complete the procedure. (Fig ②-4)



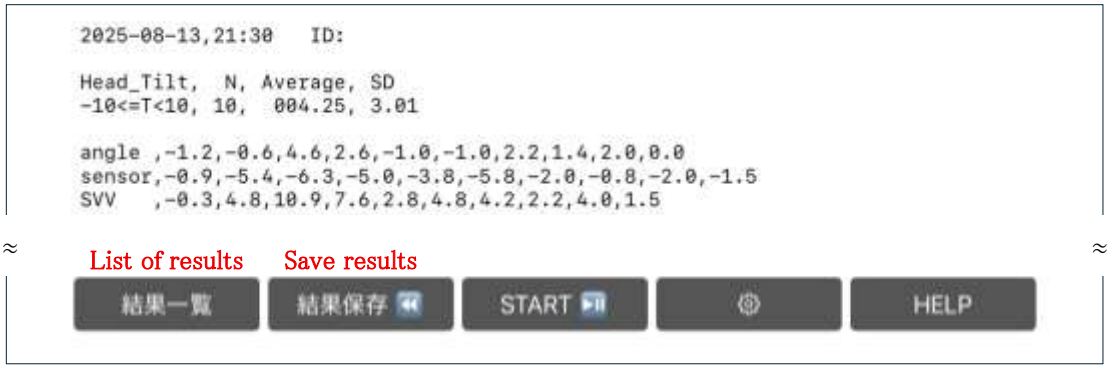



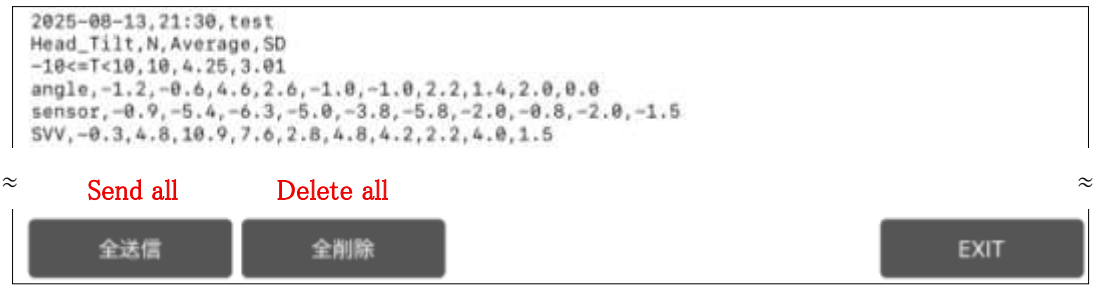

③ After completing the SVV test, the results will be displayed.
The numerical deviation between the patient’s perceived vertical (subjective visual vertical) and the actual gravitational vertical is displayed.

※This is a clinical test used to assess the presence or absence of vestibular dysfunction.



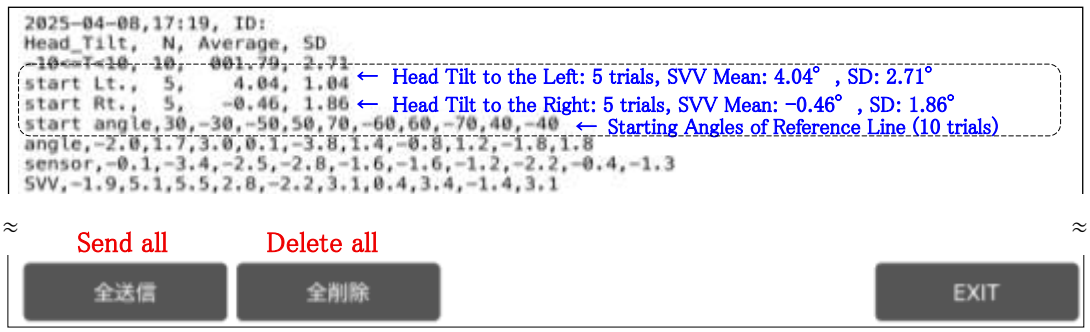

④ Tap Save Results ⏮ ,enter your ID, and tap OK.


⑤ Tap Results List

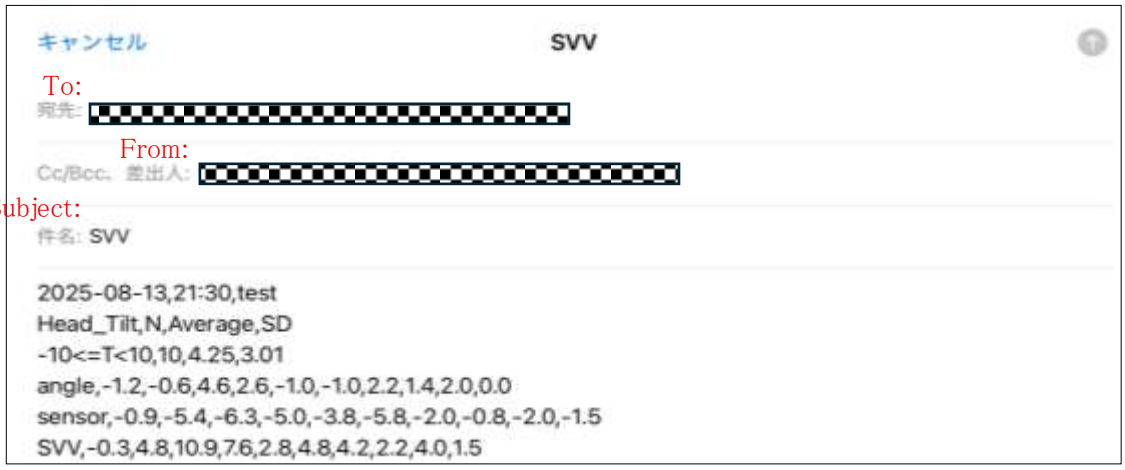



➢ When information is added to the results list

When you tap “Settings,” turn off “Vertical Line: Moving,” and change the starting position of the reference line from Dynamic Mode to Random Fixed Mode, the results list will display the number of occurrences, mean, standard deviation (SD), and the starting angle of the reference line for each direction of head tilt (left and right).



⑥ Tap Send All .



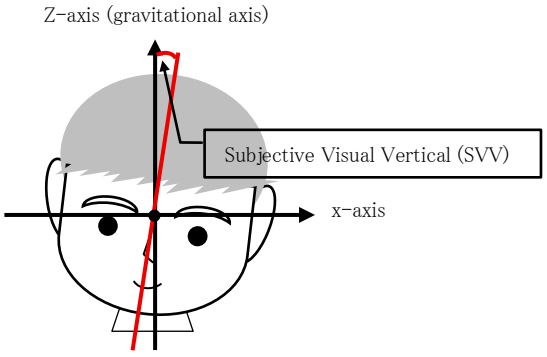

⑦ You will receive the result data via email.

| 2025/8/13 | 21:30 | test | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Head Tilt | N | Average | SD | | | | | | | |
| −10<=T<10 | 10 | 4.25 | 3.01 | | | | | | | |
| angle | −1.2 | −0.6 | 4.6 | 2.6 | −1 | −1 | 2.2 | 1.4 | 2 | 0 |
| sensor | −0.9 | −5.4 | −6.3 | −5 | −3.8 | −5.8 | −2 | −0.8 | −2 | −1.5 |
| SVV | −0.3 | 4.8 | 10.9 | 7.6 | 2.8 | 4.8 | 4.2 | 2.2 | 4 | 1.5 |

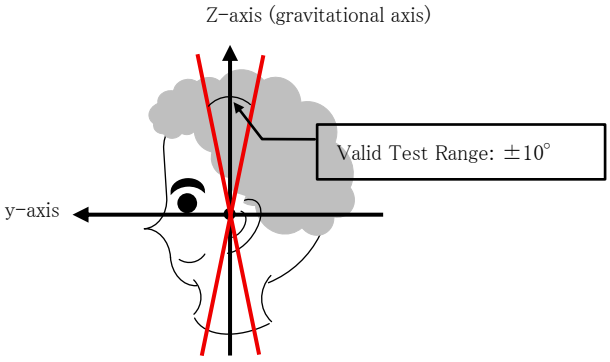
a) Head Tilt: Head tilt (left/right) : ±10°
b) N : Head tilt repetitions to the left and right : ±10 times
c) Average : Average Head Tilt Angle : 4.25
d) SD : Head Tilt SD : 3.01° (uncorrected for degrees of freedom)
e) Angle : Head tilt angle = Vertical component angle measured by iPhone − Subjective vertical angle (the perceived tilt of the vertical axis by the subject)
f) sensor : Device Tilt = Vertical Component Angle measured by iPhone − Absolute Vertical Angle (90° )
g) SVV : angle - sensor = Head Tilt Angle − Device Tilt Angle

※ The SVV test indirectly measures the difference between the subjectively perceived vertical and the true vertical using the iPhone's accelerometer.

※ The SVV test is considered valid only when the head position is within ±10° relative to the Y-axis; if outside this range, the reference line is displayed in black to indicate invalid data.



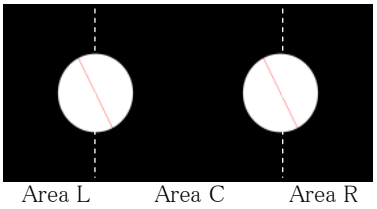

The contrast between subjective vertical perception and physical reality




SVV testing is performed only when the head position is within ±10° of the Y-axis.

【Operation Guide for Combined Use of VR Goggles and Remote Controller】

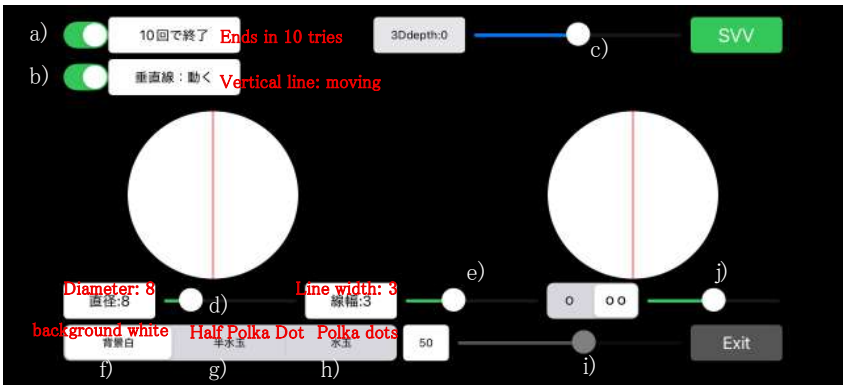
When using an iPhone in combination with VR equipment (goggles and controller), the remote controller functions—rewind (⏪), play/pause (⏯), and fast-forward (⏩)—are mapped respectively to the L (Left), C (Center), and R (Right) zones for operation (see diagram below).




VR Goggles and Remote Controller (Model: JC-VRR04BK)

【 setting 】


① Tap ⚙ Send All




a) When set to ON, the SVV test automatically ends after 10 trials. The SVV indicator is displayed as a red line that rotates, dynamically changing the starting position of each test. (When the indicator is manually returned to vertical, it turns blue.) When set to OFF, measurements can be performed any number of times and ended at any desired timing. To end the measurement: double-tap the iPhone's C zone while the indicator is red, or tap the remote controller's ⏯ button twice.

b) When set to ON, the indicator rotates automatically, shifting the starting position of each test. When set to OFF, the indicator line moves to a random position and remains stationary.

※ From this state, the SVV test can be repeated any number of times.

c) The "parallax" setting can be adjusted within a range of -30 to 30 to create a sense of depth in the indicator.

※ iPhone-compatible VR goggles are used. If VR goggles are not used, set the "parallax" value to 0.

d) Adjust the circle size (diameter) in 50 incremental levels.

e) Select the indicator line width from 10 levels (0 to 9).

f) Set the platform to a plain white disc.

g) Fill part of the platform with polka dots.

h) Fill the entire platform with polka dots.

i) Adjust the rotation speed of the polka-dot platform within a range of -360° to 360°, in 5°/second increments.

j) Specify whether to use one or two platforms.

② Tap EXIT to complete the settings.