

**A Brief Examination of
Starkey's Balance
Assessment Tool**

Options for audio include computer speaker or dial-in and enter access code: 2866 858 5727
(Australia +61 2 85181923, NZ +64 9 9291750, Singapore +65 31581414)

For technical questions or log-in information please contact Steven Le
at 0437 622 596. Steven_Le@Starkey.com

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The webinar will start in....
00:05:00

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Technical Issues

If not using speakers and you haven't already, please call into
the call center number and enter access code 2866 858 5727
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Please be sure to keep microphones muted

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Questions

Please share any questions you may
have in the Chat Box directed to *All
Panelists*. We will do our best to
answer them throughout the training.

WebEx Control Panel

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This launch webinar is endorsed for Audiology Australia and ACAud inc. HAASA points

You must stay logged on for the full session

AudA members must complete a 10 questions quiz with a passing score of 70% as
well as your CPD Reflections and Evaluations

ACAud inc. HAASA members must complete the quiz to receive full points.

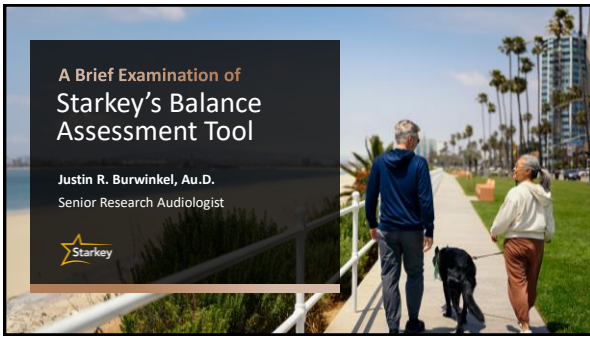
Endorsed Session

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**Learner
Outcomes**

- 1 Identify the CDC STEADI protocol components
- 2 Identify where to find the Balance Assessment tool within My Starkey
- 3 Discuss different patient populations that could benefit from the Balance Assessment tool

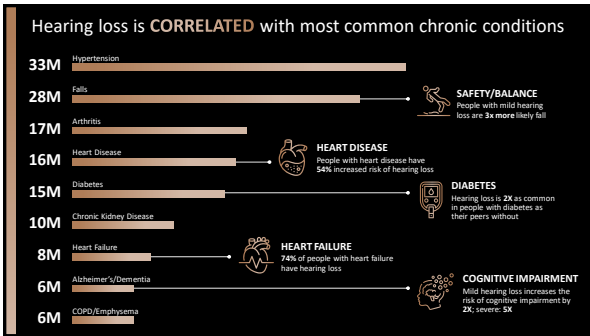
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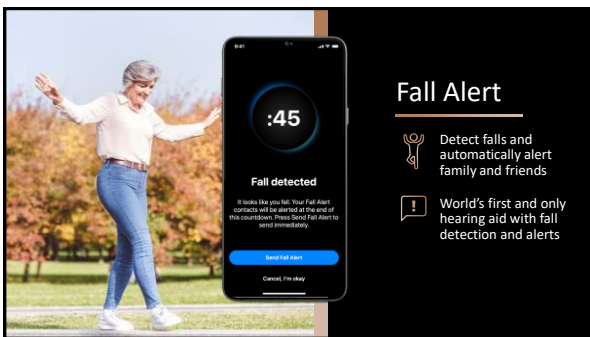
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“Hearing loss may decrease older adults’ participation in social activities and increase the likelihood of developing depression and anxiety
This in turn may affect cognition, reduce physical activity and competence, and increase risk of falls”

Agmon M, Lavi L, Doumas M. The Association Between Hearing Loss, Postural Control, and Mobility in Older Adults: A Systematic Review. *Journal of the American Academy of Audiology*. 2017; 29(6):575-588.

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For every 10 dB increase in hearing loss, people spend

8.5 minutes
more per day being sedentary



Kuo, P.-L., Di, J., Ferrucci, L., & Lin, F.R. (2021). Analysis of Hearing Loss and Physical Activity Among US Adults Aged 60-69 Years. *JAMA Network Open*, 4(5), e212484. <https://doi.org/10.1001/jama-networkopen.2021.4484>

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Adults 60+ spend 80% of life sitting down

Sedentary lifestyle is a risk for falls due to impact on muscle function and mobility

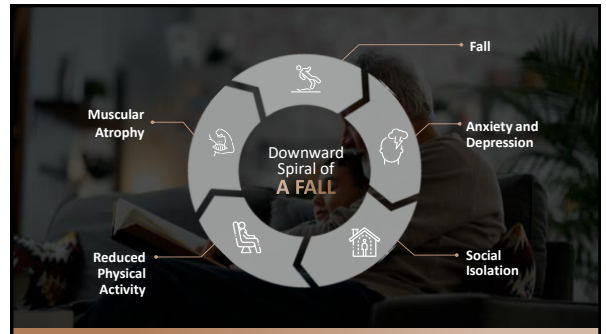


30+ minutes
of physical activity per day at age 65 can reduce 35-40% of falls when older

Harvey JA, Chastin SMF, Sinton DA. How Sedentary Are Older People? A Systematic Review of the Prevalence of Sedentary Behavior, Journal of Aging and Health, 2013; 25(1):81-98; <https://doi.org/10.1177/0898264312462054>

Paganini-Hell A, Greenlee DC, Perry S, et al. Lower likelihood of falling at age 80 is associated with daily exercise: a member of a family study. *The Journals of Gerontology*. 2011; 66(5):315-320; <https://doi.org/10.1093/geronj/gln235>

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“With the audiologist’s regular contact with older individuals and their graduate training of the vestibular and balance system, their importance in the early identification of fall risk is undeniable”

van Rie, K.J., Kang, A., & Naude, A. (2022). Professional Guidelines and Reported Practice of Audiologists Performing Fall Risk Assessment With Older Adults: A Systematic Review. *American Journal of Audiology*, 31(1), 243-260. https://doi.org/10.1044/2022_AJA-21-01148


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Reasons Patients Don't Talk to Their Doctor

- Belief that falls are a normal part of aging
- That reporting a fall may lead to loss of independence
- Not aware of common fall risk factors



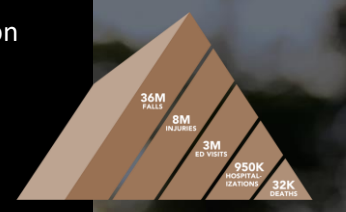
Falls might not be a priority for patients
Less than half of older adults who fall, talk to their doctor about falls

Downes PA, Behrman AL, Mark SA, Ruhl M, O'Carroll E, Adler C. Gender Differences in Seeking Care for Falls in the Age-Related Assessment and Research Study (AARAS). *JAGS*. 2012;64(1):114-120. doi:10.1111/jags.12015.
Downes PA, Ruhl M, Behrman AL, O'Carroll E. Older Adult Fall Prevention: Perception, Beliefs, and Behavior. *AGF*. 2014;18(1):10-17. doi:10.1177/1082263013508804.
Husted PL, Karim S, Beggs G, Mavrou J. Willingness to Change Medications Linked to Increased Fall Risk: A Comparison Between Age Groups. *JAMA Geriatr*. 2014;9(2):101-105. doi:10.1001/jama.2013.28196.

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Falls are Common

Every second an older adult falls



Data sources: National Vital Statistics System, National Electronic Injury Surveillance System—All Injury Programs, and Behavioral Risk Factor Surveillance System.
CDC. Web-based Injury Statistics Query and Reporting System (WISQARS) System. Updated 2023 July 12. Available from: <https://www.cdc.gov/nchs/wisqars/>.
Hornbrook & Kessler S, Henry A, Tanaka H. Hospital Falls and Fall-Related Injuries Among Adults aged 65 years—United States, 2011-2018. *MMWR Morbidity and Mortality Weekly Report*. 2020;69(17):482-487. doi:10.1093/mmwr.mm6917a1.

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- Cognitive Mechanisms**
 - Cognitive decline
 - Divided attention
 - Impaired central compensation
 - Reaction speed
 - Stroke and brain injuries
 - Medication side effects
- Environmental Factors**
 - Home hazards
 - Environmental awareness
 - Spatial orientation
 - Biofeedback
- Behavioral Effects**
 - Depression and anxiety
 - Social participation
 - Physical activity
- Sensory Disturbances**
 - Common-pathway pathologies
 - Conflicting inputs
 - Sensory organization
 - Stochastic resonance
 - Medication side effects

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Falls Are Preventable

The Stopping Elderly Accidents, Deaths, and Injuries (STEADI) initiative was developed by the U.S. Centers for Disease Control and Prevention (CDC)

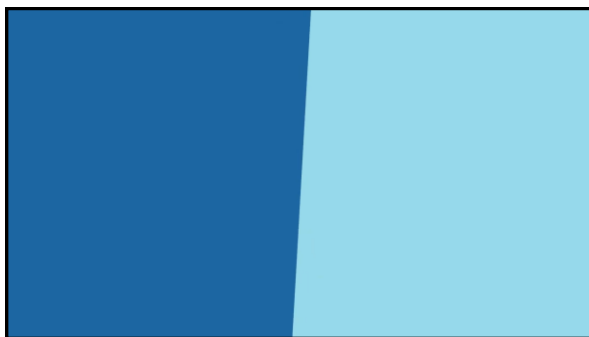
STEADI is based on the American and British Geriatrics Societies' Clinical Practice Guideline for Prevention of Falls in Older Persons and designed with input from healthcare providers

STEADI offers tools and resources to help healthcare providers Screen, Assess, and Intervene to reduce fall risk



Screen: Identify patients at risk for a fall. Assess: Identify modifiable risk factors. Intervene: Use effective clinical and community strategies.

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Common Fall Risk Factors

Fall risk increases as the number of risk factors increases

Modifiable Risk Factors	Non-modifiable Risk Factors
Gait, strength, and balance deficits	Age
Medication side effects	Sex
Home hazards	Race/ethnicity
Orthostatic hypotension	History of falls
Vision problems	
Foot issues/inappropriate footwear	
Vitamin D deficiency	
Comorbidities	

Horwood B, Kessler S, Henry A. Trends in Hospital Falls and Fall-Related Injuries Among Adults Aged 65 years—United States, 2012-2018. *MMWR Morbidity and Mortality Weekly Report*. 2020;69(17):482-487. doi:10.1093/mmwr.mm6917a1.
Anderson AJ, Paul D. Modifiable Risk Factors for Falls Among Older Adults: A Review of the Literature. *Medical Clinics of North America*. 2013;87(4):741-750. doi:10.1016/j.clin.2013.06.008.
Trentham M, Spence H, et al. Risk Factors for Falls Among Elderly Persons Living in their Community. *Age Ageing*. 1997;26(4):327-331. doi:10.1093/agea/26.4.327.
Baron E, Kessler S. Deaths from Falls Among Persons Aged 65 Years—United States, 2007-2016. *MMWR Morbidity and Mortality Weekly Report*. 2019;68(17):482-487. doi:10.1093/mmwr.mm6817a1.

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Signs of Potential Falls Risk

Frailty

Shuffling of feet or short strides

Slowed walking speed

Reliance on using hands when getting out of a chair

Easily fatigued or winded

Reaching out to furniture or walls for stability or confidence when walking

Use of walking aids, including relying on a companion

Bruises or other injuries

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Check Your Risk for Falling

Question	Response	Score
1. Have you had a fall in the past year?	Yes	1
2. Do you have trouble walking on uneven surfaces?	Yes	1
3. Do you have trouble walking on uneven surfaces?	No	0
4. Do you have trouble walking on uneven surfaces?	Yes	1
5. Do you have trouble walking on uneven surfaces?	No	0
6. Do you have trouble walking on uneven surfaces?	Yes	1
7. Do you have trouble walking on uneven surfaces?	No	0
8. Do you have trouble walking on uneven surfaces?	Yes	1
9. Do you have trouble walking on uneven surfaces?	No	0
10. Do you have trouble walking on uneven surfaces?	Yes	1
11. Do you have trouble walking on uneven surfaces?	No	0
12. Do you have trouble walking on uneven surfaces?	Yes	1
13. Do you have trouble walking on uneven surfaces?	No	0
14. Do you have trouble walking on uneven surfaces?	Yes	1
15. Do you have trouble walking on uneven surfaces?	No	0
16. Do you have trouble walking on uneven surfaces?	Yes	1
17. Do you have trouble walking on uneven surfaces?	No	0
18. Do you have trouble walking on uneven surfaces?	Yes	1
19. Do you have trouble walking on uneven surfaces?	No	0
20. Do you have trouble walking on uneven surfaces?	Yes	1
21. Do you have trouble walking on uneven surfaces?	No	0
22. Do you have trouble walking on uneven surfaces?	Yes	1
23. Do you have trouble walking on uneven surfaces?	No	0
24. Do you have trouble walking on uneven surfaces?	Yes	1
25. Do you have trouble walking on uneven surfaces?	No	0
26. Do you have trouble walking on uneven surfaces?	Yes	1
27. Do you have trouble walking on uneven surfaces?	No	0
28. Do you have trouble walking on uneven surfaces?	Yes	1
29. Do you have trouble walking on uneven surfaces?	No	0
30. Do you have trouble walking on uneven surfaces?	Yes	1
31. Do you have trouble walking on uneven surfaces?	No	0
32. Do you have trouble walking on uneven surfaces?	Yes	1
33. Do you have trouble walking on uneven surfaces?	No	0
34. Do you have trouble walking on uneven surfaces?	Yes	1
35. Do you have trouble walking on uneven surfaces?	No	0
36. Do you have trouble walking on uneven surfaces?	Yes	1
37. Do you have trouble walking on uneven surfaces?	No	0
38. Do you have trouble walking on uneven surfaces?	Yes	1
39. Do you have trouble walking on uneven surfaces?	No	0
40. Do you have trouble walking on uneven surfaces?	Yes	1
41. Do you have trouble walking on uneven surfaces?	No	0
42. Do you have trouble walking on uneven surfaces?	Yes	1
43. Do you have trouble walking on uneven surfaces?	No	0
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47. Do you have trouble walking on uneven surfaces?	No	0
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53. Do you have trouble walking on uneven surfaces?	No	0
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80. Do you have trouble walking on uneven surfaces?	Yes	1
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82. Do you have trouble walking on uneven surfaces?	Yes	1
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86. Do you have trouble walking on uneven surfaces?	Yes	1
87. Do you have trouble walking on uneven surfaces?	No	0
88. Do you have trouble walking on uneven surfaces?	Yes	1
89. Do you have trouble walking on uneven surfaces?	No	0
90. Do you have trouble walking on uneven surfaces?	Yes	1
91. Do you have trouble walking on uneven surfaces?	No	0
92. Do you have trouble walking on uneven surfaces?	Yes	1
93. Do you have trouble walking on uneven surfaces?	No	0
94. Do you have trouble walking on uneven surfaces?	Yes	1
95. Do you have trouble walking on uneven surfaces?	No	0
96. Do you have trouble walking on uneven surfaces?	Yes	1
97. Do you have trouble walking on uneven surfaces?	No	0
98. Do you have trouble walking on uneven surfaces?	Yes	1
99. Do you have trouble walking on uneven surfaces?	No	0
100. Do you have trouble walking on uneven surfaces?	Yes	1

Screening Tool
Stay Independent Brochure

<https://www.ahrq.gov/ocs/ostc/docs/stay-independent-038.pdf>

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Hearing Loss is an Independent Risk Factor for Falls

1.4X INCREASE

Incidence of falls for every 10 dB of measured hearing loss over preceding 12 months

LIN, et al. 2012

2,017 participants
Age 40-69 years

Cross-sectional study

Hearing
Audiometrically confirmed

Falls
Self-reported falls

Lin FR, Ferrucci L. Hearing Loss and Falls Among Older Adults in the United States. Archives of Internal Medicine. 2012; 172(16):1200.

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2024

Burwinkel and Kao

Stay Independent Question	Sample Size	Factor	OR (95% CI)	p-value
"Have you had a fall in the past year?"	388	Age	1.08 (1.01, 1.16)	<.001
		Female	1.28 (1.08, 1.52)	<.001
		Married	0.78 (0.62, 0.98)	<.001
"Sometimes I feel unsteady when I'm walking."	388	Age	1.13 (1.07, 1.19)	<.001
		Female	1.28 (1.08, 1.52)	<.001
		Married	0.78 (0.62, 0.98)	<.001
"I usually need help getting into furniture when walking at home."	388	Female	1.28 (1.08, 1.52)	<.001
		Married	0.78 (0.62, 0.98)	<.001
"I've noticed about falling."	388	Age	1.08 (1.01, 1.16)	<.001
		Female	1.28 (1.08, 1.52)	<.001
		Married	0.78 (0.62, 0.98)	<.001
"I need to grab onto my handrail to get out of a chair."	388	Age	1.08 (1.01, 1.16)	<.001
		Female	1.28 (1.08, 1.52)	<.001
		Married	0.78 (0.62, 0.98)	<.001
"I often have to look to the side."	388	Age	1.08 (1.01, 1.16)	<.001
		Female	1.28 (1.08, 1.52)	<.001
		Married	0.78 (0.62, 0.98)	<.001
"I have had some trouble in the bath."	388	Age	1.08 (1.01, 1.16)	<.001
		Female	1.28 (1.08, 1.52)	<.001
		Married	0.78 (0.62, 0.98)	<.001
"I often feel that someone could trip me if I'm walking or even that I'm alone."	388	Age	1.08 (1.01, 1.16)	<.001
		Female	1.28 (1.08, 1.52)	<.001
		Married	0.78 (0.62, 0.98)	<.001
"I have trouble seeing my stairs or other steps."	388	Age	1.08 (1.01, 1.16)	<.001
		Female	1.28 (1.08, 1.52)	<.001
		Married	0.78 (0.62, 0.98)	<.001
"I often feel nervous or unsteady."	388	Age	1.08 (1.01, 1.16)	<.001
		Female	1.28 (1.08, 1.52)	<.001
		Married	0.78 (0.62, 0.98)	<.001

Table 1. Summary of significant predictors of responses to the CDC's Stay Independent brochure's questions.

Data Collection and Analysis

Falls risk screening and audiologic data were collected from 378 community-dwelling adults (aged 19.9 to 90.7 years, mean age 69.6 years)

A stepwise linear regression identified audiological factors explaining variance in Stay Independent scores

A multiple logistic regression assessed the predictive value of these variables for specific responses to each Stay Independent question

Assessments

- Pure-tone audiometry, unaided speech recognition tests in quiet and noise
- Tinnitus Handicap Inventory (THI)
- Montreal Cognitive Assessment (MoCA)
- Lifestyle inquiries and case histories
- Stay Independent brochure's 12-item questionnaire

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STEADI Assessment

The CDC provides a list of common assessments to identify modifiable fall risk factors in at-risk patients:

- Evaluate gait, strength, and balance
- Identify medications that increase fall risk
- Ask about potential home hazards
- Measure orthostatic blood pressure
- Check visual acuity
- Assess feet and footwear
- Assess vitamin D intake
- Identify comorbidities

AOL/BCS. Summary of the Updated American Geriatrics Society/British Geriatrics Society Clinical Practice Guidelines for Prevention of Falls in Older Persons. J Am Geriatr Soc. 2011;59(1):148-57. DOI: 10.1111/j.1532-5415.2011.03124.x
CDC. Algorithm for Fall Risk Screening, Assessment, and Intervention [online]. Updated 2012. January 2012. Available from URL: www.cdc.gov/steadi/pdf/STEADI-Algorithm-2012a.pdf. Atlanta, GA: Centers for Disease Control and Prevention.

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Exclusive to Edge AI


Balance Assessment

Gain an awareness of your balance with this self-guided evaluation

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Why Offer Balance Assessment?

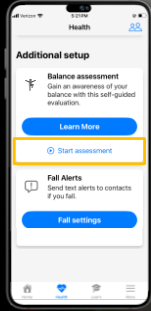
Balance Assessment is a tool for promoting wellness for all ages and is great for:



- Someone who has some early concerns but are not yet ready to see a professional about it
- Someone who has already seen a professional and may want to periodically reassess themselves

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Balance Assessment

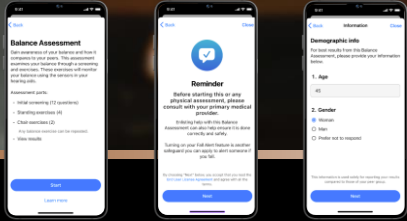


During the assessment, the user receives on-screen and voice instructions

The user can exit, repeat or skip any exercise

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Onboarding



- Overview
- Safety Reminders
- Collect Demographic Info

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Part 1 Fall Risk Screening

Validated self-assessment tool

12 Yes/No questions to assess balance concerns


Check "Yes" or "No" for each statement below	Why it matters	
Yes (Y) / No (N)	I have fallen in the past year	People who have fallen once are likely to fall again.
Yes (Y) / No (N)	I have tripped, lost my balance, or almost fallen in the past year	People who have tripped or almost fallen in the past year are likely to fall again.
Yes (Y) / No (N)	Someone has helped me with my walking	Someone who needs help when walking may have a sign of poor balance.
Yes (Y) / No (N)	I have trouble walking on uneven surfaces	This may be a sign of poor balance.
Yes (Y) / No (N)	I am worried about falling	People who are worried about falling are more likely to fall.
Yes (Y) / No (N)	I have difficulty walking on stairs	This is a sign of weak leg muscles, a major reason for falling.
Yes (Y) / No (N)	I often wake up shaking up onto a walk	This is a sign of weak leg muscles.
Yes (Y) / No (N)	I often have to rush to the toilet	Rushing to the bathroom, especially at night, increases your chance of falling.
Yes (Y) / No (N)	I have not been looking at the feet	Walkers in your feet can cause tripping and balance falls.
Yes (Y) / No (N)	I have trouble with my balance when I am walking	Good balance is important for walking. Poor balance may lead to falls.
Yes (Y) / No (N)	I have trouble with my balance when I am standing	Good balance is important for standing. Poor balance may lead to falls.
Yes (Y) / No (N)	I have trouble with my balance when I am sitting	Good balance is important for sitting. Poor balance may lead to falls.
Yes (Y) / No (N)	I have trouble with my balance when I am lying down	Good balance is important for lying down. Poor balance may lead to falls.

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Part 2 Balance Assessment

Balance Assessment includes exercises focused on three elements: somatosensory balance, functional lower body strength, and gait

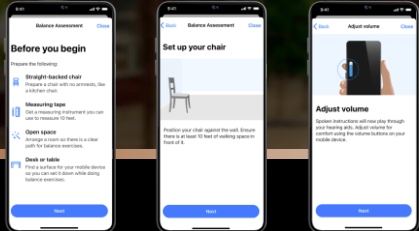
4-Stage Balance Test → 4 Standing Exercises
30-Second Chair Stand → Chair Stand
Timed Up & Go → Timed Stand-Walk



SCORING			
Chair Stand Below Average Scores			
AGE	MEN	WOMEN	
60-64	< 14	< 12	
65-69	< 12	< 10	
70-74	< 12	< 10	
75-79	< 11	< 10	
80-84	< 10	< 9	
85-89	< 8	< 8	
90-94	< 7	< 4	

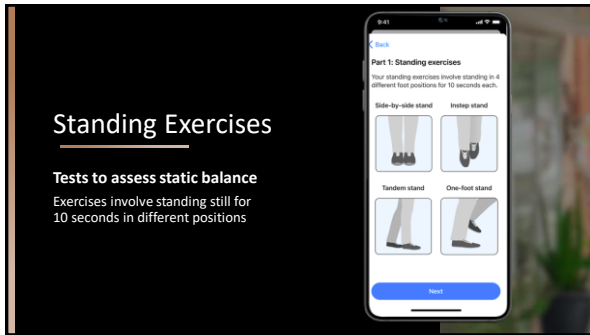
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Balance Assessment Set Up

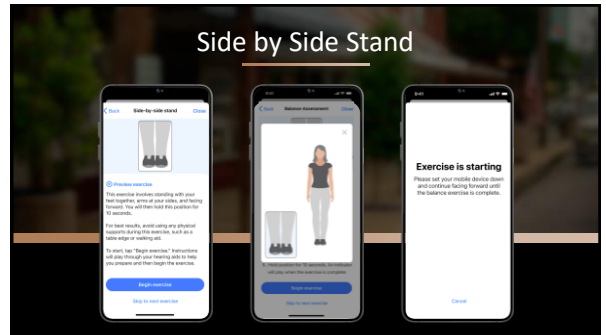


- Before you begin
- Set up your chair
- Adjust volume

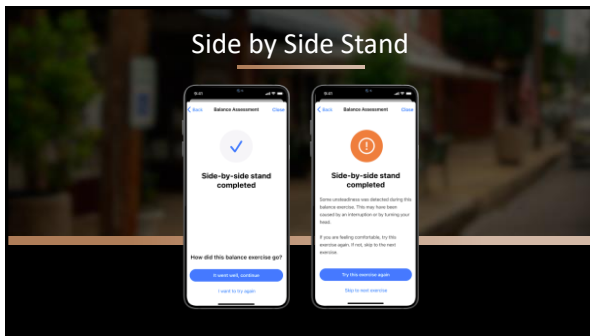
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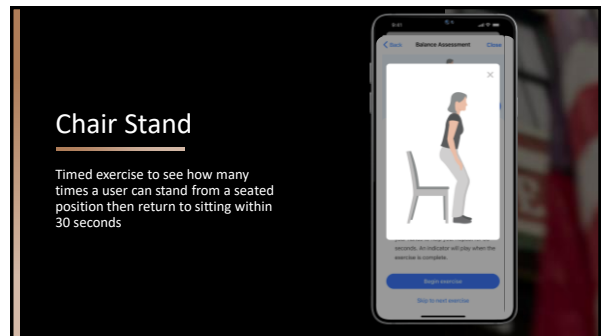
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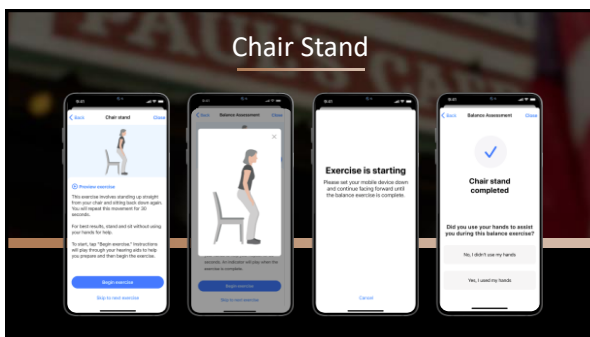
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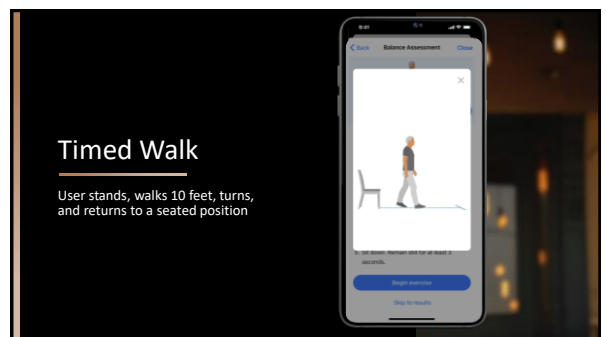
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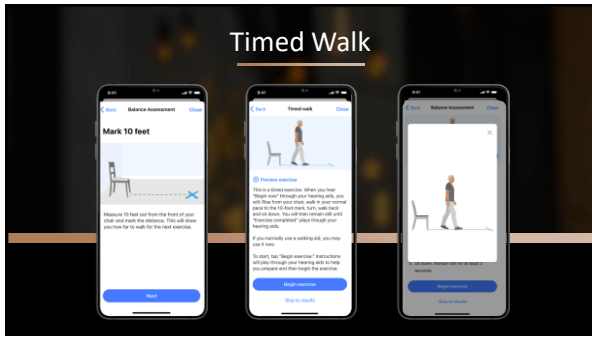
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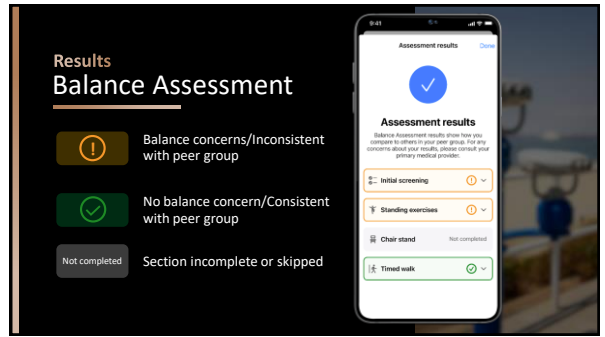
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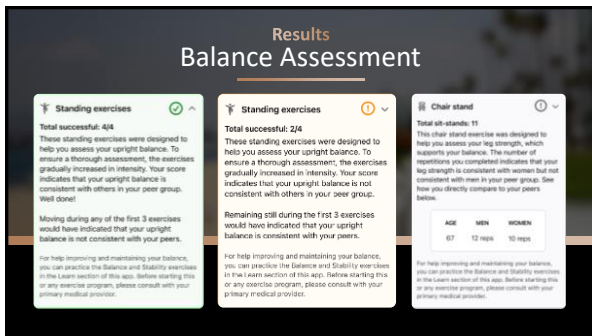
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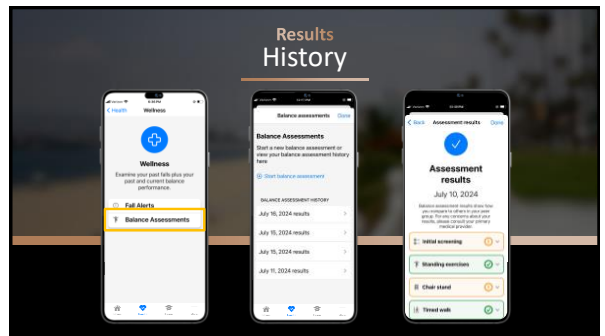
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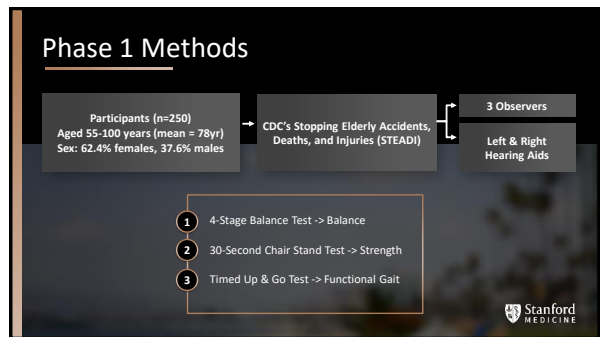
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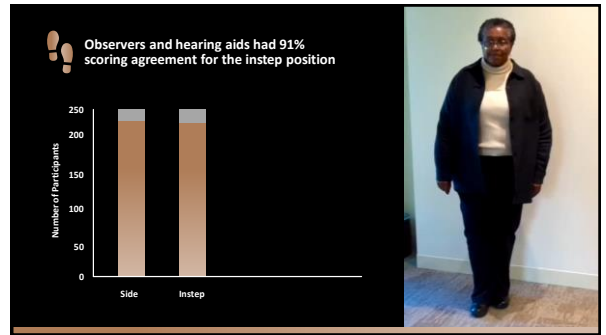
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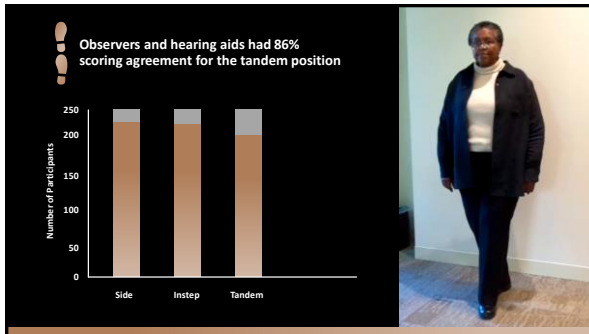
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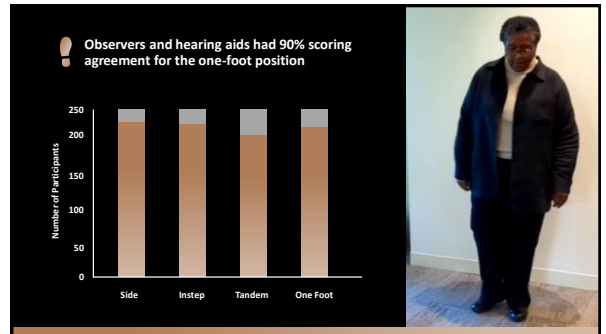
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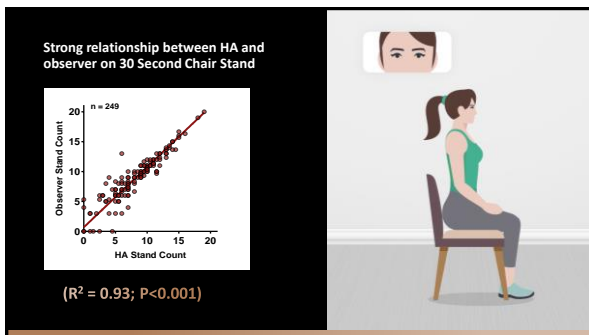
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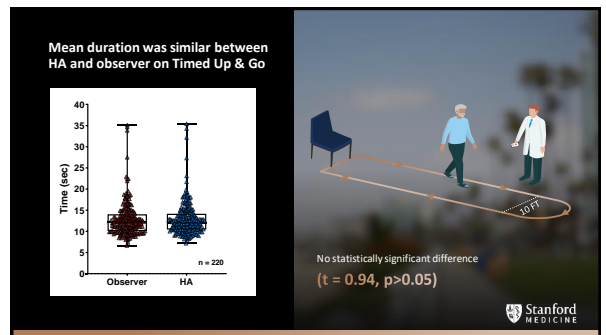
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Starkey's Final Field Validation



Objective
Evaluate usability and effectiveness in supervised vs. unsupervised environments

Participants
14 total, split into "Demo" (n=7) and "No Demo" (n=7) groups

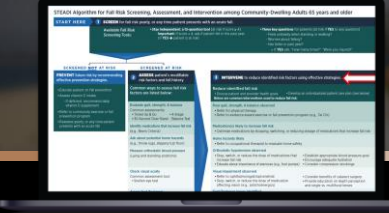
Method
Clinician-led vs. app-only instructions
Assessed balance, chair stand, TUG, and Stay Independent Scores

Results
No significant differences in scores across groups or environments

Conclusion
Safe and reliable across settings, though initial guidance may improve user experience

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STEADI Intervention

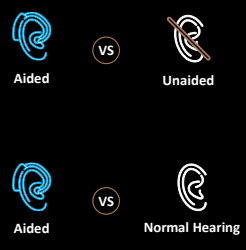


STEADI Algorithm for Fall Risk Screening, Assessment, and Intervention among Community-Dwelling Adults 65 years and older

CCO: Algorithm for Fall Risk Screening, Assessment, and Intervention (2014) [2013 January 30]. Available from: <http://www.cdc.gov/steadi/2013/001/001-Algorithm-2014.pdf>

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Hearing loss is a modifiable risk factor



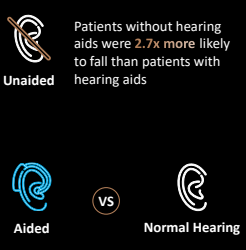
Aided VS Unaided

Aided VS Normal Hearing

Tsang, V. L., Tang, A., Vasanthakumari, D. K., Patel, R., Adelman, J. S., Yu, S. P., Appathurai, J. R., & Johnson, A. S. (2020). Impact of Hearing Loss on Falls Risk in the Community Setting. *American Journal of Preventive Medicine, 58*(2), 837-844.

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Hearing loss is a modifiable risk factor



Unaided VS Normal Hearing

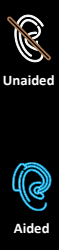
Aided VS Normal Hearing

Patients without hearing aids were 2.7x more likely to fall than patients with hearing aids

Tsang, V. L., Tang, A., Vasanthakumari, D. K., Patel, R., Adelman, J. S., Yu, S. P., Appathurai, J. R., & Johnson, A. S. (2020). Impact of Hearing Loss on Patient Falls in the Community Setting. *American Journal of Preventive Medicine, 58*(2), 837-844.

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Hearing loss is a modifiable risk factor



Unaided VS Aided

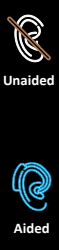
Patients without hearing aids were 2.7x more likely to fall than patients with hearing aids

Patients with hearing aids were NOT significantly more likely to fall than patients with normal hearing

Tsang, V. L., Tang, A., Vasanthakumari, D. K., Patel, R., Adelman, J. S., Yu, S. P., Appathurai, J. R., & Johnson, A. S. (2020). Impact of Hearing Loss on Patient Falls in the Community Setting. *American Journal of Preventive Medicine, 58*(2), 837-844.

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Hearing loss is a modifiable risk factor



Unaided VS Aided

Patients without hearing aids were 2.7x more likely to fall than patients with hearing aids

Patients with hearing aids were NOT significantly more likely to fall than patients with normal hearing

"These findings suggest that adding hearing loss as a modifiable risk factor in risk assessment tools for falls and exploring the use of amplification devices as an intervention may help to reduce falls in patients."

Tsang, V. L., Tang, A., Vasanthakumari, D. K., Patel, R., Adelman, J. S., Yu, S. P., Appathurai, J. R., & Johnson, A. S. (2020). Impact of Hearing Loss on Patient Falls in the Community Setting. *American Journal of Preventive Medicine, 58*(2), 837-844.

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Fall Alert

World's first and only hearing aid with fall detection and alerts

Delivers peace of mind and ease of use

Fall detected
It looks like you fell. Your fall alert contacts will be alerted at the end of the countdown. Please don't get up until you need immediately.

Download app

Cancel, I'm okay

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Referrals & Recommendations

Primary care/Gerontology Pharmacy

Use of ≥4 medications, sleep aids, diuretics, or anti-depressants warrants a therapeutic review

Pharmacists review and coordinate prescriptions from patients' multiple providers

Physical & Occupational Therapy

CDC & STEADI

Community based programs

Otago Exercise Program

Silver Sneakers

Tai Chi

Stepping On

Stay Active & Independent for Life (SAIL)

Home Hazard Removal Program (HARP)

<https://ncoa.org/evidence-based-programs>

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STEADI Tools & Resources

For clinicians

For patients

<https://www.cdc.gov/steadi/>

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STEADI Initiative

Can help determine modifiable risk factors and guide interventions

Stanford Medicine

Demonstrated that the STEADI's assessment protocols could be safely and accurately implemented by using hearing aids in a home setting

Balance Assessment Feature

May empower users to detect changes in their balance earlier, enabling them to take timely action

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Questions?

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Learn More

Edge AI Launch Event
Recording Available

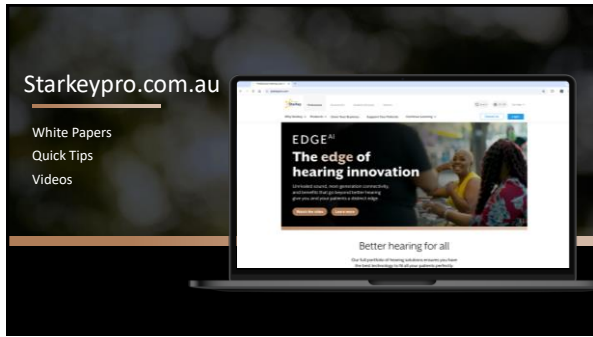
Neuro Sound 2.0
Recording Available

Future Forward Connectivity
Recording Available

Starkey's Balance Assessment Tool

www.starkeylearninghub.com.au

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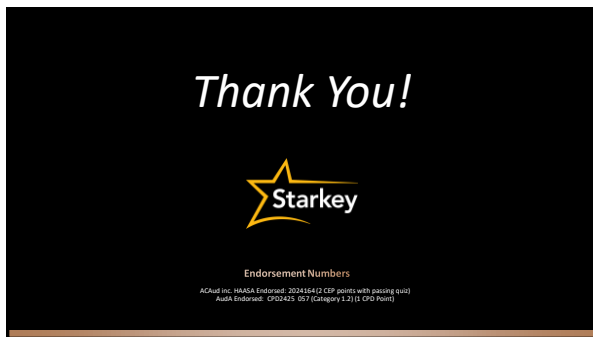
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