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Judo for safer falling and ageing well.

Using judo to reduce the Fear of Falling among older people

Professor Mike Callan

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Overview.

- Costs of Falls, Size of the problem
- The role of judo
- Ukemi
- Fear of Falling
- Judo-based solutions

Introduction.

- Mike Callan PhD
- Professor of Judo Education, University of Hertfordshire
- International Judo Federation, Scientific Committee
- Commonwealth Judo Association, Education Director

Costs of Falls
Size of the problem.

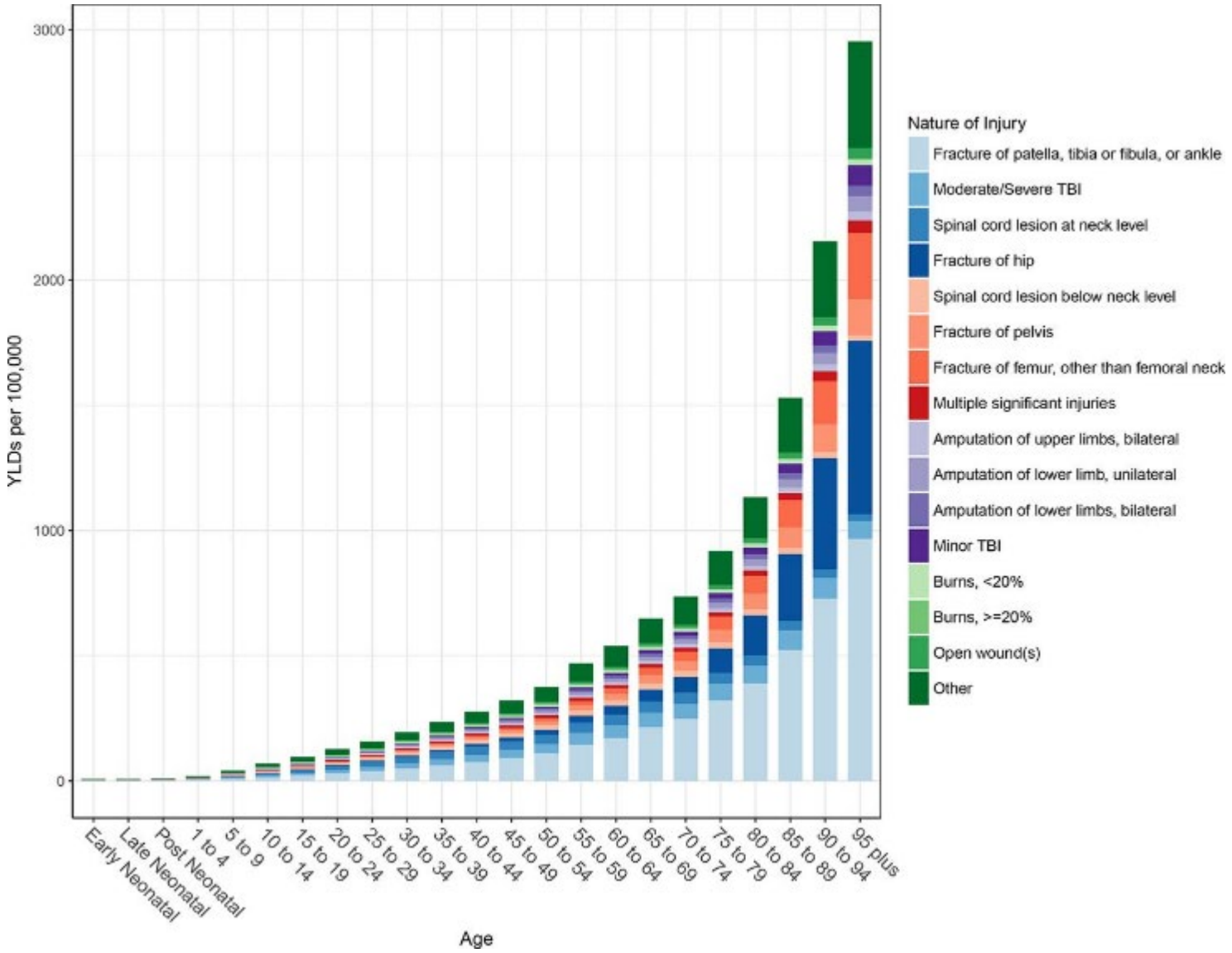
Cost of Falls.

- Most common cause of death from injury over 65s
- 33% of over 65s, & 50% of over 80s fall once a year
- Costs the NHS £2bn+ a year (£4.6m daily)
- Over 4 million bed days
- Other economic, medical and social costs
- Falls by older people are an important problem for society
- (Fenton. 2014. The human cost of falls)

James SL, Lucchesi LR, Bisignano C, *et al*. The global burden of falls: global, regional and national estimates of morbidity and mortality from the Global Burden of Disease Study 2017. *Injury Prevention* 2020;**26:**i3-i11.

Age-specific nature-of-injury composition of falls globally. TBI, traumatic brain injury; YLDs, years lived with disability.

James SL, Lucchesi LR, Bisignano C*, et al.* The global burden of falls: global, regional and national estimates of morbidity and mortality from the Global Burden of Disease Study 2017. *Injury Prevention* 2020;**26:**i3-i11.



The role of judo.

The Evidence.

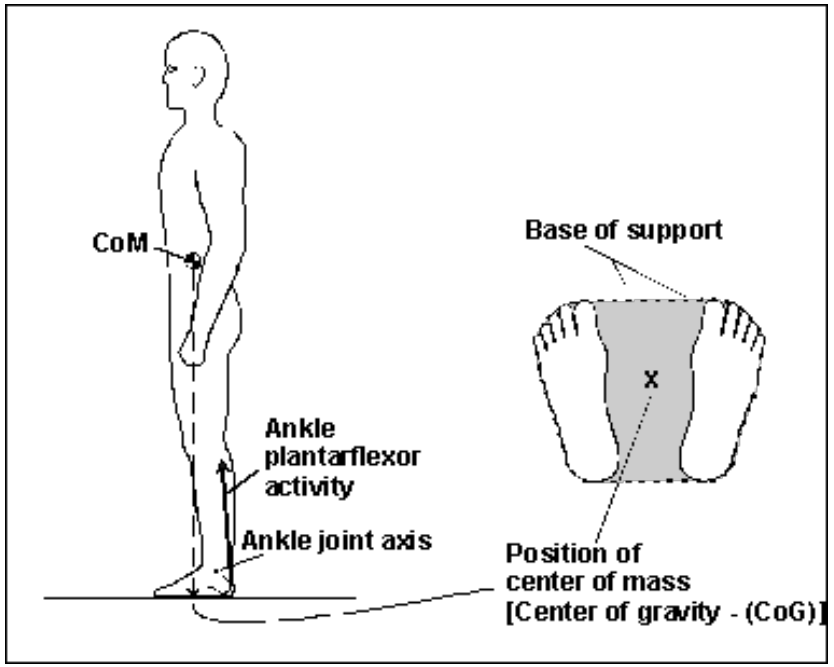
- Intervention programmes of muscle strengthening and balance training are likely to be beneficial. National Institute for Health and Care Excellence (NICE)
- Trials of exercise programmes have shown reductions in the risk of falling of between 35% and 54%. (Age UK, 2013)
- A positive association between judo and Bone Mineral Density accrual in pre- and post-menopausal women.
- Coaches should consider to introduce judo fall techniques to prevent fall-related injuries, especially in the older population. (Ciaccioni et al. 2017)
- Fall training may be useful to prevent hip fractures in the elderly.
- After fall training, fear of falling was reduced on a visual analogue scale. (Groen et al. 2010)

Definition of a fall.

- A fall is a biomechanical event, in that an external force, gravity, destabilizes the body's alignment of the torso over the legs.

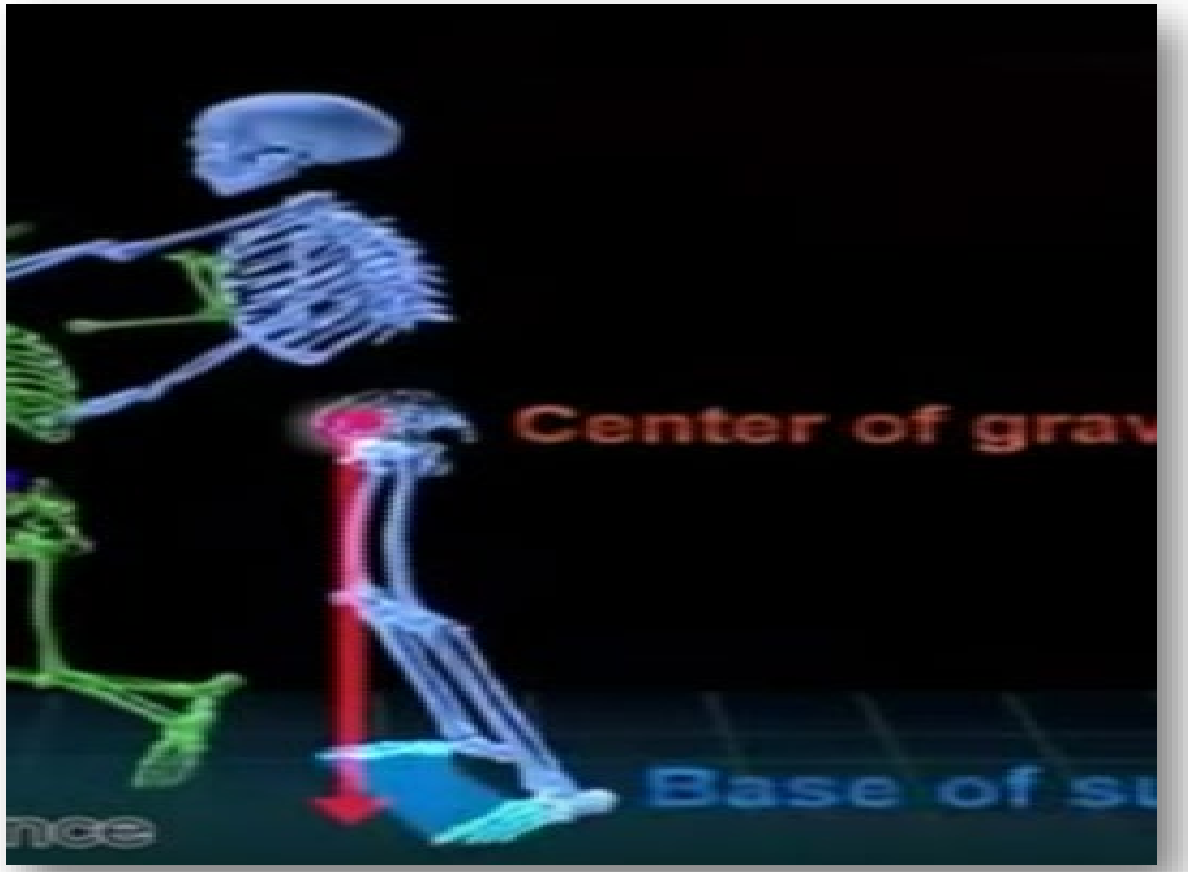
- A fall occurs when the centre of gravity of the trunk moves outside the base of support provided by the feet against the floor.

- Tencer, A. (2005). Biomechanics of Falling. *Mayo Clinic Proceedings. 80/7.* 847-848 https://doi.org/10.4065/80.7.847



We call that..

Kuzushi



Judo-based Solutions.

- Judo teaches participants how to keep balance, fall safely, and get up easily
- Evidence shows this is a useful skill for older people to reduce fear of falling
- Judo coaches can easily teach people to fall safely

Age and Ageing 2022; **51:** 1–36
https://doi.org/10.1093/ageing/afac205

GUIDELINE

World guidelines for falls prevention and management for older adults: a global initiative

Manuel Montero-Odasso[1,2,3,†], Nathalie van der Velde[4,5,†], Finbarr C. Martin[6], Mirko Petrovic[7], Maw Pin Tan[8,9], Jesper Ryg[10,11], Sara Aguilar-Navarro[12], Neil B. Alexander[13], Clemens Becker[14], Hubert Blain[15], Robbie Bourke[16], Ian D. Cameron[17], Richard Camicioli[18], Lindy Clemson[19], Jacqueline Close[20,21], Kim Delbaere[22], Leilei Duan[23], Gustavo Duque[24], Suzanne M. Dyer[25], Ellen Freiberger[26], David A. Ganz[27], Fernando Gómez[28], Jeffrey M. Hausdorff[29,30,31], David B. Hogan[32], Susan M.W. Hunter[33], Jose R. Jauregui[34], Nellie Kamkar[1], Rose-Anne Kenny[16], Sarah E. Lamb[35], Nancy K. Latham[36], Lewis A. Lipsitz[37], Teresa Liu-Ambrose[38], Pip Logan[39], Stephen R. Lord[40,41], Louise Mallet[42], David Marsh[43], Koen Milisen[44,45], Rogelio Moctezuma-Gallegos[46,47], Meg E. Morris[48], Alice Nieuwboer[49], Monica R. Perracini[50], Frederico Pieruccini-Faria[1,2], Alison Pighills[51], Catherine Said[52,53,54], Ervin Sejdic[55], Catherine Sherrington[56], Dawn A . Skelton[57], Sabestina Dsouza[58], Mark Speechley[3,59], Susan Stark[60], Chris Todd[61,62], Bruce R. Troen[63], Tischa van der Cammen[64,65], Joe Verghese[66,67], Ellen Vlaeyen[68,69], Jennifer A. Watt[70,71], Tahir Masud[72], the Task Force on Global Guidelines for Falls in Older Adults[‡]

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Manuel Montero-Odasso and others, World guidelines for falls prevention and management for older adults: a global initiative, *Age and Ageing*, Volume 51, Issue 9, September 2022, afac205, https://doi.org/10.1093/ageing/afac205

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Professor Jigoro Kano.

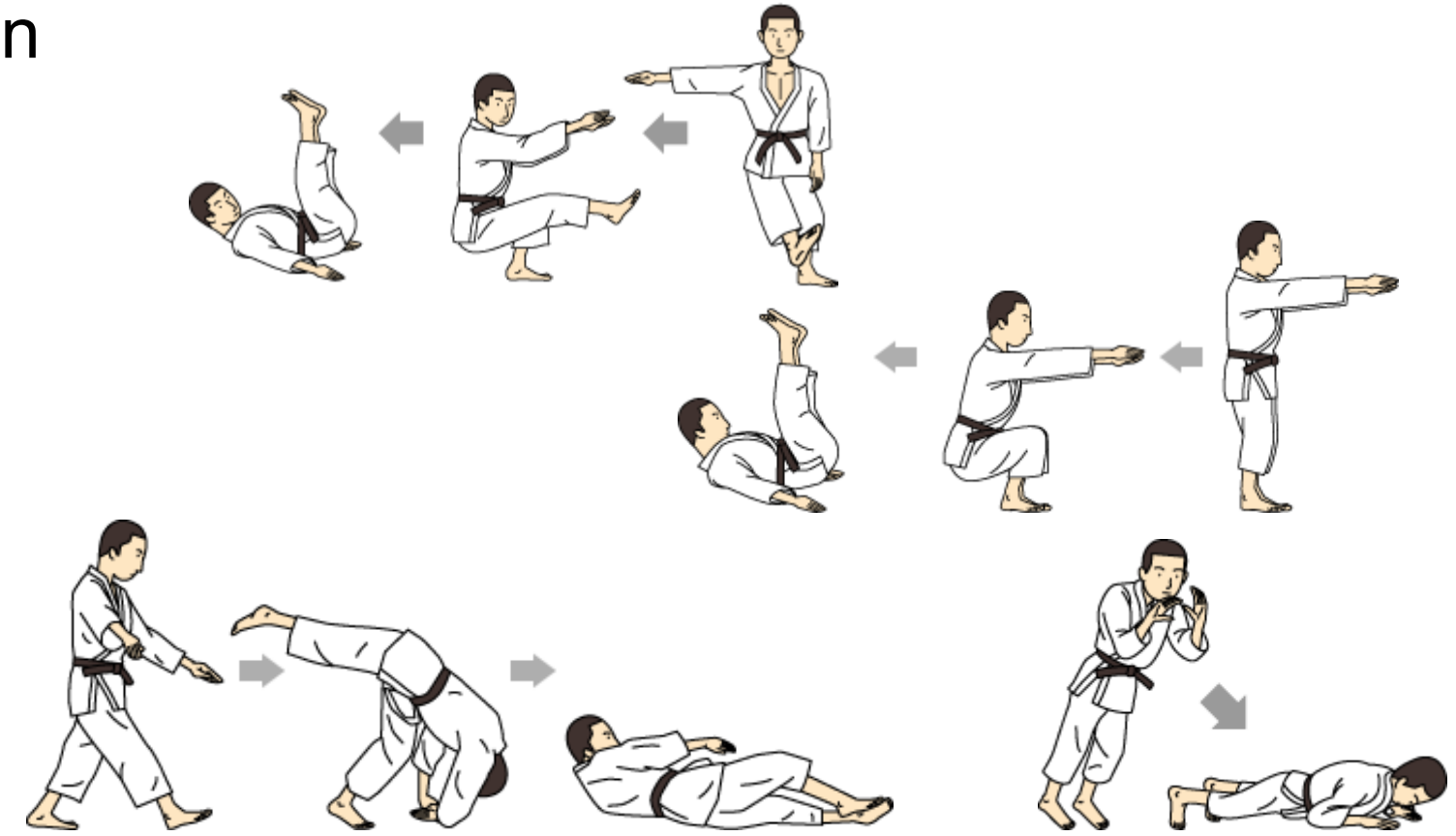
- “The final aim of judo practice and study is to …. work for the benefit of society.”

Ukemi.
(breakfalls)

Ukemi techniques in judo.

Identified by the Kodokan

1. *yoko-ukemi*
2. *ushiro-ukemi*
3. *mae-ukemi*
4. *mae-mawari-ukemi*

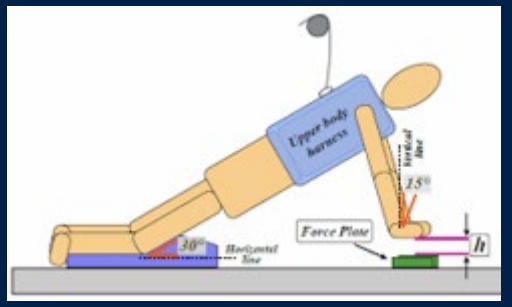


講道館
KODOKAN

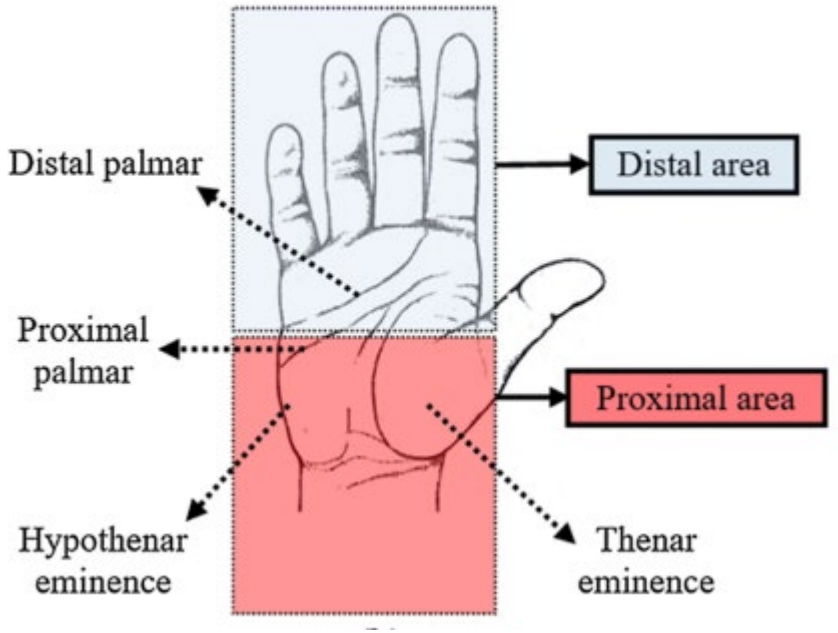
Pressure.

- Pressure is measured in Pascals
- 1 kilogramme of mass = 9.8 Newtons of force (weight)
- 1 Newton per square metre = 1 Pascal
- An elephant exerts 125,000 Pa pressure under each foot
- A stiletto shoe exerts 3,000,000 Pa pressure under each heel

Upper limb falling reflex.

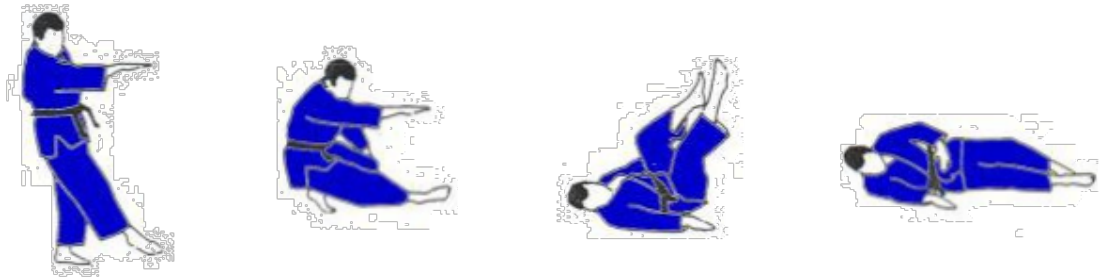


- 60 kg person falling on proximal area of one hand
- = 277,000 Pa
- Swinging a sledgehammer
- = 240,000 Pa



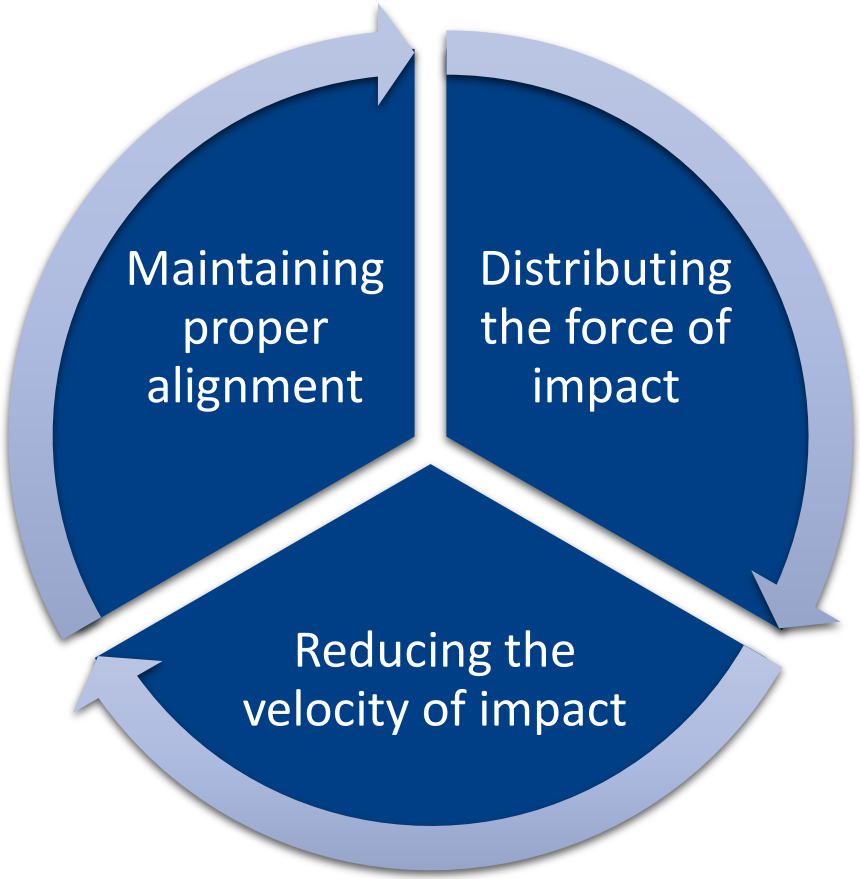
Yoko ukemi (side breakfall).

- Total surface area of a woman is 1.6 sq metres
- 14% of body surface contacts the ground in *yoko ukemi*
- = 0.224 sq metres contact area
- Mass of 61 kg is 598 Newtons
- = 2,670 Pa



- Pressure on hand from falling reflex = 277,000 Pa
- Pressure on body from *yoko ukemi* < 3,000 Pa

Three principles of ukemi.



Maintaining proper alignment.

1. Head off the mat
2. Arm at 30°
3. Palm down
4. Knees bent
5. Legs not crossed

Distributing the force of impact.

1. Contact ground from foot to shoulder
2. Contact with whole arm and hand

Reducing the velocity of impact.

- V = d/t
- F = m x a
- Increase the time it takes to fall
- Through rolling
- Therefore reduce the velocity…
- and reduce the force of impact

Coaching of micro-progressions.

- Small steps
- Develop competence
- Develop confidence

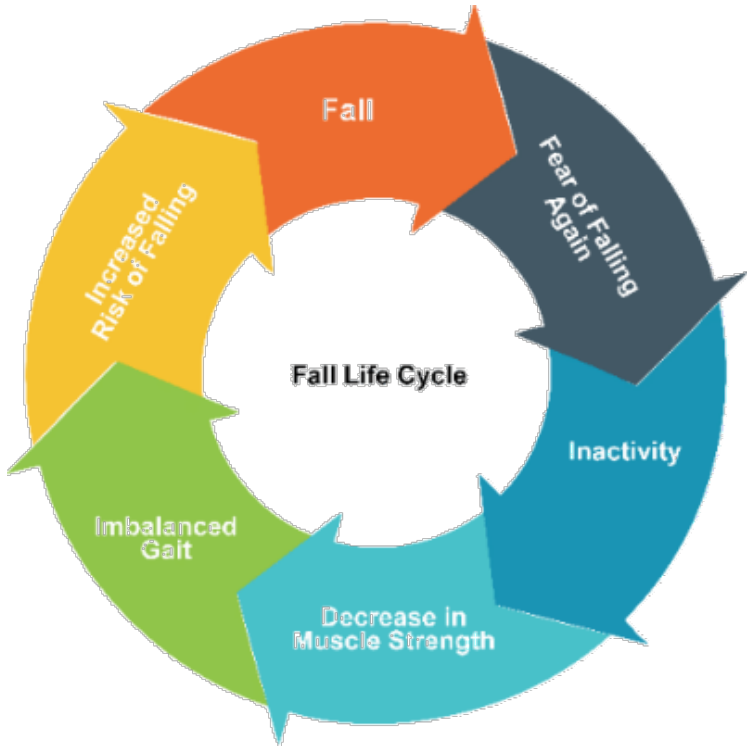
Table 1

Micro-progressions for mae-mawari-ukemi

Step	Exercise
1	Lying on back in correct end position for yoko-ukemi
2	Raising and lowering arm to slap the mat
3	Rocking from side to side to slap the mat
4	Increasing the magnitude of the rocking, starting from lying on the side
5	Start from lying on front, roll onto back and finish with yoko-ukemi
6	From on all fours position reach one arm under your other armpit along the mat (threading the needle)
7	From threading the needle position, reach as far as possible to look up at ceiling and place shoulder blade on floor
8	Progress from step 7 to roll sideways and end with yoko-ukemi
9	From step 6 position, partner stands at the side and pulls the arm to create a sideways roll ending in yoko-ukemi
10	Progress from step 8 to raise one knee in start position.
11	Progress from step 10 to start from both knees raised (squatting position)
12	Progress from step 11 to reaching the arm through the legs to send the roll over one shoulder rather than sideways.
13	From standing, do a half squat into the start position for step 12
14	Practice mae-mawari-ukemi from a standing position

Fear of Falling.

Fear of Falling



- Older people fear falling
- The fear of falling (FOF) = avoidance of activity, loss of muscle strength, compromised balance & increased likelihood of falling.
- FOF can contribute to depression, isolation, loneliness reduced social activities = negative impact on mental health and wellbeing.
- There is clear evidence that reducing fear of falling leads to reduced numbers of falls.

FFQ-R questionnaire.

Fear of Falling Questionnaire – Revised (Bower, 2015)

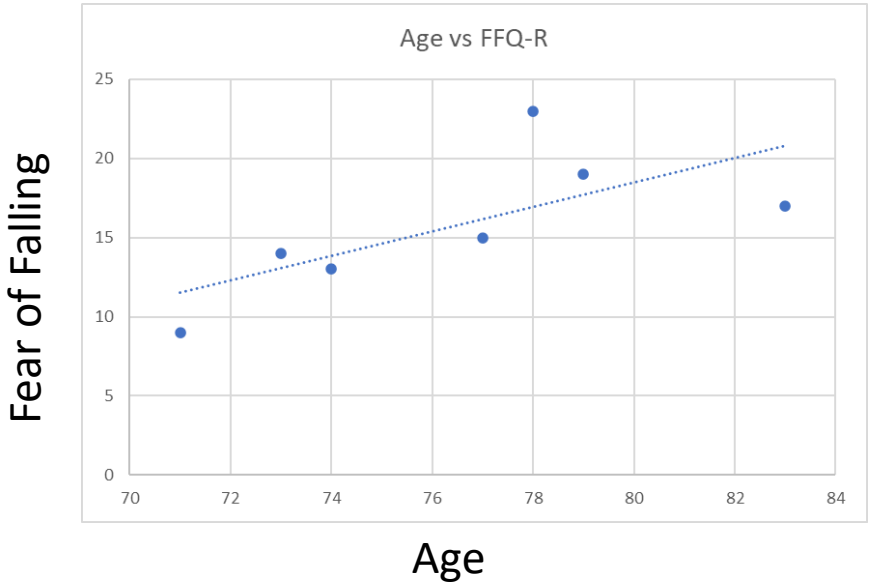
		Strongly agree	Agree	Disagree	Strongly disagree
1	If I fall, chances are I will be hurt in some way				
2	I am afraid of falling again				
3	If I fall, my life would change greatly				
4	The thought of falling really frightens me				
5	I will probably fall if I get dizzy or trip				
6	One of my worst fears is that I will fall				

The UH Project.

- To reduce Fear of Falling in older populations through the use of judo principles and methods.
- Focussed in Hertfordshire, with experienced judo coaches.
- Using *Yawara-chan-taiso* method from Japan
- Evaluated using the FFQ-R: Fear of Falling Questionnaire Revised (Bower et al. 2015)

Yawara-chan Taiso.

- 7 people (6F, 1M), Mean age 76.4 years
- Sessions attended – mean of 3.14



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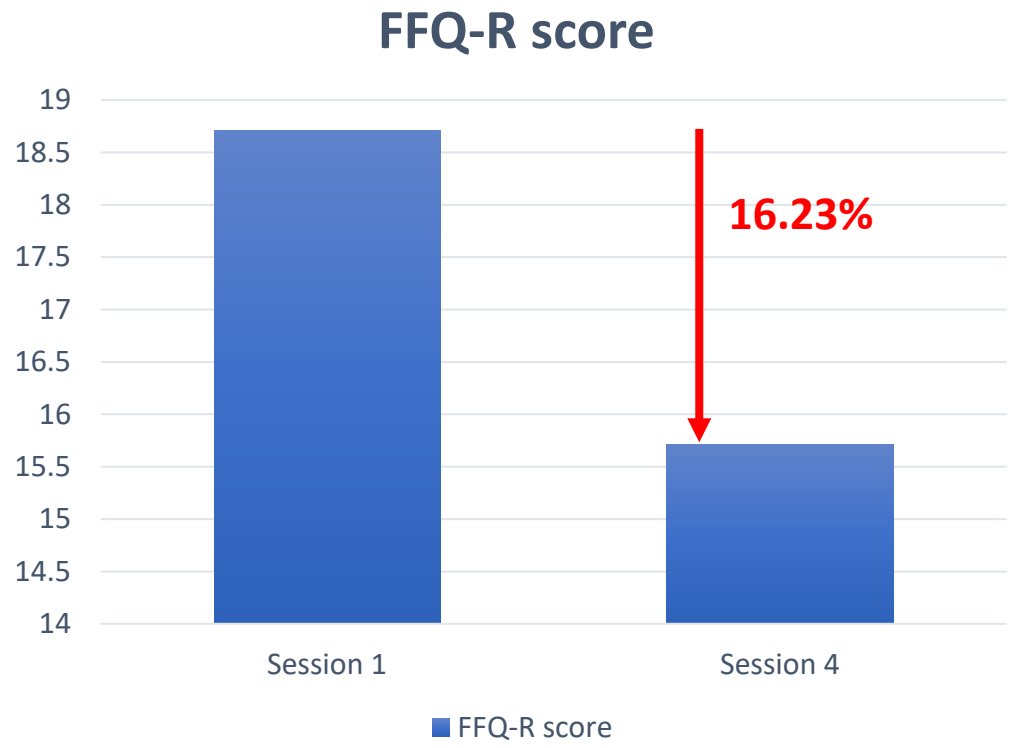
Fear of Falling Findings.

- FFQ-R before **18.71**
- FFQ-R after **15.71**
- Reduction in Fear of Falling 3.0 points (16.23%)
- Significance P<0.05 (P = 0.043)



Judo based solutions.

Judo-based safe falling around the world.

- Growing body of work concerning the introduction of judo-based safe falling practices to older people
- Japan
- Sweden
- Spain
- Australia
- Denmark
- Canada
- Netherlands
- Belgium
- Italy
- Azerbaijan
- United Kingdom

Adapted Utilitarian Judo (Spain).

The results show that the JUA program reduced the fear of falling by 11.9%, dropping from 40.35% before the intervention to 28.39% after participation in the program. As a consequence, we can state that this program substantially reduced the risk of suffering fall episodes, as the FES-I was 18.17 following the intervention, and an FES-I > 26 is a potent predictor of falls [29].





Judo4Balance (Sweden).

- All measures displayed improvements at follow-up
- Short Physical Performance Battery (SPPB) ↑ 38%
- Falls Efficacy Scale – Swedish (FES-S) for fall techniques ↑ 51%
- Fall techniques were improved among the participants by:
  - 71% for fall techniques backward
  - 75% for fall techniques forward

Safer Falling (United Kingdom).

- Pedagogical Coach Education method advocated by the British Judo Association coaching module
- To be launched next month

International Consensus Conference on Safe Falling for the Elderly through Judo.

- Organised by University of Hertfordshire, i-dojo
- Hosted at Tokai University, Japan on 27 & 28 November 2023
- Supported by JUDOs NPO, Judospace Institute, IJF Academy

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Yawara-Chan Taiso
Safe Falling course for older people.

- University of Hertfordshire, HSV Sports Hall 1
- Mondays 16:30 – 17:15
- Starts 2nd October for 29 weeks
- Free
- All welcome

WELWYN HATFIELD



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Summary.

- Costs of Falls, Size of the problem
- The role of judo
- Ukemi
- Fear of Falling
- Judo-based solutions

Questions?

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