



Professor Irene McAra-McWilliam OBE
Deputy Director Research & Innovation
Director GSA Highlands and Islands
The Glasgow School of Art

**INNOVATION
SCHOOL
THE GLASGOW
SCHOOL OF ART**



CREATIVE RESEARCH AND INNOVATION

Distributed geography - rural, marine, islands - interconnected

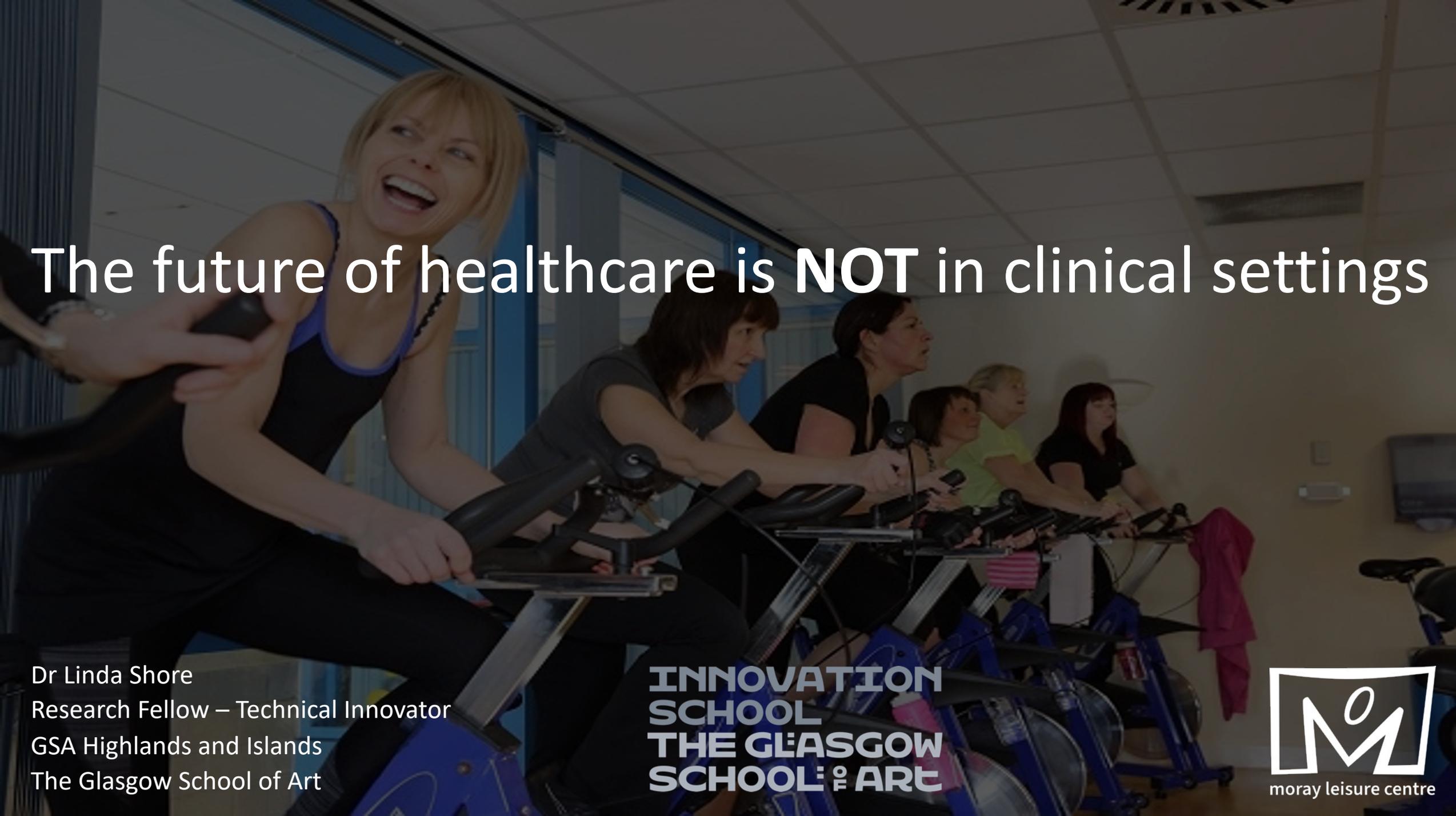
The power of interdisciplinary research and practice to create collective solutions to shared problems

PORTFOLIO

- Interaction Design
- Environmental Design
- Circular Economy
- Future Heritage

- Digital Health & Care (DHI)
- Artificial Reality/VR
- Soil and food futures
- Education Innovation
- Wellbeing Economy

**INNOVATION
SCHOOL
THE GLASGOW
SCHOOL OF ART**

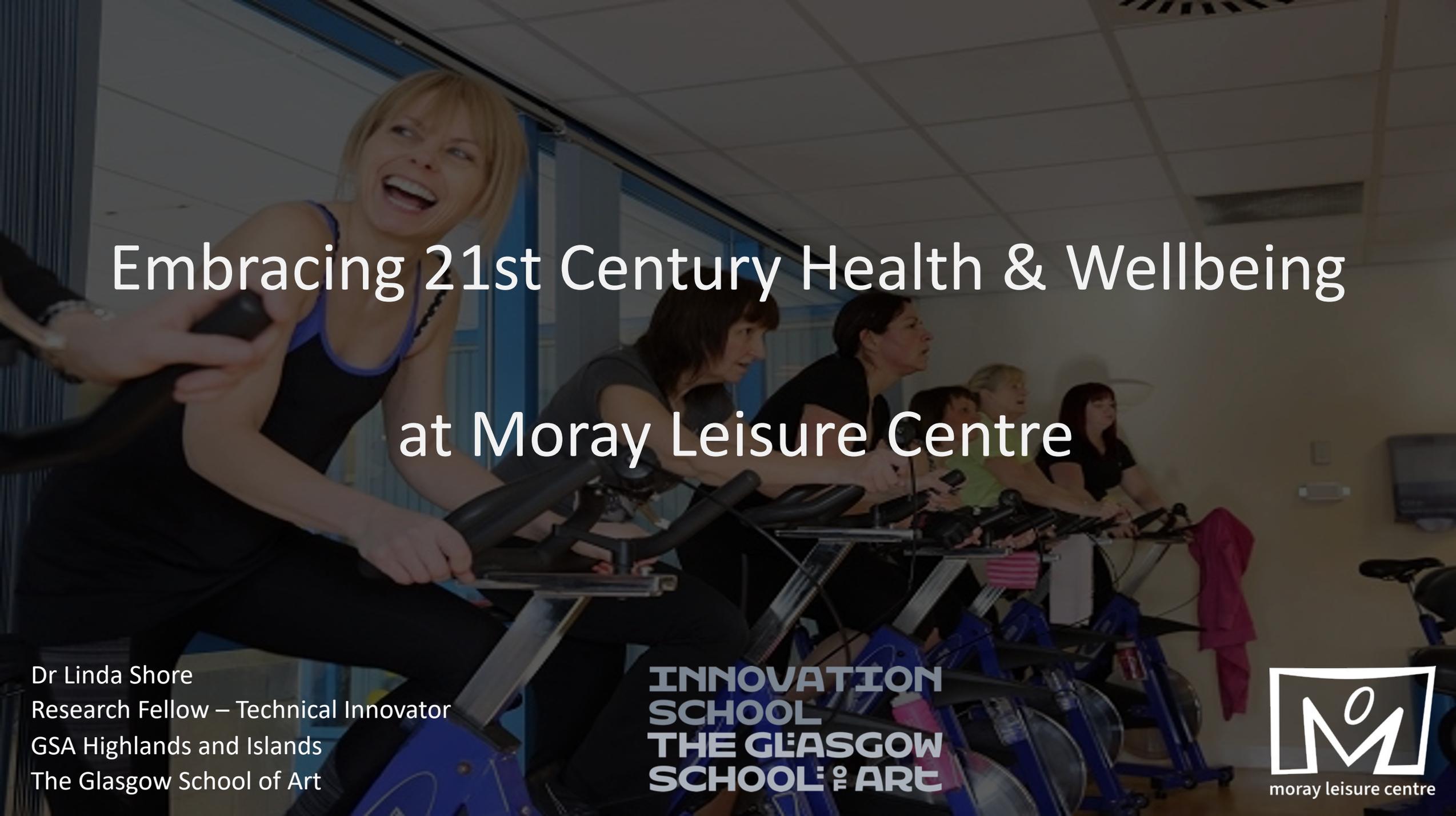


The future of healthcare is **NOT** in clinical settings

Dr Linda Shore
Research Fellow – Technical Innovator
GSA Highlands and Islands
The Glasgow School of Art

**INNOVATION
SCHOOL
THE GLASGOW
SCHOOL OF ART**





Embracing 21st Century Health & Wellbeing at Moray Leisure Centre

Dr Linda Shore
Research Fellow – Technical Innovator
GSA Highlands and Islands
The Glasgow School of Art

**INNOVATION
SCHOOL
THE GLASGOW
SCHOOL OF ART**





In the UK

More than one-in-four adults are physically inactive

One-in-three children do less than half the physical activity recommended for their age

(Keech, 2022)



Exercise & physical activity improves emotional health & wellbeing and is a key aspect for children's motor and cognitive development.

Lack of physical activity and its impact on health costs the **NHS 1 BILLION annually!**

(Keech, 2022)

Healthcare & Economy

“Globally, there are inequalities in levels of physical activity between women and men, girls and boys, old and young, and the socio-economically advantaged and disadvantaged – **this is unfair and unjust**”

WHO, 2022

* Nearly half of new **NCD cases (47%) will result from hypertension

43% will result from depression

* Physical inactivity costs health systems US\$ 27 billion a year and by 2030, US\$ 300 billion.

– if we do nothing

WHO, 2022



* Global stats

** Noncommunicable diseases (NCDs) – heart disease, cancer, chronic respiratory disease, diabetes

But first.....



“it’s not about the pink it’s about the paddling”

(McDonough et al., 2011)



Menopause - a pathway to successful ageing (or not)



Moray Leisure Centre

Published by **Moray Leisure** · 18 October 2022

Today is [#WorldMenopauseDay](#)

The menopause is an important life transition that usually happens between 45 and 55.

For some, symptoms are mild and for others they are more severe, however, the timing and symptoms are different for everyone.

We are delighted to let you know that we are working with Mel Allan to bring you a series of workshops, support groups and fitness classes specially tailored to those affected by the menopause.

To register your interest and receive further information and dates, please DM us with your email address or email info@mlc-elgin.co.uk

For now, here is a great page put together by NHS inform about the menopause, including a myth busting video →

<https://nhs24.info/menopause>

The poster features a vibrant background of pink and red flowers. A large green female symbol is prominently displayed in the center. The Moray Leisure Centre logo is in the top left corner. The text 'Menofit' is written in a large, bold, pink font, with 'Launch Event' in a smaller pink font below it. At the bottom, the event details are listed in a smaller font.

Menofit
Launch Event

Monday, 28th November @ 7pm

With Grant Cumming BSC (Hons) MSc(HB) FRCOG MD &
Dr Kerry Cottonach, GP & GMS Menopause Specialist



The future of healthcare is NOT in clinical settings



Four Key Drivers to a 21st Century 'Leisure' Centre?

Breathe | Eat | Sleep | Move!

However,...

5 Key Drivers to a 21st Century Health-E-Space

- Breathe
- Eat
- Sleep
- Move!
- +
- GROW

“People being healthy in a building that is healthy”

– John O’ Kane



5 Key Drivers to a 21st Century Health-E-Space

- Breathe – **Altitude Lab**
- Eat – **Nutrition Lab**
- Sleep– **Sleep Lab**
- Move! – **Gait Lab**
- +
- **GROW** – Sustainable building - carbon neutral

“People being healthy in a building that is healthy”

– John O’ Kane



Breathe – Altitude Lab in MLC

- Asthma is a major global health problem affecting over 300 million people worldwide (*Saxer, et al. 2019*)
- Can be considered a suitable treatment option for patients with a persistent uncontrolled asthma (*Fieten, et al., 2022*)
- Scientifically proven to assist weight loss, reduce blood pressure and much more (Altitude lab, UK)
- Habitual Physical Activity associated with lower risk of Chronic Obstructive Pulmonary Disease (COPD)(*Chen, et al. 2022*)



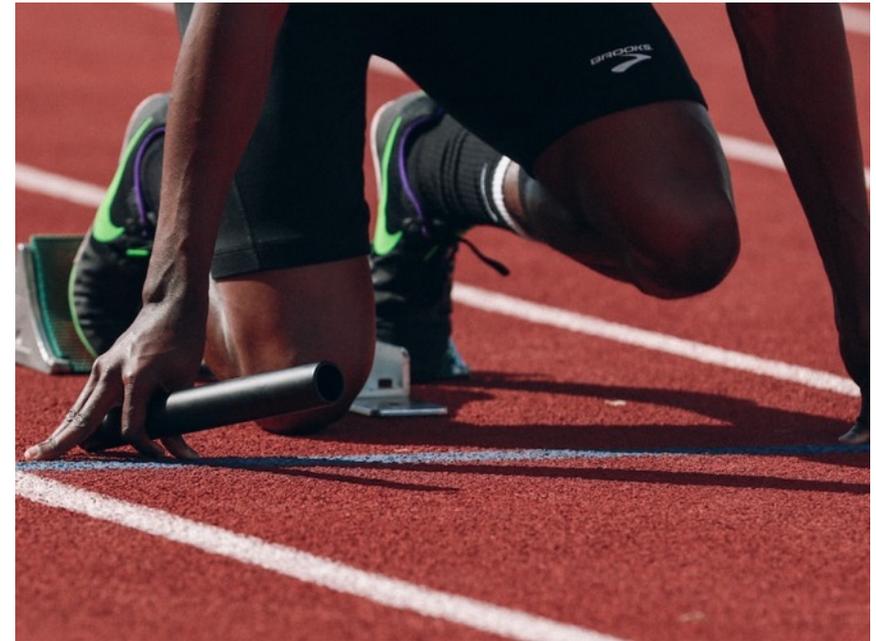
Sleep – Sleep Lab in MLC

- Challenges to sleep as part of life transitions e.g., menopause (Tutia, *et al.* 2019)
- Sleep problems impacts on elite athletes' well-being and performance (Rice, *et al.*, 2016)
- Sleep studies are undertaken to diagnose sleep disorders (Mayo Clinic)
- Sleep Apnoea may be a risk factor to stroke (Culebras, 2015)



Move! – Gait Lab in MLC

- Research Innovation Centre
- Research in a controlled environment such as a gymnasium are understudied (Schmidt et al., 2021)
- Assistive Technology such as Functional Electrical Stimulation can enhance experience in a gym setting (Bulley et al., 2011)
- Post-menopause estrogen replacement may be a factor in maintaining muscle strength and enhancing muscle trainability and thus be important in maintenance of static and dynamic balance and the potential risk of falls in older females (Perry, et al., 2005)



Future Work - **GROW**

...aligns with compatible partners in working towards a net zero future

BE—ST

Built
Environment
—
Smarter
Transformation

Some Barriers to Physical Activity

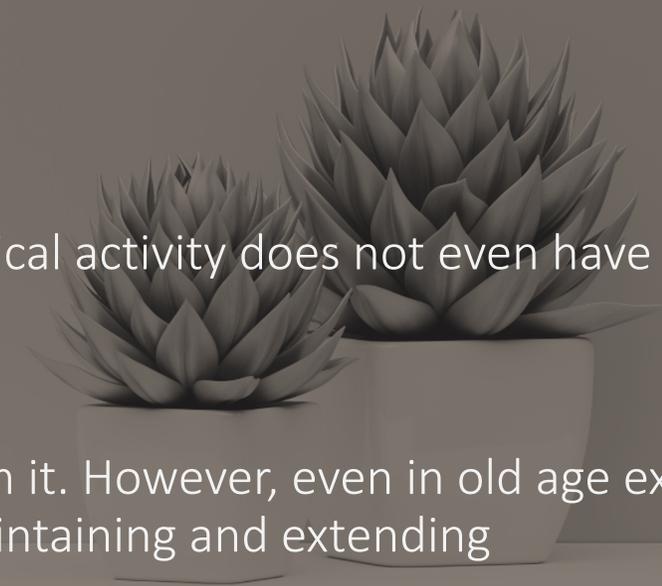
Stigma: Patients can often feel that exercise is not for 'people like them', even though it is for everyone, regardless of age, ability, weight, or background.

Pain: Many patients with long term conditions have concerns about the safety of exercising. However, for patients with chronic conditions, the benefits of physical activity far outweigh the risks

Financial: Being more active does not have to be expensive

Time: Formal exercise does not have to involve hours in the gym, and physical activity does not even have to be separate from day-to-day living.

Age: Many patients may feel they are too old to exercise, or to benefit from it. However, even in old age exercise can safely confer benefits including reducing the likelihood of falls, and maintaining and extending



Healthcare & Economy

“Globally, there are inequalities in levels of physical activity between women and men, girls and boys, old and young, and the socio-economically advantaged and disadvantaged – **this is unfair and unjust**”

WHO, 2022

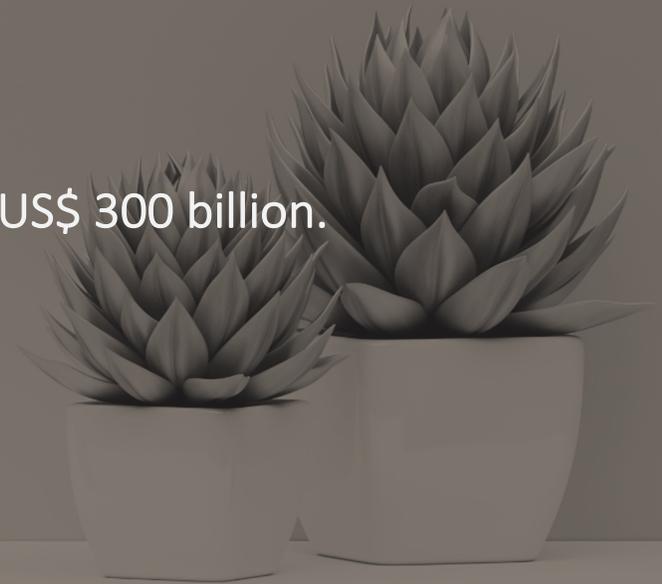
* Nearly half of new **NCD cases (47%) will result from hypertension

43% will result from depression

* Physical inactivity costs health systems US\$ 27 billion a year and by 2030, US\$ 300 billion.

– if we do nothing

WHO, 2022

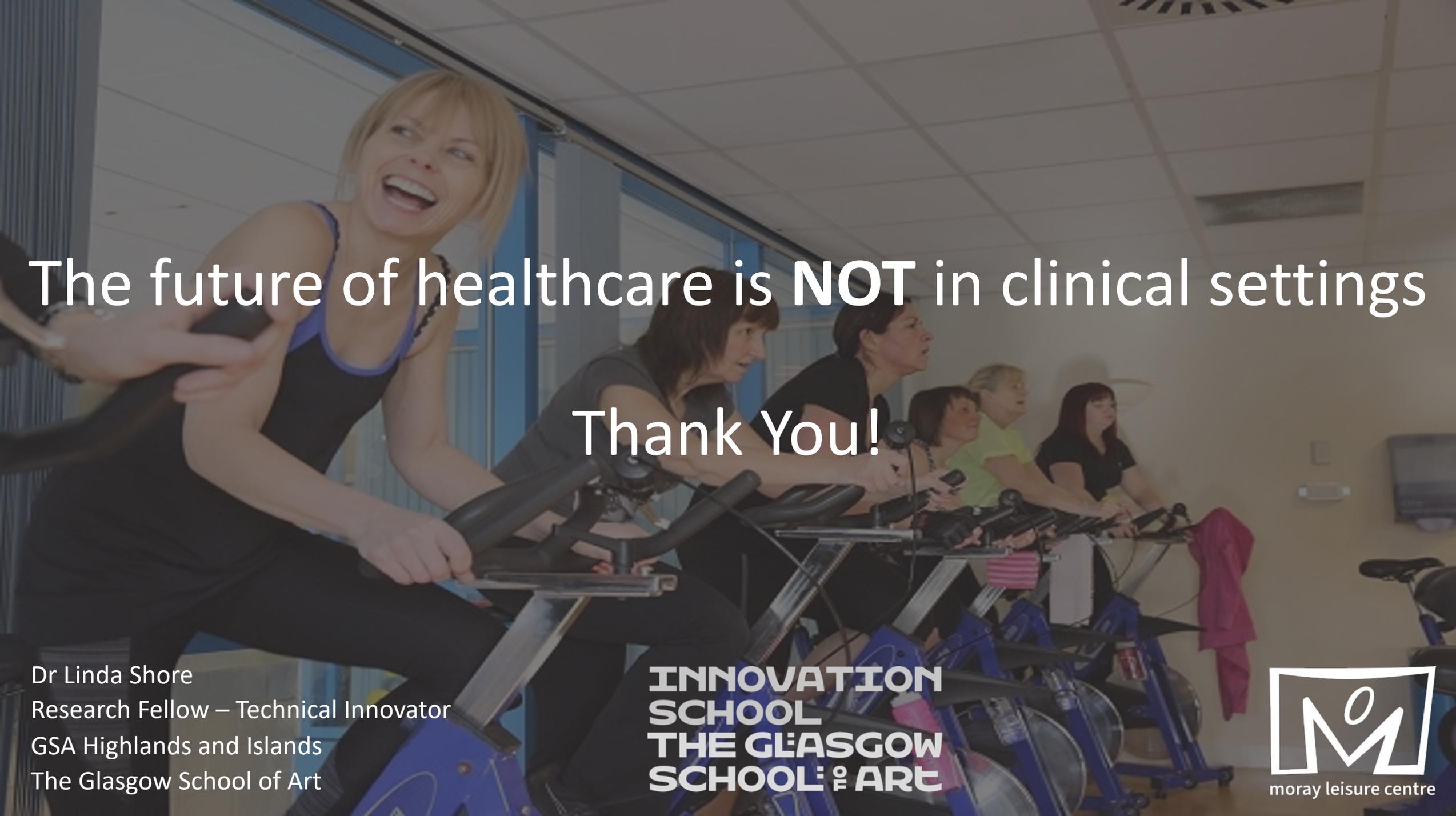


* Global stats

** Noncommunicable diseases (NCDs) – heart disease, cancer, chronic respiratory disease, diabetes

References

- McDonough, M. H., Sabiston, C. M., & Ullrich-French, S. (2011). The Development of Social Relationships, Social Support, and Posttraumatic Growth in a Dragon Boating Team for Breast Cancer Survivors, *Journal of Sport and Exercise Psychology*, 33(5), 627-648. Retrieved Feb 19, 2023, from <https://journals.humankinetics.com/view/journals/jsep/33/5/article-p627.xml>
- Keech M. Health promotion: Exercise. *InnovAiT*. 2023;16(1):14-18. doi:10.1177/17557380221132580
- World Health Organisation (2022) Global status report on physical activity ISBN: 9789240059153
- Fieten, KB, Drijver-Messelink, MT, Cogo, A, et al. Alpine altitude climate treatment for severe and uncontrolled asthma: An EAACI position paper. *Allergy*. 2022; 77: 1991– 2024. doi:[10.1111/all.15242](https://doi.org/10.1111/all.15242)
- Saxer, S., Schneider, S.R., Appenzeller, P. et al. Asthma rehabilitation at high vs. low altitude: randomized parallel-group trial. *BMC Pulm Med* 19, 134 (2019). <https://doi.org/10.1186/s12890-019-0890-y>
- Altitude Lab, UK - <https://www.altitudecentre.com/>
- Unsplash.com
- University of the West of Scotland - <https://shop.uws.ac.uk/product-catalogue/schools/school-of-health-and-life-science-hls/altitude-training-5-sessions#:~:text=Altitude%20training%20%2D%205%20sessions%20%7C%20University,West%20of%20Scotland%20Online%20Store>
- Chen, L., Cai, M., Li, H. et al. Risk/benefit tradeoff of habitual physical activity and air pollution on chronic pulmonary obstructive disease: findings from a large prospective cohort study. *BMC Med* 20, 70 (2022). <https://doi.org/10.1186/s12916-022-02274-8>
- Ingram J, Maciejewski G and Hand CJ (2020) Changes in Diet, Sleep, and Physical Activity Are Associated With Differences in Negative Mood During COVID-19 Lockdown. *Front. Psychol.* 11:588604. doi: 10.3389/fpsyg.2020.588604
- McIntosh T, Hunter DJ, Royce S. Barriers to physical activity in obese adults: A rapid evidence assessment. *Journal of Research in Nursing*. 2016;21(4):271-287. doi:[10.1177/1744987116647762](https://doi.org/10.1177/1744987116647762)
- Macdiarmid, J. I., Douglas, F., & Campbell, J. (2016). Eating like there's no tomorrow: Public awareness of the environmental impact of food and reluctance to eat less meat as part of a sustainable diet. *Appetite*, 96, 487-493.
- Spronk, I., Heaney, S. E., Prvan, T., & O'Connor, H. T. (2015). Relationship Between General Nutrition Knowledge and Dietary Quality in Elite Athletes, *International Journal of Sport Nutrition and Exercise Metabolism*, 25(3), 243-251. Retrieved Feb 21, 2023, from <https://journals.humankinetics.com/view/journals/ijsnem/25/3/article-p243.xml>
- Tutia, A., Baljon, K., Vu, L., & Rosner, D. K. (2019, May). HCI and menopause: Designing with and around the aging body. In *Extended abstracts of the 2019 CHI conference on human factors in computing systems* (pp. 1-8).
- Rice, S.M., Purcell, R., De Silva, S. et al. The Mental Health of Elite Athletes: A Narrative Systematic Review. *Sports Med* 46, 1333–1353 (2016). <https://doi.org/10.1007/s40279-016-0492-2>
- Mayo Clinic <https://www.mayoclinic.org/tests-procedures/polysomnography/about/pac-20394877#:~:text=Polysomnography%2C%20known%20as%20a%20sleep,measures%20eye%20and%20leg%20movements.>
- Culebras, A. Sleep Apnea and Stroke. *Curr Neurol Neurosci Rep* 15, 503 (2015). <https://doi.org/10.1007/s11910-014-0503-3>
- Schmitt, A. C., Baudendistel, S. T., Lipat, A. L., White, T. A., Raffegau, T. E., & Hass, C. J. (2021). Walking indoors, outdoors, and on a treadmill: Gait differences in healthy young and older adults. *Gait & Posture*, 90, 468-474.
- Bulley, C., Shiels, J., Wilkie, K., & Salisbury, L. (2011). User experiences, preferences and choices relating to functional electrical stimulation and ankle foot orthoses for foot-drop after stroke. *Physiotherapy*, 97(3), 226-233.
- Perry SD, Bombardier E, Radtke A, Tiidus PM. Hormone replacement and strength training positively influence balance during gait in post-menopausal females: a pilot study. *J Sports Sci Med*. 2005 Dec 1;4(4):372-81. PMID: 24501551; PMCID: PMC3899653.



The future of healthcare is **NOT** in clinical settings

Thank You!

Dr Linda Shore
Research Fellow – Technical Innovator
GSA Highlands and Islands
The Glasgow School of Art

**INNOVATION
SCHOOL
THE GLASGOW
SCHOOL OF ART**



moray leisure centre