

HEALTHY HAPPY PLACES

Healing environments and pain management

Dr Rachel Turnbull

AHSN NENC Conference: Feeling the Pain, Reducing Harm Caused by Opioids for Non-Cancer Pain

November 2022

Supporting and creating mental health and wellbeing through the built environment

.....using a multi-sector approach between health, public health, architecture, arts,
planning, and citizens

.....focussing on areas of inequalities

Funded by.....



Healthy Happy Places 'Ingredients'

Trauma
Informed /
Healing

Biophilic /
Nature

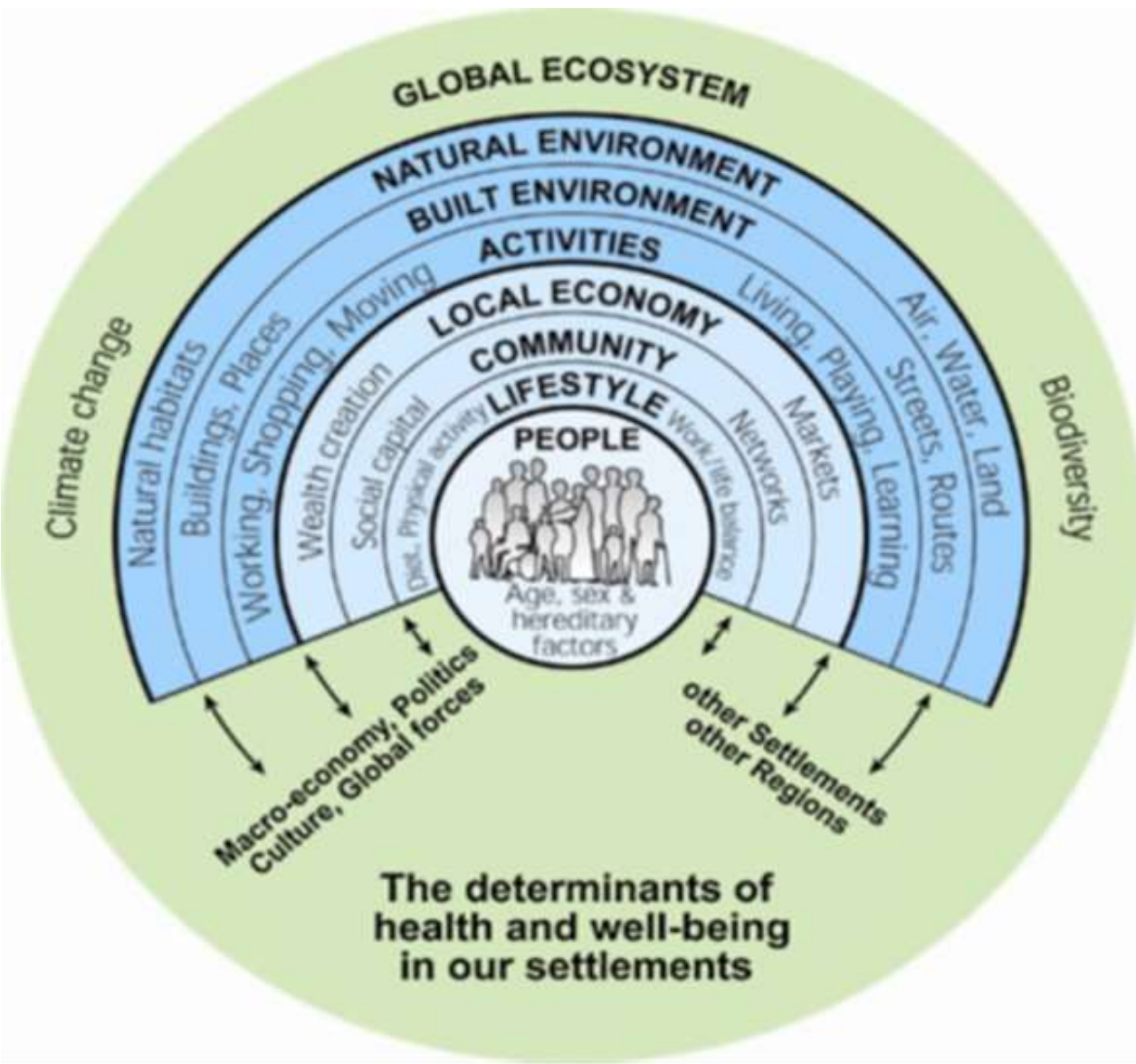
Dementia
friendly

Neurodiverse
aware

Citizen
activation /
ownership

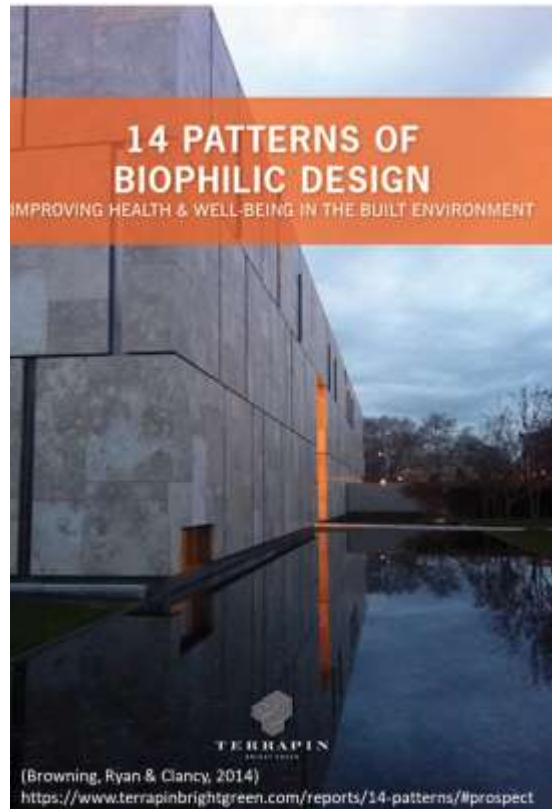
Arts &
Creative

Lifestyle
Security



Settlement health map (Barton, 2009)

“People’s opportunities for health are influenced by factors outside of the health and social care system. They lie in the circumstances in which people are born, grow, live, work, and age: the social determinants of health. These are the ‘causes of the causes’ of ill health and they can enable individuals and societies to flourish, or not. Creating a healthier population requires greater action on these issues. This includes addressing the role of both the physical built environment and the social factors which shape neighbourhoods and places” (pg. 4; NHS England, Putting Health into Place 2019).



“The concept of biophilia implies that humans hold a biological need for connection with nature on physical, mental, and social levels and this connection affects our personal well-being, productivity, and societal relationships” – *Sheeps Meadow, 2004* (in *14 Patterns of Biophilic Design*)

“Biophilia is the innately emotional affiliation of human beings to other living organisms” – *E.O. Wilson, 1984* (in *14 Patterns of Biophilic Design*)



3 Experiences and 25 Attributes of Biophilic Design (Kellert, 2018)

1. Direct Experience of Nature	2. Indirect Experience of Nature	3. Experience of Space and Place
<ul style="list-style-type: none"> • Light • Air • Water • Plants • Animals • Landscapes • Weather • Views • Fire 	<ul style="list-style-type: none"> • Images • Materials • Texture • Color • Shapes and forms • Information richness • Change, age and the patina of time • Natural geometries • Simulated natural light and air • Biomimicry 	<ul style="list-style-type: none"> • Prospect and refuge • Organized complexity • Mobility • Transitional spaces • Place • Integrating parts to create wholes

3 Categories and 15 Patterns of Biophilic Design (Browning and Ryan, 2020)

1. Nature in the Space	2. Natural Analogues	3. Nature of the Space
<ul style="list-style-type: none"> • Visual Connection with Nature • Non-Visual Connection with Nature • Non-Rhythmic Sensory Stimuli • Thermal & Airflow Variability • Presence of Water • Dynamic & Diffuse Light • Connection with Natural Systems 	<ul style="list-style-type: none"> • Biomorphic Forms & Patterns • Material Connection with Nature • Complexity & Order 	<ul style="list-style-type: none"> • Prospect • Refuge • Mystery • Risk/Peril • Awe



<https://www.terramai.com/blog/biophilic-design-real-life-examples/>

'Nature in Space' – Direct experiences of nature



<https://www.terramai.com/blog/biophilic-design-real-life-examples/>



<https://www.pinterest.co.uk/pin/253046072794066932/>



‘Natural Analogues’ – Indirect or representational experiences of nature



<http://blendconcepts.com/2016/06/biophilic-design-features-for-environments/>



Refuge



Prospect



‘Nature of the Space’ – Prospect, refuge, mystery, risk/peril, awe

“Refuge conditions have been shown to improve concentration, attention and perception of safety while also reducing irritation and fatigue.” ([Terrapin Bright Green](https://www.terrabinbrightgreen.com/wp-content/uploads/2015/11/641-Case-Study-Fall15.pdf))



14 PATTERNS OF BIOPHILIC DESIGN

IMPROVING HEALTH & WELL-BEING IN THE BUILT ENVIRONMENT



TERRAPIN
BRIGHT GREEN

Reference: Browning, Ryan & Clancy (2014)

<https://www.terrabinbrightgreen.com/reports/14-patterns>

Health Impacts

- **Cognitive effects** – “Strong or routine connections with nature can provide opportunities for mental restoration” (pg.11) thus our capacity for performing mentally focussed tasks is greater than someone with fatigued cognitive resources.
- **Psychological effects** – “experiences of natural environments provide greater emotional restoration, with lower instances of tension, anxiety, anger, fatigue, confusion and total mood disturbance than urban environments with limited characteristics of nature” (pg.11)
- **Physiological effects** - Physiological responses triggered by connections with nature include relaxation of muscles, as well as lowering of diastolic blood pressure and stress hormone (i.e., cortisol) levels in the blood stream (e.g., Park et al., 2009) ... Physiological responses to environmental stressors can be buffered through design, allowing for the restoration of bodily resources before system damage occurs (Steg, 2007)” (pg.11)
- *See page 12 of this document for cited articles of each of the 14 patterns*

An orange plastic pill bottle is lying on its side on a light blue surface. The bottle is tilted, and several white, round pills are scattered on the surface in front of it. The background is a soft, out-of-focus light blue.

So how does this relate to pain and opioids?
(*caveat – this is a very new area of research and practice!)



Nature and Recovery.....

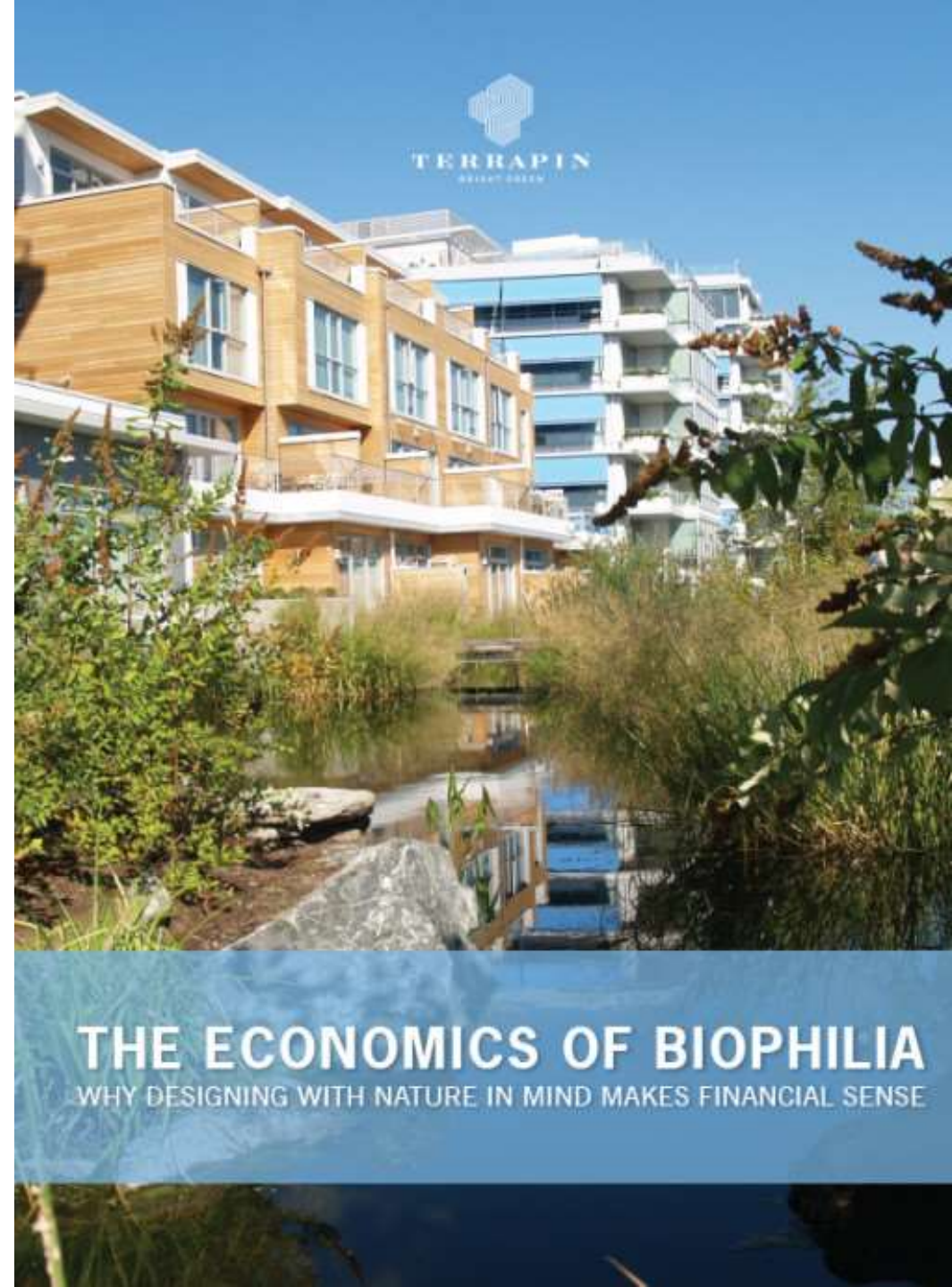
- **Ulrich stress recovery theory**
- US study during the 1980s found that patients who were recovering from gall bladder surgery had quicker, and more positive recovery experiences when their bed faced a view of trees and nature compared to those who faced a brick wall. (8.5% shorter hospital stay, patients took fewer analgesics)

“In 2005, a study assessed the significance of sunlight in a hospital room on patients’ recovery from a cholecystectomy, by measuring the quantity of analgesic medication and pain medication costs. The patients were divided into rooms with varying sunlight. Patients on the bright side were exposed to 46% higher sunlight intensity than those housed in dimmer rooms. The result of the study measured standard morphine equivalent, based on all opioid medication used postoperatively. **The study determined that patients exposed to greater dosages of sunlight perceived less pain, took 22% less analgesic medications per hour, and accumulated 21% less in pain medication costs for the length of their stay** (Walch et al., 2005)”.

In US, estimated cost savings of \$93 million per year in reduced hospital stays.

“Research results demonstrate that poor design and lack of exposure to nature inhibit recovery rates and blood pressure stabilization, exacerbate anxiety and **increase administration of pain medications**” (pg.17).

Credit: <https://www.terrabinbrightgreen.com/publications/>



Attention restoration theory

(The Restorative Benefits of Nature, Kaplan 1995)

- Nature has a restorative effect and acts as a form of retreat in response to high mental demand scenarios requiring sustained periods of attention
- Natural environment restores ability to direct and control attention
- It is thought that green space may contribute to improved health outcomes through enhanced air quality, improved physical activity, stress reduction and increased social cohesion
- Viewing urban forest landscapes has been found to significantly decrease blood pressure, heart rate, sympathetic nervous system activity and evoke more positive moods, known as 'forest bathing' in Asia.
- Green spaces introduced in schools has shown that such interventions can improve activity levels, reduce bullying and enhance attitudes to learning.
- In architectural circles, this has translated into biomimicry and biomorphic design which mimics forms and functions found in nature, to respond to humans innate desire to be close to natural environmental stimuli.

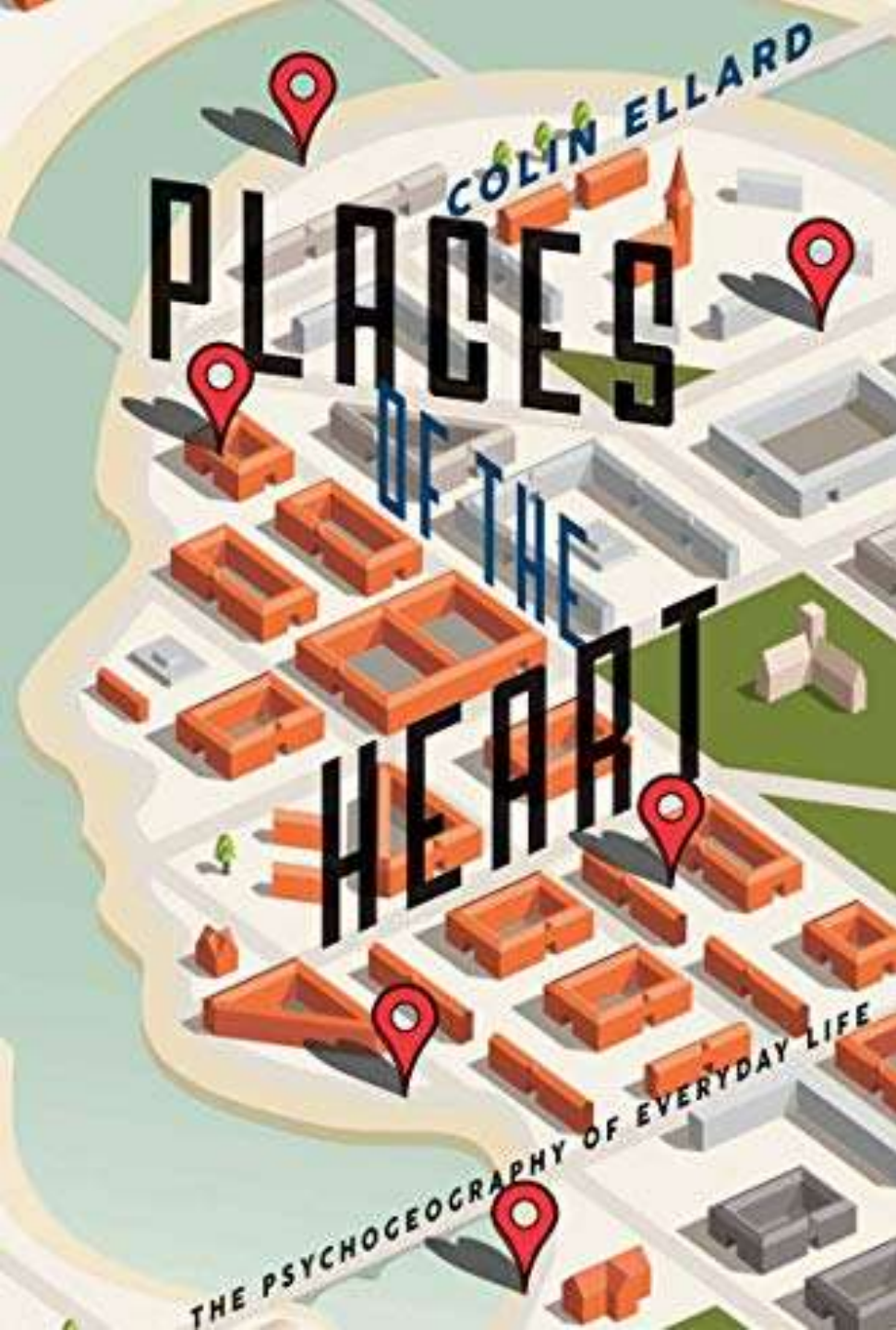




Nearby Nature Buffers the Pain Catastrophizing–Pain Intensity Relation Among Urban Residents With Chronic Pain

- “pain demands cognitive resources and hinders the individual from directing attention elsewhere.”
- “intentional distraction from pain (by attending to other stimuli) might increase tolerance of pain or reduce pain intensity”
- Participants: 81 NYC residents with chronic pain experienced for at least 3 months not due to cancer, mainly hip/knee osteoarthritis and lower back pain, experiencing pain >5
- Measured:
 - daily pain intensity
 - Daily pain catastrophizing (seven statements representing three subscales of pain catastrophizing: rumination, helplessness, and magnification)
- Results
 - Effects of nearby nature are clinically significant—with a reduction of pain intensity of nearly two points (on a 10-point scale) among those with the highest levels of pain catastrophizing
 - Has an effect on rumination but not on helplessness and magnification (for pain catastrophizing)

Measures of “nearby nature”



Psychogeography – how place and our surroundings impact our emotions and behaviours

- Nature in Space
- Places of Affection
- Boring Places
- Places of Anxiety
- **Places of Awe**
 - “a feeling of **vastness** and a sense of **accommodation**” (pg. 154)
 - “Accommodation describes the manner in which we may be required to adjust our world view in response to the stimulus that generates awe...it normally brings together two things – ideas, notions or even sensory experiences – that are contradictory” (pg.154)

The Role of Awe in Architecture as a Pain Disruptor – A Call for New Research

- “The author hypothesizes that awe can be used as a form of the proven self-regulating pain management method known as reappraisal. Pain reappraisal is cognitive reframing of the context and meaning of pain, changing the value that pain is assigned and resulting in decreased pain perception.”
- “Cognitive reappraisal in the form of CBT has proven successful in pain management through modification of the understanding, expectations, and beliefs related to pain.”
- “This paper proposes the consideration of awe as a form of self-regulating pain management, akin to cognitive reappraisal. Reappraisal and awe have similar characteristics, primarily the ability to shift perspective, through updating existing mental structures. If the experience of awe can shift perspectives similarly to cognitive reappraisal then awe should be considered as an innovative pain management tool.”

Relationship of Healthy Building Determinants With Back and Neck Pain(systematic review 2022)

- Evidence was found to generally support a relationship indicating that as healthy building determinants worsen, the risk of back and neck pain increases.
- Based upon "The 9 Foundations of a Healthy Building“, healthy building determinants
- Not a gold standard but a starting point and framework
- Further research needed (none included were interventional)

<https://pubmed.ncbi.nlm.nih.gov/35815341/>



Neighborhood Walkability in Relation to Knee and Low Back Pain in Older People

- Cross sectional study.
- After adjusting for sociodemographic covariates, the prevalence ratio (PR) of knee and low back pain was significantly lower in neighbourhoods with better access to parks and sidewalks, good access to fresh food stores, and higher population densities
- Further research needed on environmental determinants of pain



Neighbourhood built and social environment and meeting physical activity recommendations among mid to older adults with joint pain (2020)

- Non-pharmacologic interventions, particularly physical activity, are by far the most effective in treating many musculoskeletal pain conditions
- Studies have found that attributes of the patient's built environment may facilitate physical activity, especially as walking in their neighbourhood would be an easy, low-cost solution to improving patient outcomes
- Two commonly identified aspects of neighbourhood characteristics are the physical environment, such as **walkability**, and the social environment, e.g. **neighbourhood cohesion**. Each appears to independently influence physical activity in mid to older adults, many of whom may have arthritis
- Results:
 - **Less than a highly-walkable neighbourhood and lower social cohesion were independently associated with decreased odds of meeting physical activity recommendations among adults with arthritis and recent joint pain.**

*“The 20-minute neighbourhood is a catchy name for **‘walkable neighbourhoods’**, a concept that’s become popular across the world from Melbourne to Paris and Portland. It’s an established principle of urban design and planning, which aims to make sure that people’s everyday needs are within easy safe walking distance of their homes: schools, shops, parks, good public transport and so on.” (Nick Wright, MRTPI)*

Emphasises importance of cross disciplinary programmes of work that can influence policy and practice related to the wider determinants of health



THANKS FOR LISTENING!

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❖ View our [webpage](#)



Academic Health Science Network
North East and North Cumbria

Dementia Friendly Environments

How do we design places and spaces that prevents and supports people living with dementia?

This innovative webinar will bring together practitioners from the built environment, medical and therapeutic disciplines, and academia to share and celebrate best practice to build a collaborative approach to planning and design.

Thursday 19th May 2022, 13:00-14:30 GMT

#HealthyHappyPlaces



Academic Health Science Network
North East and North Cumbria

Thursday, 7 April 2022, 11:00-12:30

#HealthyHappyPlaces

NeurodiverCity

Neurological difference and inclusion in the designed environment

This webinar is part of a series of events which will showcase perspectives from mental health, architecture and urban planning. It will include:

- The psychological impacts of neurodiversity
- The lived experience of autism in relation to the urban environment
- The creation of inclusive places and spaces through design



Academic Health Science Network
North East and North Cumbria

Healing Environments

How do places and spaces play a role in how we feel and heal?

REGISTRATION OPEN

SPEAKERS

- Dr Rachel Turnbull, Programme Lead for Healthy Happy Places, AHSN NENC
- Dr Angela Kennedy, Head of Centre for Specialist Psychological Therapies, Cumbria Northumberland Tyne & Wear NHS Foundation Trust
- Timothy Crawshaw, Vice President of the Royal Town Planning Institute
- Christopher Shaw, Chair of Architects for Health and Senior Director at Medical Architecture

#HealthyHappyPlaces

Thursday 2nd December 2021 11:00 – 12:15



Academic Health Science Network
North East and North Cumbria

Bottom Up Urbanism

Tackling wellbeing in the built environment through citizen participation and leadership

This webinar will explore some of the creative and community driven approaches to creating vibrant spaces and places that contribute and support wellbeing and mental health

Thursday, July 5 2022, 11:00-12:30 GMT

#HealthyHappyPlaces



Academic Health Science Network
North East and North Cumbria

Biophilic Design

Working with nature through design and its impact on mental health and wellbeing

This webinar will explore the elements of **biophilic design**; the psychological impacts and experience of mimicking nature in design; the clinical experience of incorporating nature into therapy; and showcase examples of biophilic design in internal and external spaces through the lens of architecture and urban planning.

REGISTRATION OPEN

Thursday 17th February 2022 13:00 – 14:30 #HealthyHappyPlaces