

BRINGING FRONTS BACK

A research agenda to investigate the health and well being impacts of front gardens

Authors

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The social and aesthetic function of front gardens has been widely explored, and while domestic gardens are a valuable component of green infrastructure, their relative contribution remains largely un-quantified [1]. To date, front gardens have largely been overlooked in the assessment of public health, environmental, and planning outcomes.

"We propose the importance of investigating how green spaces in the immediate vicinity of the house influence health and wellbeing."

The context

This is in the dual context of the recognised impact of nature and green spaces on physical and mental health, and the growing trend in the UK to pave over front gardens for off-road parking and ease of maintenance.

This prospective article reviews current evidence and sets out a future agenda for guiding this field of research.

Introduction to front gardens

Enclosed outdoor spaces date back to the emergence of the first civilizations, initially as a barrier for excluding animals, and later as functional gardens to contain edible plants, and also as a form of adornment. Egyptian tomb paintings of the 16th century BC depict the earliest evidence of ornamental horticulture and landscape design, whilst wealthy landholders of times past, are noted for using elaborate and formal front gardens in their estates as a display of class, culture and status.

Specifically, a front garden is the piece of land between the street and the front of a residential home. The modern words of "garden" and "yard" are descendants of the Old English geard, which denotes a "patch of ground around a house" or "fenced enclosure" and also the Proto-Germanic gardan, meaning an enclosure, garden or yard [2].

As private land belonging to the homeowner, the range of streetscape typologies, resident demographics and cultures, means that front gardens can take on a greater significance in certain areas than in others. The front garden may vary in size, shape, aspect, and vegetation type, depending where in the world it is located, and may include a hedge or fence delimiting it from the pavement or public area.

Typically visible from the street and pavement, as well as from any windows at the front of the home – common features include lawns, climbers, shrubs, annual bedding plants, herbaceous plants, richly scented rose borders, ponds, and rockeries.

The main difference between front and back gardens is the role frontages play as unique buffer zones that connect the home to the outside world, providing services both to residents and passers-by, while simultaneously separating the private from the public realms [3]. The front garden as a front-facing and exterior manifestation of the house, serves as a direct link between the front door and the pavement – a welcoming front entrance, evoking positive and memorable first impressions, improving street appeal and a sense of anticipation at what lies beyond.

Depicted as a form of aesthetic expression, most notably by the famous French painter Oscar-Claude Monet and William Morris, leader of the Arts and Crafts Movement, front gardens and the pastime of gardening, became increasingly popular during the Elizabethan era, as well as throughout the late 19th and early 20th centuries – times of increasing prosperity. During this era, families often spent considerable social time in the front garden, entertaining children, playing with pets, socializing with friends, family and neighbors, and partaking in the incidental exercise of gardening.

Green health benefits

The health and well-being benefits of consistent exposure to restorative environments and gardening, as a physical activity are well-documented, showing positive effects on mental health, physical health, and social cohesion. Research focused on the restorative, rehabilitative, and nutritional aspects of gardening activities for different groups in a variety of settings also has positive findings. Moreover, physical and social activity in natural settings has been shown to be more advantageous in terms of restoration, mood, and self-esteem when compared to that conducted in non-natural indoor and highly urban settings [4]. This is true for adults with both good and poor mental health.

Benefits lost

In the last few decades, however, there has been a gradual decline of the front garden and its place in modern society. This can be linked to changes in social networks and entertainment preferences, particularly with the arrival of television and smart-devices meaning people spend more time indoors, in addition to the increase in the number of families with both parents working, the number of licensed vehicles on the world's roads, and the necessity of two-car driveways making way for "hard landscaping".

Over five million front gardens (front yards) in the United Kingdom (UK) now have no plants growing in them (one in three), and four and a half million front gardens (one in four) are completely paved over [5]. This is three times less plant cover in front gardens than ten years ago [5]. In part, this is due to increasing fees and regulations for road parking, a desire for lower maintenance requirements, and a lack of time or skills to look after green space [6]. In 2013, over one million homeowners paved over a portion of their garden [7]. Reasons cited were to create a driveway for off-road parking, and to minimise garden maintenance.

As front gardens are increasingly being paved over, significant ecological benefits will be lost, including environmental ecosystem services provided by garden plants and permeable surfaces, including important sources of food, pollination resources and habitat for wildlife. Removal of plants and trees will also affect the natural temperature control on the environment by reducing shade and insulation, whilst also heightening the risk of localized flash-flooding.

> **"The garden is the smallest parcel of the world and then it is the totality of the world."**
>
> – **Michel Foucault**

Michel Foucault encapsulates how small spaces that are part of our everyday lives can also carry much deeper significance than might be assumed based on their size and ordinariness. To date, front gardens have largely been overlooked in the assessment of public health, environmental, and planning outcomes.

The research agenda

We propose a research agenda to evaluate how front garden landscapes influence health and well-being. There is merit in valuing front gardens not only for the ecological ecosystem services, but also for their multiple positive psycho-socio-cultural impacts.

Potential research findings will have implications for fields of horticulture, landscape architecture, urban planning, and public health. These should be articulated in ways relevant to policy-makers, decision-makers, and funding bodies to empower them to integrate the value of front gardens in their work, particularly when dealing with front garden paving regulations, future housing developments, and streetscape greenery, amongst others.

COMMENTARY

Front gardens: Bringing green space to the doorsteps of communities experiencing disadvantage

Michael Norwood | Senior Research Assistant | The Hopkins Centre

Introduction

Neighbourhood urban green space that is easily accessible to local residents has sometimes been catchily labelled "Doorstep greenspace" (Gidlow & Ellis, 2011). The article "Bringing Fronts Back: A Research Agenda to Investigate the Health and Well-Being Impacts of Front Gardens" convincingly suggests research is needed to examine the effects of front gardens on health – arguably the epitome of "doorstep" greenspace. The article highlights that although there is a vast body of literature on greenspace and health, the effects, and effective uses, of front gardens has been overlooked. This is in the context of massive losses of front gardens in the UK.

The authors draw attention to the importance of the research agenda to address health equity. Indeed, it is suggested doorstep greenspace is especially valuable for those whose activities are restricted outside their local area (Van Herzele & Wiedemann, 2003). Front gardens may be valuable for people in this group, and also people whose movement is restricted within their local area. This commentary will build on the authors, Chalmin-Pui et al. (2019), research agenda, and extend the authors creditable position on the use of this research for health inequality in disadvantaged communities.

This commentary suggests that research on the health effects of front gardens would fill the gap identified by Chalmin-Pui et al. (2019), and could assist another research deficit in the greenspace literature – that of disadvantaged groups or communities and greenspace in general (Kuo et al., 2019). Furthermore, if this new research base finds positive benefits from front gardens, as is the probable outcome, then a regeneration of front gardens may be a suitable approach to close the real-life gap in access to greenspace experienced by disadvantaged communities.

Cities, greenspace, and disadvantage

In 2018, 55% of the world's population lived in urban areas and this will grow to 68% by 2050; relatedly, by 2050 the worlds rural population will have declined (United Nations Department of Economic and Social Affairs (UN DESA), 2018b). In Australia, current trends show all the almost 10 million expected population growth by 2050 will live in urban areas, with the rural population starting a decline (United Nations Department of Economic and Social Affairs (UN DESA), 2018a).

Urbanisation and the loss of exposure to the natural environment is having a significant impact on people's health and increased green exposure can neutralise or reverse this impact. For example, the upturn in emotional and behavioural difficulties in young people (Konowałek & Wolanczyk, 2018; Safer, 2018) has been linked to urbanisation (Butler, Kowalkowski, Jones, & Raphael, 2012; Rudolph, Stuart, Glass, & Merikangas, 2014) and exposure to green environments may counter this trend (Faber Taylor & Kuo, 2011; Norwood et al., 2019).

Another example, is that urbanisation has been linked to increased obesity and unhealthy lifestyles (LeBlanc & Chaput, 2019) and access to green space is associated with increased physical activity (Cohen et al., 2007) and improved physical health (Lee & Maheswaran, 2011). Clearly there are several mechanisms that facilitate the benefits of greenspace. Indeed, to counteract various damaging facets of urbanisation, urban planners are increasingly using nature in urban design (Lennon & Scott, 2016). However, disadvantaged areas often have less greenspace to facilitate a push back against damaging aspects of urbanisation.

In the UK, the location of the Chalmin-Pui et al. (2019) article, the most disadvantaged areas tend to be nearer to city centres and not in rural and green locations (GLA Economics, 2016; Riva et al., 2009). However, there is a deficit in research that explores the effect of green environments on populations experiencing disadvantage (Kuo et al., 2019). Existing research suggests there may be a greater chance of local contextual barriers preventing benefits from greenspace such as through fear etc. (Gidlow & Ellis, 2011). However, it may be disadvantaged areas where benefits from exposure to greenspace may be felt the keenest. It is problematic then that there is inequality experienced in

these areas, not only in terms of limited access through fear or social context, but also through a lack of the existence of greenspace (Kweon et al., 2017). Therefore, it is in these disadvantaged urban areas where gardens may be most beneficial.

In the UK, Brindley et al. (2018) report that health inequality is at its highest in areas with small domestic gardens and suggest that in new builds garden size may be a method to reduce socioeconomic health inequalities. This may not be easily implemented – new houses in UK cities are getting smaller (LABC Warranty, 2019). However, the importance of public greenspace is recognised by town planners. This new field of research may explore how front gardens – which provide immediate, safe, and more sociable access to greenspace – compare to neighbourhood parks; it can inform urban planners on how to divide space between the two.

It is clear increased research into front gardens and increased research into green space and populations experiencing disadvantage can mutually benefit from each other. The proposed research agenda of the effects of front gardens on health, is well-suited to address current issues in access to greenspace for disadvantaged areas, and the effects of greenspace on people living in disadvantaged urban areas. This will be a challenge, in cities where space is limited, but may be worthwhile.

Each aspect of health identified by Chalmin-Pui et al. (2019) – physical, social and mental – will now be addressed individually, to outline how greenspace might positively effect people experiencing disadvantage, and to identify avenues of study for researchers.

Physical

There are several ways front gardens could improve physical health. Firstly, on a larger, societal level, front gardens could be used to improve air quality in cities. If air quality mediates the effect of greenspace (Dadvand et al., 2015) and air quality is worse in cities, where we may expect a higher concentration of low socio-economic areas (GLA Economics, 2016) then front gardens could affect health equality. Chalmin-Pui et al. (2019) cite the large land area gardens cover – over 25% in an average city – and the number of front gardens which have been lost – four and a half million front gardens (one in four). By greening front gardens across a city, many plants and trees could be planted, which could contribute to cleaner air.

Next, on a medium, community level, front gardens will make local streets more walkable and aesthetically more pleasant. If a greening of front gardens could encourage physical activity, as the presence of local parks do, then this could encourage physical exercise. On an individual level, people may use their front garden for both of these things – exercise and fresh air – but also as a way of alleviating the physical impact of stress.

Social

Greenspace in disadvantaged areas may not receive the same benefits due to social reasons. Social problems mean some green areas in inner cities are not accessible due to fear etc. If people access front gardens, especially in denser areas such as cities and disadvantaged areas in cities, this may create a greenspace where people can socialise and gain a sense of community without fear. This may be especially true for children, who may not access local parks themselves due to fear (Gidlow & Ellis, 2011) or because of parental concern (Fullagar & Harrington, 2009). Where back gardens are often used for a sense of privacy, an additional front garden can be used as more public or social greenspace. This may even have knock on effects creating a safer local environment in general. This interacts with the physical outcome by creating a safer walkable space for locals.

Mental

Mental benefits of views and access to greenspace are well documented (Browning & Rigolon, 2019; Schutte et al., 2017). Cognitive benefits from views of greenspace even extend to the lowering of ADHD symptoms (Faber Taylor & Kuo, 2011) and improved behaviour in children (Faber Taylor et al., 2002). Therefore, views from windows onto greenspace in disadvantaged areas may start to close the gap in cognitive, behavioural and other developmental issues.

However, cities and disadvantaged areas have less greenspace and homes are more likely to look onto urban buildings, traffic or not have a garden at all; this may be especially true in the location of the paper, the UK, where living areas tend to be located at the front of the house (Ozaki, 2017) rather than overlooking the back garden.

Application to Australia

Disadvantaged areas in the UK tend to be in inner cities (GLA Economics, 2016; Riva et al., 2009) but in Australia they are in rural areas (Australian Bureau of Statistics, 2018). Therefore, differences in the effect of front gardens may differ not only between rural and urban areas,

but also cross-culturally on an international scale. Social benefits in particular may differ, as the lower population density of rural areas may mean potential benefits through incidental social contact and safe play areas may not be as strong.

Contrastingly, many urban Australian houses, particular in sub-tropical areas such as Brisbane, have living areas contiguous with the outdoors situated in the privacy of a large back garden or deck; therefore, using the front garden as a social space may encourage community spirit. Certainly, findings from disadvantaged areas of inner-city London may translate to similar areas in, for example, inner-city Sydney, but rural areas of Australia, where disadvantage is more common, will require site specific research, which may result in weaker effects.

Conclusion

In summary, addressing the lack of research into front gardens may be an effective approach to also filling the research gap made by underrepresentation of disadvantaged communities. This in turn could lead to a potential solution to closing the green cover gap between disadvantaged and wealthy neighbourhoods and schools. Chalmin-Pui et al. (2019) identify a strong body of evidence for benefits in mental, physical and social health from green space. Disadvantaged areas experience less of all three of these "doorstep greenspace" benefits. The proposed research of front gardens may expose a way of combating this inequality by bringing greenspace, literally, to people's doorsteps.

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THE DIGNITY PROJECT

Citizenship and dignity in times of austerity

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> "EVERY HUMAN BEING IS CONSIDERED A MEMBER OF THE HUMAN FAMILY"
>
> Waldschmidt and Sepulchre (2019)

In times of global insecurity and economic austerity, rampant individualisation grows, and with it, increased disparities and inequality (Goodley, 2017). For the over a billion people who are estimated to live with disability globally, about 15% of the world's population (WHO, 2011) times of austerity escalate inequality and instability, while the struggle for a fairer and more inclusive global society becomes more difficult (Barnes, 2020).

Indeed, disability and economy are closely linked in a relationship that is exacerbated by economic recession (Flynn, 2017). Public expenditures on social services and new policies that reterritorialise what it means to have a disability, serve to decrease service provisions for people with disability at a time when they may most need it (Flynn, 2017).

In order to ensure that all members of our global society have access to equal human rights based on human dignity, it is essential that we embrace this moment as an opportunity to examine relational ethics (Turner, 2006; Waldschmidt and Spelchre, 2019).

We urge members of the global commonwealth of humanity, the citizens of the world, to think about how "we are all made through our connections with others" in an interdependent community (Pothier and Devlin, 2006). The drafters of the Universal Declaration of Human Rights established dignity as the underpinning tenant on which they built their articles. Dignity, rather than liberty or freedom, was chosen, because of its ability to recognise and respond to human vulnerability (Series, 2020) and its ability to accommodate universal and personal aspects.

On a universal level, all people have an inherent dignity which cannot be eroded or taken away. However, on a personal level, dignity is greatly affected by context, relationships with others, and our human vulnerabilities. At a time when all members of our global community are feeling vulnerable, people with disability may experience a further heightened vulnerability, particularly if they require support workers for their daily living arrangements (Kevin Cocks, 2020).

People with disability may also be subjected to the traditional views of the medical model in times of health crisis, in which they are given less access to life saving or even basic treatment, in favour of people who are "fully abled". Although most health practitioners would not want to ration healthcare on the basis of disability, this becomes a necessary evil when the health system is overloaded.

In order to preserve the personal dignity and inherent human rights granted to all global citizens, particularly people who may be more vulnerable due to their disability, we must come together as citizens of the world and hold each other accountable at an individual, local, state, national, and global level. In this current global context of pandemic, self-isolation, economic austerity, and vulnerability, the importance of our Dignity Project is magnified.

The Dignity Project is a research platform designed by The Hopkins Centre to provide people with disability an opportunity to share experiences and concerns.



Our **Dignity Hub** will be officially launched next month, in order to address the physical, systemic, and attitudinal barriers that lead to exclusion, marginalisation, and undignified treatment for people with disability.

Now more than ever, it is important to uncover the experiences and stories of people with disability in order to illuminate future possibilities, pathways that should never again be travelled, and methods through which policymakers, practitioners, and citizens can enact meaningful change.

Prior to our launch, we ask that you ensure that your local, state, and national governments are providing proactive, virtual programs to check on the wellbeing of people with disability and respond to their ongoing service needs.

Access to essential health services and continuity of care will require physically and technologically accessible environments. Furthermore, there must be clear plans to build the support networks of people with disability who may not have access to school environments or other natural networks.

As we come together as a global community, isolating to protect each other, it is an important time to consider all citizens of humanity. We need to give particular consideration to the vulnerabilities that already exist for people with disabilities and those that will be created by this pandemic.

The impact will extend well beyond COVID-19, including the economic and social barriers that will further limit their access to services and ongoing participation as citizens. The Dignity Project will be telling these stories and finding solutions.

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Time between acquired brain injury and admission to community-based rehabilitation: differences in cognitive and functional gains

Elly Williams, Angelita Martini, Hayley Jackson, Janet Wagland & Lynne Turner-Stokes (2020). Time between acquired brain injury and admission to community-based rehabilitation: differences in cognitive and functional gains, *Brain Injury*, 34:6, 713-722, DOI: 10.1080/02699052.2020.1740943.

Introduction

Following acquired brain injury (ABI), some adults require a prolonged period of rehabilitation to achieve significant gains in function, independence, community integration, social participation and/or productivity. This longer rehabilitation is termed "extended" rehabilitation.

This PEER review examines a study which reports the rehabilitation outcomes of 92 adults who accessed 12 months of "extended" community-based rehabilitation at Brightwater Care Group in Perth, WA.

In the Brightwater model of care, clients progress through 10 different stages of independence – from requiring maximum assistance (stage 1) to living independently (stage 10).

People can access Brightwater rehabilitation from early post-injury up to 5 years post-injury, and may be admitted straight from hospital, from the community or from supported living facilities.

The study participants accessed extended rehabilitation at different points in their recovery: 'early' (<12 months post-injury), 'middle' (1-2 years post-injury) or 'late' (2+ years post injury). The Mayo Portland Adaptability Inventory-4 (MPAI-4) and the UK functional assessment measure (UK FIM+FAM) were used as outcome measures.

Findings

In summary, the study found that after 12 months of extended rehabilitation:

- All client groups (early, middle, late) made statistically significant gains in all categories of the UK FIM+FAM (motor, cognitive and extended activities of daily living)
- Statistically significant gains were made in participation (all groups), ability (early and late groups) and adjustment (early group) on the MPAI-4
- 'Early' recovery clients made the greatest changes
- 'Late' clients had improvements in functional independence and participation.

Both outcome measure tools appear appropriate to capture different aspects of clinical change (e.g., functional skills and participation) following rehabilitation.

The authors suggest that using both outcome measures provides complementary information on client outcomes, with the UK FIM+FAM more sensitive for those with more severe disability, and the MPAI-4 more appropriate for those with greater abilities. These tools appear to capture the outcomes of extended rehabilitation.

Commentary:

Kerrin Watter (Clinical Lead) & **Kate Cameron** (Senior Speech Pathologist) from the **Acquired Brain Injury Transitional Rehabilitation Service**.

This paper demonstrates the benefits of extended community rehabilitation for adults with ABI, including for those later in recovery (i.e., >2 years post injury).

It strengthens the evidence base that recovery can continue long post-injury, and that some people require a longer period of time to make rehabilitation gains.

It also presents an economic argument for extended rehabilitation, suggesting that improvements in the areas of self care, transport, support needs and social contact may reduce carer burden and long-term care costs, even many years post-injury. These findings raise key points for clinicians, researchers, families, service providers and funders to consider, around intervention timing, service access, the benefits of longer-term rehabilitation and ongoing advocacy for access to longer-term specialist rehabilitation for adults with brain injury.

In Queensland, the statewide brain injury rehabilitation service (BIRS) provides a range of services to meet the rehabilitation needs of adults with ABI. This includes a dedicated sub-acute rehabilitation unit, extended rehabilitation facility, transitional community rehabilitation service, post-discharge outpatient (day hospital) services, and longer-term community rehabilitation and case management services. Clients may access rehabilitation from one or multiple services, and often access services sequentially (e.g., inpatient rehabilitation, community rehabilitation, outpatient day hospital services, longer-term case management). Clients may also re-enter the rehabilitation continuum through the outpatient day hospital services, and longer-term community rehabilitation and case management services.

Clinically, we see the outcomes and benefits for clients who access this continuum of rehabilitation, including those who access specific extended rehabilitation and / or longer-term rehabilitation in Queensland. In our community transitional service (ABI TRS), we often see clients who have undertaken an extended period of rehabilitation – involving sub-acute inpatient rehabilitation and then dedicated extended rehabilitation - these clients may be >1 year post injury on referral to our service.

Our experience is that these clients and their families continue to have rehabilitation goals when transitioning into the community, benefit from supports to transition to the home / community, and demonstrate gains in function and participation following our community rehabilitation program.

For adults with ABI who do not access the BIRS continuum, rehabilitation is provided via other health-based inpatient, outpatient and community services across Queensland. Additionally, with the implementation of funded insurance schemes (e.g., NIIS-Q and NDIS), access to longer-term community rehabilitation and capacity building services for adults with ABI has increased. This should continue to address areas including functional independence, participation, and productivity / work roles and positively impact the futures of those with brain injury and their families.

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NOVEL CORONAVIRUS

COVID-19

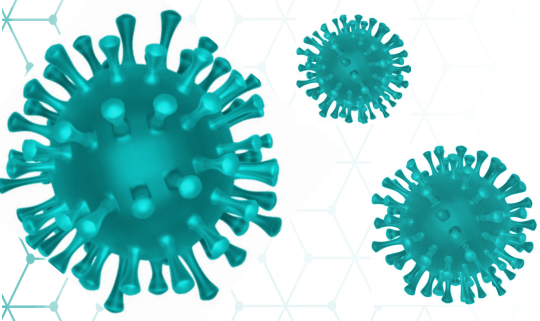
WHAT YOU NEED TO KNOW

COVID-19 AND SUPPORTING PEOPLE WITH DISABILITIES

Many people with disability, families, carers and service providers are understandably very concerned about the outbreak of COVID-19. People with disability are more at risk of developing a serious infection, particularly those with high rates of comorbid health conditions. Rightly so, many are also worried about being able to access essential disability and medical services.

What you need to know about coronavirus (COVID-19)
COVID-19 is a highly infectious respiratory illness. Caused by a new virus known as SARS-CoV-2, it is easily spread from person to person and has diverse symptoms, ranging from extremely mild to serious, and in some cases requiring hospitalisation and intensive care.

What is COVID-19?
COVID-19 is the disease caused by a new coronavirus. It was first reported in December 2019 in Wuhan City, China. Coronaviruses are a large family of viruses that cause respiratory infections. These can range from the common cold to more serious diseases, including pneumonia.



Who is at risk?
According to the advice of the Australian Government, those most at risk include:

- People who have recently been overseas or a place of high risk (China, Iran, Italy and Korea)
- People who have recently been in contact with someone with a confirmed diagnosis of COVID-19.

People with increased vulnerability:

- Elderly people
- Those with disabilities
- Those in group living settings
- Babies and very young children
- Aboriginal and Torres Strait Islander People.

High needs support:

- Intellectual Disability
- Autism
- Acquired Brain Injury
- Cerebral Palsy
- Spinal Cord Injury.

Medically complex:

- Diabetes
- Spinal Cord Injury
- Tetraplegia
- Motor Neurone Disease (MND)
- Multiple Sclerosis (MS)
- Rheumatoid Arthritis
- Autoimmune Diseases.

How does coronavirus spread?

- Direct / close contact with an infectious person, even if they are not showing symptoms
- Through coughing and sneezing on others
- Touching contaminated objects and surfaces (door-knobs, tables, taps) and then touching the mouth and face.

Incubation period
The World Health Organisation (WHO) currently estimates that the incubation period ranges from 0 - 14 days, with many incubation periods being 5 – 6 days. Depending on the individual, symptoms can appear any time during this period.

Symptoms
Symptoms can range from a mild illness to more serious conditions, including pneumonia. Visit the Online Symptom checker

Common symptoms include:

- Fever
- Fatigue
- Sore throat
- Runny nose
- Sneezing
- Coughing (dry or wet)
- Vomiting
- Chills, aches and pains
- Diarrhea or abdominal pain
- Sore eyes / conjunctivitis
- Shortness of breath
- Acute respiratory infection.

If you, or someone in your care, have the symptoms mentioned above, and need to visit a doctor or hospital emergency department, **call before visiting**. Be sure to describe all symptoms and travel history, in addition to details of any disability and/or medication.

If you, or someone in your care has difficulty breathing, call triple zero (000) immediately. Tell the call handler and the paramedics on arrival about any disabilities, medication, recent travel history and any close contact with a person with confirmed COVID-19.

IMPORTANT CONTACTS AND ONGOING SUPPORT

Emergency – 000 | **National Coronavirus Helpline** – 1800 020 080 | **Qld COVID-19 Hotline** – 13HEALTH (13 43 25 84)
Department of Health – 1800 020 103 | **Community Recovery Hotline** – 1800 173 349 | **Health Direct** – 1800 022 222
NDIS – 1800 800 110 or enquiries@ndis.org.au | **QDN** – 1300 363 783 | **Carers Qld** – 1800 242 636 | **Beyond Blue** – 1300 22 4636
Lifeline – 13 11 14 or 0477 13 11 14 (SMS) | | **Vision Australia** – 1300 84 74 66 | **Expression Australia** – AUSLAN Coronavirus updates
Assistance for Hard of Hearing – 131 450 or visit National Relay Service Website | Translating and Interpreting Service

MINIMISING RISK

Isolation / Self-Isolation
Based on current information from the Australian Government and the Australian Department of Health, a period of self-isolation (14 days) is required for the following individuals (even if they have no symptoms):

- Anyone returning from international or interstate travel
- Anyone who has been tested and is awaiting results
- Those with a negative test result (must continue isolating for the full 14 days).

Practice safe hygiene

- Wash your hands with soap and water for at least 20 seconds (especially before and after eating and going to the toilet)
- Use alcohol-based hand sanitiser often
- Practice safe hygiene and cleanliness (i.e.: bathing)
- Clean surfaces with disinfectant
- Assist people with disabilities or special needs with their hygiene.

Droplet and airborne precautions

- Cover your nose and mouth when sneezing or coughing with a tissue or your elbow
- Wear PPE equipment (mask).

Infection control

- Avoid meetings / gatherings
- Work from home (if possible)
- Practice social distancing
- Maintain a safe distance (1.5m)
- Avoid physical contact with others (touching, kissing, hugging, shaking hands)
- Adhere to the latest information and guidelines on visiting vulnerable groups of people, including residential care facilities, high-care hospitals and remote Aboriginal and Torres Strait Islander Communities.

OTHER IMPORTANT INFORMATION

Flu vaccinations
The vaccination will not protect you, or those you care for from coronavirus, but it is a great method of protection from influenza. It is important that we all take care of our health now, both for our own sake, for those under our care and to take pressure off our health system.

Groceries
It is advised to do what is necessary to ensure you, and those you care for have adequate supplies. It is recommended to have at least two weeks' worth of fresh and non-perishable food.

- Coles and Woolworths "Community Hour" for people with a disability / seniors 7-8am
- A Pensioner Concession Card, Commonwealth Seniors Health Card, Companion Card or Health Care Card is required.
- Emergency services and healthcare workers can shop during this hour Tuesday and Thursday (ID required)
- Both Woolworths and Coles has priority delivery of groceries
- For food and pharmaceutical deliveries contact the **Community Recovery Hotline 1800 173 349** or **13HEALTH (13 43 25 84)**
- To find out which charities are delivering in your area and the availability contact Foodbank www.foodbank.org.au

Medication / medical supplies
Whilst there are presently no medicine shortages, it is recommended to have one (1) months' supply of PBS medications available. Many pharmacies will deliver via: www.tonicapp.com.au

NDIS
Face to face meetings are being reduced, with telephone meetings offered as a safer alternative. The agency is encouraging participants to identify essential supports and to use their funding flexibility to meet critical needs. NDIS is also reaching out to "targeted higher risk participants" to ensure essential supports are being met.

SUPPORTING PEOPLE WITH DISABILITIES

Dr. Dinesh Palipana OAM, LLB, MD

The disability community have concerns about the effect of the novel coronavirus (COVID-19) on people with disabilities. There are several facets to these concerns.

Medically, certain conditions like high-level spinal cord injuries confer reduced respiratory capacity to a person. There are other conditions that can impact a person's immune system. Yet again, other people may be taking immunomodulatory medications for various reasons. Nonetheless, all these people can have a higher risk of complications from COVID-19.

There is also a cohort of individuals that may have specific social requirements that can adversely affect them psychologically in the event that they are isolated from familiar caregivers.

Logistically, some cohorts of people with disabilities are dependent on caregivers. At times, these caregivers provide 24-hour care in teams. In the event that a person with a disability or their care team are isolated, there are logistical implications. These range from infection control measures for handling a person with a disability to the availability of backup care teams. In the worst case scenario, local hospitals will be the last port of call for an isolated person dependent on care.

This set of circumstances create unique challenges in an already unprecedented situation. Therefore, it is important for state and federal government; and relevant stakeholders to have practical plans for managing people with disabilities. More importantly, it is important for people with disabilities and their caregivers to plan ahead during this interesting time for our nation. If you consider yourself to be high risk, this may mean considering early self-isolation with a group of caregivers and supplies until the situation unfolds more.

While conversations are taking place amongst relevant stakeholders, a concerted communication and outreach plan is necessary from high levels.

While there is no benefit in panic, planning ahead will ensure that it prevails as it always has.

COVID-19: THE FRONTLINE

Our valuable health workforce and community workers are continuing to work through this health crisis in a bid to keep us all safe and well looked after.

People with disability are a vulnerable group, and so far, the health sector appears to be under prepared for the volume of specialised care required.

Suggestions for increasing capacity in supporting people with disabilities:

- Provide a dedicated hotline, SMS contact number and/or email for people with disabilities
- Ensure all COVID-19 clinics are accessible and inclusive; and that people with disabilities and special needs receive equal treatment and are not discriminated against
- Ensure you have relevant accessibility equipment and facilities
- Those hard of hearing will be disadvantaged with the use of face masks, due to the loss of lip reading as a visual cue. It is suggested to use voice-to-text apps in this instance
- Draw on the support of a range of professionals, including: allied health, occupational therapists, physiotherapists and social workers
- Liaise with Aboriginal and Torres Strait Islander advocacy groups and communities to ensure that their needs are met. Visit NACCHO: Aboriginal Health News Alerts
- Ensure all information is shared in ways that are easy to understand and accessible for everyone, including children – with special consideration for the hard of hearing, those with low vision and people with English as a Second Language (ESL)
- Provide relevant information and access to support services in your local area
- Provide clinicians, patients, families and support workers priority access to personal protective equipment
- Call on disability support workers and specialised carers to fill the workforce gap (where possible)
- Ensure essential supports continue for people with a disability on specialised NDIS plans
- Any NDIS plan disruption needs to be clearly communicated, with options provided so individuals can continue receiving essential care.

For further information for clinicians, visit the Novel Coronavirus (COVID-19) website and FAQs.



DISABILITY RIGHTS: EVEN MORE IMPORTANT NOW

Troy Hakala | Social Worker

Health Equity and Access Unit, Metro South Hospital & Health Service

The past decade has seen a growing focus on the human rights and healthcare needs of people with disability. Most recently, the Disability Royal Commission has heard about the serious healthcare challenges experienced by people with disability. These challenges become critical in our responses to the COVID-19 pandemic.

Access to healthcare
Telehealth is important at any time, but during a pandemic it helps avoid exposing vulnerable clients to infection. Our COVID-19 Testing Clinics must be fully accessible for people with disability. Access to life-saving intensive care must also be allocated equitably, consistently and with transparent decision-making criteria.

Involvement in care
At an organisational level, health services need to include people with disability and their needs within our COVID-19 response plans. More than ever, at an individual level, health workers need to work with people with disability and their carers to plan and make decisions about their care.

Person-centred care
Health care must make reasonable adjustments to accommodate the unique care needs of people with disability. In our COVID-19 responses it will mean considering the unique hospitalisation or home isolation needs of people with disability who may rely on others for care.

Inclusive health data
The health sector does not collect reliable data to measure healthcare access, patient experience or health outcomes for people with disability. This needs to be improved, but right now, we also need to collect Enhanced Surveillance data about the COVID-19 impact on people with disability.

Respectful and equitable care
As we address COVID-19 we must be aware of the broader context of discrimination and marginalisation experienced by people with disability. Discrimination complaints on the basis of impairment and disability are the most common complaints received by the Qld Human Rights Commission – and every other Australian jurisdiction except one. As COVID-19 stretches demand for health care resources, we must work harder than ever to ensure that people with disability are treated fairly, respectfully and equitably.

Care coordination and linkage
Health workers play an important role in linking people with the care that they need. We need to assist people with disability to access the disability, financial, community and health care supports that they need as COVID-19 affects them and their families.



The Hopkins Centre Research for Rehabilitation and Resilience

A joint initiative of Griffith University Queensland Australia | Menzies Health Institute Queensland | Metro South Health | Queensland Government

Exploring the efficacy of housing alternatives for adults with an acquired brain or spinal injury: A systematic review

Wright, C., Colley, J., & Kendall, E. (2019). Exploring the efficacy of housing alternatives for adults with an acquired brain or spinal injury: A systematic review. *Brain Impairment*, 1-29. doi:10.1017/BrImp.2019.33



Objective

Supported by The Hopkins Centre and The Motor Accident Insurance Commission (Queensland), this systematic review examined the current research evidence regarding the efficacy of housing alternatives for adults with acquired brain injury (ABI) or spinal cord injury (SCI) in relation to four principal outcomes of interest: the person's (1) community integration/participation, (2) independence (including physical/cognitive functional recovery), (3) psychosocial well-being (including satisfaction, choice and control in decision-making, adjustment) and (4) quality of life. The review also sought to identify how the reported efficacy of the housing alternatives might be impacted by individual factors.

Overview

In Australia there is an estimated unmet need for suitable, affordable housing for between 83,000 and 122, 000 people with significant and lifelong disabilities (National Disability Services, 2018; Wiesel & Habibis, 2015). People with ABI or SCI feature in these estimates (Wright, Colley, Knudsen & Kendall, 2019; Wright, Muenchberger & Whitty, 2015) and individuals with these conditions, require not only high levels of health care, rehabilitation and support, but also modifications to their home and/or living environment.

Adults with ABI or SCI aspire to live as independently as possible within the community, and it is widely acknowledged that living environments, housing design, location and the way people are supported, play a central role in well-being, mindset and the regaining of independence and autonomy.

> **"There are a number of accommodation options in Australia for people with disability, including ABI and SCI, however, for many people with disability, where they reside often becomes a forced choice out of necessity."**

This study reviewed the current research evidence surrounding the effectiveness of housing alternatives for individuals with SCI and ABI and grouped the accommodation options into the following categories; 'Home-like' settings (living at home alone or with partner, family, friends, relatives) and 'Non-home' settings, which can be broken down into 'Disability-specific' settings (group homes, foster care), or 'Structured' settings (residential aged care (RAC), nursing homes, slow-stream rehabilitation or long-term care facilities).

Returning to life in 'home-like" settings following an acquired brain or spinal injury, whilst preferred, requires careful planning and consideration, particularly during the initial recovery and rehabilitation period. Continued care and ongoing support is often required long-term, and more often than not, the original home requires significant modifications, which can put financial strain on families.

Whilst staying at home in privately owned/rented housing is often the preferred option, in many cases it is not possible, nor financially viable – depending on the level of acquired disability (low, moderate or severe), aspects of recovery and outpatient rehabilitation, support services and care required, and home-modifications required to meet specific needs.

Where staying in the family (or pre-injury) home is not an option, the move into more adequately equipped 'disability-specific' settings, with higher care living arrangements may be necessitated. These accommodation settings are dependent on availability and suitability, including;

- Physically accessible social housing or public housing managed by Government departments,
- Accredited Specialist Disability Accommodation (SDA) funded through the National Disability Insurance Scheme (NDIS), typically owned by individuals or non-government organisations,
- Disability Specific (SSA) settings, including shared supported housing, apartments, cluster units and foster care homes, or
- Residential Aged Care (RAC), including high, nursing and long-term care facilities.



> **There is currently a strong focus in Australia on the provision of suitable, affordable housing for this population and on maintaining people's right to choose where they live, and with whom.**

Results

The research identified lower levels of community integration/ participation, independence, psychosocial well-being and quality of life for adults (particularly younger adults) with ABI living in 'structured settings' (i.e., residential care) compared to those living in 'home-like' environments (i.e., private homes) and 'disability-specific' settings (i.e., shared supported accommodation, group homes, foster care homes, cluster units).

The findings also suggest that the SSA model is more suitable for young adults with ABI than RAC. It highlights that home-like and disability-specific settings may better support the independence and social participation of adults with traumatic brain injury (TBI). The evidence indicated that 'home-like' settings (i.e., private homes) were associated with greater community integration/participation, independence, psychosocial well-being and quality of life, compared to 'structured settings' (i.e., RAC, residential care facilities, nursing homes).

'Disability-specific' settings (i.e., SSA, group homes, foster care homes, cluster units) were also associated with greater community integration/ participation, independence (in relation to performing activities of daily living without difficulty) than 'structured' settings. Further, 'disability-specific' environments appeared to make independence and participation easier for people living in them, despite many people still experiencing social isolation.

Community integration/ participation, psychosocial well-being (specifically, choice and control in decision-making), quality of life and the ability to live in 'home-like' accommodation with good quality and accessible design, in addition to having necessary supports and care, were areas that rated highly amongst participants of the studies included in the review.

Aspects that rated poorly, included RAC-style living arrangements and having limited opportunities to make everyday choices (i.e.: meal, bathing and bed times), feelings of isolation due to lack of, or restricted indoor and outdoor leisure time and social activities, lack of privacy and control over simple things often taken for granted, such as personal grooming, clothing and furnishing choices).

Conclusion

The findings of this review support international policies and practices that are focused on moving people with complex disabilities (particularly younger adults) out of RAC or preventing them from entering such settings in the first place, with 'home-like' and 'disability-specific' settings preferred as the more suitable alternative.

Overall, the study successfully uncovered many areas for future consideration and collaboration between key stakeholders, including policy makers, architects, designers, builders, developers, funding agencies, international researchers, as well as people with ABI or SCI and their families, who will no doubt benefit from the findings of this review.

Visit our website at: www.hopkinscentre.edu.au

Why this work is important?

Dr Grace Bitner, Research Fellow

This work draws much needed attention to the important role that the built environment plays in facilitating improved outcomes for individuals with disability in a number of important domains such as independence, community participation, psychosocial wellbeing and quality of life. Equally importantly, it highlights the need for more consistency in evaluating the impact of different housing typologies in which individuals live. As the authors highlight, "Uniform evaluation frameworks, methods and measures are urgently needed to consistently and rigorously evaluate the efficacy of housing alternatives for adults with ABI and SCI" (p.24).

This review provides an excellent springboard, from which we are able to launch much needed further research into the person-environment relationship for individuals with acquired brain or spinal injury, particularly those living in 'home-like' and 'disability-specific' settings in the community. While there has been a good deal of work on how structured settings like institutions impact on the daily lives, health and wellbeing of individuals, there has been considerably less work into 'home-like' and 'disability specific settings' within the community.

This work is even more critical at the moment, as the current COVID-19 pandemic highlights a range of existing and new challenges that individuals with disability (and their families) living in community settings face, such as the increased risks associated with private residences being both a 'home' and 'workplace' for paid caregivers. Several projects currently underway at The Hopkins Centre are delving deeper into the range of accessible housing options available for individuals with disability in Queensland, as well as looking at the complex interrelationship that individuals with disability and their families have with their home environments.



COVID-19: THE FRONT LINE

RECOGNISING OUR HEALTH AND COMMUNITY WORKERS

As the number of positive COVID-19 cases increases throughout Queensland and Australia this week, our valuable first responders, health and community workforce continue to work through this health crisis in a bid to keep us all safe and well looked after.

Whilst our health and community workers are well trained and passionate about their roles, responding to disasters is challenging, and at times, dangerous work.

Sources of stress for emergency responders and health workers often includes witnessing human suffering, and in the case of coronavirus, it will also include the untimely death of patients. Our health workers are also facing personal harm, intense workloads, life-and-death decisions, and separation from their own family and loved ones (CDC, 2020).

COVID-19 is similarly leaving many people with disabilities in vulnerable positions, with the least access to assistance. To ensure, people with disabilities are not left in undignified and dangerous situations, our army of carers and allied health practitioners soldier on during these extraordinary times, often without access to personal protection equipment (PPE) and adequate means of sanitisation.

The health, wellbeing and community support of our clinical workforce is a priority, so they can continue to offer us the high quality of care that Australia is renowned for. Thus, in such busy and tumultuous times, we give thanks to all our dedicated workers on the front line, and urge them to take time to look after their own health and wellbeing, as well as to look out for their colleagues.

> **"We appreciate all our health professionals so much at this time. They are taking a risk to keep us all healthy and well. We applaud them for their incredible effort and commitment."**

For information and advice on wellbeing and resilience for first responders visit the **CDC website**.

Interested in working for Queensland Health during our response to COVID-19? Click **here** for information.



WHO | Thank a health worker: #ThanksHealthHero

Thank a health worker: #ThanksHealthHero. At the heart of humanitarian action are the doctors, nurses, paramedics and other health workers who selflessly serve their communities, often with little access to resources and frequently at great personal risk. Visit their website at: **www.who.int**

A message from our Director

We spare a thought for our wonderful clinical researchers who are all preparing to re-enter their clinical work. They are sad to be leaving their research projects temporarily, but their work in the hospital is extremely important. Recruitment of clinical staff is ramping up and there are many opportunities for health professionals to contribute within this crisis. We appreciate all our health professionals so much at this time. They are taking a risk to keep us all healthy and well. We applaud them for their incredible effort and commitment.

It has been heartening to see the appreciation for health workers from around the world. People have cheered from their balconies. There have been millions of social media messages and random acts of kindness for health workers. Coles supermarkets have announced dedicated shopping times for healthcare and emergency workers to show appreciation.

WHO has always asked us to thank our health workers for their tireless efforts and there is never a better time to do that. You can send a virtual card, or share a photo of our incredible health workers using the hashtag **#ThanksHealthHero**. Your vote of thanks might be just the thing to keep their spirits up. Our thoughts are with all our colleagues at this time, and we hope they take care and stay safe.

Professor Elizabeth Kendall
Director, The Hopkins Centre

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People with disabilities with suspected novel coronavirus (COVID-19) infections: Considerations for emergency departments.

Dr Dinesh Palipana OAM, LLB, MD

Emergencies increase the vulnerability of people with disabilities. People with disabilities already experience significant disadvantages in the healthcare they receive, but in times of adversity, the impact is magnified. For example, the fatality rate for people with disabilities during the earthquake and tsunami affecting Japan in 2011 was 2.06% as opposed to 1.03% in the general population.

During the early days of the COVID-19 pandemic, concerns arose within the disability community about the preparedness of infrastructure to support people with disabling conditions. In emergency departments and community health systems, awareness of the following considerations may facilitate flow, reduce disruption, and encourage good quality care. Of course, national, state, and local guidelines and advice should always take precedence over these considerations. However, it may save valuable lives if we all think cautiously about the additional impact of COVID-19 on those with disabilities in our community.

1. Accessing emergency departments

a. As people with disabilities face difficulty in accessing medical facilities, presentations may be delayed, resulting in more severe symptoms and more likelihood of transmission.

b. In regional and remote areas in particular, people with disabilities are more reliant on emergency departments for standard treatment so may now be reluctant to seek care for conditions that affect their ongoing health.

c. People with disabilities may face transport issues, as well as physical access challenges, so temporary facilities need to be audited for access.

d. Certain visual, auditory, physical, and intellectual disabilities can mean that people with disabilities may not be aware of best practice. They may miss signage regarding COVID-19 or be unable to follow good infection control practices. Social distancing may not be an option when care needs necessitate physical contact with caregivers.

e. Indicators of COVID-19, such as a fever and cough and respiratory challenges may be present or impaired in certain disabilities, requiring vigilance from caregivers and consideration of the entire clinical picture during triage.



IMPORTANT CONTACTS AND ONGOING SUPPORT

Emergency – 000 | **National Coronavirus Helpline** – 1800 020 080 | **Qld COVID-19 Hotline** – 13HEALTH (13 43 25 84)
Department of Health – 1800 020 103 | **Community Recovery Hotline** – 1800 173 349 | **Health Direct** – 1800 022 222
Beyond Blue – 1300 22 4636 | **Lifeline** – 13 11 14 or 0477 13 11 14 (SMS) | **Salvation Army Australia** – 13 SALVOS (13 72 58)
Assistance for Hard of Hearing – 131 450 or visit National Relay Service Website | Translating and Interpreting Service

2. Caregivers

a. Out of 2.65 million unpaid Australian carers, 861,000 are primary carers for someone with a disability. The potential impact of COVID-19 and the restrictions imposed on society to prevent its spread, are therefore twofold. If caregivers become unwell, the impact will be felt by people with disability who depend on them.

b. Caregivers are often intimately acquainted with the needs of the person they are caring for. They are a resource for the health provider and usually want to play a large role in the care delivered to the person.

c. In the event that a carer, or a care team, becomes isolated or ill; the person being cared for runs a risk of neglect, lack of care, or care from inadequately trained teams. Therefore, early access to social work and staff acquainted with emergency provisions provided by schemes such as the National Disability Insurance Scheme will help mitigate risks.

d. In the event the person being cared for becomes ill, with or without the need for isolation, involving the existing care team to the greatest possible extent will minimise distress, unforeseen injury, or exacerbation of existing conditions, such as pressure ulcers that may not be immediately visible. Such involvement will require consideration of infection control precautions.

e. In the event that person with disability becomes isolated from his or her caregivers, an alternative caregiver may need to be identified. A contingency plan is essential.

f. Caregivers may play a particularly important role when the person being cared for has communication challenges. Seek advice from caregivers about how to best communicate.

g. In people who are susceptible to emotional distress, such distress will be exacerbated in situations requiring physical isolation. Challenging behaviours should not be ignored as they are often an indicator of distress.

h. Caregivers may be able to reduce nursing loads if they are familiar with, or given instruction in, infection control measures and are able to continue their role across multiple settings.

i. If the primary caregiver, or care team, presents to a department with a suspected infection, accompanied by the person being cared for, a social admission may become necessary. Ensure that appropriate arrangements are made for the person with disability if a social admission to hospital is not possible.

j. Additional nursing staff may be required to manage certain patient groups, particularly if their personal care staff becomes unavailable and they become distressed or confused.

k. When patients are reliant 24 hours a day, as in those who are ventilator dependent, enabling carers to take a role in caring for patients may reduce load on intensive care units.

3. Infection control

a. People who are ventilator-dependent may have additional infection control precautions in the prehospital phase and during hospitalisation.

b. Equipment such as wheelchairs, indwelling catheter attachments, walking sticks, and other assistive equipment may require specific cleaning regimes for infection control.

c. People with sensory impairments, including visual challenges, may require additional considerations particularly when relying on tactile input. Consider alternative formats for information (e.g., Braille, Auslan, captions, descriptions of images).

4. Social support

a. Increased social work staffing may be of value to support people with disabilities, both in the community and in the hospital system.

b. Rapid access to community support networks and caseworkers for schemes such as the National Disability Insurance Scheme may prevent unnecessary admission or facilitate a rapid transition back to the community.

c. Contribute to any initiatives that support the independence of people with disabilities in the community and during stressful engagements with the medical system.

“Increased social work staffing may be of value to support people with disabilities, both in the community and in the hospital system.”



5. Underlying medical conditions

a. Some people may present with atypical symptoms due to the impairment of normal physiological responses such as a fever or cough.

> **Take clear history in all medical assessments.**

b. Respiratory capacity will be impaired in many respiratory, neuromuscular, or other conditions and may require a vigilant approach with early aggressive interventions, and timely discussions with the relevant local specialist teams.

c. Medical conditions that may predispose people to emotional distress (e.g., mental illness, brain injuries, intellectual disability) may require additional care to prevent disruption of infection control measures in the event of physical agitation.

d. In the event of providing community self-isolation advice, certain people with disabilities will require the isolation of their entire care team. This situation may require a brief admission to a short stay unit to support and prepare the community care team.



6. Stopping stigma and fear

a. Consider the stigma being experienced by people with disabilities in the face of this pandemic and do not add to this burden. Behave with respect to all people with disabilities and acknowledge the increased challenges they face.

b. Public announcements have emphasised the vulnerability of this group and have therefore increased levels of anxiety and fear.

> **Check on the mental wellbeing of people with disabilities whenever you can.**

c. Some public messages have also hinted at the different value placed on different lives by stating that only the elderly and those with existing disabilities are likely to die as a result of infection. This is not true.

d. In the community, it is also important to remember that every cough is not COVID-19. Many people with disabilities have respiratory symptoms all the time and cannot physically follow recommended hygiene practices. Being shamed in social settings is never appropriate.

d. When taking a panic-driven response to COVID-19 (e.g., panic buying and hoarding, abusing others for their actions, or disregarding regulations), remember that your actions have greater impact on people with disabilities.

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The Hopkins Centre Research for Rehabilitation and Resilience

A joint initiative of Griffith University Queensland, Australia | Menzies Health Institute Queensland | Metro South Health | Queensland Government



Robotic assisted rehabilitation therapy for enhancing gait and motor function after stroke

Yun-Hee Kim, 2019
Robotic assisted rehabilitation therapy for enhancing gait and motor function after stroke, *Precision and Future Medicine.2019; 3*(3): 103. http://dx.doi.org/10.5853/jos.2013.15.3.174
https://www.pfmjournal.org/journal/view.php?doi=10.23838/pfm.2019.00065

Stroke is a common, serious, and disabling global health-care problem and many patients, who survive from stroke, experience disabilities including gait abnormality or deficits in upper extremity control. Survivors also live with functional limitations in activities of daily living (ADL) and suffer life-long residual disability, requiring ongoing rehabilitation.

After neural injury such as stoke, the ability of the brain or neural network to change, named "neuroplasticity", is the basic mechanism of functional recovery. High-dose intensive intervention, through training and repetitive practice of specific functional tasks, are essential for neural network reorganisation and functional recovery.

> **During the last two decades there have been remarkable developments in robotic assisted rehabilitation therapy for promoting walking ability and upper extremity motor function.**

Rehabilitation robots for stroke can apply constant therapy for long periods and allow for continuous monitoring of patient performance and progression, that can be delivered to the therapist.

There are several types of rehabilitation robots, including exoskeleton and end-effector type robotic-assist systems. Exoskeletons resemble the human upper limb and robot joint axes match the limb joint axes. End-effector robots hold the patient's hands or feet at one point and generate forces at the interface.

Well-coordinated multidisciplinary stroke care, including comprehensive rehabilitation, combined with robot-assisted therapy works to provide a beneficial treatment option for motor recovery of the arm and gait.

There have been many studies into the benefits of rehabilitation robots in assisting patients who have suffered disability as a result of stroke. Whilst the results of the studies were varied, it is the general consensus that robot-assisted therapy on gait recovery delivered superior results in patients with subacute stroke, particularly when applied in combination with conventional physiotherapy compared with conventional therapy alone.

It was also concluded in a large participant study, that robot-assisted gait training with regular physical therapy produced promising effects on locomotor function in subacute stroke patients than regular physical therapy. In all studies, improvements were noted in gait speed, cadence, step length, and balance, as well as reducing the double limb support period. Further, robot-assisted therapy also showed improvements in arterial stiffness and increased peak aerobic capacity.

In patients looking to improve arm function and arm muscle strength after stroke, it was concluded that robotic assisted arm training improved ADL, function, and muscle strength of the affected arm. Robotic assisted therapy for hand motor function also delivered favourable to superior effects.

The main advantage of electromechanical or robotic assisted walking devices over conventional gait training, is that they reduce the need for intensive therapist support, have been shown to increase early independent walking after stroke, and could be also considered for patients who would not otherwise practice walking. Overall, the role of robotic assisted gait therapy in stroke rehabilitation is an adjunct to, rather than a replacement, for conventional rehabilitation therapy.

Whilst there were variations between the trials in the intensity, duration, and amount of training, type of treatment, participant characteristics, and measurements used, the quality of evidence was high, and has resulted in changes to the description for practice guideline in stroke rehabilitation.

Robotic assisted therapy for stroke rehabilitation has achieved remarkable advances in recent decades and holds considerable promise – however, they have not yet achieved strong clinical recommendations, due to barriers such as limited data on efficacy, financial constraints and lack of clinician familiarity with technology. Thus, ongoing improvements of the related technology, combined with further studies, will be required to clarify the best protocol for individual patient's need and its transferring effect to the real-world activities of patients.

Such advances, particularly during the age of the fourth industrial revolution, may enhance the clinical and economic efficiency of robotic assisted rehabilitation therapy and will lead to it becoming a standard therapeutic modality in stroke rehabilitation in the future.



Commentary: Robot-assisted stroke rehabilitation therapy



Dr Camila Shirota | Research Fellow, The Hopkins Centre

Dr Alejandro Melendez-Calderon | Senior Lecturer, University of Queensland | Adjunct Assistant Professor, Northwestern University

Rehabilitation and assistive robots are on an uprise. More and more devices are being developed and becoming commercially available. The excitement around novel developments and possibilities, however, often comes with overwhelming options and confusing – at times even contradictory – outcomes. Reviews like this one consolidate information from multiple studies, enabling us to have a better overview of activities and knowledge in the field, and see where results may or may not generalise outside of individual studies. This commentary aims to provide further contextualising information, to support the interpretation of the paper's results. To facilitate visualisation, we graphically re-display part of the information from Tables 1 and 2 of the original paper as Figures in this commentary.

Robots – what is hard to see

Hardware

The idea of machines that support or augment human movement is not new; early exoskeleton-like devices were patented already in the late 1800s http://cyberneticzoo.com/early-teleoperators/. However, our ability to turn these devices into reality was limited by technology and our understanding of neurological recovery. To achieve the technical requirements, we could only build devices that were enormous, heavy, complicated and impractical. In the past few decades, the development of new actuators – smaller, lighter, more powerful – has allowed the field to take strides.

> **In parallel, the breakthrough discovery that the brain is not hardwired but rather plastic, supporting the approach of relearning movements and not just compensatory strategies, further pushed the development of robots to support rehabilitation therapy.**

As the author points out, the first lower-limb rehabilitation robots were big, stationary, and created to support therapist work during gait training. Traditionally, treadmill-based gait training of spinal cord injured patients requires 3 therapists – one to support the patient's body weight, and one to move each leg. Therapists could be off-loaded from strenuous tasks by exploiting robots for what they can do best – move each leg repetitively through the walking motions, and support the patient's weight. This can be achieved with exoskeleton-like devices that attach to the pelvis and legs (Lokomat), or through attachments at only a few places like the pelvis and feet (Gait trainer).

Upper-limb therapy robots, on the other hand, were first derived from movement neuroscience research. As such, most upper-limb robots initially focused on recovery (i.e. relearning) not assistance (i.e. replacement of abilities that cannot be recovered). As our understanding of the field evolved, promoting neurological recovery of the patient has been the biggest driver in the development of all types of robots for therapy.

As technology improves, we have seen the emergence of wearable exoskeletons: devices that are self-contained and worn by users moving in the environment. Lower-limb exoskeletons tend to be used for patients with less gait impairments, since they do not require as much body weight support. However, these devices are usually designed for specific gait deficits or patient populations, which greatly influences their capabilities. Different devices can support different combinations of joint movements – for example, only the hip (Honda SMA; GEMS), hip and knee (Hybrid Assistive Limb), or only the ankle (Anklebot). Similarly to the lower-limb devices, advances in technology have allowed the development of smaller and portable upper-limb devices, albeit they are still technically very challenging thus fewer.

As is likely becoming clear, differences in hardware make it difficult to compare outcomes from studies using different devices. Even when devices are similar, for example supporting movements of the same joints, the particularities of their designs change characteristics that are inherent to the device (for example, its weight and how the weight is distributed within the device), which will affect its ability to support different activities. Each device can also be adjusted to the size or body shape of different users, fitting some better than others – thus, even comparing the same device across users should be done with care.

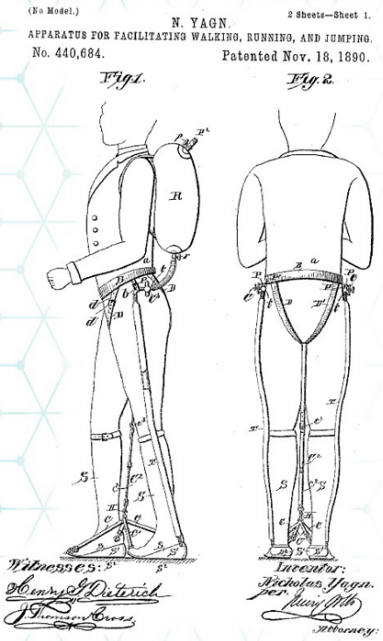

(No Model.) 2 Sheets—Sheet 1.
N. YAGN.
APPARATUS FOR FACILITATING WALKING, RUNNING, AND JUMPING.
No. 440,684. Patented Nov. 18, 1890.
Fig. 1. Fig. 2.
Witnesses: Henry G. Dietrich
Inventor: Nicholas Yagn, per Munn & Co
Attorney:

Figure 1: 1890 – Assisted-walking Device – Nicholas Yagn (Russian)

Control

To further accommodate the abilities of individual users, most robots that support movement have many parameters that can be modified to influence their behaviour to best serve the activity being done. A prime example of this is the concept of 'assist-as-needed', born from the realisation that passive movement alone – as was done by the first rehabilitation robots – is not enough to promote neurological recovery and regain active control of movements; the user needs to be trying to move to be able to harness neuroplasticity and motor learning. This means that the robot should not be driving the movement, but rather follow the user's lead and only interfere when the user needs support to complete the intended motion.

Interaction between machines and humans, however, is not easy to realise in practice. Understanding when users need to be supported and how much support to provide, while keeping the user safe, is a challenge. Many groups are working hard on allowing interactions to happen in a smooth and intuitive way (intention detection, shared control, assist-as-needed). On the flip side, a safe but poorly controlled interaction could be counter-productive and train users to make inadequate movements, or lose their ability to move correctly. Thus far, studies and systematic reviews point to no detrimental effects from using robots.

Are robots effective in promoting recovery?

The effectiveness of robot-assisted therapy has been a controversial issue. Systematic reviews over the last 10 years have reported mixed evidence supporting their use to promote functional recovery. The lack of solid evidence that robot-assisted therapy can offer greater functional improvement than dose-matched conventional therapy has split the opinion in two. For many, this has discouraged their use and adoption in the clinical practice; they expect robotic devices to deliver better results than traditional care. For others, these results have instead encouraged their adoption and support of new concepts such as robotic rehabilitation gyms, since their use has been proven safe and not detrimental to recovery.

However, we cannot analyse the efficiency of robot-assisted therapy as we commonly do with, for example, pharmaceutical interventions. Robots, per se, are not an intervention – robots are tools. The concept of 'robot-assisted therapy' is vague, due to the huge number of possible hardware/control combinations—a few of which were described above.

> **In our opinion, there must be a shift about the way we talk about the topic of robot-assisted therapy, and instead, focus on understanding interventions based on their neuroscientific bases.**

There is still a lot of debate about the role of therapy dosage (how much time or how many repetitions), intensity (dose per session), and timing during recovery to promote the best outcomes for stroke survivors – which is not isolated to robotic therapy, but relates to stroke rehabilitation as a whole (Senesh & Reinkensmeyer, 2019; Ward, Brander, & Kelly, 2019).

Because of this, it is important to consider the protocol used in each study, as well as parallel participation in other therapy programs – as is mentioned in this review. Nonetheless, results are still inconsistent, and suggest that further studies are needed to better understand how different elements interact and can be exploited to provide the best outcomes.

Robots for rehabilitation – outlook

Besides therapy, robots can be used to create efficient clinical settings at multiple levels. Robots have the potential to increase therapy time; allow healthcare professionals to manage multiple patients simultaneously while still creating personalised therapies for each; facilitate training opportunities when healthcare personnel are not directly available (e.g., weekends or during idle time); or enable tele-rehabilitation scenarios for remote communities or home delivery.

We believe that robots will fundamentally change the way we diagnose and assess physical impairments. Robotic devices have many embedded sensors, which are need for their control. They can measure parameters beyond what can be observed with the naked eye, extending the ability of clinicians to assess their patients.

These measurements could enable real-time feedback of performance to the user, as well as monitoring how they progress through therapy. This does not mean that a robot will completely replace a clinician in the clinical evaluation process; clinicians have access to the patient history and other parameters to which the robot is blind to. Robots are tireless, and excel in precise and accurate measurements and repetitions.

> **It will be the combination of human and machine expertise that will become an essential component in the diagnosis and assessment of patients.**

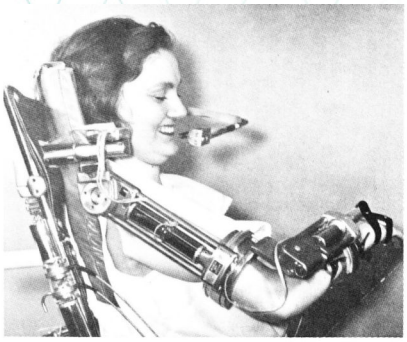


Figure 2: The Rancho Los Amigos Orthosis from 1977 [adapted from cyberneticzoo.com].

A challenge here is that, in the majority of cases, these sensor-based measurements are very different from clinical assessments, so it is important to understand how to interpret these or derived values in a clinically meaningful way (Shirota et al., 2017).

There is no question that robotics is already impacting clinical practices and will continue to play a fundamental role in all facets of patient care. However, current advances in robotics for rehabilitation and technological innovations are, mostly, technology-driven, and there is still a long way to optimise these devices for maximum benefit of both patients and clinics.

To solve this, we think there needs to be a fundamental shift about how we think and evaluate these technologies. The first shift must be about the way we talk about the topic of robot-assisted therapy, and instead, focus on understanding interventions based on their neuroscientific bases (regardless of being robotic or non-robotic) - we should always remember that robots are just another tool to support the delivery of rehabilitation interventions. Secondly, as these devices prove their worth in research studies and migrate towards real-life clinical and everyday use, they also need support to establish economical value (Pinto et al., 2020).

Figure 3: Besides therapy, robots can impact clinical practice in a variety of ways.

> **Finally, if we want to see these developments reach their intended end-users, we need to foster transdisciplinary and multi-stakeholder approaches to therapy and technological innovation, working together to make a case for solutions that are valuable to all.**
>
> (Kendall et al., 2019; Shirota, Balasubramanian, & Melendez-Calderon, 2019)

The clinic of the future should include biomedical engineers as an integral part of the clinical team. In parallel, clinicians, users and other non-engineering professions need to be included—from the start—in applied technology projects.

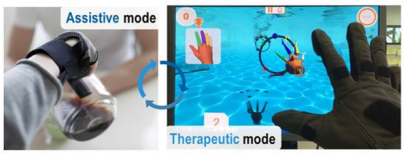
These cross-exposures, which are crucial to the advancement of this field, can create opportunities for educational programs at and exchanges with universities – creating a dynamic that will foster the development of technology that is user-driven. This will, with no doubt, enrich clinical reasoning by adding a different dimension to the understanding of impairments in everyday practice, and help us get closer to achieving our end-goal that is the recovery of patients.

Increase staff efficiency



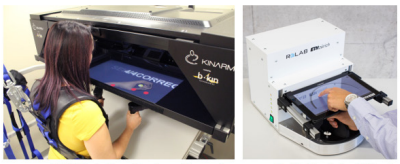
Hocoma AG, Switzerland

Dual assistive & therapeutic function



HandinMind | IronHand projects (http://www.ironhand.eu/)

Diagnostics & assessment



BKIN Technologies, Canada ETH Zurich, RELab

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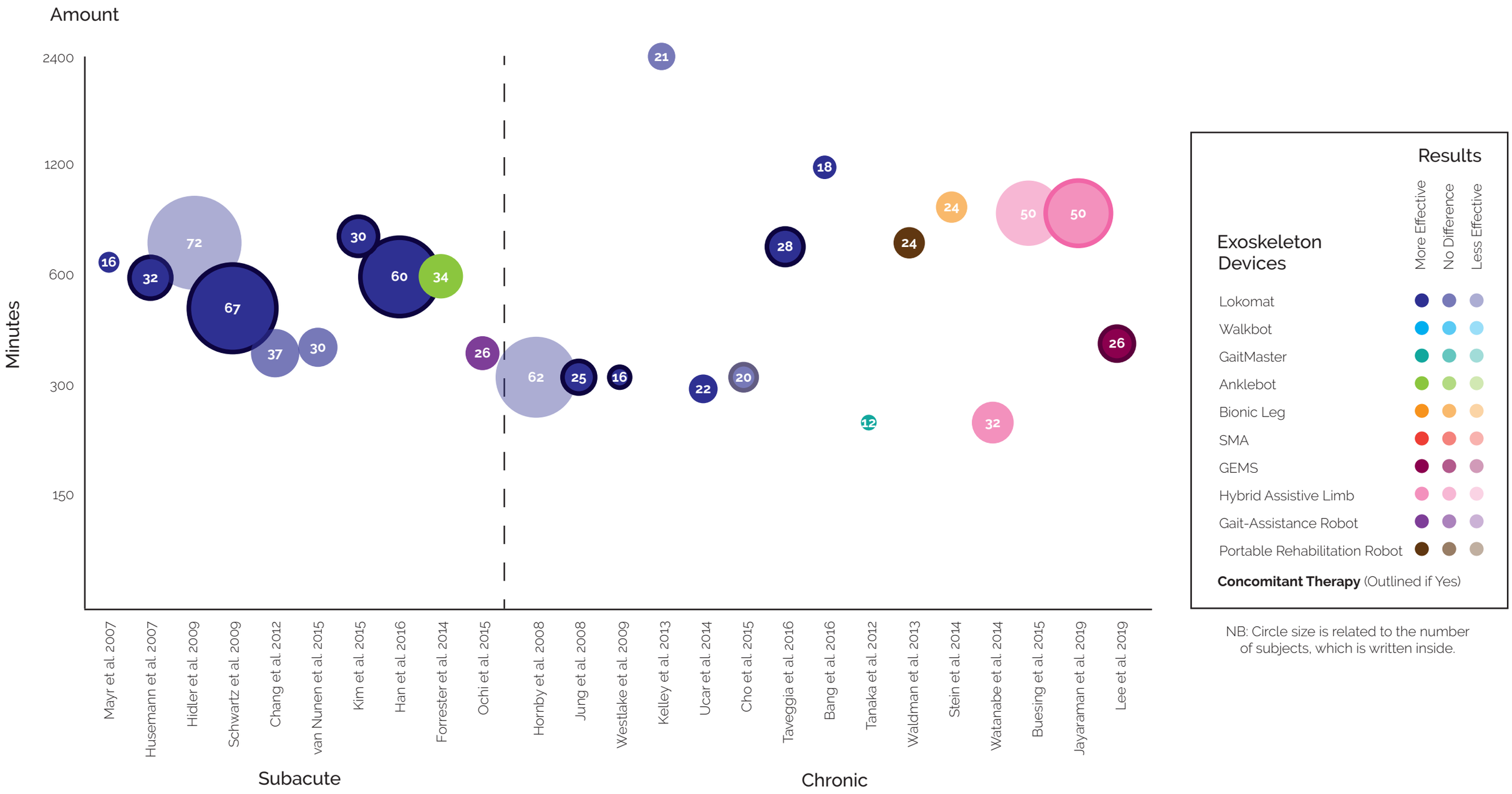
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Table 1: Summary of robotic or electromechanical-assisted gait training (Exoskeleton Devices)

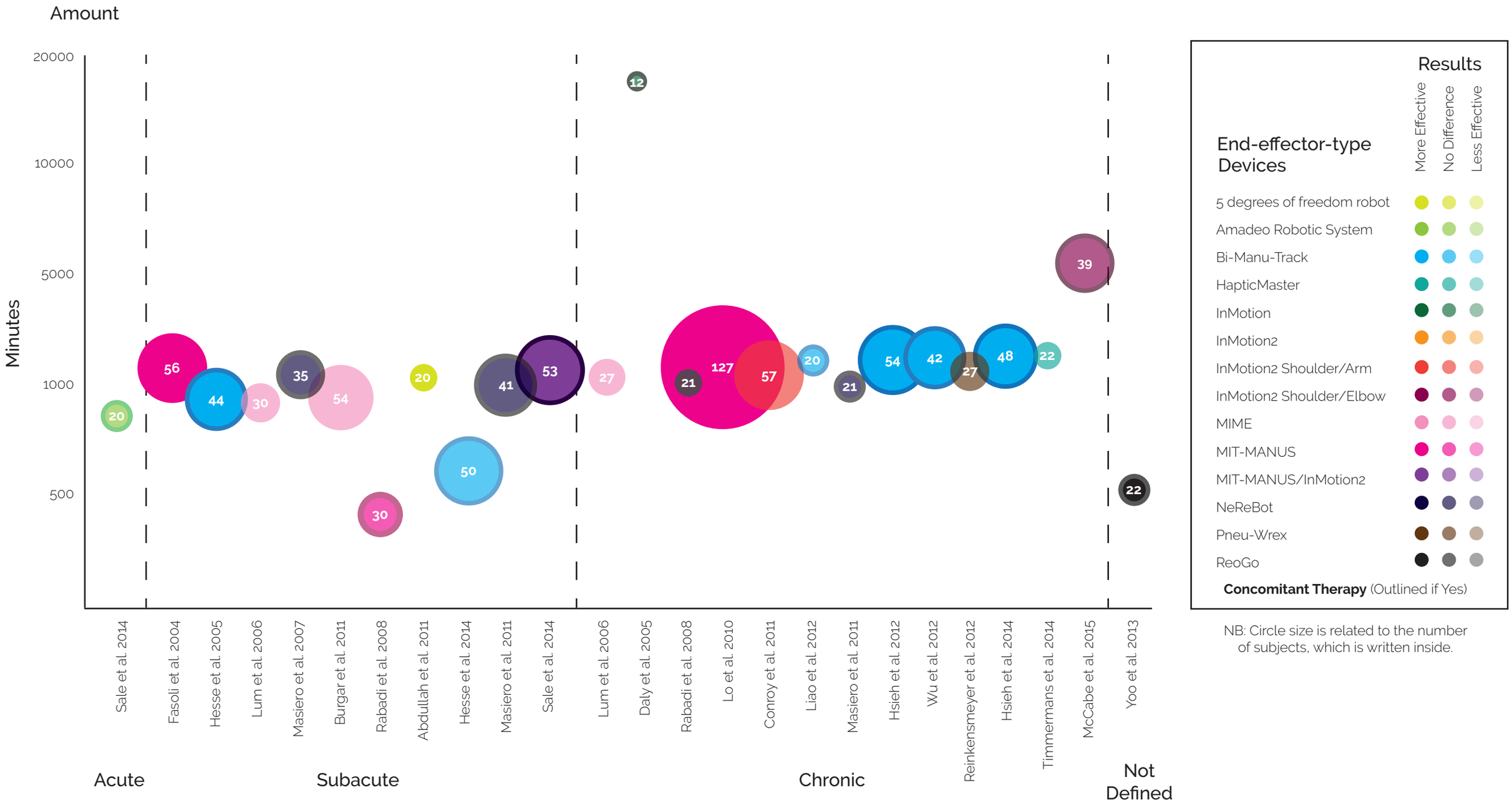
Results in comparison with conventional therapies



NB: Circle size is related to the number of subjects, which is written inside.

Table 2: Summary of robotic or electromechanical-assisted training for upper limb motor function (End-effector-type devices)

Results in comparison with conventional therapies



NB: Circle size is related to the number of subjects, which is written inside.



Sleep Disturbance and Disorders within Adult Inpatient Rehabilitation Settings:

A Systematic Review to Identify Both the Prevalence of Disorders and the Efficacy of Existing Interventions.

Laver, K. E., Spargo, C., Saggese, A., Ong, V., Crotty, M., Lovato, N., ... & Vakulin, A. (2020). Sleep Disturbance and Disorders within Adult Inpatient Rehabilitation Settings: A Systematic Review to Identify Both the Prevalence of Disorders and the Efficacy of Existing Interventions. *Journal of the American Medical Directors Association.* https://doi.org/10.1016/j.jamda.2020.03.002

COMMENTARY

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It is well established that sleep is an important factor impacting recovery post-injury. Consequently, Laver and colleagues conducted a systematic review synthesising the extent of research investigating the prevalence of sleep disturbances and disorders amongst ageing adult rehabilitation unit inpatients. Their review also aimed to identify interventions which have been used to improve sleep quantity and/or quality amongst the cohort.

Of the 19 studies which met inclusion criteria, 12 included ageing adults who have experienced a stroke and the remaining studies included people with diverse conditions. Prevalence studies synthesised, concluded that obstructive sleep apnea is a common sleep condition amongst those with stroke, while some form of sleep disturbance is consistent across ageing rehabilitation unit inpatients with diverse conditions. The three intervention studies synthesised investigated the efficacy of Continuous Positive Airway Pressure (CPAP) therapy on the sleep and functional rehabilitation outcomes of inpatients.

Their review is important as it has confirmed that many ageing adults receiving rehabilitation have a sleep condition which may impact functional rehabilitation outcomes. As a result, Laver and colleagues advocate that implementing interventions and/or programs to promote better sleep amongst rehabilitation unit inpatients, including interventions which consider the hospital environment, are worthwhile.

Environmental determinants of sleep in rehabilitation settings: The need for an evidence-base

Environmental factors overnight in hospital (for example, noise, light and temperature) have an impact on sleep outcomes [1-21]. Studies have confirmed that increased sound [10-13, 15-19, 21] and light [12, 16] throughout the evening are both associated with adverse sleep quantity and/or quality. As the referenced studies generally investigate the impact of determinants overnight on the sleep of people within intensive care units or acute settings, they do not add to our understanding surrounding the impact of hospital environmental determinants on the sleep and functional rehabilitation outcomes of rehabilitation unit inpatients. This is an area of worthy of further investigation, confirmed by findings from Laver and colleagues and Amato [22] which both highlight that a lack of research in this area exists.

Acquired brain injury, sleep, and rehabilitation environments

It is important that research investigate the impact of environmental determinants overnight on the sleep outcomes of people who have experienced an acquired brain injury (ABI) and are receiving rehabilitation. It is well established that adverse sleep outcomes are a consequence of experiencing an ABI [23-29].

> **The adverse sleep consequences of ABI is problematic as poorer sleep is associated with unfavourable functional rehabilitation outcomes.** [30, 31]

In the face of medical complications and physical and cognitive impairments that are associated with newly diagnosed ABIs, sleep disorders can often go unnoticed [32]. Early identification and treatment of sleep difficulties is imperative [33] as for people with ABI, increased sleep over and above what is typically required by people without injury is necessary to promote recovery [34, 35]. This is especially so during the acute stage of injury where improved sleep is instrumental in addressing recovery [35, 36].



> **The increased noise in hospital overnight may have an impact on patient recovery and wellbeing.**

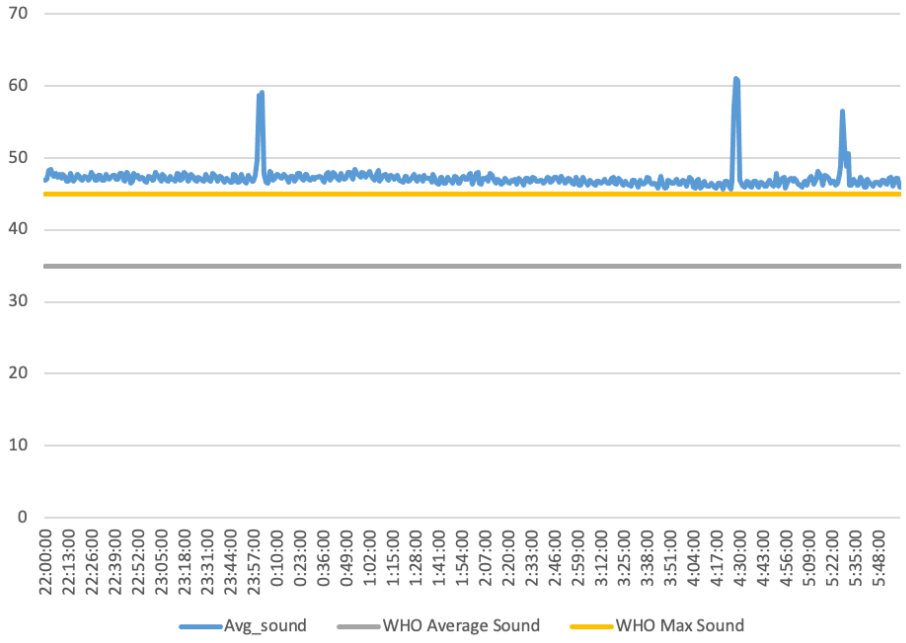
The impact of rehabilitation unit environmental factors overnight on the sleep of people with an ABI is largely unknown [22]. At the Gold Coast University Hospital Neurorehabilitation Unit, we have conducted a pilot study to investigate baseline levels of environmental factors overnight and the impact that these have on the sleep and fatigue of inpatients with an acquired brain injury (ABI) receiving rehabilitation.

Preliminary findings were presented at The Hopkins Centre, 2019 ***Bold Ideas Better Solutions Symposium*** [37], and these preliminary findings concluded that overnight sound levels (measured in decibels [dBs]), within a patient's room over a period of seven nights, were consistently above World Health Organization (WHO) hospital environment guidelines [38]. Please see the line graph [right] where a single night's sound has been illustrated. These findings are similar to Oliveira, Gomes [16] which confirmed that overnight sound levels in a paediatric unit were consistently above WHO recommendations. In combination, the findings suggest that high levels of overnight noise are likely prevalent throughout diverse hospital units. The increased noise in hospital overnight may have an impact on patient recovery and wellbeing.

Concluding remarks

Environmental factors overnight may adversely impact the sleep and functional rehabilitation outcomes of rehabilitation unit inpatients. Due to a lack of research, definitive conclusions are not possible. Laver and colleagues suggest that interventions and/or programs that promote sleep are necessary, and these need to consider environmental factors. Prior to the development of such interventions, rigorous research needs to establish baseline measures of environmental determinants, and investigate the impact of these determinants on sleep and functional rehabilitation outcomes. Such research can inform interventions and programs that should be implemented. It is expected that the pilot study undertaken by THC researchers and colleagues from the Gold Coast University Hospital Unit can assist in identifying important factors to consider for future interventions.

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Social connectivity in a time of uncertainty, fear, physical distancing and toilet paper hoarding

Associate Professor Carolyn Ehrlich PhD | The Hopkins Centre

The world as we know it has changed. Daily, and even hourly, our news feeds are telling us about the impact of COVID-19 throughout the world. We know where it started, that Italy is struggling to cope, that many people are dying, that our most vulnerable citizens are at great risk and that a vaccine is still in the distant future. We don't know how or even if our healthcare and economic systems can cope. We have been told that social distancing is mandatory, and our government is taking drastic action to ensure that we remain apart from our fellow man.

> **How do we stay socially connected in such strange times?**

How do we ensure that people who are already physically isolated from others and who have limited social connectivity are supported, that they do not fall through widening cracks in the social fabric of our community?

Now more than ever, we need to know and understand who people are in their own context. We need to practice person-centeredness, compassion and empathy; we need to ensure that we are not creating additional burden or harming people; we need to understand and support weak social networks that may become weaker in the wake of 'social distancing' practices that are being policed more emphatically as each day living in the presence of COVID-19 progresses.

In the midst of this pandemic, we need to ensure that people are cared for physically, emotionally and spiritually. We have a great opportunity to forge stronger and more resilient communities if we respond to what is happening in our own communities by using our existing social networks and by establishing new networks.

In my research at The Hopkins Centre, we have been exploring the importance of family networks for people following serious injury such as spinal cord injury and brain injury.

We know that people and networks can, and do, experience high levels of burden when the work that they are required to do is greater than their capacity.

> **Individuals and entire networks can become stressed and stretched beyond their ability to cope.**

We know that it is not just one member of a network that does all the assisting, caring and helping; and that networks have unique ways of deciding who does what, when and how they do it. We also know that people belong to many different networks at the same time. Therefore, my research also explores ways of keeping people at the centre of the care and support that formal (health professional) and informal (family and social) networks provide. But, there is still a need to understand ways of increasing resilience in these networks.

IMPORTANT CONTACTS AND ONGOING SUPPORT

Emergency – 000 | **National Coronavirus Helpline** – 1800 020 080 | **Qld COVID-19 Hotline** – 13HEALTH (13 43 25 84)
Department of Health – 1800 020 103 | **Community Recovery Hotline** – 1800 173 349 | **Health Direct** – 1800 022 222
Beyond Blue – 1300 22 4636 | **Lifeline** – 13 11 14 or 0477 13 11 14 (SMS) | | **Salvation Army Australia** – 13 SALVOS (13 72 58)
Assistance for Hard of Hearing – 131 450 or visit National Relay Service Website | Translating and Interpreting Service







We need to invite other people into our networks. We need to make links across networks so that together we ensure that everybody is cared for and supported. We must check on our neighbours, we must look out for one another, we must know where we can go for help, we must practice self-care and self-compassion, and we must not be afraid to put up our hand to both offer and ask for support.

Services, workplaces, community groups, welfare organisations, faith-based groups and all manner of community networks across society, are working hard to ensure that they are able to continue to respond, and even to increase their response in their local communities.

In this time of fear and uncertainty, there are some who are asking;

> **'What if?'— What if we could support people differently?**

What if we could develop stronger social connectedness in an online and virtual world? What if we could be more inclusive? What if we could surround people with the certainty that they are loved, valued and appreciated? What if...?

These questions are important. They help us to focus on faith rather than fear; community connectedness rather than selfishness and searching for light and opportunity rather than focusing on uncertainty and fear. The organisations, community and faith-based networks I belong to are developing and implementing strategic and considered responses that address these questions.

There are ample examples of opportunistic kindness and generosity. Even our celebrities have shared their music and entertainment. But how can we support the elderly and others in our community who cannot leave their homes? How can we prevent social isolation at the same time as preventing transmission of this virulent virus to vulnerable people? In my community, we are mobilising small groups of already connected people to move beyond their established networks and connect with other members of the community virtually and often.

We will be checking in with people regularly, making sure that important information is communicated to them and working with them to understand their needs. We are identifying escalation pathways to ensure that people are connected to services that can best help them. We are developing detailed communication plans, better understanding of the breadth and depth of our community, and ensuring that people remain socially connected.

We are exploring talent and skill in our community, we are harnessing peoples' passion and enthusiasm for caring to ensure that we are neither duplicating unnecessarily nor missing something that is essential. We are wrestling with how to best support people who are disenfranchised, isolated and in need.

> **Most importantly, we are actively asking 'What if?'**

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Accepted Article

COVID-19 and spinal cord injuries: the viewpoint from an emergency department resident with quadriplegia

Short running title: The effect of COVID-19 on spinal cord injuries.

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COVID-19 and spinal cord injuries: the viewpoint from an emergency department resident with quadriplegia

I am a resident who works in an Australian emergency department. I also have a spinal cord injury (SCI) with quadriplegia. At the onset of the COVID-19 pandemic, I began to think about its implications for people with SCIs.

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SCI patients are more vulnerable than their uninjured counterparts to complications from many conditions. As the world attempts to understand the disease, the potential effects of COVID-19 on those with SCIs will benefit from some consideration. Not only could the altered physiology in a person with SCI alter the presentation and management, but their social circumstances create complex logistical and ethical issues. These complexities can create significant challenges for emergency departments that come under siege during a pandemic.

The effect of disrupted physiology

Responses like a fever[1] and cough[2] typically expected from infectious stimuli can be impaired in a SCI. Normal physiological function such as respiration[3] and immunity[4] may also be affected. Sensorimotor disruption may mean that symptoms arising from an illness is not experienced the same way.[5] Therefore, a SCI may present the perfect storm of a patient who has immunocompromise and respiratory impairment with an increased likelihood of other underlying chronic comorbidities[6].

Many current testing guidelines for COVID-19 do not account for the altered physiology in a person with a SCI. Due to their disrupted physiology, features such as fever, cough and chest pain may be absent. Therefore, the risk of missing a COVID-19 diagnosis in a person with a SCI may be elevated.

In emergency departments, this situation may generate challenges in triaging SCI patients and directing them to appropriate areas with infection control. The infection control implications for a ventilator-dependent person with a SCI is unclear. The

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infection control implications for assistive devices such as wheelchairs require consideration.

Due to disruptions in physiology, the risk of Acute Respiratory Distress Syndrome (ARDS) from COVID-19 may be higher than the normal population.[7] Therefore, patients with SCIs may benefit from aggressive early management. This may include early access to experimental therapies where available. The discourse regarding ventilator therapy however, raises ethical challenges for what may become overloaded healthcare systems.

Healthcare rationing

At the early stages of the pandemic, concerns began to emerge about the rights of people with disability in responding to COVID-19.[7] Literature already suggested that healthcare providers can make unfounded judgements regarding the quality of life in people with disabilities.[8] In the United States, the Office of Civil Rights received complaints surrounding the rationing of life-saving therapy which adversely affects people with disabilities during the pandemic.[9]

In a SCI, the risk of a poor outcome is arguably higher compared to the normal population. In a resource-stretched department, this may create a tension between equity and efficiency. Therefore, people with SCI run a higher risk of being affected by healthcare rationing. To address this risk, healthcare providers should be educated on the ethical considerations when delivering healthcare to those with SCIs. Early advanced care planning may be beneficial. Civil rights organizations could proactively remind healthcare providers of their obligations.

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In the event of an uncontrollable pandemic that overrun healthcare systems, difficult decisions will inevitably be made. Therefore, the best way to protect those with SCIs is to prevent them from becoming infected with COVID-19.

Prevention

Strict social isolation measures prevent the spread of disease to society's most vulnerable people. Public health messaging may create more of an impact by highlighting this point. Additionally, people with SCI may benefit from specific isolation instructions. That is, to strictly isolate themselves early in the pandemic to prevent infection. Such an activity is not without logistical challenges.

Many people with SCIs rely on daily caregivers to assist with activities of daily living. In the event of strict isolation, caregivers will need to be isolated as well. This is the only way to prevent the introduction of disease from the community. Such isolation is not without a significant financial and social cost.

The reliance on caregivers also places people with SCI at social risk. If the caregiver or a team of caregivers becomes affected by COVID-19, a person's entire care structure can be dismantled. Such an event may require social admissions to hospitals, or in worse cases, generate life-threatening neglect in the community. Social admissions will increase the risk of hospital-acquired complications as well as acquiring COVID-19 itself.

Emergency department presentations

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In emergency department under siege, a high care SCI patient presenting for social reasons will add to the human resource requirement. Some patients will require staff skilled in ventilator management even in the absence of COVID-19. Others will require regular assistance with activities of daily living in addition to SCI-specific needs such as pressure relief and bladder management. In rural and remote emergency departments, the resource requirement may be felt more particularly as rural Australians with disabilities are more dependent on emergency departments.[10]

To mitigate the demand on health systems human resources, training a patient's regular caregivers to care for them in a department can be of benefit. This not only provides a familiarity of care, but people well-versed in the needs of the person being cared for. However, this is contingent on infection control requirements.

Where possible, early planning to streamline the emergency care of people with SCIs is of value. Planning may include ascertaining optimal ways to triage these patients; creating an accessible assessment and management space with thought to unique infection control requirements; considering early aggressive management where indicated; enabling rapid disposition pathways; and ensuring the availability of necessary social services. This type of planning can not only benefit patients with SCIs, but also other disabilities.

Considering the complexities of the hospital admission for a person with a SCI during the pandemic, the primary goal must remain to prevent them from being infected. If a patient presents for social reasons, rapid social interventions may facilitate a quick discharge back to the community.

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Conclusion

People with SCI may benefit from specific diagnostic and treatment pathways during the COVID-19 pandemic. Prevention of disease in this group remains a critical priority due to the complex medical, social, and ethical challenges that widespread community infection can create.

While the SCI population face unique challenges, many of these are shared by the global community of people with disability. To protect the most vulnerable in our society from complications of COVID-19, health systems must create unique pathways and prioritise prevention. Nonetheless, in the event that patients attend emergency departments with COVID-19 associated presentations, emergency physicians should be aware of the medical and social complexities in managing this vulnerable group.

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