

LIFE FOLLOWING SPINAL CORD INJURY – SECONDARY COMPLICATIONS AND THE USE OF ASSISTIVE TECHNOLOGY



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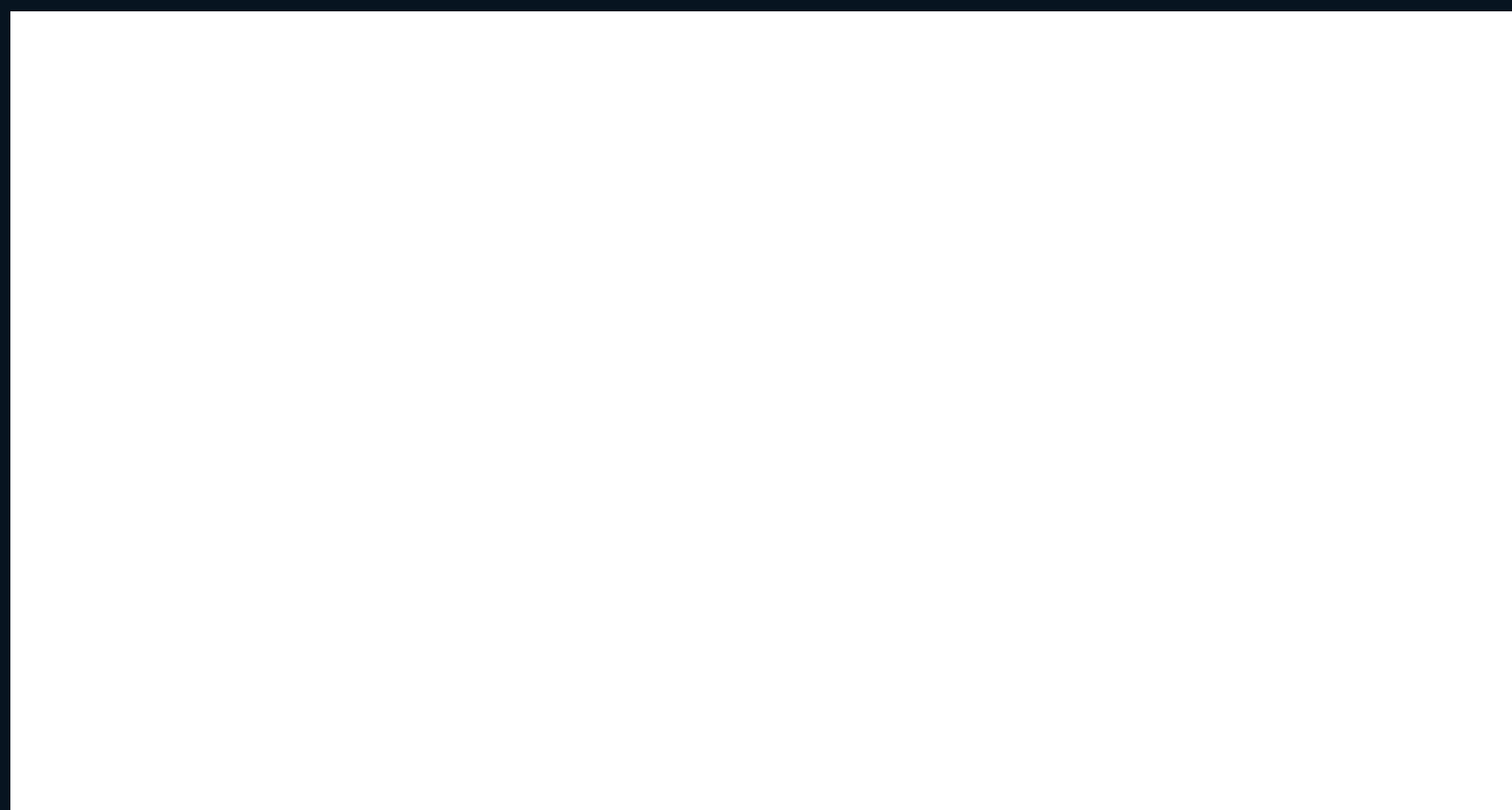
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SIA 2022 - Top physical health concerns

72% bowel management

66% bladder management

51% pain management

33% skin care and management including accessing information on pressure ulcers

28% fitness and exercise

25% ageing with a SCI

SAI 2022 - Top mental health concerns

46% lack of access to counsellors and therapists who understand SCI

45% lack of specialist rehabilitation support

41% specifically anxiety or depression has impacted them

35% said lack of availability of services that support wheelchair provision or housing adaptations

34% isolation or loneliness

30% self-confidence has been affected

28% relationships have been impacted by their SCI

Top barriers to leading a fulfilled everyday life

92% society's attitudes towards people with disabilities

89% worried about adapting their homes to suit their needs

80% concerned about locating and acquiring accessible housing

75% access to employment is a barrier to leading an equal life

69% funding their care needs

62% accessing social care was a concern

65% eligibility for care was concerning

52% standards of care was a worry for them

38% access to wheelchair and mobility equipment is a concern

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Cleen

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Meet Adam

- 20 year old
- SCI T1 complete
- Hip pain
- Mood
- Autonomic Dysreflexia
- Disturbed Sleep
- Spasticity
- Bowel and Bladder



- Negative inpatient rehabilitation experience
- AD injury above T6 – Lack of awareness of medics inc response teams
- Individual triggers to AD – what are the symptoms usually continence or foot care, overheating.
- Involuntary spontaneous bowel evacuation

Need for Care Plan and Emergency Care Plan!



Pressure Ulcers and Positioning

Before



After



**Emergency
Care Plans –
Personalised to
the individual.**

Autonomic dysreflexia

Respiratory function

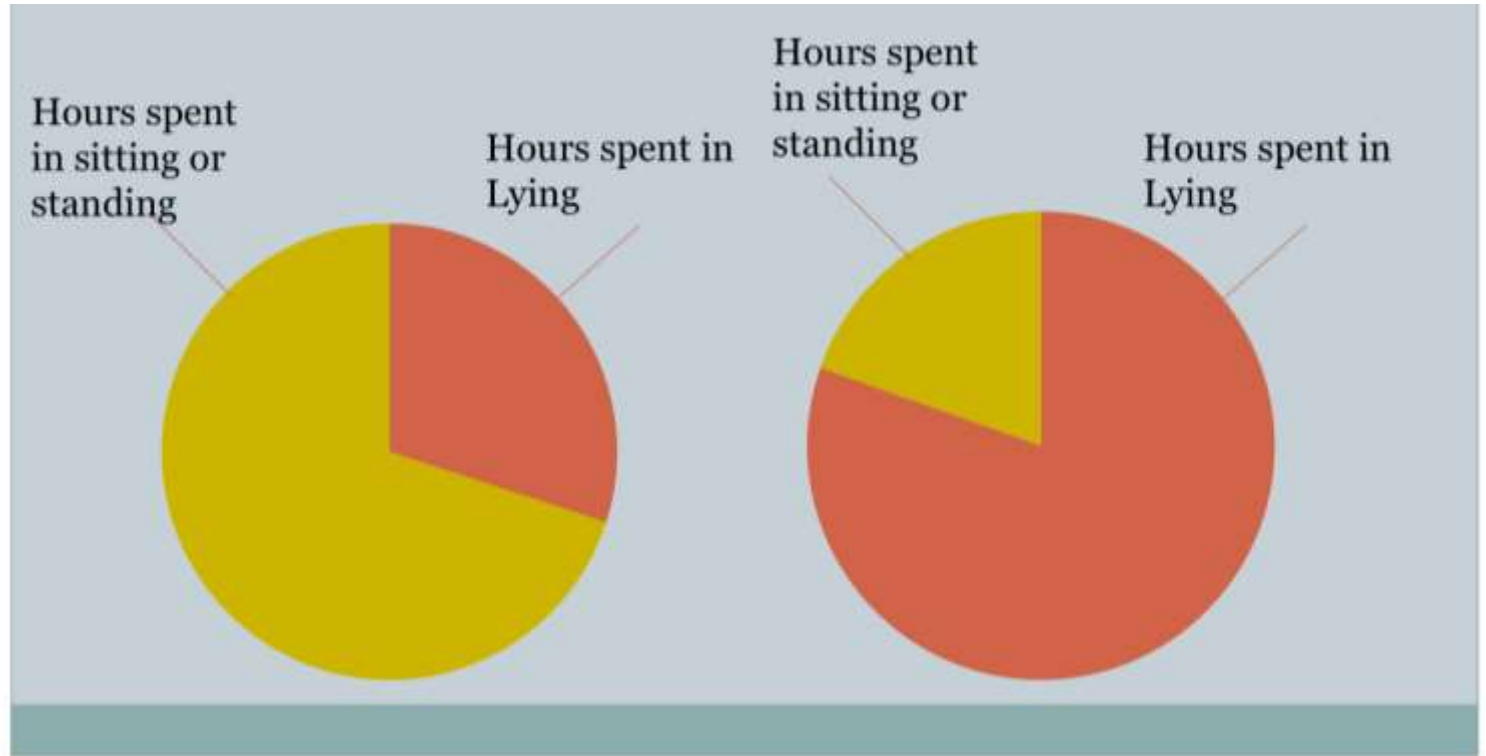
Skin care

Bladder management

Bowel management

Essential Care

ASSESSMENT OF 24 HOUR POSITIONS

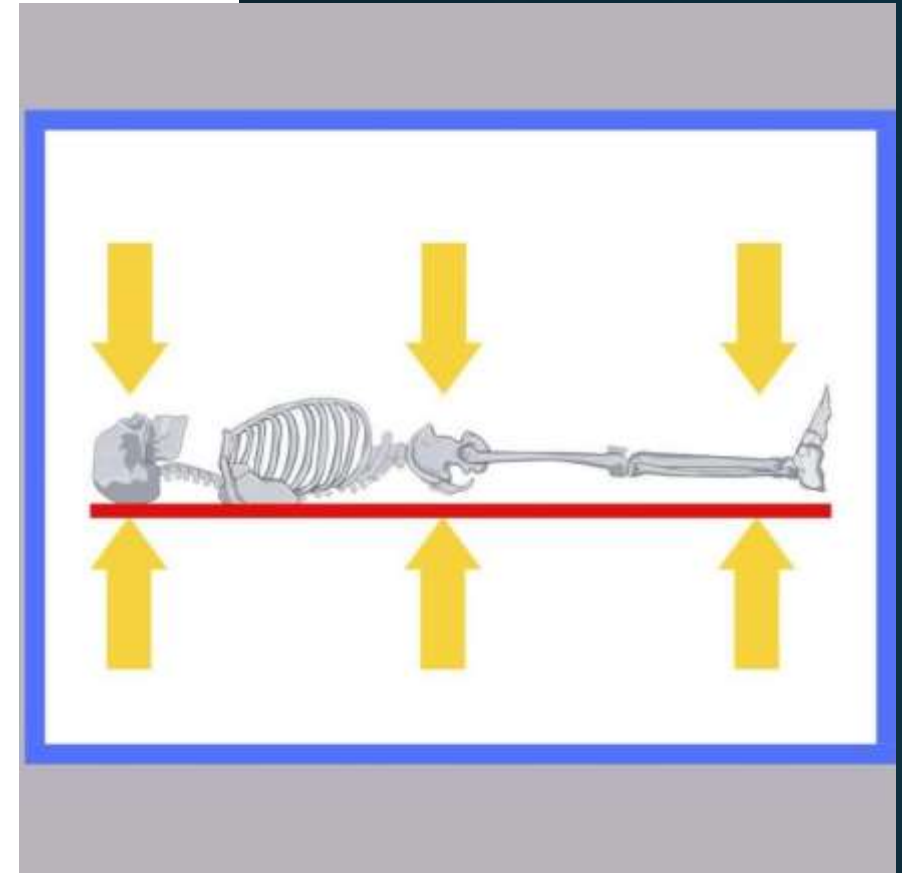


Night time support

Need for repositioning whether for postural needs, pressure care, continence or comfort (temperature, need for fluids etc)

Myth that there are no risks when lying in bed.

Balance between disturbing a person's sleep and ensuring the body is protected to prevent secondary complications



Night-time Support



24 hour care plan

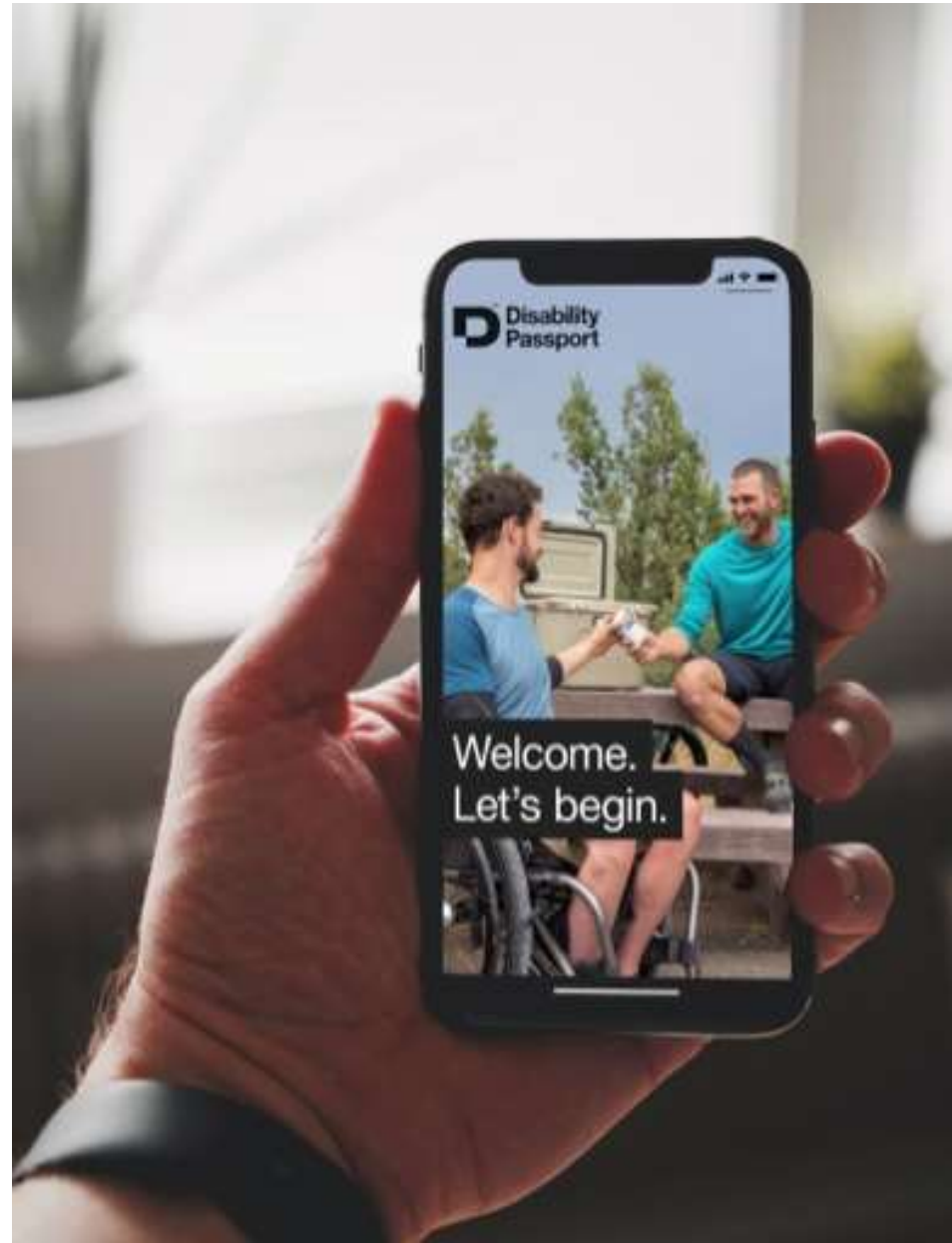


Transfers

- Mobile hoist
- Ceiling Track or Gantry Hoist
- Slide board/banana board
- Standing transfer aids



Digital Passport




Assistive Technology

The advancement and increasing use of ATs present an opportunity for improving the quality of life of individuals with disabilities.



Different types of ATs have potential applications in various areas such as pressure ulcer prevention, rehabilitation, food administration, therapy, and brain connectivity.



Home-based systems, virtual reality, and electronic portable devices present opportunities for effective therapy and better management of neuromotor disorders.

Assistive Technology

“products or systems that support and assist individuals with disabilities, restricted mobility or other impairments to perform functions that might otherwise be difficult or impossible”.

It is important to be clear on terminology, just because a product is used in a healthcare environment or by a healthcare professional, this does not necessarily mean it is a medical device.

An assistive technology product can be classed as a medical device,

<https://www.gov.uk/government/publications/assistive-technology-definition-and-safe-use/assistive-technology-definition-and-safe-use>



AT IN THE
1960'S



AT NOW

- Grid Pad 13 is a powerful and fully featured environmental control unit with speech generation and full computer access ready for use with eye tracking technology or head mouse.



AT NOW

Possum Freedom
- an overview



Basel (2023) Development and Use of Assistive Technologies in Spinal Cord Injury

The technologies highlighted
in the studies include

neuro-prostheses, orthotic
devices, hybrid
systems, robots, arm supports,
tongue barbell piercings,
mechatronics, robotics, virtual
reality, functional electrical
stimulation (FES),

powered exoskeletons
(PEXOs)

brain-computer interfaces
(BCIs),

electronic portable assistive
devices.

[https://pmc.ncbi.nlm.nih.gov/
articles/PMC10252185/](https://pmc.ncbi.nlm.nih.gov/articles/PMC10252185/)



Thor AT

CycleMotus



Thor AT

- Dexa Scan
- Exoskeletal suit – ExoMotus M4. Robotic walking assistance,



Assistive Technology wheelchairs



SCEWO chair stair climber

Mapping the relationship between lesion location and functionality in tetraplegia.

Area	Functionality of the Respiratory System	Functionality of the Neuromuscular System
C1–C4	Mechanical breathing is required	Arms are totally paralyzed
C5	Problems with coughing. Requests for support in removing the secretions are probable	Paralysis of the muscles of triceps, hands, and wrists is present
C6	The same as above	Paralysis of the wrist flexors, triceps, and hands
C7–C8	The same as above	There is a difficulty in releasing and grasping and some force lacking in the muscles of the hands

Findings

- Skepticism exists regarding the performance of PEXOs for mobility among SCI patients
- A low-to-moderate effectiveness of ATs for pressure ulcer prevention in SCI has been identified
- There are limits in the application of BCIs
- There is a lack of knowledge regarding brain connectivity following SCI, which could impact the proper choice of ATs
- Mechatronics and robotics as ATs for food administration have limited also in the most developed countries.



Example of Costs in AT Report

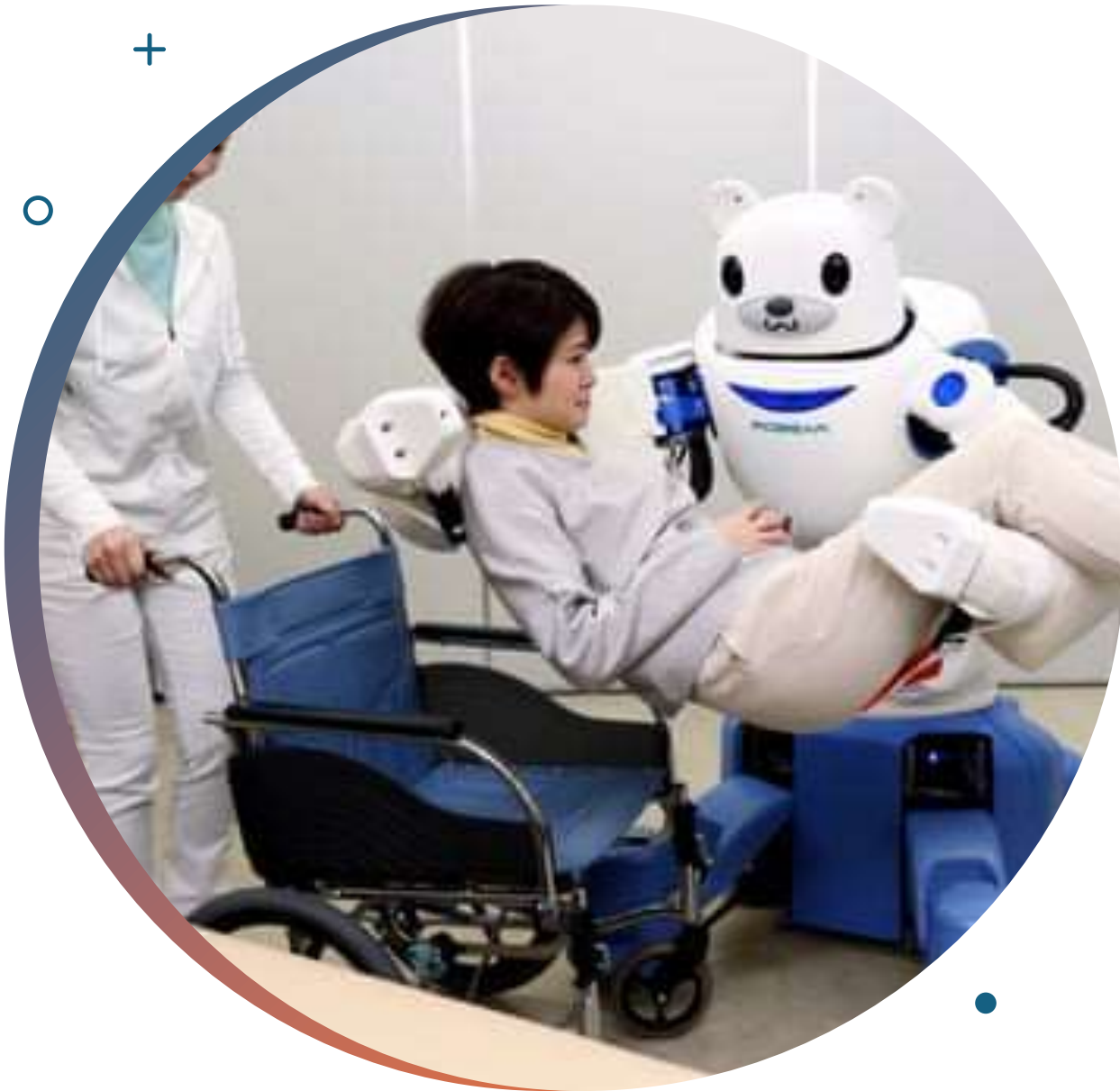
- External doors - openers for the main entrance total cost of **£7130**.
- Internal doors - motorised door 8 internal motorised door openers at a cost of £2300 each. total cost of, **£18880**.
- Door entry - door entry system main door remotely One door station, D1101V Flush-mount IP Video Door Station is required at **£579**
- Windows - motorised window opener 8 window openers at £860 each, giving a total of, **£6880**.
- Curtains - motorised curtains 6 window openers at £1050 each, giving a total of, **£6300**.
- Lights - control the lights in all rooms five lights at £88 each, giving a total of **£440**.
- Mains sockets - remote control sockets in each room cost of 62 each, giving a total of **£992**.
- Controller - Automated devices to control within home, spread across various rooms. cost of **£330**.
- Installation costs are calculated at **£10540**.
- Maintenance - Annual maintenance costs will be five percent of capital costs.

What can go wrong?

- issues arising as a result of inadequate repair or maintenance instructions from the manufacturer
- absence of individual risk assessment for users of prescribed assistive technology device including entrapment risks.
- risk of injury due to use of assistive technology devices (including the prescribed ones) that are not appropriate for specific needs of the user
- poor or lack of training in how to use/repair/maintain the device

Care bots!





Care bots were used initially and then “locked away in a cupboard”. Tellingly, the company behind Pepper [ceased producing it](#) in 2021, citing weak demand.

Found that care bots often created more work for caregivers, who needed to maintain, monitor and operate them.

Dr Kate Hamblin leads on digital research for the UK’s Centre for Care, and she echoes the concern that care tech may not be the labour-saving dream it seems. “Context is so important,” she says. “Technologies can support carers... but can also add a layer of complexity and frustration if they’re poorly delivered and designed.”

Recent article in the Guardian 2024

Good Practice using Assistive Technology

an appropriate risk assessment should be carried out before the initial prescription of the device and reviewed after significant change in user's condition or needs

for non-prescribed devices, users and/or carers should consult with provider or relevant healthcare professional to select the right device suitable for individual needs of the user

users and/or carers (including non-professional carers) should be appropriately trained in the use of the device

Telecare

a pendant alarm to call for help

epilepsy monitor

Falls equipment



THANK YOU
FOR
LISTENING

ANY QUESTIONS ?



References

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