

## Decision Box

### Older Adults

# Maintaining Independence in Daily Activities

#### THIS DOCUMENT IS AIMED AT...

- Older adults living in the community
- Friend or family caregivers of older adults, where applicable

#### THIS DOCUMENT IS DESIGNED TO...

- Inform people of the benefits and harms of the available options to prevent loss of independence in daily activities
- Prepare people to discuss their options with healthcare professionals
- Help people choose an option that respects their priorities

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## Loss of Independence in Daily Activities

As they are aging, some people **lose their abilities to perform tasks of everyday living**, such as:

- eating
- dressing
- bathing
- housekeeping
- cooking
- using the telephone
- using transportation
- managing money

### Possible causes of older adults' loss of independence in daily activities

- Extended bed rest
- Side effects of medication
- A need for invasive devices, such as a catheter, an oxygen cylinder, a wheelchair or other walking aids
- Experiencing more than one disease at the same time
- Worsening of a chronic condition
- A personal crisis

### Risk factors for older people's loss of independence in daily activities

- Weight loss or gain
- Slower walking speed
- Decreased grip strength
- Poor balance
- Problems with thinking or memory
- Depression
- High use of drugs
- Little social contacts and activities
- Low level of physical activity
- Heavy alcohol use or smoking

### Who should consider making a change to maintain their independence in daily activities?

People aged 65 years or more who have experienced

- a fall
- a **loss of independence in self-care capabilities\***
- a limitation in the **use of a shoulder, arm, or hand**

### We recommend that...

- The decision take into account the person's values and priorities
- The decision be shared among the healthcare professional, the person and, if necessary, the caregiver

\* See Glossary p. 13





## OPTIONS

Explore the options



### Physical Activity Tailored to Older Adults

Physical activity programs can be adapted to older adults. They may include **walking, water exercises, balance or flexibility exercises, and weight training**. They can be done **individually at home or with other people**. The activities should produce a sensation of warmth, and make you breathe harder. You should be able to hold a conversation while exercising but be too short of breath to sing.

#### BENEFITS

##### ↑ Ability to perform daily activities ⊕ ⊕ ○ ○

For every 100 older adults who are physically active, **12** improve their **ability to perform daily activities** due to physical activity.

##### ↑ Walking speed ⊕ ⊕ ○ ○

For every 100 older adults who are physically active, **2** increase their **walking speed** due to physical activity.

##### ↑ Endurance ⊕ ⊕ ⊕ ○

For every 100 older adults who are physically active, **16** increase their **endurance** due to physical activity.

##### Balance ⊕ ○ ○ ○

Older adults who are physically active experience **inconsistent effects on their balance**. Some tests suggest they increase their balance, while others suggest they do not.

##### ↑ Other health benefits ⊕ ⊕ ⊕ ⊕

Regular physical activity has several additional benefits, for example:

- **reduced risk of chronic disease** and premature death
- **independence** in daily activities
- improved **fitness** and **bone health**
- **reduced risk of heart diseases\***
- **improved mood**
- **reduced risk of falls**
- **improved sleep**.

#### HARMS

##### ↑ Muscle, bone, or joint problems ⊕ ○ ○ ○

Some older adults feel **temporary muscle soreness after exercising**. They can also experience **muscle, bone or joint problems** (for example minor strains, tendonitis, exacerbation of osteoarthritis, or joint pain).

#### PRATICAL ISSUES

##### Time required ⊕

In general, to experience positive impacts from physical activity, people must be physically active at least 3 weeks, either for 20 minutes 3 times a week, or for 2 hours once a week. Whatever the duration and frequency of the exercise, **it takes time**.

\* See Glossary p. 13





## OPTIONS

Explore the options



### Yoga

Yoga includes physical, mental, and spiritual practices that originated in ancient India. It involves **holding stretches** as a kind of low-impact physical exercise, and may involve **meditation, visualization, breathing exercises, and music.**

#### BENEFITS

##### ↑ Balance



For every 100 older adults who do yoga, **63** increase their **balance** due to yoga.

##### ↑ Mobility



Older people who do yoga are more likely to have a **normal mobility** compared to those who don't.

#### HARMS

##### ↑ Muscle or bone pain



Older adults who do yoga may experience minor adverse events such as **knee pain, lower back pain, or minor muscle strain.** Some may also experience a **worsening of existing lower back pain.**

#### PRATICAL ISSUES

##### Time required



To feel the benefits, the person generally needs to do yoga for **60 minutes or more at a time, 1 to 2 times a week, and for at least 8 weeks. This takes time.**

#### CONFIDENCE IN THESE RESULTS:

- ⊕⊕⊕⊕ **High:** Further research is very unlikely to change our confidence in the estimate of effect.
- ⊕⊕⊕○ **Moderate:** Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
- ⊕⊕○○ **Low:** Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
- ⊕○○○ **Very low:** Any estimate of effect is very uncertain.
- **Not evaluated** due to a lack of an estimate of effect.





## OPTIONS

Explore the options



### Rehab or Occupational Therapy at Home

Rehab (rehabilitation) or occupational therapy at home is provided by healthcare workers in various professions, as part of homecare services, more often occupational therapist, physiotherapists, and nurses. It allows people to continue to go about their daily activities and tasks in an independent manner, based on their own goals. After an initial assessment, the healthcare provider prepares an action plan detailing care, preventative measures, and rehabilitation to help compensate for the person's limitations. It can take at least 6 weeks to complete, depending on the person's needs.

#### BENEFITS

↑ Ability to perform daily activities ⊕⊕⊕○

For every 100 older adults receiving rehab or occupational therapy at home, **25** improve their **ability to perform daily activities** due to this intervention.

Risk of dying ⊕○○○

Current research shows that receiving rehab or occupational therapy at home **does not reduce older adults' risk of dying**.

↓ Emergency department visits ⊕⊕○○

For every 100 older adults who receive rehab or occupational therapy at home, **10 avoid emergency department visits** due to this intervention.

Hospital admissions ⊕○○○

The current research does not show any effect of rehab or occupational therapy at home **to avoid hospital admission of older adults**.

↓ Admission to long-term care ⊕⊕○○

For every 100 older adults receiving rehab or occupational therapy in the home, **11 avoid admission to a long-term care facility** due to this intervention.

#### HARMS

↑ Unmet needs ⊘

Some older adults feel that rehab or occupational therapy in the home do not meet all their needs because...

- they were **not consulted or informed** enough before reablement
- the time spent for reablement was **too short**
- they observed a **lack of standardized care from the various professionals**

#### PRATICAL ISSUES

Acces to occupational therapy ⊘

There may be **delays** in accessing public rehabilitation or occupational therapy services. This type of service is also offered in the private sector, but it must be **paid for**.

#### CONFIDENCE IN THESE RESULTS:

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- ⊕⊕○○ **Low:** Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
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## OPTIONS

Explore the options



### Smart homes

Smart homes feature **technologies** that are **integrated into the infrastructure of the residence** to monitor what is happening and improve residents' experience at home. In healthcare, these technologies may be used to **monitor the occupant's health**, for example their weight, pulse, blood pressure, falls and movements. They can also help maintain their well-being, for example by controlling the quality of the air.

#### BENEFITS

##### ↑ Ability to perform daily activities ⊕⊕○○

Older adults who live in smart homes **are more likely to be able to perform daily activities** compared to those who don't.

##### ↓ Hospitalization ⊕⊕○○

For every 100 adult who live in smart homes, **7 avoid hospitalization** during the first 30-day episode of homecare due to the technologies.

##### Health ⊕

The current research does not show any effect of smart home technologies on **disease, illness, or injury**.

#### HARMS

##### ↑ Dependence on technology ⊘

Some older adults are worried about becoming **overly reliant** on these technologies.

#### PRATICAL ISSUES

##### ↑ Cost ⊘

In most cases, living in smart homes **requires the purchase and installation of equipment**. If the technology needs to be connected to the Internet or to a Web portal, then a monthly fee is also charged (ranging from \$130 to \$150 per month).

##### ↓ Access ⊘

Some older adults who live in remote or under-served urban areas **may have difficulty accessing** smart home technologies.

##### Difficulty in learning how to use sensors and technology ⊘

Some older adults **lack familiarity with computers** and it can be difficult for them to learn how to use smart home technologies.

##### ↑ Obtrusiveness ⊘

Location of technologies in the home (i.e., in the bedroom or bathroom) or types and size of devices may be **obtrusive**.

#### CONFIDENCE IN THESE RESULTS:

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## OPTIONS

Explore the options



### Self-management Program

Self-management support programs are educational and supportive interventions provided by healthcare staff to encourage people living with chronic diseases to take a more active role in their health. They aim to increase the person's skills and confidence in managing their own health problems. These programmes can include information about the disease; education to offer knowledge, skills, and strategies to manage the consequences of the disease/disability; social support through communication with other patients or professionals; and training.

#### BENEFITS

**↑ Independence in daily activities**    ⊕ ○ ○ ○ ○

Older adults who participate in self-management support programs are more likely to be **independent in their daily activities** compared to those who do not take part in such programs.

**↓ Unplanned hospital readmissions**    ⊕ ⊕ ○ ○ ○

For every 100 adults who participate to a self management program, **12 to 17 avoid hospitalization** during the first 30-day episode of homecare due to the program.

**Mobility**    ⊕ ○ ○ ○ ○

Current research does not show any effect self-management support programs on mobility of older adults.

#### PRATICAL ISSUES

**Time**    ⊖

Some older adults who take part in self-management programs find them **strenuous due to the time involved**.

#### CONFIDENCE IN THESE RESULTS:

- ⊕ ⊕ ⊕ ⊕ **High:** Further research is very unlikely to change our confidence in the estimate of effect.
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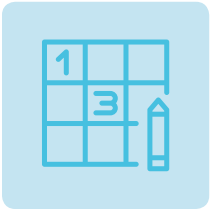






## OPTIONS

Explore the options



### Brain Exercises

Consists of doing **activities and games** that stimulate mental capacities, e.g., reading, crosswords, sudoku. These activities can either be done individually, or in a group under the supervision of a professional.

#### BENEFITS

↑ Ability to perform daily activities ⊕ ○ ○ ○ ○

For every 100 older adults who do brain exercises, **11 maintain or improve their ability to perform daily activities due to the exercises.**

↑ Processing speed ⊕ ○ ○ ○ ○

For every 100 older adults who do brain exercises, **22 maintain or increase their processing speed\*** due to the exercises.

#### HARMS

↑ Anxiety to do well ⊘

Older adults may feel some **anxiety to do well if brain exercises are done in a group.**

\* See Glossary p. 13

#### CONFIDENCE IN THESE RESULTS:

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## OPTIONS

Explore the options



### Watchful Waiting

Watchful waiting consists of actively monitoring the person's health without them undertaking treatment or making lifestyle changes.

#### BENEFITS

##### ⬇️ Avoid making a change if the impacts are uncertain



Among the older adults who make changes improve their independence in daily activities, a certain proportion **do not experience any improvement**. They may be disappointed that the steps they took did not allow them to reach their goals.

##### ⬇️ Inconveniences associated with the available options



All the available options to improve mental capacities cause some **inconveniences**. These inconveniences are reviewed in the previous pages of this document. People who do not undertake any new treatment or changes to their lifestyle **do not experience any of these inconveniences**.

##### Take the chance that things improve on their own

For every 100 older adults experiencing a loss of autonomy, about **49 experience an improvement in their independence** without undertaking any change to their lifestyle.

##### Take the time to find solutions on your own



People who experience a loss of independence in daily activities may wish to **take some time to find solutions by themselves**, and to try to develop strategies that best suit their needs.

#### HARMS

##### ⬇️ Odds of maintaining or improving independence in daily activities



People who choose watchful waiting without making any changes are **less likely to improve their independence** than those who choose one of the other options presented in this document (p. 4-10).

##### ⬆️ Risk of dying



Actively monitoring the health of older adults identified as at risk of losing their independence, without them undertaking treatment or making lifestyle changes, **increases their risk of dying**.

##### ⬆️ Admission to a long-term care facility



Actively monitoring the health of older adults identified as at risk of losing their independence, without them undertaking treatment or making lifestyle changes, **increases their risk of being admitted to a long-term care facility**.

##### Feeling of helplessness



Failing to make changes to one's lifestyle or undertake treatment to prevent loss of independence in daily activities can lead to **feelings of helplessness and distress**.

##### ⬇️ Quality of life



Actively monitoring the health of older adults identified at risk of losing their independence, without them undertaking treatment or making lifestyle changes, increases their risk of experiencing a **decrease in their quality of life**.

#### CONFIDENCE IN THESE RESULTS:

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- ⊕⊕○○ **Low:** Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
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# PRIORITIES

Maintain your independence while respecting your priorities

SELECT WHAT IS MOST IMPORTANT TO YOU AND LOOK AT THE OPTIONS ASSOCIATED TO IT.\*

CHECK A SINGLE ITEM AT THE TIME

**Improve my ability to perform daily living activities**

POSSIBLE OPTIONS TO MAINTAIN MY INDEPENDENCE:

- Physical activity
- Monitoring technologies
- Self-management program
- Brain exercises

**Improve my independence in self-care and my mobility**

POSSIBLE OPTIONS TO MAINTAIN MY INDEPENDENCE:

- Physical activity
- Yoga

**Find solutions on my own**

POSSIBLE OPTIONS TO MAINTAIN MY INDEPENDENCE:

- Watchful waiting

**Avoid hospital admissions**

POSSIBLE OPTIONS TO TO MAINTAIN MY INDEPENDENCE:

- Rehab or occupational therapy at home
- Monitoring technologies
- Self-management program

**Improve my mental capacities**

POSSIBLE OPTIONS TO MAINTAIN MY INDEPENDENCE:

- Brain exercises

**Other:**

\_\_\_\_\_

List the options **to prevent a loss of independence** that support this priority:

\_\_\_\_\_

\_\_\_\_\_

\* In this exercise, the benefits and harms of the available options (see previous pages) become priorities to consider. For example, if an option causes some harms, limiting these harms may be a priority for some people and they will want to consider other options.





## CHOOSING AN OPTION

Which option do you prefer?

Are you comfortable with your choice?

YES NO

<b>SURE OF MYSELF</b>	Do you feel SURE about the best choice for you?	<input type="radio"/>	<input type="radio"/>
<b>UNDERSTAND INFORMATION</b>	Do you know the benefits and risks of each option?	<input type="radio"/>	<input type="radio"/>
<b>RISK-BENEFITS RATIO</b>	Are you clear about which benefits and risks matter most to you?	<input type="radio"/>	<input type="radio"/>
<b>ENCOURAGEMENT</b>	Do you have enough support and advice to make a choice?	<input type="radio"/>	<input type="radio"/>

IF YOU ANSWERED NO TO ANY OF THE QUESTIONS ABOVE, TALK TO YOUR HEALTH PROFESSIONAL.

SURE TEST  
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## LIST OF CONTACTS TO ACCESS SERVICES

The *Caredove* website lists the available services in your region.

- Alberta: [www.caredove.com/auaalberta](http://www.caredove.com/auaalberta)
- Ontario: [www.caredove.com/auawaterloowellington](http://www.caredove.com/auawaterloowellington)
- Quebec: [www.caredove.com/auaquebec](http://www.caredove.com/auaquebec)





## GLOSSARY

Definitions

### Self-care capabilities

Capacities in managing one's own symptoms, treatment, physical and psychosocial consequences, and lifestyle changes caused by a chronic condition.

### Processing speed

Time it takes a person to do a mental task. It is related to the speed at which a person can understand and react to the information they receive. In other words, processing speed is the time between receiving and responding to a piece of information.

### Heart disease

Heart disease refers to a group of conditions that affect the structure and functions of the heart and has many root causes. Conditions include angina, heart attack, hypertension, and stroke.

## CREDITS

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### **NO CONFLICT OF INTEREST TO DECLARE:**

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# REFERENCES

## Introduction

Sutton et al. [2008]. Screening tools to identify hospitalised elderly patients at risk of functional decline: a systematic review. *Int J Clin Pract*, 62[12], 1900-1909.

Hoogerduijn et al. [2007]. A systematic review of predictors and screening instruments to identify older hospitalized patients at risk for functional decline. *J Clin Nurs*, 16[1], 46-57.

Hebert et al. [1997]. Functional decline in old age. *CMAJ*, 157[8], 1037-1045.

Stuck et al. [1999]. Risk factors for functional status decline in community-living elderly people: a systematic literature review. *Soc Sci Med*, 48[4], 445-469.

Vermeulen et al. [2011]. Predicting ADL disability in community-dwelling elderly people using physical frailty indicators: a systematic review. *BMC Geriatr*, 11, 33.

## Physical Activity Tailored to Older Adults

### Ability to perform daily activities

New meta-analysis by the Decision Box team based on the results reported in Gine-Garriga et al. [2014]. *Arch Phys Med Rehabil*, 95 [4], 753-769;e753. Design: Systematic review of 19 randomized controlled trials, including 6 trials on ADL; Participants: 594 individuals aged 65 and older with moderate dependence in terms of mobility; Intervention: Physical activity (e. g., aerobic, balance, flexibility, endurance, strength activities, or other activities related to maintaining and improving performance in ADL); Follow-up: Varied from the end of intervention to 6 months.

### Walking speed

New meta-analysis by the Decision Box team based on the results reported in Gine-Garriga et al. [2014]. *Arch Phys Med Rehabil*, 95 [4], 753-769;e753. Design: Systematic review of 19 randomized controlled trials, including 5 trials on gait speed; Participants: 532 individuals aged 65 and older with moderate dependence in terms of mobility; Intervention: Physical activity (e.g., aerobic, balance, flexibility, endurance, strength activities, or other activities related to maintaining and improving performance in ADL); Follow-up: variable among studies, from the end of intervention to 6 months.

### Endurance

New meta-analysis by the Decision Box team based on the results reported in Gine-Garriga et al. [2014]. *Arch Phys Med Rehabil*, 95 [4], 753-769;e753. Design: Systematic review of 19 randomized controlled trials, including 2 trials on endurance; Participants: 81 individuals aged 65 and older with moderate dependence in terms of mobility; Intervention: Physical activity (e.g., aerobic, balance, flexibility, endurance, strength activities, or other activities related to maintaining and improving performance in ADL); Follow-up: Varied among studies, from the end of intervention to 6 months.

### Balance

Gine-Garriga et al. [2014]. *Arch Phys Med Rehabil*, 95 (4), 753-769.e753. Design: Systematic review of 19 randomized controlled trials, including 13 trials on balance; Participants: 532 older adults with moderate dependence with regard to mobility; Intervention: Physical activity (e.g., aerobic, balance, flexibility, endurance, strength, or other activities related to maintaining and improving performance in ADL); Follow-up: Varied from the end of intervention to 6 months.

### Other health benefits

Nelson et al. [2007]. *Med Sci Sports Exerc*;39(8):1435-45. Physical activity and public health in older adults: recommendation from the American College of Sports Medicine and the American Heart Association.

### Muscle, bone, or joint problems

El-Khoury et al. [2013]. *BMJ* 2013, 347:f6234. Design: Systematic review of 17 randomised controlled trials; Participants: 4,305 older adults aged 60 years and more living at home; Intervention: Physical activity (e.g., Tai chi, balance or strength exercises) with the aim of preventing falls.

Liu, C.-j., & Latham, N. K. [2009]. *Cochrane Database Syst Rev*(3). Design: Systematic review of 121 randomised controlled trials; Participants: 6,700 older adults aged 60 years and more; Intervention: Progressive resistance strength training; Follow-up: Varied from the end of the intervention to 1 year.

### Time required

Gine-Garriga et al. [2014]. *Arch Phys Med Rehabil*, 95 [4], 753-769;e753. Design: Systematic review of 19 randomized controlled trials, including 6 trials on ADL; Participants: 594 individuals aged 65 and older with moderate dependence in terms of mobility; Intervention: Physical activity (e.g., aerobic, balance, flexibility, endurance, strength activities, or other activities related to maintaining and improving performance in ADL); Follow-up: Varied from the end of intervention to 6 months.

## Yoga

### Balance

New meta-analysis by the Decision Box team based on the results reported in Youkhana et al. [2016]. *Age Ageing*, 45 [1], 21-29. Design: Systematic review and meta analysis of 5 randomized controlled trials on balance; Participants: 307 older people with a mean age ranging from 63 to 84 years; Intervention: 60-90 min of yoga, 1-2 times per week, for 8-24 weeks in total; Follow-up: Varied from 8 to 24 weeks.

### Mobility

Based on a new meta-analysis done by the Decision Box team, and based on Youkhana et al. [2016]. *Age Ageing*, 45 [1], 21-29. Design: Systematic review and meta analysis of 3 randomized controlled trials on mobility; Participants: 307 older people with a mean age ranging from 63 to 84 years; Intervention: 60-90 min of yoga, 1-2 times per week, for 8-24 weeks in total; Follow-up: Varied from 8 to 24 weeks.

### Muscle or bone pain

Youkhana et al. [2016]. *Age Ageing* 45 [1]: 21-9. Design: Systematic review with meta-analysis of 6 randomized controlled trials, including 3 trials on physical mobility; Participants: 307 people with a mean age ranging from 63 to 84 years; Intervention: 60-90 min of yoga, 1-2 times per week; Follow-up: Varied from 8 to 24 weeks.

Tiedemann et al. [2013]. *J Gerontol A Biol Sci Med Sci*, 68 [9]: 1068-75. Design: Pilot randomized controlled trial reporting results on mobility; Participants: 54 people aged 59 to 87 years with a mean age of 68 years; Intervention: twice-weekly group-based program of Iyengar-style yoga; Follow-up: 12 weeks.

Cheung et al. [2014]. *BMC Complement Altern Med* 14 : 160. Design: Pilot randomized controlled trial reporting results on osteoarthritis outcomes; Participants: 36 people with a mean age of 72 years; Intervention: one 60-minute Hatha yoga class per week; Follow-up: from 8 to 20 weeks.



## Time required

Youkhana et al. [2016]. Age Ageing, 45 [1], 21-29. Design: Systematic review of 6 randomized controlled trials, including 3 trials on physical mobility; Participants: 90 older adults with a mean age ranging from 63 to 84 years; Intervention: 60-90 min of yoga, 1-2 times per week, for 8-24 weeks in total; Follow-up: Varied from 8 to 24 weeks.

## Rehab or Occupational Therapy at Home

### Ability to perform daily activities

Tuntland et al. [2015]. BMC Geriatr 15: 145. Design: Randomized clinical trial; Participants: 61 home-dwelling older adults with functional decline in one or more daily activities living in rural areas (Norway); Intervention: reablement intervention including maximum rehabilitation period of 3 months, training in daily activities, adaptations to the environment or the activity, and exercise programs; Follow-up: 9 months.

### Risk of dying

Lewin et al. [2013]. Health & social care in the community 22[3]: 328-336. Design: Randomized controlled trial; Participants: 750 older adults with a mean age of 82 years, needing assistance with one or more activities of living; Intervention: homecare reablement including strength, balance and endurance exercises to improve or maintain mobility; Follow-up: 24 months.

### Emergency department visits

Tinetti et al. [2002]. Jama 287 [16]:2098-2105. Design: Controlled clinical trial; Participants: 691 individuals aged 65 years or older at risk of functional decline after acute illness or hospitalization but with the potential for maintaining or improving their function; Intervention: Restorative care; Follow-up: 2 years.

### Hospital admissions

Lewin et al. [2013]. Health & social care in the community 22[3]: 328-336. Design: Randomized controlled trial; Participants: 750 older adults with a mean age of 82.28 years, needing assistance with one or more activities of living; Intervention: homecare reablement including strength, balance and endurance exercises to improve or maintain mobility; Follow-up: 24 months.

### Admission to a long-term care facility

Tinetti et al. [2002]. Jama 287 [16]:2098-2105. Design: Controlled clinical trial; Participants: 691 individuals aged 65 years or older at risk of functional decline after acute illness or hospitalization but with the potential for maintaining or improving their function; Intervention: Restorative care; Follow-up: 2 years.

### Unmet needs

Patient and Client Council. [2012]. Care at Home - Older people's experiences of domiciliary care. Design: cross-sectional survey; Participants: 1,161 Northern Irish adults aged 65 years and older receiving domiciliary care service and their carers; Intervention: Domiciliary care; Follow-up: no follow-up.

Glendinning et al. [2010]. ISBN 978-1-907265-08-2. Design: longitudinal study; Participants: 1,015 individuals aged 65 years and older; Intervention: homecare reablement services offered in five councils; Follow-up: 12 months.

## Smart Homes

### Ability to perform daily activities

Tomita et al. [2007]. Topics in Geriatric Rehabilitation, 23[1], 24-34. Design: randomized controlled trial; Participants: 106 individuals with a mean age of 72 in intervention group and 75.6 in control group; Intervention: a computer with Internet access and X10-based smart home technology; Follow-up: 24 months.

Pecina et al. [2013]. Qual Life Res 22(9): 2315-2321. Design: randomized controlled trial; Participants: 205 individuals aged 60 years and older; Intervention: daily home telemonitoring; Follow-up: 12 months.

### Hospitalization

Chen et al. [2011]. Am J Manag Care 17(6): e224-e230. Design: retrospective nonexperimental study; Participants: 5,873 Medicare beneficiaries aged 65 years and older, receiving home health services through a network of community-based home health agencies operating in the states of Texas and Louisiana; Intervention: integrated, clinician-focused telehealth monitoring system; Follow-up: 1 year.

### Health

Demiris et al. [2008]. Med Inform: 33-40. Design: Systematic review; Participants: older adults, people with cognitive impairment and general population; Intervention: technologies for functional monitoring, safety monitoring, physiological monitoring, cognitive support sensory aids, and to increase social interaction; Follow-up: not mentioned.

### Admission to the emergency room or long-term care facility

Demiris et al. [2008]. Med Inform: 33-40. Design: Systematic review; Participants: older adults, people with cognitive impairment and general population; Intervention: technologies for functional monitoring, safety monitoring, physiological monitoring, cognitive support sensory aids, and to increase social interaction; Follow-up: not mentioned.

### Dependence on technology

Chung et al. [2016]. Annu Rev Nurs Res 34: 155-181. Design: Integrative literature review including 16 studies with multiple designs; Participants: 7 to 119 older adults and caregivers; Intervention: smart home technologies (various sensors: motion, bed, stove, door, etc.); Follow-up: not mentioned.

### Cost

Reder et al. [2010]. Gerontechnology 9[1]:18-31. Design: longitudinal study; Participants: 12 individuals aged 55 years and older living at home; Intervention: sensor technology for remote monitoring; Follow-up: 12 months.

<https://www.cbc.ca/news/technology/use-of-surveillance-tech-to-monitor-seniors-at-home-on-rise-1.2535677>

### Access

Chung et al. [2016]. Annu Rev Nurs Res 34: 155-181. Design: Integrative literature review including 16 studies with multiple designs; Participants: 7 to 119 older adults and caregivers; Intervention: smart home technologies (various sensors: motion, bed, stove, door, etc.); Follow-up: not mentioned.



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## Difficulty in learning how to use sensors and technology

Tomita et al. [2007]. *Topics in Geriatric Rehabilitation*, 23[1], 24-34. Design: randomized controlled trial; Participants: 106 individuals with a mean age of 72 in intervention group and 75.6 in control group; Intervention: a computer with Internet access and X10-based smart home technology; Follow-up: 24 months.

## Obtrusiveness

Chung et al. [2016]. *Annu Rev Nurs Res* 34: 155-181. Design: Integrative literature review including 16 studies with multiple designs; Participants: 7 to 119 older adults and caregivers; Intervention: smart home technologies (various sensors: motion, bed, stove, door, etc.); Follow-up: not mentioned.

## Self-management Program

### Independence in daily activities

Van Het et al. [2016]. *Int J Nurs Stud*, 61, 230-247. Design: Systematic review of 12 randomized clinical trials; Participants: 3,101 individuals living in the community aged 64 and older; Intervention: Self-management support program defined as an educational and supportive intervention with the aim of increasing patients' skills and confidence in managing their health problems; Follow-up: 12 weeks to 24 months.

### Unplanned hospital readmissions

Chow et al. [2014]. *J Adv Nurs* 70[10]: 2257-2271. Design: randomized clinical trial; Participants: 281 individuals aged 65 years and older hospital-discharged with comorbidities; Intervention: nurse-led case management program; Follow-up: 12 weeks.

## Mobility

Leveille et al. [1998]. *J Am Geriatr Soc* 46[10]: 1191-1198. Design: randomized clinical trial; Participants: 201 chronically ill adults aged 70 and older recruited through medical practices; Intervention: A targeted, multi-component disability prevention and disease self-management program led by a geriatric nurse practitioner [GNP]; Follow-up: 12 months.

## Time

Elzen et al. [2007]. *Soc Sci Med* 46[9]: 1832-41. Design: randomized clinical trial; Participants: 139 people aged 59 or older with different comorbidities (lung disease, heart disease, diabetes, or arthritis); Intervention: The Chronic Disease Self-Management Program; Follow-up: 6 months.

## Brain exercises

### Ability to perform daily activities

Rebok et al. [2014]. *J Am Geriatr Soc* 62(1): 16-24. Design: randomized controlled trial; Participants: 2,832 older people with mean age of 73.6 years; Intervention: memory training, reasoning training and speed processing; Follow-up: 10 years.

### Processing speed

Rebok et al. [2014]. *J Am Geriatr Soc* 62(1): 16-24. Design: randomized controlled trial; Participants: 2,832 older people with mean age of 73.6 years; Intervention: memory training, reasoning training and speed processing; Follow-up: 10 years.

## Anxiety to do well

Kueider et al. [2012]. *PLoS One* : 7 : pages e40588. Design: Systematic literature review including 38 experimental studies; Participants: 3,205 individuals aged 55 years old or more, presenting with mild cognitive impairment; Intervention: Computer-based cognitive training for 2-68 weeks and from 20-120 minutes a day, depending on the study.

## Watchful Waiting

### Risk of dying

Jagger et al. [1993]. *Ageing*, 22[3], 190-197. Design: longitudinal cohort study; Participants: 1,203 individuals aged 75 years and older, living in the community and institutions; Intervention: watchful waiting; Follow-up: 5 and 7 years.

### Admission to a long-term care facility

Jagger et al. [1993]. *Ageing*, 22[3], 190-197. Design: longitudinal cohort study; Participants: 1,203 individuals aged 75 years and older, living in the community and institutions; Intervention: watchful waiting; Follow-up: 5 and 7 years.

### Feeling of helplessness

Sundli et al. [2014]. *Clin Interv Aging*, 9, 95-103. Design: randomized controlled study; Participants: 30 individuals aged 75 years and older; Intervention: watchful waiting vs. self-care telephone talks; Follow-up: 19 weeks.

Asakawa et al. [2000]. *Int J Aging Hum Dev*, 50[4], 319-328. Design: longitudinal study; Participants: 692 individuals aged 65 years or older who had high functional health status at the baseline; Intervention: watchful waiting across time (between baseline and 2 years); Follow-up: 2 years.

Orellano et al. [2012]. *Am J Occup Ther*, 66[3] 292-300. Design: Systematic review; Participants: older adults living in the community (mean age >72 years ); Intervention: IADL interventions (included an activity-based or occupation-based component); Follow-up: varied from 10 weeks to 5 years.

## Quality of life

Orellano et al. [2012]. *Am J Occup Ther*, 66[3] 292-300. Design: Systematic review; Participants: older adults living in the community (mean age >72 years ); Intervention: IADL interventions (included an activity-based or occupation-based component); Follow-up: varied from 10 weeks to 5 years.

