

# All About Aging

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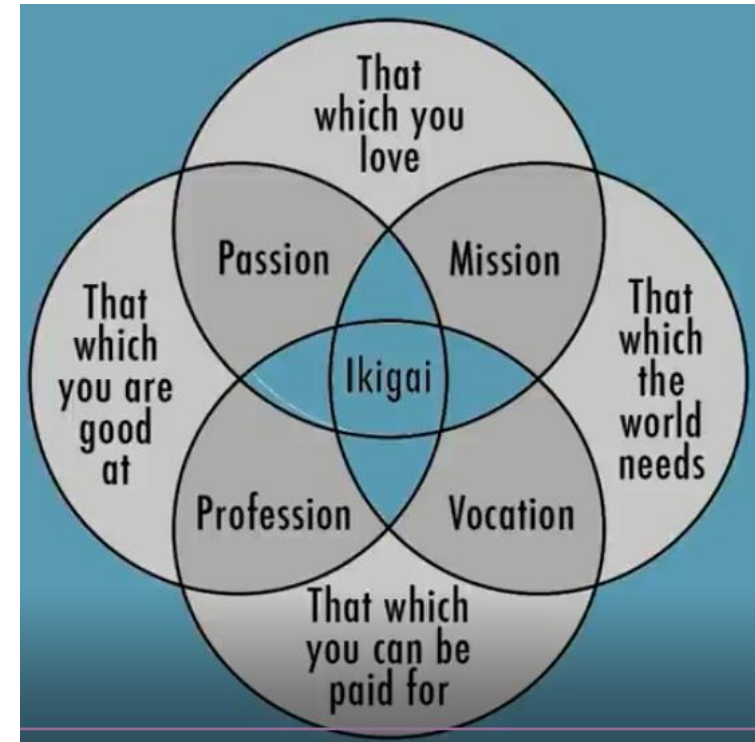
## [The Secret to Successful Aging](#)\_\_ Cathleen Toomey (10 min)

- Video



# The Secret to Successful Aging — Cathleen Toomey

- Why don't we approach aging with 'enthusiasm'?
  - Fear of aging and death
  - No roadmap – nobody expected this
- Instead
  - Don't think about it!
  - Stay 'connected' – volunteer, teach (I added this)...
  - Know your purpose – 'ikigai'\*
    1. What are you passionate about?
    2. What does the world need?
    3. What are you good at?
    4. What is your 'vocation'?
  - Maintain relationships



\*Ikigai = 'life' + 'what one hopes for' (aka 'a reason to get up in the morning')

# The Secret to Successful Aging \_ Cathleen Toomey

- What is the secret to successful aging?
  1. Don't be an Ostridge – celebrate your age, where you are
  2. Defy expectations – find the reason to get up in the morning, find your purpose
  3. Grow friendships – relationships matter, get out of the house, connect
- Look forward

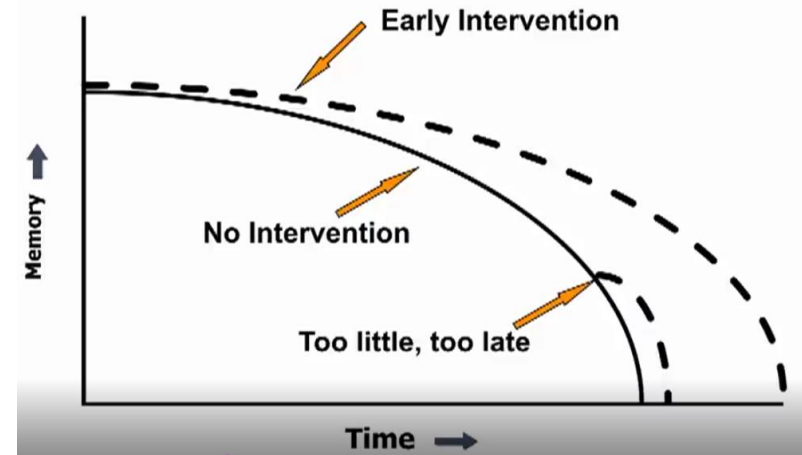
## [The Formula for Successful Aging](#) - Gary Small (11.5 min)

- Video

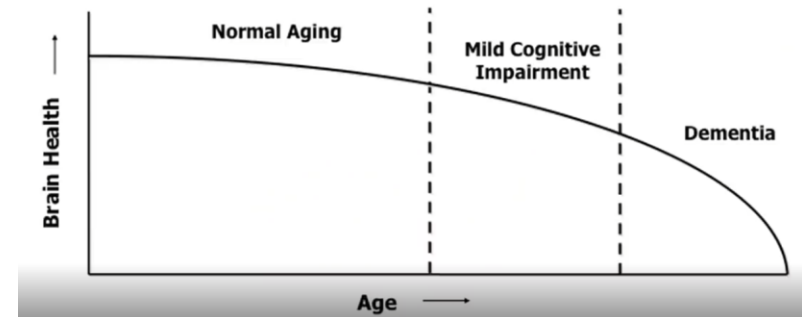


# The Formula for Successful Aging — Gary Small

- Blue Zones
  - Formula for successful aging
    1. Physical activity
    2. Mental exercise
    3. Stress management
    4. Healthy diet
  - Brain health
    - Early detection and intervention
  - Brain aging
    1. Normal aging
    2. Mild cognitive impairment
    3. Dementia



Stages of Brain Aging



# [Aging, It's Not What You Think](#) - Thad Polk (14 min)

- Video



# Aging, It's Not What You Think - Thad Polk

- In the absence of disease, the mental aspects of aging are restricted to only a few cognitive processes
  - Fluid processing – can you think logically, recognize patterns, solve problems
  - Crystallized processing – knowledge, experience, acquired skills
- Impact of aging on both
  - Fluid processing declines (starting at age 20!)
  - Crystallized processing gets better
    - Procedural memory remains intact
    - Emotional processing improves – greater life satisfaction...

What is 'Procedural memory' – a part of the long-term memory that is responsible for knowing how to do things, also known as motor skills



# Aging, It's Not What You Think - Thad Polk

- Research results
  - Leverages 'functional' MRI – looking for patterns of neural activation
    - Young subjects – distinctiveness activation patterns
    - Old(er) subjects – neural distinctiveness tends to decline (but not in everyone)
  - People with reduced neural distinctiveness have reduced fluid processing
  - Brains “don’t take aging lying down”
    - **As you get older, you start recruiting new brain regions** – this is great news!
      - High performing young – one hemisphere
      - Old(er) low performing – one hemisphere
      - **Old(er) high performing – both hemispheres** (helpful)
  - More accurately: **aging is 'transformation'** versus 'deterioration'

## Thriving Longer, The Future of Aging - Dr. Mark Allen (10.5 min)

- Video



# Thriving Longer, The Future of Aging — Dr. Mark Allen

- How to Cure Aging
  - Target and preserve 'regenerative capacity'
  - Treat & prevent multiple age-related diseases
  - Extend 'healthy' lifespan

# More on Aging

# What is the biggest benefit technology will have on ageing and longevity?

An example of technological innovations have been deployed to keep people physically active and enable independent living

- technology for detecting falls
- smart home technology
- early detection of diseases and management of disease conditions
- maintenance of social connections by reducing social isolation and continued engagement in the workforce

Issue: Many older people have not enjoyed a digital education nor feel at ease with new technologies as younger people do.

- These innovative solutions, assistive technologies or digital services tailor-made to the needs and preferences of older people harbor great potential to improve the quality of life and support independent living, also later in life
- To reap those benefits, it is essential to ensure that everyone has the required digital skills – and stays curious
- Interesting factoid: Technology adoption and use increased tremendously, with 44% of those 50 and older becoming more comfortable with technology now than before the pandemic.



**One in five** households provides care to an elderly or disabled individual who requires assistance. The number is expected to grow to **one in two** by **2030**

Health care spending is on the rise, with **75% of spending** due to **chronic disease**



2015



2030



Of adults 65 and older: **67%** go online, **80%** own a cellular phone, **40%** own a smartphone



**85%** of adults **65 and older** want to stay in **their home** and community as they age

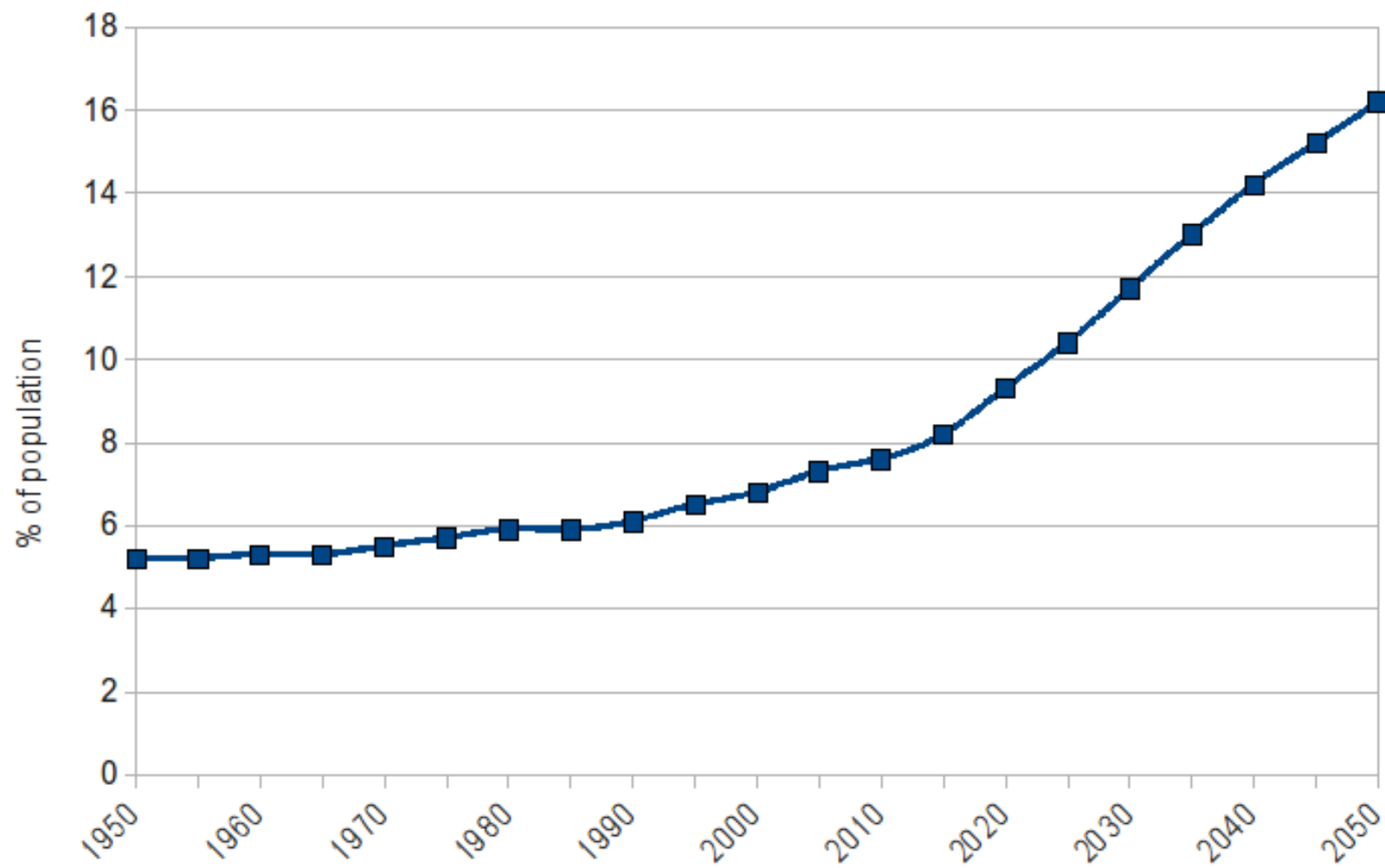
# 6 Ways Technology Can Make a Big Difference for Aging Populations

- **1. Identify at-risk individuals early on**
  - [Using Big Data](#), we can shift to a predictive model of helping people
- **2. Help seniors be more self-sufficient**
  - [Internet of Things technology](#), we can provide people with simple tools to make a small but meaningful difference in their lives
- **3. Bring medical care into their own homes**
  - **Telehealth services** allow patients to contact doctors either by phone or via video calls
  - [Voice Helper](#) can send out **programmed reminders to take medication**
- **4. Protect them from fraud**
  - Banks can protect seniors from theft, with things like [fraud detection systems](#). **Virtual wallets** specially designed for seniors are also available
- **5. Keep them feeling like part of a community**
  - **Video chatting apps** and **social media** can help seniors stay in touch, and [virtual reality](#) can connect them to their past memories, and **cognitive games** can help keep them mentally sharp
- **6. Identify problems before they become a full-blown crisis**
  - Data collected from the previous examples can help identify a problem before it becomes a crisis. We can **establish patterns** more easily, and **spot changes earlier on** than without data and caregivers can reach out to intervene early on.



### Percentage of the World Population Over 65, 1950-2050

Source: UN World Population Prospect, 2008



# How technology for seniors can improve quality of life

- Here's a new category - the so-called 'young-old' seniors aged 65-74 years, who use the internet (aka digital seniors)
  - How new tech solutions can target seniors: five key areas

**Home life**  
– safety, home tasks  
and consumption

**Wellbeing**  
– Health and exercise

**Social life**  
- Keeping contact and  
socialize

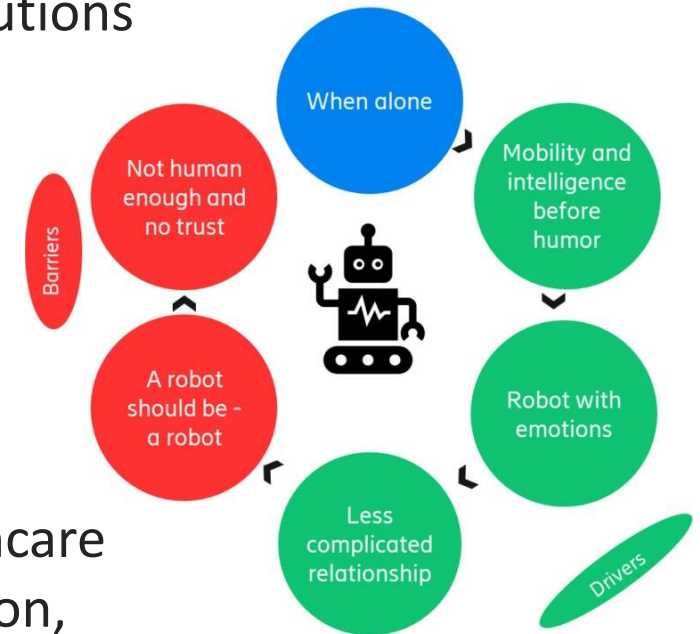


**Mobility**  
– personal and goods  
transport

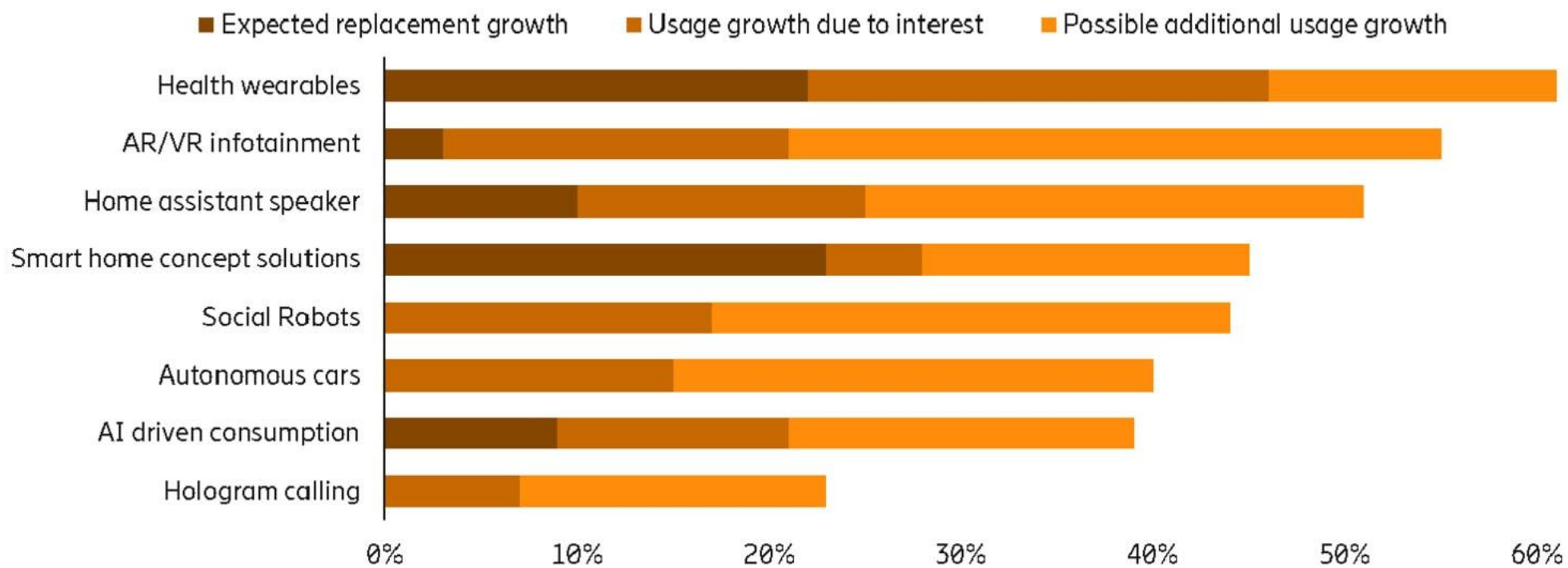
**Infotainment**  
– to get informed and  
entertained

# How technology for seniors can improve quality of life

- 5 tech solutions for seniors
  - **Home life**; an easier life for seniors with selected tech solutions
    - Better communication
    - Easier consumption
    - Better functionality
    - More convenience
  - **Social life**; a future companion can be a robot\*
  - **Mobility**; ageing is obvious since convenience and safety are top of the list
  - **Health**; optimistic views on using tech solutions for healthcare and exercise, incl. wearables, online healthcare consultation, mobile medical clinic, robots in the hospital...
  - Having fun with **Virtual Reality** – but utility is more important



## Possible usage levels for tech solutions in five years



# 7 (actually 6) new tech devices for elder care that help seniors live happier, healthier lives

- Intuition Robotics

- The proactive cognitive artificial intelligence product initiates conversation to help the senior stay in touch with family or loved ones, engage in healthy behaviors — including nudges to take medication — and stay connected with the outside world.

- Joy For All

- The robotic cats and pups have sensors that allow them to interact with a human companion as they would with a live pet. The cat responds to touch, rolls over and utters 32 different types of purring sounds. The pup's heartbeat slows down if a hand is placed on its back.

# 7 (actually 6) new tech devices for elder care that help seniors live happier, healthier lives

- Toi Labs

- Created a toilet seat called TrueLoo. With the ability to fit on any toilet, TrueLoo has sensors that can determine who the user is. It then scans the toilet bowl to determine the size, color, consistency, frequency and shape of the excreta. The information is provided to the senior living managers so they can monitor their residents' health.

- VitalTech

- VitalBand is an emergency voice call-out and fall-detection watch that provides a more subtle way to monitor for falls, while tracking vital signs like heart and respiratory rate and oxygen saturation, as well as physical activity and sleep quality. It also provides medication reminders.

# 7 (actually 6) new tech devices for elder care that help seniors live happier, healthier lives

- Embodied Labs

- Provides an immersive program that uses virtual reality headsets. When worn, these headsets offer simulations in which caregivers take on the persona of an aging person facing a variety of situations, including macular degeneration, Alzheimer's and Parkinson's disease.

- Neuro Rehab VR

- By employing machine learning, the company tailors each exercise to a patient's specific therapy needs and ability. The customized virtual therapy exercises record physiological and kinematic responses, quantifying the progress of the patient with scores and metrics over time.

# Videos

- [What is pain?](#)
- [The most advanced prosthetic in the world](#)
- [The formula for successful aging - Gary Small](#)
- [The Secret to Successful Aging | Cathleen Toomey](#)
- [Thriving longer, the future of aging - dr mark allen](#)
- [A prosthetic arm that feels - todd kuiken](#)
- [Aging: It's Not What You Think | Thad Polk](#)
- [How we'll become cyborgs and extend human potential | Hugh Herr](#)



Thank you!