



## **An Aging-in-Place Solution: Dementia Caregivers Skills Training through Virtual Reality (VR-SIM CARERS)**

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## Family Caregivers & Care partners: A Working Definition

“Individuals who provide extraordinary, uncompensated care on a long-term basis, predominantly in the home setting, involving significant amounts of time and energy, requiring the performance of tasks that may be physically, emotionally, socially, or financially demanding.”

Reference: Biegel, D., Sales, E., and Schulz, R. (1991). Family caregiving in chronic illness: Heart disease, cancer, stroke, Alzheimer's disease, and chronic mental illness. Newbury Park, CA: Sage Publications.



# Family Caregivers' Well-being

## THE IMPACT OF COVID-19 ON CAREGIVERS. A COMPARISON OF YEAR ONE AND TWO



**58%**  
of caregivers  
feel burnt out



**61%**  
of caregivers find  
caregiving stressful  
overall, up from 49%



**42%**  
of caregivers say their  
mental health is worse  
now compared to a  
year ago



**23%**  
of caregivers say they  
are not coping well, as  
compared to 17% the  
year prior



**46%**  
feel lonely, isolated,  
up from 43%



**76%**  
are tired, up  
from 66%



**64%**  
are anxious and  
worried, up from 57%



**61%**  
are overwhelmed,  
up from 53%



**53%**  
feel trapped,  
helpless and  
frustrated, up  
from 43%



**45%**  
feel  
unappreciated,  
up from 39%



**20%**  
took out a loan or line  
of credit to help pay  
for the expense, up  
from 17%

## Family Caregivers: Key partners in care

- Family and unpaid caregivers play an essential role in care and aging-in-place.
- What are they saying:
  - include them as care partners on the care team –wealth of information to inform care
  - connect them to training opportunities, workshops, and resources to support their own well-being – resilience building



**Reference:** The Ontario Caregiver Organization (2021); “Spotlight 2021 - The Impact of Covid-19 on Caregivers: Year Two”

# The Reitman Centre CARERS Program

A Therapeutic Skills Training Program

Coaching, Advocacy, Respite, Education, Relationship, Simulation

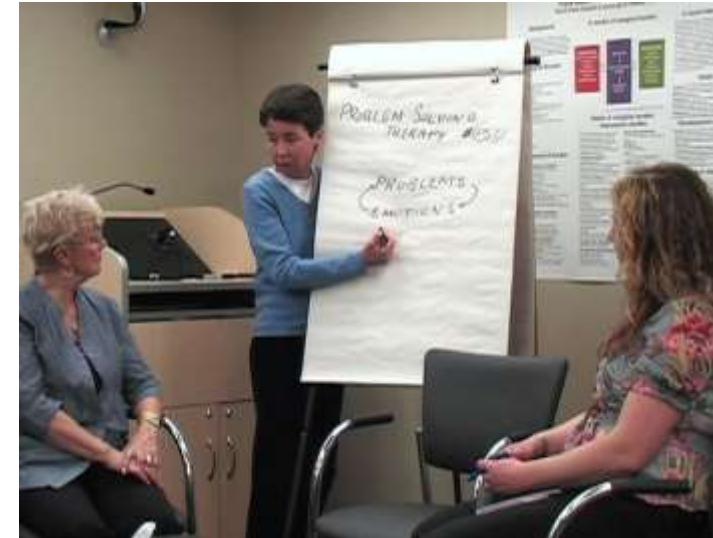


**Evidence-based clinical intervention:**  
Group Psychotherapy with  
Simulation / Experiential Learning  
Tailored for Dementia Family Caregivers



# Reitman Centre CAREERS Program

- 8-week small group psychotherapy
- Co-facilitated by two mental health clinicians
- 3 theoretical “pillars”:
  - Tailored dementia education
  - Problem Solving Techniques
  - Skills training through Simulation



~ Emotional experiences acknowledged and processed ~

# Simulation - Experiential Learning



Reitman Centre YouTube Channel Playlist  
Caregiving: Coaching using simulation video series

“For the things we have to learn  
before we do them, we learn by doing them”

- *Aristotle*

# Common Dementia Caregiving Challenges

Some commonly encountered caregiving scenarios previously scripted and included in Dementia Advisor App were:

- Dealing with refusal
- Managing work demands
- Managing difficult behaviours
- Dealing with family tension
- Having no time for self
- Making difficult decisions
- Accessing and managing services





## Dementia caregivers skills training through virtual reality simulation (VR-SIM CARERS)

Dementia is a major public health challenge. Most persons with dementia are cared for at home by community caregivers who often lack the skills to provide safe and effective care. In-person skills-training interventions can be effective in imparting skills but are time and resource intensive and not widely accessible. Virtual reality-based (VR) simulation training is one solution that could overcome these deficits. This project aims to:



Person wearing virtual reality goggles. She is facing a computer screen that shows an artificial intelligence avatar.

1. employ a co-design approach (including input from caregivers and typical demographic representatives) to develop and validate an immersive VR simulation training environment for caregivers of persons with dementia;
2. evaluate the developed VR simulation training for feasibility, acceptability and tolerability;
3. conduct pilot testing of the developed VR simulation training to examine:
  - the initial clinical efficacy in improving quality of relationship with persons with dementia, competence, resilience, and reducing depression and stress in caregivers; and
  - the readiness for implementation in the community.

### Collaborators:

- Ontario Shores Centre for Mental Health Sciences
- NRC's Medical Devices Research Centre

**Contact:** Michael Smith, Medical Devices, NRC

Source: <https://nrc.canada.ca/en/research-development/research-collaboration/programs/projects-funded-under-nrcs-aging-place-challenge-program-canadian-institutes-health-research-cihr>

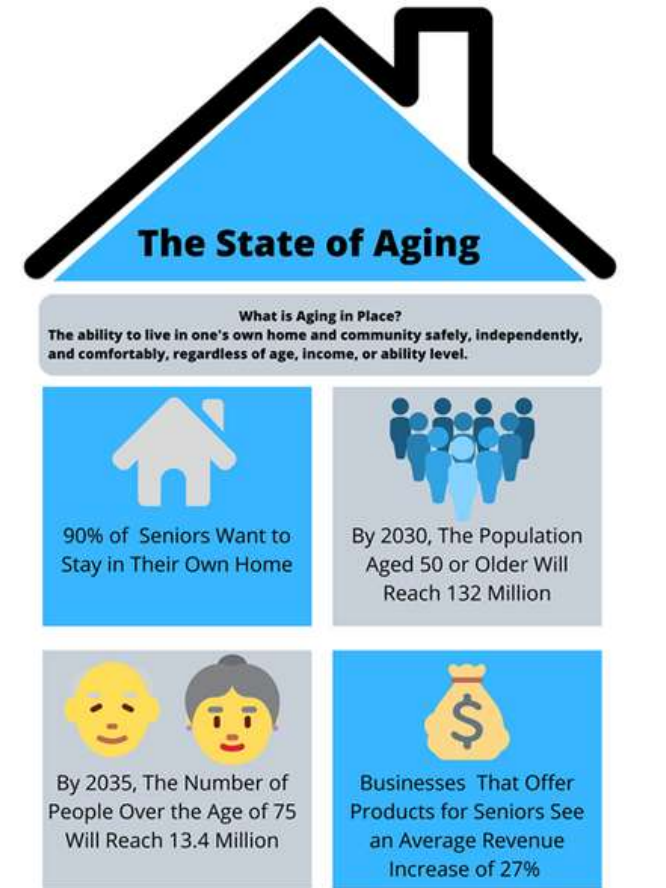
## VR-SIM CARERS:

# Adaptation of Reitman Centre CARERS Program into Virtual Reality

# VR-SIM CARERS: An aging-in-place solution

“Plan for the future today to help you live the life you want tomorrow.”

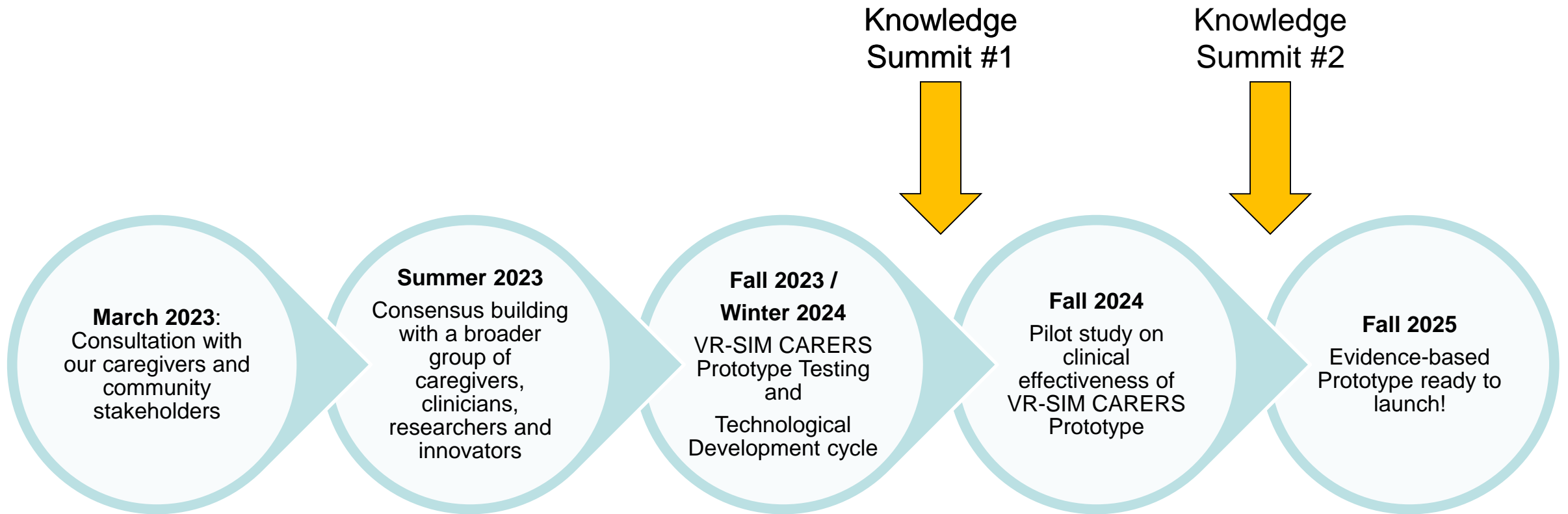
- National Research Council Canada (NRC)



Infographic Source:

<https://www.smithmicro.com/blog/2019/12/05/aging-in-place-how-technology-is-keeping-seniors-at-home-longer/>

# Co-design with Knowledge Users



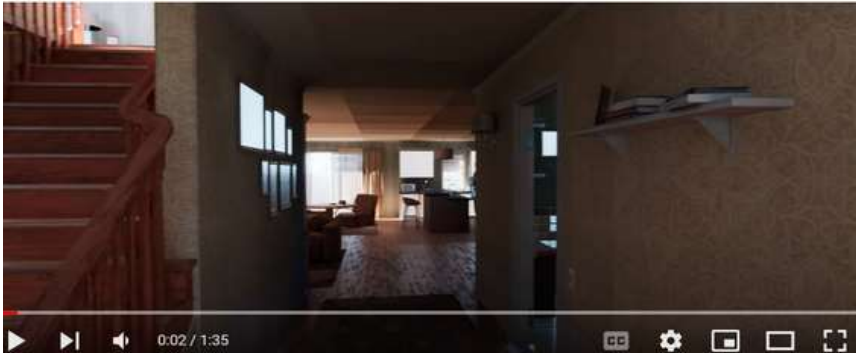
# VR-SIM CARERS: Focus Group Findings

On March 29<sup>th</sup> the VR SIM CARERS initiative hosted a Consultation Session and three focus groups with caregivers, clinicians, researchers and other key stakeholders.

Themes:

- **Challenges encountered by caregivers:** communications, role-reversal, difficult relationship, role restructuring, self-care, ambiguous loss and grief, physical & mental health decline
- **Practical issues with VR:** Barriers to access, user-friendliness, safety, inexperience with technology and VR
- **Consideration for technology development:** human element, social and emotional connection, customization per stage of dementia/caregiver characteristics
- **Implementation of VR-SIM CARERS:** inclusivity, accessibility, different modes of interaction, tech coaching





## VR-SIM CARERS: Virtual Reality Demonstration



# Immersive Technology

- Immersive technology refers to any technology that creates a sense of presence or immersion in a virtual environment.
- It blurs the line between real and simulated worlds, and gives users a 360-degree perspective of their environment.
- Immersive experiences are commonly achieved through:
  - Virtual Reality (VR)
  - Augmented Reality (AR)
  - Mixed Reality (MR)
- The umbrella term for these three experiences is Extended Reality (XR).

# Immersive Technology (cont.)

**VR**



**Digital environments  
that shut out the real world.**

**AR**



**Digital content on top  
of your real world.**

**MR**



**Digital content interacts  
with your real world.**

# Concept Demo



# Demo Review

- REPLACE SLIDE WITH GRAPHIC FROM PROTOTYPE

# Future Developments

- Narrative & User Interface: Non-playable characters within the game currently have a set dialogue option, however randomized inputs could be incorporated, adding to the immersive experience.
  - A narrator should be added to provide support to the player. They would provide tips and reaffirm the player's action. This could be done via a tip box, floating head, etc.
  - Subtitle size will be increased, and response options will be summarized on the surface.
- Character & Models: Models are needed to reflect the appearances of the characters in each scenario
  - These models could be changed at any point to reflect diversity.
  - Additionally, non-playable characters should be able to randomly roam around their environment, or preform idle animation when stationary to bring a sense of life into the scenario.
- SLIDE TO BE UPDATED BASED ON VIDEO SELECTION



# Future Developments (cont.)

- **Environments:** Depending on the content group, various environments will be created to better fit specific scenarios, and give a sense of diversity.
  - For example: A home, a store, a office, etc.
- **Audio:** Professional voice acting and sound effects should be added into the simulations, which will add value to the immersion.
- **Settings:** Graphic settings will be incorporated to adjust for various hardware specs. Movement settings will be incorporated so that the player can choose what best fits their needs (snap teleport or locomotion).

# Acknowledgement



Our Designated Knowledge Users:  
Mr. Ron Beleno & Ms. Irene Rubinstein