Frail Aging Simulation Toolkit

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Figure 1. Baycrest CLRI Programs
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What is Simulation?
By Dr. Bruce Ballon

Simulation is the imitation or emulation of some real thing, state of affairs or process. It is a methodology to help achieve educational goals. The most powerful and efficacious simulations are conducted based on strong educational principles, run by expert facilitators and within the context of the objectives of a curriculum.

Simulation used for healthcare encompasses a range of activities that share a broad, similar purpose: to improve the safety, effectiveness and efficiency of healthcare services.

Simulation can include a variety of modalities, ranging from:
- Manikins
- Task trainers
- Standardized patients
- Moulage and props
- Environmental elements
- Psychological factors
- E-blended learning and e-simulations
- Film/video
- Hybrid forms of the above

The key to using simulation effectively is to match appropriate levels of fidelity of a simulation to the learning objectives and level of training of the learners. High fidelity simulations, such as manikins, are not needed for every type of learning encounter— and in fact may be poorly matched for the needs of the session. Cost-effective choices of using what is needed to create the proper level of challenge and maintain the simulation “reality” is the true art of the simulationist.

Simulations can be created for individuals, teams and agencies to improve patient safety (e.g. creating scenarios that enhance communication, management skills and assessment abilities). Simulation can be geared to the learners’ experience and the context of training. One can match the intensity and goals of a simulation for new students to seasoned, well trained teams of healthcare professionals. Simulations can also guarantee that learners be exposed to certain healthcare situations that are rare and often would not come up during training, but may help them when they go into the field. Due to the multiple ways of observing a simulation, a rich wealth of feedback is available for learners to absorb and use in their development as healthcare providers.
What is a Simulationist?
By Dr. Bruce Ballon

Often healthcare simulation education is run by those whose official primary designation is in one or another branch of healthcare (i.e. the nurse clinician specialist, an EMS trainer and so on). Our goal in creating the concept of the simulationist is to help promote being a simulation expert as a primary role in healthcare, for such a role is going to be important in helping transform how we educate and train our future healthcare professionals.

A simulationist is an educational expert in the knowledge, skills and attitudinal aspects of using the methodologies of simulation to achieve learning objectives.

A content expert in one branch of healthcare does not equate to having the knowledge, skills or attitudes to bringing such content to life in the experiential way a simulationist can. Neither does it mean that a content expert has the ability to brief, debrief and facilitate such experiences in an effective and safe manner.

A technician who can run the technical devices or a human factor who is trained to play a role does not always equate to being able to do the educational aspects in simulation. However, over time, many in such fields start to develop, or wish to develop, those missing aspects.

Thus, the simulationist combines the aspects of the educator, the technician, the roleplayer, the writer, the briefer/debriefer/facilitator, with mastery of creating a rich and collaborative learning climate of discovery for their learners and trainees. They employ appropriate levels of fidelity from a variety of simulation modalities to help reach the learning objectives for the participants. These concepts should be grounded in sound learning theories that support the use of simulation in the most effective ways. The simulationist must also, like any major production, do many things behind the scenes, such as detail management, budget control, keep to timelines and be a trouble-shooter extraordinaire. Along the way, the abilities to incorporate new special effects, set design and the art of iteration flourish in the simulationist.

The capable simulationist’s major abilities include being able to help learners deal with their resistance to simulation, helping educators incorporate simulation into curricula, and demonstrating ways to create formative and summative simulation experiences.
What is a Facilitator?

There are a variety of definitions for a facilitator:

1. "An individual who enables groups and organizations to work more effectively; to collaborate and achieve synergy. He or she is a 'content neutral' party who by not taking sides or expressing or advocating a point of view during the meeting, can advocate for fair, open, and inclusive procedures to accomplish the group's work" - Doyle[1]

2. "One who contributes structure and process to interactions so groups are able to function effectively and make high-quality decisions. A helper and enabler whose goal is to support others as they achieve exceptional performance" - Bens[2]

3. "The facilitator's job is to support everyone to do their best thinking and practice. To do this, the facilitator encourages full participation, promotes mutual understanding and cultivates shared responsibility. By supporting everyone to do their best thinking, a facilitator enables group members to search for inclusive solutions and build sustainable agreements" - Kaner[3]


A Frail Aging Simulation Toolkit to Shift Values & Attitudes through Experiential Learning

The Baycrest CLRI is responsible for investigating new educational approaches to enhance values and attitudes for LTCH staff. One such opportunity occurred during the Interprofessional Internship in Innovation and Aging, which is a summer program run by the Baycrest CLRI. It allowed us to trial a frail aging simulation suit which laid the groundwork for developing this toolkit.

This toolkit will allow users to:

1) Identify and utilize frail aging simulation techniques and scenarios
2) Use these simulations to engage participants to reflect and develop a deeper understanding of frail aging, age-related changes and disease-related changes

Participants of the simulation will experience and reflect on common scenarios encountered by the elderly in the healthcare system.

Facilitators, using this toolkit, will have the ability to utilize various activities and learning materials with an interprofessional audience.

Simulated Learning Toolkit Goals:

1. Increase knowledge and understanding of frail aging vs. normal aging
   With an aging Baby Boomer demographic, society as a whole, and especially health care providers and professionals, must gain a strong understanding of the impact of aging and frailty. This simulation intends to increase a person’s awareness of assumptions about aging.

2. Enhance empathy and increased awareness of attitudes towards the frail elderly
   An improved understanding of common physical, emotional, and sensory challenges will lead to enhanced empathy and attitudes towards the frail elderly. Simulations can also be used to reflect on an individual’s attitudes towards aging and the elderly.

3. Enhance the care practices of healthcare professionals
   As a form of experiential learning, simulation enables healthcare professionals to integrate thinking, feeling, perceiving, and behaviour change to improve care practices with the frail elderly.
Frail Aging Simulation: Anticipated Experience

Physical Changes
1. Movement
2. Posture
3. Gait
4. Strength

Sensory Impairments
5. Hearing
6. Vision
7. Tactile grip

Frail Aging Simulation: Implications for Practice

Educators and leaders are seeking creative ways to engage teams in transforming care of the elderly. Resistance to change is sometimes driven by underlying values and attitudes that reflect individual experiences and collective world views. By providing a lived experience of being less able and increasingly frail, and through guided reflection, these simulations allow participants to gain increased awareness of frailty. Previous participants elucidated changes in perspective and subsequent behaviour when working with frail elderly persons. Others have reported increased empathy and compassion.

In contrast to traditional didactic education, simulation offers alternative, immersive learning experiences that can shift beliefs. Staff and students report a range of physical and emotional experiences, as well as immediate implications and reflections for future professional practice and care.
Frail Aging Simulation Scenarios

These simulations are designed for one to experience what it is like to be frail and elderly. The tasks below will allow the participant to feel the impact of aging. The conversation is designed to allow the “helper” to be as distant and unhelpful as possible. “Helper” is to speak as quickly and softly as possible, without emotion.

Anything in quotation marks ("... ") is to be read out loud by “helper.” Please do not offer help, unless the participant in the suit asks for it.

If the participant has attempted a task 3 times, does not ask for help, and is unable to complete the task, he or she should be instructed to proceed to the next activity (e.g., participant unable to complete task 1 - step 2, proceed to task 1 - step 3).

The objective of the “helper” is to guide the participant wearing the aging suit through a series of tasks.
Outpatient Scenarios

Simulation Scenario 1: MRI

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Visual Impairment</th>
<th>Hearing Impairment</th>
<th>Mobility Impairment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waiting room + mock MRI</td>
<td>✔</td>
<td>✔</td>
<td>Slight</td>
</tr>
</tbody>
</table>

Slight mobility impairment consisted of tightened belts at the elbows and knees in order to limit range of movement in those joints.

Equipment needed: Sakamoto suit, 2 chairs, waiting room sign, clipboard, form, pen, MRI room sign, plinth or surface to lie down.

1. Once participant is in the suit (includes glasses, earplugs, gloves, and cane): “Go to the waiting area and sit down”
2. Allow participant to walk a distance
3. Once seated call to the participant: “Get the clipboard from the counter”
4. Participant walks to counter
5. Once they have the clipboard: “Go back to seat and fill out the clipboard”
6. Participant walks to waiting room chair
7. Once participant is done filling out the form: “Return clipboard to counter and go back to your chair”
8. After one minute has passed: “Head over to MRI room”
9. Participant walks to ‘MRI room’
10. Once in the ‘MRI’ room: “Sit in the chair until you’re called”
11. Count ten seconds once seated, then instruct participant to: “Come into the MRI”
12. Participant walks to plinth
13. Once participant has almost reached the plinth: “Lie down”
14. After one minute has passed: “You’re done. Return to the waiting room chair”
15. Allow participant to walk a distance
16. Once the participant has waited for 1-2 minutes, end scene
Simulation Scenario 2: X-ray

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Visual Impairment</th>
<th>Hearing Impairment</th>
<th>Mobility Impairment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waiting room + mock X-ray</td>
<td>✔️</td>
<td></td>
<td>Moderate</td>
</tr>
</tbody>
</table>

Moderate mobility impairment consisted of tightened belts at the elbows and knees as well as tightened straps along the trunk and upper leg. This limited range of movement in the elbow, knee and hip.

**Equipment needed:** Sakamoto suit, 2 chairs, waiting area sign, clipboard, form, pen, x-ray room sign, plinth or surface to lie down.

1. Once participant is in the suit (include glasses, no ear plugs, tightened straps for torso and legs, and cane): “Go to the waiting area and sit down”
2. Allow participant to walk a distance
3. Once seated, call the participant: “Get the clipboard from the counter”
4. Participant walks to counter
5. Once participant has the clipboard: “Go back to your seat and fill out the clipboard”
6. Participant walks to waiting room chair
7. Once participant is done filling out the form: “Return the clipboard to the counter and return to your chair”
8. After one minute has passed: “Head over to x-ray room”
9. Participant walks to x-ray room
10. Once in the ‘x-ray room’: “Stand at the x-ray machine”
11. Once done the ‘x-ray’: “Return to the waiting room chair”
12. Allow participant to walk a distance
13. Once the participant sits, wait for 1-2 minutes, then end scene.
Simulation Scenario 3: Dressing

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Visual Impairment</th>
<th>Hearing Impairment</th>
<th>Mobility Impairment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waiting room + dressing examination</td>
<td></td>
<td>✔</td>
<td>Severe</td>
</tr>
</tbody>
</table>

Severe mobility impairment consisted of tightened belts at the elbows and knees as well as straps along the trunk and upper tightened until the effect of creating a stooped posture is achieved.

**Equipment needed**: Sakamoto suit, 2 chairs, waiting room sign, change room sign, clipboard, form, pen, gown

1. Once participant is in the suit (no glasses, includes earplugs, tightened straps for torso and legs, and cane): “Go to the waiting area and sit down”
2. Allow participant to walk a distance
3. Once participant sits, wait 1 minute: “Get the clipboard from the counter”
4. Participant walks to counter
5. Once participant has the clipboard: “Go back to seat and fill out the clipboard”
6. Participant walks to waiting room chair
7. Once participant is done filling out the form: “Return clipboard to counter and return to your chair”
8. Wait 1 minute: “Head over to the change room”
9. Participant walks to change room
10. Once in the waiting room, hand participant the gown: “Put the gown on and take your shoes off”
11. Once changed, walk back: “Go back to the waiting room but put your shoes on first”
12. Allow participant to walk a distance
13. Once participant sits, wait for 1-2 minutes, then end scene
Long-Term Care Home Scenarios

These simulation scenarios are designed for one to experience what it is like to be frail and elderly. The tasks below will allow the participant to feel the impact of aging. The conversation is designed to allow the “helper” to be as distant and unhelpful as possible. “Helper” is to speak as quickly and softly as possible, without emotion.

Anything in quotation marks (“…” ) is to be read out loud by “helper.” Please do not offer help, unless the participant in the suit asks for it.

If the participant has attempted a task 3 times, does not ask for help, and is unable to complete the task, he or she should be instructed to proceed to the next activity (e.g., participant unable to complete task 1 - step 2, proceed to task 1 - step 3).

The objective of the “helper” is to guide the participant wearing the aging suit through a series of tasks.

Equipment: Sakamoto suit, 4 chairs, table, bedroom sign, dining room sign, gown, cutlery, a glass with a straw, a plate, and clothing protector, recreation room sign

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Visual Impairment</th>
<th>Hearing Impairment</th>
<th>Mobility Impairment</th>
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</thead>
<tbody>
<tr>
<td>Long-Term Care Home</td>
<td>✔</td>
<td>✔</td>
<td>Severe</td>
</tr>
<tr>
<td>Scenarios</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Severe mobility impairment consisted of tightened belts at the elbows and knees as well as straps along the trunk and upper tightened until the effect of creating a stooped posture is achieved.

Task 1: Putting on a Gown (Gown, bedroom sign & chair)

1. Once participant is in the suit (glasses, includes earplugs, tightened straps for torso and legs, and cane): “You have no clothes. Everything is in the laundry. Put on this gown. Tie both ties!”
2. Hand them the folded gown.
3. Leave the room for 2 minutes.
4. Come back in.
5. If the gown is not tied in 2 spots. Sigh. Tie the ties for the participant while shaking your head and say “I have to do everything for you.”
6. Once the gown is on correctly say “Go to the dining room and sit on the chair.”
7. Participant walks to the assigned dining room chair
Task 2: Dining Room (Dining room sign, cutlery, glass, plate, straw, 2 chairs and a table)

1. As the participant approaches the dining room say, “Sit down.”
2. As soon as the participant selects a chair say, “You’re in the wrong chair! Don’t you remember where you sit? Sit on the other chair”
3. Participant walks to the other chair to sit.
4. Step away and allow them to sit for 1 minute without providing instructions.
5. Come back in.
6. Provide them with cutlery, a glass with a straw, and a plate. Allow them to apply their own clothing protector.
7. Say, “Drink your water. You have to drink!”
8. Step away and allow them to sit for 1 minute without providing instructions.
9. Come back in.
10. Say, “Breakfast is over! Go to the Recreation Room”

Task 3: Recreation Time (Recreation room sign & 2 chairs)

1. As soon as the participant arrives say, “Time for exercise. Sit down.”
2. Exercises will begin. Perform these with the participants.
3. “Reach for the sky.” Raise both hands straight up in the air 4-6 times
4. “Kick your legs one at a time. Follow me.” Raise and straighten your legs from a sitting position. Lift one side then the other. Do 4-6 sets.
5. “Stand up and bend side to side now.” Stand up. Bend on one side then the other. Do 4-6 sets.
6. “Go on your tippy toes now.” Stand up and raise yourself up on the ball of your feet. Do 4-6 sets.
7. Once participant completed these exercises, say “You’re done. Stay here.”
8. Step away for 1 minute:
9. Come back into the room: “OK all done. Go back to your room.”

Task 4: Changing (Bedroom sign & chair)

1. As participant is walking towards the room: “There you are. You’re still here? What’s taking so long? Take off your gown. Your clothes are here”
2. Allow the participant to remove the gown. Wait 1 minute
3. Come back in.
4. If the gown is still tied in 2 spots. Sigh. Untie the ties for the participant while shaking your head and say “I have to do everything for you.”
5. Once the gown is off, say “Let’s go. Lunch is here.”
Support Services in LTC Scenarios

This simulation is designed for one to experience what it is like to age with frailty and to experience poor communication from staff.

The tasks below will allow the participant to feel the impact of frail aging. The conversation is designed to allow the “helper” to be as distant and unhelpful as possible. Speak as quickly and softly as possible, without emotion.

Anything in quotation marks (“…”) is to be read out loud by the “helper.” Please do not offer help, unless the participant in the suit asks for it.

If the participant has attempted a task 3 times, does not ask for help, and is unable to complete the task, he or she should be instructed to proceed to the next activity.

The objective of the helper is to “guide” the participant wearing the frail aging suit through a series of tasks.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Visual Impairment</th>
<th>Hearing Impairment</th>
<th>Mobility Impairment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-Term Care Home Scenarios</td>
<td>✓</td>
<td>✓</td>
<td>Severe</td>
</tr>
</tbody>
</table>

Severe mobility impairment consisted of tightened belts at the elbows and knees as well as straps along the trunk and upper tightened until the effect of creating a stooped posture is achieved.

Equipment: Sakamoto suit, 5 chairs, bedroom sign, reception sign, waiting room sign, dressing room sign, x-ray room sign, gown, clipboard, pen with a cap, patient form)

**Task 1: Pick up** (Bedroom sign, chair)

1. Once participant is in the suit (no glasses, includes earplugs, tightened straps for torso and legs, and cane) and standing: “Name. You have an appointment. Come with me”
2. Walk quickly ahead of the participant: “Walk fast! You’re late!”
3. Once 10-20 seconds have gone by: “Are you coming?”
4. Pretend to Call Dispatch and speak into a phone: “Hi Joe, I’m going to be late for the next one. Things are moving slow here”
5. Send participant to the next task

**Task 2: Sign in** (Reception sign, chairs, clipboard, patient form, pen with a cap)

1. Once participant is in sight: “Name. Please come here and fill out the forms”
2. Allow the participant to finish walking to you, then hand over the clipboard with form attached, and a pen
3. Once participant has the clipboard, form and pen: “Go have a seat and fill out the clipboard”
4. Participant walks to waiting room chair
5. Once a minute has passed: “Are you done?” if not, "Could you just sign it at the bottom and pass it back to me?"
6. Once clipboard is received: “Have a seat.”
7. Have participant wait 1 minute then proceed to next task

Task 3: Waiting (Waiting room sign, chair) (have 2 helpers)
1. While participant is sitting in the waiting room, walk by and clean around him/her
2. Another co-worker comes in to the scene: “Oh hi! How was your long weekend?”
3. Have a discussion about your weekend, ignore participant, laugh, be loud
4. Walk away with your co-worker

Task 4: Putting on the gown (dressing room sign, chair, gown)
1. While the participant is in the waiting room: “Go to the change room.”
2. Allow participant to walk the distance
3. Hand participant gown: “Put this gown on and tie both ties. Take your shoes off for ... what’s your test again? Is it ECG, EEG, CT, MRI, fMRI, ABG, CBC, Lytes, LFTs? Do you know? Of course you don’t....”
4. Once participant is wearing gown: “Go over to the dressing room. Yes over there and make sure to take your shoes off”
5. Leave the room for 1 minute
6. If the participant does not tie both ties: “that’s too bad but you really need your shoes on”
7. Direct participant to next stop: “Go to the procedure room over there please”

Task 5: X-ray (X-ray room sign, chair)
1. Once participant is in the x-ray area: “Come with me for your PA x-ray”
2. Allow participant to walk the distance and once close to the chair under the sign ‘x-ray room’ point to the armchair: “Sit in the chair – all the way back”
3. Once participant has sat in the chair for 1 minute: “Stay here”
4. Leave the room for 1 minute
5. Come back into the room: “OK, all done. Go back to the Dressing Room.”
6. Once gown is off, wait 1 minute then proceed to next task

Task 6: Changing (dressing room sign, chair, gown)
1. Once participant is walking toward the dressing room: “There you are. You’re still here? What’s taking so long? Please take off your gown.”
2. Once gown is off, wait 1 minute: “Let’s go. The doctor has been waiting ...”
## Age-Related Changes

Age-related changes happen in different systems of the body impacting elderly persons. The frequently occurring changes included here show that we must adapt the way we care, converse, and approach the elderly in our care. These are not to be confused with disease-related changes, nor do they diminish the reality that successful aging still occurs.

### Neurological – Head, Nerves, Pain

- Less blood flow to brain leads to a decline in executive function (i.e. planning, attention and problem solving abilities)
- Reduced brain size and neurons lead to slower speed of thinking, poorer short-term memory, and longer time needed for reasoning
- Slower nerve impulses (sensory and motor) lead to changes in movement and motor control
- Slower movements, not as balanced or coordinated
- Bone thinning of the spine may increase pressure to the spinal cord and may lead to decreases in response to stimuli and longer reaction time
- More difficulty choosing words
- Less ability to filter out distracting information
- Less ability to regulate heat
- Fever becomes less likely with infection
- Less likely to have a fever when they have infections

### Mood & Behaviour

- Fewer neurotransmitters and catecholamines
- Poor sleep leads to an increased risk of major depression, memory problems and fewer social interactions

### Sensory – Eyes, Nose, Ears, Tongue

**Eyes:**
- Less flexibility in lenses, which leads to poorer focus on close objects (presbyopia) and lowered ability to adjust to changes in bright lighting (glare prevents seeing clearly)
- Less night vision
- Less sensitivity in cornea and conjunctiva
- Less tear production
- Less ability to see differences in colour
- Cholesterol deposits lead to visual haziness
- External ears get larger
- More ear wax impaction
- Less elasticity in the ear canal
- Thinning and stiffening of the tympanic membrane
- Less ability to recognize speech
- Less ability to hear higher tones
- Less ability to follow conversations
- Slower brain processing of auditory information
- Changes in the vestibular system of the inner ear lead to more dizziness with falling

**Smell:**
- Less smell leads to less taste, which may lead to decreased appetite
- More ability to identify odours
- More chance of nose bleeds

**Taste:**
- Less taste
- Less saliva production

### Respiratory – Breathing & Lungs

- Stiffer chest wall and reduced lung muscle strength and elasticity
- Less gas exchange
- Drier mucus membranes
- Lower cough reflex leads to reduced ability to clear mucus/foreign matter and an increased risk of infection and spasm of airway
- Greater chance of loss of breath when working harder than normal which leads to lower exercise tolerance

### Cardiovascular – Heart & Circulation

- Heart has to work harder due to thicker heart muscles, stiffer arteries and heart valves, thicker arterial walls and more fat around the heart
- Less blood flow leads to cool arms, hands, legs and feet
- Fewer white blood cells and lower immune response = higher risk of infections
- Lower heart rate during exercise and a high risk of heart rhythm changes
- Less cardiac reserve leads to more tiredness, shortness of breath and a slow recovery from higher heart rate (i.e. after exercise).
- Higher risk for a drop in blood pressure when changing positions (postural hypotension) – laying down to sitting or sitting to standing
Integumentary – Skin & Touch

Skin:
- More dryness; more scaly and wrinkled
- Less subcutaneous fat (under the skin) leads to less stretch but more visceral fat (deep)
- Less ability to sweat
- Thinning and shrinking of the top layer of skin (epidermis) leads to slower healing
- Fewer nerve cells leads to less ability to feel and sense
- Less contact between dermis and epidermis (skin layers) leads to reduced nutrient exchange
- Changes in hair: colour and thinner scalp, pubic and axilla hair; thicker nasal and ear hair
- More facial hair for women
- More risk of infection, trauma, cancerous lesions, and pressure ulcers
- Changes in nails: thickening, slower growth, yellowing and brittleness, increased risk of splitting and infections due to reduced blood supply

Gastrointestinal – Mouth, Digestion & Elimination

- Less able to taste and feel thirst
- Less calories needed but same nutritional needs
- Teeth sockets wear away and shrunken gums leading to tooth loss
- Greater risk of chewing problems and poor nutrition
- Less strong chewing muscles
- Thinner mucus lining in the mouth (less protection) leads to dry mouth
- Swallowing muscles are less effective leads to risk of swallowing difficulty (dysphagia)
- Weaker peristalsis and weaker esophageal
- sphincters lead to GERD (heartburn);
- Weaker mucosal barrier lead to more injury risk

GI Changes:
- Indigestion
- More flatus (gas)
- Change in absorbing nutrients (Ca+, Fe+) and medication
- Higher risk of bad drug reactions due to decrease in liver size, blood flow and reserve
- Less able to digest starch
- Less bile production lead to less tolerance for fats
- Less able to feel the need to defecate BUT constipation is NOT normal
- Risk of fecal incontinence with disease (not when one is healthy)

Genitourinary – Renal System & Elimination

Kidneys:
- Smaller kidney, less blood flow and function leads to lesser ability to clear drugs and toxic substances, more risk of electrolyte imbalance
- Leads to body becoming a more acidic environment
- Leads to more risk of kidney injury and dangerous drug reactions
- Higher risk of water retention in body (in heart failure)
- Higher risk of dehydration

Bladder:
- Less elastic, has less muscle tone and less capacity: from 500-600 ml to 150-250 ml
- More urine left in bladder after voiding,
- More night time urine produced and need to void (nocturia and polyuria) – higher risk of urinary urgency

Incontinence is NOT a normal finding

In Females:
- Shorter urethra in women leads to a higher risk of UTI which also increases potential for falls
- Less estrogen leads to tissue shrinkage and less lubricating secretions

In Males:
- Prostate enlargement, smaller testicles, less sperm count and less testosterone
- Larger prostates in men compress the urethra and leads to difficulty voiding

Musculoskeletal – Muscles & Bones

- Less muscle mass and coordination (sarcopenia) leads to weakness, poor exercise tolerance and less strength
- Leads to higher risk of disability, falls and unstable gait
- Less cartilage-forming cells leads to more joint damage
- Less lean body mass, more fat and less able to absorb calcium lead to bone thinning
- Bone loss in women and men leads to higher risk of fractures
- Less ligament and tendon strength, elasticity, and flexibility
- Cartilage wears away leading to changes in how they stand, height, range of motion, more joint instability, higher risk of osteoarthritis, less flexibility and less mobility

Safety

- Lowered immune response
Age-Related Changes

The following are age-related changes that happen to the different systems of the body and how it may affect the elderly. These changes show that we must adapt the way we care, converse and approach them. Remember that these are separate from disease-related changes but despite the decline, remember that successful aging still occurs.

**Neurological – Head, Nerves, Pain**
- Decrease in executive brain functions (i.e. planning, attention, problem solving abilities)
- Slower thinking
- Poorer short-term memory
- Slower movements, not as balanced, not as coordinated
- Changes in movement and motor control
- Decreased reaction time
- Harder to choose words
- Less able to filter out distracting information

**Mood & Behaviour**
- Poor sleep may increase risk of major depression, memory problems, and lead to fewer social interactions
- Less neurotransmitters and catecholamine

**Sensory – Eyes, Nose, Ears, Tongue**
- Eyes: Less able to focus on close objects, harder to adjust to changes in lighting, decreased ability to see colour differences, higher glare
- Ears: Less able to recognize speech, lose ability to hear higher tones, less able to follow conversations, increased dizziness with falling
- Nose: Less able to identify odours
- Taste: less taste

**Respiratory – Breathing & Lungs**
- Stiffer chest wall
- Less lung muscle strength
- Decreased gas exchange
- Easier to lose breath when working harder than normal, less ability to tolerate exercise

**Cardiovascular – Heart & Circulation**
- Less blood flow and fewer blood cells, fewer white blood cells
- Lower maximal heart rate achievable during exercise (160bpm vs. 220 bpm)
- High risk of electrical irregularities and changes, which affect heart rate
- Less cardiac reserve – under stress and exercise, the heart rate and blood pumped out of the heart do not go as high as they should which leads to tiredness, shortness of breath, and slow recovery from a high heart rate
- Less blood flow to peripheries
- Less oxygen goes to tissues
- Blood pressure drops when changing positions

**Integumentary – Skin & Touch**
- Slower healing - thinning and shrinking of the top layer of skin, less strength and stretch
- Fewer nerve cells (can’t feel as well)
- Skin is drier, more scaly, wrinkled
- Less able to sweat

**Gastrointestinal – Mouth, Digestion & Elimination**
- Fewer calories required but same nutritional requirements
- Less able to taste and sense thirst
- Thinner mucus lining in the mouth (less protection) = dry mouth
- At risk of swallowing difficulty (dysphagia)
- Less able to feel the need to defecate BUT constipation is NOT normal

**Genitourinary – Renal & Elimination**
- For the bladder, less elasticity, less muscle tone, less capacity (decreased from 500-600 ml to 150-250 ml)
- More urine left in bladder after voiding, more night time urine produced and need to void, which leads to a higher risk of urinary urgency
- Incontinence is NOT a normal finding
- Higher risk of dehydration

**Musculoskeletal – Muscles & Bones**
- Less muscle mass and coordination which leads to weakness and poor exercise tolerance which in turn leads to higher risk of disability, falls, and unstable gait
- Bone loss in women and men after peak mass at 30 to 35 years = higher risk of fractures
- Changes in how they stand, limits in range of motion, joint instability, risk of osteoarthritis, less strength, less flexibility, less mobility

**Safety**
- Lowered immune response
- Less likely to have a fever when they have infections
- Less able to regulate heat

About: www.baycrest.org/lri
Email: lri@baycrest.org
Sample Presentation

Sample Presentation – Clinical Audience

Frail Aging Simulation Experience

Transforming Care of the Elderly by “Taking a Walk in Their Shoes”:
A frail aging simulation to shift values and attitudes
through experiential learning.

Jennifer Reguindin, Raquel Meyer, Gillian Nichol, Keira Lum, Audrey Gottlieb, & Sylvia Davidson.

See Appendix A
Sample Presentation – Non Clinical

Support Services Retreat

Thursday, April-30-15

See Appendix B

Sample Video

2 min + captions.wmv
Recommendations

1. Consider how the suit can be used to aid in making environmental recommendations. For example, task requirements, waiting room arrangement, and appropriate seating.

2. Consider that the current simulation only focuses on physical limitations. Acknowledge the link between physical limitations and cognition. For example, people with hearing impairments may progress to having cognitive impairment.

3. Consider evaluating mood immediately before and after participation in the simulation in order to obtain a more objective view of the emotional impact of the simulation.

Recommendations for Running the Simulation

1. When using the suit as a learning tool, run each participant through multiple tasks. This will serve two purposes:
   a. Expose learners to multiple experiences as a frail elderly in order to give them a new perspective and increased awareness.
   b. Allow for learners to grasp and understand the use of the suit under several different levels and areas of impairment.

2. As an alternative to several short simulations, a longer simulation could be developed in which each subject receives one suit adjustment throughout the simulation in its entirety. A debrief should be scheduled immediately following the simulation. It was noted that there is a difference in learner feedback between having one long simulation over several shorter simulations.

3. A pre-assessment may be provided before the participant is engaged in the simulation to note any differences in values, attitudes, skills, and knowledge. Please see the recommended questionnaires.

4. Brief: Prior to running the simulation, hold an orientation period to outline the simulation and highlight important points.
   a. Encourage role-play and immersion into character.
   b. Encourage learners to adapt to the limitations of the suit rather than over-powering or overcoming those limitations. For example, do not perform knee flexion beyond the restriction of the knee belt and do not fidget with the goggles.
   c. If learners are in simulation together, encourage interaction within the context of the simulation and their role. For example, do not allow them to lose character by talking about school projects but instead encourage them to talk about the weather in character.
   d. Inform and encourage learners to view this simulation as a professional learning experience to further their skills in future practice.
   e. Inform participants that they may end the scene at any time if they feel unsafe.
6. Safety for the participant is very important especially if they are in the “severe physical impairment” setting. If you see a participant in physical distress, ask if they still want to continue the simulation.

7. During the scenarios, some participants will not find difficulty in the physical settings of the suit, you may build in additional length of time for the participant to walk as this enhances the feeling of tiredness if the simulation scenarios are of a longer length.

8. Debrief: Regardless of whether several simulations or one simulation is used, schedule a reflection or debrief period immediately following the end of the simulation experience. This is preferred over having reflection periods between simulations and is best practice, as such scheduling would remove the learner from character and take away from the experience. At the end of the simulation, learners should be able to grasp and break down the limitations and impairments, understanding how they would affect a geriatric individual. Ensure that the emotional experience is reflected upon as well. Please see the recommended questionnaires.

9. Incorporate additional aspects of aging, such as ageism and isolation towards the elderly. Old age has several negative connotations in current society. As a result, aged individuals are often subjects of prejudice and discrimination. Incorporation of ageism and isolation into the simulation scenarios would further subjects’ experiences of emotional challenges that may occur in the elderly.

**Practical Recommendations**

1. Consider hygiene. Plan how to clean the suit and its reusable accessories.

2. When outfitting participants, ensure that the belts at the elbow and knee joints are placed with 60% of the belt’s width above the joint. This is to account for the increased contribution from the upper arm and leg muscles in flexion compared to that from the lower arm and leg muscles.

3. Consider the number of learners on which the simulation is to be run. Depending on the number of learners and time restrictions, it may be necessary to purchase more than one suit.

4. Consider the availability and replacement cost of disposable accessories, such as earplugs and gloves.

5. Always consider participants’ health concerns and accommodate suit modifications accordingly. For example, do not give a participant a stooped posture if he or she has a back injury. This could mean lessening the extent of their mobility impairment in the scenario or assigning them to a different scenario in which mobility impairments are of lower severity.

**Recommendations for Improving Efficacy of the Suit**

1. Consider using thicker gloves in order to increase the level of impairment for 2-point tactile discrimination, finger and palm grip, and ease of finger flexion/extension.

2. As a safety precaution, ensure that comfortable shoes are worn and that a facilitator is in close proximity to accompany the participant and ensure that a fall does not occur.
Debrief & Questionnaires

Pre-questionnaire
1. Why would you try on an aging suit?
2. What are your expectations about wearing the suit?

Post-questionnaire
1. How was your experience?
   a. How did your mobility feel in the suit? (i.e. gait changes)
   b. How did you feel about your ability to hear, see, feel?
2. Were there any changes to your sense of self?
   a. How did it make you feel? What was going through your mind?
   b. Did you adapt to any changes that you felt you had? If so, how?
3. How was it when you had to complete the assigned tasks? (i.e. gown, reading, getting up and down, moving to different locations and exercises)
4. Did you see how others reacted to your movement and appearance?
5. Given that we are all aging, has this experience allowed you to think about your aging body? How might you treat it/see it/care for your body differently?
6. Have you participated in other simulations of aging? If so, how did you feel that the current simulation compared to your previous experienced simulation?
7. On a scale of 1-10, how much did this sim-in-action session allow you to:

   a. Gain more knowledge about physical limitations related to frail aging

   Not at all  | A little bit  | Quite a bit | Very much
   --- | --- | --- | ---
   1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10

   b. Have more empathy for physical limitations experienced by the frail elderly

   Not at all  | A little bit  | Quite a bit | Very much
   --- | --- | --- | ---
   1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10

   c. Think of new ways to support a frail elderly person

   Not at all  | A little bit  | Quite a bit | Very much
   --- | --- | --- | ---
   1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10

8. Would this experience influence the way you provide care to your clients?
Aging Suit Simulation Evaluation

1. Your age group:
   - ☐ <30
   - ☐ 30-40
   - ☐ 40-50
   - ☐ 50+

2. On a scale of 1-10, how much did this sim-in-action session allow you to:
   a. Gain more knowledge about physical limitations related to frail aging
      | Not at all | A little bit | Quite a bit | Very much |
      | 1          | 2            | 3           | 4          | 5          | 6          | 7          | 8          | 9          | 10         |
   
   b. Have more empathy for physical limitations experienced by the frail elderly
      | Not at all | A little bit | Quite a bit | Very much |
      | 1          | 2            | 3           | 4          | 5          | 6          | 7          | 8          | 9          | 10         |

   c. Think of new ways to support a frail elderly person
      | Not at all | A little bit | Quite a bit | Very much |
      | 1          | 2            | 3           | 4          | 5          | 6          | 7          | 8          | 9          | 10         |

3. What did you learn from this aging simulation?

4. What surprised you the most?

   __________________________________________________________
   __________________________________________________________
   __________________________________________________________
   __________________________________________________________
Aging Simulation Post-Simulation Discussion

1. Did the frail aging simulation influence the way you provide care to your clients?

2. If so, can you provide examples of what impact it had on your practice?

3. On a scale of 1-10, how much did this sim-in-action session allow you to:

   a. Gain more knowledge about physical limitations related to frail aging

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   b. Have more empathy for physical limitations experienced by the frail elderly

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   c. Think of new ways to support a frail elderly person

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Sample Q & A

1. Why would anyone invest in this suit?
   The Frail Aging Simulation Experience is an effective learning technique that generates immediate and positive changes in awareness and empathy in the following ways:
   a. **Quickly increases knowledge and awareness about frail aging**
      With an aging baby boomer demographic, society as a whole, and especially health care providers, must be knowledgeable about the common physical, emotional, and sensory challenges associated with aging and frailty.
   b. **Enhances empathy and attitudes towards the frail elderly**
      Since learners are exposed to the potential vulnerability, isolation, discomfort and losses that may be experienced by frail elderly, the simulation fosters enhanced empathy and attitudes.
   c. **Improves the care practices of healthcare professionals**
      As a form of experiential learning, simulation enables healthcare professionals to quickly integrate thinking, feeling, perceiving, and behaviour change to improve care practices with the frail elderly.

2. Who should put on the suit?
   Healthcare staff, students, caregivers, volunteers and managers, and even the public, would greatly benefit from the Frail Aging Simulation Experience. They would gain a greater understanding about the population that they are caring for and how to support the frail elderly in different settings.

3. What other applications does the simulation have?
   Any organization can use the Frail Aging Simulation Experience to design activities, processes and environments that support the frail elderly population. A simple customer service scenario can quickly allow managers and staff to understand and adapt to the immediate lessons learned.

4. What do people experience in the suit itself?
   **Mobility Limitations**
   a. Weighted limbs (changes coordination, strength expenditure, gait & mobility)
   b. Restricted range of motion through the bands around the joints (neck & spine, elbows, hip, knees)
   c. Change in grip ability & strength with the gloves
   **Sensory Impairments**
   d. Hearing (reduces sound intensity)
   e. Vision (yellowing of the cornea, blurred vision, narrowing of the visual field)

5. What are the implications for practice?
   This toolkit provides creative ways to engage healthcare teams in transforming care of the elderly. Resistance to change is sometimes driven by underlying values and attitudes that reflect individual experiences and collective world views. In contrast to traditional education, simulation offers alternative, immersive learning experiences that can shift beliefs. Staff and students report a range of physical and emotional experiences, as well as immediate implications and reflections for future professional practice and care.
Form for Signatures

MEDICAL HISTORY

PATIENT NAME ___________________________ Birth Date ______________

Although dental personnel primarily treat the area in and around your mouth, your mouth is a part of your entire body. Health problems that you may have, or medication that you may be taking, could have an important interrelationship with the dentistry you will receive. Thank you for answering the following questions.

- Are you under a physician’s care now?  ☐ Yes ☐ No  If yes, please explain: ____________________________
- Have you ever been hospitalized or had a major operation?  ☐ Yes ☐ No  If yes, please explain: ____________________________
- Have you ever had a serious head or neck injury?  ☐ Yes ☐ No  If yes, please explain: ____________________________
- Are you taking any medications, pills, or drugs?  ☐ Yes ☐ No  If yes, please explain: ____________________________
- Do you take, or have you taken, Phent-Fei or Redux?  ☐ Yes ☐ No
- Have you ever taken Fosamax, Boniva, Actonel or any other medications containing bisphosphonates?  ☐ Yes ☐ No
  - Women: Are you pregnant? ☐ Yes ☐ No  If pregnant, are you trying to get pregnant? ☐ Yes ☐ No  If yes, please explain: ____________________________
- Are you on a special diet?  ☐ Yes ☐ No
- Do you use tobacco?  ☐ Yes ☐ No
- Do you use controlled substances?  ☐ Yes ☐ No
  - If yes, please explain: ____________________________

- Are you allergic to any of the following?  ☐ Yes ☐ No
  - Drugs: ☐ Antihistamines ☐ Beta blockers ☐ Antibiotics ☐ Aspirin ☐ Penicillin
  - Other: ____________________________

- Do you have, or have you had, any of the following?  ☐ Yes ☐ No
  - AIDS/HIV Positive ☐ Anemia ☐ Arthritis ☐ Artificial Heart Valve ☐ Asthma
  - Blood Disease ☐ Blood Transfusion ☐ Breathing Problem ☐ Bruxism Easily ☐ Cancer
  - Chemotherapy ☐ Chest Pains ☐ Colds ☐ Congestive Heart Failure ☐ Comas
  - Constipation ☐ Coporosis ☐ Diabetes ☐ Drug Addiction ☐ Early Wind↓
  - Emphysema ☐ Epilepsy or Seizures ☐ Excessive Blood Pressure ☐ Excessive Thirst
  - Fainting Spells/Dizziness ☐ Frequent Cough ☐ Frequent Diarrhea ☐ Frequent Headaches
  - Gastritis ☐ Glaucoma ☐ Gastroesophageal Reflux Disease ☐ Heart Attack/Stroke
  - Hay Fever ☐ Heart Attack/Stroke ☐ Heart Failure ☐ Heart Murmur
  - Heart Palpitations ☐ Heart Problems ☐ Heart Trouble/Disease ☐ Homophobia
  - Hepatitis A ☐ Hepatitis B or C ☐ Herpes ☐ High Blood Pressure
  - Inflamed或Stomach Gastritis ☐ Inflamed or Stomach Ulcers ☐ Inflamed or Stomach Ulcers
  - Hypothyroidism ☐ Hypoglycemia ☐ Hypertension ☐ Insulin
  - Injuries ☐ Irregular Heartbeat ☐ Kidney Problems ☐ Lymphoma
  - Liver Disease ☐ Low Blood Pressure ☐ Lung Disease ☐ Malignant Melanoma
  - Multiple Sclerosis ☐ Malignant Tumor ☐ Muscular Dystrophy ☐ Nephritis
  - Osteoporosis ☐ Pain in Jaw Joints ☐ Parathyroid Disease ☐ Psychiatric Care
  - Radiation Treatments ☐ Recent Weight Loss ☐ Renal Dialysis ☐ Rheumatic Fever
  - Rheumatism ☐ Sickle Cell Disease ☐ Sinusitis Trouble ☐ Skin Infection
  - Spleen Infection ☐ Stomach/Intestinal Disease ☐ Stroke ☐ Swelling of Limbs
  - Tonsillitis ☐ Tuberculosis ☐ Tumors or Growth of Tissues ☐ Ulcers
  - Venereal Disease ☐ Yellow Fever

Have you ever had any serious illness not listed above?  ☐ Yes ☐ No  If yes, please explain: ____________________________

Comments:

____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

To the best of my knowledge, the questions on this form have been accurately answered. I understand that providing incorrect information can be dangerous to my (or patient’s) health. It is my responsibility to inform the dental office of any changes in medical status.

Signature of Patient, Parent, or Guardian ___________________________ Date ____________

© March 2015 Baycrest Centre for Learning, Research & Innovation
Appendix A: Sample Presentation

Frail Aging Simulation Experience

Transforming Care of the Elderly by “Taking a Walk in Their Shoes”:
A frail aging simulation to shift values and attitudes through experiential learning.

Jennifer Requindin, Raquel Meyer, Gillian Nichol, Keira Lum, Audrey Gottlieb, & Sylvia Davidson.

Frail Aging – Suiting up
Physical Changes

Movement  Posture  Gait  Strength

Visual Limitations

Change in colour  Blurry vision  Narrow visual field
Debrief Themes

Experiences with:
- physical pain,
- fear and isolation,
- embarrassment,
- shame and loss
- immediate panic
- powerlessness

Reflections

“Aha” moments
- More meaningful
- Including the resident more
- Changing the approach to care
- Identifying with residents!
Appendix B: Sample Presentations – Non-Clinicians

Support Services Retreat

Thursday, April 30, 2015

Ontario’s Centres for Learning, Research & Innovation in Long-Term Care

Goal: to contribute toward enhancing the quality of care in the LTC sector

Through education, research, innovation, evidence-based service delivery & knowledge transfer; and

By facilitating collaboration between researchers, educators, LTC home personnel & other practitioners in the development, adoption & continuous improvement of evidence-based best practices that increase efficiency, effectiveness, sustainability & quality of care.

Supported with funding from the Government of Ontario
We want to know about you!

Introduce yourself and include your:

- Name
- Unit
- Role
- **What 1 word, thought or feeling comes to mind when you hear the word “AGING?”**

  Don’t define!

Your Clicker

To answer

- Press the letter or number button

- Look for the **green light** to flash!
Years in healthcare?

A. Less than 2
B. 2-4 years
C. 5-9 years
D. 10-14 years
E. 15-19 years
F. 20+ years

Years since you finished school for your role?

A. Less than 2
B. 2-4 years
C. 5-9 years
D. 10-14 years
E. 15-19 years
F. 20+ years
Challenges of an aging population

By 2051, nearly one in four Canadians will be 65 years or older.

Age-Related Changes
NORMAL AGING
Poor sleep leads to memory problems and increased risk of depression.

A. True
B. False

The reflex to cough & clear mucous or foreign objects declines in old age.

A. True
B. False
does not pump as much blood. This leads an elderly person to be more tired during activities.

A. True
B. False

An elderly bladder can usually hold 150-250 ml. of urine.

A. True
B. False
Physical strength tends to decline in old age.

A. True  
B. False

This is the tone of voice you should use with older adults.

A. True  
B. False
**Body Systems**

Which system(s) are affected? How?

- Safety & Environment
- Background & Baseline
- Function – ADL, IADL, programs, roles
- Neurological – Pain
- Cardiovascular – circulation
- Musculoskeletal – muscles & bones
- Integumentary – skin
- Neurological (brain, mind, pain)
- Mood & Behaviour, Psychosocial
- Sensory – eyes, ears, touch, taste, smell
- Cardiovascular – heart
- Respiratory – breathing & lungs
- Gastrointestinal – mouth, digestion, bowels
- Genitourinary – kidneys, voiding

**Aging by Body Systems**

- Need more time to respond to environment
- Needs repeated exposure
- Support their strengths
- Always consider comfort, pain is experienced differently
- Quick position changes may make them dizzy
- Slower movement, decreased strength, decreased mass, and increased risk of injury
- Poorer thermoregulation
- Slower information processing but BETTER problem solving
- Increased stress from multiple losses (physical, social, work...)
- Less visual-spatial processing, can’t see, hear, smell, taste, and feed as well
- Slower for heart and BP to get back to normal after exertion
- Decrease lung reserves and capacity
- Slower motility, not as able to metabolize toxins, may forget to drink and not inclined to eat
- Decreased bladder capacity, decreased reproductive hormone level
AGING WITH DISUSE

Some factors that lead to Disuse

• Lack of exercise
  – leads to cognitive, emotional, immune, cardiovascular, and respiratory dysfunction
• Diet
  – Increased sugar, fat, cholesterol
• Poor sleep habit
• Sun exposure
  – Photo-aging
AGING WITH CHRONIC CONDITIONS

If you worked with 6 residents in 2012...

- 4 have Dementia
- 4 have Hypertension
- 2 have Arthritis
- 2 have Depression
- 2 have Osteoporosis
- 2 are Diabetic
- 1 has a Stroke
- 1 has Gastrointestinal disease
- 1 has Hypothyroidism
- 1 has a Heart Condition
- 1 has Emphysema/COPD
- 1 has Congestive Heart Failure
- 1 has Cataracts

Photo: From http://image.search.google.com/search?tbm=isch&tbo=pwa&source=hp&q=senior+people&aq=f&aqi=&aql=&oq=&pbx=1&no=1&num=100&hl=en&biw=1280&bih=694
What percentage of Canadian seniors live in special care facilities?

A. <1%
B. 5%
C. 7%
D. 10%
E. 35%
F. >50%

Long-term care homes

2011: In Canada, 224,280 nursing home residents were over 65 years old

- 2011: 91,495 of these residents live in Ontario
- 2012: number of nursing home residents cared for in Ontario grows to ~ 106,000

CIHI, 2013
StatsCan, 2013
Geriatric Giants/Syndromes?

- Delirium
- Depression
- Falls
- Deconditioning
- Skin breakdown
- Incontinence
- Pain
- Malnutrition & dehydration
- Sleep disorders
- Functional decline
- Incontinence
- Polypharmacy
- Elder abuse NCHE (2013)

Clinical Frailty Scale

1. Very fit
2. Well
3. Managing Well
4. Vulnerable
5. Mildly Frail
6. Moderately Frail
7. Severely Frail
8. Very Severely Frail
9. Terminally Ill

Moorhouse et al., 2012