A Novel Tool to Decrease Avoidable Emergency Department Visits

Care by Design Conference, Halifax, NS
November 23, 2018

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Conflict of Interest Declaration

In the past 2 years until July 2018, I worked as a contract faculty member for the Canadian Foundation for Healthcare Improvement.

I am the owner of the PREVIEW-ED Health Tools Inc., however no funds have been used to support this program.
Objectives

1. Describe the current Long-Term Care Population in Canada and how it differs from the past.

2. Share the development and testing of the PREVIEW-ED© tool.

3. Practice using the tool and report outcomes to date.
How to Quantify a Nurse’s ‘Gut Feelings’ (Aug 09, 2018)

- She seems not quite herself, her breathing is slightly more laboured
- On paper she looks stable
- I had a nagging sense that something was wrong, but I couldn’t articulate it

• Gut feelings are really agglomerations of observations and experiences over time that have turned into finely tuned clinical judgement.
• Working at the bedside has honed staff perceptions to be especially alert to brewing trouble.
• The goal is to identify patients who might look stable but are in fact fragile.
Context – The Aging Population

• The proportion of seniors 65 + years is growing faster than any other age group.

• By 2036 the population of seniors will represent 23-25% of the population - an increase of 56% from 2014.
The Long-Term Care Population

- Current population is older, frailer, and sicker, have multiple co-morbidities, complex histories, cognitive impairment or dementia, limited ability to physiologically compensate for critical illness

- Limits in vision, hearing, and cognition alter their ability to communicate symptoms, medical history or basic personal information

(CIHI, 2014. Sources of Potentially Avoidable Emergency Department Visits)
The Long-Term Care Population

• Seniors living in long-term care are at a higher risk of being admitted to a hospital.

• Approximately 23%-44% of older adults who are admitted to hospital suffer serious or fatal complications such as infections, or falls.

• A 2014 CIHI report showed that a third of the Emergency Department visits from long-term care homes could have been avoided.

(CIHI, 2014. Sources of Potentially Avoidable Emergency Department Visits)
What is Known about Preventable Transfers - Literature

• Between 21% and 48.2% of hospital admissions of LTC residents are potentially preventable.  

• Many ED visits by residents of LTC are potentially preventable if caught early. Regular care providers such as Certified Nurse Assistants (CNAs) have intimate knowledge of the regular health status of residents and can be trained in the early identification of emerging acute episodes.  
  (Intrator et al 2004, Kontos et al 2010)

• Reducing avoidable hospitalizations for the elderly is an area of provincial priority... tools must be developed to quantify risk for avoidable hospitalizations in the community, LTC and other non-acute settings.  
  (Report of the Avoidable Hospitalization Advisory Panel 2011)

http://www.nelhin.on.ca/Page.aspx?id=1BAE2A90EA4B46C88B8E76F9D0295AAC
Several conditions are identified as being potentially preventable or treatable in LTC facilities. These conditions include non-traumatic, ambulatory-care sensitive conditions such as pneumonia, dehydration, congestive heart failure, and urinary tract infection.

According to a Canadian study based on the proportion of most responsible potentially avoidable hospitalizations, these four conditions comprise 49% of the diagnoses of preventable hospitalizations.

Frail Elderly in the Emergency Department

Challenges

• Frail elderly in EDs may be at risk for functional decline and iatrogenic complications such as falls, pressure ulcers, delirium, dehydration etc.

• The busy, noisy environment in EDs makes it a difficult place for care of the elderly particularly those with delirium or dementia

• Lack of a familiar setting, staff, and routines, contribute to confusion, and potential behaviour changes in the elderly

Canadian Institute for Health Information, November 2014. Sources of potentially avoidable emergency department visits. 
https://www.cihi.ca.
CIHI Data

ED Length of Stay for Elderly

23% increase in ED length of stay for most patients who were admitted for reasons related to pneumonia last year in Canada.

9 out of 10 ED stays before admission for pneumonia were completed within 40.7 hours, up from 33.2 hours 2 years ago.

16% increase in ED length of stay for most seniors who were admitted to hospital in Canada.

90% of visits of seniors in ED who were admitted were completed within 36.3 hours (a 5 hour increase) from 2015-16.

In Nova Scotia

2.24 Care by Design

• “Emergency department personnel told us nursing home patients in need of medical care are often transferred via ambulance, regardless of whether the situation is an emergency or not. This is not an effective use of resources.”

• “The central zone has implemented a program called Care by Design. It regularly schedules health care team visits to nursing homes. The team includes physicians, nurses, and paramedics to provide coordinated care. Central zone hospital staff told us that, in some instances, the program allowed for a 30 to 40 percent reduction in patient transfers from nursing homes to emergency departments.”
In Nova Scotia

March 9, 2018

Premier Stephen McNeil

“for the past 5 years, 21% of acute care beds were occupied by people waiting in hospital for LTC placement.”

• Approximately 4602 Acute Care beds 2016-2017

• About 966 Acute Care beds are filled by people waiting for LTC.

The Identified Problem

• Increasing numbers of Long Term Care residents being sent to ED
  • Many suffering iatrogenic complications as a result (pressure ulcers, dehydration, deconditioning, delirium)

• Existing available data (MDS),
  • Did not provide timely information
  • Limited ability to take proactive measures to prevent decline based on MDS quarterly assessments
Intervention Related Evidence

Search Strategy

- English language published studies between 1982-November 2012
- Databases consulted:
  - Medline, Healthstar, CINAHL, Embase, Scopus
  - Secondary references obtained from primary articles
- Google Scholar – unpublished resources
Intervention Related Evidence

Key Evidence

• (Two-cohort) prospective and retrospective study (Cuthbertson et al 2010)

• Prospective observational population based study (Duckitt et al 2007)

• Systematic review of track and trigger systems (Smith, Prytherch et al 2008)

• Medical & Nursing Journals focused on Geriatrics

• Grey Literature – (Ministry Reports, LHIN Accountability Agreements)

Observations

• Majority of work on decline is from acute care (mortality or ICU transfer)

• Most of the work on predictors of decline (acute care) is in the UK – assessment standardized across NHS “National Early Warning Score”

• Only one author described any type of systematic method of monitoring elderly for decline in nursing homes “Stop and Watch”
Evidence Guiding the Innovation

• No “elder specific” tool to predict decline in LTC residents was found that leveraged existing resources
• No tool was found that was simple, easy to understand, took minimal time to complete and did not rely on vital signs
• No tool was found that could be completed by non-registered staff (PSWs)

Create a Novel Tool to meet the need
The Challenge

• Literature regarding the solutions for the identification of decline in health status of LTC residents is sparse
• No existing “elder specific” tool was identified
• Approximately 70% of direct care in LTC is provided by Personal Support Workers who have intimate day-to-day knowledge about the health status of the residents they care for
Methodology

1. Literature Review
2. Instrument Design
   - Literature
   - Focus Groups
   - Retrospective Chart Audit
3. Education
   - Case studies, resource binder, hands-on
4. Implementation
   - Unit Champions
5. Pilot Study
   - 3 months (including refinement)
6. Evaluation
   - Analysis of results, staff focus groups
7. Sustainability
   - Performance 3 and 6 months after pilot
The Innovation – Preview-ED©

• A one-page tool used daily by Care Aides/PSWs to identify early signs of decline in the health status of LTC residents,

• Focused on 4 conditions, urinary tract infection, pneumonia, dehydration, congestive heart failure,

• Weighted scores are assigned to observations on each of 9 indicators,

• The scores for each indicator are totalled to give an aggregate score that helps identify residents with changes to their health status,

• A supporting escalation path triggers specific actions when certain scores are reached.
Using the Tool – A Case Study
Case Study – Stella Black

Stella is an 89-year-old woman living in your long-term care home.

She lives there due to her multiple medical conditions which have resulted in her inability to care for herself at home.
Stella - Normal State

- Arthritis
- Cardiac and respiratory disease
- Diabetes (left foot amputated)
- Minimally participates in her ADLs
- Good appetite
- Unable to mobilize on her own
- Enjoys most social activities
Stella Today

While caring for Stella today you have noticed that:

• She refused lunch,
• She has been talking about her neighbour who baked bread this morning,
• Stella seems to be short of breath while she is speaking,
• Her skin seems cool and clammy.

These issues are not normal for Stella
Completing the PREVIEW-ED® Tool

Step 1

Complete Resident Specific Information

PREVIEW-ED Tool®

Practical Routine Elder Variants Indicate Early Warning for Emergency Department

To be completed on each resident each day on day shift

Date: Nov 22, 2018
Time: 1300
Resident Name: Stella Black
Room Number: 221-A

(Please Print)

Check this box if resident is not at the facility during your shift today and do not score. ☐
## Stella Today

### Step 2

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Score</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Food and Fluid intake</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Refusing food or fluids (new)</td>
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<tr>
<td><strong>Mobility</strong></td>
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<tr>
<td>Requires more assistance than normal to mobilize</td>
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<tr>
<td><strong>Activities of Daily Living</strong></td>
<td></td>
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<tr>
<td>Complete dependence in ADLs (new)</td>
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<tr>
<td>Participates less in ADLs (new)</td>
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<tr>
<td><strong>Mental State</strong></td>
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<tr>
<td>Mood seems depressed (new)</td>
<td></td>
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<tr>
<td>Resists to care (new)</td>
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<tr>
<td><strong>Urinary System</strong></td>
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<tr>
<td>No urine output</td>
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<tr>
<td>Decreased urine output (new)</td>
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<tr>
<td>Dark coloured urine (new)</td>
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<tr>
<td><strong>Respiratory</strong></td>
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<tr>
<td>Shallow and/or rapid breathing (new)</td>
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<tr>
<td>Less able to lay flat (new)</td>
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<tr>
<td><strong>Skin</strong></td>
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<tr>
<td>Skin cool and/or damp to touch (new)</td>
<td></td>
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<tr>
<td>Skin more pale in colour than usual</td>
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<tr>
<td><strong>Family/resident Concern</strong></td>
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<tr>
<td>Feels unwell (new)</td>
<td></td>
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</tr>
<tr>
<td>Feels tired/weak (new)</td>
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</tr>
</tbody>
</table>

Some indicators, signs and symptoms have been removed to maintain copyright.
Stella Today

Step 3

Resident Score

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food &amp; Fluid Intake</td>
<td>2</td>
</tr>
<tr>
<td>Mobility</td>
<td>0</td>
</tr>
<tr>
<td>ADL</td>
<td>0</td>
</tr>
<tr>
<td>Mental State</td>
<td>3</td>
</tr>
<tr>
<td>Urinary System</td>
<td>0</td>
</tr>
<tr>
<td>Respiratory</td>
<td>3</td>
</tr>
<tr>
<td>Skin</td>
<td>3</td>
</tr>
<tr>
<td>L</td>
<td>0</td>
</tr>
<tr>
<td>Resident/family concern</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>11</strong></td>
</tr>
</tbody>
</table>

Actions

If total score = 0
Care Aide files scoring sheet in file folder for appropriate date.

If total score = 1 or higher
Care Aide informs Registered staff ASAP. Registered staff assesses resident and takes appropriate action, including NP/MD notification if necessary.

Registered staff document score and action taken in progress notes.
Registered staff enters score on 24 hour report sheet.

If total score = 3 or higher
Registered staff must notify nurse practitioner or physician.

Registered staff who takes action on Resident score: Myrna Matthews

Complete this section ONLY if the score is 1 or higher

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Was the score communicated to a Registered staff member or Charge Nurse?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Was the nurse practitioner or physician notified regarding the score?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Were orders or instructions received from the NP or physician?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Was the resident transferred?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Reason for transfer

Staff member completing the tool and score: Sarah Thomas

Name (Please Print) | ST (Initials)
Testing the Tool

Two Pilot Studies

1) Toronto, ON (2012)
   66 LTC Residents – Duration 13 weeks

2) Fraser Health Authority, BC (2016)
   176 Residents, 4 facilities – Duration 19 weeks
Testing the Tool
The Starting Point for Each Pilot

<table>
<thead>
<tr>
<th></th>
<th>Toronto</th>
<th>Fraser Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase in ED visits</td>
<td>• 7% increase in ED visits in two consecutive years (2010-2012)</td>
<td>• 5% increase in ED visits (2014-15);</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 7% increase in (2015-16)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 27% of the Residential Care population was transferred at least once to ED in 2015</td>
</tr>
<tr>
<td>LTC residents admitted</td>
<td>• 71% of LTC residents arriving at ED were admitted</td>
<td>• 47% of RC residents arriving at ED were admitted</td>
</tr>
<tr>
<td>hospital from ED</td>
<td>• Average Length of Stay - 6 days (2011)</td>
<td>• Average Length of Stay - 9 days (2015)</td>
</tr>
</tbody>
</table>

Result – increased pressure on hospital bed flow; health status of some residents declined while in hospital due to iatrogenic complications
Pilot Results
## Comparison of Results of Toronto and Fraser Health Pilot Studies

<table>
<thead>
<tr>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Decrease in tool sensitive transfers*</td>
<td>57%</td>
<td>71%</td>
</tr>
<tr>
<td>Tool completion rate (min 92%)</td>
<td>95.5%</td>
<td>94%</td>
</tr>
<tr>
<td>Average time to complete the tool/resident</td>
<td>8-15 seconds</td>
<td>10 seconds</td>
</tr>
<tr>
<td>Average number of residents who triggered the tool/week</td>
<td>1 in 10</td>
<td>1 in 20</td>
</tr>
<tr>
<td>Number of residents triggering the tool at least once</td>
<td>53%</td>
<td>37%</td>
</tr>
</tbody>
</table>

*The decrease in transfers is an annualized number as compared to the baseline data collected.*
Results: Tools Requiring Action

Toronto Pilot
Number of Tool Scores Requiring Action
n = 80

- Tool score < 3
  - Registered Staff Action 39
  - Tool score ≥ 3
    - MD Action 41

Fraser Health Pilot
Number of Tool Scores Requiring Action
n = 181

- Tool score < 3
  - Registered Staff Action 82
  - Tool score ≥ 3
    - MD Action 99
Results: MD Actions Upon Notification

Toronto Pilot (n= 26)
• Lab tests ordered (8)
• Add/adjust medications (6)
• Falls follow-up (5)
• Increase fluids, monitor, catheter (2)
• X-Ray ordered (2)
• Transfer to hospital (2)
• Specialist Consult (1)
Statistically, Food/Fluid and Mental State are two areas that triggered warning most frequently;

The number of triggers for Food/Fluid is positively correlated to the number of triggers for mental state in a significant way ($r(66)=.72, p<0.01$);

Other indicators, urinary system, respiratory system, and ADL, also had positive correlation with triggers in Food/Fluid intake, albeit to a lesser degree;

These results suggest that when one indicator triggers a warning, other areas may be implicated as well. They don’t occur in isolation.

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### Pearson Correlation between Assessment Domains

<table>
<thead>
<tr>
<th>Food and Fluid Intake</th>
<th>Mobility</th>
<th>ADL</th>
<th>Mental State</th>
<th>Urinary System</th>
<th>Respiratory System</th>
<th>Skin</th>
<th>Level of Consciousness</th>
<th>Family/Resident Concern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Correlation</td>
<td>.076</td>
<td>.266*</td>
<td>.715**</td>
<td>.490**</td>
<td>.444**</td>
<td>.016</td>
<td>.141</td>
<td>.294*</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.546</td>
<td>.031</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.895</td>
<td>.258</td>
<td>.017</td>
</tr>
<tr>
<td>N</td>
<td>66</td>
<td>66</td>
<td>66</td>
<td>66</td>
<td>66</td>
<td>66</td>
<td>66</td>
<td>66</td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).
Sample Resident Scores & Actions
Toronto Pilot

Score History and Action Resident ID 60

- Early Warning Score
- MD Notified
- Started on antibiotics
- Fluids
- Monitor
- Date
- Pilot Complete
- Tools Not Completed
- Resident Agitated
- Coughing wheezing
- To ED Pneumonia
- Returned

PreviewED
Improved Experience

Residents and Family

- Ability to be cared for in “home” environment
- Less traumatic (familiarity with staff and environment)
- Opportunity for families to contribute to observations

Staff

- Easier to communicate changes in resident health status
  - Provides a common language & numerical value
- A systematic method of thinking about how a resident may change over time
- PSWs felt more valued & engaged
Better Outcomes

• Avoidance of possible complications from transfer to hospital
• Identification of other conditions such as influenza
• Earlier identification of residents in active dying stage
Better Value

Cost savings do not consider additional savings from avoiding complications of hospital acquired iatrogenic complications.

<table>
<thead>
<tr>
<th>Toronto Pilot</th>
<th>Fraser Health Pilot</th>
</tr>
</thead>
<tbody>
<tr>
<td>57% ↓ in tool sensitive transfers</td>
<td>71% ↓ in tool sensitive transfers</td>
</tr>
<tr>
<td>Potential provincial savings: <strong>$6.2 million</strong> (75,000 beds)</td>
<td>Potential provincial savings: <strong>$9.85 million</strong> (25,768 beds)</td>
</tr>
</tbody>
</table>
Fraser Health Spread 2017

79 Homes (8063 residents)
• Phased-Approach
• Train-the-Trainer Model
• Workshops, webinars, and online learning platform (resources/tools)
• Weekly site visits

“Once I got used to it, PREVIEW-ED© was easy to use and doesn’t take long for each resident.”
Impact on ED Transfers for Tool-Sensitive Conditions Comparison

Conventional Implementer Group

Non-Conventional Implementer Group

PRE-IMPLEMENTATION
Average monthly ED visits: 10.4

POST IMPLEMENTATION
Average monthly ED visits: 5.6

PRE-IMPLEMENTATION
Average monthly ED visits: 8.4

POST-IMPLEMENTATION
Average monthly ED visits: 10.8

Monthly ED visits (implementer cohort = 8 homes)

Monthly ED visits (non-implementer cohort = 8 homes)
What did we hear from the FH Spread teams?

- **Empowerment of HCAs**
- **Quality of Resident Care**
- **Improved Communication**

“I use this tool every day and have seen the benefits and watched it do more than we thought it could. It is simple, self-explanatory and involves front-line workers and families like no other tool does.”

Bryan D. Gay
Care Aide, Mennoplace LTC, BC.
Benefits to LTC homes and Residents

• Improved communication between team members
  – Care Aides ↔ Registered Staff ↔ Physicians

• Earlier identification of health decline in residents

• Empowerment of Care Aides/Personal Support workers

• Fewer transfers of residents to ED for 4 conditions

• Better quality of life for residents being cared for by staff familiar with them in an environment the resident knows
Current State

Versions of PREVIEW-ED© have been designed for:

- A LTC Ventilator unit at Fraser Health
- Home Care Version designed and testing has started at Fraser Health
- E-tool versions have been developed
- Publication: Decreasing Preventable Emergency Department Transfers for Long-Term Care Residents Using PREVIEW-ED©
  Healthcare Management Forum Volume 31 Issue 4, July 2018
doi.org/10.1177/0840470417753969
Challenges

• **Infrastructure** – some facilities with software and IT support wanted to move beyond the paper version quickly,
  – Differences in IT infrastructure and support required more than one e-tool solution,

• **Knowledge gaps** – difficulties using pre-populated excel spreadsheets to complete audits used with paper based tools,

• **Differences in implementation** – some chose to find alternative tool designs, started-stopped-restarted implementation, inconsistency in audit completion rates,

• **Leadership changes** – Turnover of senior leaders created gaps in communication and inconsistent implementation

• **Readiness for change** – LTC homes in some cases had other major initiatives i.e. accreditation, other quality initiatives
## Critical Success Factors

<table>
<thead>
<tr>
<th>Leadership</th>
<th>Education</th>
<th>Data</th>
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</thead>
<tbody>
<tr>
<td>Communication</td>
<td>Unit Champions</td>
<td>Evaluation</td>
</tr>
<tr>
<td>Implementation Plan</td>
<td>Engage Residents &amp; Families</td>
<td>Celebration</td>
</tr>
<tr>
<td>Oversight &amp; Support</td>
<td>Engage NPs &amp; MDs</td>
<td>Thinking about Changes in resident health status</td>
</tr>
</tbody>
</table>
Key Messages

1. Is a cost effective way to identify early decline in LTC residents, when used daily it can result in reduced transfers to ED

2. Based on identification of changes in normal behaviour or activities that are not detected through traditional measurement methods

3. Leverages the unique relationships and observations of direct care staff

4. Helps to address a key priority in the health system by supporting care of our aging population in their homes
5. Tool completion rate must be ≥92% to provide maximum benefit for identification of early decline in health status

6. The tool is built on the identification of subtle (not big) changes, which may be early identifiers of the declining health of residents

7. Implementing PREVIEW-ED© changes the way interprofessional teams work with each other

8. PREVIEW-ED© is beneficial in helping to avoid preventable transfers of LTC residents to ED
9. Care Aides/PSWs are typically the strongest supporters of the tool

10. Implementation is relatively easy but requires vigilance and commitment to sustainability

11. The importance of embedding the completion of PREVIEW-ED© into daily work flow cannot be underestimated
“Nova Scotia Long-Term Care Homes Launch Novel Tool to Decrease Preventable Emergency Department Transfers”
Questions

Thank You!

www.previewedtool.ca