The Personal Support Algorithm: An evidence-informed framework for allocating personal support and homemaking in Ontario's home and community care sectors

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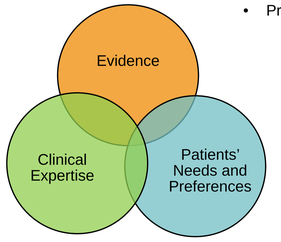
Introduction

- People in Ontario deserve outstanding, high-quality, consistent, and integrated home and community care that is delivered through provincial solutions and practice, and informed by evidence and research[1]
- The transition from the RAI-Home Care to the interRAI Home Care assessment system presents the opportunity to develop new evidence-informed decision support algorithms to guide care coordinators in planning for patient care
- Key priorities focused on guidance for eligibility, priority, and allocation of hours of personal support services
- A panel of researchers from the University of Waterloo/interRAI Canada and leads from the Ontario Association of Community Care Access Centres (OACCAC) and Community Care Access Centres (CCACs) was formed

OACCAC	CCACs	University of Waterloo
Heather Binkle, Director, Client Services Janet McMullan, Client Services Aaron Jones, Sector Funding & IM Nancy Ackerman, Education Services Shelly Anne Hall, Sector Funding & IM	Gail Riihimaki, HNHB CCAC Ian Ritchie, NW CCAC Laszlo Cifra, CE CCAC Jennifer Wright, Central CCAC Valerie Armstrong, NSM CCAC Gayle Seddon, TC CCAC Amy Mangone, NE CCAC	Dr. John Hirdes Chi-Ling Joanna Sinn Nancy Curtin-Telegdi Leslie Eckel Jenn Bucek

- The panel sought **to develop an evidence-informed framework for supporting Care Coordinators' decisions in allocating hours of personal support and homemaking based on differentiating patient needs**



- Principles established for this project include:
  - Patient needs for the purpose of resource allocation are **clearly distinguishable**
  - Clinical decision-making is **equitable** and **consistent**
  - Decisions are **fiscally responsible**
  - Decisions are **evidence-informed** and use the full range of tools available
  - Guidelines are **practical** and **simple** to provide guidance for Care Coordinators
  - Guidelines reinforce **the role of clinical expertise** in decision-making

Part 1. Algorithm Development

Data Sources

- Unique RAI-Home Care (RAI-HC) assessments in 2013 from 14 CCAC agencies in Ontario (n=128,169)
  - Excluded hospital versions, received case management or placement services only, received fewer than three weeks of active service*, top 1% of personal support users (i.e., service maximums)
  - Linked to billed home care services calculated as weekly average of hours received within 12 weeks of RAI-HC assessment
- Unique interRAI Community Health Assessment (interRAI CHA) assessments in 2013 from three community support service (CSS) agencies in Ontario (n=1,985)

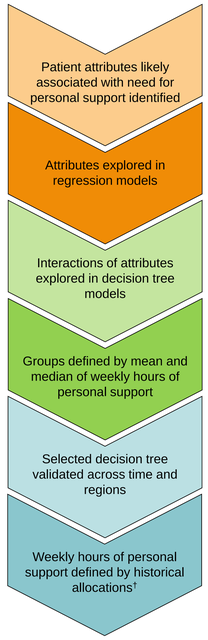
Allocation of Personal Support Framework

Group	Hours per week† (Historical numbers only) 10th Percentile (Lower range)	50th Percentile (Median)	90th Percentile (Upper range)
1	0.0	0.0	1.0
2	0.0	1.7	5.2
3	0.7	3.4	11.0
4	0.9	5.7	14.0
5	1.1	7.0	16.3
6	1.9	12.0	20.6

*Services include Nursing, Nutrition, Physiotherapy, Occupational Therapy, Speech Language Pathology, Social Work, Personal Support, and Other
†Hours do not necessarily reflect the levels of service that provide the best outcomes. Service is constrained by resource availability.

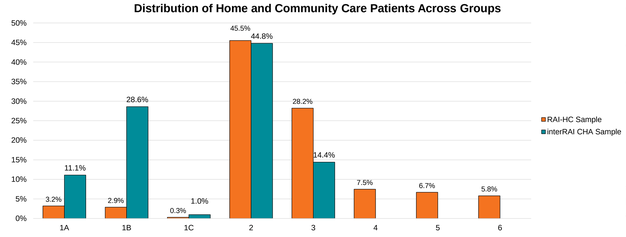
Part 1. Algorithm Development (continued)

Methods and Results



- Panel members and Care Coordinators were surveyed for an initial list of patient attributes that were likely associated with need for personal support
- Activities of daily living (ADL) and cognition scales were most strongly associated with need for personal support
- Other attributes included bladder and bowel incontinence, unsteady gait, and unable to go outside
- Decision tree modelling was conducted as this approach focuses on only the most relevant attributes for groups of patients[2]
- For example, independent activities of living (IADLs) helps to determine need for personal support only for patients who are relatively independent in ADL
- Modeling produced 21 decision tree nodes ("leaves") that were collapsed into six groups with significantly different group means and distinct percentile distributions
- The decision tree is presented as ***The Personal Support Algorithm***
- Algorithm explains 30.8% variance in personal support allocation and discriminates well between groups such that the highest group means is 32 times greater than the lowest group means
- Algorithm performs consistently well across CCACs and other jurisdictions in Canada using data from 2011–2013
- Within each algorithm group, the weekly hours of personal support at the 10th percentile, 50th percentile (median), and 90% percentile were retrieved
- The algorithm group and range of hours can be used by Care Coordinators as anchors in allocation of personal support hours.
- The ***Allocation of Personal Support Framework*** indicate ranges of hours using historical rationing of services. The groups are expected to remain consistent. Further research is needed to identify ranges that provide best value for outcomes.

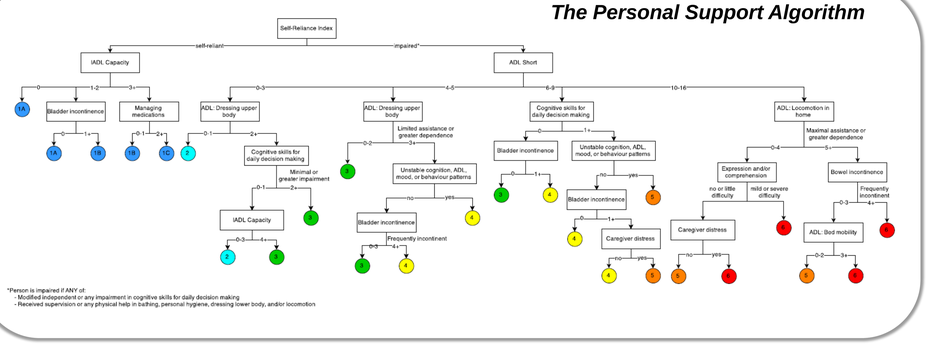
Distribution of Home and Community Care Patients Across Groups



- CCAC patients generally have higher personal support needs‡
- CSS patients generally have lower support needs‡
- A shared Personal Support Algorithm can serve both patient groups

‡CSS patients who have been assessed with the RAI-HC and receive CCAC services generally are not assessed with the interRAI CHA

The Personal Support Algorithm



*Person is impaired if ANY of:
- Modified independent or any impairment in cognitive skills for daily decision making
- Received supervision or any physical help in bathing, personal hygiene, dressing lower body, and/or locomotion

Part 2. Pilot Testing

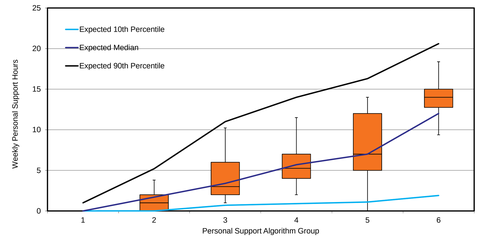
Design and Sample

- 28 Care Coordinators from six CCACs completed 276 RAI-HC assessments, followed their normal assessment and allocation processes, and then filled out an online survey that was available 24 hours after locking their assessment

Results

- Care coordinators agreed that the Personal Support algorithm **produced a clinically appropriate range 93% of the time**, and that their **actual allocation was in that range 89% of the time**
- Fewer hours were allocated usually as a result of personal preference / private pay caregiver while more hours usually occurred because of greater patient functional complexity

Weekly Personal Support Hours by Personal Support Algorithm Group



- Box plot areas represent the range of hours allocated by Care Coordinators during the pilot test
- Personal support hours allocated largely match their expected ranges

Part 3. Focus Groups

Design and Sample

- 36 Care Coordinators and Managers (recruited from pilot testing) participated in one of two hour-long focus groups

Results

To understand the Care Coordinator and Manager experience in using the Personal Support algorithm in comparison to usual practice	To identify strategies to address training needs for Care Coordinators and Managers in their use of the Personal Support algorithm	To identify opportunities / strategies to support Care Coordinator user acceptance and considerations for implementation
• Current practice was most often aligned with outcome of the algorithm • Ranges for weekly hours were thought to be wide; however, lower and upper bounds were useful: *"The range was so wide that it wasn't giving much direction, but then again, it gave me flexibility"* • Provincial consistency recognized as a need: *"Interesting getting a taste of policies of other CCACs. Generally speaking [it] would be helpful because the patient experience would be similar across Ontario"*	• Education should include discussion about the algorithm logic and how coding could affect algorithm outcomes: *"Going through what are the decision points in the algorithm, same way as they train the other algorithms"* • interRAI competency testing should be mandatory across CCACs to support consistency with coding • Process for requesting exceptions must be clear and have support from management: *"Knowing that these are suggested hours. If it falls outside, you simply have to call your manager. It is flexible—that is the main point to get across"*	• Effective communication and change management strategies are important: *"Offer opportunities to attend training, go through the scenarios, and make them confident in using the algorithm"* • Emphasize the role of the algorithm as one part of the clinical decision-making process: *"It's about supporting decision-making, not making [the decision] for you"* • Present the algorithm as a guideline to promote fairness and equity within our health care system

Conclusions

- The Personal Support algorithm was developed as a framework for allocating personal support and homemaking hours for both the home and community sector and describes six distinct patient groups
- It has been validated over time in Ontario, across CCAC regions in Ontario, and other jurisdictions in Canada
- Pilot testing for user acceptance indicated that Care Coordinators found the ranges to be useful, clinically appropriate, and consistent with current practice
- Focus groups provided important feedback that will be used to further operationalize the use of the Personal Support algorithm in Care Coordinator clinical practice

References

1. OACCAC (2013). Vision, mission and values. Retrieved from: http://oaccac.com/Who-We-Are/Vision-Mission-and-Values
2. De Ville, B., & Neville, P. (2013). *Decision trees for analytics: Using SAS Enterprise Miner*. Cary, NC: SAS Institute.

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