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POSITIONING PAPER

Resource Planning in Ontario LHIN Funded Home and Community Care

The relationship between LHINs and SPOs and what optimization tools can be brought to bear on the problem

Prepared by

Adrian Schauer
Founder & CEO
AlayaCare

William Falk
Healthcare Strategy and Public Policy
AlayaCare Board Advisor

Louis-Martin Rousseau
Canada Research Chair
Healthcare Analytics and Logistics

INTRODUCTION

The Patients First Action Plan for Health Care laid out by the Ontario Government promises to help build a health care system that is patient centred. There are four key objectives:

1. *Improve access – providing faster access to the right care.*
2. *Connect services – delivering better coordinated and integrated care in the community, closer to home.*
3. *Support people and patients – providing the education, information and transparency they need to make the right decisions about their health.*
4. *Protect our universal public health care system – making evidence based decisions on value and quality, to sustain the system for generations to come.*

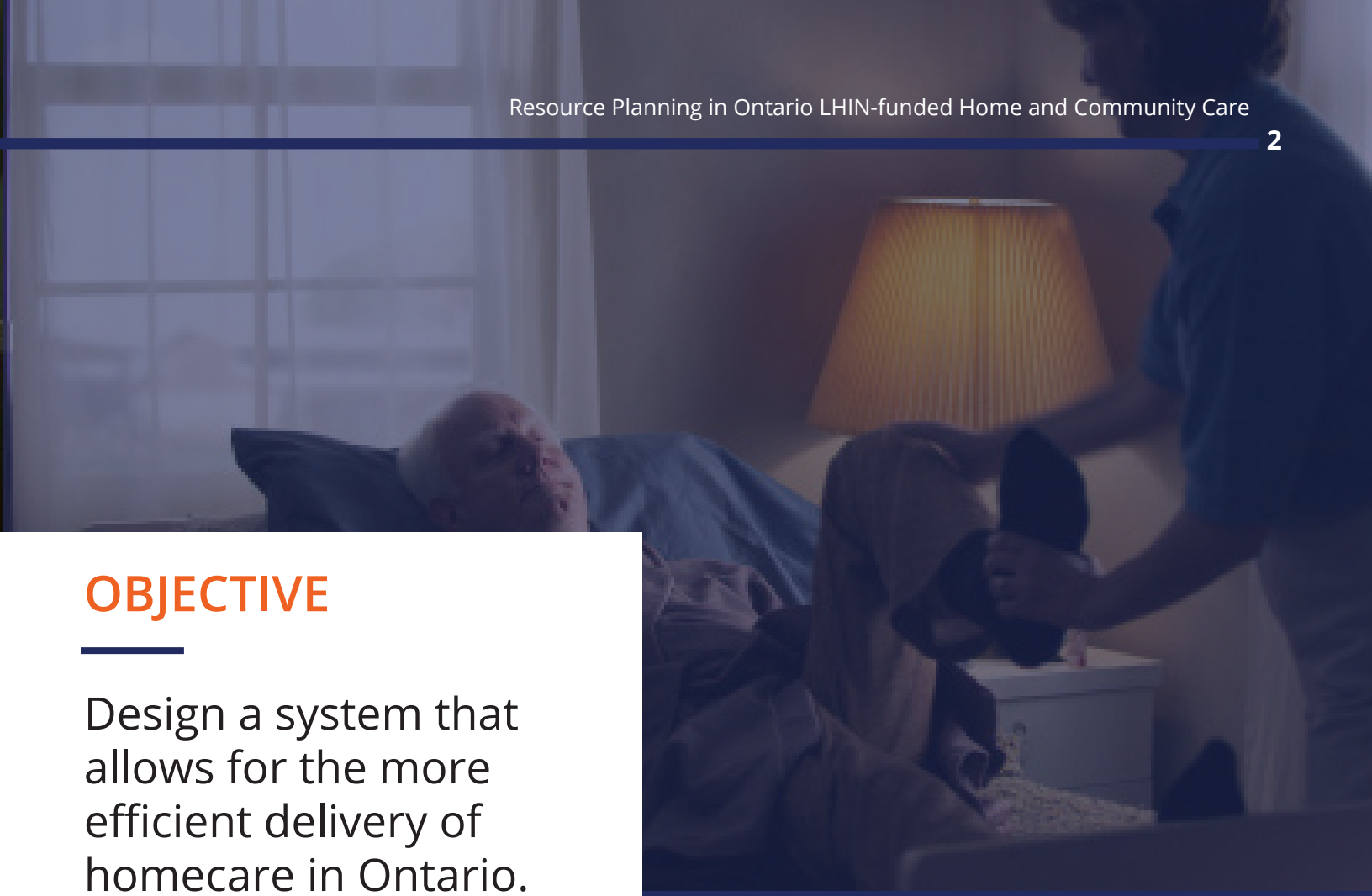
> “The role of technology is an integral component for all stakeholders to achieve this vision and ultimately deliver better health outcomes.”

AlayaCare believes the role of technology is an integral component for all stakeholders to achieve this vision and ultimately deliver better health outcomes. Of interest for this positioning paper is objective two, which we believe can be improved by exploring the following areas:

- Delivering referrals to Service Provider Organizations (SPO) based on geographic proximity while preserving the existing market share agreements;
- Recognizing the constraints of time specific visits in high demand 8:00 am and 11:00 am visit periods;
- Investigate time based bill rate adjustments designed to shift high demand visits;
- Adoption of schedule and route optimization decentralized at the SPO level.

Care worker shortage, family care giver stress and a chronic ageing population requires all stakeholders to explore innovative business, operation and technology solutions to meet the challenges of the sector.

Adrian Schauer
AlayaCare



OBJECTIVE

Design a system that allows for the more efficient delivery of homecare in Ontario.

Home Care Optimization Statistics

"AlayaCare and VHA anticipate the workforce optimization solution will yield between a 10-20 per cent increase in PSW utilization"

33.5%
Reduction in travel time per week

35%
Reduction in scheduling time

15%
Reduction in recruitment costs

VHA Home HealthCare - Scheduling Optimization Presentation, Better Outcomes 2017

CONTEXT

01 There is an overall labour shortage in home & community care that is likely to become more severe over time.

02 There is a mismatch between the temporal labour demand curve and the temporal labour supply curve:

- Patients (ie: recipients of publicly funded home & community care) want care disproportionately in the mornings and in the evenings.
- Caregivers (PSWs, Nurses, Therapists) want contiguous shifts of a minimum and maximum length during which they can see as many patients as possible while traveling as little as possible.

03 Homecare agencies, for the most part, have the opportunity to utilize Schedule & Route Optimization tools to greater optimize caregiver assignment and visit/recurrence timing resulting in reducing excessive travel time, unhappy caregivers, and the improving the ability to meet the preferences of their clients.

04 The round-robin allocation of homecare referrals to SPOs based on market share is inefficient and leads to unnecessary travel time.

05 Coordination is the #1 overhead cost for the sector, and this cost falls on the SPOs. Investments in technology to reduce coordination costs have to be made to increase the efficiency of the sector.

CURRENT STATE

LHIN case managers assess patients and prescribe a certain amount of funded homecare:

- CHRIS is the case management software used.
- Referrals often specify time specific visits, even if these constraints are not clinically necessary.

These Services are offered to SPOs via electronic referral on a round-robin basis based on market share as determined in RFPs:

- The Offer is sent out via HPG or via its PXML interface.
- The recipient SPO has a set amount of time to accept the Offer before it is offered to the next SPO (KPIs are set for offer referral, often >95%).
- When an SPO accepts an Offer, they receive the Referral containing all relevant information to provide the contacted Service.

The SPO receives the referral, contacts the patient, and negotiates a visit schedule and caregiver(s) assignment:

- This process often involves a complex negotiation both with the caregivers and the patients to deliver a schedule that meets the requirements and preferences of each stakeholder group.

On average, 15-25% of scheduled visits are adjusted and/or re-assigned due to one of the following reasons (AlayaCare Data, 2017)**:**

- Frequency update from LHIN.
- Change in caregiver availability (personal reasons, illness, churn, etc.).
- Need for the caregiver to fill other shifts.
- Client availability, ad hoc events etc.

The LHIN priorities for Patient Centred Care, as outlined on the Patients First Roadmap, are encapsulated by the following KPIs requested of SPOs:

- Continuity of care.
- Minimizing missed care.
- Maximizing on-time care.
- Acceptance rate on new offers.

The most critical issues that most SPOs report are:

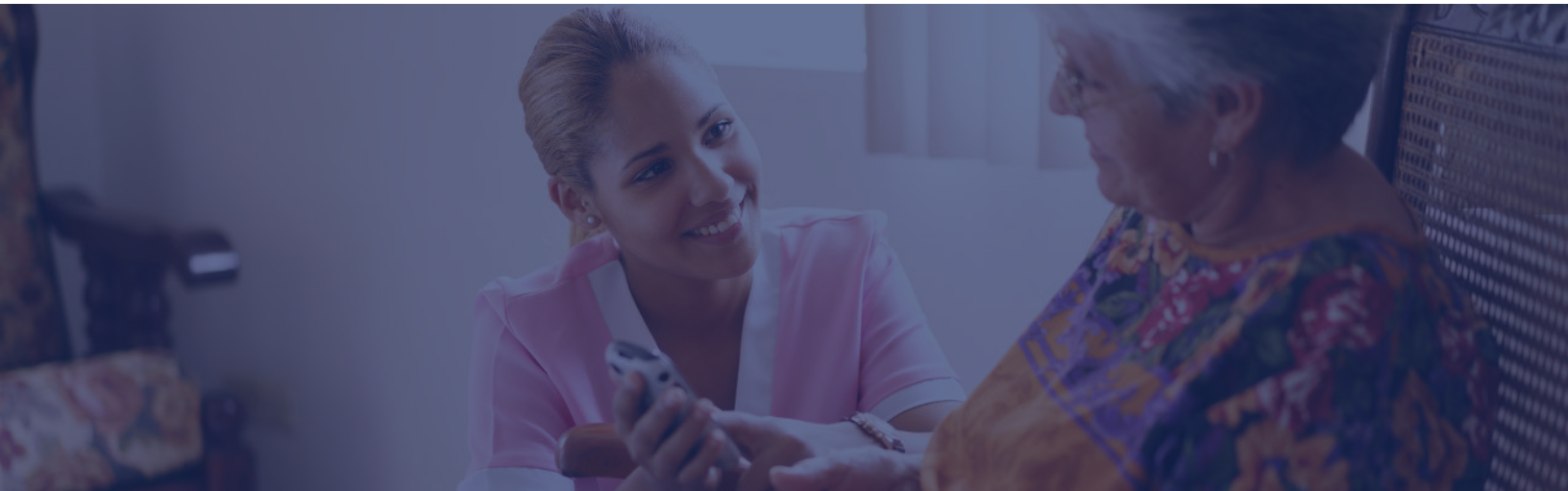
- Recruiting and retaining caregivers, with the most addressable items being
    - o Giving a stable and minimum number of hours to PSWs.
    - o Giving convenient shifts to PSWs – maximum amount of visits in a minimum amount of time (ie: minimizing travel time).
- Filling visits during high-demand times – weekday mornings.
- Filling visits during low-supply times – week-end evenings.

OPPORTUNITIES

Optimization software configured to meet minimize travel time, drive Key Performance Indicators, while meeting key care metrics such as continuity are all possible with today's technology.

- If client preferences were expressed as time windows vs time-specific visits on referrals, SPOs would have an addition degree of freedom to meet the demand while building efficient schedules and routes. The wider the time windows, the more efficient the routes can be.
- LHINs should explore geographic realignment to have fewer providers for a given service in a given region while still maintaining overall market share for their LHIN.
- There is an opportunity for SPOs to leverage optimization research to produce better schedules and route.
- Patients should be given more control to express their scheduling preferences.
- Economics 101 suggests that the way to bring supply and demand curves into alignment is via the pricing mechanism.

"If case managers could encourage patients to consider visits outside the 8:00 am to 11:00 am window, the downstream effect would give greater flexibility and improve SPOs adherence to LHIN developed KPIs and metrics."



RECOMMENDATIONS

LHINs should explore geographic realignment to have fewer providers for a given service in a given region

- Maintain existing market share at the LHIN-level
- Clustering analysis can be used to optimize this transition (Ministry to provide financial support for this activity).
- Certain LHINs (CW and HNHB) have already engaged in these projects.

Only make referrals time-specific if absolutely necessary, otherwise, express a time window.

Launch patient portal in which scheduling preferences can be expressed.

Incentive to encourage SPOs to adopt Schedule & Route Optimization tools (Ministry to provide financial encouragement).

Consider variable pricing allowing:

- **Demand shaping:** Patients to opt for more care at non-peak times (eg: 4 non-peak-time visits a week vs 3 peak-time visits, or shorter visits during peak times).
- **Supply shaping:** SPOs are paid more for peak-time visits allowing them to offer more per peak-time visit and thus increase the capacity.
- *Alternately: the narrower the time window, the more expensive the visit should be.*

Key points in the SPO scheduling workflow where AlayaCare believes optimization can be operationalized

1

Intake Optimization:

Caregiver assignment and recurrence patterns established when a new client is onboarded.

2

Vacant Visit Assignment Optimization:

As last minute call-offs and schedule changes create vacancies in a schedule, optimize the assignment of these visits – do these in a batch not one at a time.

3

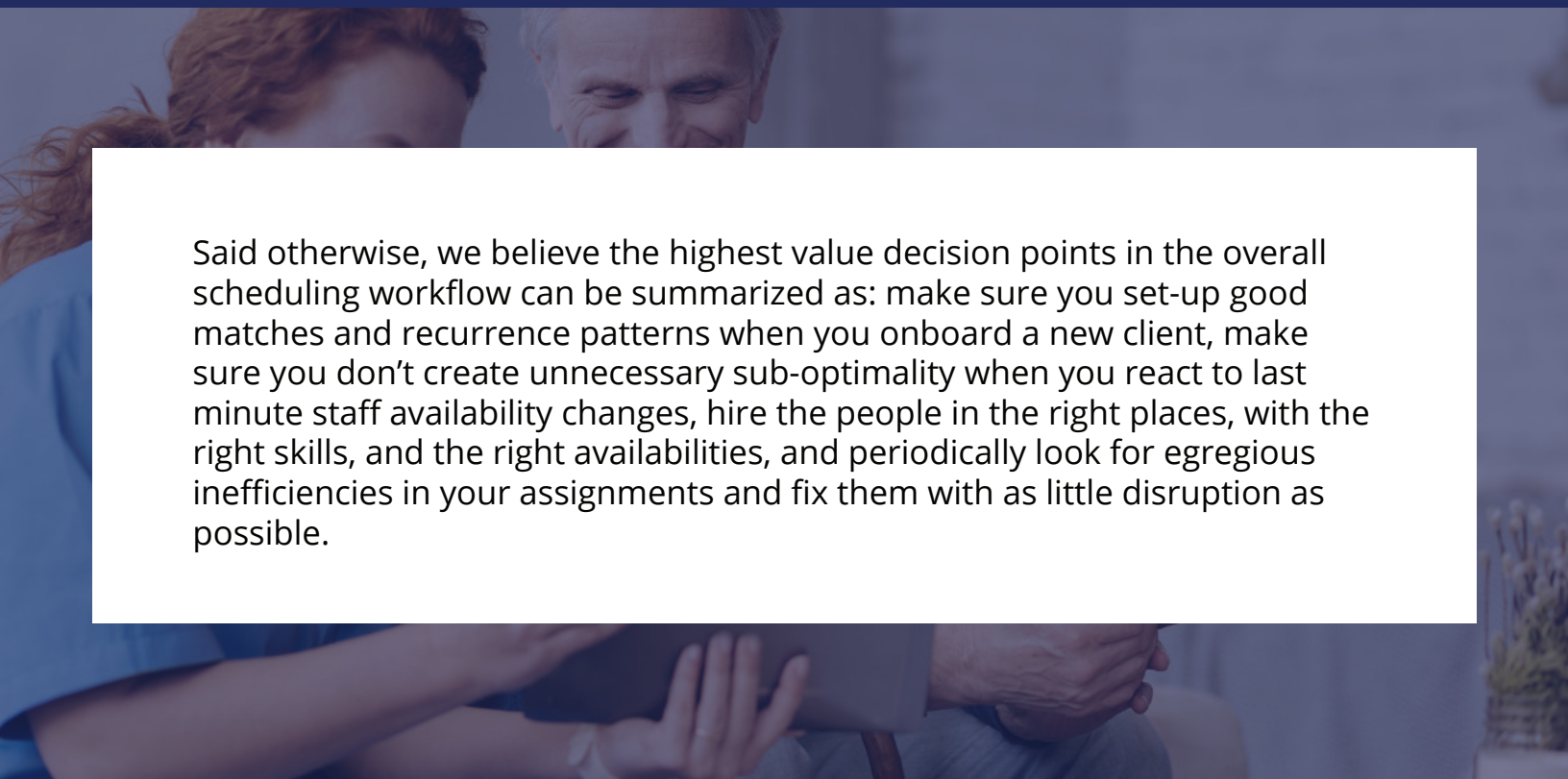
Forecasting of Labour Demand to Optimize Hiring:

Accurately forecast labour demand by geography, time of day/ week, and skill to build a workforce that can serve your client demands.

4

Full Schedule Reshuffle with Transition Model:

As greedy decisions migrate your schedule and routes away from optimality, periodically identify opportunities to increase your efficiency while minimizing disruption to your staff and clients.



Said otherwise, we believe the highest value decision points in the overall scheduling workflow can be summarized as: make sure you set-up good matches and recurrence patterns when you onboard a new client, make sure you don't create unnecessary sub-optimality when you react to last minute staff availability changes, hire the people in the right places, with the right skills, and the right availabilities, and periodically look for egregious inefficiencies in your assignments and fix them with as little disruption as possible.

GLOSSARY

CHRIS = Case Management Software used by LHINs, a provincial asset managed by HSSO

HPG = Health Partner Gateway, the portal in CHRIS for SPOs

KPI = Key Performance Indicator

LHIN = Local Health Integration Network

Offer = the electronic referral made available via HPG

PSW = Personal Support Worker

PXML = the CHRIS encoding for electronic referrals

Service = the detailed care services to be provided by SPO

SPO = Service Provider Organization, ie: homecare agency authorized to provide publicly-funded homecare in Ontario

Adrian Schauer
Founder & CEO - AlayaCare

Adrian Schauer is the founder and CEO of AlayaCare, a healthtech start-up serving the home healthcare market and looking to deliver the next disruptive solution for the i ndustry by combining remote patient monitoring, clinical documentation and back office software. Adrian is a serial technology entrepreneur having built two successful mobile software companies; both achieving leadership positions in their respective markets before being acquired. Adrian is also an active Angel Investor and sits on the boards of several companies including fast growing technology firms like the point-of-care medical device company Chipcare, the SaaS company TrackTik, and the GRC software provider Resolver. Adrian is also the co-founder of the Madiro Fund, an organization created to support innovative solutions to the health problems in low income countries.

Louis-Martin Rousseau
Canada Research Chair on Healthcare Analytics and Logistics

After completing his PhD in computer science and operations research at Université de Montréal, Louis-Martin Rousseau joined the Mathematics and Industrial Engineering Department at École Polytechnique de Montréal in 2003. Louis-Martin was one of the first researchers to investigate the hybridization of classical operations research methods and constraint programming, which comes from artificial intelligence. His current research focuses on transportation logistics, scheduling and resource optimization in healthcare.

William Falk
Board Advisor - AlayaCare

Will splits his time since retiring from PwC among several organizations that are trying to improve healthcare through policy and digital innovation. He is an Executive in Residence with ThinkReseach working with the executive team to developed clinical knowledge management solutions. He is a Senior Fellow at the CD Howe Institute and has two appointments at the U of T as an Executive Fellow at Rotman and the Mowat Centre. This January he is teaching an intensive course in Health Innovation at Rotman with Zayna Khayat.

Will is an active community volunteer and advocate. He was on the Boards of ICES, the William Osler Health System, and the Children's Aid Foundation. He was a member of the Premier's Expert Panel on Adoption & Infertility. He has advised the Harper & Martin governments on healthcare policy -- PM Martin at the 2004 First Ministers Meeting and The as the External Advisor to the Strategic Review of Health Canada in 2008. He has been a foster parent and is active in child welfare causes. He was a member of the Ministry negotiating team for the 2012 physician fee negotiations in Ontario.

Better Technology, Better Outcomes.

AlayaCare
330 Bay Street, Suite 500
Toronto, ON
M5V 0K3