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Association of  
**TELEHEALTH**  
Society

"Delivering Quality Healthcare Anywhere Through Telehealth"

## Home Care and Technology: A Case Study

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## HCA-T Project



**Funder:** Health and Wellness

**Project Timeline:** February, 2011 – March, 2012

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## Co Principal Investigators

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## Alberta Health Services Zone Map

HCA-T Research Sites

▲ Phase 1 Sites  
Research Completed



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HCA-T  
Health Care Aides &  
Technology Project

### Background: Health Care Aides

- In Alberta, approximately 16,000 health care aides (HCAs) serve the needs of clients in various types of organizations.
- Second to nurses, HCAs form the largest group of front-line service providers in the health care system.
- By 2017, it is projected that there will be a significant shortage of these service providers (nearly 7500) .

Contributing factors to increasing shortage and high turnover rates:

- Low job satisfaction
- Increasing job stress
- Poor hours/compensation/benefits



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### HCA-T Project

This project addresses a *key strategic objective of Alberta's Health Workforce Action Plan*:

To increase capacity of the health workforce by increasing productivity and reducing workload through the application of ICT (Information Communications Technologies).

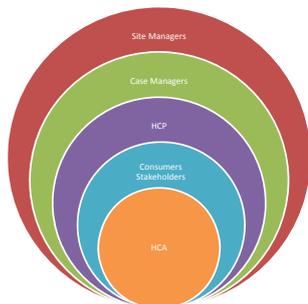
**Question:**

*How can technology reduce the workload and increase the productivity of Health Care Aides in home care settings and increase the efficiency of the home care teams overall?*



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### Research Participants



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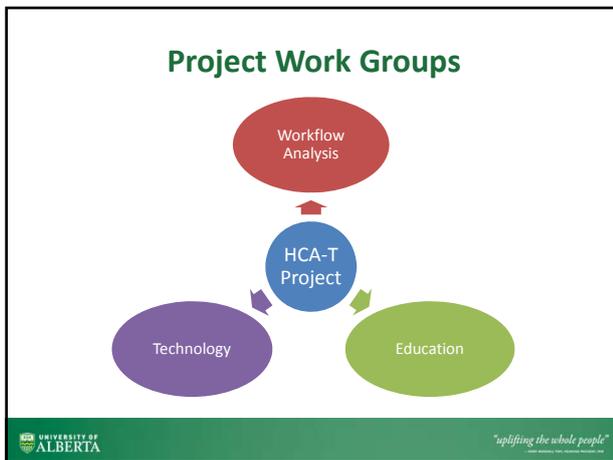
### Background: ICT

A variety of ICTs are currently being applied to assist clients with activities of daily living and to facilitate health care delivery.

There has been little to no investigation into commercial, 'off-the-shelf' (ICT) to address the workload of HCAs.



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### Research Process:

**Phase 1:**

Understand and describe challenges that affect HCAs' workflows and team interactions. Ethnographic approach used to collect information through documentation review, questionnaires or surveys, interviews and focus groups, about the typical HCA tasks, responsibilities and routines.

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### Research Process:

**Phase 2:**

Based on Phase 1 findings, consultations and meetings with service providers and expert groups, to identify key challenges that may be addressed by ICTs. An ICT tool suite was designed, integrating available existing and newly developed (by our team) technologies to address these issues.

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### Research Process:

**Phase 3:**

Assess the potential impact of these technological solutions on the workflow and productivity of HCAs, their healthcare teams, and client care.

Technologies were deployed in simulated settings with real HCAs; knowledge translation strategies for education programs developed.

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### Mixed-Method Approach

- **Qualitative** – Focused Ethnography
- **Quantitative** - Survey (Likert and written responses)
- **Data collection methods:**
  - Semi- structured interviews
  - Focus groups
  - Questionnaires
- **Documentation review**
- **Knowledge Translation/Mobilization:**
  - Symposiums and Conferences
  - Community Sounding Board



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### Results: Phase 1

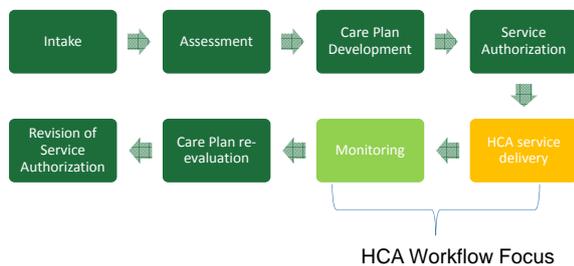
421 Research Participants across 5 health zones

- a) Interviews/surveys  
90 HCAs
- b) Questionnaires  
153 HCA respondents  
16 non HCA respondents
- c) Focus groups  
129 HCA participants



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### Homecare Workflow



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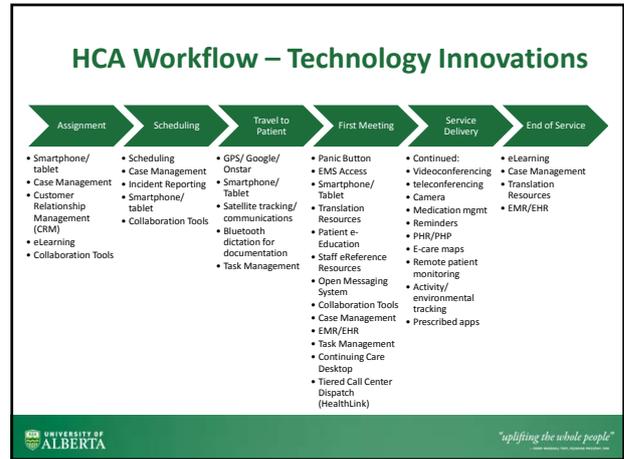
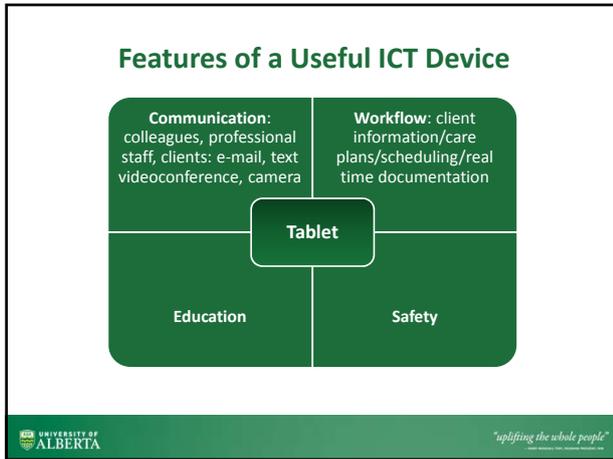
### Results for Phase 1

Key themes:

- 1) need for better scheduling,
- 2) improved communication of relevant client information,
- 3) timely communication between home care offices and HCAs, and
- 4) varying levels of perceived acceptance that technology can support provision of care.



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### Results: Phase 2

**Platform:** consists of a server and two clients: a web-based one for schedulers at the head office and a mobile app for HCAs in the field.

**Cloud deployment** - Our software, deployed on the cloud, relies on open standards and supports multi-platform mobile applications.

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### Results for Phase 2

**Scheduling Solution:**

We developed an algorithm based on previous work on ambulance scheduling. This algorithm respects the availability constraints and capabilities of clients and HCAs, considers client-HCA affinity, and optimizes HCA travel time.

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## Results for Phase 2

### The mobile "HCA App"

Enables HCAs to:

- (a) access their daily schedule and each individual client's information and required services, and
- (a) record notes on how these tasks were accomplished and other pertinent information.

## Results for Phase 2

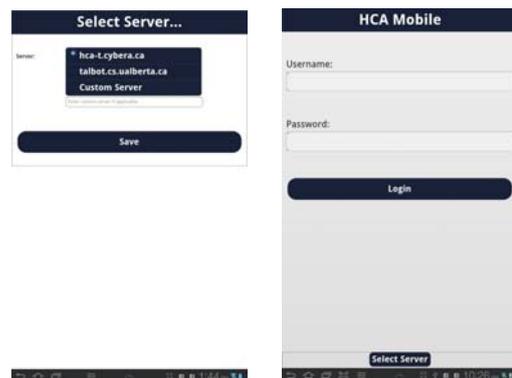
A set of third-part tools, including:

- a. **Navigation support** (thus addressing travel-related safety concerns);
- b. **Messaging tools** (to address ad-hoc communication needs);
- c. **GPS-enabled alarm service** (to address safety concerns); and
- d. **Access to the authoritative on-line Community-Care Desktop** (addressing just-in-time knowledge needs).

### HCA-T ICT Piloted Solution: Samsung Galaxy Tablet

#### Equipped with:

- Navigation
- Care Plan
- Camera and Video
- Skype
- Email and texting
- Continuing Care Desktop
- GPS Tracking app (Safetracks)
- Fruit Ninja App (for training)
- TiKl (in-facility walkie talkie type app)
- HCAMobile App (developed by University of Alberta)



**Schedule for 4-11-2012**

Barbara Zoolander  
5:54PM to 5:59PM

Barbara Zoolander  
5:59PM to 6:03PM

Logout

**Appointment Details**

Barbara Zoolander  
5:54PM to 5:59PM

- Address & Phone Number
- Emergency Contact
- Case Coordinator
- Risks In Home

Care Plan

Shaving: Add client in shoving  
Incomplete

Patient History

Narrative Record

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**Enter Note...**

Tap here to enter text...

Done

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Username: Password: Login

**Case Coordinator – desktop app**

Personal Information:

Glenda Phillips  
1 (780) 333-4444  
606376@yahoo.ca  
43234 Hwy 56  
Camrose AB Postal Code...

Emergency Contact:

Emergency Contact Name...  
Emergency Contact Phone...  
Emergency Contact Address...  
Emergency Contact Relation...

Case Co-ordinator:

Case Coordinator Name...  
Case Coordinator Email...  
Case Coordinator Phone...

Patient History:

Medical History...  
Social History...  
Risks In Home...

Wanda Gainer  
Monday Noon care, 6:15AM-6:30AM

Care-Plan:

Meal Assist (3 min)  
Remove client to eat

Bathing (3 min)  
Help client in and out of tub

Dressing (3 min)  
Aid client in dressing themselves

Notes: Add message

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Availability:

Feb 19, 2012 - Feb 25, 2012  Edit this week onward  Edit just this week

	Sun Feb 19	Mon Feb 20	Tue Feb 21	Wed Feb 22	Thu Feb 23	Fri Feb 24	Sat Feb 25
6:00AM	Unavailable	Unavailable	Unavailable	Unavailable			
7:00AM	Unavailable	Unavailable	Unavailable	Unavailable			
8:00AM							
9:00AM					8:00AM to 10:00AM	Unavailable	8:00AM to 10:00AM
10:00AM					Unavailable		
11:00AM							

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**Andrew Jones**  
 Name: 1 (780) 390-7801  
 Email: andrew.jones@alberta.ca  
 Home: 1 (780) 390-7801

**Personal Information:**  
 Center: Gofford  
 1 (780) 390-7801  
 andrew.jones@alberta.ca  
 2001 100 Street  
 Edmonton, AB T6E 1A1  
 900 Valley St

**Login Credentials:**  
 Username: andrew  
 Password: andrew

**Availability:**  
 Feb 19, 2012 - Feb 25, 2012  
 Sun Feb 19 Mon Feb 20 Tue Feb 21 Wed Feb 22 Thu Feb 23 Fri Feb 24 Sat Feb 25

**DAILY AVAILABILITY**

8:00AM	Unavailable						
7:00PM							

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### Map services

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**Service:**  
 Name: Gofford (Gofford)  
 Description: Use client's device and record value in the client's log.  
 Duration: 30 minutes

	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
HCA DEVICES							
HCA DEVICES10	Wanda Garner 8:00AM-1:00PM	Larry Yang 8:00AM-1:00PM	Wanda Garner 8:00AM-1:00PM				
HCA DEVICES11	Wanda Garner 8:00AM-1:00PM						
HCA DEVICES12	Larry Yang 8:00AM-1:00PM						
HCA DEVICES13	Larry Yang 8:00AM-1:00PM						
HCA DEVICES14	Larry Yang 8:00AM-1:00PM						
HCA DEVICES15	Larry Yang 8:00AM-1:00PM	Wanda Garner 8:00AM-1:00PM					

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### Results for Phase 3

**Training**  
 We provided training for HCAs over 2-3 hours, followed by two simulated home visits with "clients". HCAs completed pre/post-training/simulation questionnaires, and a focus group at the end of each session.

**Total number of HCA participants:**  
 53 (range/site: 1-5, mean/site: 3)  
 Focus group participants: range/zone: 8-15, mean/zone: 6  
 Percentage Rural/Urban: 75/25%

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### Results for Phase 3

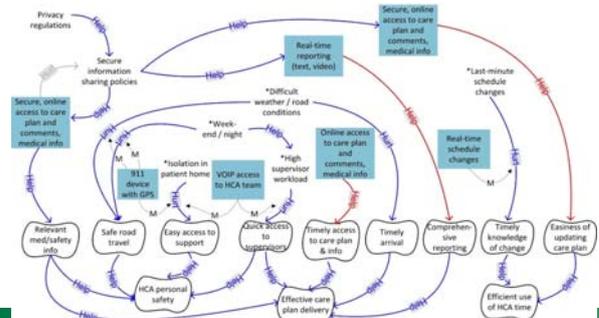
**Post-training and simulation:**

The majority of HCAs responded they would use ICT for:

- Internet (91%)
- Voice recognition (88%)
- Skype (88%)
- Camera (97%)
- Messaging (94%)
- E-mail (91%)
- GPS (91%)



### Workflow and technology analysis



### ICT Acceptance – Changing Attitudes

The first thing I said as soon as (the training) was over - "I want one."

### ICT Barriers to acceptance

If the tablet doesn't do it all ... then it's not really worth it. I would want it to do everything I need ...when I go out the door all I do is grab my tablet and I am ready for anything.

**Benefits of ICT**

**Job satisfaction:** *I feel appreciated, or "You're doing an important job here. We need you to have some good equipment on board."*

**Decreased job stress:** *If you could pass that information on to the next person, then they could just start right out with that.*

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**Benefits of ICT**

**Documentation & Efficiency** *...where if we had a system set up where it was documentation there, and everyone had access to it, they could pop it up and see it and it wouldn't have to be all this circle of time-wasting.*

**Communication** *Especially when you cannot describe, there is a, like, bruise or, you know, redness in the skin, you cannot describe how red it is. So you can show it to the nurse (using the camera function).*

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**Benefits of ICT**

**Increased perception of support, well-being and security.** **Heightened sense of autonomy – more immediate care for clients:**

*If the client had a question about what a pill is...I would just say, "Ask your nurse," but now I could ask the nurse for her, right in front of her.*

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**Why are ICT solutions so important?**

*A lot of times in our work, especially if we work out of facility, we feel **segregated** because we're going individually from home to home to home, but at the same time we're very **disconnected** from the rest of the world, and this is a plug-in to **feeling connected**.*

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## Conclusions

Our data demonstrates that technology can help address workload, productivity and efficiency of home care:

1. **Retention** - HCAs felt they would be safer, could work more efficiently and would feel more valued, if they were provided with the technology.

2. **Recruitment**

Although working with clients brings job satisfaction, participants believed that the technology would attract more people to the profession.

3. **Recognition**

HCAs thought the technology would make them feel recognized for their work because the tools would address their workflow and communication challenges.

## Questions

