

Usability Evaluation
of a Decision Support
Innovation Linking
Evidence Based
Practice with HOBIC
Outcomes
Measurement



Investigators

Diane Doran, RN, PhD

Faculty of Nursing
University of Toronto

André Kushniruk, PhD

Health Information Science
Victoria University

Brenda Laurie-Shaw, RN, MN

University Health Network

Sharon Straus, MD

Faculty of Medicine
University of Toronto

John Hirdes, PhD

Health Studies
University of Waterloo

Nancy Lefebvre, RN, MScN

Saint Elizabeth Health Care

John Mylopoulos, PhD

Computer Science
University of Toronto

Lynn Nagle, RN, PhD

Faculty of Nursing
University of Toronto

Souraya Sidani, PhD

Faculty of Nursing
University of Toronto

Ann Tourangeau, RN, PhD

Faculty of Nursing
University of Toronto

Edith Hillan, PhD

Faculty of Nursing
University of Toronto

Cheryl Reid-Haughian, RN, MHScN

ParaMed Home Health Care

Funding

- **Ontario Ministry of Health and Long-Term Care**
- **Communications and Information Technology Ontario**
- **Nortel**
- **Canadian Health Services Research Foundation**

In kind support: **Mount Sinai Hospital**
University Health Network
ParaMed Home Health Care
Saint Elizabeth Health Care

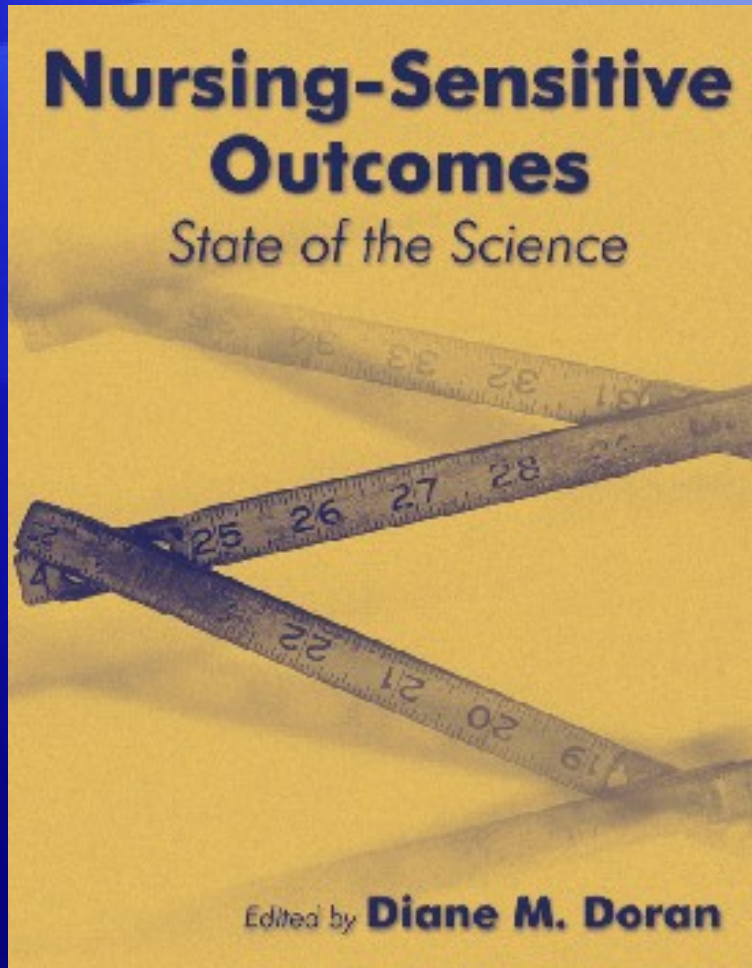
Why is this Study Important?

- It is a challenge for nurses to regularly access information that is current and reliable (Estabrooks et al., 2003).
- Nurses report a lack of interest or time for reading journals or using the Internet (MacIntosh-Murray, 2005).
- Information technology can help promote safe, high quality care and enhance the continuity of care through improved communication and decision support (Bates and Gawande, 2003).
- PDAs can provide the opportunity to access current information at the moment the nurse meets the patient (Lewis and Sommers, 2003).

Context for the Study

- **MOHLTC Health Outcomes for Better Information and Care (HOBIC)**
April 2007
- **Nursing sensitive outcomes** as part of routine care in health record
 - Functional Status
 - Symptoms (pain, nausea, dyspnea, fatigue)
 - Therapeutic Self-Care
 - Pressure Ulcers
 - Falls
- **Seamless across the continuum of health care**
- **Outcomes information available to nurses in real-time**

Approach to Measurement



ADL and IADL interRAI
MDS LTC & HC

Numeric rating scales
Frequency and Severity

12-item Scale

interRAI MDS

interRAI MDS

Patient Health Outcomes



- Provide us with information about how patients respond to nursing interventions
- Also used as a baseline indicator for planning and evaluating care

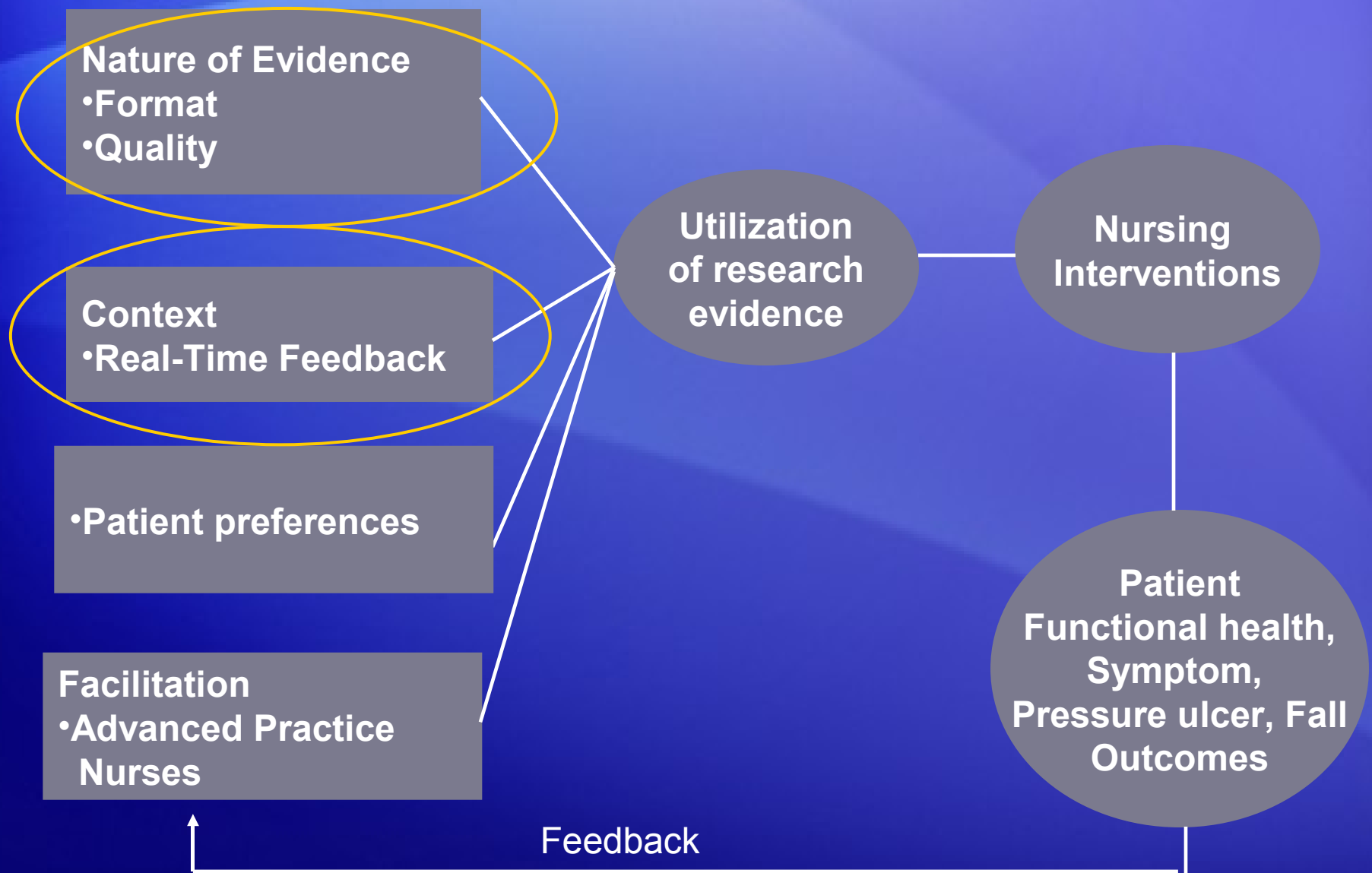


How do we provide clinicians with access to outcomes information in a meaningful way so that they can use this information to improve patient care?

e-Evolution in Outcomes- Focused Knowledge Translation™



Outcomes Focused Knowledge Translation



Prototype System

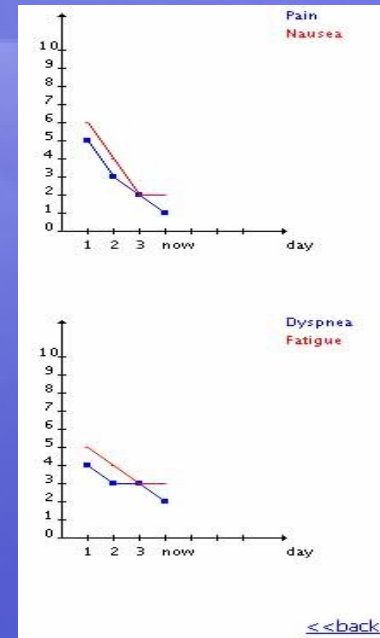
Six Functions:

- **Patient Outcomes Data**
- **Real-time feedback**
- **Best practice guidelines**
- **Case-based reasoning**
- **Drug dictionary**
- **Telephone**

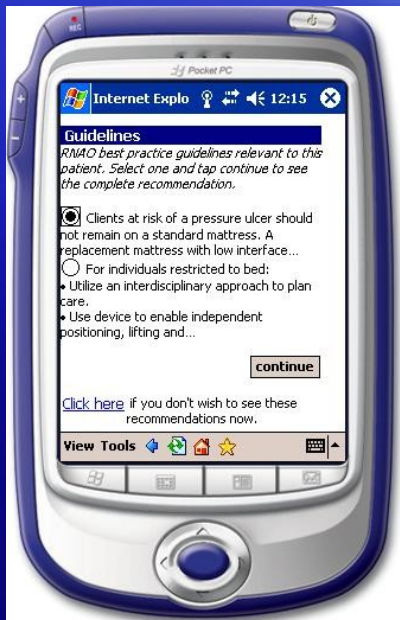
Wireless Data collection



Real-Time feedback



RNAO Best-practice guidelines



Benchmarking

Health-Care Decision Support

Search	Discovery	Benchmark
Functional status	Symptom	
Name	Average	Focus
Fatigue	2	5
Nausea	2	5
Breath	2	2
Pain	5	3
PressureUlcer	5	5
BradSensory	3	3
BradMoisture	3	2
BradActivity	2	5
BradMobility	6	6
BradNutrition	5	3
BradFriction	3	2

Research Development

Phase 1: Hospital-and community nurses contributed to the development of the system



Doran et al. (2007). Evidence in the Palm of Your Hand: Development of an Outcomes-Focused Knowledge Translation Intervention. *Worldviews on Evidence-Based Nursing* 4(2), 69-76.

Phase 2: Usability evaluation in Lab study



Doran & DiPietro (in press). Human And Social Issues in Information Systems (Ed. Kushniruk)

Phase 3: Usability and effectiveness Evaluation in field study



Field Evaluation

Design: Quasi-Experimental

Setting

- **Three Hospitals: 6 control units and 6 experimental units**
- **Three home care agencies**

Field Evaluation

Procedure

- **Nurses on the experimental units attended a training workshop and then used PDAs to document outcomes of up to ten patients each.**
- **Research assistants collected outcomes data on control units**
- **Hospital nurses used WLAN network**
- **Home care nurses used high speed cellular network**

Field Evaluation

Data Collection

- **Communication questionnaire (Shortell)**
- **Usability questionnaire (Norman)**
- **Chart audit for evidence of documentation of BPG interventions**
- **Qualitative interviews**

Sample – Acute Care

- **170 Nurse participants: 70 Experimental, 100 Control**
- **ages range: 24 to 66, mean 42**
- **9.9 years experience in organization**
- **Female 90%**
- **83% regular full-time**
- **92.5% RNs; 2.3% RPN, 5.1% Other**
- **53.2% Diploma**
- **63% RNAO NBPGs available on the unit; 63% of these had not consulted them in past month**

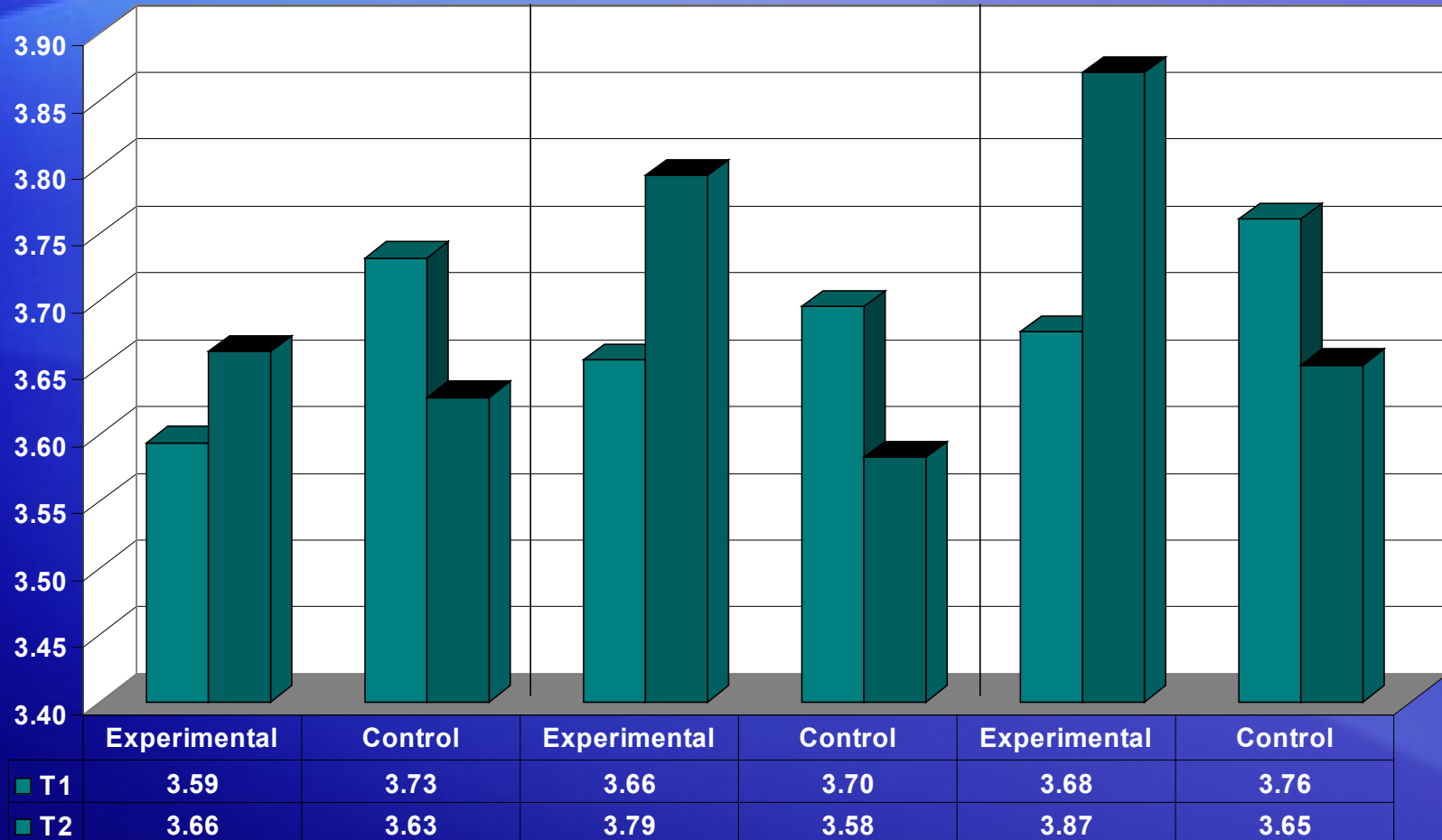
Sample - Home Care Nurses

- Nurse Participants: 22 volunteered, 11 field tested prototype
- Mean age 47
- 6.5 years experience with organization
- 91% female
- 39.3 hours/week (28-50)
- 68% RN or RPN, 32% Baccalaureate or Master's in progress or completed
- 86% RNAO NBPGs available; 89% had not consulted them in past month

Usability Evaluation (9-point scale)

	Hospital	Home Care
Screen (8 items)	7.2	7.4
*System capabilities (2 items)	7.2	5.9
Using PDA to look up information (4 items)	7.1	7.3
Using PDA to enter information (6 items)	7.1	7.3
Terminology and system information (6 items)	7.0	6.8

Communication Among Health Care Providers



NurseNurse Communication

Nurse-HCP Communication

Info communicated quickly
when status changes

ANCOVA Results

Difference Between Experimental and Control Units

Dependent variable	F Value	Partial Eta Square	R Square
Timeliness of information transfer	5.08 p<0.05	6%	11%
General communication	5.28 p=0.05	6%	20%
Teamwork	3.69 p=0.06	5%	26%

Communication: Home Care

	T1 Baseline	T2 follow-Up
Nurse/Nurse	3.81	3.35
Nurse/HCP	3.16	3.50
General	3.02	3.08

Best Practice Guidelines

- **Significantly high likelihood of appropriate nursing interventions for patients who met ‘trigger’ criteria for pressure ulcers (Braden score) and pain (intensity >1).**
- **However no difference in the documentation of nursing interventions consistent with the Guidelines between experimental and control patients.**

Qualitative Comments

- Liked PDA for collecting data
- Liked that device was small, compact and lightweight
- Need to develop interface with EHR
- Information obtained from functional and symptom assessment aided in planning care
- Some nurses commented that it was helpful to see trends in outcomes, but also to share this information with patients

Next Steps

- **Develop the EHR interface**
- **Explore the value of providing nurses with different types of electronic resources**
- **Explore different approaches for providing nurses with benchmarking data**
- **Explore different wireless information terminals – tablet PC, PDAs**

Enhancing Service for Patients with Mental Health Needs

Interdisciplinary

Decision-Support

- RAI- Mental Health
- Inter-professional plan of care
- Evidence-based practice guidelines

The screenshot shows the 'Update Issue/Need' form in the TREAT system. At the top right, the user 'Samantha Jones CAMH' is logged in. The form header includes the patient's name 'Kathy Kellar', DOB '27-Sep-1977', and MRN '#:4000832'. The domain is 'Communication / Therapeutic Relationships (CTR)'. The issue title is 'Interpersonal Conflict'. The details section lists two bullet points: 'A hostile patient is persistently hostile or critical of family/friends.' and 'Patient is persistently hostile toward or critical of other patients or staff.' The goals section has a dropdown menu and three priority dropdowns (Status: Auto-Updated, Client Priority, Clinician Priority). The strengths/resources and challenges sections are empty text boxes. The plan section has a dropdown for 'Plan *', a 'Status *' dropdown, and a 'Comments' field. Below the plan dropdown is a list of suggested plans with checkboxes and asterisks. The form also includes 'Start' and 'End' date pickers, 'Submit', and 'Cancel' buttons.

TREAT Samantha Jones CAMH Logged In

Update Issue/Need

Client: Kathy Kellar DOB: 27-Sep-1977 MRN #:4000832

Domain: Communication / Therapeutic Relationships (CTR)

Issues/Needs Title * Interpersonal Conflict

Issues/Needs Details

- A hostile patient is persistently hostile or critical of family/friends.
- Patient is persistently hostile toward or critical of other patients or staff.

Goals **

Status * Auto-Updated

Client Priority

Clinician Priority **

Strengths / Resources

Challenges

Treatment/Rehabilitation/Intervention

Plan * Status * Comments Last Update:

Choose a suggested plan or enter your own:

Start: End:

Submit Cancel

* Involve family by listening to concerns, exploring expectations and understanding of illness and treatment.

** Offer support and education to client's family and/or significant others.

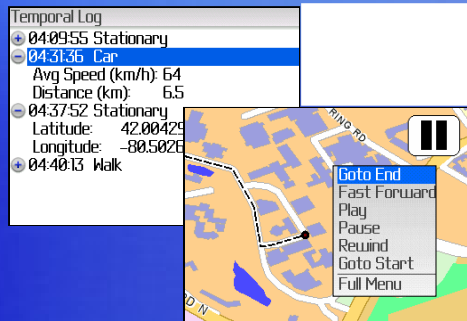
** Incorporate illness education, symptom management, emotional support and coping skills in interventions for client's family.

** Engage and collaborate with client's family, especially during crisis/relapse episodes.

** Include family in goal setting, treatment planning, and service delivery.

** Include the client in family interventions to the extent possible.

Safer Patient Care for Community Dwelling Older Adults



Cellphone-support GPS tracking



Sensors in the Home
For Home Monitoring

Point-of-Care and Virtual Healthcare
Decision Support

Industry sponsors: Nortel, HInext, RIM

Contact Information

Diane Doran, RN, PhD, FCAHS
Professor

Lawrence S. Bloomberg Faculty of Nursing,
University of Toronto
diane.doran@utoronto.ca

