The Toronto Virtual Ward
Collaborating to reduce readmissions

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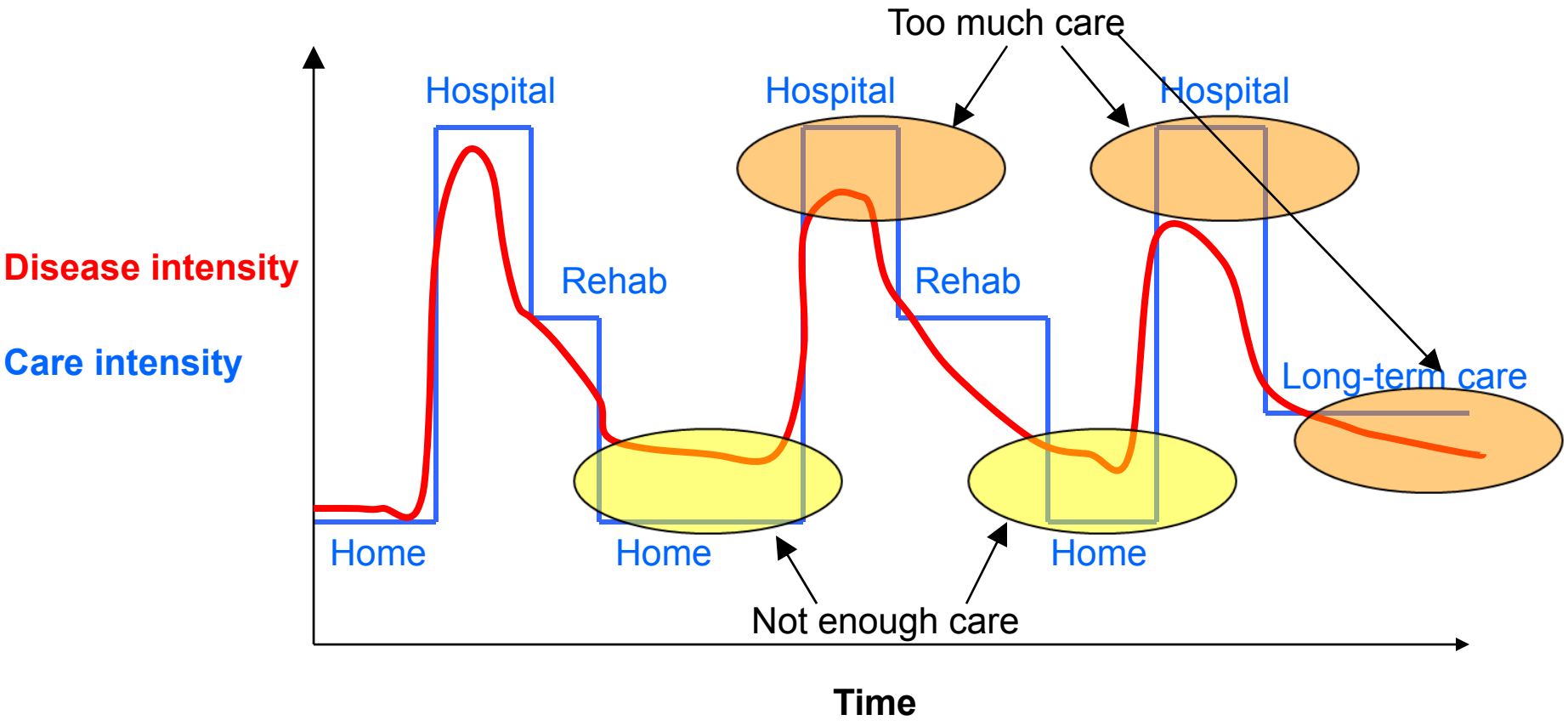
The problem

- Most “acute illnesses” are now actually exacerbations of chronic disease, so patients do not leave hospital in a state of perfect health
- Hospital admissions have become shorter and shorter, so patients are sicker at discharge
- Large “voltage drop” in the intensity of care at the time of discharge
- Readmissions are
  - Common (10-25% of patients are readmitted within 30 days)
  - Costly (~$700 million per year in Ontario)

Why focus on care after discharge?



Summary of transitions literature

- Post-discharge health outcomes probably can be improved
- Best interventions combine pre- and post-discharge care and include in-person contact
- May be able to reduce readmission rate well below current rates, since no interventions have been comprehensive (e.g., limited additional physician involvement after discharge)
- As in other areas of medicine, impact is likely to be greatest if we focus on those at highest risk

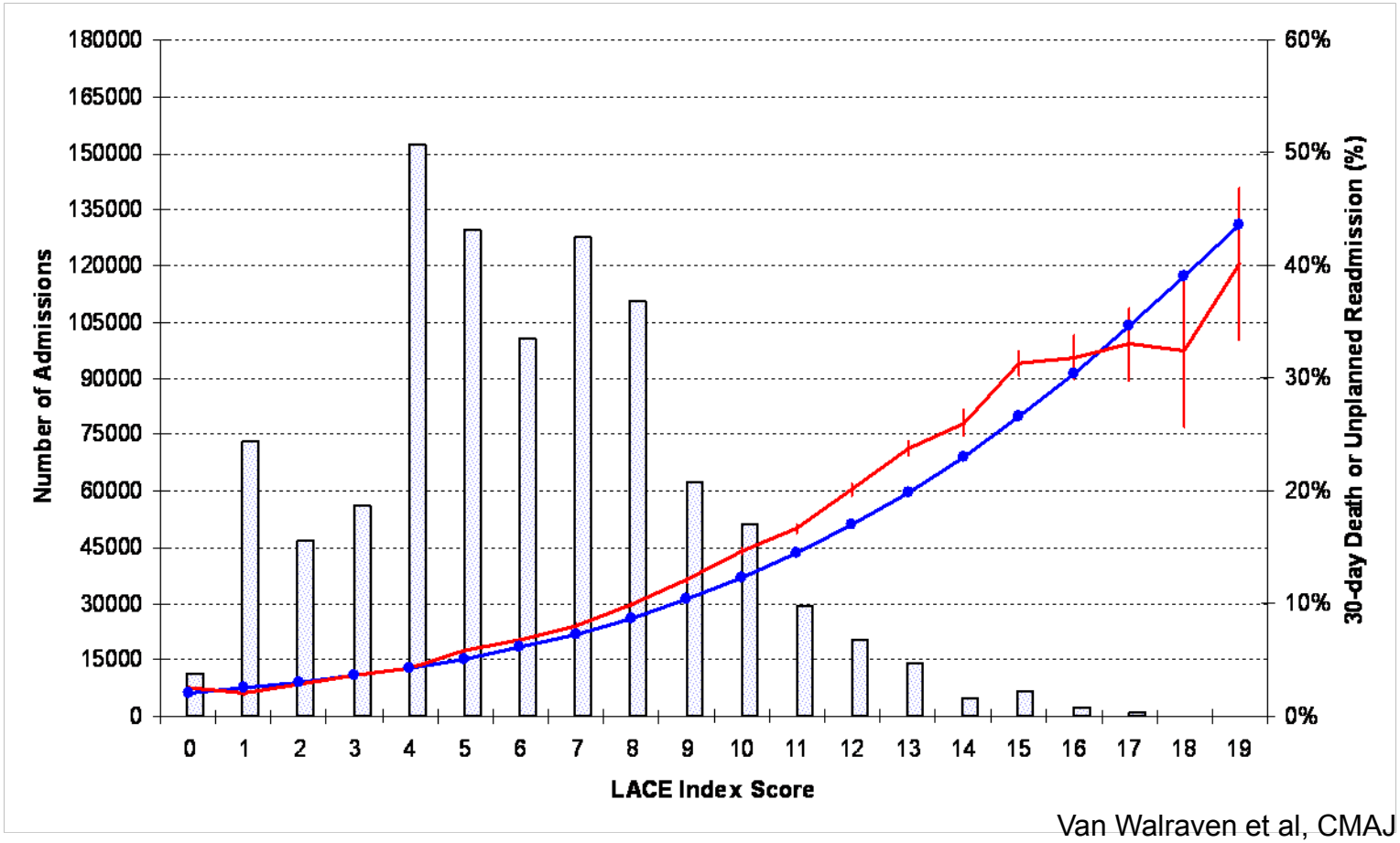
A tool to estimate the risk of readmission

- The LACE index
  - Clinical prediction rule derived and internally validated using data collected for the OAtH study (4812 patients at 11 hospitals)
  - 48 potential predictors considered, including functional status (Walter index) and support at home (lives alone vs. not)
  - Externally validated using data from 1 000 000 patient records from CIHI-DAD

L = length of stay
A = acuity of admission
C = Charlson comorbidity index
E = number of ER visits in last 6 months

Van Walraven et al, CMAJ 2010

Prediction of readmission using the LACE index



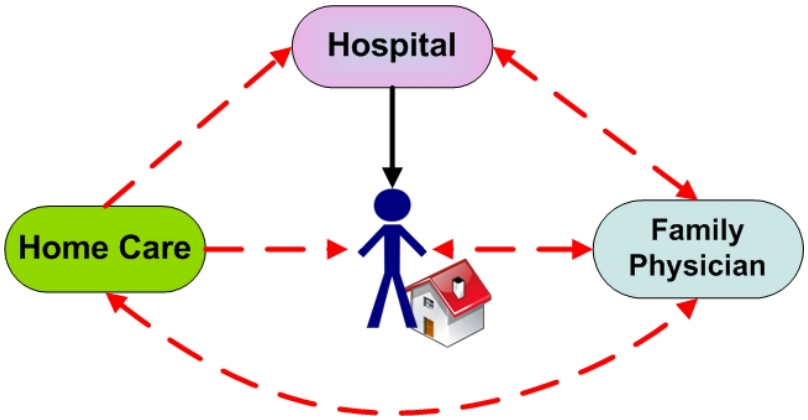
Van Walraven et al, CMAJ 2010

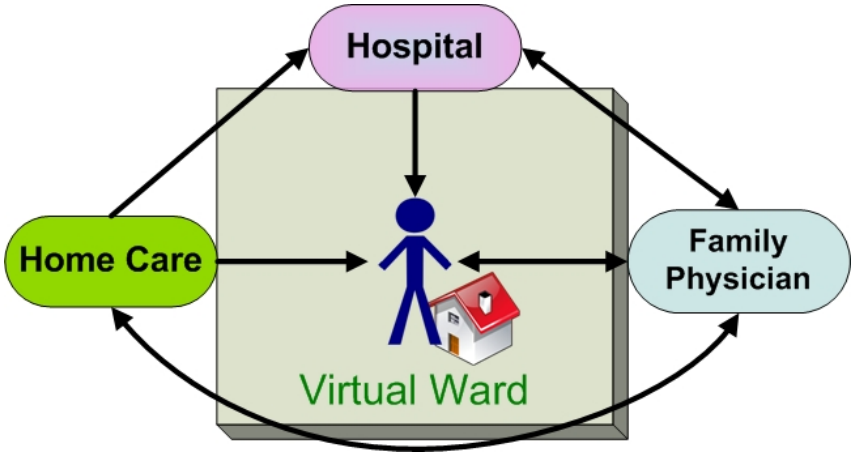
Post-discharge health outcomes*

	LACE < 10 (N = 17 191)	LACE ≥ 10 (N = 8 854)
Readmission or death within 30 days of discharge	1705 (9.9%)	1905 (21.5%)
Readmission or death within 90 days of discharge	2861 (16.6%)	**3181 (35.9%)**

*Medical admissions, 2007, TC LHIN

A Virtual Ward



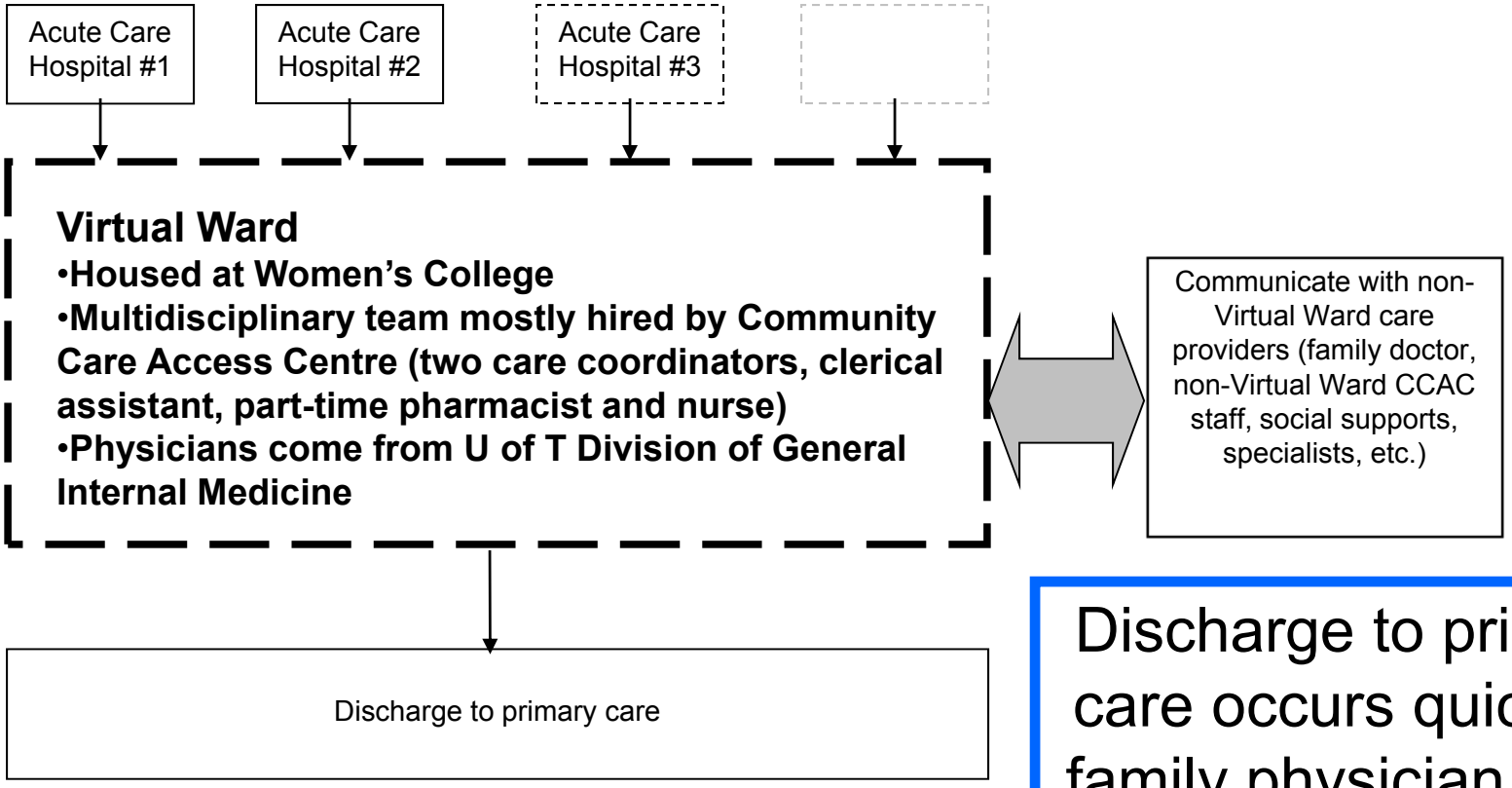


- Method of providing care to people in the community who are most vulnerable to unplanned hospital admissions
- "Ward" – Borrows elements of hospital care
  - Team-based, shared notes, single point of contact
- "Virtual" - Patients remain at home
  - Nothing high-tech about it

The Ontario health care system

- **14 Local Health Integration Networks**
- **Hospitals**
  - **Long history of independence, now notionally accountable to LHINs**
- **Physicians**
  - **Independent, capitation or fee-for-service (even those who work in hospitals)**
- **Home care**
  - **Organized by Community Care Access Centres (1:1 with LHINs)**
  - **Purchaser-provider split → most services delivered by independent agencies**
- **Long-term care**
  - **Independent, but publicly regulated and mostly publicly funded**
  - **CCACs act as gatekeepers to long-term care**
- **Pharmacies**
  - **Independent, largely publicly funded**

Our Virtual Ward model



Discharge to primary care occurs quickly if family physician keen to assume care


Relay For Life
Canadian Cancer Society
Société canadienne du cancer
www.cancer.ca

The situation

- **63 year old woman, living alone at home, discharged from hospital after being treated for a pulmonary embolism as well as COPD and CHF exacerbations**

- **Seen at home on day after discharge**
  - **Very short of breath**
  - **Poor understanding of medications**
  - **Not using community support services**
  - **No appointment with family physician**

What the Virtual Ward team did

- **Stabilized the patient**
  - **Brought patient to Women's College Hospital (for 3-4 hours) to assess need for home oxygen**
  - **Patient met criteria→home oxygen arranged**

- **Refined the diagnosis**
  - **Arranged pulmonary function tests which ruled out COPD. This allowed intensive focus on CHF and discontinuation of puffers**

What the Virtual Ward team did

- **Provided in-home support**
  - **Medication counseling (warfarin, puffers, adherence aid)**
  - **Arranged in-home dietary counseling for CHF**
  - **Increased in-home nursing until patient more stable**

- **Established plan for post-Virtual Ward care**
  - **Spoke with family doctor several times to ensure good handover**
  - **Expedited cardiac assessment at CHF clinic to refine treatment plan**

Outcome

- **No readmission**
- **Satisfied patient**
  - **“I don’t know what would have happened [without the Virtual Ward] …would have gone back to hospital”**
  - **“I used to be a volunteer gardener [2003-2007]. This month, I’ll go back to my plot.”**

Evaluating health service interventions

Developing and evaluating complex interventions:

new guidance

Evaluating health service interventions

- **RCTs are the gold standard**
  - "Randomization … is the most robust method of preventing the selection bias that occurs whenever those who receive the intervention differ systematically from those who do not, in ways likely to affect outcomes."

Randomized controlled trial

- **P = Population**
  - **High-risk adults (LACE ≥ 10) discharged to home or long-term care**
- **I = Intervention**
  - **Virtual Ward**
- **C = Control**
  - **Usual Care**
- **O = Outcome**
  - **1º Readmission or death within 30 days**
  - **2º Readmission, death, ER visits, death at 30, 90, 180 and 365 days**

RCT design – sample size

- **Baseline readmission risk conservatively estimated to be 15%**
- **We hypothesize that Virtual Ward will reduce readmission by 33% (i.e., to 10%)**
- **Assume 10% lost to follow up**
- **Requires 1510 patients (755 in each arm)**
  - **Note that this is 2x as large the Coleman Care Transitions Intervention trial and the Jack trial and 4x as large as the Naylor trial**
  - ***Approximately 430 enrolled so far***

Early lessons from the Virtual Ward

- **Organizations can partner to collaborate at the point of care**
  - → **Need clinical and administrative leaders each organization**
- **New models of care can and must be rigorously evaluated**
  - → **Researchers and providers should collaborate at the design stage**
- **Lack of integration is a major problem**
- **Access to primary and specialty care is a challenge for individuals who home-bound and/or non-adherent**

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