The Alternate Care Environment:
A Project to Reduce
Inpatient Length of Stay

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Co-Authors and Acknowledgements

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A Bit About Canada

- Single payer, universal for ~70% of care (medically necessary)
- Jointly funded by federal and provincial governments. Systems run by each province.
- Private delivery model (physicians are not employees, not-for-profit hospitals only with global budget)
- No two-tier
Welcome to Sick Kids!

- Tertiary/Quaternary children’s hospital located in downtown Toronto, Ontario, Canada with significant secondary care.

- 53,000 ER visits/yr

- 215,000 children visit ambulatory clinics/yr

- General Paediatrics: 3,000 admissions/yr
The Problem/Opportunity

An executive walks into your office and informs you that the hospital is operating with a large deficit.

Inpatient length of stay on general paediatrics has been identified as an area for improvement.

She believes you are well suited to lead a quality improvement project to reduce length of stay.

She requests a timeline for launching a prototype of 3 months…
Putting Ourselves in a Patient’s Perspective

I don’t understand why my child needs to spend 3 days in hospital waiting for a test. I have other children at home who need my care.

It’s so uncomfortable staying overnight. There is so little space to sleep.

The nurses come in every few hours to check my child, even though there is nothing wrong with her. It disrupts her and my sleep and might even be making her sick!

* These are anecdotal experiences. More robust data on patient experience to be presented.
## Step One: Assemble a Team and Make a Plan

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### Project Team
- Kate Langrish
- Charlotte Moore Hepburn
- Sarah Schwartz
- Ashley Spiegel
- Chantal St. Jules
- Ali Damji
- Tom McLaughlin

### Project Advisory Committee
- Charlotte Moore Hepburn
- Carolyn Beck
- Trey Coffey
- Deena Savlov
- Michelle Shouldice
- Sarah Schwartz
- Michael Weinstein
- Joseph Wiley
- Jennifer Smith
- Kim Zhao
- Lynn Mack
- Michelle Bisnauth
- Stuart Tammadge
- Marilyn Sperini
- Adal Bhalibi
- Alyson Ella
- Carolina Strattioto
- Kate Langrish
- Jennifer Smith
- Lynn Mack
- Michelle Bisnauth
- Stuart Tammadge
- Marilyn Sperini

## Alternative Care Patient Space – Study Process

<table>
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<th>Patient / Family Interviews</th>
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<tr>
<td>26 Patients / Families since July 2 2014</td>
<td>Daily Audits since June 23rd 2014</td>
<td>PM Admits with LOS &lt;2 days for May and June 2014</td>
<td>3 Staff MD, 1 Resident, 3 RN, 1 NP/SCU, 1 Advisory Committee</td>
<td>Executive Decision Making</td>
<td>3 Day Meeting for Solution Design, Process Mapping, &amp; Operational Plan</td>
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</table>

**Advisory Committee**
- Executive Decision Making
- Weekly Updates on Project Progress

**RIE**
- 3 Day Meeting for Solution Design, Process Mapping, & Operational Plan

**Healthier Children. A Better World.**
Step Two: Study the Concept
“Can we avert admissions?”

Data Source: Retrospective Chart Review -- Paeds LOS <2days

May 2014
- 37% ACE
- 63% NON-ACE

June 2014
- 49% ACE
- 51% NON-ACE

- In May 52/83 patients with LOS<2days met ACE criteria
- In June 36/70 patients with LOS<2days met ACE criteria
- All patients may not have been ACE appropriate.
Proof of Concept: Can we avert admissions?

Admission Times for potential ACE Appropriate Patients

59% of the total “ACE” patients are admitted between 2200 & 0700 hrs.
Proof of Concept: Can we reduce ward LOS?

Data Source: 7BCDE Ward Team Audits (July)

On average, 4 pts/day (range: 1-7) were suitable for ACE.

This equates to approximately 7.8% of the total patient volume of Paediatric Medicine.
Patient Input (July 2014)

• 21 “ACE-appropriate” families interviewed

• 14/21 preferred to go home at night if no treatment needed
  • Other home responsibilities, more comfortable
  • Would prefer same medical team, same location

• 7/21 did not prefer to go home
  • Inconvenience of travel, anxiety, more comfortable

• Factors that would increase support for ACE environment:
  • Transportation/accommodation nearby
  • Ability to re-enter inpatient unit if needed
  • Firmly scheduled appointments
Target Populations Identified

Data Source: Focus Groups/Ward Audits

Failure to thrive
- Metabolic Crisis
- Migraine
- Leg Mass
- Status Epilepticus
- CVL Bloodwork
- Chronic Constipation
- Respiratory Distress
- Seizures
- Toe Abscess
- Dehydration
- Resp Distress
- Hyperbilirubinemia
- ITP
- PKU
- Fever
- Knee Pain
- Sickle Cell Disease with Fever
- Omphalocele
- Facial Pain
- Visual Disturbances
- Nephrotic Syndrome
- Routine Pulse Steroids
- Metabolic Work-ups
- Bilious Vomiting
- Kawasaki/Retropharyngeal Abscess
- Unrepaired PDA
- Dental Abscess
- Weight Loss
- Hypotonia
- NYD
- Constipation
- Regression
- Unsteady
- Pneumonia
- Consults

Rumination Syndrome
- Bacteremia
- Post-Procedure Observation
- DI/IGT
- Resp Distress Syndrome
- Solid Tumor
- Oncology Work-Ups
- Liver Mass Investigation
- R/O Metabolic Disorder
- Hypotonia
- Q24 Meds
- Q8 Meds Weakness
- R/O Seizure
- Sepsis
- Melena
Most Common Patient Diagnoses from Ward Audits (N=48)

- FUO: 12.5%
- Hyperbilirubinemia: 6.3%
- Seizure work-ups: 6.3%
- ITP: 4.2%
- Metabolics work-ups: 4.2%
- Nephrotic Syndrome: 4.2%
- Pneumonia: 4.2%
Most Common Reasons for ACE “Referral” from Ward Audits (N=48)

- Waiting for consults: 42.0%
- Waiting for tests/DI: 35.0%
- Facilitate discharge: 23.0%
- IV ≥q8: 23.0%
- Waiting for work-ups: 21.0%
- Oral meds: 21.0%

Step Three: Rapid Improvement Event (July 14-16, 2014)
Step Four: Change Idea

The Paediatric Medicine Alternative Care Environment (ACE Space):

- Multidisciplinary alternative care environment where inpatients can go home at night and return during daytime hours for rapidly arranged follow-up, investigations, procedures, and specialty consultations.

- A resource-optimization opportunity
  - Eliminate non-value added hospital hours / days

- An opportunity to improve process standardization
### Logistics: Inclusion/Exclusion Criteria

#### Inclusion Criteria
- Not requiring nursing care overnight
- Medically stable

#### Exclusion Criteria
- Oxygen requirement (not on home O2)
- IV fluids/ medications q<12h
- Medically unmanaged pain in last 24 hrs
- Medications best delivered in an inpatient setting
- Caregivers unable to competently care for (or access resources to care for) patient overnight while at home
- Family challenges that limit follow-up
Logistics: Pilot ACE Space Hours/Space/Volume

• Full capacity 5 days per week
  • Monday to Friday (8 AM- 8 PM).

• Limited capacity weekend care for patients that require follow-up to fill in gaps in primary care.

• Booking Slots: 1 hour booking slots with capacity of booking up to 12 hrs

• Goal Patient Volume: Approximately 6 patients/day
Logistics: Pilot ACE Space Staffing Model

ED daytime (8-8) admissions

Ward patients followed by Ward Teams

Community Hospital Transfers

2 ACE RNs Coordinates Services and Provides Nursing Care
## Measures: LOS Project Metrics

### Outcome Measures
- Average Length of Stay (ALOS)
- Total bed days/Total Separations

### Contextual Measures
- Total Patient Volume
- Resource Intensity Weighting

### Process Measures
- Total Referrals (accepted, declined, redirected to clinic)
- % Care completed within target timeframe *
- Number of averted admissions (MAP/CAP Referrals)

### Balancing Measures
- Readmission Rate (within 7 days)
- Patient Satisfaction*
- Staff Satisfaction
- Hours per Patient Day
- (Cost Per Case)
Process Mapping

• Several processes were mapped out in detail during the RIE.

These included:
• Initial Patient Referral, Scheduling, and Registration
• Facilitation and Coordination of ACE Care
• Discharge and Follow-up
• Patient Recruitment and Communications/Education
• Staff Communications/Education

• These processes were also tested using typical ACE patient scenarios.
Step Five: Pilot (29 months and counting!)

• Pilot launch date: August 11, 2014

• Included consultations with key stakeholders within the hospital (Allied Health, IGT/Tests/Imaging, ED, Consulting Services, Complex Care, Inpatient unit staff, Risk/Legal, MDs, CHS Admins, Finance/Decision Support etc.)

• Ongoing marketing of ACE Space to staff and families

• Development of digital platforms to support ACE care – initially Excel, now on EMR.

• Creation of educational and promotional materials (Public Affairs/Creative Services)

• Adaptation of existing patient documentation for ACE (Forms Committee)
Results from 29 Months

• 1467 patient visits to ACE Space from Aug 2014 – Dec 2016

• Estimated 1666 bed days saved during pilot period

• Most common reasons for visit:
  • Post-discharge F/U (n=406)
  • Post Anesthetic Monitoring (n=260)
  • Diagnostic Uncertainty (n=215)
  • Dental Abscess (n=180)
Results from 29 Months

• Adverse Events
  • Typically 1-2 patients/month admitted into ward from ACE Space

• Typical care received in ACE Space
  • Subspecialty Consults
  • Infusions/Med Administration
  • Diagnostic Imaging
  • Central Line Bloodwork
Run Chart: Number of ACE Space Visits
Conclusion

• Lean methodology was used to develop an alternative care environment to avoid admissions to hospitals.

• Appropriate venue to expedite diagnostic imaging, subspecialty consultations and monitoring.

• Use of service is increasing.

• Insufficient time to see impact on bed days saved.

• Staff and patients satisfied with new intervention and model is currently sustainable.

• SPC and cost per case analysis to be completed.
A Quick Summary of My Program

• IHPME now offers MSc. System Leadership and Innovation, formerly LEAD Scholars program

• Open to ~20 medical students and residents to complete on part-time basis alongside medical education.

• Includes courses in health sector strategy, finance, public policy, research methods, leadership, and multiple practicum projects (this project was one of them, and I am currently here for another).
Thank you
Appendix: Process Maps & Others
Process Map: ACE Space Ward Admission (page 1 of 3)

ACE RN attends morning rounds and flags patients for ACE

ACE RN

Ward Identifies Patient + Approaches Family at Rounds

Phone Call to Book ACE Space

Information Reviewed

Coordinate Other Services/procedures if needed

Book Patient Appointment on iShare

Communicate time to Referral Source

Staff/Resident/NP/Fellow

Provider Phones ACE RN

ACE RN

ACE RN

ACE RN

Confirm iShare capabilities

**Process Map: ACE Space Ward Admission (page 2 of 3)**

**Communicate Time to Family and Give Postcard / Educational Materials**
- ACE RN

**Approval from Creative Services for Educational Items**
- ACE RN

**Preparation of Materials and Equipment for ACE Visit**
- ACE RN
  - Acquiring charts from home unit + health records
  - Obtaining materials/equipment

**Patient Discharged from Ward**
- Resident asks Clerk to do Pre-Admit. Resident enters Pre-Admit Orders. ACE RN inserts special instructions into D/C

**Patient Arrives and Registered + Sent to Bed**
- ACE RN

**Activate Pre-Registration + Notifies Home Unit/Consulting Services**
- ACE RN

**Coordinated Services/Nursing Care Provided**
- ACE RN / Services

**Return Visit**
- KidCare D/C
  - Maintaining iPass list

**Healthier Children. A Better World.**
Process Map: ACE Space Ward Admission (page 3 of 3)

Home Unit Team Informed After All Care Provided

ACE RN Phones Home Unit

Home Unit Discharges Patient

ACE RN does D/C planning. The D/C summary is done by the Home Unit.

Patient/Family Leaves ACE Space

Follow-up in Community?

D/C Summary sent to Primary Provider

ACE RN

RATE LIMITING STEP. Home units must stick to timelines when called.
Process Map: ACE Space ED Admission (page 1 of 3)

1. MAP and ED MRP identify suitable ACE Patient
2. MAP and ED MRP with Patient Flow Staff Support
3. Informs Patient about ACE Space
4. Phone Call to Book ACE Space
   - MAP Phones ACE RN
5. Information Reviewed
   - ACE RN
6. Coordinate Other Services/procedures if needed
   - ACE RN
7. Book Patient Appointment on iShare
   - ACE RN
8. Communicate time to MAP
   - ACE RN

Communicates Time to Family and Gives Postcard / Educational Materials

Preparation of Materials and Equipment for ACE Visit

Patient Discharged from ED

Patient Arrives and Registered + Sent to Bed

Activates Pre-Registration + Notifies SCU /Consulting Services

Coordinated Services/ Nursing Care Provided

ACE RN

ACE RN

ACE RN

ACE RN

ACE RN

ACE RN

ACE RN

ACE RN

ACE RN

Ace RN

Approval from Creative Services for Educational Items

Acquiring charts from home unit + health records Obtaining materials/equipment

ACE RN prepares Pre-Admit. ACE RN enters orders written by MAP.

Waiting area for patients

KidCare D/C Maintaining iPass list

Prepared Pre-Admit. ACE RN enters orders written by MAP.

SCU Team Called After All Care Provided to Inform

ACE RN Phones SCU

SCU Discharges Patient

ACE RN does D/C planning, The D/C summary is done by SCU.

Patient/Family Leaves ACE Space

Follow-up in Community?

D/C Summary sent to Primary Provider

ACE RN

SCU Team Called After All Care Provided to Inform

ACE RN Phones SCU

SCU Discharges Patient

ACE RN does D/C planning, The D/C summary is done by SCU.

Follow-up in Community?

D/C Summary sent to Primary Provider

ACE RN

SCU Team Called After All Care Provided to Inform

ACE RN Phones SCU

SCU Discharges Patient

ACE RN does D/C planning, The D/C summary is done by SCU.

Follow-up in Community?

D/C Summary sent to Primary Provider

ACE RN

Process Map: ACE Space ED Admission (page 3 of 3)
Process Map: ACE Space Associate Admission (page 1 of 3)

1. Suitable patient found
   - CAP with staff support

2. Informs Patient about ACE Space
   - CAP

3. Phone Call to Book ACE Space
   - CAP Phones ACE RN

4. Information Reviewed
   - ACE RN

5. Coordinate Other Services/procedures if needed
   - ACE RN

6. Book Patient Appointment on iShare
   - ACE RN

7. Communicate time to CAP
   - ACE RN

Process Map: ACE Space Associate Admission (page 2 of 3)

- Phones
  - Patients/Families to Provide Education and ACE Reminders
  - ACE RN scripted phone call

- Preparation of Materials and Equipment for ACE Visit
  - ACE RN
  - Acquiring charts from home unit + health records
  - Obtaining materials/equipment

- Pre-Admit Completed
  - 1. ACE RN prepares Pre-Admit. ACE RN enters orders written by CAP.
  - 2. CAP enters orders when patient arrives to ACE

- Patient Arrives and Registered + Sent to Bed
  - ACE RN
  - Waiting area for patients

- Activate Pre-Registration + Notifies CAP/Consulting Services
  - ACE RN

- Coordinated Services/Nursing Care Provided
  - ACE RN / Services

Process Map: ACE Space Associate Admission (page 3 of 3)

ACE RN Phones CAP

ACE RN Called After All Care Provided to Inform

CAP Discharges Patient

ACE RN does D/C planning, The D/C summary is done by CAP.

Patient/Family Leaves ACE Space

Follow-up in Community?

D/C Summary sent to Primary Provider

ACE RN

Rate limiting step. CAP must stick to timelines when called.
Process Map: ACE Space Pre-Admit Admission (page 1 of 3)

1. Service (ex. MRI, Dentistry) emails 7B CSN
2. Service to CSN
3. 7B CSN triages patient and refers to ACE when appropriate
4. 7B CSN calls ACE RN
5. Phone Call to Book ACE Space
6. Information Reviewed
   - ACE RN emails Service to obtain more information or looks up on Kidcare
7. Coordinate Other Services/procedures if needed
   - ACE RN
8. Book Patient Appointment on iShare
   - ACE RN
9. Communicate ACE appointment time to Service
   - ACE RN
**Process Map: ACE Space Pre-Admit Admission (page 2 of 3)**

1. **Phones Family to Provide Education and ACE Reminders**
   - ACE RN scripted phone call

2. **Preparation of Materials and Equipment for ACE Visit**
   - ACE RN
   - Acquiring charts from home unit + health records
   - Obtaining materials/equipment

3. **Patient Arrives and Registered – Sent to Bed**
   - ACE RN

4. **Notifies CAP/Consulting Services as needed**
   - ACE RN

5. **Coordinated Services/Nursing Care Provided**
   - ACE RN / Services

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**Return Visit**

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**Healthier Children. A Better World.**
The D/C summary is done by CAP.

Follow-up in Community?

D/C Summary sent to Primary Provider
Process Map: Contingency Plan if Family/Patient Needs Readmission

- Patient/Family Request or Requires Readmission to Unit

  - Patient/Family
    - Determine bed availability in home unit
      - ACE RN phones CSN and MDs
    -ACE RN

  - Bed Readily available
    - Patient transferred from ACE to Home Unit
      - ACE RN does KidCare transfer
    - Patient Admitted to Unit
      - MAP

  - No bed Readily available
    - Another patient flagged for discharge taken to ACE (ABC Room) to expedite discharge
      - ACE RN
    - Current ACE Patient transferred to Open Patient Bed in Available Unit
      - ACE RN/TRANSPORT
    - ABC Room
      - Patient D/C from ACE to free up ABC Room
    - Unit Team Delivers D/C to ABC

Decision: Supporting Families / Contingency Planning

- Families to call HOME WARD if **urgent** concerns related to their admission arise while at home overnight.

- Patients transferred to ACE to remain on iPass/CSN list.

- ACE patients will not be removed from the list until they have completed all visits and are discharged from ACE.

- If ACE patient becomes acutely unwell during overnight “home” period, after consulting with resident over phone, will be instructed to return to original unit.

- ACE RN can help facilitate patient flow to free up bed and may use ABC room for ward discharges.