Different Strokes:
Engaging Pharmacy Technicians
in Medication Reconciliation

Tuesday, March 9, 2010
Guest Speakers

The Moncton Hospital

Rochelle Johnston, Clinical Pharmacist

The Ottawa Hospital

Mario Bédard, Pharmacy Director
Christa Karkkainen, Lead Pharmacy Technician

Trillium Health Centre

Allan Mills, Pharmacy Director / Bruce L. Tugwood, DUE Co-ordinator
Jessy Samuel – Pharmacy Clinical Manager

Peterborough Regional Health Centre

Dawn Ellis, Senior MedRec Pharmacy Technician
Sarah Hickey, Clinical Pharmacist
Objectives

1. Describe the medication reconciliation model developed for pharmacy technicians
2. Review the training and/or certification process involved for pharmacy technicians in medication reconciliation
3. Highlight the role of the pharmacy technician in the Emergency Department and/or the pre-admission clinic.
Benefits to you

Helping hospitals leverage their HIS investments since 1990

- Software, Integration and Reporting services
- In over 800 hospitals worldwide
- Medication reconciliation for the continuum
- Patient safety applications
- Clinical, financial and administrative solutions

www.iatric.com
Different Strokes - Engaging Pharmacy Technicians in MedRec

Safer Healthcare NOW! MedRec National Call, March 9th, 2010
Rochelle Johnston, BScPharm, ACPR; Horizon Health Network, Zone 1 Moncton
Obtaining the Best Possible Medication History:

Comparison of Pharmacy Technician versus Pharmacist-Obtained Medication Histories in the Emergency Department
Research Team

- Rochelle Johnston, BSc (Pharm), ACPR
  - Horizon Health Network, Zone 1 Moncton

- Lauza Saulnier, BSc (Pharm), ACPR
  - Horizon Health Network

- Odette Gould, PhD
  - Mount Allison University
  - Horizon Health Network
Background Information
Background Information

- **Medication Reconciliation:**
  
  A formal process of obtaining a complete and accurate list of each patient’s current home medications; followed by a comparison to orders written at interfaces of care.

- **Best Possible Medication History (BPMH):**
  
  Systematically derived comprehensive list of regularly used medications.
Pharmacy Technicians?

- Several studies in the past few years involving pharmacy technicians in medication reconciliation

- Gaps in literature:
  - Formal comparison of pharmacy technicians’ ability to complete a BPMH *compared to pharmacists*
  - Medication reconciliation with technicians in the emergency department
Current Practices at The Moncton Hospital

- Clinical pharmacist + pharmacy technicians
  - Direct patient care areas (e.g. ER, family practice)

- Technicians currently help with the BPMH in the ER:
  - Technician reviews patient’s medication vials and/or list, contacts community pharmacy if necessary
  - Technician records the information on the home medication database
  - Pharmacist uses the information retrieved by the technician to complete the BPMH with the patient
Research Question

- Can trained pharmacy technicians obtain a BPMH with as much accuracy and completeness as pharmacists in the emergency department?

- Hypothesis: YES they can!
Primary Objectives

1. Determine if pharmacy technicians can perform a BPMH with similar accuracy and completeness as pharmacists in the emergency department.

2. Determine if pharmacists and pharmacy technicians meet the national average value for unintentional discrepancies and success index for medication reconciliation, as reported by SHN.
Secondary Objective

1. Determine the average length of time it takes to perform a BPMH by both pharmacists and technicians
Study Methods
Study Design

- Prospective study performed during December 2008

<table>
<thead>
<tr>
<th>INCLUSION CRITERIA</th>
<th>EXCLUSION CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients admitted to hospital through ER</td>
<td>Patients transferred from nursing home or hospital (MAR = BPMH)</td>
</tr>
<tr>
<td>Patients who required a medication history upon request from a member of the healthcare team</td>
<td>Patients whose home-med database was initiated by another healthcare professional prior to enrolment</td>
</tr>
</tbody>
</table>
Randomization

- Sealed envelope randomization method

**Randomization #1:**
Determined patient inclusion in study (each eligible patient had 50/50 chance of being enrolled)

**Randomization #2:**
Determined order of patient interviews (techs 1st for half, pharmacists 1st for half)
Step 1:

- Provided for ER pharmacists and technicians
- Reviewed background information from SHN! toolkit
- Outlined process of completing a BPMH, tips for success
- Provided staff with interview guide “cheat sheet” to have on hand while completing histories
Technician Training Program

Step 2:

Background Readings

- Selected readings and references from SHN! Getting Started Kit
- Completed independently prior to study initiation
Step 3: Interview Observation and Practice

- Observed pharmacist completing BPMHs
- Completed practice interviews, followed by detailed feedback and comparison to pharmacist-obtained history
Technician Training Program

Step 4: Validation Process with Standardized Patient

- Interviewed standardized patient, assessed for BPMH accuracy and completeness
- Reviewed results in detail following interview
Data Collection

1. Eligible patients randomized into study
2. Technician completes preliminary list, makes copy
3. Copies of home-med database placed in secure study envelope
4. Randomization #2 performed, interviews completed
5. Databases compared by primary author within 24h, discrepancies recorded
6. Discrepancies clarified with patient and resolved on patient chart if necessary
## Classification of Discrepancies

- **Types of discrepancies recorded (for Rx and OTC):**

<table>
<thead>
<tr>
<th>Medication omission</th>
<th>Discrepant dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discrepant drug</td>
<td>Discrepant frequency</td>
</tr>
</tbody>
</table>

- **Classification for potential severity (Cornish, et al):**

  - **CLASS 1:** Unlikely to cause discomfort or clinical deterioration
  - **CLASS 2:** Potential to cause moderate discomfort or clinical deterioration
  - **CLASS 3:** Potential to cause severe discomfort or clinical deterioration

---

*Arch Intern Med 2005; 165: 424-9*
Results
Description of Sample

- 60 patients enrolled, 59 used for analysis
  - Not able to include 1 randomized patient due to severe cognitive dysfunction by both patient and caregiver

- Distribution mirrored ER coverage by both pharmacists and technicians
  - Even distribution among 2 technicians (e.g. 30 pts each)
# Table 1 (N = 59)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex, # (%)</strong></td>
<td></td>
</tr>
<tr>
<td>- Male</td>
<td>29 (49.2%)</td>
</tr>
<tr>
<td>- Female</td>
<td>30 (50.8%)</td>
</tr>
<tr>
<td><strong>Age (years)</strong></td>
<td></td>
</tr>
<tr>
<td>- Mean (SD)</td>
<td>61.3 (18.6)</td>
</tr>
<tr>
<td>- Range</td>
<td>20 - 93</td>
</tr>
<tr>
<td><strong>Time of enrolment, # (%)</strong></td>
<td></td>
</tr>
<tr>
<td>- 0800 to 1059</td>
<td>19 (32.2%)</td>
</tr>
<tr>
<td>- 1100 to 1359</td>
<td>24 (40.7%)</td>
</tr>
<tr>
<td>- 1400 to 1700</td>
<td>16 (27.1%)</td>
</tr>
<tr>
<td><strong>Number of Rx meds per patient</strong></td>
<td></td>
</tr>
<tr>
<td>- Mean (SD)</td>
<td>6.2 (4.6)</td>
</tr>
<tr>
<td>- Range</td>
<td>0 - 16</td>
</tr>
<tr>
<td><strong>Number of OTC meds per patient</strong></td>
<td></td>
</tr>
<tr>
<td>- Mean (SD)</td>
<td>1.9 (1.8)</td>
</tr>
<tr>
<td>- Range</td>
<td>0 - 10</td>
</tr>
</tbody>
</table>
Primary Objective #1

Determine if pharmacy technicians can perform a BPMH with similar accuracy and completeness as pharmacists in the emergency department.

- **Pharmacists:** 23 total discrepancies in 17 patients
  - The 3 pharmacists did not differ statistically on whether or not their patients had Rx or OTC errors

- **Technicians:** 23 total discrepancies in 15 patients
  - The 2 technicians did not differ statistically on whether or not their patients had Rx or OTC errors
Primary Objective #1

- Patients with Rx discrepancies (N = 59):

<table>
<thead>
<tr>
<th></th>
<th>Pharmacists</th>
<th>Technicians</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pts with no discrepancies</td>
<td>47</td>
<td>50</td>
</tr>
<tr>
<td>Pts with 1 or more discrepancies</td>
<td>12</td>
<td>9</td>
</tr>
</tbody>
</table>

No significant difference between pharmacists and technicians in terms of how patients were distributed across presence or absence of Rx discrepancies ($X^2 = 1.11, p = 0.29$)
Primary Objective #1

- Number of Rx discrepancies (N = 59):

<table>
<thead>
<tr>
<th></th>
<th>Pharmacists</th>
<th>Technicians</th>
<th>Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean # of discrepancies per patient</td>
<td>0.25 (SD = 0.54)</td>
<td>0.24 (SD = 0.68)</td>
<td>t = 0.15, p = 0.88</td>
</tr>
</tbody>
</table>

*No significant difference between pharmacists and technicians in mean number of Rx discrepancies*
Primary Objective #1

- Patients with OTC discrepancies (N = 59):

<table>
<thead>
<tr>
<th></th>
<th>Pharmacists</th>
<th>Technicians</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pts with no discrepancies</td>
<td>52</td>
<td>53</td>
</tr>
<tr>
<td>Pts with 1 or more discrepancies</td>
<td>7</td>
<td>6</td>
</tr>
</tbody>
</table>

No significant difference between pharmacists and technicians in terms of how patients were distributed across presence or absence of OTC discrepancies ($X^2 = 0.15, p = 0.70$)
Primary Objective #1

- Number of OTC discrepancies (N = 59):

<table>
<thead>
<tr>
<th></th>
<th>Pharmacists</th>
<th>Technicians</th>
<th>Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean # of discrepancies per patient</td>
<td>0.14 (SD = 0.39)</td>
<td>0.15 (SD = 0.48)</td>
<td>t = -0.22, p = 0.83</td>
</tr>
</tbody>
</table>

*No significant difference between pharmacists and technicians in mean number of OTC discrepancies*
## Severity of Discrepancies

<table>
<thead>
<tr>
<th></th>
<th>Class 1*</th>
<th>Class 2*</th>
<th>Class 3*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmacists</td>
<td>12</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>Technicians</td>
<td>17</td>
<td>6</td>
<td>0</td>
</tr>
</tbody>
</table>

* Number of discrepancies (Rx + OTC)
Severity of Discrepancies

- Mean weighted sum of severity:

<table>
<thead>
<tr>
<th></th>
<th>Pharmacists</th>
<th>Technicians</th>
<th>Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rx meds</td>
<td>0.42</td>
<td>0.34</td>
<td>t=0.50, p=0.62</td>
</tr>
<tr>
<td>OTC meds</td>
<td>0.17</td>
<td>0.14</td>
<td>t=0.39, p=0.70</td>
</tr>
</tbody>
</table>

Pharmacists and technicians did not differ significantly in discrepancy severity for both Rx and OTC medications.
Primary Objective #2

Determine if pharmacists and pharmacy technicians meet the national average value for unintentional discrepancies and success index for medication reconciliation, as reported by SHN

- **Unintentional discrepancy:**
  - Medication error that can lead to adverse drug events

- **Success index:**
  - Total percentage of good or acceptable orders
Unintentional Discrepancies

- National average (Dec 2008*) = 0.54 (SD = 0.68)

**Pharmacists:**
Mean = 0.25 (SD = 0.54)

Significantly fewer unintentional discrepancies compared to the national average
(t = -4.03, p < 0.001)

**Technicians:**
Mean = 0.24 (SD = 0.68)

Significantly fewer unintentional discrepancies compared to the national average
(t = -3.43, p = 0.001)

*Reflective of March 2009 report from SHN!*
Success Index

- National average success index (Dec 2008*) = 87.48%

**Pharmacists:**
Mean = 95.48% (SD = 11.72)

Significantly higher success index compared to the national average
(t = 5.02, p < 0.001)

**Technicians:**
Mean = 97.05% (SD = 7.47)

Significantly higher success index compared to the national average
(t = 9.08, p < 0.001)

*Reflective of March 2009 report from SHN!
Secondary Objective

Determine the average length of time it takes to perform a BPMH by both pharmacists and technicians.

- **Pharmacist interviews:**
  - Mean = 9.24 minutes (SD = 4.75)

- **Technician interviews:**
  - Mean = 7.96 minutes (SD = 4.60)

*Technician interviews were significantly shorter than pharmacist interviews*  
(t = 3.24, p = 0.002)
Discussion

- Study limitations
  - Small sample size, short duration
  - Limited generalizability

- How can this influence practice?
  - Pharmacists
  - Technicians
  - Organization
Conclusion

Trained pharmacy technicians *can* obtain a BPMH with as much accuracy and completeness as pharmacists in the emergency department.
Acknowledgements

- Michelina Mancuso
- Olavo Fernandes
- Emergency Department Team:
  - Leslie Manuel, Gerry Cormier, Hannah Wheaton
  - Meaghan Hayes, Bethany Shaffer
- Lauza Saulnier
- Odette Gould
References


Saulnier L. Should pharmacy technicians be trained to obtain medication histories and provide discharge counselling? The “pro” side. CJHP 2008; 61 (6): 441-2.
Contact Info

Rochelle.Myers@horizonNB.ca
Different strokes – Engaging Pharmacy technicians in med rec.

The Ottawa Hospital Experience
March 9th, 2010
Mario Bedard / Christa Karkkainen
Medication Reconciliation Model

• Pharmacy techs are in Emerg at both campuses
  – Hours are 8am to 10pm 7 days/week

• BPMH is completed in Emerg. for patients who will be admitted to the hospital
  – Medication Reconciliation form is used to complete the BPMH

• Physicians reconcile medications
  – Once signed by MD = valid order
| Name/Brand Name | Dose | Time of Day | Frequency | Continue in Hospital | Continue Home | Diag. or 30 Day | Notes
|----------------|------|-------------|-----------|---------------------|---------------|-----------------|---------
| 1              |      |             |           |                     |               |                 |         
| 2              |      |             |           |                     |               |                 |         
| 3              |      |             |           |                     |               |                 |         
| 4              |      |             |           |                     |               |                 |         
| 5              |      |             |           |                     |               |                 |         
| 6              |      |             |           |                     |               |                 |         
| 7              |      |             |           |                     |               |                 |         
| 8              |      |             |           |                     |               |                 |         
| 9              |      |             |           |                     |               |                 |         
| 10             |      |             |           |                     |               |                 |         

**Additional Medications**

<table>
<thead>
<tr>
<th>Name/Brand Name</th>
<th>Date</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Medication Reconciliation model

- Pharmacy technicians fill part of the form
  - Medication history
  - Complementary medicine
  - Allergies
  - Source of the information
  - Signature
Selection

• **Job description for the med rec technician:**
  – Pharmacy technician level 2
  • Tech check tech
  • Independent work (on-call, team leader)
  – Eventually to be a registered pharmacy tech.

• **Interview process:**
  – Focus on communication skills
  – Team work with other professionals
  – Patient / client contact
Training

- **Formal process developed in-house**
  - 4 weeks full-time
  - Didactic component
  - Clinical environment for training
  - Multiple preceptors
  - Realistic environments
    - Dialysis unit, medicine units, Emergency
Training Schedule

• Week 1
  • Introduction + didactic components + resources
  • Observe pharmacist
  • Complete med rec for selected patients

• Weeks 2, 3
  • Interview about 30 patients while being evaluated

• Week 4:
  • Medicine inpatients with pharmacist supervision
  • Emerg with pharmacist
Role of Med Rec Techs in Emerg

• In Emerg the med rec tech will:
  – Work with nursing and physicians to assess which patients will be admitted
  – Interview the patient and/or their family
  – Contact their retail pharmacy for information
  – Access the Ontario Drug Benefit claims database online
  – Verify other TOH databases
  – Consult with ER pharmacist as needed
Different Strokes: Engaging Pharmacy Technicians in Med Rec

Bruce Tugwood RPh, BScPhm
Trillium Health Centre

- Large two site community hospital located in Mississauga and Etobicoke in Greater Toronto area
- 755 acute, rehabilitation and chronic care beds
- Largest concentration of critical care services in Canada
- Largest ER in Canada, serves 130,000 patients annually
- Regional Centre for Stroke, Neurosurgery, Sexual Assault and Domestic Violence
- Provincial Centre for Cardiac Services, PCI, Cardiac Surgery
- Largest free standing Day Surgery centre in North America
**Project plan:** To implement admission medication reconciliation for ER and Pre-op Same Day Admit Surgical patients in preparation for Accreditation

**Options for Program:** Pharmacist vs. Nurse vs. Shared responsibility with Pharmacy Technician support for collection of preliminary list

**Funding for implementation:** 2 FTE Pharmacy Technicians

**Certification:** Developed education & certification program for Pharmacy Technicians to collect Best Possible Medication History and complete Reconciliation Process
Ten Pharmacy Technicians were selected for education and certification.

Technicians participated in a 6 hour education session focusing on collection of a BPMH, forms completion & patient interviewing skills.

Opportunity to observe and practice performing BPMHs alongside the Pharmacist in the ER.

Certification test requires Technicians to:
- Obtain BPMH from a simulated patient
- Document BPMH on the Preadmission Medications & Allergies Form
- Reconcile these medications against physician’s admission orders
- Complete a Discrepancies & Omissions Form.
Interviewing Skills:

♫ Technician *interviewing skills* were evaluated based on the Empathetic Interviewing Skills Rating Scale developed by C. Boyd at the University of Toronto. A minimum score of 3/5 in all categories was required.

♫ All pre-specified *Essential Content Points* were required during the interview.

Written Test:

♫ A written test was developed to further assess the technicians, for which a minimum mark of 80% was required.

Implementation

♫ Once certified, technicians collected BPMH in ER for patients who were being admitted, and in Pre-op Clinic for Same Day Admit Surgical Patients.

♫ Review of the information by a Pharmacist or Nurse was required.
In order to assess the accuracy of the Technician generated BPMH, a facilitator was trained and certified for taking the BPMH using the same process as the technicians.

The trained facilitator completed a BPMH for ER admitted patients who had previously had a BPMH completed by the Technician. No reference was made to the Technician’s work until the facilitator completed a BPMH.

A BPMH error was defined as any difference in medications identified by the Technician versus the facilitator with respect to the following: wrong drug, dose, strength, route or frequency, missed drug or documented drug not being taken by the patient.
### Best Possible Medication History Accuracy 2007

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Number of Patients</td>
<td>53</td>
</tr>
<tr>
<td>Total Number of Medications Identified</td>
<td>393</td>
</tr>
<tr>
<td>Mean Number of Medications per Patient</td>
<td>7.4</td>
</tr>
<tr>
<td>Total Number of Errors Identified (Facilitator vs. Technician)</td>
<td>20</td>
</tr>
<tr>
<td>Mean Number of Errors per Patient</td>
<td>0.38</td>
</tr>
<tr>
<td>Accuracy of Technician BPMH</td>
<td>95%</td>
</tr>
<tr>
<td>Experienced Technician Accuracy</td>
<td>97.5%</td>
</tr>
<tr>
<td>Novice Technician Accuracy</td>
<td>86%</td>
</tr>
</tbody>
</table>
Changes in Program Since Implementation

- Based on accuracy of Technician BPMH, requirement for Review has been eliminated, ongoing Quality Assurance to demonstrate continued accuracy, results indicate discrepancy rate of less than 1%
- An additional 4 technicians have been trained and certified for med rec
- Technicians no longer work in Pre-op Clinic, currently 7 days per week in ER and Monday to Friday on inpatient units
- Additional requirement for the certification process is accurate completion of first 10 med recs, reviewed by ER Pharmacist
Thank You.

For more information contact:
Bruce Tugwood
Pharmacy Services
100 Queensway Ave West
Mississauga, Ontario L5B 1B8
Phone: 905-848-7580 ext 3283
E-Mail: btugwood@thc.on.ca
Different Strokes: Engaging Pharmacy Technicians in Medication Reconciliation

Tuesday, March 9, 2010

Dawn Ellis, Pharmacy Technician
Sarah Hickey, Pharmacist
About us….

Peterborough Regional Health Centre

Our new 494-bed regional hospital opened in spring 2008, replacing a two-site, 335-bed facility. As one of the region’s largest employers, our staff is 2,000 strong with more than 600 volunteers, serving a population of over 300,000 people in four counties.

Our Pharmacy Team

~24 FTE technician positions
8.5 FTE pharmacist positions
2.8 FTE telepharmacists
and clerical staff
Our Medication Reconciliation Team.....

- Reports to Pharmacy Nursing Medication Steering Committee
Consists of:
- Quality Improvement Consultant as project manager
- Medication Practices Nurse (New role Feb 2010)
- Pharmacist Clinical Lead
- Senior Pharmacy Technician
- 3 additional techs trained in Pre-op and ER Med Rec
- Many other amazing people from IT and Clinical Informatics to
  Physician Champions and Department staff that have all
  contributed to the success of our program
Key Success Factors:

- TECHNICIAN CHAMPION
- Support of Senior team
- A commitment to designing a process that improves patient care
- Commitment to quality training and improvement
- QI Consultant as Project Manager
- Physician support and satisfaction
- Core Team dedicated to design process, and consultation as required with all other related personnel (Dr.s, nurses, ward clerks, order entry techs, IT Dept, Clinical Informatics)
- Used quality improvement techniques to implement (e.g. PDSA model for improvement)
- Used the “upstream model” of list + order
- Designated office space and tools (Desktop and Computer on Wheels) in Pre-op and ER, amendment of Pre-op schedule to accommodate new tech role)
What Appeals to PRHC Techs About Med Rec?

- Clear definition of Role/Responsibilities
- Opportunity to interact with patients and enhance their experience at our hospital
- Opportunity to Work directly with other professionals as a valued member of the Pre-op and ER teams
- Freedom to work independently
- Interesting, exciting and rewarding experiences (great opportunity for learning, and knowing that we are contributing to Quality Patient Care)
• A Med Rec Tech Experience…expanding our horizons.

Sept/08 – the first patient to go through the entire med rec process at PRHC

What happened?
Benefits of Technicians as part of the Medication Reconciliation Team:

• Through comprehensive training, pharmacy technicians have become trusted experts in obtaining BPMH

• Saves Pharmacists’ time
• Saves physicians’ time
• Saves Nurses’ Time
• Supports a safer process for patients
• Provides greater job satisfaction for Pharmacy Technicians
How do we know we are making a difference? Here’s what some PRHC physicians have said about Med Rec...

• **Dr. A. Thompson**: “The Medication Reconciliation process is a welcome and significant enhancement – one that I was advocating for. Pharmacy’s support in creating one correct list of home medications that we can use to generate our admission orders really helps us provide safer patient care, and as a bonus improves our efficiency.”

• **Dr Hutton** (anesthesiology) “This is a good thing!”
Dr Maini recorded live on video from the PRHC Cafeteria saying…

- “The Med Rec that you have kindly provided us has been absolutely fantastic! It really helps us get an accurate list of drugs, and it’s really the patients who benefit in the end.”
Training of Preadmission Clinic (PAC) Pharmacy Technicians

• Independent readings
• 10 shifts under supervision of Senior Technician
• Written test
• 3 interviews observed and evaluated by pharmacist
Training of Emergency Department Pharmacy Technicians

- Must have successfully completed PAC training
- Emergency Meditech Patient Tracker training
- Violence prevention training
- Orientation to Emerg Department flow and use of Drug Profile Viewer
- Total 1-2 weeks supervised
Questions?
“The names of the patients whose lives we save can never be known. Our contribution will be what did not happen to them. And, though they are unknown, we will know that mothers and fathers are at graduations and weddings they would have missed, and that grandchildren will know grandparents they might never have known, and holidays will be taken, and work completed, and books read, and symphonies heard, and gardens tended that, without our work, would never have been.”

Donald M. Berwick, MD, MPP

President and CEO

Institute for Healthcare Improvement