A framework to guide and evaluate health policy and service interventions in improving patient handovers
--HANDOVER Project

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December 2, 2014
Clinical handovers:

- are often suboptimal - due to over/incomplete (60%); seriously misunderstood (10%) information or delayed (50% >2days after discharge) or absent (8%) information exchange
- cause a high number of adverse events (e.g. Forster et al, 2003):
  - unnecessary readmissions (10%)
  - medication error and diagnostic follow-up errors (50%)
  - 62% are preventable
  - patient-anxiety,
  - extra costs (1.4 billion a year in the Netherlands; Foekema & Hendrix, 2004)
Unfortunately, animals sometimes lack the necessary skills to communicate with each other.
HANDOVER-Hospital to Community Transition
HANDOVER AIMS

1. Identify the transitional care outcomes and components that matter most to patients and caregivers.

2. Determine which evidence-based transitional care components (TCC) most effectively yield patient and caregiver desired outcomes overall and among diverse patient and caregiver populations in different types of care settings and communities.

3. Identify barriers and facilitators to the implementation of specific TCCs for different types of care settings and communities.

4. Develop recommendations for dissemination and implementation of the research findings on the best evidence regarding how to achieve optimal TC services and outcomes to patients, caregivers and providers.
Modified Donabedian Causal Chain

Lilford R J et al. BMJ 2010;341:bmj.c4413
Effective handover interventions are mostly aimed at improving organizational and technical aspects of the handover process:

- structuring and reconciling discharge information (e.g. discharge format/ checklist)
- coordinating follow-up care (e.g. discharge plan/ liaison nurse or pharmacist)
- direct and timely communication (e.g. phone hotline/ electronic notifications)

Lack of evidence-based interventions that focus on handover training and aspects that relate to organizational culture

- inward attitude by care providers
- respect and understanding between hospital and primary care providers
- handover administration compliance
- lack of (constructive) feedback and training

Methods—quantitative, qualitative and Improvement

• Individual Interviews-MD’s, RN’s, Patients, Families
• Surveys
• Focus Groups
• Process Maps
• Artifact Analysis
• Ishikawa diagrams
• Personas
• Group Concept Mapping (multidimensional scaling and hierarchical cluster analysis)
• Near miss and story analysis
• Bayseian and Cost benefit analysis of interventions

Many Actors are Involved

Social insurance office
Pharmacy
Medical Service
Means of assistance
Economic & Adm.
Wellfare officer
EMS
Family
Physicians
Reg. Nurses
Staff nurses
Dietitian
Physioterapist
Speech therapist
Pedicure
Home-help service
Results (from qualitative study)

- 192 individual interviews
- 26 focus group interviews
- 4 principal organizational cultural themes emerged from the analysis

<table>
<thead>
<tr>
<th>Fragmented handover interface</th>
<th>Providing care dominates the handover administration</th>
<th>Attitudes towards reflections and process improvement</th>
<th>Patient–centeredness and participation</th>
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</thead>
<tbody>
<tr>
<td>Inward focus in hospital</td>
<td>Professional identity</td>
<td>Skepticism towards individual feedback</td>
<td>Patient awareness</td>
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<td>Lack of awareness to needs, skills and work patterns of counterpart</td>
<td>Providing care in a ‘here and now’ situation</td>
<td>Negative associations with giving and receiving feedback</td>
<td>Patient–centeredness</td>
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<tr>
<td>Lack of collaborative attitude</td>
<td>The burden of administrative work</td>
<td>Handover ruled by informal habits</td>
<td>Patient empowerment</td>
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<tr>
<td>Relationship between hospital and primary care providers</td>
<td></td>
<td>Appreciating and integrating new practices</td>
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Objective
Gain insight in organizational cultural themes, encountered across various European settings, that seem to hinder or facilitate handover practice
Five principal cultural themes

1. **Fragmented culture hospital - primary care**
   - *Inward, non-collaborative attitude*
   - *Distant and negative relationship*
   - *Lack of knowledge/understanding/respect of different scope/work patterns*

2. **Professional culture**
   - *Relying on routines*
   - *Priority on current care/avoidance of administrational burden*

3. **Hospital and ward culture**

4. **Learning culture**
   - *Attitude to reflect, learn and improve*

5. **Patient-centered culture**
   - *Patient-centeredness, participation and empowerment*
Fragmented culture

Hospital physician, Poland: I work in the hospital and my responsibility for the patient finishes when the patient closes the hospital door behind him.

GP, the Netherlands: Well, in 50% of the cases it is communicated. In the other 50% of the cases there is no communication at all, or the expectation is that you’ll understand it.
Patient–centered & –participation culture

Patient, Italy: I go back home with a bag of drugs and trust me that was a mess...I couldn’t sort it out...They haven’t told us that there could be a risk of depression....

Relative, the Netherlands: A little bit compassion and understanding would have made it much easier (...) Well, there was a conversation just before discharge, but it was a real technical-medical conversation. Not in the sense of “are you looking forward to go home”?

Patient, the Netherlands: You have to be alert...really alert that medications are correct and well organized.

Community nurse, Sweden: a lot of patients really do not understand much of what has been said. The information is given too fast and the amount is too much.

Patient, the Netherlands: You have to be alert...really alert that medications are correct and well organized.

Community nurse, Sweden: a lot of patients really do not understand much of what has been said. The information is given too fast and the amount is too much.
**Hospital physician, the Netherlands:** Well only if one can cope with the electronic patient records... but there are a lot of people, especially the older generation detest it... because it takes a lot of time to understand it.

**Hospital nurse, the Netherlands:** Well, I have to say that I never heard something back from my handovers, so I suppose that I’m doing quite fine! But that’s the question...

**GP, Poland:** Communication between levels of care is far from good as this issue is never taken up during the conferences and seminars we have...

**GP, Poland:** We GPs are mainly just referral providers (...) we don’t talk to specialists very much. (...) At discharge they provide their recommendations which we follow. I view them as high class specialists and as superior authority.
Diagram depicting barriers to effective communication in healthcare.

**Barrier to effective communication**

- **Place**: Lack of nurse discharge report, lack of standardization of Handover process, lack of importance.

- **Procedure**: Ineffective admission and follow-up, lack of guidelines about the content of the information, coincidence about priority information.

- **Limitations at Hospital**: Lack of direct access to information, difficulty in reaching hospital professionals by telephone, unavailability of ICT, missing information.

- **Limitations at Primary care centers**: Different schedules with the hospital, lack of direct means of contacting professionals.

- **Training**: Lack of supervision of residents, lack of training in communication skills, lack of knowledge availability of some resources.

- **Supervision**: Inexperienced nurses, nurse turnover, lack of time and staff capacity, social disadvantages.

- **Comorbidities**: Different specialties caring patients, low health literacy.

- **Ineffective Guidelines**: Lack of information about how the process works, lack of knowledge about some guidelines.

- **Education**: Incentives for early discharge, incentives to promote integrated care.

- **Policies**: Professional incentives, local process orientation.

- **Professionals**: Stereotypes about other healthcare professionals, workload, restrictive social resources, lack of family support.

- **Patients**: Risk aversion, lack of knowledge, and support.

- **Barriers to effective communication**: Complex relation between hospital and PC centers, some PC centers not part of the integrated care network, some hospitals not part of the public network.
Intervention Mapping (IM) is a stepwise and systematic approach for theory and evidence based development, implementation and evaluation of interventions.

- **Step 1: Problem analysis and identification of determinants**
  - (Input from D3, D5 and D6)

- **Step 2: Specification of intervention program objectives**
  - (by crossing performance objectives and determinants in matrices)

- **Step 3: Selection of theory-based methods & practical applications**
  - (Input from systematic review and brainstorm sessions)

- **Step 4: Development intervention program**

- **Step 5: Preparation on adoption and implementation**

- **Step 6: Preparation on evaluation**

Developmental Evaluation

• The evaluators become part of the project team (M. Paton)

• They became the “voice of evaluation”

• This new formative evaluation is really a
  + Embedded
  + Continuous
  + Has a goal of learning with the team and yet
  + At arms length

Johnson J, Barach P, QSHC, 2013
Handover Toolbox www.handover.eu

**Stay up-to-date on the latest developments on handovers**

**Find interesting tools to improve your handovers**

**Contribute your own handover tools**

**Rate and annotate tools and articles**

**Add interesting information and experiences to the toolbox**

**Find training examples and advice to create your own training in handover**

**Become a member and start sharing!**

**Share knowledge on best practices**

**Discuss with other experts in the field**

**Start your own group**
CEX

5 minute “interval patient events” video

Contains important clinical updates to trigger anticipatory guidance & to-do items

- Follow-up on labs
  + “Remember to tell your cross-cover to take a peek at the potassium on the 10PM BMP”

- Oxygen requirement
  + “Dr., the patient is looking more tachypneic and is hypotensive”

- Family meeting
Hand-off CEX

Based on “Mini- CEX” instrument widely used in internal medicine (Norcini, et al, 2003)

Domains assessed:
- Organization/Efficiency
- Communication skills
- Clinical judgment
- Professionalism

9-point scale
Peer Evaluations

Competency-based peer evaluation of handoffs

Administered to interns through New Innovations at end of inpatient general medicine month

Anonymously evaluate co-interns on

• Delivering signout (updated written sign-out)
  • Receiving signout (listening behavior, cross-cover, documentation of overnight events.)

<table>
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<tr>
<th>Professionalism</th>
<th>Colleaguality</th>
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<tr>
<td>Low Unsatisfactory (1) Frequently signs-out early in the day with multiple patient tasks/procedures which require follow-up</td>
<td>High Superior (9) Signs-out when foreseeable work is completed</td>
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<table>
<thead>
<tr>
<th>Unsatisfactory</th>
<th>Satisfactory</th>
<th>Superior</th>
<th>Insufficient contact to rate</th>
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<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<td></td>
<td>5</td>
<td>6</td>
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<td>9</td>
<td>10</td>
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The development of a nine-step evaluation framework

1. Identification of multiple endpoints and arranging them into manageable groups;
2. Estimation of baseline overall and preventable risk;
3. Bayesian elicitation of expected effectiveness of the planned intervention;
4. Assigning utilities to groups of endpoints;
5. Costing the intervention;
6. Estimating health service costs associated with preventable adverse events;
7. Calculating health benefits;
8. Cost-effectiveness calculation;

Evaluating Policy and Service Interventions: A Framework to Guide Selection and Interpretation of Study End Points
Sample size of a future study

Table of the sample sizes for different plausible estimates of the effectiveness of the intervention ($\delta$) and of the preventable rates of AE:

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<th>$\delta$</th>
<th>Preventable AE rate</th>
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<tr>
<td></td>
<td>0.01</td>
</tr>
<tr>
<td>0.1</td>
<td>4,816,572</td>
</tr>
<tr>
<td>0.2</td>
<td>1,201,705</td>
</tr>
<tr>
<td>0.4</td>
<td>299,203</td>
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Baseline risk of AE 19%
Sample sizes calculated at the usual 5% significance level (alpha) and 80% power (beta).
Lessons Learned

• Gap in knowledge and understanding between hospital and primary care
• Clinicians focus on their own clinical work, less on ensuring continuity of care,
• Normalized deviance (Diane Vaughn) and lack of psychological safety (Amy Edmonson)
• Lack of structural, constructive reflection and process improvement
• Evaluating health policy and human factors in practice (in situ) at ward level—context matters
• Engaging physicians and allied health around safety, quality and handovers-ownership is key (Karl Weick-sense-making)
• Education and training—All training and accountability at the microsystem level

- Management interventions may be divided into two categories; targeted service interventions with narrow effects, and generic service interventions that (like policy interventions) have diffuse effects.

- Measurement of clinical processes rather than patient outcomes may be more cost effective in evaluations of targeted service interventions.

- Clinical processes are not usually suitable primary end points for policy and generic service interventions because the effects at this level are too diffuse.
Elements of Effective Hand Overs

- Efficient/effective communication
- Anticipatory Management
- Continuity of care (technical and from the patient’s perspective)
- Interprofessional collaboration/ teamwork

Barach P, Suresh G, 2014
Teamwork Training

THE CORE

Team Leadership
Mutual Performance Monitoring
Back-Up Behavior
Adaptability
Team Orientation

Closed Loop Communication
Mutual Trust

Shared Mental Models

Baker, Salas, King, Battles, Barach, 2006
Location and Culture matter

- Correct Physical Ergonomic Barriers
  - Workspace design: access to necessary equipment and lighting
  - Equipment: malfunction, inaccessible or difficult to interpret

- Aim to Reduce Variation through Harmonization (vs. Standardization)
  - Lots of expert based tools hard to articulate are used to convey patient complexity and urgency
  - Focus on requiring verbal communication & correcting barriers to achieving this

- Importance of a Safety Culture that supports Hand-offs as a Priority
  - Barriers include scheduling issues and fatigue
  - The hand-off is more than just transfer of content, also the transfer of professional responsibility

Johnson J, Barach, MJA 2009
The essential role of patient engagement and empowerment

The results of the survey underscore the value of a strong patient-physician connection, but also the role of effective communication in empowering and engaging patients. Among patients who say they are well-informed about their health, more than two-thirds report that they make better and informed healthcare decisions.

By engendering a sense of involvement and providing useful, accessible information, safety net providers can count on improved patient experiences and, ultimately, better health outcomes for some of our most vulnerable residents.

Flink M, et al 2013
Work Based Assessment and Flow

Handovers are an integral to the daily clinical work

• Improvement must be driven by those doing the handovers

There’s the research, but then there’s the improvement

• Improving handovers were a vehicle for teaching improvement skills
• The best way to learn about improvement is by trying to improve

There are cultural differences, but at some level we have the same needs and the same problems

• Local solutions may vary
Evaluation, Sustainability and Transferability

- What happens when you are “done” with the project?
- How do you sustain the improvement?
  + Identify local champions
  + Build around microsystem
  + Build-in process monitoring and evaluation from the beginning
  + Connect to present clinical and organizational processes


Local Leadership

• All change is local
• The research team can’t improve the process that is being studied -- this has to be accomplished by those at the front lines
• Local champions are necessary to lead and manage the improvement piece
• Champions need to be nurtured (they won’t necessarily know what to do)
• Culture eats strategy for breakfast (Peter Drucker)
Scientific Deliverables

• 3 PhD’s
• 30 peer reviewed papers
• 20 national and international talks
• Special issue of BMJ
• Upcoming book under contract with Springer
• EU Funded PATIENT Project- "Improving the continuity of patient care through teaching and researching novel patient handover processes in Europe"
Future research is needed on (potential effective) discharge interventions that address organizational cultural barriers

- **Inward attitude and understanding:** collaborative meetings/ training programs to exchange ideas to understand each other, and to learn to know each other (as persons and regarding knowledge, skills and possibilities)

- **Lack of feedback:** feedback letter/ open discussion forums followed by a collaborative educational program

- **Handover administration compliance:** warning signs or reminders in electronic agenda’s or information systems when certain administration tasks are not executed in time

- **Evaluation**—developmental, formative and summative
Please contact me at:

Email: pbarach@gmail.com

Project Website: http://handover.eu

BMJ special issue on project, at http://qualitysafety.bmj.com/content/21/Suppl_1.toc