Centre for Healthcare Improvement (CHI)

Chalmers and Healthcare in Collaboration

For Sustainable Healthcare

Centre for Healthcare Improvement (CHI)
- a research and education centre at the Department of Technology and Economics, Chalmers University of Technology
- organizes cooperation between researchers from different discipline and led by two directors.
- conducts research and education in improvement, innovation and transformation of health care.
- our goal is to collaborate with Swedish Healthcare to create, translate and disseminate research-based and action-oriented knowledge.
- to achieve this goal, CHI focuses on two parts - research and education.

Approaches

Organizing and managing
- Principles for organizing, organizational learning, how to deliver value, organizational change...

Data-driven operational development
- Applied statistics, "from data to improvement", visualization...

Processes and flow
- Value focus, capacity planning, coordination, integration...

Improvement knowledge
- Variation, systems understanding, psychology...

Sustainability
- Social, financial, environmental...

Action oriented
- Action research – interactive research
- Experiential learning
**Action research – with (not on) care practitioners**

> "The knowledge that is generated shall be both scientifically relevant, and relevant for practitioners. You must be able to use it, and act on it."

**Collaboration through research**

- Patient oriented and integrated cancer care processes
- In Search of Sustainable High Quality Health Care
- Decision support system for Warfarin treatment
- Experienced Based Co-Design – to involve patients, relatives and staff in a joint improvement work
- Patient complaints as a basis for improvement work
- Chest pain – variation in quality, safety and cost
- System dynamics at a Dermatology Department
- Learning micro-systems in healthcare processes
- The application of Lean Six Sigma in a healthcare context
- When process orientation meets the functional structures
- Analyses of medication processes
- Prognosis and and tactical planning within surgery
- Reimbursement models and process effectiveness
Collaboration through education

Professional education
- Quality driven organizational development (30 credit)
- Quality Management for senior managers (7.5 credit)
- Advanced improvement knowledge (30 credit)
- Lean healthcare (7.5 credit)
- Improvement knowledge for residents (7.5 credit)

PhD education
- Reflexive action research (7.5 credit)
- Quality Management (7.5 credit)
- + other courses at Technology Management and Economics

CHI has trained more than 250 managers and improvement leaders within Region Västra Götaland

Education as a catalyst for change
Approaches

Organizing and managing
- Principles for organizing, organizational learning, how to deliver value, organizational change...

Data-driven operational development
- Applied statistics, “from data to improvement”, visualization...

Processes and flow
- Value focus, capacity planning, coordination, integration...

Improvement knowledge
- Variation, systems understanding, psychology...

Sustainability
- Social, financial, environmental...

Action oriented
- Action research – interactive research
- Experiential learning

---

Reduce variation in INR of patients undergoing warfarin treatment as a way to eventually decrease mortality and morbidity

---

Warfarin treatment
- Warfarin – an oral anticoagulant (blood thinning) treatment effective for the prevention of thromboembolic events in various clinical contexts.
- Serious risks related to Warfarin treatment, thus requiring great care and caution when ordinating Warfarin pills to patients.
- Patients undergoing Warfarin treatment are therefore monitored regularly by blood testing.
- International Normalized Ratio (INR) is usually used to measure the effect of Warfarin treatment.
International Normalized Ratio (INR)

\[ \text{INR} = \left( \frac{\text{coagulation time of patient plasma}}{\text{coagulation time of normal plasma}} \right)^{0.2} \]

- The standard INR range (also called the therapeutic range) for most clinical situations is 2.0-3.0.

Histogram over INR-values at SkaS in 2005

Probable causes of variation in INR

- **At start up**
- **Drugs added/withdrawn**
- **Ordination routines**
- **Dr doesn’t know of ordination**
- **Concurrent disease**
- **Information to patient**
- **Patient compliance**
- **Interruption routines**
- **Lab variation**
- **Other**
VCHEN (INR: 60%)

SiF (INR: 70-75%)
Plot of INR and number of tablets/day

Hemolysis

Vacutainer canula

constant dimension
The Skaraborg Hospital Group (SkaS)……..//……. Using an action research approach, this article describes the lessons that were learned from the first 22 Six Sigma projects, completed between 2006 and 2008 and having a success rate of 75%.

Net cost savings per project = 40 000 €

Approaches

Organizing and managing
* Principles for organizing, organizational learning, how to deliver value, organizational change...

Data-driven operational development
* Applied statistics, "from data to improvement", visualization...

Processes and flow
* Value focus, capacity planning, coordination, integration...

Improvement knowledge
* Variation, systems understanding, psychology...

Sustainability
* Social, financial, environmental...

Action oriented
* Action research – interactive research
* Experiential learning

A physician-led, and learning driven approach to the regional development of 23 cancer pathways in Sweden

The cancer challenge

* Every third person in Sweden at some point in their lives has experience of cancer. That amounts to 50 000 patients a year – one new admission every ten minutes.
* Projections suggest that the number of men with cancer in 2030 will be almost 130 % more than today - the corresponding increase for women is around 70 %.

* Cancer care is:
  - highly decentralized
  - involves most levels of care
  - highly multi-professional activity
  - fragmented
  - long and varying delays
  - a general lack of patient orientation.
National cancer strategy

- 4 Patient centred criteria
- 3 Criteria regarding training, knowledge management and research
- 3 Criteria regarding the organizing of RCCs

Project Design

"The knowledge that is generated shall be both scientifically relevant, and relevant for practitioners. You must be able to use it, and act on it."

Agreed-upon core principles... so far

- Patient focused
- Physician-led
- Learning driven
- Systems approach
- Positive and opportunity-driven
- Research informed
A process oriented view

Patient process
Care team
Regional process group
Regional cancer centre

4 + 1 C

Community  Control

Customer

Cure  Care

Glouberman & Mintzberg 2001
Customer involvement

- Experience-based codesign (patients and close relatives)
- Patient Associations
- Patient diaries
- Young Cancer

Appreciative Inquiry: 4 + 1 C

- Different ways of creating value (value logics)
- Resource consumption (CPP-data)
- Effectiveness and production planning
- Developmental dialogues
- Early detection
- Palliative care
- Support for cancer survivorship
- Patient diaries
- KPI for tumour processes

Support for innovations - ongoing initiatives
Value logic – production logic

- We need different production logics to create value for our patients
  - "How we organize people, competences, services, standards and procedures at at a certain time in the system"

Sven, 62

- No earlier diseases
- Former football player
- Accelerating pain from left hip
- Severe arthrosis
- Needs:
  - New hip prosthesis including a swift, efficient and safe process

Process: Hip replacement

- Need: New hip
  - Diagnosis → Preparation → Operation
  - Rehabilitation → Final evaluation
- Output: Improved function, no pain
Anna, 40

- Discovered a tumor in left breast
- Needs:
  - Immediate diagnosis
  - Plan for further treatment
  - Relieve anxiety

(One-stop) Solution workshop – Patient center

Örjan, 76

- Diabetes and congestive heart failure for many years
- Several visits to in- and outpatient clinics
- Needs:
  - Safety and good quality of life at home
  - No admissions to the hospital
  - Be able to monitor and “treat” exacerbations at home
  - A trustworthy contact nurse, easy to get hold of
  - Be able to meet other patients with similar experiences
Network logic

- Self monitoring
- Patient co-produces care
- Coordinating centre
- Mobile teams

Healthy elderly people

Elderly people with one or two stable chronic diseases and taken care of by the ‘ordinary’ care system

Elderly people with multiple chronic diseases in unstable condition and taken care of by the integrated mobile care team

Elderly people with multiple chronic diseases but in stable condition and taken care of by the ‘ordinary’ care system

0.2%

7% of elderly population

Figure 2. Conceptual figure developed by the team together with the researchers that illustrates the different proportions of elderly people with different care needs in the actual area

Lifvergren et al. (2012) Learning microsystems in Healthcare

Different business models

- High volume, high quality, low cost
- Unique service, one stop shop
- Health promotion, prevention, upstream, behavioral aspects
**Approaches**

Organizing and managing
- Principles for organizing, organizational learning, how to deliver value, organizational change...
- Data-driven operational development
  - Applied statistics, "from data to improvement", visualization...
- Processes and flow
  - Value focus, capacity planning, coordination, integration...
- Improvement knowledge
  - Variation, systems understanding, psychology...
- Sustainability
  - Social, financial, environmental...
- Action oriented
  - Action research – interactive research
  - Experiential learning
**Approaches**

Organizing and managing
- Principles for organizing, organizational learning, how to deliver value, improvement work

Data-driven operational development
- Applied statistics, "from data to improvement", visualization

Processes and flow
- Value focus, capacity planning, coordination, integration

Improvement knowledge
- Variation, systems understanding, psychology

Sustainability
- Social, financial, environmental

Action oriented
- Action research – interactive research
- Experiential learning

For more info:
www.chi.chalmers.se