LogiDOC
the project that kick-started CHOIR

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AGENDA

- STW LogiDOC project proposal (2007)
- Overview of results (2007-2013)
- Outlook (2013 - )
History of CHOIR before LogiDOC
2003 - 2007
Logistical improvements go hand-in-hand with quality improvements: patients that have to visit the hospital less often, have shorter waiting times, and may count on more attention from nurses and physicians.

Logistical quality improvements will yield some 3 to 3.5 billion EUR: almost a quarter of the entire hospital budget...

In other words: improved care for less money!
CHOIR history 2003 - 2007

- MSc and BSc student projects initially in:
  - **Erasmus MC**  prof.dr. Geert Kazemier, MD  
    dr. Mark van Houdenhoven
  - **AMC Amsterdam**  prof.dr. Piet J.M. Bakker, MD
  - **NKI/AVL**  prof.dr. Wim H. van Harten, MD

- Focus mostly on single departments
- Various publications in media, scientific papers
- Start of collaboration between UT departments
- Rapidly expanding network of hospitals
Founding of CHOIR (2007)
Center for Healthcare Operations Improvement & Research

To help care providers to reach their goals w.r.t.
  - Improvement of productivity
    - Reduction of waste (time, costs, resources, …)
  - Improvement of quality of care, labor and safety
    - Reduction avoidable variability (workload, access time, …)

→ Using scientific approach,
→ with quantitative techniques and ICT,
→ together with care providers,
→ Such that the chance of implementation is maximal
Project proposal in 2007

- Open technology competition of Technology Foundation STW
- Title: Logistical Design for Optimal Care (LogiDOC)
- Partners / user committee:

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<td>AMC Amsterdam</td>
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LogiDOC objectives

- ...to develop mathematical models and techniques to analyse and support the design of the *optimal logistical layout of a hospital*... in such a way that *both the interests of the patient and of the hospital are addressed*.

- ...*all levels of control*...

- ...*optimization of the entire clinical course of patients*...

- ...*to establish broad recognition in the healthcare application domain and application of the research results*. 
PhD candidates

- Theresia van Essen (HagaZiekenhuis)
- Peter Hulshof (Reinier de Graaf Groep)
- Nikky Kortbeek (AMC Amsterdam)
- Peter Vanberkel (NKI/AVL)
- Egbert van der Veen (ORTEC bv)
Research approach

- PhD students had appointment at both UT and hospital
  - 1 day a week: implementation / valorization
  - 4 days research
  - 1 - 2 days at UT, 3 - 4 days at hospital
- Inventory of actual problems from practice
- Allows involvement all the way until implementation of outcomes

- Involvement of approx. 100 BSc and MSc students for graduation projects
  - Continuation after graduation completion
Summary of outcomes
5 PhD theses
Summary of outcomes

- 5 PhD theses, 27 published, peer reviewed articles
- 16 articles still under review
- Seminars at hospitals
- Conference contributions in all relevant national and various international scientific societies
- Organization of the 2012 EURO-ORAHS international conference
Summary of outcomes

- Patient logistics course for healthcare managers
- ORchestra bibliography
- Many awards, a.o.
  - OR in practice awards (Canadian OR society; ORTEC)
  - Beta PhD award; Finalist Doctoral dissertation award (EURO-INFORMS 2013), for thesis Nikky Kortbeek
  - Poster awards (INFORMS, CTIT, Ned. Math. Congres)
  - Thesis prizes (UT, Menzis, VVS-OR, IBR)
We have...

- Studied almost all key departments in a hospital
- Developed various planning approaches to optimize patient flows across multiple departments
- Developed planning solutions for all levels of control
- Showed that “more capacity” is not the answer, and that even more demand can be handled with the available capacity
- Brought OR/OM researchers and clinicians closer together
- Demonstrated that personnel preferences can be taken into account in staffing and rostering
- Demonstrated that quality and efficiency can be jointly optimized
Outlook

- New PhD projects at:
  - HagaZiekenhuis (Nardo Borgman)
  - Jeroen Bosch Ziekenhuis (Maartje v.d. Vrugt)
  - AMC Amsterdam (Aleida Braaksma)
  - Sanquin (Sem van Brummelen)
  - LUMC (vacancy)
- Awaiting funding:
  - NKI/AVL (Arturo Perez Rivera)
  - AMC (Ingeborg Bikker)
- Collaboration with IT developers for developing ICT tools based on research outcomes
Thank you for your attention!

Center for Healthcare Operations Improvement & Research

Our website:
http://www.utwente.nl/choir

Online bibliography:
http://www.choir-ut.nl/
Topics addressed

- Wards (pooling, flex. staffing)
- Operating room planning and scheduling
- Outpatient clinic scheduling
- Operating rooms → wards
- Outpatient clinic → operating rooms
- Radiology department
- Laboratory / pharmacy policies

- Pre-operative screening
- Case mix optimization
- Oncology treatment
- Ambulance planning
- Staffing and rostering
- Rehabilitation treatment planning

- And many more…