Hospital of the future

36th Global GS1 Healthcare Conference, Delhi, India
November 5, 2019

Dr. Eric Hans Eddes, Gastrointestinal and Oncological Surgeon, General Director Dutch Institute for Clinical Auditing, the Netherlands
Alex van der Putten, Head of Procurement and Supply Chain at Radboudumc, Nijmegen, the Netherlands
Peter O’Halloran, CIO, ACT Health, Australia
Hospital of the future - overview

36th Global GS1 Healthcare Conference, Delhi, India

Dr. Eric Hans Eddes, chair
Gastrointestinal and Oncological Surgeon, General Director Dutch Institute for Clinical Auditing, the Netherlands

November 5, 2019
Presenters: Hospital of the future

Chair: Dr. Eric Hans Eddes

Alex van der Putten

Peter O’Halloran

The Global Language of Business © GS1 2019
Less bricks, more bites, different behaviour

36th Global GS1 Healthcare Conference, Delhi, India

Alex van der Putten
Head of Procurement and Supply Chain at Radboudumc, Nijmegen, the Netherlands

November 5, 2019
Radboudumc
university medical center
VISION RADBOUDUMC

We aim to be pioneers in shaping the health care of the future
Our ultimate goal is providing the best and most sustainable care for all patients.
HOW

We do this in a person-centered and innovative way
OUT OF STOCK IS NOT AN OPTION
OUR PROBLEM

- Medical supplies were not in control
- Fragmented and manual data management
- Primary systems were not connected
PROJECT OVMA

Optimization through redesign process, Oracle adjustments, EPIC link and GS1 standards
LESS BRICKS

HOSPITAL OF THE FUTURE

MORE BYTES

DIFFERENT BEHAVIOUR
LESS BRICKS

- Hospitals are “shrinking”
- Care close to the patients
- Walls (System & Organisation)
Great urgency to demolish “walls”

- Transparency in the chain
- One-time correct recording of article data
- Efficient use of stocks
MORE BYTES
EXPONENTIAL GROWTH
MORE BYTES

VERACITY     VOLUME

VARIETY     VELOCITY
MORE BYTES

VERACITY

VOLUME

VARIETY

VELOCITY
MORE BYTES

VERACITY

VOLUME

VARIETY

VELOCITY
MORE BYTES

VERACITY

VOLUME

VARIETY

VELOCITY
ROLE GS1

- Use GS1 standard
- Development barcode unraveler
- GDSN Datapool
DIFFERENT BEHAVIOUR

- Logistical responsibility in one hand
- Recording of all logistics transactions
- Stock level based on facts instead of emotion
THE CHALLENGES

- 6σ SYNDROME
- NIH SYNDROME
- TBTI SYNDROME
NEW PROCESS
THE RESULTS

- Greater medical safety
- Cost reduction (efficiency)
- Meet new EU regulations & JCI-criteria
- Solving the current bottleneck on financial inventory control
THE NUMBERS

- Departments: 16
- Stock keeping units: 4,816
- Items: 20,000
- Inventory balance: €5,400,000
- Inventory turns: 5
- Inventory accuracy: >99%
IMPACT

NO OUT OF STOCK
Proven trust in secured supplies at the right time

REDUCTION STOCK: >25%
and still counting

SAVING COSTS > €500.000,-
and still counting
DREAMS
OUR DREAMS

Automated access to article data suppliers
OUR DREAMS

Automatic detection instead of manual barcode scanning
OUR DREAMS

Optimization B.O.M. procedure based on analysis of return logistics
STAY FOCUSED
THE CHALLENGES
BE PERSISTENT
Hospital of the future

36th Global GS1 Healthcare Conference, Delhi, India

Peter O’Halloran
CIO, ACT Health, Australia
November 5, 2019
CASE STUDY ACT HEALTH – HOW GS1 STANDARDS SUPPORT INNOVATION
AUSTRALIA & THE AUSTRALIAN CAPITAL TERRITORY

• Australia is very large and remote 7.692 million km$^2$
The ACT is 2,538 km$^2$

• Australia’s population is 25.2 million
The ACT’s ~410,000

• Australia is an island surrounded by water, with coastlines exceeding 34,000km
The ACT is an island surrounded by New South Wales
WE HAD A PLAN

Based around best of breed approach rather than patients

We achieved some great outcomes despite this approach
WE HAVE A NEW PLAN

Enabling exemplary person-centred care through digital innovation

Three key themes
• Patient-centred
• Research, discovery and collaboration
• Health services enabled by contemporary technology
THERE WERE FOUR CONSTANTS

- Improving patient outcomes
- Increasing patient demand
- Never enough money
- GS1 standards and support
WHERE ARE WE?

• **Implemented**
  • Radiology system
  • Computers on Wheels (COWs)

• **Implementing**
  • Supply Chain System
  • Clinical Work Devices
  • Asset Maintenance System

• **Procuring**
  • Pathology Laboratory Information System (LIS)
  • Digital Health Record (DHR)
WHO AND WHERE?

- **Patient ID (GSRN + SRIN)**
  - Wristbands, specimen labels and clinical notes labels
- **Staff ID Cards (GSRN)**
- **Location ID (GLN)**
WHAT?

• Product ID (Serialised GTIN + ISBT-128)
• Asset ID Cards (GSRN)
• Document Type ID (GDTI)
STANDARD ISSUES

• Looooooooooong lead times

• Legacy systems cannot produce barcodes with the correct symbology or contain all data elements

• Products that do not contain GS1 barcodes or non-compliant barcodes

• Exorbitant pricing and/or lead times
STANDARD NON ISSUES

• Barcode scanners
• Staff compliance
• Keeping the benefits
• Patient/carer support
• Costs to maintain
• Changing standards
• Support from GS1
WHERE WILL BE IN 2025?

- Improved patient outcomes
- More human-centred support
- More efficient health services

SUPPORTED BY:

- Full traceability – who, where, what, how, why and when
- Scanning at the point of care (and at other points throughout the supply chain) with automated safety checks before any care activity
- Full episode costing
We've switched on the lights.
Turned up the Verdi.
And the champagne's on board.

So where the bloody hell are you?

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Dr. Eric Hans Eddes, Gastrointestinal and Oncological Surgeon, General Director
Dutch Institute for Clinical Auditing, the Netherlands

November 5, 2019
Hospital of the Future

Dutch Institute for Clinical Auditing

Eric H Eddes, MD PhD
Director DICA
GastroIntestinal Surgeon Deventer Ziekenhuis
Those were the days
Healthcare system is facing challenges

Rising costs

HC spend outgrows GDP growth in most developed countries

HC spend is about 9-12% of GDP

High or unknown variation in quality

If available, 2-36x\(^1\) variation in health outcomes is observed at all levels (within hospitals, nationally and internationally)

Still lack of transparency & agreement on health outcome measurement for many patient groups

Misaligned incentives

Focus on volume instead of value in most payments systems

Care traditionally organized by specialties instead of around patient groups

Info overload to patients online

Healthcare costs are rising at unsustainable rates
Healthcare system is facing challenges

Rising costs
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- Focus on volume instead of value in most payments systems
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- "More and more patients are going to the Internet for medical advice. To keep my practice going, I changed my name to Dr. Google."

Variation in quality

Percentage of patients with a colorectal resection with more than 10 lymph nodes found and examined by the pathologist

2009
# Healthcare system is facing challenges

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Misaligned incentives
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## Healthcare system is facing challenges

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Patients info overload, reliable, useful
“More and more patients are going to the Internet for medical advice. To keep my practice going, I changed my name to Dr. Google.”
VBHC;
Improving outcomes and costs around a patient group

Outcomes that matter to patients

Cost around a patient group

= Value around patient group
International communities forming to accelerate VBHC

Global standardization of outcomes
Standard Sets for 26 medical conditions (>50% of GBD) have been developed to date

Broad global interest in measuring and comparing outcomes

Pilot program (GLOBE) for global benchmarking initiated for hip and knee osteoarthritis and cataract

OECD gearing up to benchmark outcomes
Launched Patient Reported Indicators Survey (PaRIS) to benchmark outcomes within OECD

Started with 3 international working groups: hip and knee replacements, breast cancer care, and mental health care

World Economic Forum driving the VBHC topic
Just completed 3-year project “Value in Health” in the World Economic Forum

SteerCo included e.g., CEO of NHS, CEO of Kaiser Permanente, Dutch Minister of Health, CEO Novartis

Several pilots across the globe emerging as a result of the work done
Dutch Institute for Clinical Auditing
Providing insight in quality of care with trustworthy comparisons and analytics

- Lead by med. professionals
  - Medical specialists
  - Professional Boards

- Robust methodology
  - Correction
  - Site checks

- Value Based Healthcare

- Data driven
  - Quality & fin. data
  - PROMs / PREMs

- Nationwide ICT Platform
  - Agreements
  - Exchange, eg EMR

- Setting nationwide standards

QUALITY, IT'S ABOUT YOU
### Key figures on DICA’s growth from 2011 - today

<table>
<thead>
<tr>
<th>Year</th>
<th>Clinical registries</th>
<th>€ on avg per patient / registry</th>
<th>Patients in DICA registry</th>
<th>Hospitals and private clinics</th>
<th>Health care professionals using tool</th>
<th>Registries also include PROM collection</th>
</tr>
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<tr>
<td>2011</td>
<td>3</td>
<td>35^{1}</td>
<td>35k</td>
<td>80</td>
<td>300</td>
<td>10</td>
</tr>
<tr>
<td>2019</td>
<td>22</td>
<td>10</td>
<td>1M</td>
<td>150</td>
<td>5k</td>
<td>10</td>
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1. 2014 instead of 2011
Not only outcomes improve, but also variation reduces over time

Percentage of patients with a colorectal resection with more than 10 lymph nodes found and examined by the pathologist
Dutch Colorectal Audit led to changes in treatment plans, resulting in improved outcomes and reduced costs

- Less invasive treatments
- Improved outcomes
- Reduced costs
Dutch Colorectal Audit led to changes in treatment plans, resulting in improved outcomes and reduced costs

**Less invasive treatments**
- Less radiation (neo-adjuvant) in rectal cancer
- Short course radiation
  - Reeks1
  - Reeks2
  - Chemo radiation

**Improved outcomes**
- More laparoscopic vs open surgeries

**Reduced costs**
- Less stoma's in rectal cancer

Source: DICA & Deloitte, LOGEX analyses
75,000 pat. with colorectal cancer on Jan 1st 2016, 9793 pat. registered in DCRA in 2017, 6832 (70%) pat. with colon cancer and 2961 patients (30%) with rectal cancer.
Dutch Colorectal Audit led to changes in treatment plans, resulting in improved outcomes and reduced costs

**Less invasive treatments**
- Less radiation (neo-adjuvant) in rectal cancer
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**Improved outcomes**
- Lower mortality
- Fewer complicated trajectories
- Decreased length of stay (days)

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- Improved outcomes
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  - More laparoscopic vs open surgeries
  - Less stoma's in rectal cancer

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  - Fewer complicated trajectories
  - Decreased length of stay (days)

- **Reduced costs**
  - Δ costs compl. vs. noncompl. pt - €18k per patient
  - Weighted reduction in complicated patients 3.1%
  - # patients w colon or rectal ca (2018) ~10k
  - Cost savings (annually) -5.5M

Source: DICA & Deloitte, LOGEX analyses
75,000 pat. with colorectal cancer on Jan 1st 2016, 5793 pat. registered in DCRA in 2017, 6832 (70%) pat. with colon cancer and 2961 patients (30%) with rectal cancer.
### Equivalent potential in other patient groups

- **National potential in savings 10 – 20 %**

### Cost Savings

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<th>Description</th>
<th>Value</th>
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<td>Δ costs compl. vs. noncompl. pt</td>
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<td>~10k</td>
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<td>Cost savings (annually)</td>
<td>-5.5M</td>
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**Note:**
- Quality, it's about you
Dutch Breast Implant Registry
clinical audit & traceability

Borstimplantaat Silimed direct van de markt

Implantaten van de Braziliaanse fabrikant Silimed mogen direct niet meer gebruikt worden in Europa. Bij een fabriekskontrole bleek dat er onder meer gladdeafzetsels op de borstimplantaten zaten die daar niet thuishoren.
Dutch Melanoma Treatment Registry
clinical audit & new drugs

• Introduction new drugs
• Accelerated availability
• Professionals- Pharma – Health Authorities
• Expansion
DICA’s explorative dashboard, Codman’s

### DCRA Registrations
Dutch Collectif Audit

The Netherlands’s DICA’s dashboard provides insight into the quality of care within your healthcare institution. The results are shown based on individual unconnected patient outcomes. As a result, the results are not suitable for comparison with other hospitals. The results of previous years are shown according to the current registration definitions. The current dashboard is a beta version.

The DCRA registers the results of primary surgeries of intestinal carcinomas. As a result, the professional association gains insight into the quality of health care of their own surgeons and colleagues. With these insights and comparisons, they can demonstrably improve their work. The SCIA is founded by the Dutch Association for Surgical Oncology, the Dutch Association for Gastrointestinal Surgery and the Dutch Colorectal Cancer Group.

All Dutch hospitals performing intestinal cancer surgery are joining the webbased quality registration. Until now, more have been registered more than 6,000 treatments. This registration enables hospitals to compare their quality of intestinal cancer care with other hospitals. Clearly, this is only possible when comparisons are fair, and corrections are made for differences in heaviness of care (case mix) and random variation. The system points out oncology surgeons on possible improvements so that they can get started. The professional association facilitates this and monitors the improvements.

<table>
<thead>
<tr>
<th>Date about 2017</th>
<th>Date about 2018</th>
<th>Progress new registration year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change date</td>
<td></td>
<td>Q3 2018</td>
</tr>
<tr>
<td>Analyzed colon carcinoma patients</td>
<td>96</td>
<td>Analyzed colon carcinoma patients</td>
</tr>
<tr>
<td>Analyzed rectum carcinoma patients</td>
<td>53</td>
<td>Analyzed rectum carcinoma patients</td>
</tr>
<tr>
<td>Amount of missing surgical complications</td>
<td>193</td>
<td>Amount of missing surgical complications</td>
</tr>
<tr>
<td>Amount of missing extramural invasion on MRI</td>
<td>53</td>
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Hospital of the future

- Data driven
- Cost efficiency
- Quality improvement
- Safety
- Personalized medicine e.g., Shared Decision making
Hospital of the Future
Hospital of the future

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Wrap up

November 5, 2019
Remaining questions to the panel
Thank you very much for your attention