Economically Effective Health IT

Electronic Health Records and Chronic Disease Management

Chris Stephens, Orion Health
Regional Manager – Australia & Southeast Asia
The challenge is to connect the disparate islands of care, information, organisation and knowledge that patients encounter, and to support workflow and decision-making:
George C. Halvorson

Chairman and chief executive officer of Kaiser Foundation Health Plan Inc. and Kaiser Foundation Hospitals.


“It would be breathtakingly stupid to put healthcare data on the computer and end up with the sets of isolated, inaccessible, non-interactive information silos we now have with paper healthcare records.”
“Across Australia there is a groundswell of support for a better, more connected healthcare system. More than 80 percent of Australians are in favour of EHRs...” (NEHTA)

- Coordinated Care (IEHR)
- Connecting Australia
  E-Health Interoperability, e-Health ID, Clinical Terminology, Security Messaging, Privacy, Supply Chain
- E-Communications in Practice
  e-Discharge Summaries
  e-Medication Management
  e-Pathology
  e-Referrals
The Big Picture

- The Pareto Principle suggests that ~80% of the healthcare spend will be spent on ~20% of the population.
- Already, we know that 70% of the health spent is on chronic disease, and it’s increasing!
- Also, 80% of the healthcare costs are spent on secondary care, the ambulance at the bottom of the cliff.
1% of the population results in 35% of health care costs

Patients with 5 morbidities see an average of 17 physicians in a year

1 hypothetical patient was treated by 135 providers and they came up with 82 different assessments
“The health systems ... are struggling to cope with soaring costs.
A lot of those extra costs come from new technology—which is odd. In most other industries, new more productive technologies drive costs down…”

* The Economist: April 16th 2009

If Health IT were a drug would it be approved?

* Alliance of Clinical Excellence – opening presentation, Mehdi Khalid
Figure 4: Duplicate medical tests among sicker adults (Source: 2005 and 2008 Commonwealth Fund International Health Policy Survey of Sicker Adults) (Percentage of patients reporting that their doctor ordered a medical test that the patient felt was unnecessary because the test had already been done before (in the last two years)).
Figure 5: Test results/medical records not available at time of appointment, among sicker adults (Source: 2005 and 2008 Commonwealth Fund International Health Policy Survey of Sicker Adults)
(Percentage of patients reporting that their test results/medical records were not available at the time of the appointment (in the last two years).)
### Projected Impact of HealthInfoNet

#### Estimated Total Annual Savings for HIN Phases

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Avoided Services</td>
<td>Low: $2.6 M</td>
<td>Low: $3.5 M</td>
<td>Low: $5.2 M</td>
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<tr>
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<td>High: $2.6 M</td>
<td>High: $3.5 M</td>
<td>High: $5.2 M</td>
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<tr>
<td>Avoided Services in Ambulatory Care</td>
<td>Low: $0.3 M</td>
<td>Low: $0.4 M</td>
<td>Low: $0.5 M</td>
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<td>(Admits)</td>
<td>(Admits)</td>
<td>(Admits)</td>
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<tr>
<td>Avoided Services in Emergency Room</td>
<td>Low: $3.7 M</td>
<td>Low: $4.5 M</td>
<td>Low: $5.2 M</td>
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<td>(Admits)</td>
<td>(Admits)</td>
<td>(Admits)</td>
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<tr>
<td>Reduced ER Costs – Inpatient</td>
<td>Low: $2.5 M</td>
<td>Low: $3.0 M</td>
<td>Low: $3.5 M</td>
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<tr>
<td>Reduced ER Costs – Outpatient</td>
<td>Low: $2.8 M</td>
<td>Low: $3.4 M</td>
<td>Low: $3.9 M</td>
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<tr>
<td><strong>Total Annual Avoided Service Savings</strong></td>
<td><strong>$6.3 M</strong></td>
<td><strong>$8.0 M</strong></td>
<td><strong>$10.3 M</strong></td>
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#### Productivity

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<tr>
<td>Ambulatory Care Productivity Savings</td>
<td>Low: $1.5 M</td>
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<td>High: $1.5 M</td>
<td>High: $2.0 M</td>
<td>High: $3.1 M</td>
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<tr>
<td>ER Productivity Savings</td>
<td>Low: $2.7 M</td>
<td>Low: $3.2 M</td>
<td>Low: $3.8 M</td>
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<td>High: $2.7 M</td>
<td>High: $3.2 M</td>
<td>High: $3.8 M</td>
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<tr>
<td><strong>Total Annual Productivity Savings</strong></td>
<td><strong>$4.2 M</strong></td>
<td><strong>$5.2 M</strong></td>
<td><strong>$6.8 M</strong></td>
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</tbody>
</table>

#### Total Estimated Annual Savings

| Total Estimated Annual Savings        | Low: $10.6 M                           | Low: $13.2 M                           |
|                                      | High: $12.5 M                          | High: $15.6 M                          |
|                                      | High: $13.2 M                          | High: $17.2 M                          |
|                                      | High: $15.6 M                          | High: $20.0 M                          |

April 7, 2009
The two Kaiser centers that have piloted this program have cut the rate of hospitalization and readmission for CHF patients to about a third of the average rate system-wide. “This was not a controlled experiment, the patients weren’t randomized, but there is nothing else to explain this dramatic change,”
The EHR Journey
‘Invitation to Innovation’
Capital Health Authority

Population Served:
- Edmonton Area: 980,000
- Plus North: 1.6 million

13 Hospitals: 2,600 beds
- 436,000 emergency visits
- 106,000 admissions
- 85,000 surgeries
- 13,000 births

Employees: 20,000
Physicians: 2,000

Other:
- 22 public health centers
- 9 mental health clinics
- Health Link nurse call centre (400,000 + calls)
Capital Health Authority

- Delivering rich data from across the region
  - Patient summary, demographics and event histories
  - Consultation notes, procedure notes, transcribed reports
  - Lab results, diagnostic imaging reports
  - Event histories, discharge summaries
- Very high satisfaction rates across all service types
- High adoption and acceptance

See www.capitalhealth.ca/YourHealth/Campaigns/netCare
Summary view of Diabetes Data

Care Co-ordination

- Responsible Physician: JONES, DR. PETER
- Follow Up Scheduled: Yes
- Follow Up Date: 24-Sep-2007
- Follow Up Type/Reason: Telephone

Co-Morbidities / Complications

- Depression: 05-Sep-2007
- Foot Disorder: 07-Aug-2007
- Sexual Dysfunction: 04-Aug-2007
- Obesity: 12-Apr-2006
- Hypertension: 24-Feb-2006
- Lung Transplant: 16-Aug-2004
- Retinopathy: 05-May-2003
- Gestational Diabetes: 22-Dec-2000

Medications

- Diamicron: 1 time a day, 10 mg, 02-MAR-2006
- Glipizide: 3 times a day, 12 mg, 02-JAN-2006
- Tenormin: 1 time every month, 225 ug, 05-MAY-2007
- Atenolol: 2 times every 2 weeks, 125 ug, 02-MAY-2004

Take as supplemented, No refills, Research on Medication

Oral blood glucose lowering drugs (A108), Oral blood glucose lowering drugs (A108), Antihypertensive/Renal Medications (C02), Antihypertensive/Renal Medications (C02)

Markers Of Disease Progression

- A1C: 6.3 %, 05-DEC-2005 08:46 High
- Hemoglobin A1C (HbA1C): 6.3 %
- Blood Glucose:
  - Glucose, fasting: 5.6 mmol/L, 16-APR-2007 08:29
  - Glucose, random: 7.6 mmol/L, 19-AUG-2003 10:55
- Creatinine:
  - Creatinine: 1.59 umol/L, 16-APR-2007 08:29 High
  - Calculated GFR: 40 ml/min/1.73m2, 16-APR-2007 08:29 Low
- Lipids:
  - LDL Cholesterol: 2.15 mmol/L, 07-SEP-2006 09:02
  - Triglyceride: 1.67 mmol/L, 07-SEP-2006 09:02
  - Total Cholesterol/LDL Ratio: 3.5, 07-SEP-2006 09:02
  - Cholesterol: 4.06 mmol/L, 07-SEP-2006 09:02
- Microalbumin:
  - Albumin/creatinine: 42.31 mg/mmol, 21-JUL-2003 03:40 High
Perceived value of information: Respondents that either agreed or strongly agreed to finding the following netCARE information valuable:

- Lab Test Results: 93%
- Diagnostic Imaging: 89%
- Transcribed Reports (discharge summaries, OR reports etc.): 86%
- Event History: 76%
- Demographics: 63%
- Other Reports: 62%
- Pharmaceutical Information Network: 37%
Peer Study - Reductions

- Respondents agreed or strongly agreed to netCARE reducing:
  - Waiting time for patients: 31%
  - # of phone calls/faxes to obtain info: 70%
  - # of paper records accessed: 64%
  - Unnecessary duplication of tests and procedures: 61%

- Community Health ER Doctor “it has changed my life, the best thing that ever happened to me"
Calgary Health Region

- Delivering integrated care of chronic disease
- Commenced CDM projects early 2002
Reporting - Provider View

A1C (by Provider)

- < 7.0: 50.7%
- 7.0 - 8.4: 31.3%
- > 8.4: 4.8%
- To Be Reviewed: 10.1%
- Unknown: 3.1%

Provider: DR. ...
Total Number of Patients: 227

LDL (by Provider)

- < 2.0: 53.6%
- 2.00 - 2.50: 12.3%
- 2.51 - 3.50: 18.8%
- 3.51 - 4.50: 13.7%
- > 4.50: 0.5%
- To Be Reviewed: 5.9%
- Unknown: 5.9%

Provider: DR. ...
Total Number of Patients: 227

Total Cholesterol : HDL Ratio (by Provider)

- < 4.0: 54.6%
- 4.0 - 5.0: 26%
- 5.1 - 6.0: 2.6%
- > 6.0: 0.4%
- To Be Reviewed: 12.3%
- Unknown: 4%

Provider: DR. ...
Total Number of Patients: 227

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<tr>
<th>Category</th>
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<tbody>
<tr>
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<td>7.0 - 8.4</td>
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<td>&gt; 8.4</td>
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<td>&lt; 2.0</td>
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<td>2.51 - 3.50</td>
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<td>3.51 - 4.50</td>
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<td>&gt; 4.50</td>
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<td>4.0 - 5.0</td>
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<td>5.1 - 6.0</td>
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<td>&gt; 6.0</td>
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<tr>
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<tr>
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### Full Task List

#### CDM - HomeCare

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<thead>
<tr>
<th>Form</th>
<th>Responsible</th>
<th>Due</th>
<th>Last Edited</th>
<th>Status</th>
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<tbody>
<tr>
<td>CDM Shared Patient Assessment</td>
<td>Janice Couperwhite (200)</td>
<td>2005/12/07</td>
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<td>Janice Couperwhite (200)</td>
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<td>CDM DM-Hth-Dyslip Assess1.0</td>
<td>Lois Cassie (196)</td>
<td>2005/12/07</td>
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<td>CDM Physician form</td>
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<td>Overdue</td>
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#### DHCC pathway

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<td>DHCC assessment</td>
<td>Terry Dingle (027)</td>
<td>2006/02/21</td>
<td>2006/03/13</td>
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<tr>
<td>Progress Report</td>
<td>Terry Dingle (027)</td>
<td>2006/03/13</td>
<td>2006/03/13</td>
<td>Completed</td>
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<tr>
<td>Triage and Appointments</td>
<td>Janet Gill (010)</td>
<td>2006/01/31</td>
<td>2006/05/18</td>
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#### Living Well

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<td>LW Triage and registration</td>
<td>Chantel Van Aalst (198)</td>
<td>2005/12/20</td>
<td>2005/12/21</td>
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Extending Disease Management

- More than 20 distinct programs
- Such as
  - Diabetes, dyslipidemia, asthma, hypertension, Cardiovascular disease and COPD
- Innovative programs include
  - Chronic pain
  - Anticoagulation management
  - National home care partnership
  - WHIC minimum data set messaging
34% reduction in ER visits

Emergency Department Admissions (All Conditions)

Relative Change: 34.4% Decrease

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<tr>
<th>Cohort</th>
<th>Baseline</th>
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<tbody>
<tr>
<td>06/07_Q3 (N=4339)</td>
<td>728</td>
<td>536</td>
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<tr>
<td>06/07_Q4 (N=3045)</td>
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<td>607</td>
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<td>07/08_Q1 (N=2773)</td>
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<td>527</td>
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<tr>
<td>07/08_Q2 (N=3516)</td>
<td>749</td>
<td>445</td>
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<tr>
<td>07/08_Q3 (N=3560)</td>
<td>659</td>
<td>373</td>
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<tr>
<td>Total (N=17233)</td>
<td>755</td>
<td>495</td>
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16% improvement in A1c (diabetics)
Alberta Netcare EHR
3.3M population, 30,000 clinical users
>200,000 patients on chronic disease management programmes
High Levels of adoption and satisfaction