What is the Continuum of Wellness?

Acute Illness

Subclinical Condition

Healthy
What will clinicians measure the *Continuum of Wellness*?
A urine test for appendicitis?

Protein marker could lead to faster, cheaper diagnosis

JUNE 23, 2009

IRIS MÓNICA VARGAS
HARVARD NEWS OFFICE

Harvard researchers at Children’s Hospital Boston have identified a protein in the urine of appendicitis patients that they believe may provide the basis of a quick, noninvasive, accurate, and inexpensive test for the common condition.
Microsoft Signs Agreement With Merck & Co. Inc. to Acquire Assets of Rosetta Biosoftware, Strengthening Position in Life Science

REDMOND, Wash. - Microsoft Corp. today announced that it has signed an agreement with Merck & Co. Inc. to acquire certain assets of Rosetta Biosoftware, a business unit of Rosetta Inpharmatics LLC, a wholly owned subsidiary of Merck & Co. Inc. The deal allows Microsoft to incorporate genetic, genomic, metabolomic and proteomics data management software into the Microsoft Amalga Life Sciences platform for enhanced translational research capabilities. In addition, Microsoft will establish a strategic relationship with Merck to enhance the Amalga Life Sciences platform to meet emerging pharmaceutical research needs.
What is the Rosetta Stone?

The Rosetta Stone carries an inscription in three different languages which helped decipher the ancient Egyptian hieroglyphics. It is the only surviving fragment of a larger stele dedicated to Ptolemy V, king of Egypt.

The inscription is written in three different scripts: Hieroglyphic, Demotic, and Greek. The Greek inscription (colophon) is the key to understanding the meaning of the other scripts.

In the case of the Rosetta Stone, the traditional date of Egyptian monuments is usually from 1500 years B.C. It is the earliest example of the Egyptian language written in a pictorial script called Hieroglyphic.

As hieroglyphics were used for a very long time, the date of the inscription is crucial to understanding the meaning of the language. The inscription was written in honor of Ptolemy V, who ruled from 247 to 205 B.C. The inscription includes Ptolemy's name, his titles, and the date of the inscription.

The Rosetta Stone was discovered in 1799 by French archeologists. The stone was finally deciphered by Thomas Young in 1812 and Jean François Champollion in 1822, revealing the meaning of the hieroglyphics.
How long was it for research discoveries to reach patient care in history?
146 years

Dr. James Lind (c.1747)
70 years
1601-1865

264 years
17 years
4 years
The Speed New Medical Knowledge Reached Broad Clinical Use over the Last 2,500 Years
A Healthcare “Singularity”? Year 2025
What are Microsoft’s three pillars to enable instantaneous knowledge translation?

A Data Cloud for consumers.

Data Clouds for enterprises.

Data Clouds for researchers.
Amalga Unified Intelligence System 2009

Empower Users

Liberate Data

Connect Care
IT System Silos and Point Solutions

- **Financial System**
  - Labor and Delivery (7 vendors)
  - Time and Attendance (3 vendors)
  - Dictation (4 vendors)
  - Hospice (5 vendors)
  - Advanced Visualization (5 vendors)
  - Interface Engines (7 vendors)
  - Budgeting (3 vendors)

- **Integrated Clinical Information System**
  - EMPI (5 vendors)
  - Ambulatory EMR (Small practice) (18 vendors)
  - Lab Anatomic Pathology (6 vendors)
  - Patient Monitoring System (1 vendor)
  - Laboratory Blood Bank (9 vendors)
  - CT
  - Ultrasound
  - Ventilators
  - Fetal monitors

- **Other medical Devices**
  - Anesthesia (1 vendor)
  - Other medical Devices

- **Core Measures**
- **Rapid Response**
- **Throughput Tracking**
- **PHR integration**
- **Ambulatory Inpatient**
- **Charge & Payment Analysis**
- **Care Quality Analysis**
- **IH Triggers**
- **Quality Scorecard**
- **Infection Tracking**
**Amalga UIS Liberates Your Data**

**Integrated Clinical Information System**
- **Financial System**
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  - Hospice (5 vendors)
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  - Interface Engines (7 vendors)
  - Budgeting (3 vendors)
- **Integrated Clinical Information System**
  - Ambulatory EMR (Small practice) (18 vendors)
  - EMPI (5 vendors)
  - Ambulatory Specialty (4 vendors)
  - PACS (31 vendors)
  - Anesthesia (1 vendor)
  - Other medical Devices
- **Other systems**
  - Patient Monitoring System (1 vendor)
  - Laboratory Blood Bank (9 vendors)
  - CT
  - Ultrasound
  - Ventilators
  - Fetal monitors

**Key features**
- Core Measures
- Rapid Response
- Throughput Tracking
- PHR integration
- Ambulatory Inpatient
- Care Quality Analysis
- IH Triggers
- Quality Scorecard
- Infection Tracking
- Inpatient Throughput
- Charge & Payment Analysis
- Care Quality Analysis
- Compliance Officer
- Finance Manager
- CMO
- ICU Nurse
- Researcher

**Vendors**
- Lab Anatomic Pathology (6 vendors)
- Anesthesia (1 vendor)
- Ventilators
- PACS (31 vendors)
- CT
- Ultrasound
- Fetal monitors
- EMPI (5 vendors)
- Dictation (4 vendors)
- Laboratory Blood Bank (9 vendors)
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- Ambulatory EMR (Small practice) (18 vendors)
- Patient Monitoring System (1 vendor)
- Budgeting (3 vendors)
- Other medical Devices
What are examples of Amalga workflow components?
Health Solutions Group Customer Community Portal

The Health Solutions Group Customer Community Portal is a great way for customers to stay connected with one another as well as the Microsoft team. Discover how other organizations are using Microsoft Amalga Unified Intelligence System, share best practices and identify solutions to outstanding questions. This online destination is also an area for Microsoft to share information intended for existing customers including product updates, training content, documentation, customer webcasts and details for upcoming events. At the same time, it is also a vehicle for customers to participate in topical discussion forums, share product suggestions, exchange extensions and establish professional connections.

Benefits to joining the Customer Community Portal

There are many benefits for customers to get engaged with the community and participate in this online forum. These include:
- Peer to Peer Networking - Find out how other organizations are using Amalga with HealthVault and connect with professionals across the customer community.
- Learn about Product News, Announcements, Updates and share your own.
- Learn about customer use cases that can benefit your organization.
- Interact with members of the product technical team.
- Find information for upcoming events and webcasts exclusive to the customer community.
- Find out how other Amalga customers are addressing their issues and challenges.

Thank you for your interest in the Community Portal. For more information about the Health Solutions Group Customer Community Portal, please contact your Customer Relationship Manager or Executive.

Amalga helps hospital keep swine flu in check

El Camino Hospital in California built a custom tool on top of Microsoft’s e-health system to track patients

Elizabeth Montalbano (IDG News Service) 09 June, 2009 04:54

Tags: swine flu, e-health
Faculty Summit 2009:
Get a Preview, Check Back for News Updates

Making the Shortest Path Even Quicker
Finding the shortest path between two points in a network is a classic computing problem. Now the popularity of online maps and portable devices challenges researchers to find even more efficient ways of solving the shortest-path problem. Read more...
Discharge Instructions

4/5 Confident of Comprehension

1/5 Actual Comprehension
Patients never hear about 1 out of every 14 abnormal tests
Yesterday, I recorded one of my House Calls audio-casts with the staff at ACH. That program will be posted on my House Calls site on Microsoft.com within the next few days. In the meantime, I just couldn’t wait to tell you about this. Although the solution has just finished a limited pilot, the decision has already been made to roll it out hospital-wide. One of the highlights of my audio-cast was interviewing a 16 year-old young man who is a frequent patient at ACH. To hear his excitement about using the new bedside entertainment and education system at ACH was reward in itself. He said the system is totally awesome in helping him stay in touch with school, friends and family during extended hospital stays. His doctor has used the bedside monitor to review test results with him. And the TV, movies and Xbox games are way cool!
Maintain Sterile Environments
Gesture Based Interface Control
Working with Leaders
Case Two

Title: Instructions concerning a gaping wound in his head, penetrating to the bone.

Examination: If thou examinest a man having a gaping wound in his head, penetrating to the bone, thou shouldst lay thy hand upon it and thou shouldst palpate his wound. If thou findest his skull uninjured, not having a perforation in it...

Diagnosis: Thou shouldst say regarding him: "One having a gaping wound in his head. An ailment which I will treat."

Treatment: Thou shouldst bind fresh meat upon it the first day; thou shouldst apply for him two strips of linen, and treat afterward with grease, honey, and lint every day until he recovers.

Gloss: As for: "Two strips of linen," it means two bands of linen which one applies upon the two lips of the gaping wound in order to cause that one join to the other.

Case Three

Title: Instructions concerning a gaping wound in his head, penetrating to the bone and perforating his skull.

Examination: If thou examinest a man having a gaping wound in his head, penetrating to the bone, and perforating his skull; thou shouldst palpate his wound; shouldst thou find him unable to look at his two shoulders and his breast, and suffering with stiffness in his neck...

Diagnosis: Thou shouldst say regarding him: "One having a gaping wound in his head, penetrating to the bone, and perforating his skull, while he suffers with stiffness in his neck. An ailment which I will treat."

Treatment: Now after thou has stitched it, thou shouldst lay fresh meat upon his wound the first day. Thou shouldst not bind it. Moor him at his mooring stakes until the period of his injury passes by. Thou shouldst treat it afterward with grease, honey, and lint every day, until he recovers...

Gloss: As for: "Moor him at his mooring stakes," it means putting him on his customary diet, without administering to him a prescription.

Case Four

Title: Instructions concerning a gaping wound in his head, penetrating to the bone, (and) splitting his skull.

Examination: If thou examinest a man having a gaping wound in his head, penetrating to the bone, and splitting his skull, thou shouldst palpate his wound. Shouldst thou find something disturbing therein under thy fingers, and he shudders exceedingly, while the swelling which is over it protrudes, he discharges blood from both his nostrils and from both his ears, he suffers with stiffness in his neck, so that he is unable to look at his two shoulders and his breast...

Diagnosis: Thou shouldst say regarding him: "One having a gaping wound in his head, penetrating to the bone, and splitting his skull; while he discharges blood from both his nostrils and from both his ears, and he suffers with stiffness in his neck. An ailment with which I will contend."

Treatment: Now when thou findest that the skull of that man is split, thou shouldst not bind him, but moor him at his mooring stakes until the period of his injury passes by. His treatment is sitting. Make for him two supports of brick, until thou knowest he has reached a decisive point. Thou shouldst apply grease to his head, and soften his neck therewith and both his shoulders. Thou shouldst do likewise for every man whom thou findest having a split skull...

Gloss: As for: "Until thou knowest he has reached a decisive point," it means (until thou knowest whether he will die or he will live); for he is a case of "an ailment with which I will contend."
8%
Trillion Dollar Industry run on paper

one trillion
Winning Scorecard
Hospitals in the Veterans Affairs system outpace those in the private sector by many measures

**QUALITY of Care**
The latest Rand Corp. study found that VA patients, on average, received about two-thirds of the care recommended by national standards, compared with just half for patients at a sample of the nation's other hospitals. Here's the breakdown:

<table>
<thead>
<tr>
<th>Indicator</th>
<th>VA Score</th>
<th>National Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>67%</td>
<td>51%</td>
</tr>
<tr>
<td>Chronic care</td>
<td>72%</td>
<td>59%</td>
</tr>
<tr>
<td>Lung disease</td>
<td>69%</td>
<td>59%</td>
</tr>
<tr>
<td>Heart disease</td>
<td>73%</td>
<td>70%</td>
</tr>
<tr>
<td>Depression</td>
<td>80%</td>
<td>62%</td>
</tr>
<tr>
<td>Diabetes</td>
<td>70%</td>
<td>47%</td>
</tr>
<tr>
<td>Hypertension</td>
<td>78%</td>
<td>65%</td>
</tr>
<tr>
<td>High cholesterol</td>
<td>64%</td>
<td>53%</td>
</tr>
<tr>
<td>Osteoarthritis</td>
<td>65%</td>
<td>57%</td>
</tr>
<tr>
<td>Preventive care</td>
<td>64%</td>
<td>44%</td>
</tr>
<tr>
<td>Acute care</td>
<td>53%</td>
<td>55%</td>
</tr>
<tr>
<td>Screening</td>
<td>68%</td>
<td>46%</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>73%</td>
<td>61%</td>
</tr>
<tr>
<td>Treatment</td>
<td>56%</td>
<td>41%</td>
</tr>
<tr>
<td>Follow-up</td>
<td>73%</td>
<td>58%</td>
</tr>
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*VA: Veterans Affairs, **National Sample: Average of other hospitals.

**Patient SATISFACTION**
For the sixth year in a row, veterans in 2005 were happier than other patients with their health care.

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<tr>
<th>Indicator</th>
<th>VA</th>
<th>Private Sector</th>
</tr>
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<tbody>
<tr>
<td>Inpatient</td>
<td>83*</td>
<td>73</td>
</tr>
<tr>
<td>Outpatient</td>
<td>80</td>
<td>75</td>
</tr>
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</table>

*Out of 100. **American Customer Satisfaction Index

**TECHNOLOGY Use**
The VA has the most advanced electronic-records system in the U.S.

<table>
<thead>
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<th>Indicator</th>
<th>Percentage</th>
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<tr>
<td>VA</td>
<td>94%</td>
</tr>
<tr>
<td>Academic medical centers</td>
<td>30%</td>
</tr>
<tr>
<td>Nationwide</td>
<td>8%</td>
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*Data: Commonwealth Foundation

**Cost EFFICIENCY**

![Graph showing cost efficiency over time](image)

Data: US Health & Human Services, Bureau of Labor Statistics
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50%

COST EFFICIENCY
Ten-year cumulative percent change in costs
- Average Medicare Payments Per Enrollee
- Medical Cost Index
- Variance Per Patient

*VA data from patients; **200 hospitals.

Data: Rand Corp.; Agency for Healthcare Research & Quality

Ten-year cumulative percent change in costs.
The Traditional Healthcare Universe
“Copernican Shift” in Healthcare
Application & Device Companies
Signed and Live as of 10/29/08

- 40 live applications
- 50 connected devices
- 90 signed partners
- 12,000 SDK downloads
TrialX Facts

- 14,000+ ongoing clinical trials approved by the US FDA
- 8000+ clinical trial investigators
- 3000+ and counting participants matched to clinical trials

For Participants

Step 1: Find a matching clinical trial

Step 2: Contact the trial investigators in your area

Step 3: Get alerts on new matching trials

Get Matching Trials using your Personal Health Record

Microsoft HealthVault is the way to collect, store and share information online. Learn More

TrialX is a Google Health integrated partner. Start an account with Google Health to securely manage your personal health information online. Link up with TrialX to get personalized matching clinical trials.
Advanced Drug Safety
Check and Resolve Drug Interactions and Combined Side Effect Risks

Survey My List of Drugs for Safety

Try it now! It's Free. No login required.

Advanced Drug Safety Survey
4 steps to personalize a patient's regimen for safety

1. Input the patient's symptoms and drugs directly or via their Health Record
2. Identify symptoms that may be side effects of the patient's medications
3. Diagnose which drugs pose the highest risk of the patient's presenting side effects
4. Resolve side effects by modifying the medications to minimize the patient's risks

Modify enables "what-if" analysis, like using a spreadsheet, to simulate and evaluate the impact of changes to the medications.
Consumer Side Clinical Decision Support

This randomized, prospective study to demonstrate the value of our CareEngine clinical decision support technology was conducted by ActiveHealth Management. The study population consisted of 39,462 members of a midwestern managed care plan age 12-64 with at least 1 medical claim in the prior year. It was published as a peer-reviewed article in *The American Journal of Managed Care*.

**Across the study population:**

- 46 potentially serious medical errors identified per 1,000 people – nearly 1 for every 20 members.
- 8.4% fewer hospitalizations.

Thousands of clinical rules – “care considerations”

CareEngine™ scans claims data, prescriptions

Recommends stopping, starting treatments, tests, procedures.

Phone, fax, letter to clinicians.
Welcome

Welcome to the Mayo Clinic Health Manager, a free tool that enables you to easily manage your family’s health online.

You’ll get interactive, personal guidance based on health information from Mayo Clinic experts. Plus, you can easily access and organize your family’s health information all in one place.
WHAT AFFECTS YOUR HEART HEALTH?

- Do you have high blood pressure or a family history of high blood pressure?
- Are you physically active?
- Do you know what your cholesterol levels are?
- Do you have a family history of high cholesterol?
- Do you have diabetes or have a family history of diabetes?
- Are you overweight?
- What medications are you taking?

Sign in to use our trackers to help reduce your risk of cardiovascular disease.

Connect Your Devices

You can enter your information here in Heart360™, or directly from a device, such as a blood pressure monitor, that you can connect to your PC.
Blood Glucose
Blood Pressure
Peak Flow/FEV1
Pedometer/Steps
Weight/BMI
Well-Being
My Dashboard

Today

- **1200 calories** remaining in food budget.
- **3834 steps** taken.
- **1.7 miles** traveled.

**986 calories burned**

**0 calories eaten**

- **45% of goal at 2100**
- **30% of goal at 10000**
- **35% of goal at 5 miles**

**My stats**

- **Your weight is 149 lbs. and BMI is 26.9**
- **3147 calories burned on Sept 2, 2009**
- **12,987 steps and 4.9 miles on Sept 2, 2009**

**Updates from friends**

- **Joe @ 3:10pm on Sept 7:** Waiting for 30 min.
- **Sarah @ 11:10am on Sept 7:** Waiting for 43 min.
- **Jack @ 2:40am on Sept 4:** Running for 30 min.

**This is your activity breakdown over the day.**

For the day, excluding sleep, you were:

- **Sedentary:** for 30 min.
- **Lightly-active:** from 0 min.
- **Moderately-active:** from 0 min.
- **Very active:** from 0 min.

**Calories burned every 10 minutes**

Your sleep pattern looked like this:

- You fell asleep at 12:00am and woke up for 8 hrs 2 min.
- You took 23 minutes to fall asleep and woke up 26 times in your sleep.
- This means you were actually asleep for 7 hrs 42 min.
Cue is a simple waterproof device that’s designed to hang in the shower and remind women to perform a personal breast exam seven days after a period, a time when the tissue is least tender and identifying lumpy spots is easier to perform.
Discover the science of a good night’s sleep
1 billion PCs
3 billion cell phones
Embedded Personal Health Technologies

Clinical trials begin this year on this glucose detecting microchip, a device that has shown positive results when studied on animals.
"There is a large area outside of the transparent part of the eye that we can use for placing instrumentation," Parviz said. Future improvements will add wireless communication to and from the lens. The researchers hope to power the whole system using a combination of radio-frequency power and solar cells placed on the lens, Parviz said.

The prototype device contains an electric circuit as well as red light-emitting diodes for a display, though it does not yet light up.

The UW engineers used microscopic scale manufacturing techniques to create a flexible, biologically safe contact lens with imprinted electronic circuits and lights.
CPU Transistor Counts 1971-2008 & Moore’s Law

Curve shows ‘Moore’s Law’: transistor count doubling every two years
2030

$1,000 for one thousand
2050

$1,000 for seven billion
Stethoscope 2.0
Microsoft Health Vision

To Improve Health Around The World Through Software Innovation
Healthcare of the Future