Presentation to:
Strata Health Solutions – A Dialogue For Patient Flow Optimization
Toronto, November 15, 2006

Presented by: Dr. Ken Moselle
Mental Health & Addictions Lead – VIHA/Infoway Bridges Project
1. High-level description of project
2. Context - Vancouver Island Health Authority
3. Business Case, Scope & Objectives
4. Decision support functionality
5. What’s the Plan?
6. Benefits & Evaluation
Section 1: High-level description of project
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What is it?

- Joint initiative, amongst VIHA Mental Health and Addiction Services (MHAS), VIHA IM/IT and Canada Health Infoway
- Infoway Innovation & Adoption program – uptake is key
- A series of tools that will be implemented across all MHAS program areas and throughout the Island.
- An end-to-end information solution for a full range of information stakeholders within MHAS and the larger organizational context.
- Solution requires a comprehensive set of tools which integrate:
  - Hybrid client documentation tools (standards-based & text); and client summary reports
  - Decision support tool which matches client needs with available services
  - Reports for coordinators/clinical directors/system planners, executives e.g.,
    - Clinical profiles of clients accessing services (clinical/functional/risk status; service requirements); alignment of services with population priorities
    - Service delivery process & alignment with best practice
    - Demand estimates; service system capacity; service gaps
What are we going to build?

Target Populations

‘Mental Health’ Clients
Addictions Clients
Concurrently-Disordered Clients

Network of Hospital and Community-Based Services

- Acute Care
- Crisis/Emergency Response
- Residential/Tertiary Care
- Case Management
- Ambulatory ‘Mental Health’
- Addictions Services
- Psychogeriatric Services

Bridges Project Deliverables

Clinical Documentation & Reports (Cerner)
- Mental status
- Substance use profile
- Risk profile
- Client needs
- Client summary reports

Access & Referral Tool (Pathways)
- Real-time service inventory
- Matching client needs with services
- Optimizing resource utilization

Data - service demand; outcomes

Analytical Reports
- Supplied by Orca data repository

Data - service system capacity
Section 2: Context – Vancouver Island Health Authority (VIHA)
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VIHA Service Organization

Five Service Clusters

- **High Intensity and Rehabilitation Services**
- **Pharmacy, Diagnostic and Surgical Services**
- **Medicine/Chronic Disease Management/Primary Health Care**
- **Population and Family Health**
- **Continuing Health Services**
  - Home & Community Care
  - Seniors
  - Mental Health & Addiction Services
    - Acute care - adults & psychogeriatrics
    - Hospital & community-based crisis/emergency response
    - Case management
    - Residential care (including tertiary adult & geriatric)
    - Ambulatory services - 'mental health', 'addictions'

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Project Background

- Amalgamation of health regions into VIHA; Cerner initiative (2001)
- Needs-Based Service Delivery Model Initiative (2002)
- Research partnership interRAI (2003 - 2005)
  - interRAI-CMH development; home support project
  - interRAI ESP (Emergency Screener for Psychiatry) – deployed electronically in Psychiatric Emergency Service
- Client Profile (CP), Community-Access Needs Assessment Tool (CANAT) (2005)
- Pathways implementation in VIHA Home & Community Care (2005)
- Canada Health Infoway Innovation & Adoption Program (April, 2006)
Section 3: Business Case, Scope & Objectives
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What is the Business Case??

- The Broken Client Record - impact on delivery of care
- The 'client-centred electronic health record' - documentation strategy optimized around professions/billings and local service units *vs* documentation strategy optimized around characteristics of sub-populations (multiply concurrently disordered) and patterns of service utilization (rapid, difficult-to-manage moves through network of services)

- Organizational standards re: records integrity and information accessibility: integrated service → integrated information
- Various coroner's/QI recommendations regarding information access
- Streamline documentation (particularly for non-psychiatrists)
- EHR is coming - need to align with Infoway blueprint for the pan-Canadian EHR; VIHA IM/IT strategic directions
- Flying blind - information for clinical leads/coordinators/
- Planning blind - information for evaluators and system planners
- Flexible response to system challenges: system governed by feedback to clinicians at the point of care (dynamically regulated) vs system governed by performance targets
1\textsuperscript{st}, 2\textsuperscript{nd}, 3\textsuperscript{rd} - Order Stakeholders

Stakeholders
- Clients
  - Clinicians (Primary Care Providers, Secondary Care/Specialists)
    - Front-line leaders; service managers
- Directors (Services, Sectors)
  - Senior Executive; Ministries
- Planners, Researchers, Health Information Systems Designers
- Information Management/Information Technology Departments
- EHR Strategy - Health Authority, Provincial, Pan-Canadian; Infoway Blueprint

First-Order Applications of Information
- Use
  - Individual client-level information to support existing point-of-care service delivery processes
  - Supply pertinent clinical information to network of providers
  - Supply information for 2\textsuperscript{nd} and 3\textsuperscript{rd} order information stakeholders
- Goals
  - Effectiveness (good outcomes)
  - Best Practice/Quality (e.g. Safety, Appropriateness) at the client level
  - Safeguard Privacy of Information

Second-Order Applications of Information
- Use
  - Aggregate data from program to monitor program operation
  - Align operation with program mandate within the network of care
  - Supply information for 3\textsuperscript{rd} order stakeholders; feedback to 1\textsuperscript{st} order stakeholders
- Goals
  - Effectiveness (outcomes)
  - Efficiency (evaluate utilization against outcomes)
  - Align with Service System Priorities (are the right target sub-populations being seen?)
  - Equitable access to quality service

Third-Order Applications of Information
- Use
  - Complex service system models to set service-level benchmarks for programs
  - Validate benchmarks (and benchmarking methodology) & performance indicators against need and outcome data
  - Population-based planning
  - Cost-benefit analysis of services
  - Inform strategic planning in light of current and projected system pressures
  - Supply information to public; feedback to 1\textsuperscript{st} and 2\textsuperscript{nd} order stakeholders
- Goals
  - Macro system optimized conjointly on the basis of efficiency and effectiveness
  - A system that learns from outcome and system capacity data and uses that information to guide evolution of the system.

Infoway Project Stakeholders, Information Scope, and Deliverables v 1.3 (May 15, 2006)
Objective - Build and Deploy an

- End-to-End information solution to meet the requirements of 1st, 2nd, 3rd – order information users
- Re-assemble the client record & enhance quality of care:
  - Better information at the point of service, and associated improvements in quality of service and management of risk at a client level
  - More appropriate service
    - Right client in the right service
    - Access/referral based on a full picture of ‘what’s out there’
  - More effective service system redesign/enhancement through better ‘flow’ of information from the point of service to 2nd and 3rd order information users
- More efficient use of resources
- Business intelligence solution for Mental Health & Addictions Services
  - Input – address critical gaps on the data source side through better capture of clinician knowledge
  - Data management - industrial-grade (vs ad hoc) flow of information into data repository
  - Output -- more robust analytical information coming out of the system
    - Explicit modeling of end-to-end information uses in requirements phase of project
    - Project resourcing to implement end-to-end business intelligence solution
    - Local data to characterize target sub-populations and estimate population reach; estimate demand and set service system-level benchmarks; assess outcomes; evaluate effectiveness against costs; and quantify service system efficiency
Scope

- Clinical documentation tools that embody best practice around assessment
- Decision support tools in an EHR (Cerner) environment that best-practice system response for sub-populations
- Integration of Ministry of Health Minimum Reporting Requirements, including HoNOS
- Data standard to support referral from GP’s into MHAS
- Clinical reports to meet requirements for MHAS providers and GP’s
- Analytical reports to meet requirements of 1st, 2nd and 3rd order information users
- Deploy in all VIHA/MHAS and key contracted MHAS services in urban & rural/remote areas
- Access/control model built into EHR to manage privacy/security concerns; Privacy Impact Assessment
- Benefits evaluation of project -- generic evaluation framework for all projects & project specific evaluation framework to measure outcomes of the Bridges project
- Document a ‘Design & Development Toolkit’ to support adaptation/development in other jurisdictions or service sectors (Infoway)
Additional deliverables

- Compendium of use-cases – to describe the target sub-populations for MHAS
- Explicit statement of inclusion/exclusion criteria for program – to support access/referral and reporting
- Clinical outcome measurement scheme
- MHAS balanced scorecard built on a foundation of clinician knowledge of client clinical/functional status, risk, need and outcome
- Clinical practice enhancements
  - Promote explicit statement of competency standards for MHAS clinicians
  - Enhanced assessment & associated documentation skills on the part of clinicians
  - Standards around clinical documentation for clinicians – what, when
Section 4: Decision Support Functionality
Section 4: Decision Support Functionality
How will the matching work in Pathways?

Service Inventory
(up-to-date inventory of MHAS services)

Client Needs
(standardized clinical documentation tool in EHR-Cerner)

Matching Logic
(Pathways algorithm based on use cases)

Matching optimized around needs of groups of clients
Care paths reflecting best practice system response For sub-populations

Background Decision-Support Functionality
Foreground Decision-Support Functionality

service provider inputs information about an available service/bed

clinician assesses that client needs a service

service inventory updated

possible matches provided and clinician chooses most appropriate service

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What is the significance of Pathways to

A way to manage service access in a system under pressure

♦ A way of operationalizing best practice clinical pathways for target sub-populations
  ➢ By putting a real-time map of services into the hands of clinicians
  ➢ Clinical pathways - by setting a ‘line’ for clients through a network of services beset by challenges around access

♦ A way of optimizing access to scarce services for groups of clients – by operationalizing a needs-based service delivery model.
What is the significance of Pathways to Population-Based Planning & Service Delivery

- A way of specifying and operationalizing the boundaries around the target population for Mental Health & Addictions Services; a way of aligning services with population priorities
- A way of operationalizing the inclusion/exclusion criteria for individual programs
What is the significance of Pathways to Information Management

- A means to pull a minimum dataset from a maximum dataset in a way that reflects who the client is and how that client is moving through the system
- A way to manage the flow of clinical information into the contract service sector
- A way to operationalize an information access/control model that addresses a difficult information privacy challenge – protocols that navigate somewhere in between all information and no information to clinicians
- A driver for development of clinical standards and policy
- Business intelligence – a source of mission-critical information around service system capacity
Section 5: What's the plan?
Section 5: What’s the plan?
What are we building?

- **Documentation tools**
  - *Maximum dataset*
    - Core Minimum Dataset (a true MDS)
    - Add-ons to meet needs of specific services
  - Logic that pulls context-appropriate MDS from the ‘maximum dataset’

- **Decision-support matching logic**

- **Evaluation framework**

- **Clinical reports** - assessment reports; discharge summary reports; referral reports; electronic mental health & addictions summary

- **Future-state balanced scorecard**

- **Data extract tools**

- **Analytical reports**

- **Privacy Impact Assessment and associated Access Control Model**

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EHR-Based Information Architecture for Mental Health & Addictions Services: What Needs to Be Developed or Refined?

Clinical Reports
- Report of Clinical Encounter
- Discharge Summary
- Electronic Mental Health & Addictions Summary

Electronic Health Record Cerner
- Documentation Tools — CP, CANAT
- MoH Minimum Reporting Req’s for MHAS
- Min/Max Dataset - Logic

Clinician at the Point of Service

Decision Support System Pathways
- Service Inventory & Functional Description
- Service inclusion/exclusion criteria
- Client - Service Matching Logic
- Data Standard for Referring GP's

Referral Report

Data Repository Orca

Analytical Reports
- Utilization X Case Mix Group — risk adjusted
- Case Mix Group X Service Capacity
- Case Mix Group X Outcome X Resource Utilization

Access-Control Model (Privacy, Security)

Clinicians

Clinical Directors

Evaluators, Planners

Managers, Sv's Coordinators
Clinical Documentation Tools and Reports: design, build, test, train and launch
Access and Referral Decision Support Tool (Pathways): includes service inventory, decision support logic and interfaces with other systems - design, build, test, train and launch
Evaluation and Documentation of Tool Kit

Project Timelines

APR 06 OCT 06 APR 07 AUG 07 MAR 08

Initiation

Business Requirements
workshop with user groups

Technical Requirements

Pilots

Clinical Documentation Tools and Reports: design, build, test, train and launch

Access and Referral Decision Support Tool (Pathways): includes service inventory, decision support logic and interfaces with other systems - design, build, test, train and launch

Implementation Up-Island

Evaluation and Documentation of Tool Kit

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What are the risks?

**Change Management/Implementation Issues**
- Low uptake by physicians/clinicians due to resistance to change, privacy/security concerns, incomplete EHR solution, capacity of local managers to implement, lack of computer literacy, etc.

**Process Issues**
- Complications in system development due to varying business processes across MHAS services
- Limited ability/capacity/motivation of affiliates to maintain real-time information on service availability

**Technical Issues**
- Possible delay in implementation up-Island due to dependency on Cerner roll-out
- Bridges project’s demands on Cerner, Pathways & data repository may exceed systems’ abilities to meet project business requirements
Section 6: Benefits Evaluation
Section 6: Benefits Evaluation
How will we evaluate?

- **Generic IM/IT Evaluation Framework** - For 'full service' EHR implementations (or more focused implementations)
- Project-specific evaluation created by applying generic framework to Bridges project.
- Dialogue with Infoway to ensure evaluation scope/methodology meets expectations.
- Conduct evaluation

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Generic Benefits Evaluation Framework

Information Objectives and Dependencies

1st Order: Information to meet requirements of clinicians at the point of care

2nd Order: Information to align operation of specific program with priorities and standards

3rd Order: Information to support adaptation of service system to current and projected population pressures

Information Stakeholders

Information Objectives

Information Deliverables

Causal Linkage Model

Outcomes, Benefits

Measures

How the Information Deliverables Produce the Outcomes & Benefits

EHR Tools, e.g. Clinical Documentation Tools

Processes Enabled Through Use of the Tools

Benefits/Outcomes Arising from the Processes
## Evaluation Template for a Single Objective

### Evaluation Plan for Objective: [state objective]

<table>
<thead>
<tr>
<th>Primary Stakeholder or Beneficiary</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Objective</td>
<td></td>
</tr>
<tr>
<td>Determining Factors [causal linkage analysis]</td>
<td></td>
</tr>
<tr>
<td>Factor</td>
<td>Measurable</td>
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<tr>
<td></td>
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</tbody>
</table>

### Deliverables

### Outcomes

### Measure(s)
- Outcome:
- Determinants:

### Baseline Data

### Analytical Strategies

### Timeframes
- To get initial measurement / Time to achieve initial influence / Time to measure significant change / Time to estimate impact of project solution on outcome

### Targets

### Roles
- Who collects / Who analyzes / Who reports

### Where

### Evaluation Results for Objective

<table>
<thead>
<tr>
<th>Results</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Discussion</td>
<td></td>
</tr>
<tr>
<td>Caveats</td>
<td></td>
</tr>
<tr>
<td>Recommendations; Actions</td>
<td></td>
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</tbody>
</table>
Contact Information

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Section 7: Tool Development
Section 7: Tool Development
Design parameters for tools:

- What would be a good tool vs what are the requirements for a tool?
- The “validated tool” trap – validated for what?
- A tool to capture definitive clinical knowledge vs tool to trigger further assessment
- Documentation tools, not assessment tools
- Hybrid structure - no room for negotiation!
  - Standards-based data elements to summarize clinical judgments around clinical status, functional status, risk, and need
  - Text to capture the variable content that sits behind those judgments
- “Carving nature at its joints” – items must mirror thinking of clinicians
- Mitigating factors – “I made decision X because of Y” vs “I made decision X, despite Y, because of Z”.
- Transparency – must be able to ‘see’ through items to an underlying clear picture of client status, risk, and care requirements.
- Contextually relevant to encourage uptake by clinicians
- End-to-End solution
  - a compromise position to meet the full range of information stakeholders
  - one stakeholder cannot take the requirements of another group of stakeholders off the table
Design parameters for tools:

- Law of Tangible Benefit
- Law of the Business Process – tools will always lose in a battle with the business process
- Efficiency
- Low technology demands
VIHA interRAI pilots

- Item coverage - outstanding
- Length – incompatible with service delivery processes; interRAI-MH 2.0, interRAI-CMH: maximum datasets, not minimum datasets
- Incomplete documentation solution – after CAPS have triggered and you go back and do more assessment, where does that new information get documented? Tools become even longer when you build capacity to capture that new, clinically definitive information
- Scaling of responses – not the way clinicians think → difficult to gauge severity from frequency of behaviours
- Missing items:
  - Includes the “I did X because of Y” items, but is missing the “I did X despite Y because of Z” items
- Risk assessment - incomplete
- Analytical/measurement issues – CAPS are inconclusive – they are indicators that a problem might be present
### Distinguishing Features of Networks of Care

<table>
<thead>
<tr>
<th>Characteristics of Target Populations</th>
<th>Home Supported Clients, Assisted Living, Complex Care</th>
<th>Mental Health &amp; Addictions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical trajectory of clients</td>
<td>Gradual deterioration, punctuated by infrequent acute events</td>
<td>Unstable, frequent acute exacerbations</td>
</tr>
<tr>
<td>Treatment compliance (e.g., medication compliance)</td>
<td>Moderate – high</td>
<td>Highly variable</td>
</tr>
<tr>
<td>Behaviour likely to produce abrupt change in status/need</td>
<td>Low – moderate</td>
<td>Moderate- high</td>
</tr>
<tr>
<td>Predictability of need to relocate client within continuum</td>
<td>Moderate – high</td>
<td>Low - moderate</td>
</tr>
</tbody>
</table>

### Dynamics

<table>
<thead>
<tr>
<th></th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency of moves</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positioning within the service network from one day to the next</td>
<td>Predictable</td>
<td>Unpredictable</td>
</tr>
<tr>
<td>Array of providers engaged with client from one day to the next</td>
<td>Consistent, stable</td>
<td>Variable</td>
</tr>
<tr>
<td>Range of services accessed when capacity of current settings becomes problematic</td>
<td>Narrow (e.g., facility to ER to acute care back to facility)</td>
<td>Broad</td>
</tr>
</tbody>
</table>

### Service delivery processes within the network

<table>
<thead>
<tr>
<th>Service delivery processes across key nodes in the network</th>
<th>Consistent</th>
<th>Highly variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity to manage a fixed information agenda within the context of any given clinical service environment within the network</td>
<td>High</td>
<td>Low</td>
</tr>
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Derivation of Minimum Dataset from

Mental Health & Addiction Services - Target Population

Sub-Pop Specific Supplement
Sub-Pop Specific Supplement
Minimum Dataset
Sub-Pop Specific Supplement
Sub-Pop Specific Supplement

Maximum Dataset

Addictions
'Mental Health' Outpatient
Case Management
Emergency Response
Acute Care
Residential/Tertiary
Etc.

Service Delivery Processes/Care Paths

Clients
Clinicians
Clinical Leads
Service Coordinators
Evaluators
Planners
Senior Executive

Stakeholder Information Requirements

Program Cluster-Specific Minimum Dataset, e.g., Acute Care & Psychiatric Emergency Services
Program Cluster-Specific Minimum Dataset, e.g., Case Management & Housing/Residential
Program Cluster-Specific Minimum Dataset, e.g., Psychogeriatric Outreach & Psychogeriatric Day Programs
Program Cluster-Specific Minimum Dataset, e.g., Addictions Outpatient & Addictions Outreach

Minimum Dataset
Minimum Dataset
Minimum Dataset
Minimum Dataset
Development Process

- interRAI-Emergency Screener for Psychiatry deployed electronically in Psychiatric Emergency Service (2004/05)
- Client Profile – currently in version 5.1
  - Pilots in 21 locations – full network of services, full geography
  - Pre-production rollouts in a range of services
- Community Access Needs Assessment Tool (CANAT)
  - Based on VIHA/MHAS NAT – manage access to residential care
  - Requirements around medication, personal hygiene, upkeep of residence;
  - Supervision; monitoring
  - Pilots in residential care, tertiary facilities, tertiary step-down (Community Intensive Supportive Living); psychogeriatric acute care