Connect Care
Building a Better Health Record in Alberta Health Services
June 25, 2024
Objective

To provide a high-level overview of what is needed to support the best health record

- Digital Health Strategy
- Connect Care Overview
- Health System Overview
- Clinical Informatics
- Connect Care Clinical Content, Standards, Workflows
- Other Considerations
Digital Health Strategy
The Five Pillars of the AHS Digital Health Strategy

**Albertans First through Digital Engagement**
AHS is putting information and resources at the fingertips of patients, families and caregivers to empower them in being actively involved in their healthcare.

**Build a Digitally Connected Community**
AHS is connecting patients and their care teams through information to standardize and improve care across the system and improve health outcomes for patients.

**Empower our People**
By focusing on specific digital health goals, AHS can ensure our teams are doing the work most critical to improving care for Albertans, are empowered to find innovative solutions and experience a vibrant and inspiring work environment which fosters recruitment and retention.

**Data-Driven Decisions through a Learning Health System**
Understanding our health system through data and analytics will lead AHS to make decisions founded in knowledge, improving both clinical and business outcomes.

**Innovate upon our Integrated Digital Foundation**
AHS is committed to continually building our capacity and resources which support technological innovation, in order to be sustainable, provide the best care for every tax dollar spent and to find new and better ways to provide care to Albertans.

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**Principles:**

- **Sustainability**
  - Solid and regularly renewed technical foundation
  - Steward resources responsibly

- **Minimum number of systems**

- **Most cost-efficient ways to achieve our objectives – tech and process improvement**

- **Standards-based – reduce variation and cost**
  - (data, terminology, clinical content, workflows)
Connect Care
Who will we reach?

Population

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
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<tbody>
<tr>
<td>111,454</td>
<td>AHS</td>
</tr>
<tr>
<td>12,674</td>
<td>Covenant</td>
</tr>
<tr>
<td>9,300</td>
<td>Physicians</td>
</tr>
<tr>
<td>700</td>
<td>Nurse Practitioners</td>
</tr>
<tr>
<td>25,655</td>
<td>Students</td>
</tr>
<tr>
<td>9,810</td>
<td>Carewest / Capital Care / Alberta Precision Labs (APL)</td>
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Beds

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
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<tbody>
<tr>
<td>9,000</td>
<td>Total Hospital Acute and Sub-Acute Care</td>
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<tr>
<td>28,837</td>
<td>Total Continuing Care</td>
</tr>
<tr>
<td>3,077</td>
<td>Total Addiction &amp; Mental Health</td>
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Facilities

Community Ambulatory Care

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<thead>
<tr>
<th>Number</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>6</td>
<td>Urgent Care Centres</td>
</tr>
<tr>
<td>7</td>
<td>Ambulatory Care Centres</td>
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<tr>
<td>139</td>
<td>Public Health Centres</td>
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Addiction and Mental Health

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<th>Description</th>
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<tbody>
<tr>
<td>39</td>
<td>Addiction</td>
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<td>26</td>
<td>Community Mental Health</td>
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<td>5</td>
<td>Standalone Psychiatric</td>
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Acute Care

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<th>Description</th>
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<tbody>
<tr>
<td>106</td>
<td>Total Designated Hospitals</td>
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Cancer Care

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<tr>
<th>Number</th>
<th>Description</th>
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<tbody>
<tr>
<td>17</td>
<td>Cancer Centres</td>
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Community-Based Care

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<th>Number</th>
<th>Description</th>
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<tbody>
<tr>
<td>331</td>
<td>Long-Term Care and Supportive Living</td>
</tr>
<tr>
<td>108</td>
<td>Additional Contracted Care Sites</td>
</tr>
<tr>
<td>20</td>
<td>Community Hospice, Palliative &amp; End-of-Life Care</td>
</tr>
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</table>

Updated November 30, 2023
Practice Areas
Acute Care
Addiction & Mental Health
Ambulatory Care
Analytics, Reporting, Research
Cancer Care
Clinical Financial Management
Clinical Specialties (Cardiac Sciences, Nephrology, Gastroenterology, Critical Care, Women’s Health, Anesthesia, Surgery, Pediatrics, Transplant, Orthopedics, Ophthalmology, Rehabilitation, etc.)
Continuing Care
Delivery Site Management
Emergency Care
Laboratory
Pharmacy
Population Public Health, Infection Control
Primary Health Care (AHS)
Radiology
Self & Family Care

Foundational Technology & Tools
Clinical Engineering
Consolidation
Data Centre Infrastructure
End User Devices
Enterprise Mobility Management Integration
Interfaces
Medical Device Integration
Portals Conversion
Provincial Wifi
Single Sign-On
Supply Management
Technical Interoperability
Telehealth

Clinical Information Systems

Blood Bank
Cardiology
Clinical Education Content
Clinical Trials Management
Dictation / Transcription
Drug Databases
Enterprise Content Management
Enterprise Imaging (Pacs)
Health Records Coding / Abstracting
Radiation Oncology
Registries
Reporting / Analytics

Care at a Distance
Clinical Financials
Clinical (Inpatient / Outpatient)
Clinical Specialties
Community Connect
Government Regulations & Reporting
Interoperability
Managed Care
Mobility
Patient Engagement
Population Health

Clinical Operations & Informatics
Clinical Guidance Repository
Clinical Knowledge & Content Management
Clinical Operations Readiness
Clinical Simulation
Clinical Systems Design
eQuality & eSafety
Medical Informatics
Training
Connect Care Overview
Value of Connect Care

**Albertans**
- Access to their health information
- Better patient experiences
- Better patient information improves health outcomes
- Consistent care across four organizations, no matter where you go in Alberta

**Healthcare Providers**
- Better information about patients, accessible across the four organizations
- Can tailor information and processes to the way they work
- More efficient and safer processes

**Alberta Health Services**
- Clinical best practices
- Access to information
- Improved transitions between departments and sites
- Cost management
- State of the art technology
- More secure information

**Healthcare System**
- Consistent information and care across Alberta’s four health care organizations
- Improved health outcomes for Albertans
- Advanced academic and research efforts

**Total Value**
- Improved quality of care
- Decreased costs
Connect Care: Before and After Implementation

Before Connect Care

Number of users and level of automation
27,000 Users, 3-6 hours at HIMS* level 3
41,000 Users, 1-2 hours at HIMS level 1

Number of devices, in addition to application access
102,000 Computer and other devices
16,500 Citrix sessions at a time

Size of geography & number of sites
10% of AHS sites across Alberta had wireless networking
5,600 Network access points

Standardization
Significant provincial variation in practices and workflows

Training
MediTech basic 2 hours
Sunrise Clinical Manager 2-6 hours

After Connect Care

Level of automation
139,000** Users working at HIMS level 6

Number of devices in addition to application access
150,000 Computer and other devices
40,000 Citrix sessions

Size of geography & number of sites
100% of AHS sites across Alberta have wireless networking
26,000 Network access points

Standardization
5000 Workflows and content decisions to standardize care delivery

Training
Connect Care 16 hours

*Healthcare Information and Management Systems Society
**Includes 10,000 students
Barriers to information sharing

- Inconsistent clinical standards
- Inconsistent technical standards
- Health information legislation
- Clinician practices and preferences
- The number of independent endpoints
- Lack of common registries (patient, provider, location)
- Interprovincial sharing agreements
Health System Overview
Health System Capabilities

### Clinical Services
- **Order Management**
  - Decision/Determine
  - Authorize
  - Communicate
  - Complete
  - Track
- **Result Management**
  - Critical Results
  - Addon Tests
  - Substitutions
  - Verification
  - Distribution
- **Clinical Documentation**
  - Immunization
  - Allergies
  - Conditions
  - Directives
  - Interventions
  - Medications
  - History
  - Reports
  - Biometrics
- **Medication Management**
  - Reconciliation
  - Prescribe
  - Verify
  - Validate
  - Dispense
  - Controlled Substances
  - Work List
  - Med Safety
- **Clinical Decision Support**
  - Point of Care
  - Clinical Guidance
  - Health Maintenance
  - Chronic Diseases
  - Work List
  - Med Safety
- **Personal Health Management**
  - Point of Care
  - Clinical Guidance
  - Health Maintenance
  - Chronic Diseases
  - Work List
  - Med Safety
- **Case Management**
  - Assessment
  - Planning
  - Activities
  - Evaluation

### Clinical Operations
- **Identity Management**
  - Identity and Access
    - Create
    - Update
    - Delete
    - Modify
    - Authenticate
    - Delegate
  - Provider Identity
    - Planning
    - Movement
    - Transition
    - Length of Stay
    - Housekeeping
    - Staffing
  - Encounter Management
    - Registration
    - Admission
    - Discharge
    - Transfer
    - Encounter
    - Life Cycle Mgmt.
    - Patient Communications
  - Referral Management
    - Letters
    - Coordination
    - Triage
    - Transfer
    - OR Booking
    - OR Booking
  - Health Service Scheduling
    - Templates
    - Schedules
    - Self-Schedule
    - Provider Schedule
    - OR Booking
    - Communication
    - Front Desk
    - Appointments
  - Health Records Management
    - Coding
    - Abstracting
    - Document Management
    - Legal Record of Care
    - Release of Information
    - Data Collection
  - Master Data Management
    - Propagation
    - Collection
    - Aggregation
    - Mapping
    - Consolidation
    - Transformation
    - Reference Data
Capability Planning Framework

What are the key things health services need the ability to provide services?

What are our objectives and how will we know we are being successful?

How do health services organize services and capabilities to create patient value?

Workflow, business, project, and system models to support effective and concise communication driven by data.
Epic Integration

Interfaces

- 119 non Epic systems
- 236 interfaces in production today

Daily Volumes

Results

- Total: 5,445,097 (average)
- Vitals: 2,381,173
- ADT: 258,000 messages
- Lab Results: 400,000 messages
- Lab Orders: 290,427
- Med Orders: 203,861

Other APIs

- Dragon Medical: 17,000,000
- Imprivata: 685,000
Clinical Informatics
Delivering Best Outcomes for Patients and Clinicians
Clinical Informatics Profile

CMIO: Chief Medical Information Officer and team:
- Oversees prescribers, including physicians, nurse practitioners, physician assistants, clinical assistants, PhD scientists, dentists, medical learners, residents, fellows, and nurse practitioner students
- Supports over 13,000 prescribers across the province
- Over 3,000 medical learners and 600 new staff trained every year

COIO: Clinical Operations Informatics Officer and team:
- Oversees nurses, allied health professionals, clerical, management (e.g. PT, OT, social work, SLP, dietitians, healthcare aides)
- Connect Care by end of launch nine will have approximately 30,698 RNs, 905 RPNs, 9,132 LPNs, 7,740 HCAs, 505 NPs, 7000 allied health professionals
- Offer training for ~ ~ 10000 students from 247 post secondary institutions every year
Who are Clinical Informaticians?

• Clinical Informaticians are clinically experienced staff who deeply understand healthcare processes and technology.

• They work directly with clinicians and IT analysts to translate clinical needs into digital workflows and system content that facilitates safe, efficient and evidence-informed care, resulting in the best health outcomes for Albertans.
Clinical Informatics Functions

- **User Experience:** Training, Support, Communications, Best Practice
- **Clinical Content and Workflows:** Documentation, Orders (Sets), Decision Support
- **Clinical Information System Clinical Standards**
  - Safety, Usability and Efficiency Optimization
- **In-System Reporting and Analytics:** Design and Workflow
Emergency Department wait times are long. Clinical Informatics team members engage with clinical staff across specialties to provide ongoing education in system use, analyze workflows, and design improvements, reports, and dashboards that enable better clinical efficiency and tools for staff to track key metrics.

Research identifies a new treatment for pneumonia that saves lives. Clinical Informatics works with clinicians to design and build new standardized treatment orders and decision aids in Connect Care, along with a new workflow that is intuitive and easily adopted by clinicians. Reports are designed to ensure improved patient outcomes are achieved.

New accreditation requirements are issued for preventing pressure ulcers. Clinical Informatics works with Nursing to develop new documentation flowsheets, automated reminders, and management reports to meet the accreditation standard.

**Patients:** Shorter wait times, Better access to information, healthcare team

**Prescribers and Clinicians:** More efficient and informed care processes, better satisfaction

**Organization:** Information to drive quality, safety and continuous improvement
Connect Care Clinical Content, Standards, Workflows
Better Health, Powered by Information

What is & Where are Content / Standards?

- Allergies / Problem List
- PIEM – SOGI standards
- Lab workflows, results management
- MedRec, eMAR
- Orders, Protocols
- Assessments / Progress Notes, etc.
- Standardized data sets for outcomes measurement
- Standardized content across the health system

Better Health, Powered by Information
Goals

- Reduce the burden; eliminate duplication
- Evidence Informed Best Practice
- Adheres to professional and regulatory requirements
- Incorporates decision supports – what an opportunity!!!!
- Standardized documentation vocabulary across all care settings / continuum
- Standardized “Scales, Scores and Tools” across all providers / care settings / continuum
- Standardized “Core” set of standards (used by all) and layer on “Specialty” standards
- Supports AHS’s Collaborative Care program and Patient and Family Centered Care
Core Content – Committees

Connect Care Content & Standards Committee
  - Clinical Documentation Committee
    - Clinical Decision Support Committee
      - Clinical Improvement Support Committee
        - Components Committee
        - Clinical Builder Committee
        - Information Stewardship Committee
      - Predicative Analytics Workgroup
      - Registries Workgroup
  - Allied Health Content Standards Practice Workgroup
  - Physician Content Standards Practice Workgroup
  - Nursing Content Standards Practice Workgroup

Better Health, Powered by Information
NCSPWG / AHCSPWG / PCSPWG

• Nursing Content Standards Practice Workgroup (NCSPWG)
• Allied Health Content Standards Practice Workgroup (AHCSPWG)
• Physicians Content Standards Practice Workgroup (PCSPWG)
• Meetings since 2018 onwards
• Approximately 50+ members in each group
• Many partners – eSafety, Human Factors, IT, Professional Associations, Professional Practice, Clinical Content

• Governance for enterprise content, workflows and standards for the different disciplines
Specialty Content – Area Councils

Addictions and Mental Health
Ambulatory
Anesthesiology
Capital Management
Cancer
Cardiovascular Services
Child Health
Continuing Care & Seniors
Critical Care
Dental Health
Diagnostic Imaging
Emergency Medicine (including EMS)
Financing and Case Costing
Lab / Microbiology / Pathology
Medicine
Neurosciences
Ophthalmology
Pharmacy
Population & Public Health
Primary Care
Rehabilitation
Renal
Surgery
Transplant & Donor Care
Womens Health
Others as required

Better Health, Powered by Information
Clinical Content Standardization

• Paperless! (no more binders on the units or in clinics!)

• Standardized integrated ordering tools, decision supports, documentation and associated workflows

• Documentation spans the continuum of care – primary care, inpatient, ambulatory, continuing care & seniors, homecare, corrections (adult, peds, neonate, geriatric)

• AHS wide policy and procedure where needed (i.e. Clinical Documentation)

• Documentation norms published for the different health professionals
The Spectrum of Algorithmic Intelligence

Robotic Processing Automation
1st step

Rule-Based Logic
Expert-defined and explicitly coded

Predictive Analytics
Statistically derived to predict a pre-defined event

Generative AI (Large Language Models)
Generally trained to generate novel content

Deterministic
Targeted

Probabilistic
More generalized
Create end-to-end experiences, assign leads over each

Patient Experience

- Attract patients
- Provide access
- Streamline arrival
- Inform care pre, post, and during
- Collect money; provide estimates and payment plans

Nursing Experience

- Learn from a peer and mentor
- Document on the go
- Message with care team members
- Patients' complete education; proxies can see clinical info
- Get virtual support

Provider Experience

- Learn from a provider in the same specialty
- Document on the go
- Message with care team members
- Hold some visits virtually
- Know your EHR liaison – for suggestions and support
Successes

- Incorporated Evidence Informed Best Practice into connect care
- Reduced Burden; if anything, we have organized the burden
- Avoided duplication and aligned data collection with workflow
- Less narrative and more data driven – supports outcomes measurement
- Moved clinicians to accept standardized measures & incorporated acceptable variance where needed
- Reinforced patient safety – standardized clinical information at the point of care to make decisions (falls, pressure ulcers, etc.)
- Created standardized data sets to support self reflection of practice and provides management with information for health system planning and evaluation of patient outcomes
Other Considerations
Layers of digital health work – Evolving support model

Continuous Improvement

Sprints

Organizational Priorities

External Priorities

Upgrades, Updates & Patches

System Integrity

Clinical Integrity

Emergency Response

Grow & Transform

Operational Integrity

Emergency Response

Clinical Integrity

System Integrity

Continuous Improvement

Sprints

Continuous Improvement

Sprints

Continuous Improvement

Sprints
Understanding Continuous Improvement & Break Fix

Connect Care Clinical Systems Continuous Improvement – Understanding Key Terms & Definitions

**Break Fix** System failure, system not working as intended or approved build component was missed so requirements are not met. Example: Server failure, user profile issue, vitals not appearing correctly, order not populating the MAR, wrong dosage. Break fix request are critical pieces of work that fall outside the scope of clinical operational continuous improvements.

**Continuous Improvement – Request Types**

**Enhancements** Consists of adding a functionality not currently in place. Increasing value for the user. Example: new flowsheet such as a clinical scale, score and tool (CSST).

**Process Improvement** The proactive task of identifying, analyzing and improving upon existing business processes within an organization for optimization. Example: Phases of care.

**Optimization** Responds to requests from clinical partners for updates to existing functionality, workflow, processes, training. Example: flowsheet – making more efficient and easy for the user.

**Single Intake** The mechanism to capture all work within work streams and processes.

**Prioritization** Governance and decision making directed sequencing of activities aligned to strategic direction

**Prioritization Classification - Critical** Patient Safety Issues, Critical system issues, No functionality, etc.

**High** Patient Care Implications, Functionality Restrictions, etc.

**Medium & Low** Workarounds available, etc.

**Components** Building blocks for decisions, documentation and inquiry content and method by which continuous improvement requests (such as clinical content) are defined, normalized, categorized and how their properties affect things like results routing, referrals and exchange with other systems.
Partnerships: Arch Collaborative
AHS Net EHR Experience Score - 2023

The Net EHR Experience Score (NEES) is derived from the % of negative survey answers, subtracted from the % of positive answers.

The grey graph to the right shows the NEES for all organizations in the Arch database, with AHS’ position highlighted.
## Connect Care Clinical Optimization Priorities

### Data Accessibility
- Improve results delivery to reduce physician burden
- In-system results review to align with Netcare

### Flowsheets and Orders for Nursing / Allied Health
- Streamline document flowsheets and orders to reduce documentation burden
- Introduce productivity tools

### Training and Clinical Support
- Enhance continuing education options to improve clinician efficiency
- Integrate support areas to best serve clinician needs

### Enhancing Clinical Voice in System Governance
- Introduce rounding and improvement sprints to focus on clinical needs
- Introduce a clinical informatics program to enhance efficiency and satisfaction
Downtime

- Health care systems require extremely high availability of health record applications
- Unplanned downtime costs the health system approximately 500K / hour for clinical recovery to backload information
- All downtimes are tightly coordinated with clinical leadership to understand impact to patient care and ability to perform surgeries / clinics etc.
- Any changes to applications, operating systems, infrastructure, networks and integration need to be fully tested by all impacted teams
- Need sophisticated business processes to support unplanned downtime – disaster
Questions

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