An Overview of Alberta's Electronic Health Record Information System

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A. SUMMARY

1. Synopsis

The Alberta Electronic Health Record (Alberta EHR) is the integrated provincial electronic health information network that provides shared access to prescribed health information, by authorized custodians, in a secure environment. The scope of the Alberta EHR is limited to networked health information systems for which Alberta Health is either the Information Manager or custodian.

Alberta Health and Alberta Health Services (AHS) are jointly responsible for many of the e-health systems that comprise the Alberta EHR. This document, "*An Overview of Alberta's Electronic Health Record Information System*", was developed to summarize the Alberta EHR and the primary information systems which comprise it.   For purposes of this document, Alberta EHR is also referred to as the Alberta Electronic Health Record Information System (EHRIS).

Special Note:

This document is intended to be an overview, high level, document which outlines the major components of the EHRIS. Many of the base level feeder systems and repositories are further explained in the Privacy Impact Assessments which have been prepared by either Alberta Health Services or Alberta Health for these major components.

 Many of the details, programs, linkages, infrastructure, technology, and underlying the systems are constantly evolving. It is expected that this document may need to be updated as appropriate.

B. INTRODUCTION

1.   Objectives

One of the main objectives of creating a document like this is to explain, at a high level, the governance structure, programs, mechanisms, and tools currently in place to ensure that all components of the Alberta EHR operate in compliance with the privacy, security and accountability standards of the HIA. This objective first of all requires a clear understanding of the components of the Alberta EHR in its current state and how health information is collected, used and disclosed/transmitted among these components. The result is a comprehensive description of how Alberta EHRIS Privacy Governance operates as an integrated program providing custodians, information managers, patients and health information regulators with a sound basis for evaluating and enhancing privacy governance into the future.

2.   What is the Alberta Electronic Health Record (EHR)?

The Alberta EHR is defined in the Health Information Act (HIA) s. 56.1(a) as *"the integrated electronic health information system established to provide shared access by authorized custodians to prescribed health information in a secure environment."* By sourcing a wide network of health information repositories and tools the Alberta EHR presents a unified and comprehensive electronic health record on individual patients to healthcare providers when they need it at the point of care. It is therefore distinguished from an *"electronic health record information system"* as defined in the *Alberta Electronic Health Record Regulation* (EHR Regulation), s. 1(b), which represents the many individual applications and Electronic Medical Records (EMR) systems that may be in operation and limited to health care clinics or hospital facilities.

Access to the Alberta EHR is typically granted through the Alberta Netcare Portal (ANP) to authorized custodians and their authorized affiliates to view patients' prescribed health information that is housed in various Alberta Health repositories and registries, AHS clinical systems, and community site clinical systems. In some interfaces, such as System to System (S2S), access to the Alberta EHR is a direct connection between the Alberta Health and local systems. Some community pharmacies, for example, have S2S connection to the Pharmaceutical Information Network (PIN). In the future, more S2S connections will be deployed between community clinics and Alberta EHR repositories and registries through the Shared Health Record (SHR) initiative.

For the purpose of this overview, the scope of the Alberta EHR is limited to networked health information systems for which Alberta Health is either the Information Manager or custodian, and that are shared with other custodians in the Alberta health system. Repositories for which AHS or community health service providers are the custodians, even if they are accessible to other custodians, are identified as sources for the Alberta EHR or as parallel health information systems but are not described in detail.

3. Background

The Alberta EHR provincial program began in 1997 with the establishment of Alberta Wellnet by Alberta Health with the mandate to develop and deliver province-wide EHR initiatives. This was the predecessor to the current Alberta Netcare program.

In the spring of 1999, Alberta Wellnet implemented its first networked health information system, the Seniors Drug Program (SDP) in two Edmonton hospitals. The SDP System provided hospital staff, pharmacists and physicians caring for seniors 65 years and older to view their dispensed Alberta Blue Cross Group 66 Plan medication information from a secure environment. This allowed medical staff access to accurate and complete information about their patients' medications without relying solely on the memory or notes provided by the patient or other staff. In the fall of 1999, the SDP was also deployed to hospital emergency rooms across Alberta.

The SDP was replaced in 2001 with the PIN, which expanded its scope from seniors' medication information supplied by Alberta Blue Cross, to drug information on patients dispensed at community pharmacies in Alberta.

The HIA was proclaimed on April 25, 2001. The HIA set out the provisions for the collection, use, disclosure, access, and security standards for handling health information in health regions, pharmacies, nursing homes and government-funded healthcare services delivered by private healthcare providers, who were designated as "custodians", under the HIA. The HIA required consent of individuals to disclose health information by "electronic means", and both SDP and the PIN originally featured a patient electronic means consent workflow as an integral system process. This provision in the HIA was repealed in 2002, and the consent process in the PIN was removed.

The HIA also introduced the mandatory requirement for a PIA whenever a custodian planned to implement a new administrative practice and information system relating to the collection, use, and disclosure of individually identifying health information or a proposed change to those existing practices or systems. Since that time, PIAs have become an essential component of the development of new Alberta EHR initiatives and systems.

Also in 2001, the Alberta Medical Association (AMA) began operation of the Physician Office System Program (POSP), which was part of a trilateral agreement between the AMA, the Regional Health Authorities (RHAs) and Alberta Health. This program provided funding and expert resources for physicians to implement EMR systems in their private clinics, with the expectation that these could eventually be linked to Alberta Health systems and become part of the Alberta EHR.

The Provincial Personal Health Identifier (PPHI) initiative began in 2002, the first registry project of the Alberta EHR program. The PPHI led to the development of the Person Directory (PD) and later the Provincial Client Registry (PCR) to reliably and uniquely identify patients, a key feature of the Alberta EHR.

To establish trusted zones when connecting to the Alberta EHR from within the former RHAs (now AHS), Alberta Health developed and funded the MCR and the SCR 2004 and SCR 2005 projects. The MCR and SCR projects were the implementation of the International Standards Code (ISO) 17799 Code of Practice for Information Security Management. As a result of the these security assessments, Alberta Health removed the requirement for two-factor authentication when accessing Alberta Netcare from within Regional Health Authority Information Technology (IT) networks.

In 2003, Alberta Health implemented EHR-Release 1.0, also known as Portal 2004. The health regions agreed to join with Alberta Health and AMA in 2004 to support a single, effective, common inter-jurisdictional EHR initiative for all users in the province. The Capital Health (CH) netCARE platform began in 2004 and in March 2006, this Edmonton-based system was copied and adopted and became known as Alberta Netcare Portal 2006 (ANP 2006). In January 2008, ANP 2006 and CH-netCARE were completely merged, creating a single system referred to as ANP.

Alberta Health began delegating development of key source components of the Alberta EHR to health regions in 2005, including laboratory and Diagnostic Imaging (DI) reporting and site and provider registries. When the nine health regions merged to form AHS as the single health authority across the province in 2009, there was a renewed effort to integrate the separate regional networked health information repositories into a province-wide system.

By 2007, legislation was introduced requiring all community-based pharmacists to submit dispensing information to Alberta Health for inclusion in the PIN. Amendments to the HIA in 2010 expanded the mandatory submission of health information to all custodians for a wide range of patient health information. The EHR Regulation also formally established Alberta Health as the Information Manager of the Alberta EHR.

In 2011, Alberta Health, in partnership with AHS, began pilot projects for the development of the Personal Health Portal (PHP), under the branding of *MyHealth.Alberta*. The goal of this major new initiative was to create a single trusted source for Albertans to find health information and useful health tools among the countless internet sites available. In the fall of 2012, Alberta Health launched Release 3 of the PHP, which introduces interactive communication and health monitoring between healthcare providers and patients across the province.

4.   Current State Overview

The Alberta EHR integrates and connects over fifty e-health systems, with various custodians and affiliates contributing content and support services. In its current state, the Alberta EHR is comprised of four major components supporting the network in different ways:

Access Tools - allow users to view health data across repositories and registries in the Alberta EHR, but do not hold any data themselves.

Registries - capture, store, and provide the authoritative source of data on places, identities, and events used by all repositories and access tools for identification purposes.

Repositories - capture, store and maintain various kinds of diagnostic, treatment, and care information about patients.

Infrastructure - components that enable repositories, registries and access tools to connect and transmit health data requested by users or other systems.

Alberta Health and AHS are jointly responsible for many of the e-health systems that comprise the Alberta EHR.

The governance of such a system presents a challenge to health care custodians, Information Manager's, and regulators alike. To meet the objectives of this document in a more meaningful way, the diagram below (Figure 1) condenses the key components of the Alberta EHR documented above into a high level Alberta EHR Network Overview.
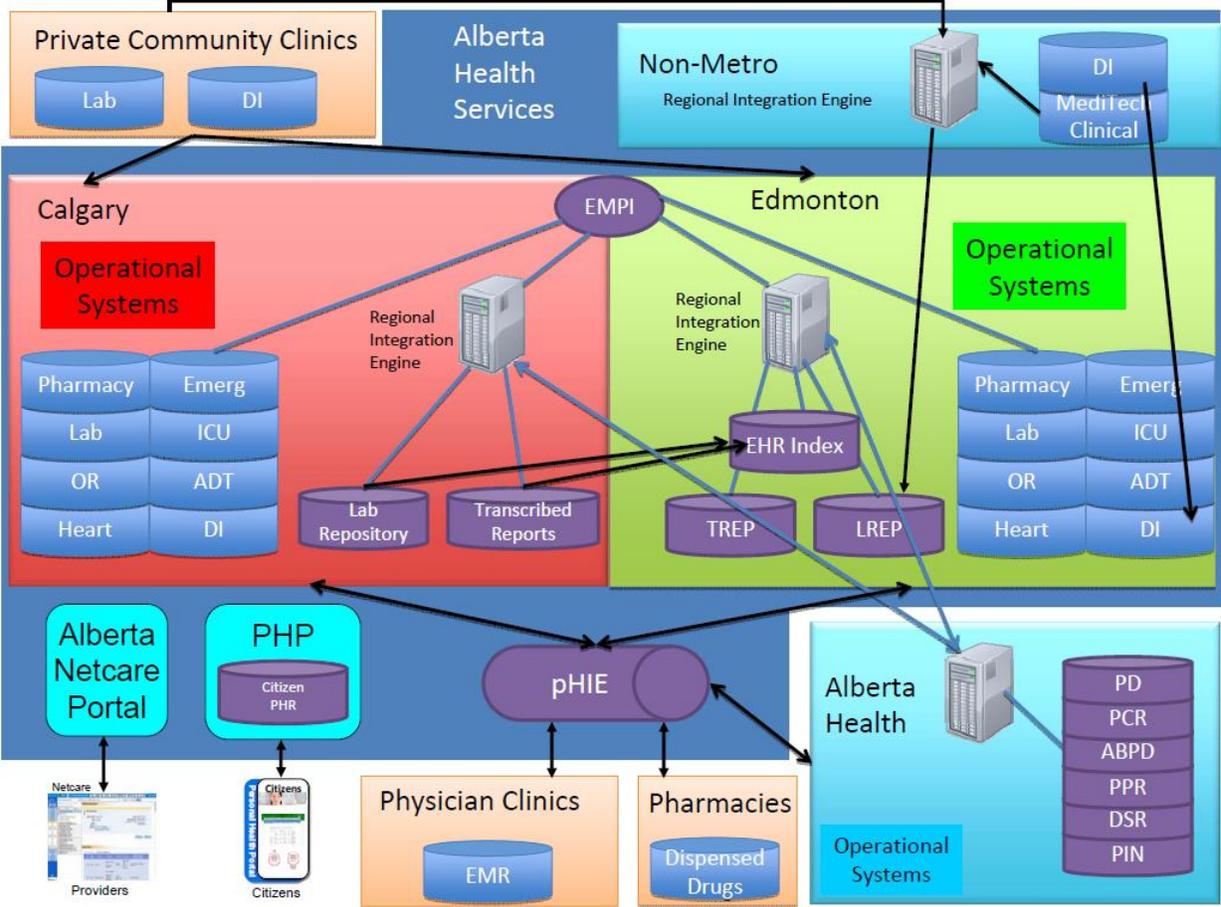
Figure 1
Alberta EHR Network Overview

In the AHS Trusted Zone, regional integration engines combine data from selected AHS operational systems in Edmonton, Calgary and rural areas. The application of AHS registries (e.g. Enterprise Master Patient Index (EMPI), Events Registry) ensures single, authoritative descriptions of patients, providers, sites and encounters. The EHR Index connects data to the correct individuals. Private community clinics contribute laboratory and DI reports to this network.

Health information from the AHS Trusted Zone is matched and exchanged with corresponding patient information in Alberta Health Trusted Zone registries (PCR, PD through the Provincial Health Information Exchange (pHIE). The pHIE acts like a router or hub that also connects pharmacies populating and using the PIN and, in the near future, physician clinic EMRs populating and using the SHR.

With select repositories and registries in the AHS Trusted Zone and the Alberta Health Trusted Zone networked with many community healthcare services and clinics, the ANP and other points of access are able to access and present a comprehensive view of health information about a single individual from a wide network of clinical and registry sources collecting or combining point-of-care information.

5. Vision for Future Development

Continuing development of the Alberta EHR focuses on the goal of "one person, one record" for the Alberta health system. The *EHR IS Business Case completed as a companion document to* Alberta 5-year Health System IT Plan (2011-2016) re-states the long-term vision for the Alberta EHRIS:

"A fully integrated, unified and coordinated network of health information systems that supports improved care for Albertans by providing up-to-date information with the appropriate decision support tools for health service providers and Albertans when they need it at the point-of-care."

In pursuit of this vision, Alberta Health, AHS and health stakeholders are working on the following key initiatives to develop and expand the Alberta EHRIS over the next five years.

a) Shared Health Record (SHR)

The SHR serves as an intermediary application that allows Netcare to provide information to local electronic medical records systems (EMRs). It has no user interface of its own; it consists entirely of messaging standards used by Netcare and EMR applications. It will be implemented via limited modifications to Netcare and more significant enhancements to EMRs, initially those EMRs were funded by the Physician Office System Program (POSP).

Release 1 of the SHR adds the encounter information of patients held in local physician clinic EMRs to patient information currently available in Netcare which allows physicians to download transcribed reports from Netcare to their local EMR systems and to receive updates when those reports have changed. Physicians may already incorporate transcribed reports into their EMR's manually, but the SHR will simplify the process. The capture of clinical and administrative health service events in physician office settings is a critical element of a patient's longitudinal health record.

In addition, Release 1 of SHR will establish system-to-system (S2S) messaging interfaces between community clinics and Alberta EHR repositories and registries. This will allow seamless capture and access to Netcare data within clinic EMRs, starting with Qualified Service Providers (QSP) systems supported through the POSP. System features will include propagating report updates and extending Global Person-Level Masking (GPLM) of Netcare data to participating EMRs.

The SHR Steering Committee on September 25, 2012 reduced the scope of the SHR project. Originally, the scope allowed for the delivery of encounter information from physician EMRs to Netcare. With this change of scope, the SHR will not transfer any personal health information from EMR systems to Netcare, for Release 1. Should this scope change in subsequent releases, updates to the AHS Netcare Clinical Repositories PIA – Shared Health Record Addendum will be completed and filed with the OIPC by AHS.

AHS operates and maintains this system on behalf of Alberta Health, who is the Information Manager of this system.

b) Personal Health Portal (PHP)

Currently, Albertans using the PHP have access to information about Alberta programs and services, consumer health information, personal health information tools, and selected portal services, all capturing only anonymous, aggregate data, via "MyHealth.Alberta". As part of the PHP Limited Production Rollout, Alberta Health plans to implement interactive features capturing identifiable personal information, such as the Personal Health Record (PHR), which will provide patients with access to some of their own personal health information in Alberta EHR systems, beginning with drug information in the PIN. The PHR will also allow Albertans to create a record of their health information, to enter measurements and data from medical devices (e.g. blood glucose monitors, blood pressure) or to track therapeutic activities (e.g., as part of cardio exercise regimes) that can be made available to their healthcare providers.

c) ePrescribing in the Pharmaceutical Information Network (PIN)

ePrescribing will replace paper or faxed prescription orders that will allow more timely and accurate prescription transactions. The PIN currently has ePrescribing functionality, but the status of digital prescriptions in PIN as legal documents has been under review. A pilot to address ePrescribing is currently underway. This initiative will resolve that issue and encourage participating pharmacies and healthcare providers to utilize the ePrescribing function. Alberta Health is the Information Manager of this system.

d) Laboratory Integration/Normalization

This initiative will have the objective of standardizing terminology for laboratory test panels, orders, and results to enhance the accuracy and usability of current laboratory information available in the Alberta EHR. Although largely implemented by AHS and individual custodians, Alberta Health EHR components will be directly affected by this initiative.

e) Cross-Enterprise Document Sharing (XDS)

This is a digital file-sharing framework operating through the pHIE that provides an interoperable, vendor-neutral platform for sharing information across provincial and national jurisdictions. The XDS framework is based on international standards and is supported by industry through the Integration of the Healthcare Enterprise (IHE) initiative.

f) eReferral

AHS, in partnership with Alberta Health, has launched the eReferral Project to support enhanced coordination and communication of patient transitioning and referral across the Alberta health system continuum of care. The eReferral system will be a central intake and triage system either integrated with existing EMRs or available through the internet for physicians without EMRs. It will support assessment and decision-making to target optimum referral services and scheduling based on patient condition and specialist availability. Through eReferral, the status and documentation from referrals will be distributed to all specialists and referring healthcare providers more consistently and quickly.

g) Pharmacy Practice Management Systems

Similar to the SHR initiative, Alberta Health is expanding S2S connections that will pull data from relevant Alberta EHR repositories and registries directly and seamlessly into on-site Pharmacy Practice Management Systems (PPMS). This initiative will also deal with extending GPLM functionality to S2S interfaces. Pilots are currently underway in selected Alberta pharmacies.

In order to have a clear, end to end, picture of privacy protections for health information collected, used or disclosed through a PPMS, all components must be captured. Discussions between Alberta Health, the RxA, and the OIPC have determined that a three pronged approach is required. The approach must include contributions from the Pharmacy itself (Organizational Policies and Procedures), the PPMS vendor (Information system privacy protections) and Alberta Health (privacy and security protections for EHR components with which data is shared). These consultation has resulted in the completion of the "PIA Template for Real Time Integration of PPMS with the PIN" document. By capturing all three areas within the Pharmacy Community PPMS PIA, a total picture of the Real Time Integration of PPMS with the PIN will be articulated to the OIPC.

C. ALBERTA EHR COMPONENTS PROFILES

1. Access Tools

a) Alberta Netcare Portal (ANP)

The ANP is an entry point/viewer for the Alberta EHR. It is a web-based clinical portal that enables authorized custodians and their authorized affiliates (i.e. authorized ANP users) to view patients' prescribed health information that is housed in various Alberta Health repositories and registries, AHS clinical systems, and community site clinical systems. ANP is the most comprehensive and widely-used access tool for the Alberta EHR.   An ANP vision and roadmap for the next 5 years is under development and is expected to be completed by March 2013.

Data Available

ANP is designed to provide healthcare providers with access to prescribed health information pursuant to the EHR Regulation, s. 4. Currently, ANP provides at least some of the following types of health information about individual patients or clients directly from the Netcare Clinical Repositories (NCR) and from Alberta Health registries, including:

- information that uniquely identifies health service providers who provide health services;
- information about where health services are provided and delivered;
- information about key clinical events at the point-of–care;
- known allergies and intolerances;
- immunizations;
- laboratory test results;
- diagnostic imaging reports and other transcribed clinical reports including
    - Discharge Summaries
    - Patient Histories
    - Consultation Reports
    - Operative Reports
    - Emergency Department (ED) Reports;
- inpatient and outpatient admission and discharge events, and
- patient medication histories via the PIN

Access

The ANP is made available to clinical areas at AHS facilities, and to family physicians, specialists, pharmacists, laboratory, long-term care facilities and diagnostic imaging clinics that have completed appropriate privacy and security requirements for ANP Access.

Source Systems

AHS operates and maintains ANP on behalf of Alberta Health. Data made available to ANP users is stored in provincial repositories and registries, including Common Clinical Data Repositories, and Independent Clinical Data Repositories. These source systems in turn capture health information either directly from healthcare providers providing services to patients at the clinic or facility or from intermediate source systems that integrates and process specific kinds of data collected at the point-of-care. The following is a list of these sources:

1. **Alberta Health Provincial Registries and Applications**
These sources may collect and process health information from other clinical source systems point and directly at point-of-care:
- Person Directory (PD)
- Provincial Provider Registry (PPR)
- Pharmaceutical Information Network (PIN)

2. **NCR and Registries**
These intermediate sources collect and process health information from various point-of-care systems either at AHS or with private providers, excluding local clinic EMRs:
- TREP – Transcribed Reports Repository (Edmonton)
- LREP – Laboratory Repository (Edmonton) which is owned by the Edmonton Zone
- RREP – Rural Report Repository (Central, North, South regions)
- CHRLRP – Calgary Laboratory Repository
- CHRDRP – Calgary Diagnostic Imaging Text Report Repository
- CHRTRP – Calgary Transcribed Report Repository
- CHRP – Immunizations
- AHS Client Registry (AHS CR)
- Events Repository (a database of key information regarding patient encounters and case types)
- CHRP - Immunizations (Immunizations from Edmonton Caseworks public health system)

System Infrastructure

The ANP uses Orion Concerto portal software, and this vendor provides ongoing IT support. Data is integrated across sources through regional integration engines and transmission is managed using the pHIE.

Privacy Compliance

Alberta Health submitted the ANP PIA to the Office of the Information and Privacy Commissioner of Alberta (OIPC) (H3879) in November 2010 and it is still under review with the OIPC. Community and private healthcare providers, AHS clinical areas, and Alberta Health sources are considered custodians of the health information they submit to and access in Alberta Netcare. Alberta Health is the Information Manager for Alberta Netcare.

b) Personal Health Portal (PHP)

The PHP is a web-based viewer designed for Albertans. The core feature of the PHP is the PHR, which will provide Albertans with access to some of their own personal health information in Alberta EHR systems, beginning with drug information in the PIN. The PHR will also allow Albertans to create a record of their health information, to enter measurements and data from medical devices (e.g. blood glucose monitors, blood pressure) or to track therapeutic activities (e.g., as part of cardio exercise regimes) that can be made available to their healthcare providers.

Currently, Albertans using the PHP have access to information about Alberta programs and services, consumer health information, personal health information tools, and selected portal services, all capturing only anonymous, aggregate data, via "MyHealthAlberta".   Alberta Health will shortly implement features capturing identifiable personal information described above as part of the PHP Limited Production Rollout.

Data Available

For this phase of its rollout, the PHP will require submission and access to patient identifier (ID) and demographics information for user access management purposes and to link to the AHS Client Registry. Users will be able to add health information, submit measurements and data from medical devices (e.g. blood glucose monitors, blood pressure) or by tracking activities (e.g., as part of cardio exercise regimes). The PHP will also allow Registered Verified Users to download their medication data from the PIN into their PHR and use this information to create, track, and manage their medications. Dispensed drug data, as it exists in Alberta Netcare, will be available for viewing by these users. Users will be able to download a 6-month dispense history for the initial download and subsequent downloads will allow for dispense information going forward from the first download by the user.

The following dispensed drug data (e.g. standard pill bottle label information) will be available for download by Registered Verified Users who are granted permission to download Netcare data:

- Drug Name (full name)
- Drug Information Number (DIN) / National Product Number (NPN)
- Label Instructions
- Quantity
- Days Supply
- Dispense Date
- Pharmacy (if pharmacy is part of Alberta Netcare)
- Prescriber (either physician name or location where the prescription originated)
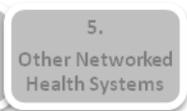
Access

For the next phase of the PHP development, there will be six types of users:

- Anonymous
- Registered Unverified
- PHP Administrator
- PHP Agent
- Registered Verified

The PHP activity will be logged to record when health information is created, accessed, modified, deleted, released, or exported, in addition to data transferred from Alberta Netcare applications.

Source Systems

At this stage, the PHP will only receive a feed of requested patient data from the PIN. The PHP Agents will access the PCR in order to verify registered PHP users.

System Infrastructure

The PHP uses Microsoft SharePoint for its platform and leverages Microsoft Accounts for identity management, SharePoint for authentication process, and Microsoft Healthvault, Microsoft BizTalk and TELUS iPHR technologies. Alberta Netcare data transmission is managed using the pHIE.

Privacy Compliance

Community and private healthcare providers, AHS clinical areas, and Alberta Health sources are considered custodians of the health information they submit to and access in Alberta Netcare. Alberta Health submitted the PHP PIA to the OIPC (H5074) in September 2011. The PIA is under review by the OIPC.

2. Registries

a) Person Directory (PD)

The PD is a database of persons accessing health services in Alberta or who are registered with Alberta Health Care Insurance Plan (AHCIP) that feeds data to the Alberta PCR, AHS PCR and ANP. Because of the authority of its sources, the PD is considered the "trusted source" for the Unique Lifetime Identifier (ULI) of individuals' records in the PCR. The registry is required to eliminate duplicates of the same information housed in several repositories in the Alberta EHR network.

Data Available

The PD provides the following types of data:

- Person ID
- PHN/ULI
- Date of Birth and Document ID #
- Gender
- Deceased Date and Document ID #
- Marital Status (separated, divorced, married, single, widowed)
- Special Status Code (e.g., newborn, newborn with no address, abandoned/adopted, out-of-province newborn)
- Current Eligibility (for AHCIP services)
- Eligibility Start Date, End date, End Reason
- Person Name
- Communication Address
- Communication Telecom
- Person External ID
- Person Residency Status
- Person Newborn
- Primary/Secondary Relationship
- Person Relationship

Access

The PD is made available to clinical areas at AHS facilities and to family physicians, specialists, pharmacists, and laboratory and diagnostic imaging clinics as an integrated component of the ANP.

Source Systems

The Alberta Health Central Stakeholder Registry (CSR) supporting mandated programs such as the AHCIP provides authoritative ULI and eligibility information on the person. Community healthcare providers and AHS healthcare providers contribute updates and information through ANP access.

System Infrastructure

The PD has been developed and maintained by Alberta Health using Alberta Health hardware and network technology.

Privacy Compliance

Alberta Health is the custodian and submitted the PD PIA in 2002 (H0051) to the OIPC that was accepted. In 2004, Alberta Health filed a PIA Addendum (H0565) that was accepted by the OIPC, which added additional registration information. A further PIA Addendum (H0935) was submitted in 2005 that addressed a project to cleanse regional source systems.

b) Provincial Client Registry (PCR)

The PCR is the provincial identity management application used to manage and identify client demographics for Alberta Health and AHS, community physician, pharmacy and laboratory stakeholders. The system collates and integrates information about individuals who may have multiple identifiers across health organizations. As such, the PCR is a registry of personal and demographic data content of provincial patients and clients in other contributing source systems connected to the Alberta EHR. The PD and the AHS CR information contribute data into the PCR from the Alberta Health and AHS domains. The registry is required to eliminate duplicate information housed in several repositories in the Alberta EHR network.

Data Available

The PCR contains a core data set of client information as a registry, but a minimum subset of data is required to be submitted by all systems accessing the PCR to create a unique PCR identity. The following are the main groups of data elements for the core and minimum data sets:

- Name
- Date of Birth   *Minimum Data Set*
- Gender
- Identifier (e.g., ULI)
- Language
- Date of Death
- Address
- Communication
- Eligibility
- Confidentiality Indicator

Access

The PCR is a system that supports the other repositories and access tools that are used by healthcare providers. Only a small number of information technology administrators and provincial Integrity Unit staff at Alberta Health have direct access to the health information in the PCR to maintain the system and investigate unresolved questions of accuracy, duplication and integrity.

Source Systems

The PCR receives data from the PD and AHS CR.

System Infrastructure

The PCR uses EMPI technology provided by Initiate Systems.

Privacy Compliance

Alberta Health as custodian submitted the PCR PIA to the OIPC in September 2007 (H1397) and has also submitted several addenda to this PIA addressing changes from the original PIA.

c) Alberta Provider Directory (ABPD)

The Alberta Provider Directory (ABPD) is a central registry containing authoritative and standardized health services provider information. The ABPD is the source of provider data for the PIN, Person Directory (PD), Alberta Ambulance Information Management System (AAIMS), Business Intelligence (BIE), Tuberculosis Integrated Public Health Information System (TBiPHIS) applications. The registry is required to eliminate duplicates of the same information housed in several repositories in the Alberta EHR network. The data will not include patient/provider encounter information or clinical information.

Data Available

The ABPD provides the following information about providers in the Alberta health system:

- Common Provider Number (CPN) - a unique lifetime identifier for all providers;
- Provider Name and Provider Name Type - An appellation by which a provider of interest to the ABPD is known or called ;
- Provider Identifier and Provider Identifier Type - An alphanumeric code assigned by an Authorized Source to uniquely identify a provider in a role recorded on the ABPD, e.g. the College Identifier assigned to a doctor by the College of Physicians and Surgeons of Alberta ;
- Provider Address, Phone Number, Email ;
- Provider Role (discipline) - The primary way in which a provider participates in the health sector as it relates to the ABPD ;
- Status Code/Status Reason - The various states that a provider can be in, e.g. active, inactive, retired, etc.;
- Provider Gender, Date of Birth;
- Credential Type - The city, province/state, country, institution, institution location and graduation year for a licensed provider's specific qualification;
- Expertise Type - Classifies the pursuit, skill or knowledge in a particular area that a provider is qualified to give special attention to, as granted by the appropriate licensing bodies ;
- Condition Type - Classifies the kinds of restrictions or permissions that may apply to a provider's practice or Provider Sub Role;
- Jurisdiction - The Canadian provincial or territorial geographical area in which the provider is operating;
- Confidential Flag - An indicator that is used to restrict access to an individual provider's data.

Access

Authorized application users have access to provider data from the ABPD through their respective applications.

Alberta Health authorized IT administrators have access to the ABPD individually identifying information. The College of Physicians and Surgeons of Alberta (CPSA) has access to physician data, which they supply to the ABPD, for error correction.

Source Systems

The ABPD accepts provider data from authorized sources: CPSA provides physician registration information through an interface file; over 20 other health professional bodies in Alberta provide additional provider data.

System Infrastructure

The ABPD has been developed and maintained by Alberta Health using Alberta Health hardware and network technology.

Privacy Compliance

Alberta Health as custodian submitted a PIA on the ABPD (H0229), which was accepted in 2005. Since then, Alberta Health has also filed two PIA Addendums with the OIPC (H0633 and H1398).

d) Provincial Provider Registry (PPR)

Alberta Health's current ABPD application required architectural, operational, security and messaging enhancements to support the information needs of the health system and the AB Netcare initiative in particular. This gave rise to the development of the PPR, a core infrastructure registry. PPR is the centralized source of trusted information about regulated providers in Alberta. The registry includes data that is collected from the regulated colleges on a daily basis and a Health Service Provider Identifier (HSPID) will be attached to each provider as it is being stored within the PPR.

This registry is used by Alberta Health, AHS and other Alberta health system stakeholders, to access and update information about Providers in Alberta. Currently, PPR only captures Providers regulated by the *Health Professions Act* (HPA) but can have its scope expanded to capture unregulated health service providers in the future.

Data Available

PPR provides the following information about providers in the Alberta health system providers:

- Provider Name
- Role/Category
- Educational Credentials
- Provider Expertise

C. ALBERTA EHR COMPONENT PROFILES

1. Access Tools
2. Registries
3. Repositories
4. Infrastructure
5. Other Networked Health Systems

- Date of Birth
- Gender
- Provider Identifier
- Status of provider's practice permit
- Conditions on practice
- Practice enhancements
- Practice restrictions
- Business contact information

Access

PPR is the source of provider data for the PIN application as well as for the AHS PR. Authorized application users have access to provider data from PPR through their respective applications.

Source Systems

The PPR accepts provider data from the ABPD and AHS CR.

System Infrastructure

The PPR has been developed and maintained by Alberta Health using Alberta Health hardware and network technology.

Privacy Compliance

Alberta Health as custodian submitted the PPR PIA (H2790), which was accepted in September 2009. Alberta Health has also submitted two subsequent PIA Addendums on the PPR to the OIPC.

e) Delivery Site Registry (DSR)

The Delivery Site Registry (DSR) is a portfolio encompassing two registries: DSR and Provincial Organization Registry (POR). The DSR provides a central repository of accurate, current, and standardized information about delivery sites and organizations of interest to health professionals in Alberta. The DSR will also facilitate queries and the management of this information and provide DSR users with various identifiers that can be used to identify delivery sites and organizations of interest. Information will be collected and consolidated from multiple sources and processes for integrity, completeness and accuracy of information to enable DSR data to be recognized as the source of trusted information for the Alberta EHR.

Data Available

DSR contains a core data set of information as a registry, but a minimum subset of data is required to be submitted and maintained by all systems accessing the DSR to create a unique delivery site identity. The following are the main groups of data elements for the core and minimum data sets:

- Delivery Site Type
- Physical Site Type
- Delivery Site Name   *Minimum Data Set*
- Delivery Site Status
- Delivery Site Location
- Organization Id
- Delivery Site to Organization Role Relationship
- Alternate Identifier
- Organization
- Organization in a Role
- Contact Information
- Notes
- Delivery Site Type to Organization Role Relationship

Access

No health information is stored in the DSR. As an information registry within Alberta EHR, there is a need to ensure the integrity and accuracy of the data since it is used to provide important contextual information in Alberta EHR repositories. The DSR uses a system of primary and secondary data sources to maintain the accuracy, reliability, and currency of the DSR data. User accounts are maintained by IBM and Alberta Health External AA using the user access management criteria and processes.

Source Systems

The CPSA, the Alberta College of Pharmacists (ACP) and the Alberta Health Facilities Planning Branch are primary sources and populate the DSR directly as authoritative sources based on the sites and geographic regions for which they maintain the most accurate and reliable data. AHS CR is a secondary data source, proposing corrections or additions that update the data from primary data sources that are reviewed before they are submitted. The DSR administrators may also receive requests for updates or correction from other users.

System Infrastructure

The DSR has been developed and maintained by Alberta Health using Alberta Health hardware and network technology.

C. ALBERTA EHR COMPONENT PROFILES

1. Access Tools
2. Registries
3. Repositories
4. Infrastructure
5. Other Networked Health Systems

Privacy Compliance

Since there is no health information in the DSR, no PIA has been completed.

f) AHS Client Registry (AHS CR, EMPI)

The AHS CR provides an authoritative source for accurately identifying patients within AHS Admission, Discharge, Transfer (AeHealth Support Team) and clinical systems, along with their key demographic information. The registry is required to eliminate duplicates of the same information housed in several systems in AHS. This registry is essentially the integrated data repository of what was formerly known as the EMPI in Calgary and Edmonton. Source systems send client identification data to the Client Registry where it is examined for data anomalies and remediated by the Data Integrity Unit (DIU) in AHS Health Information Management (HIM).

Data Available

The AHS PCR captures patient identifiers and demographic information within the following groups:

- Client Attributes
- Client Dates
- Client Identifiers (including ULI and Canadian health numbers)
- Client Names
- Client Addresses
- Client Phones

Access

Only a small number of information technology administrators and provincial Integrity Unit staff at AHS and Alberta Health have direct access to the health information in AHS CR to maintain the system and investigate unresolved questions of accuracy, duplication and integrity. AeHealth Support Team admitting clerks can view AHS CR data for patient registration and admission purposes. Along with the PD, AHS CR currently provides client demographics to ANP.

Source Systems

AHS CR receives data from AHS clinical and AeHealth Support Team systems, private DI services, and the PD. Updates are routed to the PCR and the ANP through pHIE.

System Infrastructure

The AHS CR has been developed and maintained by AHS using AHS hardware and network technology.

Privacy Compliance

The original PIA for Capital Health EMPI was submitted and accepted in 2004 (H0272). AHS, as the custodian, submitted a rewritten PIA for the AHS PCR in 2011.

3.   Repositories

a)   Pharmaceutical Information Network (PIN)

The PIN provides community physicians, pharmacists, hospitals and other authorized health stakeholders with access to patient medication histories. It enables electronic prescriptions, equipping health service providers with decision support tools for prescribing, dispensing and counselling. The PIN provides the following functionalities:

Electronic dispensing
- Records dispensing events by pharmacy for any medication
- Drug Identification Number (DIN)
- Allows pharmacist to review dispensing history
- Allows pharmacist to review prescribing history

Patient lookup
- Validates Unique Lifetime Identifier (ULI)/Personal Health Number (PHN) or
- Looks up ULI/PHN to identify patients
- Uniquely identify patients
- Health Care Provider lookup
- Uniquely identifies the physician or pharmacist linked to a particular Prescription/ Dispense record.

Masking
- Supports GPLM (*only for ANP access*)

Monographs
- Allows user to view drug monographs (i.e., information about the medication)

Delegation
- Enables HSPs to individually delegate rights to their affiliates

Data Available

The PIN captures the following types of health information:

- PIN Prescription ID - The unique identifier assigned by the PIN to the prescription record
- Prescription: Prescription Number and information including drug ordered and instructions
- Triplicate Prescription Program (TTP) information
- Dispensed Item: PIN Dispense Id (unique identifier assigned by the PIN to the dispense record); Dispense Number (unique number assigned to the dispense by the pharmacy); Days Supply Dispensed Amount (number and units); Dispensed Date; Dispensed Product DIN (drug identification number and Product Name; Dosage Specification (name of ingredients)
- Allergy intolerances
- Pharmacy – License number, Name
- Pharmacist - License number
- Prescriber – Given, middle (if available) and last names
- Patient – Date of Birth, Given, Middle (optional) and Last name; PHN; Gender
- Reason Extracted Indicator - whether this dispense was included in the extract because the drug falls within a TPP drug group, or because of an existing TPP number, or because both conditions are true.
- Event Timestamp
- Drug-to-drug interactions (adverse drug reactions)
- Duplicate therapy (generic drug level)
- Drug-to-allergy/intolerance contraindications
- Patient allergies and intolerances
- Patient profile report
- Multiple prescription renewals
- Prescription status changes (holds, releases, stops)
- Professional Service Provider
- Consultation Time and Length
- Notes associated with the Service
- Consultation Category Code (from the HL7 v3 standard list)

Access

Users can access the PIN through ANP or directly as part of their PPMS or EMR. Users include pharmacists and pharmacy technicians in a pharmacy; physicians, nurses/medical assistants and administration support staff in a physician's office; and hospital pharmacists, pharmacy technicians, physicians, clinical support staff and admitting/discharge staff in health authority hospitals. PIN will be available to patients as well through PHP.

Custodians using PIN through ANP can mask patient information using the GPLM process. The masking function is not available in S2S connections to PIN.

CPSA receives an extract of data on prescriptions for controlled substances as part of the TPP.

Source Systems

The PIN accesses the PCR, DSR, and PPR registries for authoritative patient ID and demographics, provider, and site information. Pharmacists and other professional providers are individually asked to provide their health service provider information when they initially register for access to the PIN. The SDP information is received daily, based on the Alberta Health Drug Benefit List for Group 66, directly from Alberta Blue Cross. Prescription information is entered in independent pharmacy systems and the resultant dispensed medication information and consultation service information is provided to the PIN.

System Infrastructure

The PIN supports two interface strategies for stakeholder access: ANP access and S2S messaging. The S2S option is currently being piloted and tested with a handful of pharmacies. PIN data is routed through pHIE with the exception of a portion that uses v2.4 messaging. Community pharmacies have also been submitting dispensing data to Alberta Health via the Batch Reporting System since 2007.

Privacy Compliance

Alberta Health submitted a PIN PIA to the OIPC (H3213); which was accepted in 2002. Subsequent PIA Addendums have been filed with the OIPC since this original PIA was completed. Alberta Health has commenced drafting of a new PIN PIA to replace the original PIA and all of the PIA Addendums.

C. ALBERTA EHR COMPONENT PROFILES

1. Acces s Tools
2. Registries
3. Repositories
4. Infrastructure
5. Other Networked Health Systems

b) Netcare Clinical Repositories (NCR)

The NCR contain medical reports in text form and are accessed through ANP. These repositories draw and integrate data from other point-of-care health systems and as such are intermediary sources for Alberta Netcare. The repositories currently part of NCR include:

Transcribed Reports:
- TREP
- LREP
- RREP
- CHRLRP
- CHRDRP
- CHRTRP

Other Repositories:
- Events Repository
- CHRP - Immunizations
- EHRI (indexing data to match individuals with the correct repository data)

Data Available

These repositories provide ANP with textual medical reports about patients in digital form, including:

- personal demographic information that uniquely identifies the individual;
- information that uniquely identifies health service providers who provide health services;
- information about where health services are performed on and delivered;
- information about key clinical events at the point-of-care;
- immunizations;
- laboratory test results diagnostic imaging reports and tests;
- other reports.

Access

NCRs are not directly accessible to users except information technology administrators for systems maintenance purposes. The data is only made available to authorized users through ANP, which is available to clinical areas at AHS facilities and to family physicians, specialists, laboratory, and diagnostic imaging clinics.

Source Systems

Source data for NCR is derived from point-of-care system throughout the province. The charts below provide a detailed mapping of these data source systems to the NCR:

Figure 2 (4 separate diagrams)
ANP Data Sources, ANP TREP Repository Details,
ANP RREP Repository Details and ANP Event Repository Details

Alberta Netcare Portal TREP Repository Details

Alberta Netcare
ELECTRONIC HEALTH RECORD
Portal

Legend:
- Repository
- Source System
- Vendor
- Organization

TREP (center)

Edmonton Cardiology Consultants
Canadian Blood Services
AHS Edmonton Lab
CML, IMI, MIC, Northgate X-Ray, X-Ray Clinic on 124th and 142nd Street, Amiha DI, Dr. J. P. Mayo
MicroQuest
MAK-SYStem Corp.
PerkinElmer - Newborn Metabolic Screening
SystemLink (Human Leukocyte Antigen)
Unicus
Eclipsys / Impac Medical Systems
Alberta Cancer Care: Cross cancer, Tom Baker, Alberta Screen Test Program (Edmonton and Calgary)
Eclipsys
Softworks Group
Varian
EPIC
Prov Lab
Phillips Healthcare/ Cardiac Science
Medtronic
Critical Control
AHS Edmonton
Cerner RAH AGFA
MetaHealth Dictaphone Legacy System: Vax
DI: Imageflow
iSoftQueeH
Blood Bank Reports: Traceline
Specimen Gate
Histrecord-HLA Lab Management System
Lab: LabVision PowerPath
DI: Sunrise RIS
Operative Reports and ECG's: Web SMR
Transcribed Reports: ARIA
Cohort Laboratory
DI Reports: APPROACH, CARAT
DI: Transcribed reports
Homecare Summaries
Echocardiograms, ECG: Tracemaster Vue, Xcelera Connect, Pyramis
Paceart: Pacemaker Clinic Consultations: PaceArt: GNH, RAH, MRH, Sturgeon
ED Scanning
DI Transcribed Reports: Queens, RMDI, AGFA RIS
Transcribed Dictaphone, RAH/DI: Powerscribe
Transcribed Reports: CCLD
APPROACH: Coronary Angiography, Percutaneous Intervention
APPROACH - AHS Outcome Assessment in Coronary Heart Disease
Breast Centre Radiology
CCLD prior to 25 Feb, 2011, afterwards: MediTech

As of December 2011 release

Alberta Netcare Data Sources 2011-Nov 23 (3)

Page 2 of 4

Alberta Netcare Portal RREP Repository Details

Alberta Netcare
ELECTRONIC HEALTH RECORD
Portal

Legend:
- Repository
- Source System
- Vendor
- Organization

RREP (center)

MediTech
LabFusion
AHS Rural
Keane Inc.
Nuance
MedQuist
Lab: LabFusion
Lab: Keane
DI text reports: Powerscribe
DI text reports: SpeechQ
DI text reports: MediTech RIS
Lab: MediTech LIS
Transcribed Consultations, Discharge Summaries, Admission History, Operative/Procedure, OR, Letters, Electro-diagnostic Reports: MediTech

As of December 2011 release

Alberta Netcare Data Sources 2011-Nov 23 (3)

Page 3 of 4

Alberta Netcare Portal Event Repository Details

Alberta *Netcare* ELECTRONIC HEALTH RECORD **Portal**

Logibec Groupe Informatique, Ltd

AHS Calgary In Progress

Axon

Clinibase (Urban sites)

Axon: Cross Cancer Institute

Tandem:UAH

MediPatient: FSHC, RHC, DGH,WHC

VAX: GNGH, GRH, EGH, RAH, MCH, SCH, LCH, NCHC, HFS

PCIS: AHE

Mental Health: NeoIntegrate

Event Repository

MediPatient: Airdrie, Banff Black Diamond,Canmore,Clareshol m,Claresholm,Didsbury,High River,Nanton,Okotoks,Strath more,Vulcan

MediTech: Multiple facilities for former Health Regions: Aspen, Chinook, David Thompson East Central Health, Northern Lights, Peace Country, Palliser Health Region

Lawson

Lawson

AHS Edmonton

Vax

NEOTOOL

MediTech

AHS Rural In Progress

Repository

Source System

Vendor

Organization

As of December 2011 release   *Alberta Netcare Data Sources 2011-Nov 23 (3)*   *Page 4 of 4*

System Infrastructure

Data is integrated across sources through regional integration engines in Edmonton and Calgary. Health information from external or private point-of-care systems is routed through the pHIE. Indexing data for reports and persons is stored in the EHR Index.

Privacy Compliance

AHS submitted the NCR PIA (H3782) to the OIPC in April 2012 and it is currently under review.

4. Infrastructure

a) Provincial Health Information Exchange (pHIE)

The pHIE is a message routing system used for the exchange of health information between internal AHS Netcare repositories and external data sources, including physician office systems. The pHIE plays the role of a central hub, routing messages where they need to flow, to achieve S2S interoperability among EHR repositories and applications using standard protocols such as HL7. In this way, the pHIE ensures that messages from a source system or repository can be read and accurately interpreted by a

destination system or repository. In theory, the same goal could be achieved by numerous point-to-point interfaces, but such an architecture configuration would be vastly less efficient and more costly to develop and maintain than the pHIE.

Data Available

Almost all data transmitted between and among Alberta EHR systems and repositories potentially passes through the pHIE. However, pHIE does not itself store data nor can it be used as a tool to access health information stored elsewhere among Alberta EHR components. The pHIE does use specific health information to map source and destination systems:

- Provider Information
- Name
- HSPID
- System IDs
- Clinic Information
- Clinic Name
- Clinic Address
- DSR-ID
- System IDs

The pHIE is broadly based on the Canada Health Infoway (CHI) architectural component known as the Health Information Access Layer (HIAL). The pHIE facilitates information exchange using standard protocols (e.g. HL7 messaging) and routing information provided by source systems. In the CHI blueprint for the interoperable electronic health record, the HIAL is a gateway that acts as an abstraction layer to separate point-of-service systems from the EHR infrastructure. It is made up of service components, service roles, information models and messaging standards required for the exchange of EHR data and the execution of interoperability profiles between EHR services.

The following diagram provides an overview of the HIAL gateway model used in developing the pHIE:
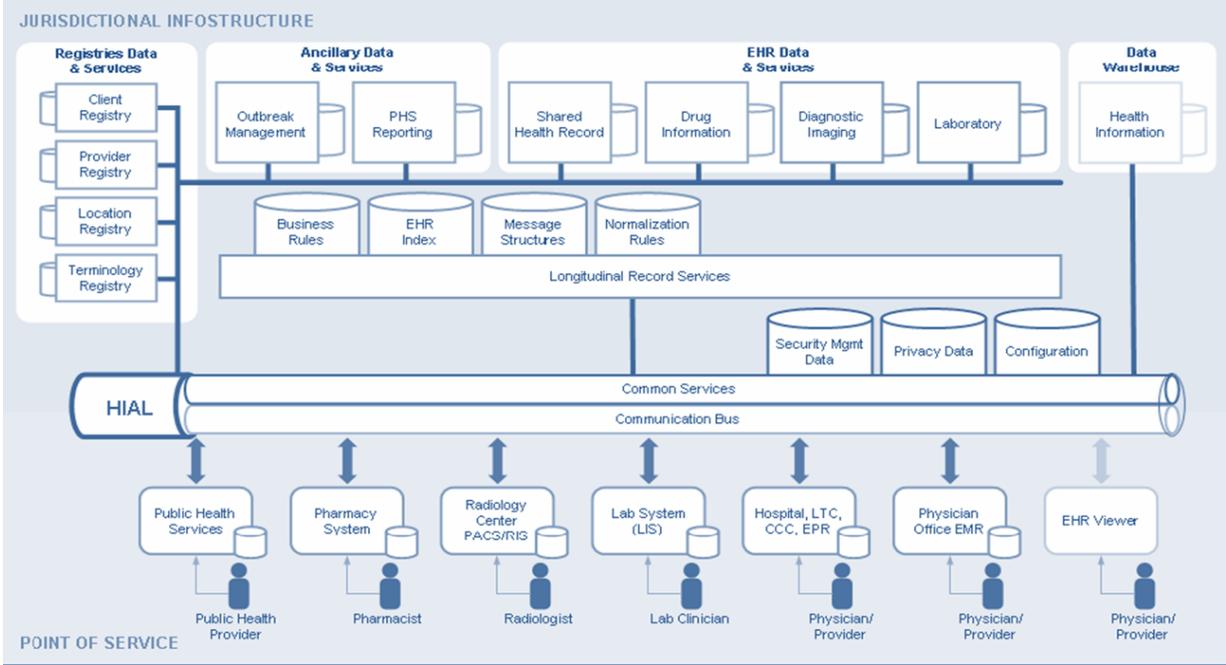
Figure 3
Health Information Exchange Information Flow Model

This diagram depicts a generic design; it is not a depiction of pHIE, although pHIE performs HIAL functions for Alberta Netcare. The pHIE reflects the HIAL design, but it also includes internal business services that which support systems and repositories including the PIN and the PCR. In addition, the pHIE includes a number of virtualized services that support AHS operations and Alberta Netcare.

Access

Only a small number of information technology administrators at Alberta Health Services have direct access to the pHIE as a hub device and the access would be to programming data and indexes that affect the functioning of the pHIE as a transmission hub, not to health information.

Source Systems

All AHS Netcare repositories and Alberta Health registries, repositories and access tools are potentially both sources and destinations for messaging transmitted through the pHIE.

System Infrastructure

The pHIE has been developed and maintained by AHS using AHS hardware and network technology. The architecture of the pHIE is based on CHI HIAL.

Privacy Compliance

The former Calgary Health Region, which was responsible for the daily operations of the pHIE under an agreement with Alberta Health, submitted the original PIA accepted by the OIPC in July 2007 (H1556). With the merging of the Regional Health Authorities into AHS, the pHIE management and operations transitioned to AHS. AHS submitted a PIA addendum to the NCR PIA in November 2012.

b) Identity and Access Management (IAM) System

The IAM system is a secure process and facility that enables ANP users to seamlessly access ANP, PIN, PD and local clinical systems using a single sign-on process.

Data Available

IAM contains the following kinds of health information:

- User ID, name, employee ID and demographics
- Professional designation, status, specialty
- Netcare username, role and permission

Access

Access Administrators (AA's) in AHS, Alberta Health and at community healthcare provider sites which are authorizing users for access to ANP can view and edit data in IAM. ANP users will be edit basic demographic information about themselves. Alberta Health and AHS information technology managers are able to access and edit data to implement approved status changes, maintain the system and provide user support.

Source Systems

AHS ePeople system provides data to establish accounts for AHS employees. Healthcare providers access the PPR to validate the status of most professionals and the DSR to provide authoritative site information. AHS Netcare repositories such as CHR LDAP, along with the PD and the PIN, provide data to confirm identity and allow access.

System Infrastructure

IAM has been developed and maintained by AHS using AHS hardware and network technology.

Privacy Compliance

AHS submitted a PIA for IAM to the OIPC in 2012. The AHS IAM is the system being used by AHS for their internal systems and will eventually replace the existing Alberta Netcare User Registration Process that is captured in the ANP PIA. Alberta Health will update the ANP PIA accordingly before this is implemented.

5. Other Networked Health Information Systems

Alberta Health is either the Information Manager or custodian of the repositories, registries, access tools, and infrastructure components that make up the current Alberta EHR described in the previous section. In addition, there are a number of parallel systems that capture and provide access to health information among multiple custodians. For most of these, AHS is the custodian or Information Manager for community-based custodians, but at least one has been initiated, implemented and maintained locally, with the community-based custodian as Information Manager for other community-based custodians. These Other Networked Health Information Systems

a) Diagnostic Imaging (DI)/Provincial Picture Archiving and Communication System (Provincial PACS)

A repository of digital diagnostic images generated by AHS and community DI providers in Alberta, including X-Rays, Magnetic Resonance Images (MRIs), Computed Tomography (CT) scans, Ultrasound, Electrocardiographs (ECGs). Provincial PACS is made available in conjunction with the Alberta Netcare Portal. AHS collects images from community DI providers to make it available via Netcare. AHS is the custodian of the Provincial PACS and AHS and the community DI providers have entered into a Diagnostic Imaging Participation Agreement (DIPA).

b) Electronic Referral Systems

This is a community-developed system in Edmonton that supports the workflows associated with referral management, including identifying specialists, scheduling events, and managing follow-up through the use standardized specialist referral forms via a web-based product. Local referral systems are already in place in some Primary Care Network (PCNs), but are distinct from the eReferral system currently being developed by Alberta Health. Individual physicians and specialists are the custodians of this information, with another PCN acting as Information Manager.

D. GOVERNANCE

1. Health Information Act (HIA)

The structure and development of the Alberta EHR is in part directed by the HIA, which governs the collection, use, disclosure and protection of health information generated by Alberta Health, AHS and most professional healthcare providers in the province. The HIA allows healthcare providers to share among them health information about patients or clients without the consent of the patient or client so long as it is limited to authorized purposes and following specific security processes and standards. The Act and its accompanying EHR Regulation adds further detailed content and information handling standards for submission and security of health information in the Alberta EHR.

a) Custodianship and Information Manager Roles

A custodian is defined in section 1(1)(f) of the HIA and includes Alberta Health, AHS and health professionals designated as custodians in the HIA Regulation.

A custodian is responsible to collect, use, disclose and protect health information within its custody and control in accordance with provisions set out in the HIA. A Custodian also has a duty to identify its affiliates (employees, Information Manager's and persons who provide services for the custodian) and to take reasonable steps to ensure they comply with the HIA and the custodian's policies and procedures. An affiliate's collection, use or disclosure of health information is considered to be a collection, use or disclosure by the custodian. An affiliate must comply with the HIA and the custodian's policies and procedures.

An "authorized custodian" is a custodian who has been given access to the Alberta EHR and includes Alberta Health, AHS and any other custodian that meets the following eligibility requirements set out in the EHR Regulation:

- completion of a PIA;
- completion of Organizational Readiness Assessment (pORA);
- conclusion of an Information Management Agreement (IMA) with Alberta Health;
- obtaining approval from Alberta Health;
- coverage under its health professional body Standards of Practice for health information management and security.

In addition, under the HIA s.56.5,authorized custodians outside of Alberta Health and AHS may only use prescribed health information for authorized purposes of providing health services, verifying eligibility for services and benefits, or for obtaining or processing payments for health services .

D. GOVERNANCE

1.	2.	3.	4.
Health Information Act	**Governance Structure**	EHR Governing Agreemens	Policy and Standards

The EHR Regulation designates Alberta Health as the Information Manager of the Alberta EHR (s. 2). In this role, Alberta Health is obligated by s. 66(4) and (5) of the HIA to only use or disclose health information for purposes authorized by the Information Manager Agreement and to comply with the HIA.

"Authorized custodians" who contribute to or access health information made available through the ANP are participating in the integrated electronic health information system established to provide shared access to health information. Custody and control of this information, and the duties to use, disclose and protect the information in the AB EHR is shared amongst all participating custodians.

As the Information Manager of the Alberta EHR, Alberta Health is obligated by the HIA s. 66(2) and the Health Information Regulation s. 7.2, to manage its collection, use and disclosure of health information from all sources according to prescribed purposes, to respond to access and correction requests, to protect and store health information securely, and to implement expressed wishes of patients according to the IMA and the IEP with authorized custodians.

b)   The Office of the Information and Privacy Commissioner of Alberta (OIPC)

This office, under mandate from the Legislative Assembly of Alberta, has been given powers to monitor and enforce compliance with the HIA of custodians and their affiliates, including Information Manager's. The OIPC receives and investigate complaints and issues, conducts inquiries, and issues binding orders relating to compliance with the HIA.

Under the HIA s. 64, all custodians must submit to the OIPC a PIA of any new policy, practice or system collecting, using and disclosing health information or affecting the privacy of individuals identified in the health information.

2.   Governance Structure

Alberta Health has established an extensive and comprehensive provincial health system Information Management/Information Technology (IM/IT) governance structure to ensure that custodians and Information Manager's collect, use, disclose and secure health information in the Alberta EHR network in compliance with the HIA.   The agencies and offices involved in leading, planning, directing, monitoring and executing the Alberta EHR at Alberta Health, and their relationships and roles, are documented in the following chart:

Alberta Provincial Health System IM/IT Governance Model
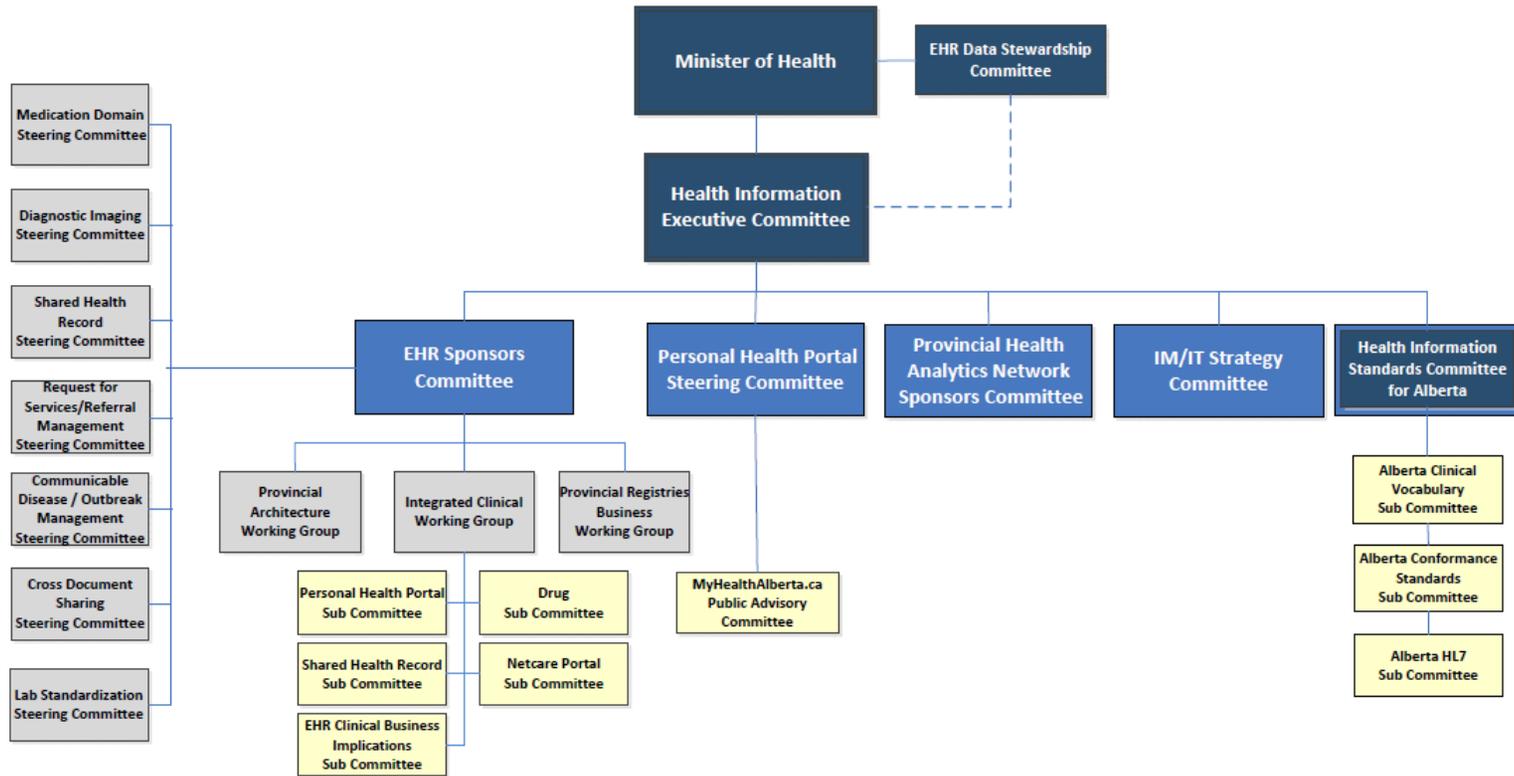
Governance Structure - Scope
May 22, 2013

| STRATEGY Vision, strategy, business plan, priorities, budget | DIRECTION Oversight of execution, consistency with business directions, recommend | EXECUTION Execution, delivery, implementation | Sub Committees as Required |

Figure 4
Alberta EHR Governance Structure

a) Minister of Health

The Minister of Health has the highest executive authority and accountability for governing the privacy and security of the Alberta EHR. Ministerial authority is directly cited in many provisions within the HIA, specifically relating to use and disclosure of health information for department purposes, and in particular, for the development and operation of the Alberta EHR.

On a program level, the Minister directs and monitors Alberta Health progress in achieving goals and strategies. For example "*Becoming the Best: Alberta's 5-year Health Action Plan, 2010-2015*", includes, under the Build One Health System Strategy, the objective to "use technology to share health information, while ensuring personal privacy."   This action plan may change in the future but the Minister's mandate will continue.

b) EHR Data Stewardship Committee (EHRDSC)

The EHR Data Stewardship Committee (EHRDSC) is the collective representative of the custodians, users, patients, and public stakeholders of the health system and the key governing body of the Alberta EHR. The custodians include Alberta Health, AHS, physicians (represented by CPSA and Alberta Medical Association (AMA)), pharmacists (represented by Alberta College of Pharmacists (ACP) and Pharmacist Association of Alberta (RxA)). The committee also includes 3 members of the public, a medical ethicist, representatives from the Federation of Regulated Health Professionals and academic representatives from Alberta universities. The 2010 amendments to the HIA (Part 5.1), made it mandatory for regulated health professionals to submit prescribed health information of their patients to the Alberta EHR system, as directed by their health professional body (HPB) or by Alberta Health, in consultation with the HPB and the OIPC. The HIA s 56.7(1) also established the EHRDSC to ensure adequate custodian and public consultation on rules related to access, use, disclosure and retention of prescribed health information through the Alberta EHR.

The EHRDSC sets out the specific rules for Alberta EHR use of prescribed health information in the Alberta Netcare IEP. The IEP is incorporated by reference into the Alberta EHR IMA, which means that all Alberta EHR users must adhere to the IEP. The rules in the IEP work in conjunction with the HIA and authorized custodians must ensure all authorized Alberta EHR users fully comply with the HIA and the IEP when using prescribed health information in the Alberta EHR. The EHRDSC reviews and approves standards and processes for user access management, including audit logging, masking and the ANP User Access Matrix.

c) Health Information Executive Committee (HIEC)

The Health Information Executive Committee (HIEC) has overall responsibility to provide strategic leadership for the Alberta EHR and initiatives in the publicly funded IM/IT health sector, as well as for intergovernmental EHR and e-health initiatives. This committee is chaired by the Deputy Minister (DM) of Health, and includes the highest executive officers of AHS, AMA, and ACP, along with the two AHS senior executive members and the Assistant Deputy Minister (ADM) of Alberta Health responsible for health information IT. The committee reports directly to the Minister of Health.

This committee approves the terms of reference and strategic direction for the IM/IT Strategy Committee, the EHR Sponsors Committee, and steering committees for specific initiatives. The HIEC approves the five-year strategic IT plan for the Alberta EHR and ensures alignment with national and international EHR initiatives. They have a key role in advising and guiding the EHRDSC on EHR priorities and strategic direction.

d) EHR Sponsors Committee

The EHR Sponsors Committee, reporting as an advisory committee to the HIEC, is responsible for directing, coordinating and monitoring all provincially funded e-Health initiatives including ANP enhancements to ensure they meet the EHR standards and objectives set by the HIEC and the EHRDSC. This committee appoints and sets terms of reference for various project-based steering committees implementing specific EHR initiatives. Currently, these initiative-level committees include the Medication Domain Steering Committee, the Diagnostic Imaging Steering Committee, the Shared Health Record Steering Committee, the Chronic Disease Management Steering Committee, the Referral Management Steering Committee and others. There are also three working groups that report to the EHR Sponsors Committee - they include the Provincial Architecture Working Group (PAWG), the Integrated Clinical Working Group (ICWG)and the Provincial Registries Working Group (PRWG).

The (PAWG) reviews and aligns IT design of Alberta EHR systems with provincial IT architectural plans and criteria.

The (ICWG) is a multidisciplinary working group overseeing a number of specialized system subgroups to ensure that clinical functions, issues, and needs are addressed and integrated into the EHR systems during their design, implementation, and operation. ICWG forwards recommendations regarding policy and strategy to the EHR Sponsors Committee when appropriate.

A number of additional sub-committees, reporting directly to ICWG, guide and design implementation of current EHR initiatives supporting such areas as diagnostic imaging, chronic disease management, and the SHR. All Alberta Health or AHS project and delivery teams deploying and maintaining the EHR component systems report regularly and work directly with these workgroups, subgroups, and steering committees.

e) Personal Health Portal Steering Committee (PHPSC)

Reporting to HIEC, PHPSC provides guidance and decision-making on business issue and planning for PHP investments, PHP information management content, functionality, technology and services in alignment with provincial plans, communication among stakeholders and with the public on PHP, and coordination support between and within PHP stakeholder groups.

f) Provincial Health Analytics Network Sponsor Committee (PHANSC)

The Provincial Health Analytics Network (PHAN) is the authoritative source of clinical and administrative data maintained specifically for health system analytics. The PHAN will provide an environment where data sets from contributing stakeholders can be analyzed and interrogated in support of health systems management, clinical program improvement, monitoring of health in Alberta and related health research. The PHAN, as a repository, will be complemented by a robust and mature analytic competency that will provide expertise to various consumers of data. This centralized analytics core will be connected to program-embedded analysts across Alberta Health and AHS, in addition to providing support to other health system stakeholders including academic research, the Health Quality Council of Alberta (HQCA), the Institute for Health Economics and other Government of Alberta departments. Reporting through to HIEC, the Provincial Health Analytics Network Sponsors Committee (PHANSC) is the joint advisory body that will monitor and assess the relationship between health information held in the EHR and the PHAN.

g) IM/IT Strategy Committee

Made up of representatives from AHS and Alberta Health, along with healthcare professional body membership, the IM/IT Strategy Committee is an advisory committee mandated to develop the 5 year strategic plans for the Alberta EHR.   The IM/IT Strategy Committee reports to HIEC.

h) Health Information Standards Committee for Alberta (HISCA)

Health Information Standard Committee for Alberta (HISCA) sets and coordinates implementation of health information standards for the Alberta health system that are consistent with national and international standards. This includes minimum data sets as well as content and format standards.

3.   EHR Governing Agreements and Programs

a) Information Exchange Protocol (IEP)

This protocol was first developed and affirmed by Alberta Health, the predecessor health regions of AHS, and key health care professional bodies in 2003, and was most recently updated in 2007. The IEP in conjunction with the HIA establishes the conditions and terms for the exchange of health information within the Alberta EHR.

The IEP provides detailed rules and procedures for use, disclosure, right of access, integrity, and security of health information accessed by healthcare providers using Netcare, including roles and procedures for breach investigations. The protocol is part of the conditions understood and accepted by authorized custodians when they sign the IMA prior to gaining access or contributing to various components of the Alberta EHR.

D. GOVERNANCE

1.
Health
Information Act

2.
Governance
Structure

3.
EHR Governing
Agreemens

4.
Policy and
Standards

b) Information Sharing Framework (ISF)

The ISF is a collaborative effort between AHS and the AMA that enables the creation of shared electronic medical records across the ambulatory/outpatient care environments. The ISF establishes a co-custodial model and governance structure for the shared EMR, creates a formal information management relationship between participating physicians and AHS and establishes a neutral oversight body to oversee compliance with the ISF agreements and address privacy and security considerations. The ISF became operational in the Edmonton area in March 2012 and will be extended into the Calgary area in mid-2013. The ISF is sufficiently flexible to allow for additional shared EMRs to be added to the framework as needed.

4. Policy and Standards

Alberta Health operates and maintains a program of standards, processes, and technology to health information in the Alberta EHR as a trusted network. The goal of this program is to protect health information from unauthorized access, modification, destruction, or inaccessibility.

a) Government of Alberta (GoA)

Alberta Health and by extension its affiliates and partners in the Alberta EHR also operate under the standards of the Government of Alberta (GoA) Information Security program led by Service Alberta. The Alberta Health Information Security Management Directives have been established to demonstrate compliance.

b) Alberta Health

Alberta Health has in place a comprehensive series of information management policies covering all aspects of access and privacy management of Alberta EHR health information under its custody, in line with both the HIA and the *Freedom of Information and Protection of Privacy* Act (FOIP).

c) Alberta Health Services (AHS)

AHS manages its Alberta EHR components on behalf of Alberta Health as the Information Manager. Health information in the AHS Trusted Zone is governed by a full series of Information Management policies covering all required areas of health information access, privacy and security.

d) Health Professional Bodies (HPB)

In compliance with the EHR Regulation, s.3 (1)(f), the HPB of custodians who as independent professionals are applying for access to Alberta Netcare must have in place Standards of Practice covering the protection, privacy and security management of health information as records in all formats by its members. The health professional bodies of physician and pharmacist custodians accessing Alberta Netcare currently have these Standards of Practice in place.

E. PRIVACY AND SECURITY CONTROLS

1. Privacy and Security Requirements Assessments and Processes

a) Privacy Impact Assessments (PIA)

Based on the OIPC Guidelines, this extensive assessment document is required by the HIA s. 64. Before implementing any new systems, policies, or practices involving identifiable health information in the Alberta EHR, Alberta Health must complete and submit to the OIPC of Alberta a PIA that describes the proposed new project, the health information made available, the privacy risks and measures used to mitigate the risks, and the privacy organization, policies, and governance structures in place to protect and manage the health information.

PIAs have been submitted for all current components of the Alberta EHR, with a number of new submissions, addenda and updates planned for the near future. Because the Alberta EHR is jointly developed and operated by Alberta Health and AHS, Alberta Health and AHS have instituted a system of joint PIA submissions, with one custodian named as either the Owner or Key Stakeholder, but with both custodians contributing to development and signing off. The role of each custodian in an Alberta EHR PIA process will be dependent on the degree to which they have direct responsibility for developing the system and maintaining the health information. The current status of Alberta EHR PIAs, and the respective roles of Alberta Health and AHS in developing and maintaining these PIAs, is documented in the following table based on information at the time of writing of this report:

Alberta EHR Related Privacy Impact Assessments

PIA Short Title	Leader/ Owner	Date Submitted To OIPC	PIA Status	OIPC File #
Alberta Netcare Portal (ANP)	AH	Oct 2010	Accepted March 18, 2013	H3879
ANP Guidebook	AH	n/a	n/a	n/a
Communicable Disease and Outbreak Management (CDOM) - Data Transfer to Alberta Health	AH	February 2013	Accepted February 2013	H5297
An Overview of Alberta Electronic Health Record Information System	AH	Fall 2012	Accepted as part of ANP PIA	H3879
Family Care Clinics PIA	AH	n/a	In Progress	
Immunization / Adverse Reaction (Imm/ARI)	AH	November 2008	Accepted May 2009	H2335
Imm/ARI First Addendum	AH	October 2009	Accepted January 2010	H3128
Imm/ARI Second Addendum	AH	November 2010	Accepted January 2011	H3889
Imm/ARI Third Addendum	AH	February 2011	Accepted	
Imm/ARI Fourth Addendum	AH	April 2011	Accepted	
Imm/ARI Fifth Addendum	AH	November 2012	Under OIPC Review	H5174
Pharmaceutical Information Network (PIN)	AH	Sept 2001	Accepted July 2002	H3213
PIN First Addendum	AH	July 2002	Accepted August 2002	H0023
PIN Second Addendum	AH	December 2003	Accepted March 2004	H2058
PIN Third Addendum	AH	June 2007	Accepted	H1642
PIN Fourth Addendum	AH	April 2008	Accepted	
PIN Fifth Addendum	AH	August 2009	Accepted	
PIN Sixth Addendum	AH	January 2010	Accepted	H3213
Personal Health Portal (PHP)	AH	Oct 2012	Not accepted	H0565, H0051
PIA Template for Real Time Integration of Pharmacy Practice Management System (PPMS) with the PIN	AH	n/a	Consulting with RxA and OIPC	n/a

Figure 5
Current Alberta EHR PIA Status

Alberta EHR Related Privacy Impact Assessments
(Continued)

PIA Short Title	Leader/ Owner	Date Submitted To OIPC	PIA Status	OIPC File #
Person Directory (PD)	AH	Feb 2002	Accepted July 2002	H5074
Provincial Client Registry (PCR)	AH	Sept 2006	Accepted Sept 2007	H1397
Provincial Provider Registry (PPR)	AH	May 2009	Accepted Sept 2009	H2790
Provincial Health Information Exchange (pHIE) Phase 1	AHS	Feb 2007	Accepted July 2007	H1556
Netcare Clinical Repositories (NCR)	AHS	May 2012	Accepted January 31, 2013	H4859
NCR Addendum - Chronic Disease Management systems (CDM) and Alberta Real Time Syndromic Surveillance Net (ARTSSN)	AHS	May 15, 2013	Accepted July 24, 2013	H5493
NCR Addendum - pHIE	AHS	Nov 2012	Accepted February 14, 2013	H5173
NCR Addendum - Shared Health Record (SHR)	AHS	Nov 2012	Under review by the OIPC	H5223
Identity and Access Management	AHS	May 2012	Under review by the OIPC	H4836
Provincial PACS / DI	AHS	August 2012	Accepted April 26, 2013	H5004

Figure 5
Current Alberta EHR PIA Status

b) Minimum Connectivity Requirements (MCR), Secure Connectivity Requirements (SCR) and Trusted Zones

Both Alberta Health and AHS are designated trusted zones for transmission of and access to health information in the Alberta EHR. AHS successfully completed the MCR, SCR 2004 and SCR 2005 security assessments projects which were developed and funded by Alberta Health. These assessments were implementations of the International Standards Organization (ISO) 17799 (currently known as ISO 27002) Code of Practice for Information Security Management. Because of the implementation of MCR and SCRs, AHS network environment is considered trusted. Access to Alberta Netcare from within AHS and Alberta Health trusted network environment does not require a two-factor authentication.

c) Provincial Organizational Readiness Assessment (pORA)

The pORA is an auditing tool and process to ensure that each Alberta Netcare custodian has required processes and measures in place to handle access in compliance with Alberta EHR policy and standards. Completed pORA sections must be reviewed and approved by Alberta Health before connectivity is approved.

Section 1 covers mandatory security requirements for all proposed sites, including:
- security awareness and training
- security administration
- security policy
- termination processes
- computer workstation security
- software installation
- authentication and authorization
- internet security software
- firewalls
- patching
- threat and risk assessment
- incident response

Section 2 is required for S2S connections to Alberta Netcare, including source system connections transferring data from the health care site to an EHR component. This section covers:
- user access in compliance with the HIA
- information security classification
- secure storage
- physical security
- access log reviews
- network segregation
- password file encryption
- inactivity session timeout
- password standards
- remote access.

Section 3 must be completed for sites using wireless devices to transmit and access health information in Alberta Netcare. This section addresses wireless use procedures, access point security, transmission encryption, network device tracking, as well as wireless system maintenance, assessment and training.

2. Managing Deployment of Alberta EHR Systems

Before connecting users in a community health clinic or facility to any Alberta Netcare service on the network, Alberta Health begins an extensive review and deployment process to ensure that all elements of Alberta EHR requirements are met. The eHealth Support Team and eHealth Consultants work across geographic areas and disciplines, manages this process.

The deployment transition process involves initial post-deployment planning, assessing and establishing readiness for access, implementation support, and post-deployment evaluation. The components of this process are summarized in the figure below:
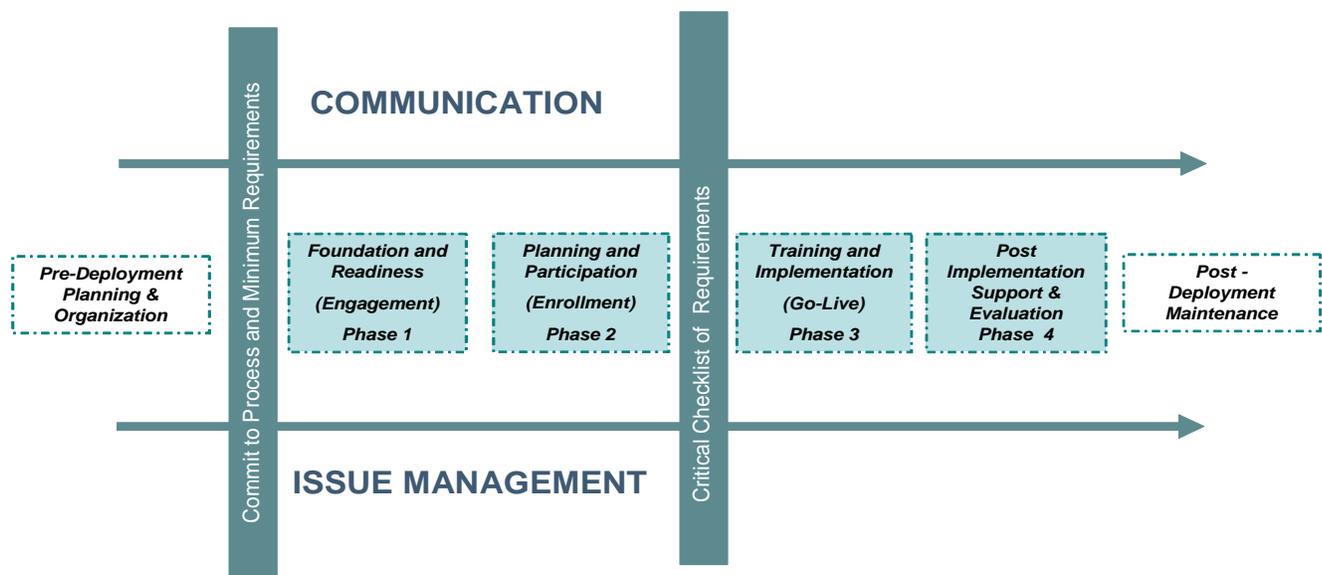

Figure 6
Alberta EHR Deployment Strategy

a) Pre-Deployment Planning and Organization

During this stage, the eHealth Consultant meets with the custodian to:
- identify the scope of the deployment
- conduct a gap analysis of current readiness
- identify stakeholders
- establish timelines, milestones and resource requirements and
- identify and mitigate potential risks

The eHealth Consultant, with the custodian, then either commits to the next phase or decides not to proceed.

b) Foundation and Readiness

At this stage, the custodian must complete the assessment requirements and agreements required under the HIA s.56.1 (b) (ii), and the EHR Regulation, s.3 (1). The first step is to ensure that the health professional body regulating the custodian has developed and implemented its required Standards of Practice. Once this is established, the custodian must complete and submit:

- a PIA assessing the custodian's organizational privacy management and project proposal. The PIA must be submitted to the OIPC;
- relevant section of pORA for review by the Alberta Health HIA Policy, Privacy and Security Unit, along with the PIA file number that has been assigned by the OIPC; and
- the IMA and acceptance of the accompanying IEC, for submission to Alberta Health HIA Policy Team via the Alberta Health HIA Policy, Privacy and Security Unit.

c) Planning and Participation

Once the PIA has been accepted, the pORA can then be reviewed and approved. The eHealth Consultant and custodian then assign and register an AA, establish roles and responsibilities for managing system access and privacy on-site, plan for training, and begin user registration.

d) Training and Implementation

With the organizational and technical infrastructure in place, the eHealth Support Team and custodian will begin controlled distribution of user IDs and fobs as needed, deliver the training plan and training materials, and support the initial login of new users. At this point, access to the Alberta EHR system is fully implemented.

The Alberta Netcare Access Re-engineering Project will also include Health Information Act (HIA) E-training including custodian and affiliate responsibilities, that will be consistent for all Alberta Netcare users. The HIA E-training module has been developed by Alberta Health, after extensive stakeholder consultation, and development details for this module are currently being finalized, with the target date being before the end of the 2013-2014 fiscal year. In addition, the Alberta Netcare Access Re-engineering Project will also force an annual validation of ANP users' accounts.

e) Post-Implementation Support and Evaluation

During the 2-6 weeks after go-live, the eHealth Support Team will identify and address any issues and adjust processes and workflows accordingly. This may require retraining. At this point, the eHealth Support Team completes a Post–Implementation Evaluation to establish that the deployment has been successful.

f) Post-Deployment Maintenance

Alberta Netcare provides ongoing upgrades, assessment, training, troubleshooting and staff change support. In addition, Alberta Health will continue to log and monitor usage, including support for review of audit logs.

3. Maintaining Alberta EHR Privacy and Security

a) Access Administrators (AA)

Alberta Health

The Assistant Deputy Minister of the Health Information Technology and Systems Division, who is also the Chief Information Officer (CIO) for the department, is responsible for the AAs at Alberta Health. Currently, Alberta Health has three AAs, who are from the Alberta Health Privacy Team. These AAs are responsible for reviewing all Alberta Netcare User Registration forms and who then execute them so that access can be granted to Alberta Health Affiliates. These AAs also provision the accounts of the AHS AAs and the eHealth Consultant.

AHS

The VP/CIO of AHS is responsible for the AAs at AHS. Currently, AHS has seven AAs, who are from the AHS IT Security and Compliance - Access, Information Management and Technology Services (IMTS). These AAs are responsible for reviewing all Alberta Netcare User Registration forms and who then execute them so that access can be granted to AHS Affiliates. When the AHS CIO wants to designate an individual as a new AHS AA or wants to remove an individual as an AHS AA, the completed form is submitted to the Alberta Health AAs so that the account can be provisioned or deleted.

Community Sites

Community sites that have been approved for connection to the Alberta Netcare network assign and register an AA at their site to:
- register, approve, maintain and manage users and permission levels
- coordinate and deliver user training in information security and privacy, including information security incident response procedures
- report information security incidents to Alberta Netcare and assist in investigations and
- identify and report changes in security or privacy controls.

The AA is trained in user access and security standards set out in the *Alberta Netcare Access Administrator Reference Guide*.

b) User Access Management (UAM)

Currently, pharmacists, physicians and nurses are the health service providers that can become Authorized Custodians. Decisions on when to add a new health service provider is based on what professions most require access to ANP and the applications that are viewable through it. Professional Colleges must establish their Professional Standards of Practice that need to address how they will manage information in a record and how they will manage electronic records, including, without limitation, standards respecting the protection, privacy and security of electronic records. These guidelines then need to be reviewed and accepted by Alberta Health. No other colleges have met this requirement to date.

Alberta Health conducts a review of the ANP Permission Matrix and other user access management proposals to determine if changes to the permission matrix will be required to add this new health services provider or if an already established role is sufficient. When the department makes the decision to add a custodial body, that decision is conveyed to the EHRDSC for information.

To ensure that the least amount of health information is accessed to complete their functions at the health site or facility, users are given access to specific screens or data elements in Alberta Netcare Portal, for instance, based on 6 Administrative, 10 Clinical and 5 Pharmacy levels. The ANP Permission Matrix below describes these levels and the information accessed:

User Role	Description	Demographics	Patient Search	Patient Lists	Limited patient Search	Restricted Patient Lists	Favorites	Access PD	Access PIN	Document Forwarding	Messaging	Lab	Event & Immunization History	Transcribed Reports	Clinical Documents	View (PIN)	Prescribe	Prescribe Delegate	Dispense	View PD	Update PD	Update Newborn	View Newborn	SDM	SMT	eSignature
Administration	**Functions Supported**																									
Admin 1	Full Demographics, PD, Update Inc. Newborn - Health Records	Y	Y				Y	Y	N		Y					N	N	N	N	Y	Y	Y	Y			
Admin 2	Full Demographics, PD View/Update - Health Records	Y	Y				Y	Y	N		Y					N	N	N	N	Y	Y	N	N			
Admin 3	Full Demographics, PD View - Admitting Clerk	Y	Y				Y	Y	N		Y					N	N	N	N	Y	N	N	N			
Admin 4	Full Demographics, PD View Inc. Newborn - Admitting Clerk	Y	Y				Y	Y	N		Y					N	N	N	N	Y	N	N	Y			
Admin 5	Identifier Search, Concerto Only	Y			Y		Y	N	N		Y					N	N	N	N	N	N	N	N			
Admin 6	PD Only - Billing Clerk							Y	N		Y					N	N	N	N	Y						
Clinical	**Typical Member**																									
Clinical 1	Physician, IMG Physician	Y	Y	*			Y	Y	Y	Y	Y	Y	Y	Y	Y	Y				Y				*	*	*
Clinical 2	Fellow, Medical Resident, Nurse Practitioner, Medical Intern, Physician Assistant	Y	Y	*			Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y		Y				*	*	*
Clinical 3	General Clinical - Name or ID Search	Y	Y	*			Y	Y	Y	Y	Y	Y	Y	Y	Y	Y				Y				*	*	*
Clinical 4	General Clinical - Name or ID Search, no Lab	Y	Y	*			Y	Y	Y	Y	Y		Y	Y	Y	Y				Y				*	*	*
Clinical 5	General Clinical - ID Search by ULI or MRN	Y			Y		Y	N	Y	Y	Y	Y	Y	Y	Y	Y				N	N	N	N	*	*	*
Clinical 6	General Clinical - access from patient list only - Capital Health only	Y				Y		N	Y	Y	Y	Y	Y	Y	Y	Y				N	N	N	N	*	*	*
Clinical 7	General Clinical - ID Search, Lab, Transcribed Reports	Y			Y		Y	N	N	Y	Y	Y		Y	Y	N	N	N	N	N	N	N	N	*	*	*
Clinical 8	General Clinical - Name or ID Search, PIN, PD, Lab, Transcribed Reports	Y	Y	*			Y	Y	Y	Y	Y	Y		Y	Y	Y				Y	Y			*	*	*
Clinical 9	General Clinical - Name or ID Search, PIN + PD only (Admin Support, Clerks, Health Records)	Y	Y				Y	Y	Y		Y					Y				Y				*	*	*
Clinical 10	General Clinical - Name or ID Search, PIN, PD, Lab Only	Y	Y	*			Y	Y	Y	Y	Y	Y				Y				Y	Y			*	*	*
Pharmacy	**Typical Member**																									
Pharmacy 1	Pharmacist - Name or ID Search, no Event History or Transcribed Reports (Community)	Y	Y	*			Y	Y	Y	Y	Y	Y			Y	Y			Y	Y				*	*	*
Pharmacy 2	Pharmacist - Name or ID Search (Cancer Board)	Y	Y	*			Y	Y	Y	Y	Y	Y	Y	Y	Y	Y			Y	Y				*	*	*
Pharmacy 3	Pharmacist - Search by ID (Hospital)	Y			Y		Y	N	Y	Y	Y	Y	Y	Y	Y	Y			Y	N	N	N	N			
Pharmacy 4	Pharmacy Technician - Name or ID Search, no Event History or Transcribed Reports	Y	Y	*			Y	Y	Y	Y	Y	Y			Y	Y				Y				*	*	*
Pharmacy 5	Pharmacy Staff - Name or ID Search, no Lab, Event History or Transcribed Reports	Y	Y	*			Y	Y	Y	Y	Y				Y	Y				Y				*	*	*

* - Capital Health Region only, when appropriate forms are completed and signed by approved authorized
Y - standard access components
N - PIN/PD access component not available
blank - Portal access component not available
blank - PIN/PD access optional on a need to know basis

Figure 7
ANP Permission Matrix

Prior to the addition of new roles, which is indicated by additional custodians or applications (e.g. Alberta Health HIA Policy Team recommends addition of new custodians, to the Alberta Health CIO, as appropriate), the Alberta Health Security Team reviews to determine if the existing roles will meet the needs, or if new permissions/roles need to be added to the ANP Permission Matrix and the same is said for new applications. This is then vetted by the Health Sector Security Working Group (HSSWG) and then is sent to the EHRDSC for approval.

Once formal approval is received, the normal Alberta Health Change Advisory Board (CAB) process is followed. The Alberta Health Privacy Team works in collaboration with the Alberta Health HIA Policy and Alberta Health Security teams to review these changes and ensures that a privacy assessment is completed/ updated as appropriate.

c) Authentication

Users accessing Alberta EHR systems within a secure network zone such as at AHS facilities use their username and password to verify their identities and log in to the system. Users accessing from other sites outside of a secure zone (including community, family physician clinics, and pharmacies) must use "two factor" authentication, such as a hardware or software token they have in their possession, in addition to their username and password.

It is prohibited to share or allow others to user your username, password or security token to sign in to an Alberta EHR system. This behaviour is reinforced through policy, training, and the knowledge that audit logging exposes the authentication owner to investigation and sanctions.

The new Identity and Access Management (IAM) system will enable users to seamlessly access ANP, PIN, PD and local clinical systems using a single sign-on process. This will not only improve the systems, but also decrease the need to remember multiple passwords.

d) Masking Patient Information

Patients have the option of requesting that their health information in Alberta Netcare be "masked" using the Global Person Level Masking (GPLM) process.   When information about an individual is masked, it will not be automatically visible when a record is accessed, except for first and last name, date of birth, gender and personal health number. This has been implemented so that expressed wishes by patients to limit disclosure of their health information (HIA s. 58(2)) can be considered and accommodated.

Currently GPLM is only available for health information accessed through ANP. Alberta EHR information transmitted by S2S messaging directly from repositories and registries to local EMRs and PPMSs cannot currently be supported by GPLM. This is limited to a small number of clinics and pharmacies, and Alberta Health is committed as part of the SHR initiative to enabling GPLM for S2S connections in the future.

To request a mask, the patient must contact a participating custodian, ideally one with whom they already have a current care relationship. The custodian can assist them in completing the request and will submit the application on behalf of the individual to Alberta Netcare. Before submitting the application, the custodian must discuss the consequences of applying and rescinding a mask with the individual. There may be circumstances where a custodian is unable to authorize that an individual's information be masked, for example, if masking that information could pose a threat to public health and safety.

Authorized custodians will know if a patient record in ANP is masked when a lock icon appears next to the individual's name. The custodian may unmask a record in limited circumstances, such as with the patient's consent or if clinically necessary. The specific authorization categories for unmasking are:

- Direct patient Care – Clinical Need
- Medical Emergency
- Patient Consented
- Public Health Follow-up
- For Authorized Release of Patient Information
- As Required by Law.

A record can be unmasked only by the custodian involved in the specific circumstance and will remain masked for subsequent access events. All unmasking activity is flagged, electronically logged and may be audited.

An individual may request that a mask be rescinded by contacting a participating custodian. A request to rescind a mask may also be initiated by a health service provider if:

- the mask has consequences for public health and safety
- the masking process is no longer consistent with the custodian's professional practical guidelines or
- there are other compelling reasons to rescind the mask.

Custodians or delegates will make every attempt to inform the individual of their decision prior to removal of the mask.

All completed GPLM application forms to add or remove masking in a record are faxed to and handled by the AHS Edmonton Zone Patient Information Services. The custodian retains a copy of the forms in their local files. The mask is usually set or rescinded within 3 business days.

Alberta Health is responsible for establishing and communicating the formal GPLM process. The Alberta Health HIA Help Desk offers support to individuals who request their information be masked by providing information about the masking process and the authorized custodian's or regulated health professional's role in the process. AHS operates the technology and workflow processes that support GPLM.

e) Auditing Access by Users

All activity by users accessing ANP is recorded in event logs. These records are key information sources for deterring and detecting unauthorized use or modification of health information. The audit logging procedures are in compliance with standards set out in the EHR Regulation, ss. 6 and 7. Audit logs contain the following information about each event:

- *User ID or application ID associated with an access*: this is a unique identifier for a user or application.

- *Name of user or application that performs an access:* this is the full name of a user that accesses a patient's record. In the case of system-to-system communication, this is the application name.

- *Role (or profession or occupation) of a user who performs an access*: the job function of a user performing an access. For instance, physician, pharmacist, nurse, etc.

- *Date of access*: the day, month and year that a user or application performs an access.

- *Time of access*: the hour, minute and second that an access is performed.

- *Actions performed by a user during an access*: this may include one or a combination of the following: create, view, update or modify, delete, patient search, copy, print, etc.

- Name of facility or organization of access.

- *Display Screen Number or Reference*: the user interface or application that was used during an access, for instance, PIN.

- *Stakeholder unique identifier*: example of unique identifier includes Medical Record Number (MRN) and Personal Health Number (PHN).

- *Stakeholder name*: the name of the patient whose information is being accessed.

The audit log reviews use a series of audit reports that flag events which exceed threshold levels. These criteria are approved by the EHRDSC and documented in the Provincial *Logging and Audit Standard*:

- *Frequently Accessed Record Audit***:** this report generates information about patient records that have been accessed several times within a specified period of time. This audit is performed by Alberta Health monthly.

- *User Name Search Audit:* the report generates the list of users who accessed their personal records within a specified period of time.

- *Same User Same Patient Last Name Search Audit:* this report generates a list of users who access the records of patients who have same last names as them within a specified period of time.

- *Unmasking Decision Audit:* this report provides information about a user who unmasked and accessed a patient's record within a specified period of time. This audit is performed monthly.

- *Lack of Use Audit:* this report generates a list of users who have been inactive within a specified period of time. Using interim tools Alberta Health is able to provide each custodian with their users that include inactive users for review and action. It is anticipated that inactive user's cleanup will be greatly enhanced with the deployment of the Identity and Access Management project, which will provide the audit toolset.

- *Frequent Failed Login Audit:* this report generates the number of failed login attempts for each user within a specified period of time.

- *Patient Activity Audit*: this report provides detailed access for a particular patient within a specified period of time.

- *User Activity Audit:* this report provides detailed access activities of a user within a specified period of time.

The Alberta Health HIA Policy, Privacy and Security Unit (P&SU) proactively conducts random, upon request and monthly audits from the generated user access log of all ANP activity. The monthly audits are mandated by the revised EHR Regulation. Individuals can also submit an HIA Access Request to the Alberta Health FOIP Office to obtain a copy of an audit log, for a specific period of time, so that they may find out who has been accessing their EHR. Custodians or individuals who suspect that their EHR has been inappropriately accessed can raise this concern with Alberta Health.

If a potential misuse of an Alberta EHR system is detected, Alberta Health P&SU contacts the AA of the practice or, for AHS, the Chief Privacy Officer. The AA will investigate and report to Alberta Health on the circumstances of the potential breach and whether further investigation is necessary.

f) **Provincial Reportable Incident Response Process (PRIRP)**

To ensure consistency and effectiveness of responses to health information under threat, Alberta Health has instituted PRIRP for all health stakeholders managing or accessing Alberta EHR systems. This process covers breaches of data confidentiality, data integrity and availability and is divided into six phases:

- *Incident Detection and Recording* – identify incident owner and recording source of any suspected threat to health data

- *Classification and Initial Support* – technical review to confirm validity of suspected threat and *activation of initial support* by Incident Response Team. This is basically the incident ownership, monitoring, tracking and communication preparation phase

- *Investigation and Diagnosis* – monitoring, tracking, communication, and implementing measures to mitigate the threat and determine cause of problem

- *Resolution and Recovery* – identify weaknesses to existing processes and make strategic recommendations

- *Incident Closure* – verification of the initial categorization that was assigned to the incident, stakeholder is notified, and then incident is closed

- *Pos- Incident Review* - implement recommendations from Review phase and ensure changes are effective.

Access Administrators are trained to know when and how to follow PRIRP as part of the Netcare deployment process, but incident investigations may be trigged by Alberta Health itself. When an incident is detected, the custodian notifies Alberta Health PS&U, which assesses the threat and activates the Incident Response Team (IRT) to investigate if the breach is validated.

g) Follow-up Remediation and Potential Consequences

Users who do not follow Alberta Netcare security and privacy policies, protocols or procedures can have their access privileges revoked. If a Netcare user deliberately breaches health information or attempts to gain unauthorized access to health information in the system, they can be prosecuted under the HIA and fined up to $100,000. Their professional regulatory bodies may also bring disciplinary charges against the user.

In an open letter to Netcare users in 2012, members of the ICWG and the EHRDSC reiterated these possible sanctions and the professional responsibility of health care professionals not to abuse their access privileges.

h) System Change Management

Alberta Health Change Management Process

Alberta Health has a defined change management process governing changes to the IT environment. This process requires the following steps for any new proposed change:

- formally initiate a change through the submission of a Request for Change (RFC);
- assign change priority and category. This assignment affects the speed at which the change will be addressed, and the route it takes for authorization;
- establish an efficient process for passing the RFC to a change manager and the CAB for approval or rejection of the change;
- plan the deployment of the change, a process that can vary immensely in scope;
- engage the embedded Release Management process to manage the release and deployment of changes into the production environment; and

- conduct a post-change review to determine if the change has achieved its intended goals and objectives.

The following diagram describes the players, circumstances and procedures used to manage system changes at Alberta Health:
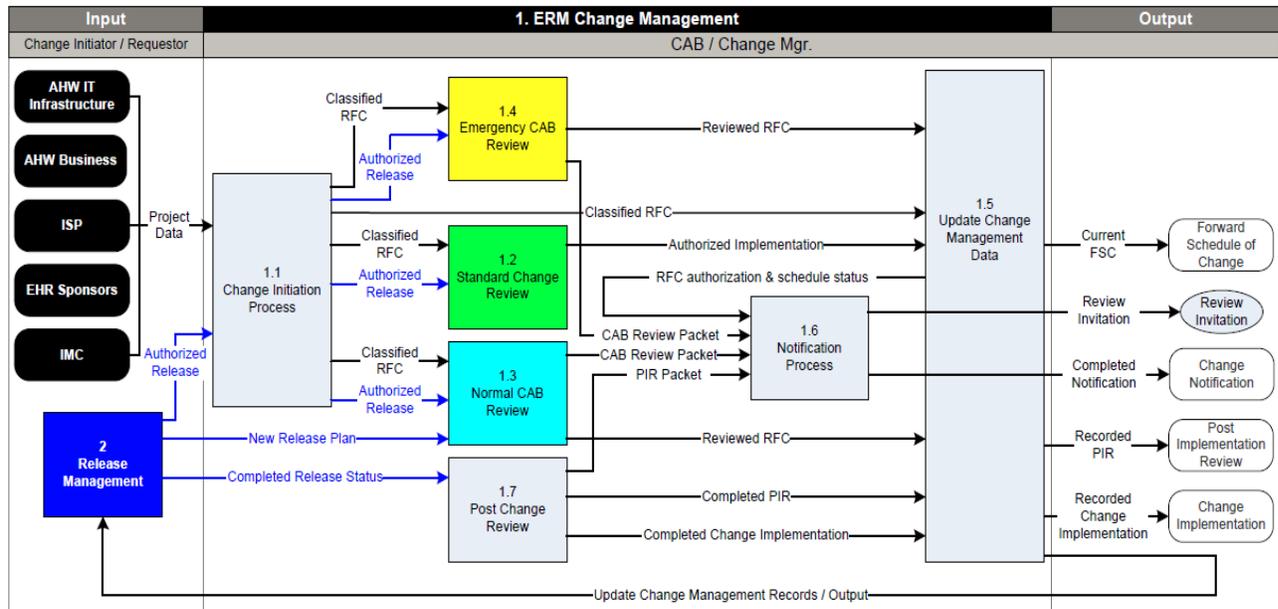

Figure 8
Alberta Health Change Management Process

AHS Change Management Process

For Alberta EHR systems managed by Alberta Health Services, the AHS Change Policy governs "the addition, modification or removal of anything that could have an effect on IT Services". According to this policy, a change is an activity that affects the operation, status, configuration, or capability of a configuration item or service. Changes are categorized into four types by AHS:

- *Normal Change*: a change that may be corrective, an enhancement/upgrade to, or an improvement to the quality of a new or existing service/component. Implementation must be reviewed, approved, and coordinated by Change Management. A Normal Change may be strategic, tactical, or operational in nature.

- *Emergency Change*: a corrective or preventative change required immediately or as soon as possible to restore service due to an incident, or to avoid one. An Emergency change must have a link to an existing High/Critical Priority Incident or Problem record, and may be recorded after implementation.

- *Standard Change*: a change to a service or component for which an accepted, established, and repeatable procedure is used to fulfill a specific change requirement. Standard Changes are typically low-risk and low-impact routine activities, executed through the Change process as pre-approved activities.

- *Project Change*: a master change created when project charters are approved. Multiple Normal changes related to the project can be created with relationships linking them to the master Project change.

Part of the decision-making related to the classification of a given change into one of the above categories involves the completion of a Risk and Impact Assessment tool. This tool, which is attached requires the change "owner" (who has responsibility for the change and its conformance to change management policy) to identify risks and mitigation measures associated with the proposed change.

Prior to the addition of new data feeds that are viewable via the ANP, the data and user permissions will be cross-referenced (by the Alberta Health Privacy Team via the PIA process), against the ANP Permission Matrix to ensure proper access is granted to the authorized users.   If and when a change to the matrix is identified through this process the matrix will be updated as required.

i)   Privacy and Security Training

Alberta Health and Authorized Custodians

Authorized custodians agree to abide by the IEP when accessing Netcare and are responsible for ensuring that they and their authorized affiliates know and follow the required privacy and security policies and procedures, as required by the HIA. It is up to custodians themselves to determine the most appropriate vehicle for this training, but Alberta Health Transition Coordinator teams can provide the following training resources to custodians and their affiliates:
- Assessing the Impact
- Applying the HIA
- General Awareness

Alberta Health will deploy electronic HIA training to all Alberta Netcare users in 2013-2014. All users, including current users, will be expected to complete this training before being given access to ANP. And all users will be required to refresh their training on a regularly scheduled basis.

AHS

AHS Information and Privacy Office's Breach Investigation and Education Team currently provides training to AHS employees and affiliates. The training includes a basic privacy and security awareness course covering privacy legislation, key privacy principles, and a review of AHS Information Management policies. In addition, the HIA Awareness course includes an overview of *FOIP*, the HIA, and related provisions for the collection, use and disclosure of personal and health information. The individual's right-of-access is also covered.

Phase 2 of the AHS on-line training program will provide more detailed training, which will include HIA *Awareness* (one hour) and *Advanced* HIA (approximately 4 hours). The advanced HIA course includes a more detailed discussion of the HIA provisions for the collection, use and disclosure of information, as well as an individual's right-of-access.

Privacy and security awareness elements have been incorporated into AHS new employee orientation and requires a compulsory 30-minute online privacy and IT security training course called "The Basics" prior to obtaining access to clinical information systems. The AHS Learning Management System will administer, deliver, track and report online learning activities.

F. CONCLUSION

The Alberta EHR has been established as a vital component of Alberta's health system, providing a comprehensive, integrated and accurate record of Alberta patients accessible at many more points of care. Along with these significant benefits comes new challenges for managing patient privacy as an intrinsic and important feature of patient care.

The Alberta EHR necessarily reflects the the Alberta health system itself: it is a federated network of applications and systems capturing health information from repositories developed and used to suppot the specific clinical and administrative objectives of thousands of Alberta health providers working across the entire continuum of care. A large part of good privacy governance involves describing and tracking the nature and relationship of Alberta EHR components as a whole on an ongoing basis. Up to this point, provincial health system administrators, health providers, regulators, could gain only a partial overall picture of the Alberta EHR and its privacy governance , mainly through Privacy Impact Assessments. This analysis therefore compiles and presents a comprehensive profile of how and why these separate components currently share health information in an integrated and interdependent network environment.

As a complex, ever-changing system involving a large number of stakeholders from many diverse healthcare services and institutions, the Alberta EHR requires a privacy governance program that incorporates effective participation and implementation at all levels of the health system. Supported by clear and consistent privacy and security policies and standards, Alberta Health, as the Information Manager of the Alberta EHR, has developed a comprehensive privacy governance regime.   The Alberta EHR privacy governance program supports ongoing planning, implementation and feedback on effectiveness of its privacy and security controls from systems development and deployment to maintainance and reassessment.   All stakeholders, from system planners to users to professional experts, need to understand and participate in Alberta EHR privacy governance, so communication and training initiatives are key components of the governance effort.

G. APPENDICES

Appendix 1: Acronyms

Acronym	Full Title
AA	Access Administrator
AAIMS	Alberta Ambulance Information Management System
ABPD	Alberta Provider Directory
ACP	Alberta College of Pharmacists
ADM	Assistant Deputy Minister
ADT	Admission, Discharge, Transfer
AHCIP	Alberta Health Care Insurance Plan
AHS	Alberta Health Services
AMA	Alberta Medical Association
ANP	Alberta Netcare Portal
BIE	Business Intelligence Environment
CAB	Change Advisory Board
CSR	Alberta Health Central Stakeholder Registry
CD/OM	Communicable Disease and Outbreak Management
CDM	Chronic Disease Management
CH	Capital Health
CHI	Canada Health Infoway
CHRDRP	Calgary Diagnostic Imaging Text Repository
CHRLRP	Calgary Laboratory Repository
CHRTRP	Calgary Transcribed Report Repository
CI	Configuration Item
CIO	Chief Information Officer
CPN	Common Provider Number
CPSA	College of Physicians and Surgeons of Alberta
CR	Client Registry
CT	Computed Tomography
DI	Diagnostic Imaging
DIN	Drug Information Number
DIU	Data Integrity Unit
DM	Deputy Minister
DSR	Delivery Site Registry
ECG	Electrocardiograph
ED	Emergency Department
EHR	Electronic Health Record
EHRI	Electronic Health Record Index
EHRIS	Electronic Health Record Information System

Acronym	Full Title
EHR Regulation	*Health Information Act (Alberta), Alberta Electronic Health Record Regulation (AR 118/2010)*
EHRDSC	EHR Data Stewardship Committee
EMPI	Enterprise Master Patient Index
EMR	Electronic Medical Records
FOIP	*Freedom of Information and Protection of Privacy Act (Alberta)*
GoA	Government of Alberta
GPLM	Global Person Level Masking
HIA	*Health Information Act (Alberta)*
HIAL	Health Information Access Layer
HIEC	Health Information Executive Committee
HIM	Health Information Management
HISCA	Health Information Standards Committee for Alberta
HPA	Health Professions Act
HPB	Health Professional Body
HQCA	Health Quality Council of Alberta
HSP	Health Service Provider
HSPID	Health Service Provider Identifier
HSSWG	Health Sector Security Working Group
IAM	Identity and Access Management
ICWG	Integrated Clinical Working Group
ID	Identifier
IEP	Information Exchange Protocol
IHE	Integrating the Healthcare Enterprise
IMA	Information Management Agreement
IM/IT	Information Management/Information Technology
IRT	Incident Response Team
ISF	Information Sharing Framework
ISO	International Standards Organization
LREP	Laboratory Repository (Edmonton)
MCR	Minimum Connectivity Requirements
MRI	Magnetic Resonance Imaging
MRN	Medical Record Number
NCR	Netcare Clinical Repositories
NPN	National Product Number
OIPC	Office of the Information and Privacy Commissioner of Alberta
PCN	Primary care Network
PCR	Provincial Client Registry
PD	Person Directory
PHAN	Provincial Health Analytics Network
PHANSC	Provincial Health Analytics Network Sponsors Committee
pHIE	Provincial Health Information Exchange
PHN	Personal Health Number

Acronym	Full Title
PHP	Personal Health Portal
PHPSC	Personal Health Portal Steering Committee
PHR	Personal Health Record
PIA	Privacy Impact Assessment
PIN	Pharmaceutical Information Network
POR	Provincial Organization Registry
PPMS	Pharmacy Practice Management System
pORA	Provincial Organizational Readiness Assessment
POSP	Physician Office System Program
PAWG	Provincial Architecture Working Group
PPHI	Provincial Personal Health Identifier
PPR	Provincial Provider Registry
PRIRP	Provincial Reportable Incident Response Process
PRWG	Provincial Registries Working Group
Provincial PACS	Provincial Picture Archiving and Communication System
P&SU	Privacy and Security Unit
QSP	Qualified Service Provider
RFC	Request for Change
RHA	Regional Health Authority
RREP	Rural Report Repository
RxA	Pharmacist Association of Alberta
SDP	Seniors Drug Profile
SHR	Shared Health Record
S2S	System to System
TBiPHIS	Tuberculosis Integrated Public Health Information System
TREP	Transcribed Reports Repository (Edmonton)
TTP	Triplicate Prescription Program
UAM	User Access Management
ULI	Unique Lifetime Identifier