

**Alberta Health and Wellness
Ambulatory Care Re-abstraction Study**

Executive Report

Version 1.0

June 30, 2006

ACKNOWLEDGEMENTS

The results of this study could not have been achieved without the support provided by the sites participating in the review, the re-abstractors, and the project participants.

Table of Contents

1. Background	4
1.1 Ambulatory Care Reporting Implementation	4
1.2 Objectives	4
2. Approach and Methodology	5
2.1 What is Re-abstraction?	5
2.2 Data Elements	5
2.3 Chart Selection Criteria and Sampling	6
2.4 Explanation of Record Types.....	7
3. Process and Products.....	7
3.1 Privacy and Security	7
3.2 Re-abstractors	8
3.3 Analytical Tool Kits.....	8
3.3.1 Re-abstraction Tool.....	8
3.3.2 Re-abstraction Training and Training Manual.....	8
3.3.3 Inter-rater Reliability Study	8
3.3.4 Quality Review	9
3.4 Data Analyses	9
4. Overall Findings and Suggested Actions	10
4.1 Emergency	10
4.2 Procedure	11
4.3 Clinic.....	11
4.4 Investigative Technology.....	12
4.5 Discrepancy and Reason Analysis – Emergency Main Diagnosis	12
4.6 Suggested Actions.....	13
5. Recommendations and Next Steps	15
5.1 Key Opportunities for Improvement Identified	15
6. Conclusions.....	16
6.1 Causes of Variation.....	16
6.2 Data Quality Accountability	16

1. Background

1.1 *Ambulatory Care Reporting Implementation*

The Alberta Ambulatory Care Reporting System and the accompanying Ambulatory Care Classification System (ACCS) were implemented in Alberta in April 1997. The ACCS grouper is a comprehensive patient classification system encompassing emergency, procedure, clinic, and investigative technology visits reported by the Regional Health Authorities (RHAs). The reported data is categorized by the ACCS grouper into clinical groups with similar resource needs and clinical profiles. Consistent and accurate reporting of the data elements included in the Ambulatory Care Reporting System is integral for correct ACCS group assignment.

Frequent users of the ambulatory care data are Alberta Health and Wellness (AHW), RHAs, and researchers. The data has provided AHW and the RHAs with a rational mechanism for quantifying and allocating funds for ambulatory care services. The data is also used for planning, trend analyses, establishing performance indicators, and determining the impact of import/export of ambulatory care services.

Data quality activities at the Department and RHA levels have been ongoing since reporting implementation. However, as part of AHW's commitment to continued data quality improvement, the decision was made to conduct a formal ambulatory care re-abstraction study.

The purpose of the Executive Report is to provide a high level overview of the study results.

1.2 *Objectives*

AHW's commitment to improving ambulatory care data assets was identified through the following four study objectives:

- gaining a better understanding of current data quality;
- enhancing consistency in data collection;
- determining opportunities for improving data quality; and
- establishing a baseline for future re-abstraction studies.

In order to ensure the objectives were met, AHW contracted Salumatics Inc. to complete the study and develop a shareable re-abstraction tool. Salumatics sub-contracted the Canadian Health Information Management Association (CHIMA) in an advisory role for the study. CHIMA has expertise with conducting re-abstraction studies and working with Provincial Ministries of Health to understand identified deficiencies in clinical data collection and reporting. CHIMA endeavours to ensure consistency, standardization, and a commitment to ongoing continuing professional education for all Health Information Management (HIM) professionals.

This study was commissioned by AHW in order to increase the Department's understanding of observed variations in ambulatory care reporting and to review coding practices in a sample of Alberta facilities.

2. Approach and Methodology

2.1 *What is Re-abstraction?*

Health data is collected by capturing defined data elements in an electronic application (abstracting) and coding data using national diagnosis and intervention classification schemes and standards. The collected data is submitted to AHW through the Morbidity and Ambulatory Care Abstract Reporting (MACAR) application.

Re-abstraction encompasses both coding and abstracting with a third component of comparing the re-abstracted data with the originally submitted data. For each difference found, codes are assigned to describe the discrepancy and the reason for the discrepancy. A standard list of discrepancy and reason codes is developed prior to re-abstraction. The re-abstraction process is completed by HIM professionals, who are experts in the domain of data collection.

2.2 *Data Elements*

Data elements were separated into three general categories related to encounter and demographics, diagnosis, and intervention.

Encounter and demographics data elements included, but were not limited to:

- date of birth
- responsibility for payment
- personal health number
- mode of service

Diagnosis data elements included:

- main diagnosis
- secondary diagnosis (1)
- secondary diagnoses (2-9)
- main and secondary diagnoses prefix

Intervention data elements included:

- main intervention
- other interventions (2-10)
- anaesthetic type
- out of hospital indicator
- intervention attributes

2.3 *Chart Selection Criteria and Sampling*

AHW was responsible for the random selection of all charts to be included in the study. A stratified sample design was developed with consideration given to the number of charts by:

- record type (emergency, procedure, clinic, and investigative technology);
- region type (Calgary Health Region, Capital Health, and Other Regions); and
- facility type (teaching, urban, and non-urban).

A total of 2280 charts from the 2003/2004 fiscal year was requested by AHW from the RHAs. The request included 550 charts for each record type and an extra 20 charts per record type in the event the original chart was not available.

Of the total 2280 charts requested, 1993 qualified for the study following the record adequacy review. A further 40 charts were removed for training purposes leaving 1953 charts for re-abstraction. The training charts were used to provide experience on the use of the re-abstraction tool and provide exposure to various facility charts.

Following this, a data quality review was completed and a further 20 records were removed from the data analysis process. The final data set on which the analysis was conducted included a total of 1,933 records. Figure 1 below displays the final record volume by record type.

Figure 1: Final record volume by record type

Visit Type	Provincial Total	Region Type			Facility Type		
		Capital Health	Calgary Region	Other Regions	Teaching	Urban	Non-urban
Emergency	547	199	201	147	175	117	255
Procedure	526	195	187	144	169	106	251
Clinic	318	135	95	88	95	58	165
Investigative Technology	542	202	195	145	173	116	253
Grand Total	1,933	731	678	524	612	397	924

2.4 Explanation of Record Types

A key to understanding the record types is to know the type of activity they represent. Listed below are examples of visits included in each record type.

- Emergency records include patients who attend a facility emergency department for treatment and care. Examples include sprains, strains, and chest pain.
- Procedure records include hemodialysis, biopsies, tonsillectomies, and endoscopies.
- Clinic records include rehabilitation (occupational therapy, physiotherapy, audiology, etc.), medical, and obstetrical clinic visits.
- Investigative Technology records include x-rays, mammograms and high cost investigative procedures such as Computerized Tomography (CT scan) and Magnetic Resonance Imaging (MRI).

3. Process and Products

3.1 Privacy and Security

Privacy, confidentiality, and security of patient information were ensured in every aspect of the study.

AHW completed an update to the Privacy Impact Assessment outlining the Ambulatory Care Re-abstraction Study and objectives. This was accepted by the Information and Privacy Commissioner.

The entire Salumatics team completed Health Information Act Training, which included a review of the Security Awareness and Privacy Awareness tutorials. Certificates of completion were provided to AHW demonstrating training completion.

The security of the paper copies of the charts was maintained throughout the study with the copies being placed in a secured, locked filing cabinet with limited access. Each page within the patient chart was numbered prior to re-abstraction. The charts were checked at the end of the study to ensure no pages or charts were missing.

3.2 *Re-abstractors*

Each re-abstractor was a qualified Health Information Management professional eligible for certification with the Canadian College of Health Record Administrators and a Salumatics employee. Each re-abstractor had a minimum of two and a half years experience in coding and abstracting ambulatory care records in Alberta.

3.3 *Analytical Tool Kits*

There were several analytical tools developed during the study that contributed to AHW's data quality initiative.

3.3.1 Re-abstraction Tool

A re-abstraction tool was created for this study to house both the originally submitted data and the re-abstracted data. The tool is comprised of screens displayed as tabs including demographic, institution, physician, diagnosis, and intervention data elements. The tool is shareable and may be used to complete future re-abstraction studies.

3.3.2 Re-abstraction Training and Training Manual

The re-abstractors received a Re-abstraction Training Manual and a comprehensive review of the 2003 ambulatory care reporting requirements. They also received information and training on the use of the automated re-abstraction tool and the assignment of discrepancy and reason codes. Training records were then reviewed as a group to provide a solid understanding of data collection requirements for the four record types and the assignment of discrepancy and reason codes.

3.3.3 Inter-rater Reliability Study

Inter-rater reliability (IRR) testing assesses the degree to which two or more re-abstractors reported the same response for selected charts. This measure is an important quality indicator for studies involving a data quality process subject to re-abstractor interpretation. The objective of the IRR study was to provide confidence in the re-abstractor findings and guidance for setting the target agreement rates used in this study.

A 5%¹ randomized sample of 95 charts was selected for the IRR study. The data elements selected for the IRR study included responsibility for payment, disposition code, main diagnosis, and main intervention.

The inter-rater reliability testing for the AHW Ambulatory Care Re-abstraction Study revealed a high overall agreement rate of 94% with a range between 88% for main intervention and 98% for disposition code. This indicates a significant degree of consistency in the re-abstracted data and supports a high level of confidence for the remaining re-abstracted records in the study.

3.3.4 Quality Review

A comprehensive data quality review of the re-abstracted data was conducted. The objectives of this review were to ensure that:

- all required data elements were present in the right format;
- values in the various data fields conformed to expected ranges; and
- all required descriptors and value lookups were included.

3.4 Data Analyses

The data was set up to enable the direct comparison of the originally abstracted value to the re-abstracted value for each data element. The agreement rate was calculated as the proportion of total records re-abstracted in the category for which the re-abstracted value matched the original value.

The agreement rates (as defined by their confidence intervals) were compared to the target rate. The target agreement rates identified by AHW were 95% for all encounter and demographics related data elements and 85% for all diagnosis and intervention related data elements. Data elements with agreement rate intervals that fell below the target rate (i.e., where the upper confidence limit was less than the target rate) were identified and highlighted.

Similarly, region type and facility type target rates were compared to each other and to the provincial average. Significant differences were identified when the confidence interval did not overlap the target agreement rate.

Part of the re-abstraction process included identification of the nature of the re-abstracted discrepancy with the original data and the reason for that discrepancy. These were indicated using pre-defined discrepancy and reason codes. An analysis of these was completed by identifying the most common discrepancy and reason codes for each of the data elements that were identified as having agreement rates below the target.

¹ The Investigative Technology records and Procedure records used a 4.5% randomized sample rate.

4. Overall Findings and Suggested Actions

The tables below summarize the data element agreement rate findings that fell below the associated target agreement rate (as represented by the ✖). The findings are organized by record type and category of data element (i.e. encounter and demographics related data elements, diagnosis related data elements, and intervention related data elements). The target agreement rates were 95% for all encounter and demographics related data elements, and 85% for all diagnosis and intervention related data elements.

4.1 Emergency

The provincial agreement rate findings for all data elements within the following categories were:

- 98% for encounter and demographics
- 87% for diagnosis
- 96% for intervention

Even though the Emergency records on average surpassed the target agreement rate for each data element category, there were specific data elements that were below the target agreement rate. Figure 2 summarizes these findings.

Figure 2: Agreement rates overview – Emergency

Category	Data Element	Provincial	Region Type			Facility Type		
			Calgary Health Region	Capital Health	Other Regions	Teaching	Urban	Non-urban
Encounter and Demographics	Disposition Time	✖		✖		✖		
Diagnosis	Main Diagnosis	✖	✖	✖		✖	✖	✖
	Secondary Diagnosis (1) ²	✖	✖				✖	
Intervention	Anaesthetic Type		✖		✖			✖
	Attribute Location for Main Intervention		✖					

² Secondary Diagnosis (1) refers to the first occurrence of the Secondary Diagnosis.

4.2 Procedure

The provincial agreement rate findings for all data elements within the following categories were:

- 98% for encounter and demographics
- 86% for diagnosis
- 94% for intervention

Even though the Procedure records on average surpassed the target agreement rate for each data element category, there were specific data elements that were below the target agreement rate. Figure 3 summarizes these findings.

Figure 3: Agreement rates overview – Procedure

Category	Data Element	Provincial	Region Type			Facility Type		
			Calgary Health Region	Capital Health	Other Regions	Teaching	Urban	Non-urban
Encounter and Demographics	Disposition Time	x	x		x	x	x	
	Registration Time	x	x	x		x	x	
Diagnosis	Main Diagnosis	x		x	x			x
	Secondary Diagnosis (1) ³	x	x	x		x	x	x
Intervention	Anaesthetic Type				x			x
	Main Intervention				x			x

4.3 Clinic

The provincial agreement rate findings for all data elements within the following categories were:

- 100% for encounter and demographics
- 85% for diagnosis
- 95% for intervention

Even though the Clinic records on average surpassed the target agreement rate for each data element category, there were specific data elements that were below the target agreement rate. Figure 4 summarizes these findings.

³ Secondary Diagnosis (1) refers to the first occurrence of the Secondary Diagnosis.

Figure 4: Agreement rates overview – Clinic

Category	Data Element	Provincial	Region Type			Facility Type		
			Calgary Health Region	Capital Health	Other Regions	Teaching	Urban	Non-urban
Diagnosis	Main Diagnosis	x	x	x		x	x	
	Secondary Diagnosis (1) ⁴	x	x	x	x	x		x
Intervention	Anaesthetic Type		x		x			

4.4 Investigative Technology

The provincial agreement rate findings for all data elements within the following categories were:

- 99% for encounter and demographics
- 95% for diagnosis
- 95% for intervention

Even though the Investigative Technology records on average surpassed the target agreement rate for each data element category, there were specific data elements that were below the target agreement rate. Figure 5 summarizes these findings.

Figure 5: Agreement rates overview – Investigative Technology

Category	Data Element	Provincial	Region Type			Facility Type		
			Calgary Health Region	Capital Health	Other Regions	Teaching	Urban	Non-urban
Intervention	Attribute Location for the Main Intervention						x	
	Main Intervention	x	x	x		x	x	

4.5 Discrepancy and Reason Analysis – Emergency Main Diagnosis

Discrepancy and reason code analysis was performed for each data element that fell below the target agreement rate. As an example, the findings for the main diagnosis code for Emergency records are displayed in Figures 6 and 7 below. These findings are similar to the analysis results for Procedure and Clinic records.

⁴ Secondary Diagnosis (1) refers to the first occurrence of the Secondary Diagnosis.

Figure 6: Discrepancy codes analysis – Emergency Main Diagnosis

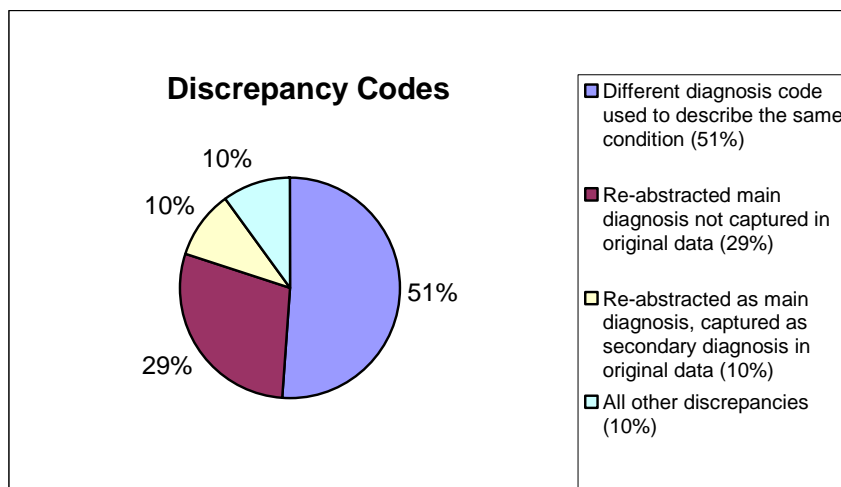
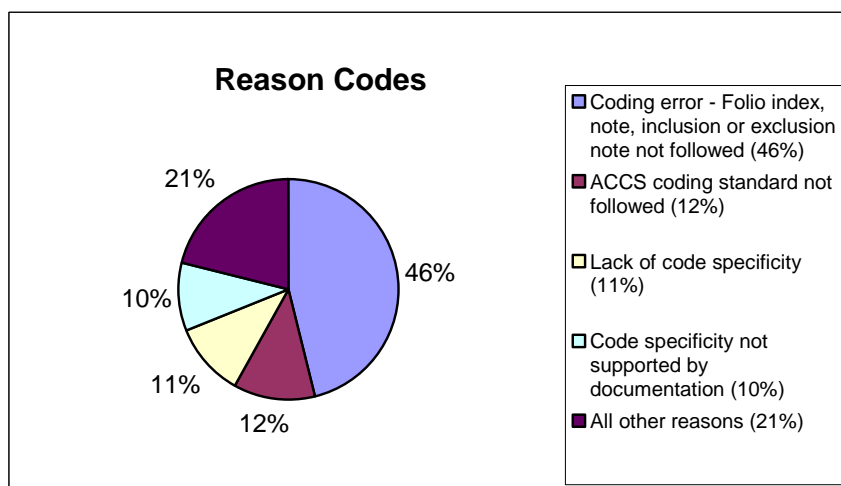


Figure 7: Reason code analysis – Emergency Main Diagnosis



4.6 Suggested Actions

To successfully improve the quality of reported ambulatory care data, the following actions are suggested.

Overall

- Ensure staff responsible for ambulatory care coding and abstracting are trained on related coding and reporting standards and attend ambulatory care education sessions provided by Alberta Health and Wellness.
- Work toward having complete documentation available on the patient chart when coding and abstracting are performed.
- Ensure HIM professionals are responsible for ambulatory care data collection or at minimum, play a key role in data collection by other staff or systems.
- Regional electronic abstracting systems should include ambulatory care edits provided by AHW and be updated as edit modifications are made. Abstracting systems should also include only valid values with an error message being generated at the time of data collection if invalid values are entered.

Emergency

- Ensure staff responsible for emergency record intervention coding follow the coding standards related to assigning one intervention code with the appropriate location attribute to reflect one procedure performed on multiple sites.
- Ensure documentation includes information to support the assignment of an accurate location attribute code for an intervention.
- Ensure the disposition time is reported and matches the disposition time documented on the patient chart.

Procedure

- Ensure staff responsible for coding report mandatory intervention codes and follow reporting standards for main intervention assignment.
- Ensure coding standards are followed. For example, coders should understand and apply the correct intervention code for biopsy of a lesion versus a partial excision of an anatomy site.
- Ensure disposition time is reported when mandatory and matches the disposition time documented on the patient chart.
- Work toward a clear definition of day surgery records so they may be easily identified and distinguished from other procedure records for data analysis.

Clinic

- AHW to gain an understanding of clinic record storage, retention, and archiving policies.

Investigative Technology

- Review the Common Procedure Examination List (CPEL) for diagnostic imaging services to ensure accuracy of the mapped CCI codes as the codes are commonly downloaded from systems into abstracting applications.

5. Recommendations and Next Steps

5.1 *Key Opportunities for Improvement Identified*

In order to transform issues identified in the re-abstraction study into strategic solutions, it is suggested that AHW engage key stakeholders to develop a feasible action plan for data quality improvement.

Key stakeholders include AHW Information Management and Health Authority Funding and Financial Accountability Branches, the Health Information Management Association of Alberta (HIMAA), the Canadian Health Information Management Association (CHIMA), the Canadian Institute for Health Information (CIHI), Health Information Management (HIM) departments, the Alberta Medical Association (AMA), allied health professionals, and regional representatives.

The following three recommendations should guide the partners and stakeholders in developing an action plan for data quality improvement.

Support continuing education of HIM professionals and other staff responsible for coding and abstracting ambulatory care records

Due to the relatively low agreement rates for the main diagnosis found in emergency, procedure and clinic records, continuing education is required for HIM professionals and other staff responsible for coding and abstracting ambulatory care records.

Improve patient chart documentation and chart completion

Establish an expert panel comprised of physicians and other allied health professionals to engage physicians in addressing chart documentation issues through the development of guidelines and tools.

Improve coding consistency

Strategic solutions involve a range of activities including reviewing existing coding standards to increase understanding and awareness, identifying workload standards, implementing standard reporting requirements, providing resources to support education and quality standards, and establishing external and internal quality and performance monitoring systems.

6. Conclusions

Overall study results were very good and in most instances, the target agreement rates set by AHW were met or exceeded. However some areas for data quality improvement were identified, particularly in the reporting of the main diagnosis. These improvements can only be achieved through an understanding of the causes for variation between the original data and the re-abstracted data and the collaborative efforts of all stakeholders.

6.1 *Causes of Variation*

The study identified the following two factors as the most significant causes of the variation between the original and re-abstracted data.

- The majority of discrepancies occurred because the re-abstractor disagreed with the original abstractor on the assessment of the clinical importance of diagnoses.
- The second source of variation that is difficult to quantify is the completeness of the patient chart at the time of re-abstraction. In some instances, the re-abstractor may have had a more complete chart to work from than what was available to the original coder. The re-abstractor would therefore have had less need to apply interpretation.

Resolving these variations would improve the quality of the coded and abstracted data.

6.2 *Data Quality Accountability*

One of the strategies outlined in the AHW 2006-09 Business Plan is “Lead, develop and implement policies and frameworks that ensure data privacy, security, standards and quality.” The following actions and accountabilities will assist AHW in successfully achieving this strategy:

- HIM professionals must adhere to the CIHI and provincial ambulatory care coding standards when assigning the Main Diagnosis.
- Facilities should ensure that HIM professionals are responsible for coding patient charts or at minimum, play a key role in code assignment.
- Facilities and HIM professionals have an opportunity to provide input to AHW in maintaining, updating, and training for ambulatory care coding.
- Facilities should enforce attendance at continuing professional education workshops for HIM professionals involved in coding and abstracting.
- Facilities should be accountable for the quality of the data they submit to AHW.

- AHW should share the re-abstraction tool that was developed for this study with the RHAs to facilitate completion of routine data quality re-abstraction studies at regional/facility levels.
- AHW should be responsible for completing re-abstraction studies at three or five year intervals to monitor data quality.

The recommendations and actions developed from the study findings were designed to involve and assign accountabilities to all stakeholder groups that have the ability to improve the quality of Alberta's ambulatory care data. AHW has now completed an inpatient and an ambulatory care re-abstraction study and the importance of data quality continues to be highlighted.

The re-abstraction studies reveal the significance of quality source documents, particularly in areas where information is downloaded from computer systems. AHW has invested time and resources into the development and implementation of the Electronic Health Record. Whether a paper chart or an electronic patient record, a complete and standardized source document will support quality coding and abstracting leading to quality data for evidence based decision making. AHW should continue to lead the development and implementation of a robust provincial data quality strategy.