



Comparison of Diagnostic Codes in a Clinical Research Database and an Administrative Database

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Background

- The COMPETE Study (Computerization of Medical Practices for the Enhancement of Therapeutic Effectiveness)
 - an electronic medical record (EMR) project based in a primary care setting
- In Canada, most physicians are reimbursed fee-for-service by Provincial insurance scheme
 - The Provincial government requires the submission of an invoice containing a patient's Health Card Number, the visit data, a single diagnostic code, similar to ICD9, and a procedure code. The Administrative database consists of the above-mentioned data.



Background contd.

- The Clinical database consists of data extracted from the EMR as described below in the Methods section.
- A research database consisting of the Administrative and Clinical databases was created to support the research team
- Physicians enter the Administrative Data and Clinical Data in separate processes in their clinics



Methods

- 18 family medicine clinics, comprising 32 Family Physicians, were recruited, fitted for, installed and trained in the use of an EMR (Purkinje Inc.'s (DCI)).
 - Physicians chart a mean of 76% of their patients into the EMR on a particular day (min-max 0-100%)
 - These data include all patients seen by the physician since they joined the study.



Methods contd.

- Data were collected using Remote Access Services (RAS) by modem dial-in
- Data for this study included records from the Practice Management Software database and from the EMR Software database from April 1, 1998 to January 7, 2000



Methods contd.

- Analyses include:
 - Comparison of diagnostic data in ICD9-CM format in both databases, looking for agreement between administrative and clinical data
 - Comparison of billing codes for those encounters which are charted electronically and those that are charted on paper
 - Comparison of EMR vs. Paper charting for patients attending more frequently than the majority of patients



Results

Table 1

Data Set

	Admin	Clinical
# of encounters	201,871	114,984
# of patients	45,617	26,511
# of diagnoses	201,871	122,449
% diagnoses in text	0	9
% Male	42	42
% Female	58	58
% > 65 yrs	15	21
% 18-64	60	57
% < 18 yrs	25	22
% Matching Diagnoses (overall)	20% (95% CI = 3.1)	
% MSK Matches	32% (95% CI = 6.2)	
% Diabetes Matches	51% (95% CI = 10.4)	
% CVS Matches	40% (95% CI = 7.3)	



Results contd.

Top 10 Diagnoses in the Administrative Database for patients with:
Signed EMR note on the same day **No signed EMR note on the same day**

<i>Disease</i>	<i>ICD9CM</i>	<i>Total</i>	<i>Disease</i>	<i>ICD9CM</i>	<i>Total</i>
Hypertension - Essential	401.	8762	Anxiety Neurosis	300.	4944
Anxiety Neurosis	300.	7581	Non-Specific Abnormal Find	796.	3717
Bronchitis-Acute	466.	4428	Nasopharyngitis-Acute	460.	2929
Annual Health Exam - Adult	917.	4317	Hypertension - Essential	401.	2858
Osteoarthritis	715.	3781	Diabetes Millitus	250.	2418
Diabetes Millitus	250.	3528	Well Baby Care	916.	2391
Nasopharyngitis-Acute	460.	3286	Bronchitis-Acute	466.	2334
Leg Cramps	781.	2734	Senile Dementia	290.	2163
Lumbar Strain	724.	2557	Dyspepsia	787.	2115
Dyspepsia	787.	2405	Lumbar Strain	724.	2006
Total # of patients		27512			28261



Results contd.

- Physicians are less likely to chart patients with the following diagnoses in the EMR:
 - Anxiety Neurosis
 - Non-specific conditions
 - Well-baby care
 - Dementia
- Physicians are more likely to chart patients with the following diagnoses in the EMR:
 - Annual Physical
 - Hypertension
 - Osteoarthritis
 - Leg cramps



Results contd.

Number of patients billed with an EMR signed note on the same day

	With more than 10 bills	With more than 20 bills	With more than 50 bills
Total			
27512	2018	305	9

Number of patients billed with no EMR signed note on the same day

	With more than 10 bills	With more than 20 bills	With more than 50 bills
Total			
28261	1594	403	48

- Patients who attend the practice more frequently are *less likely* to be entered into the EMR



Discussion

- We confirm that administrative data may not match clinical data in a number of important fields related to health care utilization and quality.
- Important questions remain regarding the impact of these discrepancies on the measurement of quality of care and the design of optimal computerized decision support.