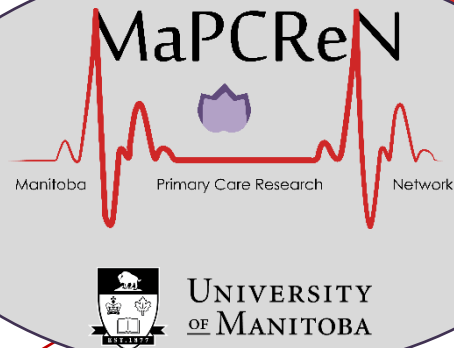


Big Data in Manitoba

Linking Primary Care and Administrative Data eHealth 2016



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What is CPCSSN?

- CPCSSN - Canadian Primary Care Sentinel Surveillance Network
- The first pan-Canadian primary care based multi-disease surveillance system
- Collaboration of Clinicians and Researchers
- A network of networks
 - securely collecting health information from Electronic Medical Records (EMRs) in the offices of primary care providers since 2008



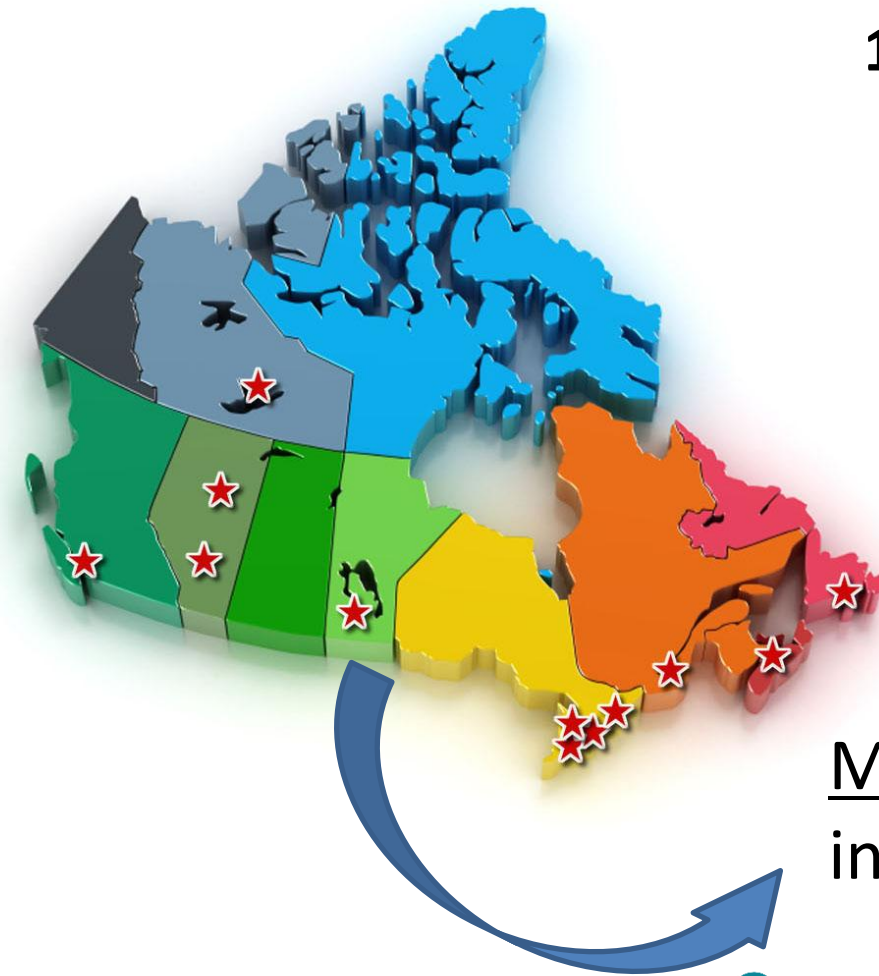
What is CPCSSN?

11 Primary-Care Based Research
Networks across Canada

7 Provinces, **1** Territory

11 *Distinct* EMR systems

MaPCReN is Manitoba's network
in the CPCSSN



What is MaPCReN?

	Clinics	Primary Care Providers	Patients
CPCSSN	200+	1000+	1,000,000+

MaPCReN 46 263 250,000+ As of Jun. 2, 2016

- Each local CPCSSN network recruits local health care providers who consent to extraction of data from their EMRs
- **MaPCReN (Manitoba Primary Care Research Network)**
 - currently extracting EMR data from practices utilizing Accuro and JonokeMed

What is the Purpose of CPCSSN?

A research ready data repository for primary care investigators

- Collect and maintain national epidemiological surveillance data to improve outcomes in health care
- Improve management of conditions; best possible patient care
- Develop reports for providers
- Platform for multi-level research



Initial Focus

Initial focus:

- 5 chronic health conditions
 - Hypertension, Osteoarthritis, Diabetes, COPD, Depression
- 3 neurologic conditions
 - Dementia, Epilepsy, Parkinson's Disease

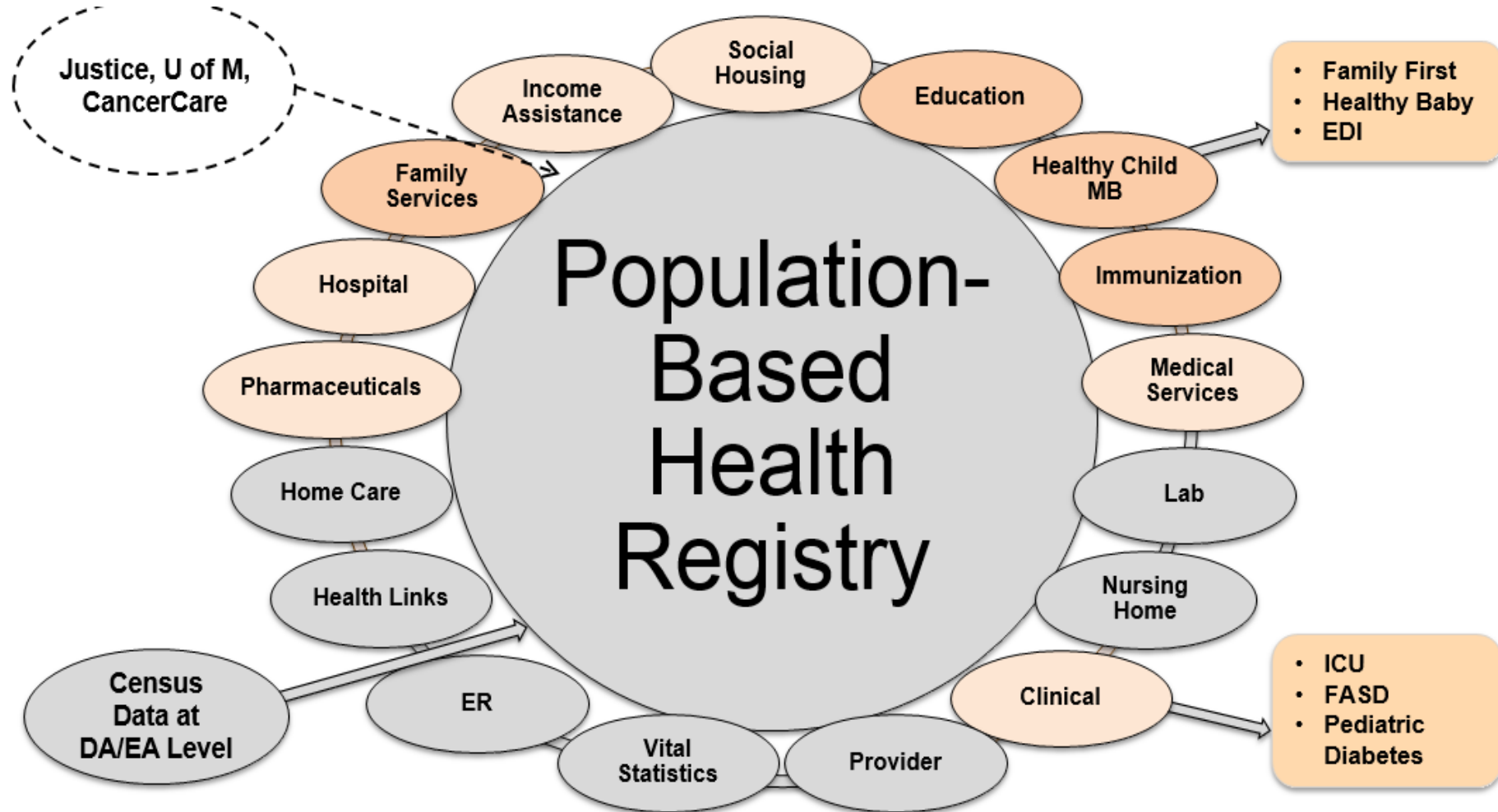
Any condition with indicators captured in a primary care EMR can be studied

CPCSSN Repository Data



- Provider profile
- Patient socio-demographics
- Disease / health condition
- Encounters
- Risk factors
- Examinations
- Medications
- Laboratory results
- Referrals
- Procedures

MCHP Population Health Research Data Repository (De-identified)



Big Data in Action

Quality and Completeness of Primary Care and Administrative Health Data in Manitoba: *A comparison of CPCSSN and Manitoba Centre for Health Policy (MCHP) repository data*



Case Definition Validation



Purpose is to validate health condition case definitions in CPCSSN data using health administrative data as reference

Case Definition Validation

1) Cohort Development

- Patients seen in MB from 1998 – 2014

2) Define Chronic Disease in Administrative Data

- Based on hospital records, physician billing claims, and prescription drug records

3) Define CPCSSN/MaPCReN Chronic Disease Status

- considering 2 years pre/post diagnosis or both

4) Analysis – study cohort description, agreement and validity estimates; Sub-Group Analyses

Cohort Description (Diabetes)

Individuals with at least one encounter in CPCSSN EMR data
between April 1, 1998 and March 31, 2014

N = 151,140



Individuals with age < 18 years at study index date

Exclude N = 22,606



Individuals without healthcare coverage for at least
2 years before and 2 years after study index date

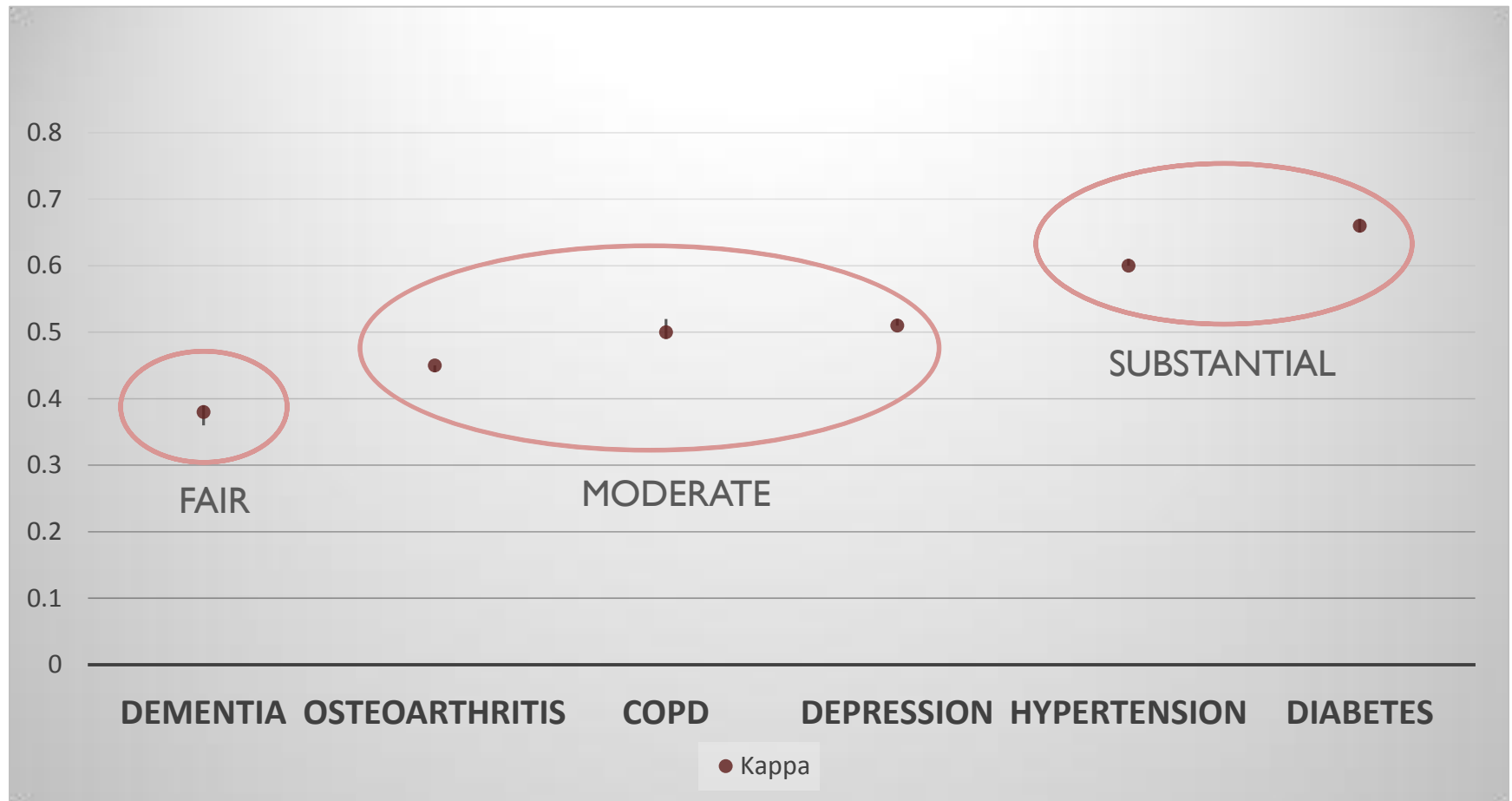
Exclude N = 25,852



Final Cohort

N = 102,682

Agreement Between Administrative and EMR Data



Validity Estimates

	DEMENTIA	DIABETES
Kappa	0.38	0.66
Sensitivity	26.21	68.25
Specificity	99.67	96.83
Positive Predictive Value	77.09	70.39
Negative Predictive Value	96.97	96.5

Big Adherence Data

- Considered only “new” prescriptions
 - (no rx in same class in previous year)
- Total Rx's Written: **275,080**
- Total Rx's Filled within 1 year: **134,513**
- **Only 48% of prescriptions written in our sample were filled within 90 days!**

Adherence Data...



(The Good) Adherence Data

- **Benzodiazepines (Anxiety)**
 - 8398 Filled, 3828 Not Filled
 - *69% Adherence*
- **Antibiotics (Infection)**
 - 28,753 Filled, 10,711 Not Filled
 - *73% Adherence*

(The Bad) Adherence Data

- **Puffers – COPD and Asthma**
 - 9447 Filled, 11962 Not Filled
 - *44% adherence*
- **Hypoglycemics – Diabetes**
 - 8045 Filled, 8897 Not Filled
 - *47% adherence*
- **Anti-hypertensives – Hypertension**
 - 31,444 Filled, 45,185 Not Filled
 - *41% adherence*

(The Ugly) Adherence Data

- Logistic regression analysis and more...



Thanks to all Funders, Stakeholders, Partners AND Sentinel Physicians

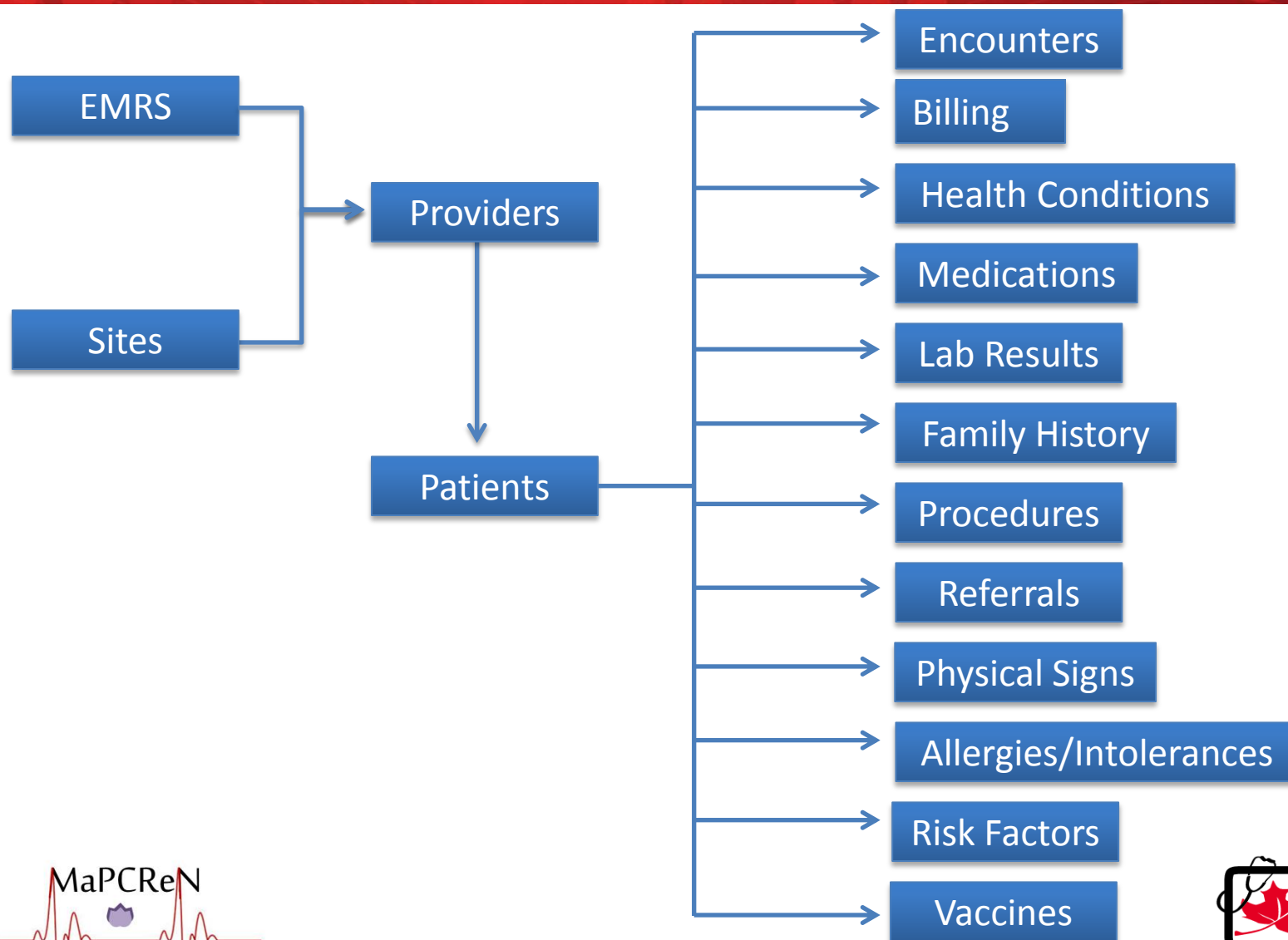


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CPCSSN Basic Entity Relationship Diagram



PROVINCE	NETWORK, LOCATION	EMR PRODUCT
BC	BCPCReN, Vancouver	<i>Wolf</i>
Alberta	SAPCReN, Calgary	<i>Med Access, Wolf</i>
	NAPCReN, Edmonton	<i>Med Access, Wolf</i>
Northwest Territories	NAPCReN, Edmonton	<i>Wolf</i>
Manitoba	MaPCReN, Winnipeg	<i>Accuro, Jonoke</i>
Ontario	DELPHI, London	<i>Accuro, Healthscreen, OSCAR</i>
	UTOPIAN, Toronto	<i>Bell EMR, Nightingale, Practice Solutions</i>
	EON, Kingston	<i>Bell EMR, Nightingale, OSCAR</i>
	McMaster U., Hamilton	<i>OSCAR, Practice Solutions</i>
Québec	RRSPUM, Montréal	<i>Da Vinci, Purkinje</i>
Nova Scotia / New Brunswick	MaRNet, Halifax	<i>Nightingale</i>
Newfoundland	APBRN, St. John's	<i>Nightingale, Wolf</i>

Process – Data Extraction

