Who are your patients with diabetes?

EMR case definitions in the Canadian primary care setting

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As FPs we know which chronic diseases affect our individual patients, but it is much more challenging to produce a registry of patients with a given condition for an entire practice, even though this might be very useful clinically. Many FPs have participated in quality improvement (QI) efforts; one of the first tasks of a QI effort is to produce a list of patients with a given condition, so that quality of care can be audited and tracked. This has proven to be surprisingly challenging, even with electronic medical records (EMRs), due in part to variability in the way information is entered in health records. For example, diabetes might be entered as *diabetes, DM, T2D,* or *ICD9 250* in different areas of the chart, making it challenging to search for this condition. Different laboratories also use different terms for a single test; all possible terms have to be included in a search. Additionally, notes such as "father has diabetes," "rule out diabetes," or "gestational diabetes" can return false-positive results.

Now, multiply this challenge by thousands of practices across Canada, using many different EMRs, and the scale of the problem becomes clearer. The Canadian Primary Care Sentinel Surveillance Network (CPCSSN) is a pan-Canadian effort that extracts data from different EMRs in community-based primary care and provides information on some of the most common chronic diseases in Canada. To study these diseases, we first have to determine which patients have which disease and what the overall prevalence of each disease is. This led CPCSSN to develop *EMR case definitions.* The definitions have not been agreed upon in Canada yet, as there were previously too few primary care physicians using EMRs to allow such a process. The few available studies focused on single EMRs or had other limitations. In the context of growing EMR use, CPCSSN provides an opportunity to develop and validate case definitions across Canada using many different EMRs.

The following example, using diabetes, illustrates how CPCSSN's EMR case definitions were developed. We based our definition of diabetes on a previously validated algorithm using billing data: presence of 2 or more billing codes for diabetes in 2 years.[1] However, this only had a sensitivity of 86%,[1] so we added the presence of at least 2 fasting blood glucose levels >7 mmol/L in 1 year,[2] or any hemoglobin A_{1c} measurement of ≥7%. We also reviewed the literature on the subject[3] and consulted our expert clinician group, and thus added the presence of diabetes in the problem list (coded or free text). If no billing, laboratory report, or problem list data indicated diabetes, we then searched for the presence of any current hypoglycemic medication, excluding female patients younger than 50 with polycystic ovary syndrome taking metformin,[4] gestational diabetes, secondary diabetes, and hyperglycemia not otherwise specified, based on coding for these conditions.

We then gave volunteer physicians a list of their own patients meeting the EMR definition. They verified the lists using CPCSSN's Disease Confirmation software. While this gave us a very good idea of sensitivity (true positives), it did not address the issue of specificity (false negatives).

Our next step, currently under way, is to verify the EMR disease definitions using randomly sampled patient charts. Once that is complete, we aim to have standardized EMR case definitions for at least 5 chronic diseases.

Although it will be challenging for individual physicians to use these complex standardized algorithms, practices with information technology skills or support should be able to generate their own registries, and might be able to use the CPCSSN standardized case definitions. Once such registries are available, they can be used to enable and monitor QI efforts. A helpful first step is to clean and standardize your EMR data.

CPCSSN provides feedback reports to sentinel sites regularly, using the CPCSSN EMR case definitions to identify chronic diseases; selected indicators of quality are then measured. Reports include practice-level data and peer comparisons. They have been extremely well received, as FPs and their teams are very interested in learning about the quality of care they provide. 🍁

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Sentinel Eye is coordinated by CPCSSN, in partnership with the CFPC, to highlight surveillance and research initiatives related to chronic disease prevalence and management in Canada. Please send questions or comments to **Anika Nagpurkar**, Knowledge Translation and Exchange Officer, at **an@cfpc.ca**.

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