



Better Rural Health Outcomes using Practice Analytics

By A/ Prof Christopher Pearce, Chair, ACRRM Digital Health Committee

"The very structure of the data determines the quality of the output.

This is the very essence of the practice of medicine. This is not an idle discussion, a little technical bookkeeping detail. The practice of medicine is the way you handle data and think with it - and the way you handle it determines the way you think."

Prof Larry Weed, 1971

Aim

Much of the clinical information available to rural practitioners is available in digital form – which allows for the potential of using the data to monitor and improve practice. This guide is designed to:

1. Highlight the value of structured data and what tools are on offer;
2. Outline how you can structure practice analytics to suit your own needs;
3. How to 'think outside the diabetes box'. E.g. if you are a hospitalist in rural Queensland, how can you use data to improve your practice.

A couple of simple principles apply:

- To deliver effective care we need to understand the care of the practice population, not just individual patients
- To do this we need the digital tools to analyse practice trends.

The basic requirements are as follows.

Data

Not all data is created equal. To maximise the utility of data, wherever possible it must be put in a form that is easily manipulated by a computer. Any piece of information can be either free text, structured or coded.

Data definitions:

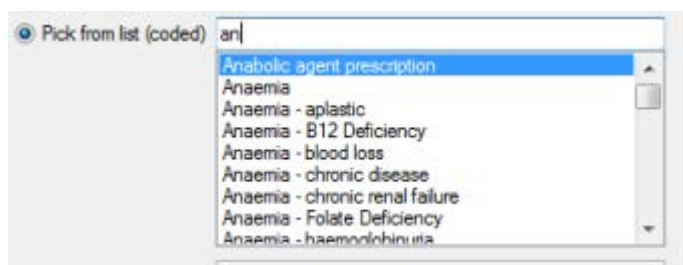
- Free text – input which is not constrained to a specific format e.g. general text in the progress notes area
- Structured information – recorded in a way that the software 'knows' its type through the context of the point of data entry e.g. diagnosis or occupation
- Coded information – information, such as a diagnosis, with an associated terminology (SNOMED-CT) or Classification (International Classification of Diseases - ICD).

Good coding underpins good electronic medical records. Coded records allow the software to process information to assist you in managing your patient load. Coded diagnoses are important for decision support and event reporting. Coding is also an essential feature of the [Practice Incentive Program](#).

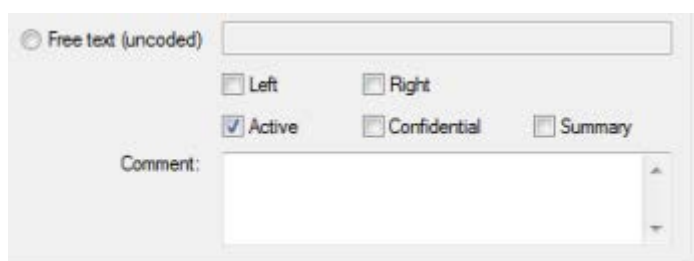


To do this, all clinical software allows you to record a diagnosis, usually in a structured way during the consultation. To attach a code to a diagnosis:

1. Select the appropriate diagnosis from the pick list generated when typing in the diagnosis.



2. Add supporting information in the 'comments' or 'further details' section:



3. It is better to select 'COPD' from the pick list and put 'home oxygen' in the 'comments' section, rather than only entering free text 'COPD on home oxygen'. The more precise and coded the information, the better it will be later on.

Always pick the closest matching diagnosis in the list and modify it in the 'comments' section.

Tools

Through the Primary Health Networks, all practices should have access to one of the common tools for helping in data analytics. They are [Outcome Health's POLAR-GP](#) and [PenCS CAT4](#) tools. Both offer advanced tools to interrogate the practice data on several fronts.

The National Prescribing Service also offers [MedicineInsight](#), with similar capabilities.

Programs such as those offered by the [Improvement Foundation](#) are also available, as are many local systems often provided by universities. Either way, each practice should choose a program and familiarise themselves with the capabilities (and limitations) of the program.

Most medical record systems themselves have analytics tools built in as well, but they generally lack the ease and flexibility of the external programs.

How

A feature of all of these programs is usually access to Business intelligence dashboards Below is an example of a dashboard showing the practice population risk factors.



They allow you to interrogate your data along specific criteria. Importantly, they do so at both the practice population level (how many patients have a high blood pressure measured in the past six months), but also have the ability to generate a practice level list of those patients. They therefore have the ability to combine *performance measurement*, with *intervention*.

Although individual programs vary, the method is generally similar:

1. Familiarise yourself with the analytics program you have
2. Decide on what your objective is
 - a. Assess performance at a practice level
 - i. Example: How many of patients with recorded diagnosis of atrial fibrillation are taking either warfarin or a NOAC
 - b. Perform intervention
 - i. Example: Which patients with a diagnosis of NAFLD have not had a screening ultrasound in the past twelve months.
3. Select relevant filters in the selected tool.
4. Generate data.

Most of the tools come with preselected analytics, often around common problems such as diabetes, or government programs such as QIPIP, HARP admission risk, etc. But the flexibility of the tools should be such that it can meet your own needs.

Example: Hepatitis

Let us assume you have a high incidence of refugee/migrants in your area, who will likely come from a part of the world with a high incidence of hepatitis. The data analytics programs (example below) will allow you to generate a profile of your practice. How many of the target population have had the relevant screening test. This gives you your benchmark performance.



Identify At Risk & Screen

Patients on this page do not have an active Hepatitis B Diagnosis, but have been flagged as "Potentially at Risk" because they have one or more known Hepatitis B risk factors (14 total).

Depending on the patient's vaccination and screening status, the recommendations are different.

Active Patient Count
116,302

No. of At Risk Patients
25,130

Screening data older than 12 months is highlighted in Red

Screening Test Summary

Patient List		Map	Values	ASHM Steps 1,2 & 3	
Patient ID	Gender	Patient Age	Risk Factor Count (14 max)	Matched Risk Factors	Hep B Status
477-796	Male	59	5	Elevated ALT: 48 Gonorrhoea and or Syphilis: Active HIV and or HepC: Active	Not enough information
477-5355	Male	51	5	Elevated ALT: 50 Gonorrhoea and or Syphilis: Active HIV and or HepC: Active	Not enough information
477-5570	Male	63	5	Cirrhosis: Active Elevated ALT: 91 Gonorrhoea and or Syphilis: Active	Not enough information
477-7352	Male	64	5	Cirrhosis: Active Gonorrhoea and or Syphilis: Active HIV and or HepC: Active	Not enough information
477-12383	Male	53	5	Elevated ALT: 78 Ethnicity: Iranian Gonorrhoea and or Syphilis: Active	Partially Vaccinated
477-13252	Male	44	5	Elevated ALT: 84 Gonorrhoea and or Syphilis: Active HIV and or HepC: Active	Fully Vaccinated
477-15160	Male	63	5	Cirrhosis: Active Elevated ALT: 46 Ethnicity: Singaporean	Not enough information
477-16827	Male	47	5	Elevated ALT: 92 Gonorrhoea and or Syphilis: Active HIV and or HepC: Active	Partially Vaccinated
477-19889	Male	60	5	Cirrhosis: Active Elevated ALT: 81 HIV and or HepC: Active	Not enough information

Screening Interpretation Legend

Screening Interpretation	HBsAg	Anti-HBc	Pr
Chronic HBV infection	Positive	Posit...	Ni
Acute HBV infection	Positive	Posit...	Ni
Susceptible to infection (Vaccination Recommended)	Negative	Nega...	Ni
Immune due to resolved infection	Negative	Posit...	Pr
Immune due to hepatitis B vaccination	Negative	Nega...	Pr
Various possibilities including: distant resolved infection, recovering from acute HBV, false positive, occult HBV	Negative	Posit...	Ni

At Risk Patient Screening

The program will give prompts when the patient visits, to improve your screening rate. Practices can design practice level interventions, or individual doctors can monitor their own performance. In any case, continual improvement can be identified, and patient outcomes improved.

But my practice is quite unusual/ I want to check some specifics

If you have a specific question, then most of the above programs have the ability to tailor specific queries. Let's say you have an interest in iron deficiency and your use of iron infusions. The software generally will allow you to select inclusions (gender/diagnosis/test results) and exclusions (age) and generate your own profile. In this case, you might choose women with a diagnosis of iron deficiency and high ferritin including those younger than 16 and over 65 to see how many have had an iron infusion.

Another option is to look at other sources available – several of the pathology providers will give you a comparative analysis of your profile (skin cancers, for instance) compared to similar practitioners.

But I'm not a traditional General Practitioner?

Rural practice means that it is possible to work in a varied environment, from largely hospital settings or traditional specialist environments (anaesthetics, for instance) all of which make data capture and analytics more challenging.

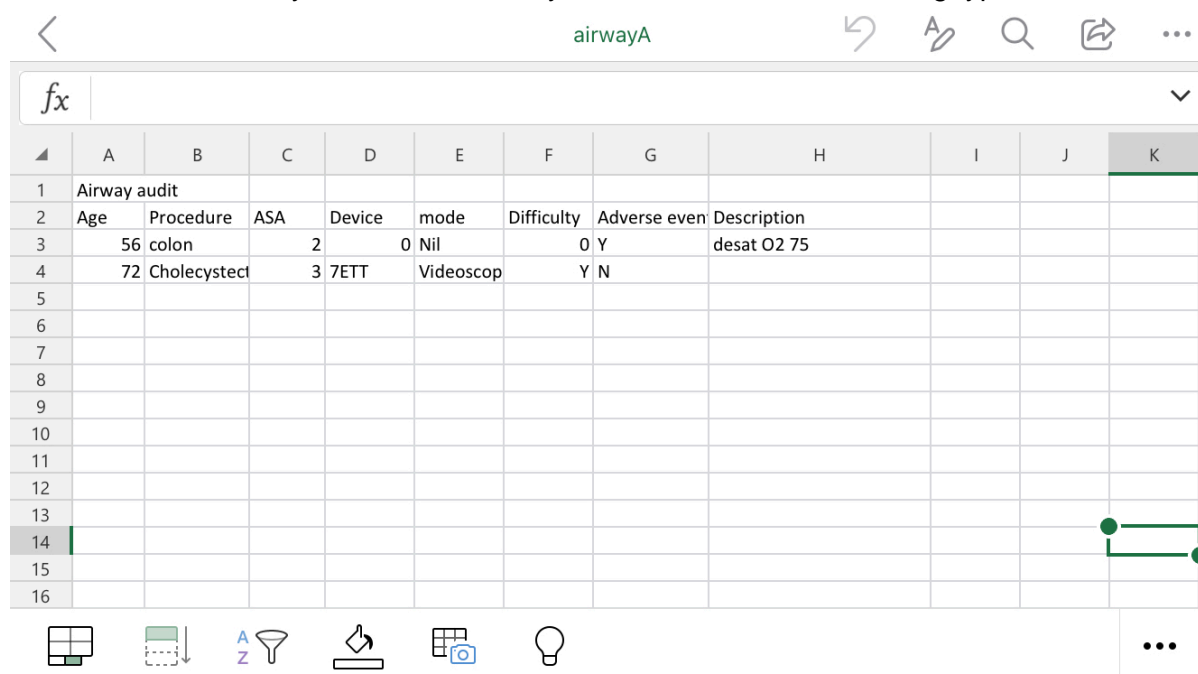
Most settings now have some sort of electronic medical record or digital recording of information, and if not, it will come soon. Most settings will have some sort of performance analysis – and you will need to contact management to design and participate in something that suits you.

Working across multiple sites (e.g. locums) represents a challenge as well. But again, most institutions can generate data as a simple excel (.xlsx) spreadsheet, allowing you to export your own data and combine it across multiple sites.

Example: a simple airway audit

The ubiquity of smartphones means that audits can be built and carried with you. Thus you can build your own reflective tool. Below is a screenshot of a simple airway audit on a mobile phone for the rural anaesthetist – who may work at multiple sites.

The first step is to consider what you want to record, in particular what you will want to analyse at the end, and what you may be able to do about it. In this case, the GP might be interested in the rates of adverse events by the mode of airway intervention, and the differing types.



The screenshot shows a mobile spreadsheet application titled "airwayA". The spreadsheet contains the following data:

	A	B	C	D	E	F	G	H	I	J	K
1	Airway audit										
2	Age	Procedure	ASA	Device	mode	Difficulty	Adverse even	Description			
3	56	colon	2	0	Nil	0	Y	desat O2 75			
4	72	Cholecystect	3	7ETT	Videoscop	Y	N				
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Conclusions

The take home message is that analysing your practice at the level of a practice population (with some degree of benchmarking) is now an essential part of practice. A digital environment has given us good tools to enable the process.