PRIMARY SENSE

PRIMARY SENSE GP USER GUIDE – Practice Software

August 2024

V0.1

Contents

OVERVIEW

1. How to use this User Guide

This guide was developed to help staff at participating practices to understand, adopt and onboard new practice staff to Primary Sense. It can be used by practice staff as a reference guide, or for the purposes of upskilling staff on how Primary Sense works in general practice.

Training materials to cover specifics of the tool are also available at www.primarysense.org.au

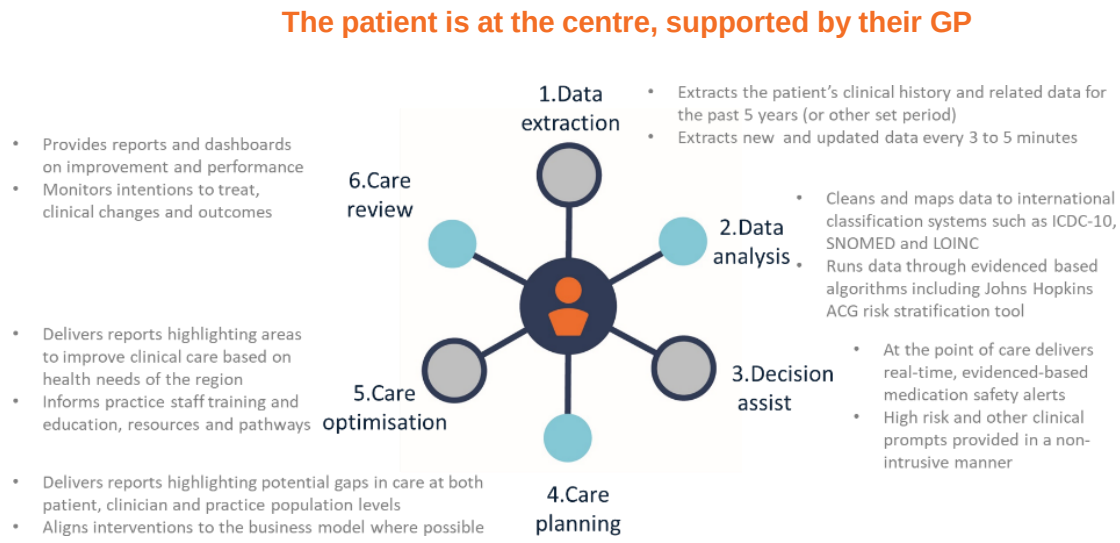
1.1 Definitions

Primary Health Network (and "**PHN**")	Participating PHNs rolling out Primary Sense in their region.
Primary Sense Administrators or **Primary Sense Team**	The set of staff employed by the Lead PHN who deliver, or provide direct or indirect support of the Primary Sense services, and ensure the overall system is working and fit for purpose.
Primary Health Insights (and "**PHI**" or "**PHI platform**")	The national data storage and analytics platform managed by the Lead PHN (for and on behalf of all PHNs) and on which the Primary Sense Application is hosted. Includes the secure, dedicated storage "lockbox" for each PHN and the analytics and data processing tools hosted on or provided through the platform (including Power BI Premium, Azure Synapse Analytics, etc.)

1.2 Overview of Primary Sense

Primary Sense is a data extraction, analysis and decision support tool designed to assist with improving the delivery and quality of care to patients in the general practice setting. The tool uses the evidenced-based Johns Hopkins University ACG® System to enable population health

management at a practice and PHN level. Key features of the product are outlined in the following diagram:



Primary Sense is designed to:

- identify high risk patients and cohorts and provide links to appropriate interventions e.g. vaccinations
- identify patients at risk of poor health outcomes or chronic diseases
- reduce the potential for adverse reactions to medication
- protect patients' and practitioners' privacy
- provide the ability to manage consent easily and explicitly for data provision for secondary purposes down to the patient level
- provide a wide range of practice and clinical performance reports
- provide ongoing, clinically informed data quality assurance
- provide the assurance of a tried and tested tool developed in collaboration with GPs, for GPs

The Application is intended to be easy for general practice staff:

- to find out information
- to commence and complete the various processes required to gain access
- to download and install the software
- to use at both practice and individual practitioner levels.

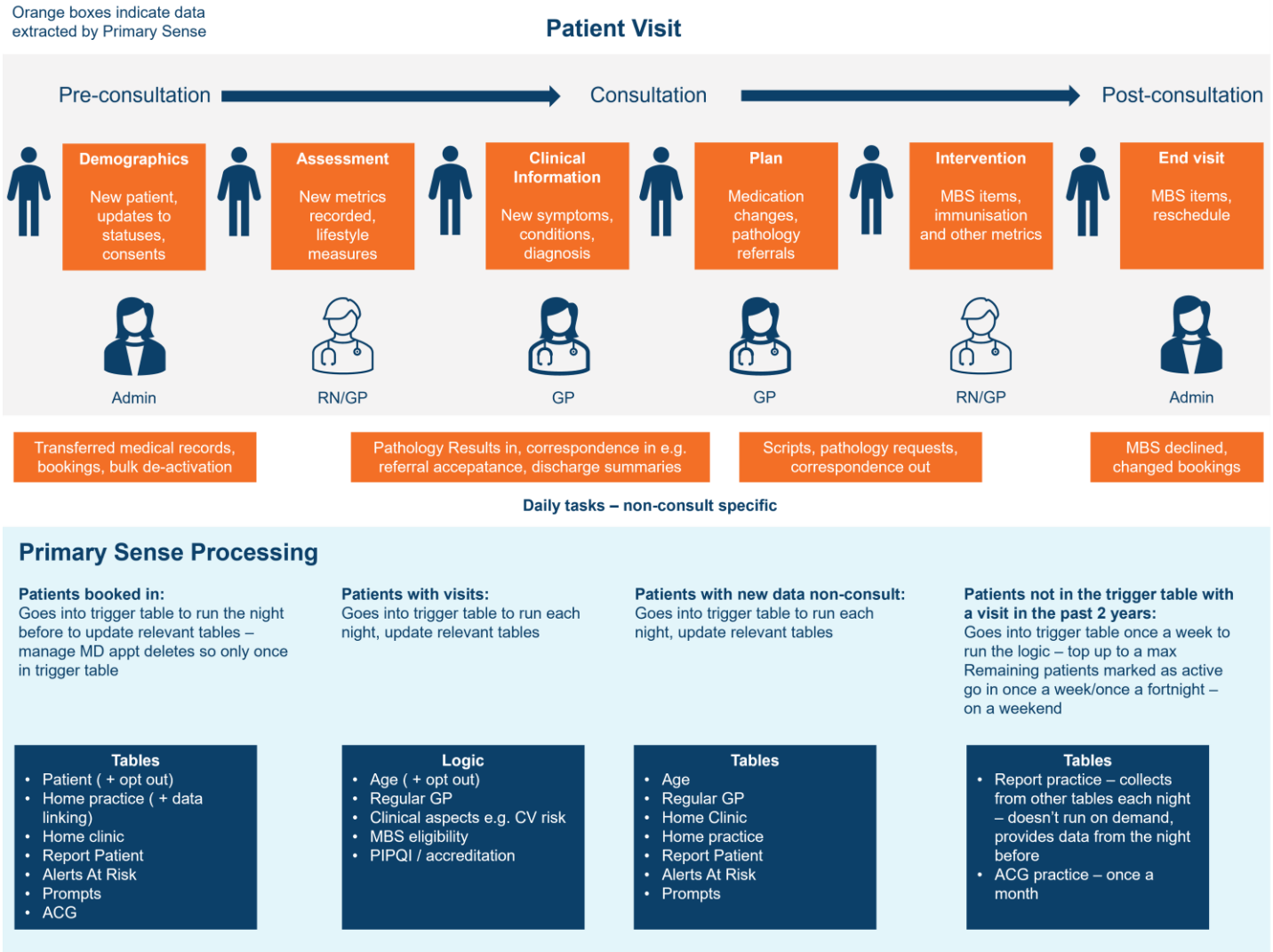
It is designed and operated to be highly secure, reliable, responsive, and to integrate with the most common clinical information systems used by General Practices across Australia (currently Best Practice and Medical Director).

Primary Sense is also designed to digitally enable a comparatively small PHN Practice Support team to provide:

- a greater level of support, in more detail, to more practices, in a more timely manner than has otherwise been possible
- PHN insights that can be incorporated directly into the normal business workflow of a general practice. This allows PHNs to enhance rather than replace traditional continuous quality improvement (CQI) methods.

Key Benefits of Primary Sense
The tool:

- includes the Johns Hopkins University ACG® System – the world's leading population health analytics software – that identifies high risk groups and predicts future health needs to improve patient's care plan
- is easy to use with most GPs requiring little to no training to get started
- can be quickly installed by practice IT support staff
- has been designed to be fast, with minimal impact on a practice's servers
- is compatible with major practice management software products e.g. Medical Director and Best Practice
- provides real time medication safety alerts, patient care prompts and notifications incorporated into the existing workflow
- reports are automatically generated with the click of a button and self-selected by the practice and individual practitioners.



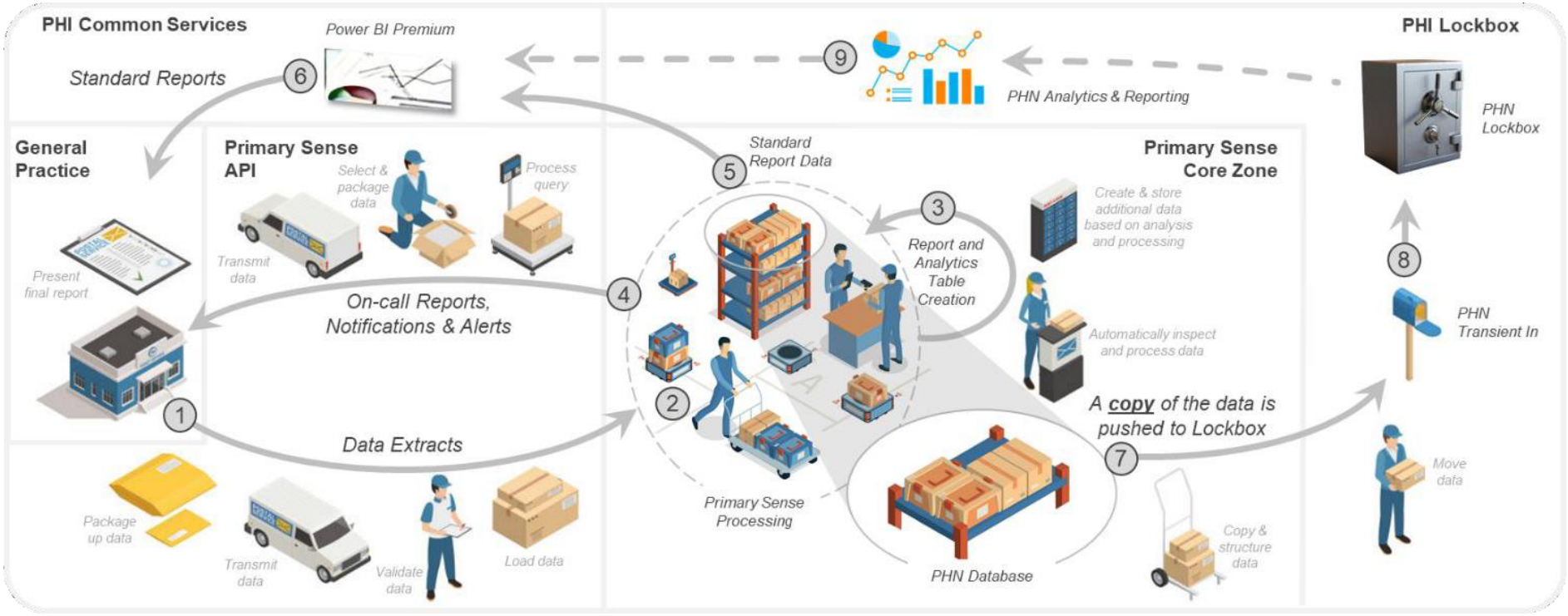
1.3 How Primary Sense works:

Primary Sense consists of:

- An **extractor** that is installed on the same physical (or virtual) server where the practices clinical information system (CIS) is installed (currently not compatible with cloud-based applications and some other GP software).
- A **desktop application** which is installed on any workstation where a user is likely to need access to its capabilities, which could include general practitioners (GPs), nurses, the practice manager and administration staff.
- An application program interface **(API)** that transfers the data and messages to a GP or practice's computer.
- A **database** in the PHI where extracted data is processed into insights and presented as reports, medical alerts or prompts back to the practice.
- A **Management Portal** where PHN's can monitor system performance and manage onboarding practices.

1.4 Primary Sense within the practice – Data Flow

Consider the analogy, that Primary Sense within PHI is established as a common ‘mail distribution centre’ serving multiple ‘floors’ (PHNs) by centralizing the process of collecting, processing and passing on information from GPs. Data ‘parcels’ are extracted from GPs, processed in the Core Zone ‘mail room’ and then re-packaged and sent back to the GP as reports, notifications or alerts, as well as duplicated and sent to each PHN’s own ‘mailbox’ on their ‘floor’ for analysis and reporting.



1. Primary Sense includes server software installed on each GPs' local database server for their clinical information system (CIS), such as Best Practice or Medical Director. On a set but configurable schedule (usually every 3 – 5 minutes), this server software:
    a) Sends a request to the Primary Sense Core via the Primary Sense API asking for the exact SQL query to be run for this specific GP to extract agreed data (in line with data sharing and/or project agreements, including for any research projects).
    b) Runs the SQL query against the CIS database, including only records that have been updated or added since the last time the query was executed.
    c) Sends the data to the Primary Sense API.

    The Primary Sense API then packages and encrypts the extracted data, transmits it over the internet to the Primary Sense Core, decrypts and unpacks the data, validates that the data is in the expected format, and then loads the data into waiting Data Extract tables inside the PHN's specific database in the Core.
2. Inside the Primary Sense Core, the extracted data is monitored and processed. This includes mapping it against standard reference tables, creating additional fields for reporting, and assessing telemetry data contained in the extract about how Primary Sense is performing within the general practice.
3. Dedicated processes create additional tables within each PHN's specific database for reporting and analytics. This includes Stored Procedures to create tables specifically for use in creating reports provided back to GPs on demand, as well as running patient data from the GP through the Johns Hopkins University ACG® System.
4. Primary Sense also includes desktop software installed on each practitioner's or staff member's workstation. This software calls the Primary Sense API either when a medication alert or notification is triggered during a consult, or when a GP user explicitly asks to view a report (pre-formatted, or which contains a selected cohort of their patient population). If the specific report requested is intended to contain identifying data, the desktop software takes the de-identified data sent via the Primary Sense API and contacts the GP's CIS. Any identifying data is added to the report on the desktop.
5. Some standard report tables created during Step 3 may also be intended for viewing through the PHI Power BI Premium service instead of (or as well as) through Primary Sense.
6. Reports or dashboards created in the PHI Power BI Premium tenancy which can be configured as either public (anybody with a link to the report can view the data), restricted (only users with a PHI 'guested' account – can view the data) or filtered (each user can only view records they have specifically been given permission to see, such as only their own GP or PHN).
7. On a set but configurable schedule (usually once a week), a data pipeline run by the Primary Sense Core will take a copy of all new or updated data in each PHN's database, package it up in both 'raw' (i.e. the data that came in from the GP, including any additional fields containing mapped or analysed data) and 'structured' formats (i.e. structured into a proper star schema optimised for data analytics and reporting). Thisdata will be sent using the pipeline to the Transient In storage account of the PHN's PHI lockbox. This is a storage account each lockbox contains, that users outside that PHN can write into, but not read.
8. A data pipeline run within the PHN's PHI lockbox (set up as part of the Primary Sense

onboarding process) will detect whenever new Primary Sense data is sent to the Transient In storage account, and will then read the data, copy it into the Lockbox Data Lake and/or the Lockbox Data Warehouse, and delete the data from the Transient In storage account.

9. As and when needed or decided, PHN data analysts can further process, analyse and report on the data. This can include creating new reports or dashboards which can be opened up to GPs or other external users through the PHI Power BI Premium tenancy.

2. Onboarding a practice - Overview

Installing and configuring Primary Sense is a simple task that has been easily undertaken by general practice IT staff in less than an hour. It requires no PHN access to configure. All links to the latest versions of the software and simple configuration instructions available from the Primary Sense website. Updates to the software are automated.

Key points for practice users:

- Detailed installation instructions and troubleshooting guides are available to assist practice IT staff to install Primary Sense.
- Your PHN will be in contact with your practice and your practice's IT support to facilitate install of Primary Sense.
- Technical installation, if done correctly, takes around 10 minutes.
- Support is available with escalation points for outsourced IT intervention. Contact your PHN in the first instance for assistance

Practice Onboarding

- Each practice using Primary Sense, must sign a Data Sharing and Licensing Agreement with their PHN (this is an agreement between the specific practice and the PHN).
- Participating PHNs will facilitate an onboarding process with their practices, which may involve an expression of interest process, and gathering of information required for onboarding via a simple checklist. Each PHN may have a different process – check with your PHN if you have any questions about the onboarding process.
- Once a practice is ready to install Primary Sense, the practice will receive a "Welcome to Primary Sense" email containing download links and installation instructions. Practice IT staff will need to follow the instructions provided to install both the extractor and desktop applications at the practice.
- After installation is complete, Primary Sense will begin its first extraction of data from the practice database. Depending on the size of the database, this may take sometime. Your PHN will confirm once the first extraction is complete, after which point reports, prompts and alerts will be fully functional within the Primary Sense Desktop app.

3. Data overview and management

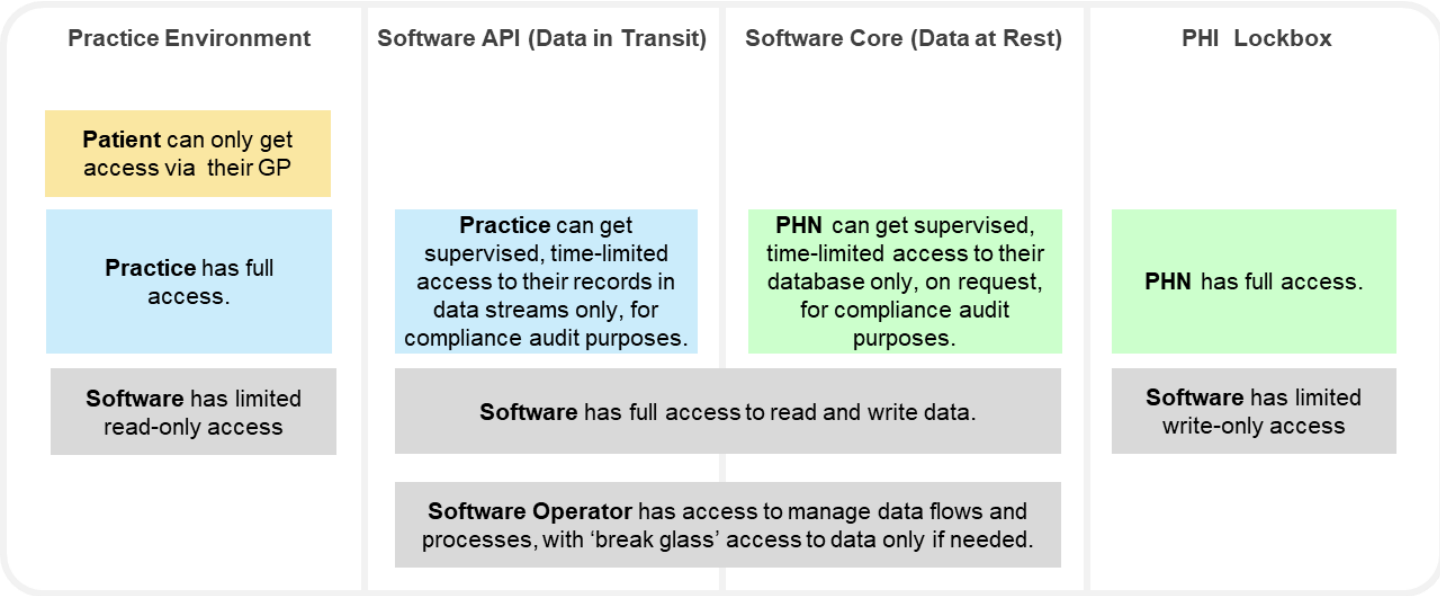
Key points for practice users:

- Primary Sense uses the highest standards of data security to extract, analyse and manage general practice data.
- Data extracted from Primary Sense is governed responsibly, privacy protected and securely stored and managed in Australia by PHI.
- All transmission of data is encrypted and sent over secure channels. It is stored or contained in reports that are locked down under multiple layers of access control.
- Once in the lockbox within PHI, Primary Sense administrators do not have access to the data but can collaborate with PHN staff to improve any mapping and interpretation in the Primary Sense application source data.

No identifying data (e.g. name, age, Medicare number, residential address) about an individual is extracted from a general practice's clinical information system. The internal ID assigned by the general practice's own software is encrypted and used as the identifying marker in Primary Sense, so any identifying data is only able to be displayed by the general practice that created the individual's data as only that general practice can link the encrypted identifying marker with their own practice software's data.

3.1 Data access roles – Patient, GP, Lead PHN, PHN

The level of access to data by each person or organisation with a defined data governance role within each discrete part of the Primary Sense data flow is contained below:



*'Break glass' access refers to an administrator account that has sufficient privileges to view data or take an action, but can only be used in an emergency situation or if specifically requested by a Custodian / Sponsor.

3.2 Data access by the Lead PHN

Since the Lead PHN controls access to Primary Sense, the degree of access that accounts used by the Primary Sense Team to different types of data must be clearly articulated. The following table provides that clarity.

Account access to data within the Primary Sense Core Zone:

Primary Sense Data Components	Primary Sense Application Accounts	Primary Sense Team "Break Glass" Accounts	Primary Sense Team Administrator Accounts	Primary Sense Team Standard Accounts	Other PHN (inc. Lead PHN) Staff
Metadata *(e.g.: table and field names, data formats, data volumes, etc.)*	Full Access	Read Access	Read Access	Read Access	No Access *(Audit Access to own data only on request)*
Telemetry Data *(e.g.: data records added or updated, tables and fields specific to API performance activity or system health)*	Full Access	Read Access	Read Access	Read Access	No Access *(Audit Access to own data only on request)*
Mapping Data *(e.g.: fields in GP data used for mapping against reference data sets)*	Full Access	Read Access	Read Access	No Access	No Access *(Audit Access to own data only on request)*
Reference Data *(not GP or PHN data – only third-party sourced or created by or for project)*	Full Access	Read Access	Read Access *(plus Scripted Write Access via Change Management)*	Read Access	No Access *(All PHNs access only via copies in Common Zone)*
All Data *(all fields, all tables)*	Full Access	Read Access	No Access	No Access	No Access *(Audit Access to own data only on request)*

Data that is extracted from Primary Sense comes from different clinical software systems. To enable consistency, where possible, data is mapped to international classification systems like:

- International Classification of Primary Care (ICPC2+)
- Logical Observation Identifiers Names and Codes (LOINC®)

At times, additional classifications might be required.

The Primary Sense logic is a series of structured queries run on the data to link data to reference tables, apply calculations and criteria. This process identifies patients most at risk.

The logic runs when the data is received in the database, for example:

- when new data for the patient is entered by the GP e.g. new medications
- when the practice requests data back e.g. running a report
- when the practices' data generated throughout the day is analysed and ready for prompts the next day.

Practice staff can provide feedback if the reports, prompts or alerts are right or wrong to enable auditing and corrections as required. There is also the ability to opt in and out of various functions:

- The GP can choose which alerts and prompts they want/don't want to receive.
- Patients can choose whether to share their data for primary purposes (e.g. risk factors presented back to the treating GP). (See patient consent in Section 7 for further information).
- Patients can choose whether or not to share their data for secondary purposes (e.g. aggregated data for planning).
- Reports are returned only when clicked on in the desktop app.

Only data used for the Primary Sense logic is extracted, and only within timeframes relevant for this purpose. Primary Sense has two functions for use of data - the primary purpose and the secondary purpose, as defined in the Data Sharing and Licensing Agreement between each practice and their PHN.

DATA DICTIONARY

As Primary Sense is built on complex mapping tables containing over 45,000 items that are constantly being updated, there is no published data dictionary for the application database.

3.3 How the mapping works

An ICPC code ID is allocated to the extracted data on insertion into the database by matching the reason to the 'description' to the 'reference table'.

Note that there are additional complexities that must be managed in the mappings. i.e. To populate the "Cardiovascular Disease Risk Factors" report in the desktop app, patients with cardiovascular disease need to be excluded (classification 11), but the report must also identify patients who are diabetic for inclusion (classification 1). Hence, additional classifications are used to group and differentiate the two in the report diagnosis refence table, which the report logic draws on.

Below is an example of how the ICPC ID works in the logic:

The ICPC code ID is applied to the extracted data by matching the two descriptions in extracted data and the reference table. This ID can then be used to determine how the diagnosis is managed in the report, alert and prompt logic. The criteria to map to descriptions allows mapping left and right stents without needing both in the reference table.

Extracted data inserted into DB		Reference table- each description has its own ID					A classification is applied as some reports use 11(CVD) and 1 (diabetes)			
ICPC Code ID	Reason	ID	Grouper	Grouper description	ICPC2+	Description	Classification		Report ID	ICPC Code ID
10966	Cva (Cerebrovascular Accident)	10966	K90	Stroke/CVA	K90010	CVA (Cerebrovascular Accident)	11	CVD	15	10966
10385	Ischaemic Heart Disease	10385	K76	Ischaemic heart disease	K76014	ischaemic heart disease	11	CVD	15	10385
10304	Myocardial Infarction	10304	K75	Acute MI	K75002	Myocardial infarction	11	CVD	15	10304
10434	Heart failure	10434	K77	Heart Failure	K77011	heart failure	11	CVD	15	10434
9873	Stent, coronary artery x 3	9873	K53	Treatment/ procedure	K53009	Stent, coronary artery	11	CVD	15	9873
10777	Cardiomyopathy ?viral	10777	K84	Heart disease other	K84041	Cardiomyopathy	11	CVD	15	10777
10970	Strokes	10970	K90	Stroke/CVA	K90010	Stroke	11	CVD	15	10970
9873	Stent, coronary artery-Right	9873	K53	Treatment/ procedure	K53009	Stent, coronary artery	11	CVD	15	9873
9873	Stent, coronary artery left	9873	K53	Treatment/ procedure	K53009	Stent, coronary artery	11	CVD	15	9873

3.4 Data extracted

Below is the list of data tables and how far back (in terms of timeframe) the initial extraction goes to collect the records. Only patients marked as 'active' have their records extracted from the practice.

Description	Table Name	Timeline
List of patients at each practice	Patient	All
List of staff at each practice	Staff	All
List of pathologies ordered for each patient	Pathology Request	5 years (except certain genetic tests)
List of visits for each patient	Patient Visit	5 years
List of allergic reactions for each patient	Allergic Reaction	All
List of historical visits for each patient	Clinical History	All
List of consultations for each patient	Consultation	5 years
List of documents for each patient	Document	5 years
List of immunisations for each patient	Immunisation	All
List of service items for each visit	MBS Billed Record	5 years
List of medications for each patient	Medication	5 years unless ceased date is null
List of observations for each patient	Observation	5 years
List of pathologies results for each pathology ordered (pathology providers not known)	Pathology Result	5 years (except certain genetic tests)
List of patient lifestyle records for each patient	Patient Lifestyle	All
List of pregnancies for each patient	Pregnancy	All
List of prescriptions for each patient	Prescription	5 years
List of visit reasons for each patient	Visit Reason	All
List of appointment dates for each patient	Appointment Date	Extracts in advance at least 2 weeks
List of pap smear tests for each patient	Pap Smear	5 years
List of birth records for each patient	Birth	All

DESKTOP FUNCTIONALITY

The following sections delve into the functionality available on the desktop application (the application that is installed on desktops at the practice).

4. Primary Sense Reports

The desktop application has two types of reports:

- **Summary reports –** provides an aggregate view of patient information at a practice or practitioner level.
- **Patient list reports –** re-identifies the patient at the practice level only with suggested interventions or possible Medicare benefits Scheme (MBS) item numbers.

Key points for practice users

- Primary Sense Reports are accessible to all practice staff with access to a Primary Sense Desktop Application
- PIP QI measures and accreditation are the top two Summary Reports downloaded by practice staff.
- Health assessment and patients booked in with missing PIP QI measures are the most downloaded Patient List Reports.
- Summary Reports, while fewer in number, make up about 20% of reports downloaded by practice staff.
- Patient List Reports get downloaded much more frequently than summary reports (about 80%).
- If the two Patient List PIP QI reports downloads were combined, PIP QI would be the most downloaded.

Current reports included in the desktop application:

Summary reports	Patient List reports
PIP QI report - 10 measures	Benzodiazepine in substance misuse
Characteristics of the Practice Patient Population	Winter Wellness
Characteristics of the PHN Patient Population	Pregnant and Vaccinations
Accreditation	Haemochromatosis
Summary report of practice improvements	Diabetes Mellitus
Your Practice Data Quality	Patients with Moderate Complexity (band 3)
	Patients with High Complexity (5 and 4)

	Bowel and Breast Cancer Screening
	Chronic Lung Disease and Asthma
	Cardiovascular Disease Risk Factors
	Cardiovascular Disease Management
	Health Assessments
	Patients Missing PIP QI or accreditation measures
	Patients booked in with missing PIP QI measures
	Frailty Care Management
	Hypertension Management
	Voluntary Patient Registration

4.1 Adjusted Clinical Groups (ACGs ®) – overview of use in reports

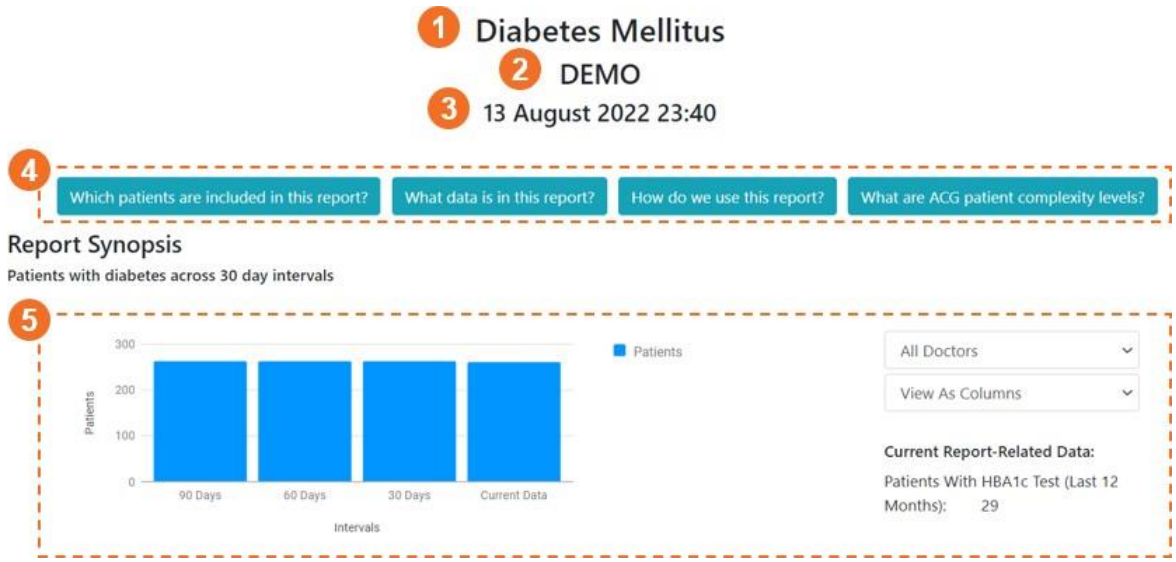
ACGs are the building blocks of the Johns Hopkins University ACG® System. ACGs are a series of mutually exclusive, health status categories defined by morbidity, age and gender. They are based on the premise that the level of resources necessary for delivering appropriate healthcare to a population is correlated with the illness burden of that population. ACGs are a person-focused method of categorising patients' illnesses. Over time, each person develops numerous conditions. Based on the pattern of these morbidities, the ACG approach assigns each individual to a single ACG category.

The complexity bands are formed by combining the ACGs to measure overall morbidity burden on a scale of 0-5, with 5 being the most complex/morbidity burden.

For further information regarding the Johns Hopkins University ACG® System, please see Section 8 in this document.

4.2 Report structure

Most reports within the Primary Sense desktop application follow a similar structure. For data security and privacy purposes, the reports can *only* be viewed in the practice using the Primary Sense desktop app. To access a report, click on the "Reports" tile and double click on any of the reports.



1. **Report name**
2. **Practice name** (in this case, we are using the “Demo” practice)
3. **Date and time** in which the report was generated
4. Tabs at the top provide additional information on how to use the report – click to open
5. **Graph** - most reports include a graph at the top so practices can see their trends going back 90 days, in 30-day increments.

6. **Table** – some reports contain multiple tables, which can be viewed by scrolling down. Generally, these tables include the date of the last visit per patient, and if the patient has an upcoming appointment booked. All reports include the patient’s age and usually the Johns Hopkins University ACG® System complexity rating band to assist practices in prioritising these lists.

   i. **Filter** – the column headings can be filtered / ordered by clicking the arrows.

   ii. **‘Remove’** – practice staff can ‘remove’ a patient from the report by clicking on the remove tab against the patient’s name. This replaces ‘remove’ with the current date,

and the patient is removed for 12 months. This allows the practice to manage the list and remove patients that have been recalled or have declined an intervention. Note that if a suggested intervention, such as a health assessment, is subsequently done then Primary Sense automatically removes the patient from the future list – this does not need to be manually done.

iii. **Export to Excel** – click the button to export the table to excel. Any filters applied to the data at the time, will be carried over.

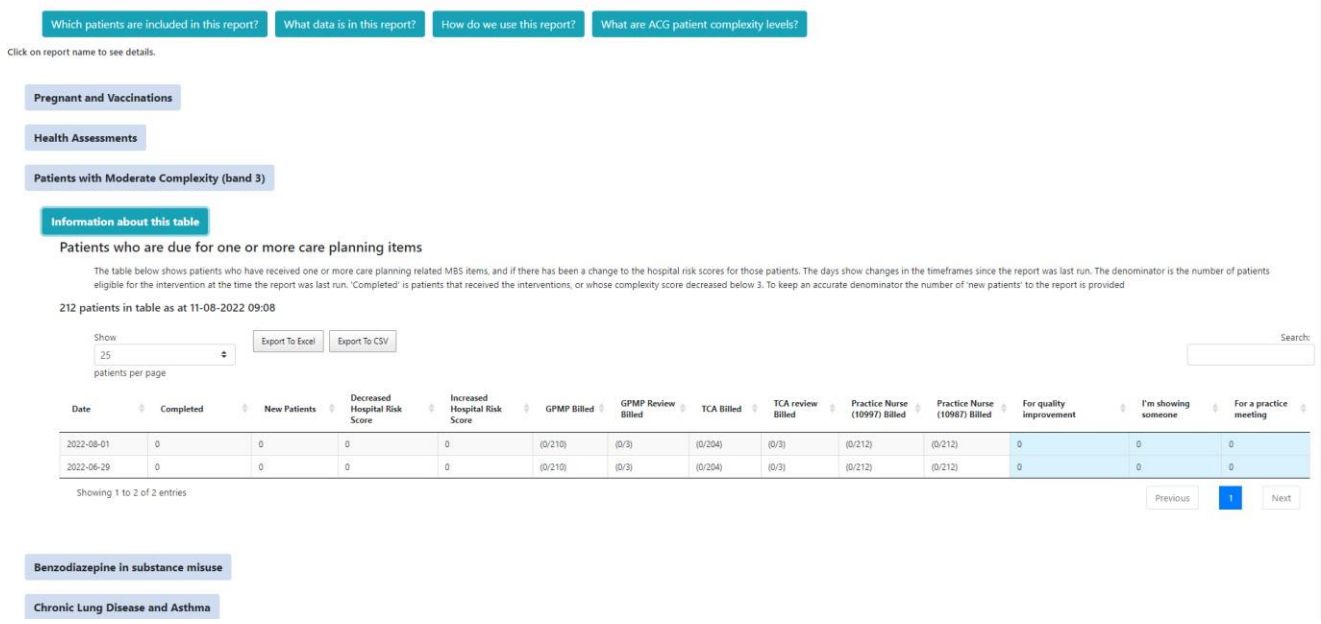
iv. **Search** – can be used to search for any attribute in the table i.e. GP name, patient name, age etc.

Additional notes:

GP name - a process works to determine who each patient's regular GP is likely to be, based on the most frequently seen GP (the GP who has opened the patient's consultation notes the most) within the last 5 visits. The logic uses a similar formula to determine which is the patient's regular practice when data sharing between practices is enabled, and which is the home clinic when practices share a server by establishing which location the patient visits most frequently. This enables a GP to view/and or download their specific patient list.

4.3 Summary Reports

Summary Reports provide an aggregated overview of the practice or an individual practitioner's aggregated patients in the chosen areas. These reports are useful for the whole practice team, enabling a snapshot view of the practice. Where possible, benchmarked data to the PHN average will be included. The reports cover age, gender, disease, medications prescribed, data quality profiles of the practice and the national Practice Incentive Program Quality Improvement (PIP QI) measures.



Example of a Summary Report

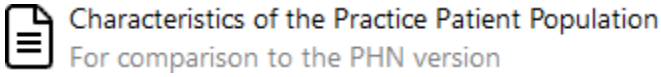
i. PIP QI Report - 10 measures

This report provides the results as a percentage against the 10 quality improvement measures as outlined below. The report refreshes each time it's run so a practice doesn't have to wait until the end of the quarter to access its data and identify trends. Note that additional reports exist which enable practices to target specific *patients* with missing PIP QI measures i.e. "Patients booked in with missing PIP QI measures" and "Patients with missing PIPQI or accreditation measures."

PIP QI Report - 10 measures:

1. Proportion of patients with diabetes with a current HbA1c result
2. Proportion of patients with a smoking status
3. Proportion of patients with a weight classification
4. Proportion of patients aged 65 and over who were immunised against influenza
5. Proportion of patients with diabetes who were immunised against influenza
6. Proportion of patients with COPD who were immunised against influenza
7. Proportion of patients with an alcohol consumption status
8. Proportion of patients with the necessary risk factors assessed to enable CVD assessment
9. Proportion of female patients with an up-to-date cervical screening
10. Proportion of patients with diabetes with a blood pressure result

ii. Characteristics of the Practice Patient Population

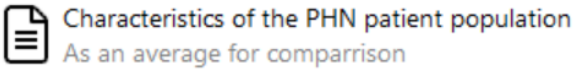


These two reports (Characteristics of the Practice Patient Population and PHN Patient Population) provide a standardised summary of the practice population profile, with the PHN version an average of all the practices enabling comparison. Population profiles are available by practice and by individual GP. All data in these reports is based on active patients that have visited the general practice in the past three years, as this is the requirement for the analysis within the Johns Hopkins University ACG® System.

Report includes:

- Age and gender analysis
- Risk band/complexity assessment of patients by age grouping
- High impact conditions (conditions deemed to have significant impact as determined by Johns Hopkins University ACG® System)
- Conditions coded and/or indicated by medication
- Diagnosis number per patient
- Number of active ingredients (prescribed medications) per patient

iii. Characteristics of the PHN Patient Population

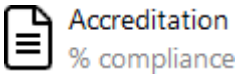


This report lists characteristics of the patient population of the PHN as an average for all practices. It provides an overview of demographics, ACG risk stratification scores and diagnostic clusters across total age groups, aggregated from all practices using Primary Sense and submitting data via Primary Sense for the PHN

Report includes:

- Age and gender analysis
- Risk band/complexity assessment of patients by age grouping
- High impact conditions (conditions deemed to have significant impact as determined by Johns Hopkins University ACG® System)
- Conditions coded and/or indicated by medication
- Diagnosis number per patient
- Number of active ingredients (prescribed medications) per patient

iv. Accreditation



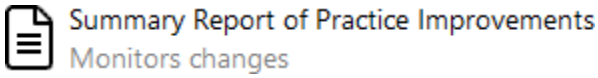
This report assists practices to prepare for accreditation. It focuses on data quality in line with The Royal Australian of College of General Practitioners (RACGP) standards for general practice (5th edition). It includes:

Total number of patients and the percentage recorded:

- Ethnicity
- Smoking status
- BMI
- Alcohol use
- Allergy status

Data Item	Practice Data	RACGP Minimum Target
Active Patient Number	360	
Allergy Status recorded	99.72%	90% Active Patients
Smoking > 10yrs old recorded	94.72%	75% Active Patients
Alcohol > 15 yrs old recorded	88.30%	75% Active Patients
BMI recorded	85.00%	75% Active Patients
Ethnicity recorded	41.94%	75% Active Patients

v. Summary Report of Practice Improvements

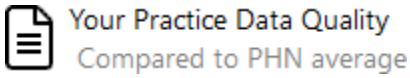


This report summarises other reports that include a patient's name. It does not enable re-identification of any patients but allows the practice to track the volume of patients in other reports within a given timeframe. This report gets updated as new patient list reports become available. Report includes:

Number of patients in the following reports:

- Patients with high complexity
- Patients with moderate complexity
- Benzodiazepine in substance abuse
- Chronic lung disease and asthma
- Missing PIP QI or accreditation measures
- Patients booked in with missing PIP QI measures
- Cardiovascular risk factors
- Diabetes mellitus
- Hemochromatosis
- Health assessments
- Pregnant women due vaccinations

vi. Your Practice Data Quality



This report provides a baseline of a practice's current coding levels. This can be used to inform areas where improved coding is required, and to guide interpreting results from other reports such as the patient list reports, which uses many of the below factors to calculate risks. The report also benchmarks the PHN average. The data item coded diagnosis is calculated by coded / (coded + free text) x 100

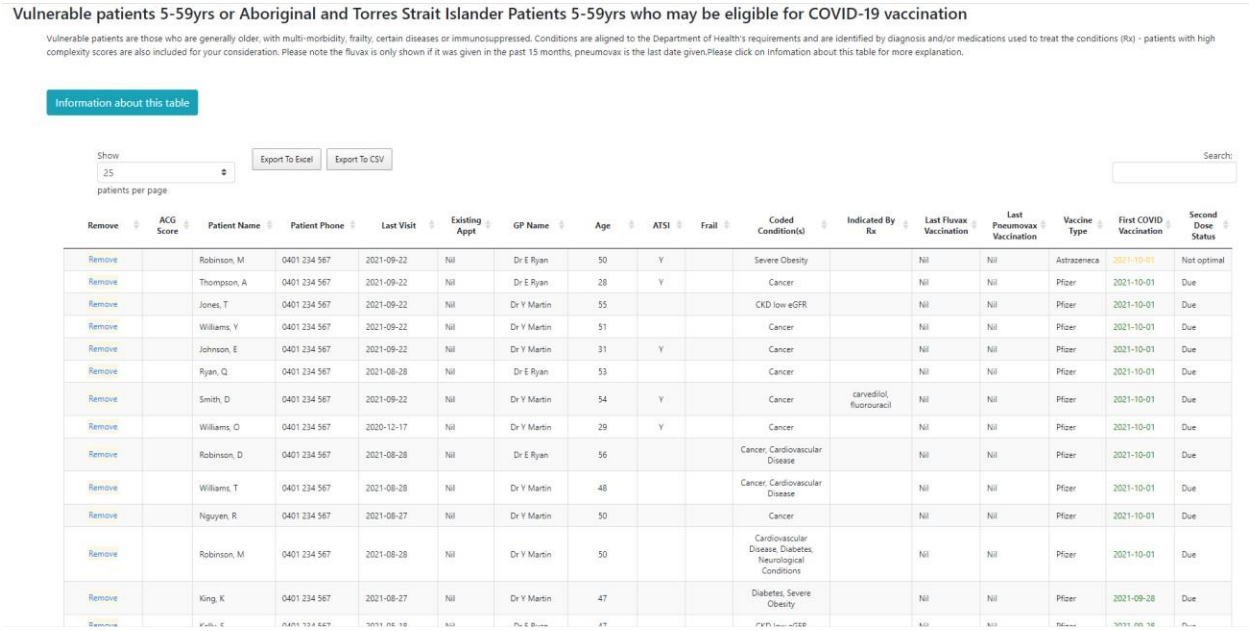
Report includes:

- Number of patients marked as 'active'
- The percentage recorded:
    - Coded diagnoses
    - Ethnicity status
    - Smoking >10yrs old
    - Alcohol > 15yrs old
    - Allergy
    - Indicated diagnoses (indicated by medication used)

Data Item	Practice Data	PHN Average
Total Patient Population	1488	2138744
Coded Diagnoses recorded	91.59%	91.70%
Ethnicity Status recorded	39.31%	71.17%
Smoking > 10yrs old recorded	88.22%	62.97%
Alcohol > 15yrs old recorded	83.85%	62.49%
BMI recorded	73.86%	29.48%
BP recorded	91.06%	37.28%
Allergy Status recorded	95.09%	75.56%

4.4 Patient List Reports

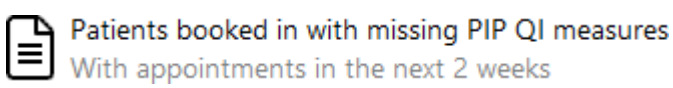
Patient List Reports connect with a practice's database to provide patient name and phone numbers to enable targeted interventions and identify patients eligible for certain MBS item numbers.



Example of a Patient List Report

Most of these reports follow a standard format of providing a patient name, phone number, last visit date and if booked in for an appointment in the future. They have been updated to use the relevant Covid-19 MBS items. Reports are listed alphabetically.

i. Patients booked in with missing PIP QI measures



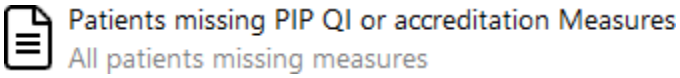
This report lists patients with upcoming appointments in the next two weeks who have missing

PIP QI measures. Active patients are based on RACGP criteria of three visits in the past two years.

Report includes

- Ethnicity recorded
- Smoking status recorded
- BMI recorded
- Alcohol status recorded
- Allergy status recorded
- Diabetes missing influenza vaccination, BP, HbA1c
- Influenza vaccination due, over 65, COPD
- CV risk factors recorded (Y or N)
- Cervical screening done

ii. Patients with missing PIPQI or accreditation measures



This report lists patients marked as active who are missing one or more accreditation or PIPQI measures. (N indicates not recorded). Where the patient meets RACGP active definition of three visits in the past two years, that is shown. To prevent potential re-identification, patients aged over 90yrs are presented as 90yrs. Due to the recent Covid vaccination program inflating numbers of patients marked as active, the best way to find regular patients is to filter on those with smoking status recorded by clicking the up and down arrow in that column.

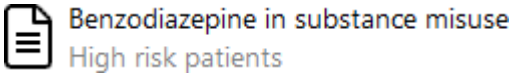
Searching the doctor's name can generate a GP list, and clicking on the arrows by each column header can create lists for a missing measure. Exporting to excel will keep the selections made (user instructions are provided in each report).

Report includes

- Ethnicity
- Smoking status
- BMI
- Alcohol status
- Allergy status
- Diabetics with missing influenza vaccination

Patient Name	Patient Phone	Last Visit	GP Name	Clinic	Age	ATSI	RACGP Active	Ethnicity	Smoking Status	BMI	Alcohol Status	Allergy Status	Diabetics with missing factors	CV Risk Factors	Cervical Screening	Fluvax
Thomas, A	0401 234 567	2021-09-22	Dr T Anderson	Surgery	15	Y			N		N					
Campbell, D	0401 234 567	2018-09-28	Dr T Anderson	Surgery	15			N	N	N	N					
Nguyen, R	0401 234 567	2019-09-16	Dr T Anderson	Surgery	15				N	N	N					
Brown, X	0401 234 567	2019-07-02	Dr T Anderson	Surgery	15				N		N					
Robinson, R	0401 234 567	2019-06-07	Dr Q Thompson	Surgery	15				N	N	N	N				
White, R	0401 234 567	Nil			15				N	N	N	N				
Lee, T	0401 234 567	2021-09-22	Dr Q Thompson	Surgery	15		Y	N	N		N					

iii. Benzodiazepine in substance misuse



This report highlights patients with substance misuse or a severe mental health condition, which have been prescribed benzodiazepine. Patients on this report may be eligible for mental health care occasions of service.

Report includes:

- ACG score
- The generic drug names
- Date the drug was started
- The count of mental health conditions
    - Mental health care plan
    - Mental health care plan review

iv. Winter Wellness

The original COVID-19 report has been updated (as of March 2023) to address broader 'Winter Wellness' concerns, via identifying patients who may be vulnerable to seasonal respiratory infections.

The report includes one table: **Vulnerable patients 5-59yrs or Aboriginal and Torres Strait Islander Patients 5-59yrs who may be eligible for seasonal vaccinations**.

Remove	ACG Score	Patient Name	Patient Phone	Last Visit	Existing Appt	GP Name	Age	ATSI	Frail	Indicated By Dx/Rx	Last EDS	Last Fluvax Vaccination	Last Pneumovax Vaccination	Covid Vaccine Count	Last Covid Vaccination	Last Covid Infection
Remove		Kelly, E	0401 234 567	2022-07-24	Nil	Dr W White	59			Cardiovascular Disease, Diabetes	Nil	Nil	Nil	1	2021-09-21	Nil
Remove		Walker, W	0401 234 567	2021-09-30	Nil	Dr W White	53			Severe Obesity	Nil	Nil	Nil	0	Nil	Nil
Remove	4	Thompson, X	0401 234 567	2021-09-30	Nil	Dr W White	57			Diabetes	Nil	2022-10-06	Nil	0	Nil	Nil

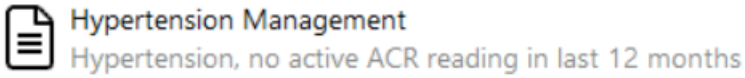
Vulnerable patients are those who are generally older, with multi-morbidity, frailty, certain diseases or immunosuppressed. Conditions are identified by diagnosis and/or medications used to treat the conditions (Rx) - patients with high complexity scores are also included for practices consideration.
Please note:

- the fluvax is only shown if it was given in the past 15 months, covid vaccination and pneumovax is the last date given.
- Count of Covid vaccinations is where it is recorded in the practices system. The date of the last COVID infection recorded is provided if documented.
- EDS is a discharge summary where received from the hospital.

The criteria used are patients:

- Diagnosed CKD, neurological disorders, obesity, affective psychosis, liver disease and severe disabilities
- With very high complexity
- Aboriginal and Torres Strait Islander people
- Immunosuppressed patients (diagnosis or indicated by medication)
- People with either diagnosed or on medication indicating diabetes, cancer, chronic inflammation, hypertension heart disease and/or respiratory disease.

v. Hypertension Management



This report highlights patients with coded hypertension that is marked as 'active' who are missing the recommended annual monitoring interventions and/or missing recommended medications. Patients with existing CVD are excluded.

Report includes:

- Patients aged 30-89yrs with a coded diagnosis of hypertension without prescriptions for lipid lowering, or antihypertensive medications in the past 18 months.
- blood pressure (SBP), cholesterol, Albumin Creatinine Ratio (ACR), microalbumin urea (MALB) or protein urea test in the past 12 months.

vi. Pregnant and Vaccinations

This report will identify pregnant women without a record of vaccination for pertussis and/or influenza during this pregnancy (less than 42 weeks gestation). Women under 15yrs and over 45yrs are excluded as they would require more monitoring than this report intends to identify.

Report includes:

- Weeks pregnant
- Due date
- Due date by source (ultrasound scan or record of the last menstruation date)
- If influenza vaccination is due (can be throughout the pregnancy). If the vaccine was given in the three months prior to the pregnancy it will appear in brackets () indicating it should be repeated.
- If pertussis is due (preferably between 28 and 32 weeks, but can be any time in the final trimester). If not due, N/A is shown.

vii. Hemochromatosis.

Haemochromatosis
Associated risk indicators

The report lists patients with a raised transferrin saturation result (>45%) or two raised ferritin results (>300 ug/l for men and >200 ug/l for women) who do not have a coded diagnosis of haemochromatosis or a record of a hemochromatosis gene (HFE) test. It states that patients are eligible for an MBS rebate for the HFE gene test if the patient:

a. has elevated transferrin saturation levels, or two or more abnormally raised serum ferritin results
b. has a first-degree relative with haemochromatosis
c. is homozygous for the C282Y gene variant or a compound heterozygote.

Report includes

- Transferrin saturation result and date
- Date of the first and second ferritin results

viii. Diabetes Mellitus

Diabetes Mellitus
Diagnosed and undiagnosed

The report has three sections to target patients at risk of diabetes, those with diabetes not coded, and those with diabetes with gaps in annual cycles of care. This report contains multiple tables, and an ACG is provided in each.

a. Table 1

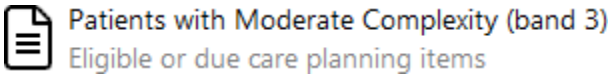
- This table lists patients with a fasting glucose >7.0mmol/l in the three months before this report who do not have a HbA1c result.
- Patients are excluded from the list if they:
    - have a coded diagnoses of diabetes mellitus
    - have polycystic ovarian syndrome
    - are prescribed anti-diabetic medication
    - are pregnant.
- As these patients are not the target group at risk of developing diabetes Type 1 or 2 as indicated by a raised fasting glucose that should be followed up with a HbA1c.

b. Table 2

- This table lists patients who may have a diagnosis of diabetes that has not been coded.
- It includes patients with a fasting glucose >7.0mmol/l more than three months before this report, lists any anti-diabetic medication prescribed for the patient and HbA1c results prior to the fasting glucose result.
- Patients are excluded from the list if they have a coded diagnoses of diabetes mellitus or polycystic ovarian syndrome or are pregnant.
- Not all the patients in this list will have a diagnosis of diabetes mellitus – clinical review is recommended.
- HbA1c results can be provided in % or mmol/mol.

c. **Table 3**
   - The table lists patients with a coded diagnosis of diabetes mellitus, but excludes those patients with gestational diabetes. The most recent results are displayed (HBA1C; blood pressure; influenza vaccination; Albumin Creatinine Ratio (ACR) and Albumin Excretion Rates (AER).
   - ACR results are displayed as ‘normal’, 'microalbuminuria' (ACR values of 2.5-25mg/mmol for males and 3.5-35 mg/mmol for females; or AER values of 20-200mg/min) and 'macroalbuminuria' (ACR of >25mg/mmol for males and >35mg/mmol for females; or AER >300mg/min).
   - Proteinuria results are not included.
   - HbA1c results can be provided in % or mmol/mol.

ix. Patients with moderate complexity (band 3)



This report highlights patients who would be eligible for coordinated care to better manage chronic diseases and mental health conditions. These patients have an ACG complexity score of 3. The report uses ACG to provide a count of chronic conditions and of mental health conditions as a mechanism to select potential eligibility for MBS care plan items. While many of the mental health conditions are included as a chronic condition, a separate count of mental health conditions is provided to help the practice assess which approach would be more beneficial for the patient.

Report includes:

- A count of the chronic conditions
- A count of the mental health conditions
- Eligibility for any of the following:
  - GP management plan
  - Mental health treatment plan
  - GPMP review
  - Team care arrangement review
  - GPMHP review
  - Practice Nurse item number 10997

x. Patients with high complexity (5 and 4)

This report shows patients with the highest risk of morbidity and mortality (ACG scoring 0-5, 5 being the highest complexity). These patients are in complexity band 5 and 4, and have attended the practice at least once in the previous 12 months.

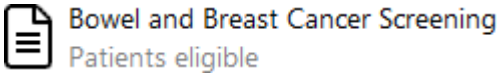
The report aims to promote ‘cycles of care’ by linking to interventions such as care plans, TCAs and reviews. It also presents the number of medications these patients are currently on, as a count in the past 12 months, and before that, which may prompt a review of the medication list for accuracy, and/or poly-pharmacy issues. The report also includes the date of the last

medication review by a pharmacist where there is one, the last date the patient visited the practice, and if they have an existing appointment. Table 1 and 2 are identical with complexity band 5 shown in table one and band 4 in table 2.

Report includes:

- Patients in the complexity band 5
- Patients in complexity band 4
- If there is a greater than 80% of risk of hospitalisation in the next 12 months (based on primary care data only using the Johns Hopkins ACG tool)
- A count of current medications in the past 12 months, and also a count prior to that date
- Eligibility for any of the following:
  - GP management plan
  - Team care arrangement
  - GPMP review
  - Team care arrangement review
  - Medication review (900)
  - Practice Nurse item number (10997): 5 in a 12 month period

xi. Bowel and Breast Cancer Screening



This report includes patients aged 45 - 74 years (and female Aboriginal and Torres Strait Islander patients aged 40-49, as they are eligible for breast cancer screening from age 40 in some states) without evidence of bowel and/or breast cancer screening completed in the past two years (noting that not all screening data may be sent to the GP.) Patients with related interventions e.g. colonoscopy are not included as they are likely already known to the GP.

The report uses patients marked as active in the practice software. Due to the recent Covid-19 vaccination programs inflating numbers of patients marked as active, practices are advised where they have good percentage of smoking recorded that the best way to find their regular patients is to filter on that column by clicking the up and down arrow in the ‘smoking status’ column.

a. Table 1

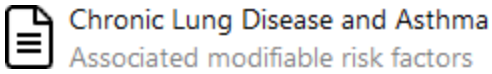
- Male patients: Excludes patients with a colonoscopy in the past two years, bowel cancer and colostomy
- Includes risk factors of smoking and obesity. ‘N/A’ means not recorded.
- Alcohol use is how the practice software describes it or the AUDITC. ‘N/A’ means not recorded

b. Table 2

- Excludes women with a history of breast cancer
- Excludes patients with a colonoscopy in the past two years, bowel cancer and colostomy
- Includes risk factors of smoking and obesity. ‘N/A’ means not recorded.
- Alcohol use is how the practice software describes it or the AUDITC. ‘N/A’ means not recorded

c. **Table 3**
   - Includes all patients that identify as female and Aboriginal/Torres Strait Islander within the ages of 40-49
   - Includes risk factors of smoking and obesity. 'N/A' means not recorded.
   - Alcohol use is how the practice software describes it or the AUDITC. 'N/A' means not recorded

xii. Chronic Lung Disease and Asthma



This report includes patients older than 14 years with a coded diagnosis of a chronic lung condition and/or asthma.

Report includes:

- Diagnosis/diagnoses
- Smoking status (using current, non-smoker or nothing recorded)
- History of smoking cessation medications tried where smoking is current
- Date of last pneumococcal vaccination
- Date of last influenza vaccination
- Date of last spirometry

xiii. Cardiovascular Disease Risk Factors

This report highlights patients who are at risk of cardiovascular disease. Only patients who are not on dual therapy (statin and antihypertensive) are included in the report. An ACG score is provided in each table, and a link to the CVD calculator is provided. Note that CV risk is currently still calculated using the old Heart Foundation calculator, however a link to the new calculator is available in the report.

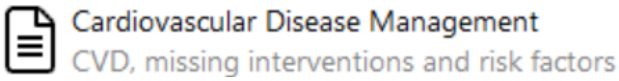
a. **Table 1**
   - The table lists patients whose most recent recorded SBP was >180, and/or with a total cholesterol >7.5 mmol/l
   - 'Clinically determined' is a level D recommendation of CVD risk guidelines and based on the clinical information or pathology results available in medical records. Risk and appropriate treatment (or not) should therefore be considered by the treating clinician for each individual patient
   - Patients are not on dual therapy (statin and antihypertensive)
   - Date of last healthy heart check MBS item

b. **Table 2**
   - The table lists patients with a high CVD risk
   - CVD risk scores were calculated using the Framingham risk calculator, which includes: SBP (treated and untreated), total cholesterol, HDL, gender, age and smoking status
   - CVD scores may underestimate the risk of patients with the following conditions or characteristics: Left ventricular hypertrophy; Aboriginal and Torres Strait Islander

people; chronic kidney disease; depression; socioeconomic disadvantage; family history of premature CVD
- Date of last Healthy Heart Check MBS item

c. Table 3
- Repeats table 2 but is for moderate CV risk

xiv. Cardiovascular Disease Management



This report highlights gaps in care for patients with cardiovascular disease. It shows patients aged 30-89 years old with Cardiovascular disease or risk of related events (including Transient Ischemic attacks and Atrial fibrillation) with missing interventions. Medications require a script in the past 18 months to be considered as active.

a. Table 1
- Report synopsis - Patients with Cardio disease in the practice across 30 day intervals
- Patients with Stroke/TIA, missing treatments
- Patients with Atherosclerotic/PVD, missing treatments
- Patients with Atrial Arythmia, missing treatments
- Patients with Cardio disease, due Fluvax

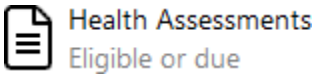
b. Table 2
- Patients with coded stroke or Transient Ischemic Attacks marked active or inactive without:
  - blood pressure reading in the last 12 months or
  - lipid tests in the last 12 months or
  - prescription for anti-platelet therapy (e.g. Aspirin / Clopidogrel) in the past 18 months
  - prescription for a lipid lowering medication in the past 18 months.

c. Table 3
- Patients with coded atherosclerosis or Peripheral Vascular Disease active or inactive without:
  - blood pressure reading in the last 12 months or
  - lipid tests in the last 12 months or
  - prescription for anti-platelet therapy (e.g. Aspirin / Clopidogrel) in the past 18 months
  - prescription for a lipid lowering medication in the past 18 months.

d. Table 4
- Patients with coded AF/Aflutter including paroxysmal active or inactive without:
  - blood pressure reading in the last 12 months or
  - lipid tests in the last 12 months or
  - prescription for warfarin or DOACs in the past 18 months.

e. Table 5
- Patients in this table have the conditions listed in the rest of the report and haven't had a seasonal influenza vaccination as of 1st Feb each year. They are in a separate table due to everyone potentially being listed at the beginning of year, which may detract form the cardiac disease management interventions as listed in the other tables. Please Check AIR.

xv. Health Assessments



This report shows the risk metrics for patients who would be eligible for proactive care to prevent or delay the onset of a chronic disease. These patients are eligible for a health assessment (will need to be confirmed at the practice). The risk of chronic disease risk score are those factors that are provided as examples under the MBS requirement. A count of two or more is used to suggest eligibility. Patients with nursing home MBS items are excluded.

b. Table 1
   - Patients with a Chronic Disease Risk Score (CDRS) of ≥2 or a Diabetes Risk Score (DRS) of ≥8 are included in this Table.
   - The CDRS range is 0-6, with 6 indicating the highest risk. Patients score one point for each of the following six factors:
     - Smoker
     - Higher than recommended alcohol use
     - systolic blood pressure >140 mmHg
     - BMI >25
     - Fasting BGL >7 mmol/L
     - Total cholesterol >5.5 mmol/L
   - The DRS score is calculated by giving points for the following factors:
     - Smoker =2
     - Prescribed antihypertensive medication =2
     - Aboriginal and Torres Strait Islander =2
     - Male gender =3
     - Age 40-44 =2
     - 45-49 =4
     - Fasting BGL >7 mmol/L =6.
   - Higher scores indicate greater risk of poor health outcomes.
   - Consider offering patients at high-risk further investigations to exclude diabetes and opportunities to address modifiable risk factors.
   - Some patients in this list may be eligible for more than one type of health assessment.
   - Patients with a family history of diabetes are eligible for a 45-49 year old health assessment, but this information cannot be extracted from practice software.

a. Table 2
   - This table lists patients who are recorded as Aboriginal and Torres Strait Islander, and have not had a health assessment in the previous nine months (as indicated by the presence of MBS item 715 or 228).

b. Table 3
   - This table lists patients who are =/> 75 years, and who have not had a health assessment in the previous 12 months (as indicated by the presence of MBS items 703, 705 or 707).

xvi. Frailty Care management

Frailty Care Management
Patients with Frailty risk factors

This report includes patients 65 yrs and over who have frailty risk factors recorded in the past 2 years (including falls, nutrition issues, lethargy or feeling depressed), and/or have a frailty flag generated by Johns Hopkins ACG tool (including incontinence, decubitus skin ulcers or dementia), and may be at risk of seasonal respiratory infections, increasing frailty, or isolated. As some of this information may not be well coded the report is intended as a resource to help identify patients with frailty indicators that may require review or confirmation of their frailty status.

Report includes

- ACG score
- If there is a greater than 80% of hospital risk in the next 12 months
- Count of chronic conditions (from ACG)
- If marked as living alone
- The frailty indicator(s) listed
- ACG frailty flag if present (as a Y)
- If the patient is on sedatives
- Chest infection(s) in the past 2 years
- Influenza infection in the past 2 years
- Date of last influenza vaccination in the past 15 months

xvii. Voluntary Patient Registration

The Voluntary Patient Registration report includes patients 'at risk,' who would benefit from enrollment. Voluntary patient enrollment is intended to promote continuity of care, strengthen the relationship between a patient, their General Practice and preferred care team, and help participating practices and providers better understand and meet their patients' needs.

Primary Sense can identify both at risk patients who would benefit from enrollment, and those that are currently experiencing fragmented care within a practice – the Voluntary Patient Registration report captures both, allowing practices to identify patients likely to meet the criteria for voluntary patient registration, and encourage that conversation at the point of care.

Patients included on the report:

- Patients with a high hospital risk score - >80% in the past 12 months
- Frailty – calculated from ACG or coded by the GP
- Severe/excessive/major polypharmacy >10 medications prescribed in the past 18 months and not ceased
- Two or more hospital or ED attendance in the past year (where able to be extracted)
- ACG band 5
- Aged care residents (patients that have been billed an MBS item in the past 12 months that indicates they are in a Residential Aged Care Facility (RACF)) are included in a separate table

Information displayed on the report:

- Age of patients – to protect patient confidentiality, the age of all patients older than 90 years are displayed as 90
- Aboriginal or Torres Strait Islander status
- Count of visits to practice in the last 2 years

- Count of active medications
- Frailty where coded or calculated by ACG
- 'Last visit' displays the last visit that was billed (excludes administration and normal after care entries in the patient record)
- 'Existing Appt' will display the next booked appointment
- 'Risk reason' will display one or more reasons the patient is determined to be high-risk. Possible reasons are:
    - Hosp = Hospital Risk
    - Frail = ACG Frailty or frailty coded by the GPy
    - PolyRX = More than 10 medication each prescribed in the past 18 months
    - ED's = 2 or more discharge summaries (ED or inpatient) in the past year
    - Complex = ACG Band 4 or 5
- 'Fragmented care' will display one or more reasons the patient is determined to have fragmented care. Possible reasons are:
    - Not Seen = no attendance in the past 6 months
    - Multi-GP = attended 3 or more GPs within the practice in the past 6 months

Using the report:

Practices may wish to utilise the 'search' field in order to identify patients who specifically have an existing appointment date in order to continue that conversation in a consult. Details (as above) on what constitutes both 'high risk' and 'fragmented care' are included in the 'information about this table' tab within the report for patients likely to meet criteria for voluntary patient registration. Note that practices are encouraged to confirm with a patient if they are enrolled elsewhere, as this is not captured within the report itself.

xviii. Child Immunisations

This report shows patients aged between 0 and 5 who are currently due or have missed a vaccination. Due dates are guidelines only based on recommendations from the Department of Health and Aged Care. Some vaccinations include an allowance for a catch-up schedule; recommended guidelines for these can be found here. Note that this report does not check patients for allergies to medication – please check for any allergies before administering any vaccinations

Report includes:

- Five tables split into age groups.
    - 2 - 6 months vaccinations
    - 6 months+ vaccinations (Influenza)
    - 12 month vaccinations
    - 18 month vaccinations
    - 4 year vaccinations
- Record of last vaccination (if any) for each of the following:
    - Hexavalent
    - Rotavirus
    - Pneumococcal
    - Meningococcal
    - Influenza
    - Meningococcal B
    - Meningococcal ACWY
    - MMR

    - Childhood HIB
    - Hepatitis A
- Date for when the next vaccination was due based on age of the patient, colour coded to reflect vaccination status:
    - N/A = Vaccination is not required or no longer eligible
    - Green = Vaccination has been given
    - Blue = Vaccination is currently due now
    - Red = Vaccination was due more than 2 months ago and has not been given yet
    - Grey = Vaccination date is upcoming, but not currently due

  Due dates marked as '(Consider)' indicates when a patient may consider a vaccination based on their location and medical condition.

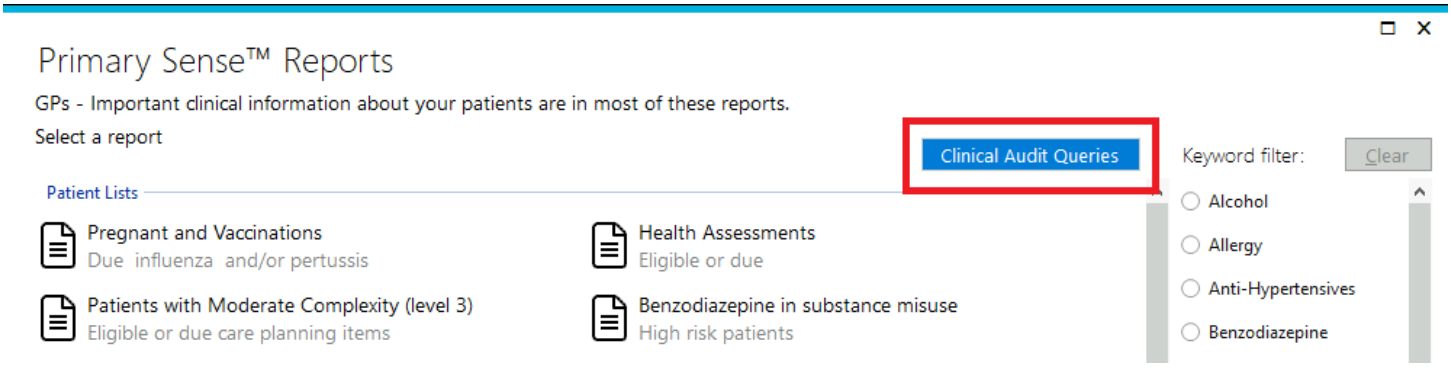
4.5 MBS items in reports and prompts

For reference:

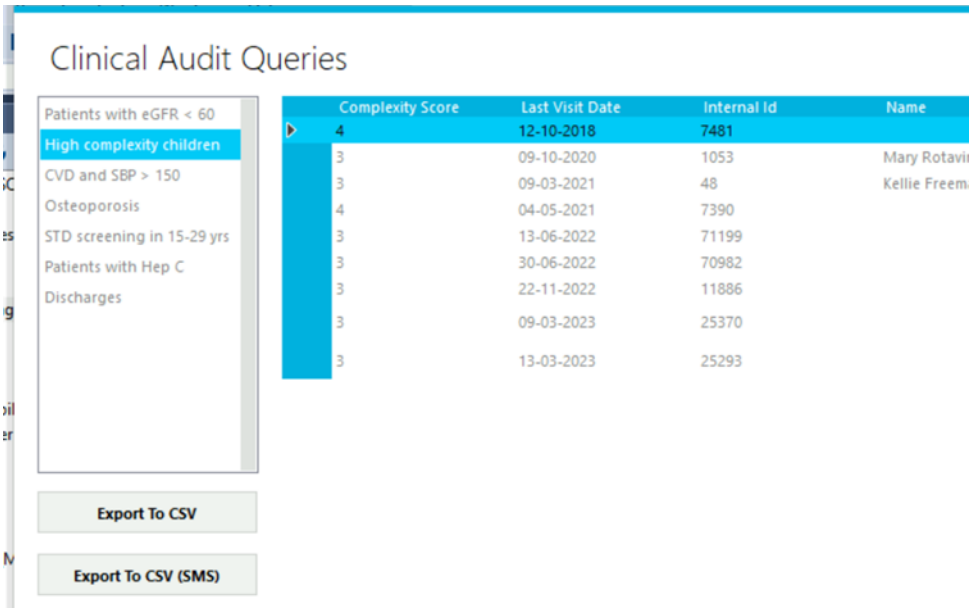
GPMP	721,723, 229,230,92025,92069, 92024,92068
GPMP review	732, 233,92028,92072
MH CP	2700, 2701, 2715, 2717, 272,276,277, 281,282, 92116, 92128, 92117, 92129, 92112, 92124, 92113, 92125
MH CP review	2712, 277, 92114, 92126
Health Assessments	699, 177, 701, 703, 705, 707, 715, 224, 225, 226, 227, 228, 92004, 92011,92016,92023
Nursing Home MBS	731, 90001, 90020, 90035, 90043, 90051, 90092, 90093, 90095, 90096, 90183, 90188, 90202, 90212, 92026, 92070, 92027, 92071
DMR (medication review)	900, 245, 903, 249
Nurse review	10997, 10987
Spirometry	11505,11506

5. Clinical Audit Queries

Clinical audit queries are similar to reports, but are a more simplistic lists of patients, enabling the volume of queries to be more extensive as there are less requirements in the logic and database processing. The intention is for use in recall lists, enrollment in projects, etc. The tab is located in the reports tile in the desktop



The list is to the left and each title has a hover over tool tip. There is also the ability to export to CSV and CSV SMS

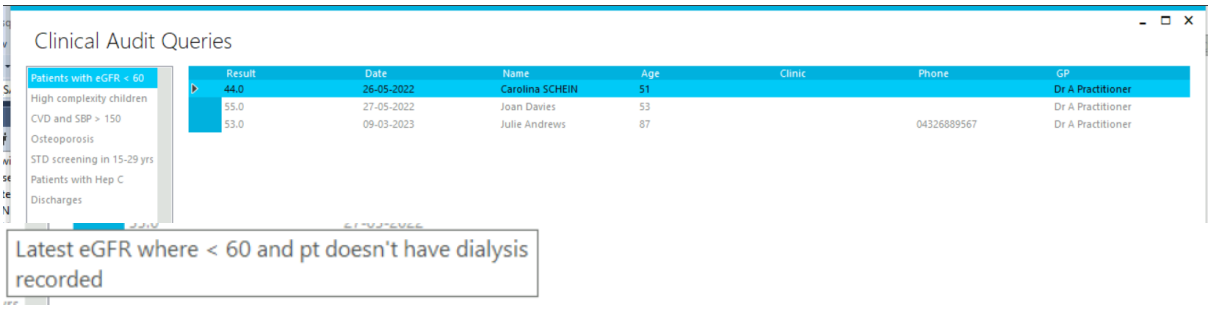


5.1 Current Clinical Audit Queries

The queries are shown below with the tool tip giving the explanation. Most will only show the last date, be that a test or date of visit

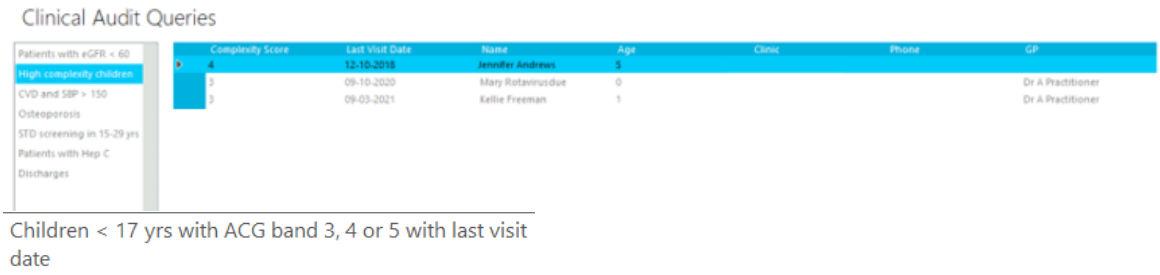
Patients with eGFR < 60

Shows the latest eGFR where it is less than 60 and the patient doesn't have dialysis recorded.
Contains data from the last 2 years.



High Complexity Children

Shows children less than 17 yrs old with ACG band 3, 4 or 5 with last visit date.
Contains data from the last 2 years.



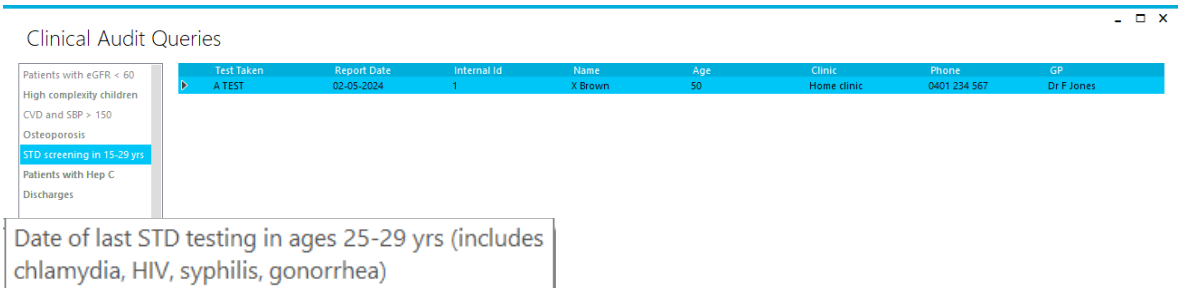
CVD and SBP > 150

Shows coded CVD and last blood pressure where > 150 mmhg.
Contains the most recent data for each patient from the last 18 months.

Osteoporosis

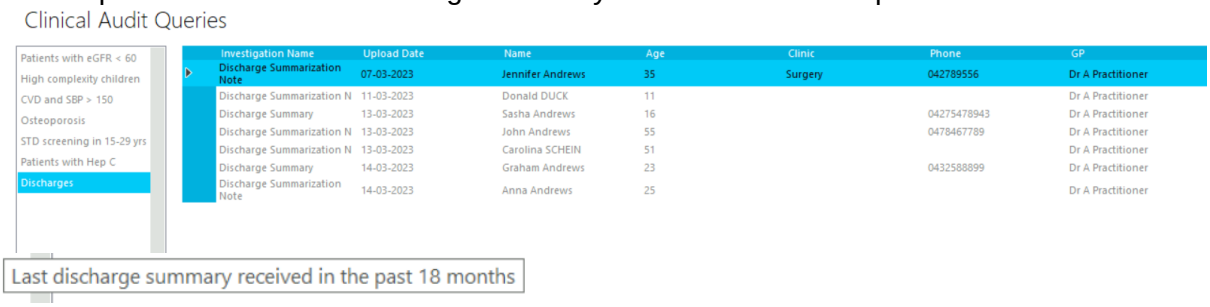
Shows coded osteoporosis with last visit date.

STD Screening in 15-29 yrs
Shows date of last STD testing in patients aged 25-29 yrs (includes chlamydia, HIV, syphilis, gonorrhea). Contains data from the last 18 months.



Patients with Hep C
Shows diagnosed Hepatitis C still active with date of last visit.

Discharges
Shows patients where last discharge summary was received in the past 18 months.



6. Medication safety alerts

Key points for practice users

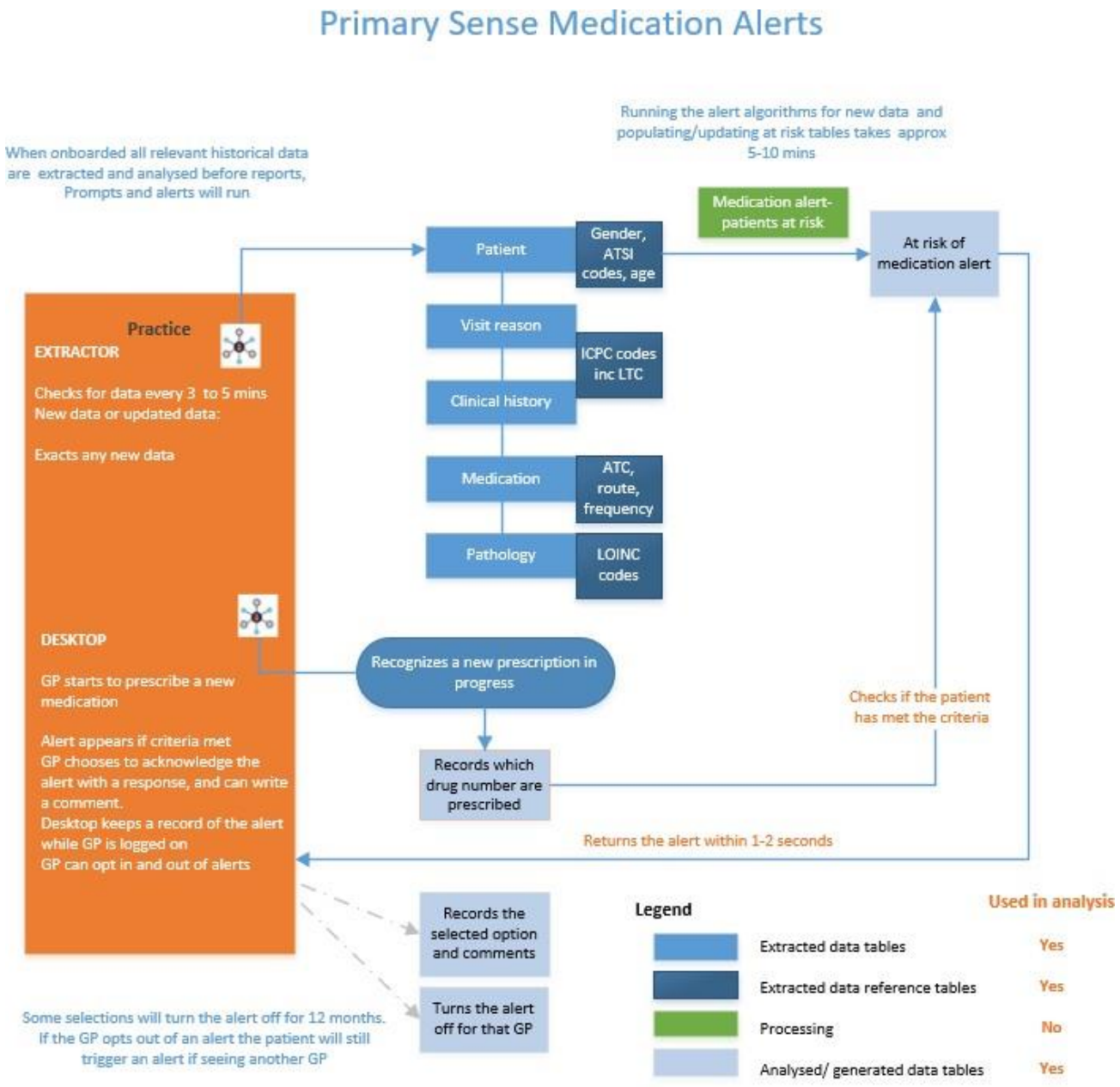
- Medication safety alerts are generated for GPs at the point of prescribing
- Each alert is evidence based and was developed based on extensive literature review
- Primary Sense alerts are different to alerts in Medical Director and Best Practice - they are more specific, relate only to high-risk medications and take individual patient factors into account
- Alerts are not intended to replace clinical judgement, and can be overridden or marked as inappropriate for the patient if necessary

An alert is a real-time notification of a potential safety issue when the GP starts to prescribe a pre-identified medication for the patient. The alerts were determined by a clinical reference group, who searched for existing indicators and contemporary drug warnings to establish a potential list of indicators to choose from. Indicator sources included:

- Literature review of studies with existing prescribing indicators in General Practice
- Review of Government therapeutic warnings
    - Australian Government – Therapeutic Goods Administration – Medicines Safety Update
    - UK Government – Drug Safety Update
    - US Food and Drug Administration – Drug safety communications
    - US Food and Drug Administration (pharmacogenomics)
- Review of contemporary GP prescribing guidelines, particularly where drug related safety issues were identified.

Primary Sense checks the practice every two seconds for a new medication being prescribed, to assess whether the current patient would be at risk in the event a specific medication is prescribed (as per the alerts below).

The medication alert process is shown below:

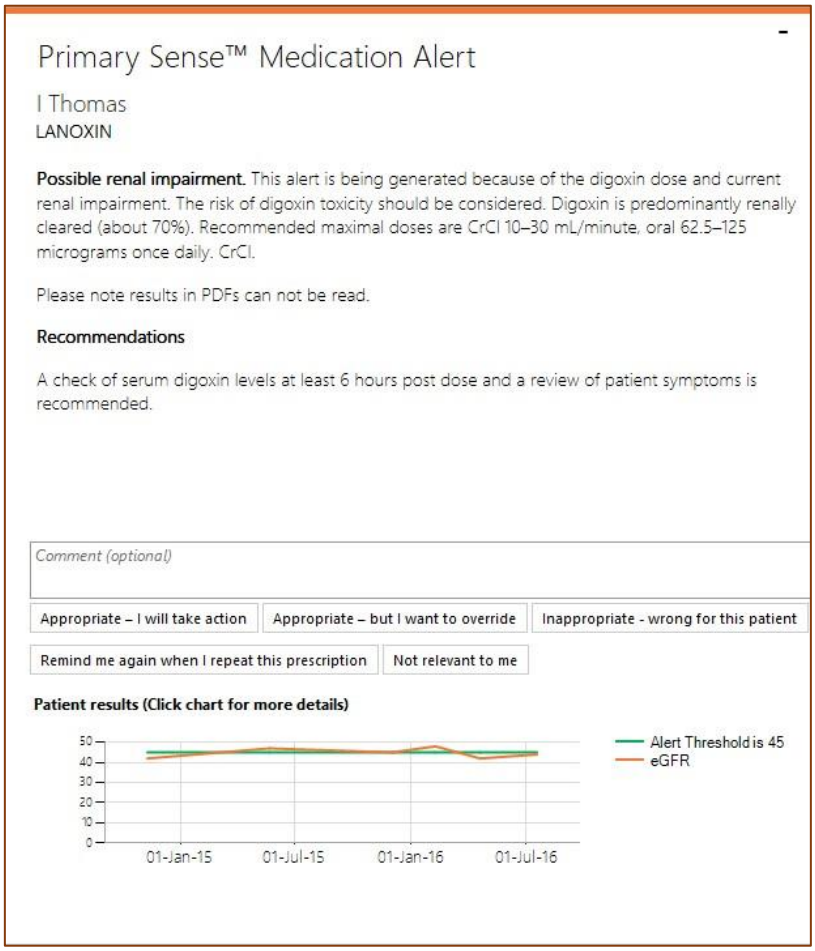


Medication Alert process in Primary Sense

If an alert is triggered it appears within seconds on the GP's screen, displaying the reason for the alert and the recommendations, including links to further information. Alerts provide five options for the GP to select. Once selected, the responses are captured in the database:

- Appropriate - I will take action.
- Appropriate - but I want to override.
- Inappropriate - wrong for this patient.
- Remind me again when I repeat this prescription.
- Not relevant to me (in case a GP is logged on at more than one PC as the alert will go to both PCs).

When the GP makes a selection, anything other than "remind me next time" will disable that alert for that GP and that patient for 12 months. The GP can also add comments when the alert appears.



A GP can review the alerts triggered during their shift, by selecting the Alerts tile, and clicking "My Alerts History."

6.1 Current medication alerts

Described below are the current medication alerts within the Primary Sense desktop app. The text and hyperlinks below are available to the GP within the displayed alert onscreen.

i. Prescribing Azathioprine/ Mercaptopurine without thiopurine methyltransferase (TPMT) testing

Thiopurine methyltransferase breaks down the thiopurine-based immunosuppressive drugs.

Approximately 0.3% of the population has a profound genetic deficiency of thiopurine methyltransferase, with approximately 10% of the population intermediate metabolisers. Individuals with intermediate or deficient TMPT activity are at increased risk for myelotoxicity after receiving standard doses of azathioprine.

A deficiency of thiopurine methyltransferase is associated with grossly elevated concentrations of thioguanine nucleotides and severe haematological toxicity (agranulocytosis). Measuring thiopurine methyltransferase activity before starting azathioprine therapy is be advisable to identify patients at risk of acute haematological toxicity. However, in practice this is variable.

Variants in the protein's gene, TPMT, can reduce the activity of the protein, resulting in toxic levels of the drug and bone marrow suppression.

Alert message

Possible missing genetic testing. This medication alert has been generated because of the absence of a screening/result for thiopurine methyltransferase (TPMT) deficiency while this patient is prescribed azathioprine or mercaptopurine therapy. A deficiency of thiopurine methyltransferase is associated with grossly elevated concentrations of thioguanine nucleotides and severe haematological toxicity (agranulocytosis) with potentially fatal consequences. Measuring thiopurine methyltransferase activity before starting azathioprine therapy is strongly advised. Up to 10% of patients have low or absent TMPT activity. Dosage modifications according to TPMT activity may also help prevent myelotoxicity.
https://www.nps.org.au/australian-prescriber/articles/fatal-azathioprine-toxicity
http://www.dorevitch.com.au/IamaDoctor/TestingGuide/NewTestingInnovations/TPMTGenotypeTesting.aspx

Please note results in PDFs cannot be read.

Alert recommendation

If not done, can you please request this test. With all pathology companies order TPMT testing. The test is often performed by specialists before therapy, but exceptions occur. Guidelines now suggest routine testing before therapy https://www.labtestsonline.org.au/learning/test-index/tpmt

ii. Prescribing an immunosuppressive drug without laboratory tests within the last six months

Medication guidelines advise regular laboratory monitoring when patients are prescribed immunosuppressive therapy. Examination of full blood count (FBC), electrolytes, urea, creatinine, fasting glucose, liver function tests and lipids is advised every three months.

Drug-related emergency room visits, and hospital admissions (DRVs) are a significant contributor to morbidity, mortality and health care costs worldwide. The proportion of total DRVs that are associated with laboratory or physiologic abnormalities, and therefore, potentially preventable is high.

The most common laboratory-related DRVs were:

- abnormalities in electrolytes (hyponatremia, hyper- and hypokalemia)
- blood dyscrasias (anemia, neutropenia)
- metabolic disturbances (hyper and hypoglycemia)
- acute renal failure.

Alert message

Possible missing pathology. This medication alert has been generated because of lack of recent (within six months) electrolytes and liver function tests (ELFT), FBC, fasting glucose and lipids lab tests while the patient is on immunosuppressive medication. Immunosuppressive therapy is a common cause of drug related misadventure.
https://www1.racgp.org.au/ajgp/2020/march/elderly-patients-taking-immunosuppressive-medicati

Please note, results in PDFs cannot be read, and some cumulative pathology results may not get imported into your system

Alert recommendation

Regular monitoring with FBC, electrolytes, urea, creatinine, fasting glucose, liver function tests and lipids is advised every three months. More frequent monitoring on drug initiation may be required. Regular monitoring can be organised using the Rule 3 exemption request on pathology forms and stating how often ordered tests need to occur eg Rule 3 exemption of quarterly FBC, ELFTs monitoring of immunosuppressant therapy
https://www.nps.org.au/australian-prescriber/articles/long-term-management-of-patients-taking-immunosuppressive-drugs

iii. Prescribing a biological drug without laboratory tests within the last six months

Biologic disease modifying anti rheumatic drugs (bDMARDs) have proven to be very effective in treating severe RA, are cost effective and work faster than traditional DMARDs. They selectively block pro-inflammatory cytokines that play a critical role in the pathogenesis of inflammatory disease or act through B or T lymphocytes to decrease cytokine production.

These medications are generally well tolerated but the existence of any contraindications to their use needs to be considered before prescribing them.

Live attenuated vaccines (e.g. rubella (MMR), BCG, yellow fever, herpes zoster and oral polio) are not recommended.

Transient dose-dependent neutropaenia and thrombocytopaenia have been reported. Very rarely late-onset neutropaenia, delayed pancytopaenia or aplastic anaemia has been recorded.

Elevations in transaminase (ALT) +/- indirect bilirubin elevations have been observed

Generally, three monthly FBC, electrolytes, creatinine and LFTs are recommended

Alert message

Possible missing pathology. This medication alert has been generated because of lack of recent (within six months) ELFT and FBC lab tests while the patient is on a biologic medication (i.e. targeted immunosuppression/anti-inflammatory agents). Treatment with biologic agents requires ongoing monitoring. Please note results in PDFs cannot be read, and some cumulative pathology results may not be imported into your system.

Alert recommendation

Generally, three to six monthly FBC, electrolytes, creatinine, and LFTs are recommended with more frequent monitoring on initiation. Regular monitoring can be organised using Rule 3 exemption request on pathology forms and stating how often ordered tests need to occur. e.g. Rule 3 exemption of 3 monthly FBC, ESR, ELFTs monitoring of biological medication. https://www.nps.org.au/australian-prescriber/articles/managing-the-drug-treatment-of-rheumatoid-arthritis#article https://www.nps.org.au/australian-prescriber/articles/managing-the-drug-treatment-of-rheumatoid-arthritis#article

iv. Prescribing an antipsychotic drug without laboratory test within the last 12 months

Patients with serious mental illness have markedly elevated rates of metabolic disturbance, including obesity, diabetes, and dyslipidemia. Antipsychotic treatment can be a contributing factor.

Antipsychotics can cause blood dyscrasias including agranulocytosis and leucopenia. There is an increased risk of developing diabetes with certain antipsychotics, particularly olanzapine, clozapine and the phenothiazines.

Antipsychotics considered a high-risk of causing hyperlipidaemia include clozapine, quetiapine, olanzapine and the phenothiazines.

Antipsychotics have been associated with hyponatraemia caused by drug-induced syndrome of inappropriate antidiuretic hormone.

Early detection and intervention for cardiometabolic risks, and a judicious tailoring of the use of antipsychotic medications can help to improve long-term outcomes in these patients. Annual blood monitoring is recommended.

Alert message

Possible missing pathology. This medication alert has been generated because of lack of recent (within 12 months) FBC, ELFT, fasting glucose and lipid lab tests.

https://www.ranzcp.org/files/resources/college_statements/clinician/cpg/schizophrenia-disorders-cpg.aspx
https://www.ranzcp.org/files/resources/college_statements/clinician/cpg/schizophrenia-disorders-cpg.aspx

Patients prescribed antipsychotic medication should have physical and laboratory monitoring for cardiometabolic risks. Please note, results in PDFs cannot be read, and some cumulative pathology results may not be imported into your system.

Alert recommendation

Lifestyle interventions to prevent weight gain and address cardiovascular risk should begin shortly after starting antipsychotic medication. If there is evidence of weight gain, consideration should be given to switching to weight-neutral antipsychotic in liaison with the patient's psychiatrist. Absolute cardiovascular risk should guide the use of antihypertensives and statin therapy.

v. Prescribing metformin where latest eGFR <30ml/min

Metformin may accumulate in people with renal impairment and increases the risk of lactic acidosis - a rare but potentially fatal adverse drug reaction. The risk increases with conditions: where tissue hypoperfusion and hypoxaemia are a problem (for example in cardiac or respiratory failure, or following a myocardial infarction), increasing age, higher doses of metformin (generally above 2 g/day).

Metformin prescribed to a patient with renal impairment where the eGFR is <30ml/min was rated in the highest risk band for the prescribing-safety indicators for GPs in the UK.

Metformin should be used with caution if GFR 30-60 mL/min/1.73m2, and is not recommended if GFR < 30 mL/min/1.73m2. It should be temporarily interrupted during periods of ill health and/or change in kidney function.

Alert message

Possible renal impairment. This medication alert has been generated because of metformin prescription in the presence of renal impairment at eGFR < 30 mL/minute. Metformin should be ceased. eGFR between 30-60mL/min/1.73m requires dose reduction and regular monitoring of eGFR https://www.racgp.org.au/getattachment/41fee8dc-7f97-4f87-9d90-b7af337af778/Management-of-type-2-diabetes-A-handbook-for-general-practice.aspx

Please note, results in PDFs cannot be read

Alert recommendation

Please consider stopping metformin if eGFR is < 30 mL/Minute/1.73m.

vi. Prescribing digoxin where latest eGFR < 45 ml/min

Reduced renal function may cause digoxin to accumulate and result in toxicity, especially in older people where it has a prolonged elimination half life1. The risk of digoxin toxicity can be

reduced by basing dosage regimens on body weight and creatinine clearance, monitoring potential electrolyte imbalances and being aware of possible drug interactions.

Prescription of digoxin at a dose >125 mg daily in a patient with renal impairment (for example, CKD 3 or worse) was rated in the second highest risk band for the prescribing-safety indicators for GPs in the UK.

Alert message

Possible renal impairment. This alert is being generated because of the digoxin dose and current renal impairment. The risk of digoxin toxicity should be considered. Digoxin is predominantly renally cleared (about 70%). Recommended maximal doses are CrCl 10 - 30 mL/minute, oral 62.5 - 125 micrograms once daily. CrCl <10 mL/minute, oral 62.5 micrograms once daily or on alternate days. Please note, results in PDFs cannot be read.

Alert recommendation

A check of serum digoxin levels at least six hours post dose and a review of patient symptoms is recommended.

vii. Prescribing a bisphosphonate drug for osteoporosis where latest eGFR <35ml/min

Bisphosphonates are not recommended for therapy when eGFR < 35ml/mi/1.73m2 (ref 1)

Unfortunately, both osteoporosis and chronic kidney disease are common in the aged population.

This indicator enables safer options for osteoporosis prescribing in general practice.

Alert message

Possible renal impairment. This medication alert has been generated because of a prescription of bisphosphonate therapy and the patient's current renal status. Bisphosphonates not recommended for therapy when eGFR < 35ml/mi/1.73m2.

https://www.nps.org.au/australian-prescriber/articles/treating-osteoporosis-1

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5079786/

Please note, results in PDFs cannot be read.

Alert recommendation

Safer alternatives should be sought e.g. Denosumab https://www.racgp.org.au/clinical-resources/clinical-guidelines/key-racgp-guidelines/view-all-racgp-guidelines/osteoporosis https://www.racgp.org.au/clinical-resources/clinical-guidelines/key-racgp-guidelines/view-all-racgp-guidelines/osteoporosis

viii. Prescribing an anti-platelet drug where there is history of peptic ulcer or gastrointestinal bleed and no gastroprotection

Antiplatelet (aspirin, clopidogrel, prasugrel, ticlopidine) therapy is indicated for the prevention of atherothrombotic events in patients who have had a myocardial infarction or ischaemic stroke, or who have established peripheral arterial disease. Combined with aspirin, the brand leader, Plavix, may also be used to prevent atherothrombotic events in patients with acute coronary syndrome.

Antiplatelet drugs also feature heavily in avoidable hospital admissions from adverse drug events – particularly gastrointestinal bleeding.

Those patients with high risks for upper gastrointestinal bleeding should receive co-therapy with a gastroprotective drug, preferably a proton pump inhibitor at a standard dose. Unfortunately, although H2-receptor antagonist can significantly reduce upper gastrointestinal bleeding risk in patients taking low-dose aspirin, it is ineffective in the prevention of upper gastrointestinal bleeding in clopidogrel users.

Alert message

Possible missing medication. This medication alert has been generated because the prescription of antiplatelet (aspirin, clopidogrel, prasugrel, ticlopidine, dipyridamole) therapy in the context of a previous peptic ulcer or gastrointestinal bleed.

Alert recommendation

Gastroprotection with a PPI is indicated. As esomeprazole and omeprazole have interactions with clopidogrel, pantoprazole is recommended.
https://onlinelibrary.wiley.com/doi/pdf/10.1111/j.1440-1746.2012.07085.x
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3752180/

ix. Prescribing a fentanyl patch where there is non-cancer pain

Fentanyl is a highly potent opioid. It is an excellent therapeutic option for cancer pain, but the RACGP position is that it is not suitable for chronic non cancer pain.

Transdermal fentanyl “patches”: reminder of potential for life-threatening harm from accidental exposure, particularly in children.

Children are at risk as they may touch, suck, chew, or swallow a patch that has not been disposed of properly. Also, children have a lower threshold for fentanyl overdose than adults. Please provide clear information to patients and caregivers regarding: risk of accidental patch transfer

- ingestion of patches
- need for appropriate disposal of patches.

Oral transmucosal fentanyl rapidly achieves high plasma concentrations and is indicated to treat breakthrough pain in cancer patients who are not opioid naive.

Fentanyl-related mortality is currently relatively low in Australia compared to the US and parts of Europe. However, fentanyl misuse is on the rise in Australia.

It has known diversional potential, extremely high street value and risk of misuse. Therefore, it should be used only as indicated.

Alert message

Possible clinical risk. This medication alert has been generated because of a prescription of a fentanyl patch and no coded cancer diagnosis. Fentanyl is a highly potent opioid. It is an excellent therapeutic option for cancer pain, but the RACGP position is that it is unsuitable for non-cancer pain.
https://www.racgp.org.au/FSDEDEV/media/documents/Clinical%20Resources/Guidelines/Drugs%20of%20dependence/Prescribing-drugs-of-dependence-in-general-practice-Part-C2.PDF

Fentanyl has a known high abuse potential. Diversion rates are high with extremely high street value and risk of misuse. Children are at risk as they may touch, suck, chew, or swallow a patch that has not been disposed of properly. Also, children have a lower threshold for fentanyl overdose than adults https://www.tga.gov.au/sites/default/files/msu-2014-08.pdf

https://www.gov.uk/drug-safety-update/transdermal-fentanyl-patches-reminder-of-potential-for-life-threatening-harm-from-accidental-exposure-particularly-in-children

Alert recommendation

Please review the reason for prescribing and/or add a coded cancer diagnosis to the medical record.

x. Prescribing a combined hormonal contraceptive where there is a history migraine

Women who have a history of migraine should be advised about the risk of using the combined oral contraceptive pill. The UK Medical Eligibility Criteria for Contraceptive Use (MEC) now considers women with migraine – category 3 - a condition where the theoretical or proven risks usually outweigh the advantages of using the medication.

Women with Migraine and Aura – category 4 - a condition which represents an unacceptable health risk if the method is used.

Alert message

Possible clinical risk. This medication alert has been generated because of the combination of migraine (or migraine therapies) and oral contraceptive therapy. The UK Medical Eligibility Criteria for Contraceptive Use (MEC) now considers women with migraine - a category 3 - a condition where the theoretical or proven risks usually outweigh the advantages of using the method. The provision of a method requires expert clinical judgement and/or referral to a specialist contraceptive provider. Since use of the method is not usually recommended, unless more appropriate methods are not available, or not acceptable, women with migraine and aura - a category 4 - condition which represents an unacceptable health risk if the method is used.
https://www.fsrh.org/ukmec/

Alert recommendation

A. The diagnosis of migraine should be reviewed and confirmed.

B. Progesterone only contraception, IUDs or other alternate methods should be considered as alternatives.

C. Documented shared decision making, with a decision by the patient to make an informed decision to continue therapy despite risks, may also be an option.
https://www.mayoclinic.org/diseases-conditions/migraine-with-aura/multimedia/migraine-aura/vid-20084707

xi. Prescribing a hypoglycaemic drug (other than single preparation metformin) in patients ≤ 75yrs where latest HbA1c < 6.5% (<48mmol)

Current comprehensive systematic reviews investigating the benefits and harms of intensive glycaemic control compared at best show no benefit, and many show increased harms from death and hypoglycaemia. This is true for both type 1 and type 2 diabetes.

Less intensive therapy is advocated.

Alert message

Possible overprescribing of hypoglycaemic medication. This medication alert has been generated because of tight glycaemic control in a diabetic patient (HbA1c < 48 mmol/mol (6.5%). Tight control is associated with poorer outcomes which prompts a consideration to reduce hypoglycaemic medication in this patient. Comparison between tight glycaemic control (Hba1c 42 mmol/mol to 48 mmol/mol (6.0 to 6.5%) and conventional care (HbA1c target 53 mmol/mol to 63 mmol/mol (7.0 to 7.9%) have failed to produce significant health benefits.
https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD010137.pub2/full

There is no renal or cerebrovascular benefit. The only subgroup differences between tight and non-tight glycaemic control groups were that more people with tight glycaemic control died owing to cardiovascular causes (32 vs 18 per 1000 people), but fewer had a non-fatal myocardial infarction (36 vs 46 per 1000 people).
https://www.cochranelibrary.com/cca/doi/10.1002/cca.1791/full

In addition, both minor and major hypoglycaemia are more commonly associated with tight glycaemic control. This is true for type 2 diabetes and type 1 diabetes.

Alert recommendation

Please consider reduction of insulins or sulphonylureas first. You may want to consider repeating the HbA1C in three months if medication is altered. Please note, results in PDFs cannot be read, and some cumulative pathology results may not be imported into your system.

xii. Prescribing a hypoglycaemic drug (other than single preparation metformin) in patients >75yrs where HbA1c < 7% (<53mmols)

Studies reveal that intensive treatment of type 2 diabetes (HbA1c <7) in older or complex patients (>3 chronic conditions) is common. In these populations, hypoglycaemia requiring A&E presentation and hospitalisation is increased.

A substantial proportion of these patients were taking sulfonylurea or insulin. Intensive treatment in these populations confers little benefit. For the majority of adults older than 65 years, the harms associated with a haemoglobin A1c (HbA1c) target lower than 7.5% are likely to outweigh the benefits.

In an American trial of older patients (>75) with Hba1c <7.0%, a reminder to prompt deprescribing of insulin / sulfonylurea resulted lower hypoglycaemic rates.

This indicator recognises the importance of hypoglycaemia avoidance overachieving glycaemic targets among the elderly. For the majority of older adults, an HbA1c target between 7.5% and 9% will maximise benefits and minimise harms.

Sulphonylureas should be used with caution because the risk of hypoglycaemia increases exponentially with age.

Avoid using medications other than metformin to achieve hemoglobin A1c<7.5% in most older adults; moderate control is generally better.

There is no uniformly agreed-upon definition of “elderly”, although it is generally accepted that this is a concept that reflects an age starting sometime after age 65.

Canadian guidelines recommend a HbA1c target of <8.5 in frail elderly. Maintain HbA1c at or above 8% rather than below a specific level, in keeping with the conclusion that lower HbA1c levels are associated with increased hypoglycemic events without accruing meaningful benefit for frail older adults with type 2 diabetes

Alert message

Possible overprescribing of hypoglycaemic medication. This medication alert has been generated to bring your attention to this patient’s HbA1c results. Elderly populations with a HbA1c < 54 mmol/mol (7.1%) prescribed more than just simple metformin, are at risk of hypoglycaemia requiring A&E presentation and hospitalisation. This indicator recognises the importance of hypoglycaemia avoidance overachieving glycaemic targets among the elderly. Individualised HbA1c targets are recommended. For health individuals at low risk of hypoglycaemia target should be 7-7.5% (53-59 mmol/mol. For frail individuals with complex comorbidities target HbA1c should be relaxed to <= 8.5% (69 mmol/mol).
https://www.racgp.org.au/getattachment/41fee8dc-7f97-4f87-9d90-b7af337af778/Management-of-type-2-diabetes-A-handbook-for-general-practice.aspx

In an American trial of older patients (> 75 yrs) with Hba1c < 53mmol/mol (7.0%) a reminder to prompt deprescribing of insulin / sulphonyluria resulted lower hypoglycaemic rates.
https://www.ncbi.nlm.nih.gov/pubmed/28848316

Alert recommendation

Please consider the therapeutic regime and decrease if you feel warranted. You may want to consider repeating the HbA1C in three months if medication is altered. Please note, results in

PDFs cannot be read, and some cumulative pathology results may not be imported into your system.

7.GP Prompts

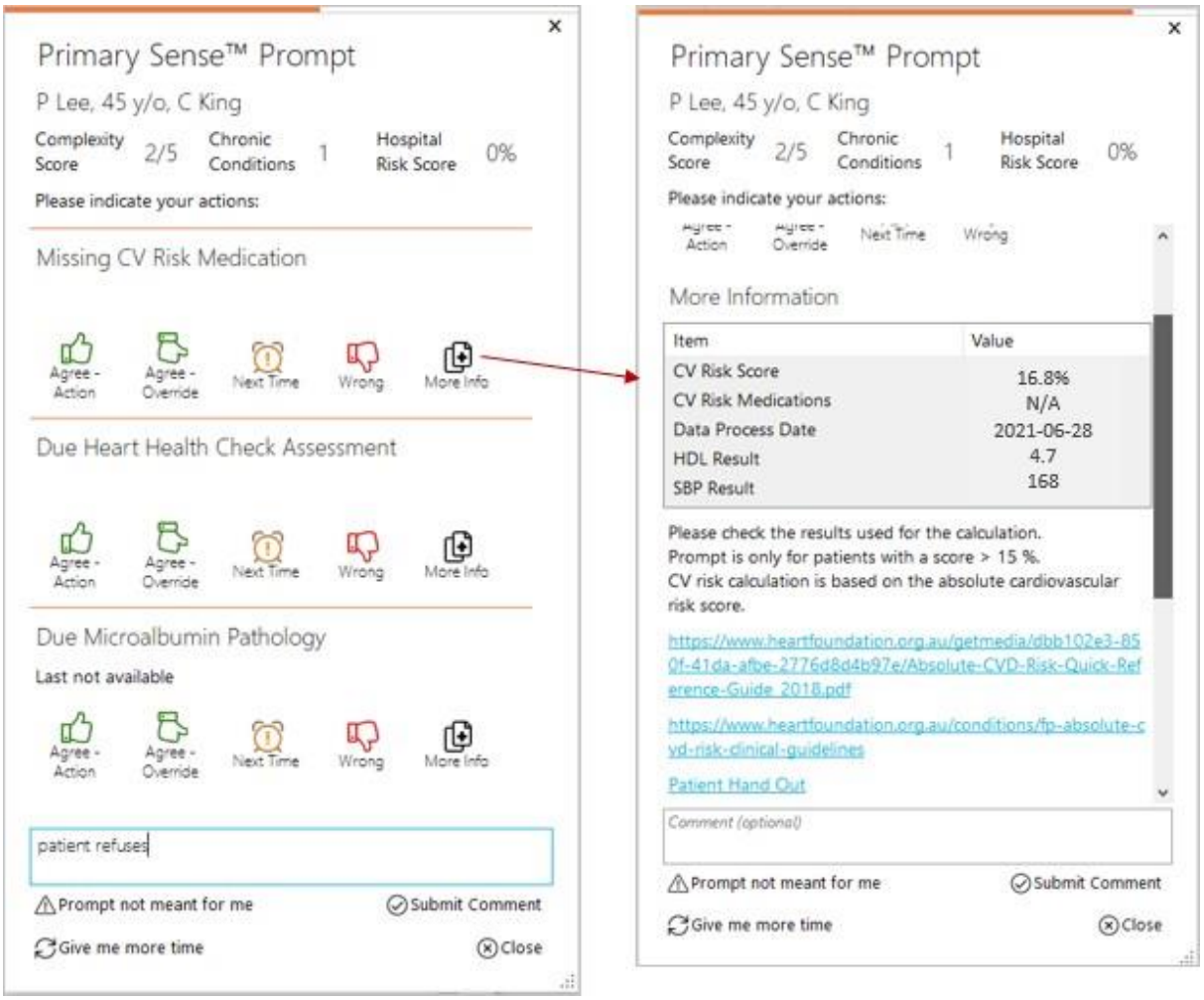
Key points for practice users

- Primary Sense GP Prompts focus on the most at risk patients, and provide on screen prompts to highlight potential gaps in care including use of the Johns Hopkins complexity and hospital risk scores
- Prompts will only generate when the patient file in the clinical software has been opened by a General Practitioner (logged in), and only in specific circumstances (where specific criteria are met i.e. complexity scores and gaps in care).
- Prompts are more frequent events than alerts – about 10% of visits generate a prompt compared to 0.5 % of visits for an alert..
- There have been increases in the suggested interventions done when compared to GPs without access to the prompts.

GP Prompts were identified for development as fewer GPs than practice managers/nurses were downloading reports; more specifically many of the reports containing the more clinically focused information weren't downloaded regularly or at all.

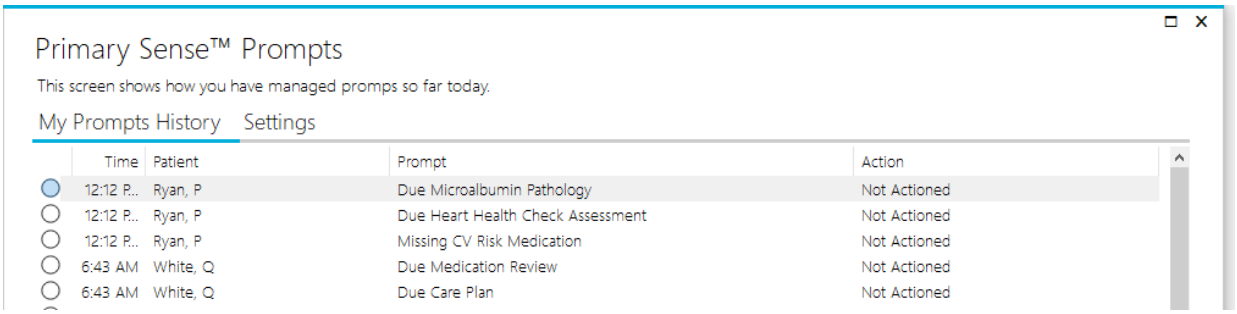
GP Prompts appear when the GP opens the patient's record in the clinical software and are specific to each patient. They only contain 3 items at a time, and these have been given a clinical priority in order of appearance. When one element is actioned that allows a subsequent element to appear on the next prompt.

The more information section provides the rationale for the prompt and the relevant details for cross reference by the GP.



Users can exit the prompt by selecting one of the 'actions' available, or by selecting 'prompt not meant for me', or close. **Selecting an action other than 'next time' or 'prompt not meant for me' will disable the prompt for the patient for 12 months**. Prompts that are part of a series, i.e. prompts for vaccinations that require multiple doses, where each dose can potentially trigger a separate iteration of the prompt, will also have a 'Dismiss' option, which will disable the entire series of prompts for the patient, rather than just the prompt for the current dose.

As prompts are more frequent than alerts, they stay visible for 3 minutes to prevent multiple prompts being open on the GP's screen at one time. The GP can click' give me more time' which re-sets the 3 minutes, or can retrieve the prompt from the "My Prompts History" for further review at the end of the shift, or to change the selected options**.**



7.1 Current GP prompts

i. Due Influenza vaccination - check COVID vax

Will prompt for ACG band 4 and 5 patients and pregnant women. Provides the date of the last influenza vaccination if available and weeks pregnant if applicable.

Text

Influenza vaccinations will re-set as due on 1 February each year.

Tool tip

Please check AIR.

https://www.servicesaustralia.gov.au/organisations/health-professionals/services/medicare/australian-immunisation-register-health-professionals

ii. Due Pertussis vaccination

Will prompt after 20 weeks of pregnancy. Provides last pertussis vaccination date if available and weeks pregnant

Text

Prompt will not occur for patients that have declined where that has been entered in the practice.

Tool Tip

Please check AIR, please confirm weeks pregnant.

https://www.health.gov.au/health-topics/immunisation/immunisation-throughout-life/national-immunisation-program-schedule

https://www.servicesaustralia.gov.au/organisations/health-professionals/services/medicare/australian-immunisation-register-health-professionals

iii. Due Meningococcal vaccination

Will prompt for 3 doses for Aboriginal and Torres Strait Islander children aged between 6 weeks and 12 months. Provides the date of the last vaccine. The gaps between dosages as being 2 doses within the first 16 weeks at 8 week intervals, the 3rd being at 12 months of age regardless of when it started with the exception of the dosages having started after 10 months of age. In the case of it starting after 10 months, dosages occur at 3 8-week intervals as a dose at 12 months would be too early. Anyone starting meningococcal vaccination at age ≥12 months requires only 2 doses of vaccine 8 weeks apart. Only available up to 23 months old.

Text

Meningococcal B vaccine catch-up is available for all Aboriginal and Torres Strait Islander children less than 2 years of age for 3 years (until 30 June 2023). Prompt will not occur for patients that have declined.

Tool tip

Please check AIR.

https://www.health.gov.au/health-topics/immunisation/immunisation-throughout-life/national-immunisation-program-schedule

https://www.servicesaustralia.gov.au/organisations/health-professionals/services/medicare/australian-immunisation-register-health-professionals

iv. Due Hepatitis A vaccination

Will prompt for Hepatitis A for ATSI children 18 months and 4 years for WA, NT SA and QLD. Prompt will provide date of last Hep A vaccination. The minimum timeframe is 6 months apart between the 18 month and 4 year doses.

Text

Only for ATSI children in QLD, NT, WA and SA. Prompt will not occur for patients that have declined.

Tool Tip

Please check AIR.

https://www.health.gov.au/health-topics/immunisation/immunisation-throughout-life/national-immunisation-program-schedule

https://www.servicesaustralia.gov.au/organisations/health-professionals/services/medicare/australian-immunisation-register-health-professionals

v. Consider Haemochromatosis testing

Will prompt if there are 2 raised ferritins, or a raised transferrin saturation. A raised transferrin saturation on the same day as a ferritin will override a normal ferritin result. Prompt will provide Ferritin and transferrin saturation results and the date.

Text

Eligibility for the prompt is raised transferrin saturation result (>45%) or two raised ferritin results (>300 ug/l for men and >200 ug/l for women) who do not have a coded diagnosis of haemochromatosis or a record of a HFE test. Patient may require further investigations or a coded diagnosis.

Tool Tip

Please check the MBS rebate for the HFE gene test.

vi. Missing CV Risk medication

Will prompt for high CV risk where there isn't a history of CVD and the patient isn't on dual therapy (statin and antihypertensive). Prompt will provide the systolic blood pressure and HDL ratio used in the calculation and the date of processing the CV risk score, and one of the medications if present. Note that CV risk is currently still calculated using the old Heart Foundation calculator, however a link to the new calculator is available in the prompt.

Text

Prompt is only for patients with a high CV risk score without dual therapy. CV risk calculation is based on the absolute cardiovascular risk score.

Tool tip

Based on the latest extractable results. https://www.heartfoundation.org.au/getmedia/dbb102e3-850f-41da-afbe-2776d8d4b97e/Absolute-CVD-Risk-Quick-Reference-Guide_2018.pdf

https://www.heartfoundation.org.au/conditions/fp-absolute-cvd-risk-clinical-guidelines

patient handout: https://www.heartfoundation.org.au/Activities-finding-or-opinion/key-statistics-risk-factors-for-heart-disease

vii. Due Heart Health Check Assessment

Prompts for an MBS healthy heart check only when the CV risk missing medication prompt criteria are met and is more than 12 months since the last health assessment if there is one. Returns the date of a last health assessment if there is one.

Text

Eligibility criteria is for a CV risk Health Assessment.

Tool tip

Please check with Medicare.
http://www.mbsonline.gov.au/internet/mbsonline/publishing.nsf/Content/Factsheet-MedicareHealthAssessments

viii. Due ATSI Health Assessment

Prompts for an MBS health assessment if CV risk >10% and no CV risk medications are present, and it is 9 months since the last health assessment. Returns the date of the last health assessment if there is one

Text

Prompt is only for patients with a score > 10% with statin and/or antihypertensive not prescribed. CV risk calculation is based on the absolute cardiovascular risk score.

Tool tip

Please check with Medicare.
http://www.mbsonline.gov.au/internet/mbsonline/publishing.nsf/Content/Factsheet-MedicareHealthAssessments

ix. Due microalbumin pathology

Prompts for a microalbumin in patients with a diagnosis of CKD and or diabetes/diabetes indicated by medication who haven't had urine microalbumin tested in the past 12 months. Returns the last results and the date done, with if the result is micro, macro or normal.

Text

Please check the results used for the calculation.

ACR results are displayed as 'normal', 'microalbuminuria' (ACR values of 2.5-25mg/mmol for males and 3.5-35 mg/mmol for females; or AER values of 20-200mg/min) and 'macroalbuminuria' (ACR of >25mg/mmol for males and >35mg/mmol for females; or AER >300mg/min). Proteinuria results are not included.

Tool tip

Based on the latest extractable results.
https://www.racgp.org.au/afpbackissues/2007/200709/200709phillips.pdf

x. Due Care Plan

Will prompt for ACG band 4 and 5, and for 3 where there is a >80% risk of hospitalisation in the next 12 months, and a GPMP has not been billed in the past 12 months. Will provide the date of the last GPMP if there is one.

Text

Eligibility for the prompt with a complexity score of 3 is based on 3 or more chronic conditions (complexity 3s need to have a >80% hospital risk score)

Tool tip

Please check with Medicare. http://www9.health.gov.au/mbs/fullDisplay.cfm?type=item&q=721

xi. Due Mental Health Care Plan

Will prompt for a complexity score 3 and above where the patient has 2 or more mental health conditions and a GP mental health treatment plan has not billed in the past 12 months. Will provide the date of the last GP mental health treatment plan if there is one.

Text

Eligibility for the prompt is based on two or more Mental Health conditions as per MBS guideline.

Tool tip

Please check with Medicare.
http://www9.health.gov.au/mbs/fullDisplay.cfm?type=item&q=2715&qt=item

xii. Due medication review

Can only prompt if a GPMP is due and ACG complexity score is 4 or 5, the medication count is >6 and a DMMR has not been billed in the past 12 months. Medications included are those that have not been ceased. Excludes most topical applications in the count.

Text

Eligibility for the prompt is based on patients with a complexity score of 4 or 5 with 7 or more current medications (those not ceased) while also being due a GPMP

Tool tip

Based on the current medication list, check MBS.
http://www9.health.gov.au/mbs/search.cfm?q=900&sopt=S

8.Nurse Prompts

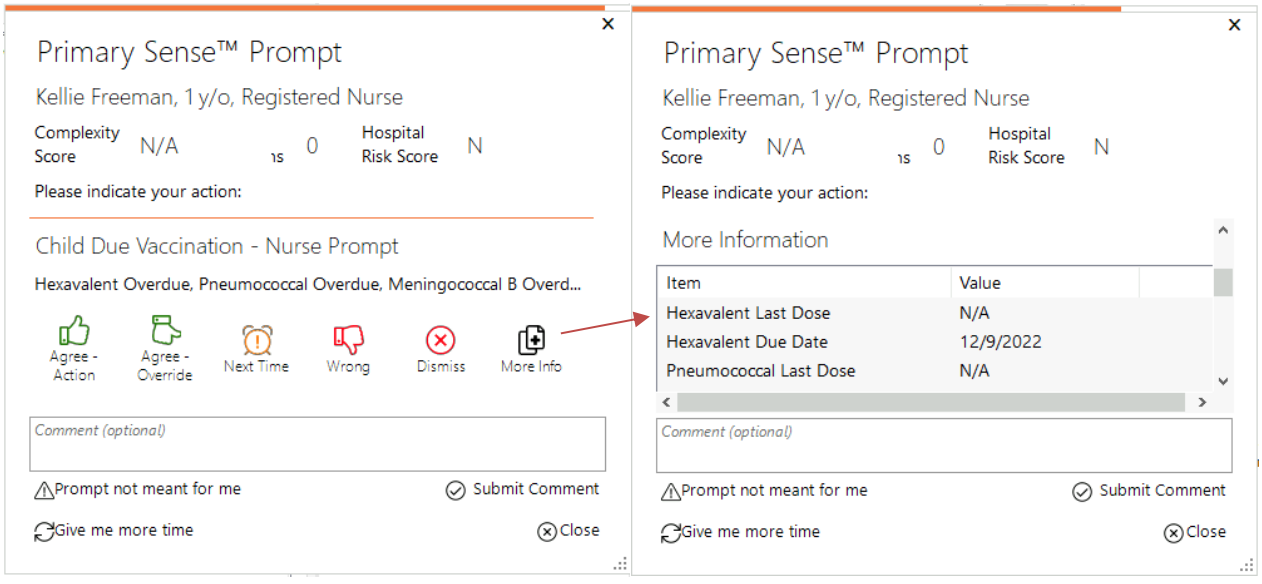
Key points for practice users

- Primary Sense Nurse Prompts will only generate when the patient file in the clinical software has been opened by a nurse (logged in to the clinical software), and only in specific circumstances (where specific criteria are met i.e. complexity scores and gaps in care).
- Like GP Prompts, Nurse Prompts focus on the most at risk patients, and provide on screen prompts to highlight potential gaps in care including use of the Johns Hopkins complexity and hospital risk scores.
- The Prompts available to nurses are different to those available to GPs and are tailored to focus on the kinds of patients/appointments that are likely to be more relevant to nurses

Nurse Prompts were identified for development after GP Prompts in response to requests to provide nurses with the ability to receive their own set of prompts that were tailored specifically to their needs.

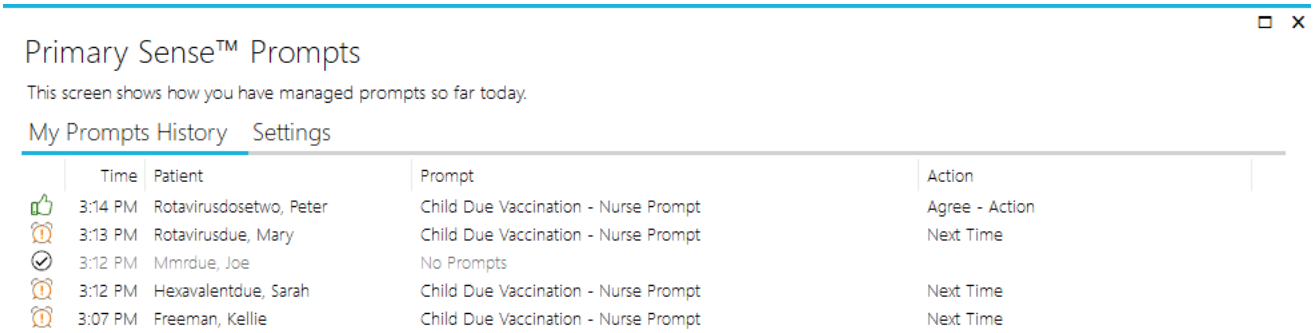
Nurse Prompts appear when the nurse opens the patient's record in the clinical software and are specific to each patient. As more nurse prompts are made available, they will allow for up to 3 items at a time, ordered by clinical priority (similar to GP Prompts). When one element is actioned, that allows a subsequent element to appear on the next prompt.

The more information section provides the rationale for the prompt and the relevant details for cross reference by the nurse.



Users can exit the prompt by selecting one of the 'actions' available, or by selecting 'prompt not meant for me', or close. **Selecting an action other than 'next time' or 'prompt not meant for me' will disable the prompt for the patient for 12 months**. Prompts that are part of a series, i.e. prompts for vaccinations that require multiple doses, where each dose can potentially trigger a separate iteration of the prompt, will also have a 'Dismiss' option, which will disable the entire series of prompts for the patient, rather than just the prompt for the current dose.

As prompts are more frequent than alerts, they stay visible for 3 minutes to prevent multiple prompts being open on the nurse's screen at one time. The nurse can click' give me more time' which re-sets the 3 minutes, or they can retrieve the prompt from the "My Prompts History" for further review at the end of the shift, or to change the selected action**.**



8.1 Current Nurse Prompts

i. Child Due Vaccination- Nurse Prompt

Will prompt for patients aged under 5 years who are currently due or overdue for a vaccination. Shows the due date and last dose date (where available). Due dates are guidelines only based on recommendations from the Department of Health and Aged Care.

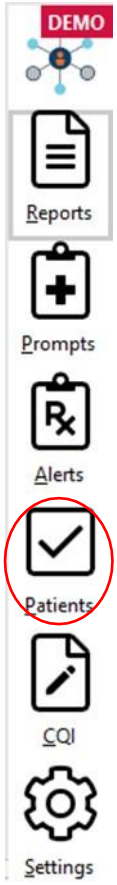
Text

Eligibility for the prompt is based on patients under 5 years old that are currently due or overdue for a vaccination. Some vaccinations are marked to be considered based on their circumstances

Tool tip

Based on guidelines from Department of Health and Aged Care

9.Patient consent



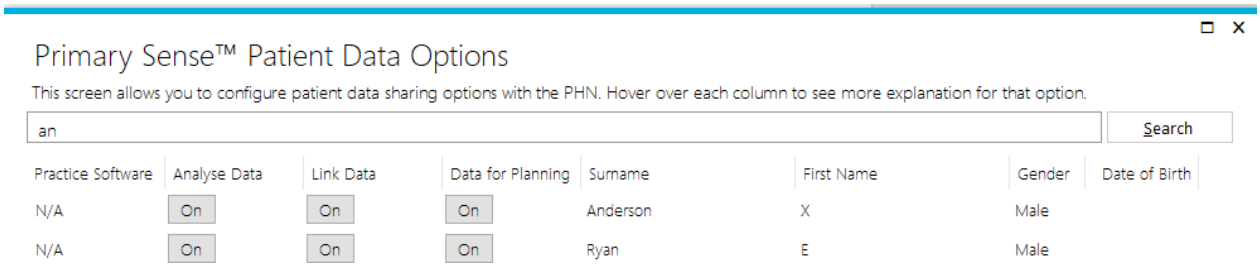
Key points for practice users

- If a patient chooses to not share their data, practices need to turn off data sharing options in a patient's profile to successful opt out them out of sharing data.
- Primary Sense patient data options include:
    - **Analyse Data** – enables PHNs to access data and report back only to the patient's practice on their risk factors
    - **Link Data tool** – enables PHNs to link data from practices the patient attends and reports back to those practices only on their risk factors
    - **Data for Planning** – PHN uses aggregated data from a patient's practice to inform education, research and better healthcare.
- Practices may choose to link their data when they have multiple sites and this is managed by the PHN during the onboarding process when the practices are set up as a group.

How to turn off data

- Search for a patient's name – it requires at least two letters to do a search.
- Select the patient and turn off the data sharing option they do not want to consent to

If the patient chooses to switch off "Analyse Data", then the other options disappear and any data held is deleted that night and no further data is extracted.



10.The Johns Hopkins University ACG® System.

Key points for practice users

- The Johns Hopkins University ACG® System. is a third party application and while they guard their IP, they collaborate with us to refine and validate the tool for use in Australia.
- The Johns Hopkins University ACG® System runs when the patient's visit generates data for the ACG input file and once a month for the whole practice.

Primary Sense uses the data outputs from the ACG® System, which is backed by 30 years' experience ensuring a robust evidence base, utilising data to best inform risk identification from data such as morbidity, disease burden and medication profiles. It has been used in 20 different countries from general practices to hospital settings to better inform individual patient and population risk management. The robust data platform relies on relative morbidity burden and disease profiling to manage patient care in a more targeted way. In the UK it has been used in 1200 General Practices. The ACG® System categorises the practice population into 6 complexity bands[1] from no complexity to very high complexity due to multi-morbidities and disease types. Multi-morbidity is common and far more of a risk factor for poor outcomes than age or individual diseases and requires efficiently coordinated care. From the UK data it is estimated that the top 1 % of the highest risk patients utilise 18 % of health resources. The cost utilisation increases exponentially with number of co-morbidities.

[1] The Johns Hopkins University uses the term Resource Utilization Bands (RUBs). We have permission to refer to these as 'complexity bands' as this is language Australian GPs are more familiar with.

Data is imported into ACG® System when either a practice first onboards, or when there are subsequent visits by the patient. ACG® will also run once a month for the practice to enable some further use of its predictive scores. The ACG® takes some patient demographics; diagnosis recorded in the past 12 months as an ICPC2+ code, or long term condition as an ICPC2+ code determined by University of Sydney; current medications; some pathology and PBS/MBS costs for the patient. The results are imported into the Primary Sense database.

Adjusted Clinical Groups (ACGs ®)

The first step of the ACG® grouping logic is to assign each diagnosis code to one or more of 32 diagnosis groups referred to as Aggregated Diagnosis Groups, or ADGs. Numbers in bold indicate high impact ADGs.

ADG	Duration	Severity
1. Time Limited: Minor	Acute	Low
2. Time Limited: Minor-Primary Infections	Acute	Low
3. Time Limited: Major	Acute	High
4. Time Limited: Major-Primary Infections	Acute	High
5. Allergies	Recurrent	Low
6. Asthma	Recurrent or Chronic	Low
7. Likely to Recur: Discrete	Recurrent	Low
8. Likely to Recur: Discrete- Infections	Recurrent	Low
9. Likely to Recur: Progressive	Recurrent	High
10. Chronic Medical: Stable	Chronic	Low
11. Chronic Medical: Unstable	Chronic	High
12. Chronic Specialty: Stable- Orthopedic	Chronic	Low
13. Chronic Specialty: Stable- Ear, Nose, Throat	Chronic	Low
14. Chronic Specialty: Stable- Ophthalmology	Chronic	Low
16. Chronic Specialty: Unstable- Orthopedics	Chronic	High

17. Chronic Specialty: Unstable-Ear, Nose, Throat	Chronic	High
18. Chronic Specialty: Unstable-Ophthalmology	Chronic	High
20. Dermatologic	Acute, Recurrent	Low to High
21. Injuries/Adverse Effects: Minor	Acute	Low
22. Injuries/Adverse Effects: Major	Acute	High
23. Psychosocial: Time Limited, Minor	Acute	Low
24. Psychosocial: Recurrent or Chronic, Stable	Recurrent or Chronic	Low
25. Psychosocial: Recurrent or Persistent, Unstable	Recurrent or Chronic	High
26. Signs/Symptoms: Minor	Uncertain	Low
27. Signs/Symptoms: Uncertain	Uncertain	Uncertain
28. Signs/Symptoms: Major	Uncertain	High
29. Discretionary	Acute	Low to High
30. See and Reassure	Acute	Low
31.Prevention/Administrative	N/A	N/A
32. Malignancy	Chronic	High
33. Pregnancy	Acute	Low
34. Dental	Acute, Recurrent, Chronic	Low to High

Complexity bands

ACGs are collapsed into resource utilization or complexity score bands:

- 0 - No or Only Invalid diagnosis
- 1 - Healthy Users
- 2 - Low
- 3 - Moderate
- 4 - High

- 5 - Very High

The relationship between ACG categories, reference ACG concurrent risks and complexity scores are defined below:

ACG Description	0 to 64yrs	65yrs +	complexity score
6-9 Other ADG Combinations, Age > 34, 3 Major ADGs	6.451	1.776	5
6-9 Other ADG Combinations, Age > 34, 4+ Major ADGs	12.218	3.015	5
10+ Other ADG Combinations, Age 1 to 17, 2 Major ADGs	12.171	N/A	5
10+ Other ADG Combinations, Age > 17, 3 Major ADGs	7.536	2.213	5
10+ Other ADG Combinations, Age > 17, 4+ Major ADGs	18.71	4.666	5
Infants: 0-5 ADGs, 1+ Major ADGs, low birth weight	10.955	N/A	5
Infants: 6+ ADGs, 1+ Major ADGs	10.538	N/A	5
Infants: 6+ ADGs, 1+ Major ADGs, low birth weight	31.997	N/A	5
Pregnancy: 0-1 ADGs, delivered	2.51	N/A	4
Pregnancy: 2-3 ADGs, no Major ADGs, delivered	2.888	N/A	4
Pregnancy: 2-3 ADGs, 1+ Major ADGs	2.572	N/A	4
Pregnancy: 2-3 ADGs, 1+ Major ADGs, delivered	3.195	N/A	4
Pregnancy: 4-5 ADGs, no Major ADGs	2.234	N/A	4
Pregnancy: 4-5 ADGs, no Major ADGs, delivered	3.197	N/A	4
Pregnancy: 4-5 ADGs, 1+ Major ADGs	2.938	N/A	4
Pregnancy: 4-5 ADGs, 1+ Major ADGs, delivered	3.722	N/A	4
Pregnancy: 6+ ADGs, no Major ADGs	2.553	N/A	4
Pregnancy: 6+ ADGs, no Major ADGs, delivered	3.636	N/A	4
Pregnancy: 6+ ADGs, 1+ Major ADGs	4.06	N/A	4

Pregnancy: 6+ ADGs, 1+ Major ADGs, delivered	5	N/A	4
Pregnancy: 6+ ADGs, 1+ Major ADGs, not delivered	2.897	N/A	4
4-5 Other ADG Combinations, Age 18 to 44, 2+ Major ADGs	2.307	N/A	4
4-5 Other ADG Combinations, Age > 44, 2+ Major ADGs	2.81	0.812	4
6-9 Other ADG Combinations, Age < 6, 1+ Major ADGs	1.831	N/A	4
6-9 Other ADG Combinations, Age 6 to 17, 1+ Major ADGs	2.234	N/A	4
6-9 Other ADG Combinations, Males, Age 18 to 34, 2+ Major ADGs	3.648	N/A	4
6-9 Other ADG Combinations, Females, Age 18 to 34, 2+ Major ADGs	3.332	N/A	4
6-9 Other ADG Combinations, Age > 34, 2 Major ADGs	3.616	1.088	4
10+ Other ADG Combinations, Age 1 to 17, 1 Major ADGs	3.188	N/A	4
10+ Other ADG Combinations, Age > 17, 0-1 Major ADGs	2.79	0.889	4
10+ Other ADG Combinations, Age > 17, 2 Major ADGs	4.572	1.422	4
Infants: 0-5 ADGs, no Major ADGs, low birth weight	2.745	N/A	4
Infants: 0-5 ADGs, 1+ Major ADGs	2.784	N/A	4
Infants: 0-5 ADGs, 1+ Major ADGs, normal birth weight	1.943	N/A	4
Infants: 6+ ADGs, no Major ADGs, low birth weight	3.999	N/A	4
Infants: 6+ ADGs, 1+ Major ADGs, normal birth weight	5.478	N/A	4

Expanded diagnosis clusters (EDCs)

EDCs are used to easily identifying people with specific diseases or symptoms, or combinations. Each diagnosis code maps to one or more EDCs. Diagnosis codes within an EDC share similar clinical characteristics and are expected to evoke similar types of diagnostic and therapeutic responses. Where a single diagnosis code indicates more than one underlying condition, more than one EDC may be assigned. EDCs have many applications, particularly in areas of profiling and disease/case management. EDCs can be used to:

1. Describe the prevalence of specific diseases within a single population;

2. Compare disease distributions across two or more populations; and,
3. Aid disease management/case management processes by identifying individual patients by condition and displaying a patient condition profile.

Both EDCs and ADGs are aggregations of diagnosis codes. However, there is a significant difference in the methodology underlying the grouping of diagnosis codes: ADGs are groups of diagnoses with similar expected healthcare need, while EDCs are clinically similar clusters.

EDC Type	EDC	EDC Description
Administrative	ADM02	Surgical aftercare
	ADM03	Transplant status
	ADM05	Administrative concerns and non-specific laboratory abnormalities
	ADM06	Preventive care
	ADM07	Medical Counseling/advice
	ADM08	Family Planning/Fertility
	ADM09	Social Services/Support
Allergy	ALL01	Allergic reactions
	ALL03	Allergic rhinitis
	ALL04	Asthma, w/o status asthmaticus
	ALL05	Asthma, with status asthmaticus
	ALL06	Disorders of the immune system
Cardiovascular	CAR01	Cardiovascular signs and symptoms
	CAR03	Ischemic heart disease (excluding acute myocardial infarction)
	CAR04	Congenital heart disease
	CAR05	Congestive heart failure
	CAR06	Cardiac valve disorders
	CAR07	Cardiomyopathy

	CAR08	Heart murmur
	CAR09	Cardiac arrhythmia
	CAR10	Generalized atherosclerosis
	CAR11	Disorders of lipid metabolism
	CAR12	Acute myocardial infarction
	CAR13	Cardiac arrest, shock
	CAR14	Hypertension, w/o major complications
	CAR15	Hypertension, with major complications
	CAR16	Cardiovascular disorders, other
Dental	DEN01	Disorders of mouth
	DEN02	Disorders of teeth
	DEN03	Gingivitis
	DEN04	Stomatitis
Ear, Nose, Throat	EAR01	Otitis media
	EAR02	Tinnitus
	EAR03	Temporomandibular joint disease
	EAR04	Foreign body in ears, nose, or throat
	EAR05	Deviated nasal septum
	EAR06	Otitis externa
	EAR07	Wax in ear
	EAR08	Deafness, hearing loss
	EAR09	Chronic pharyngitis and tonsillitis
	EAR10	Epistaxis
	EAR11	Acute upper respiratory tract infection

	EAR12	ENT disorders, other
Endocrine	END02	Osteoporosis
	END03	Short stature
	END04	Hypothyroidism
	END05	Other endocrine disorders
	END06	Type 2 diabetes, w/o complication
	END07	Type 2 diabetes, w/ complication
	END08	Type 1 diabetes, w/o complication
	END09	Type 1 diabetes, w/ complication
Eye	EYE01	Ophthalmic signs and symptoms
	EYE02	Blindness
	EYE03	Retinal disorders (excluding diabetic retinopathy)
	EYE04	Disorders of the eyelid and lacrimal duct
	EYE05	Refractive errors
	EYE06	Cataract, aphakia
	EYE07	Conjunctivitis, keratitis
	EYE08	Glaucoma
	EYE09	Infections of eyelid
	EYE10	Foreign body in eye
	EYE11	Strabismus, amblyopia
	EYE12	Traumatic injuries of eye
	EYE13	Diabetic retinopathy
	EYE14	Eye, other disorders
	EYE15	Age-related macular degeneration

Female Reproductive	FRE01	Pregnancy and delivery, uncomplicated
	FRE02	Female genital symptoms
	FRE03	Endometriosis
	FRE04	Pregnancy and delivery with complications
	FRE05	Female infertility
	FRE06	Abnormal pap smear
	FRE07	Ovarian cyst
	FRE08	Vaginitis, vulvitis, cervicitis
	FRE09	Menstrual disorders
	FRE10	Contraception
	FRE11	Menopausal symptoms
	FRE12	Utero-vaginal prolapse
	FRE13	Female gynecologic conditions, other
	FRE14	Pregnancy with termination
Gastrointestinal/Hepatic	GAS01	Gastrointestinal signs and symptoms
	GAS02	Inflammatory bowel disease
	GAS03	Constipation
	GAS04	Acute hepatitis
	GAS05	Chronic liver disease
	GAS06	Peptic ulcer disease
	GAS07	Gastroenteritis
	GAS08	Gastroesophageal reflux
	GAS09	Irritable bowel syndrome
	GAS10	Diverticular disease of colon

	GAS11	Acute pancreatitis
	GAS12	Chronic pancreatitis
	GAS13	Lactose intolerance
	GAS14	Gastrointestinal/hepatic disorders, other
	GAS15	Hepatitis C
General Signs & Symptoms	GSI01	Nonspecific signs and symptoms
	GSI02	Chest pain
	GSI03	Fever
	GSI04	Syncope
	GSI05	Nausea, vomiting
	GSI06	Debility and undue fatigue
	GSI07	Lymphadenopathy
	GSI08	Edema
General Surgery	GSU01	Anorectal conditions
	GSU02	Appendicitis
	GSU03	Benign and unspecified neoplasm
	GSU04	Cholelithiasis, cholecystitis
	GSU05	External abdominal hernias, hydroceles
	GSU06	Chronic cystic disease of the breast
	GSU07	Other breast disorders
	GSU08	Varicose veins of lower extremities
	GSU09	Nonfungal infections of skin and subcutaneous tissue
	GSU10	Abdominal pain
	GSU11	Peripheral vascular disease

	GSU12	Burns--1st degree
	GSU13	Aortic aneurysm
	GSU14	Gastrointestinal obstruction/perforation
	GSU15	Alimentary or excretory surgical openings
Genetic	GTC01	Chromosomal anomalies
	GTC02	Inherited metabolic disorders
Genito-urinary	GUR01	Vesicoureteral reflux
	GUR02	Undescended testes
	GUR03	Hypospadias, other penile anomalies
	GUR04	Prostatic hypertrophy
	GUR05	Stricture of urethra
	GUR06	Urinary symptoms
	GUR07	Other male genital disease
	GUR08	Urinary tract infections
	GUR09	Renal calculi
	GUR10	Prostatitis
	GUR11	Incontinence
	GUR12	Genito-urinary disorders, other
Hematologic	HEM01	Other hemolytic anemias
	HEM02	Iron deficiency, other deficiency anemias
	HEM03	Thrombophlebitis
	HEM04	Neonatal jaundice
	HEM05	Aplastic anemia
	HEM06	Deep vein thrombosis

	HEM07	Hemophilia, coagulation disorder
	HEM08	Hematologic disorders, other
	HEM09	Sickle cell disease
Infections	INF01	Tuberculosis infection
	INF02	Fungal infections
	INF03	Infectious mononucleosis
	INF04	HIV, AIDS
	INF05	Sexually transmitted diseases
	INF06	Viral syndromes
	INF07	Lyme disease
	INF08	Septicemia
	INF09	Infections, other
Malignancies	MAL01	Malignant neoplasms of the skin
	MAL02	Low impact malignant neoplasms
	MAL03	High impact malignant neoplasms
	MAL04	Malignant neoplasms, breast
	MAL05	Malignant neoplasms, cervix, uterus
	MAL06	Malignant neoplasms, ovary
	MAL07	Malignant neoplasms, esophagus
	MAL08	Malignant neoplasms, kidney
	MAL09	Malignant neoplasms, liver and biliary tract
	MAL10	Malignant neoplasms, lung
	MAL11	Malignant neoplasms, lymphomas
	MAL12	Malignant neoplasms, colorectal

	MAL13	Malignant neoplasms, pancreas
	MAL14	Malignant neoplasms, prostate
	MAL15	Malignant neoplasms, stomach
	MAL16	Acute leukemia
	MAL18	Malignant neoplasms, bladder
Musculoskeletal	MUS01	Musculoskeletal signs and symptoms
	MUS02	Acute sprains and strains
	MUS03	Degenerative joint disease
	MUS04	Fractures (excluding digits)
	MUS05	Torticollis
	MUS06	Kyphoscoliosis
	MUS07	Congenital hip dislocation
	MUS08	Fractures and dislocations/digits only
	MUS09	Joint disorders, trauma related
	MUS10	Fracture of neck of femur (hip)
	MUS11	Congenital anomalies of limbs, hands, and feet
	MUS12	Acquired foot deformities
	MUS13	Cervical pain syndromes
	MUS14	Low back pain
	MUS15	Bursitis, synovitis, tenosynovitis
	MUS16	Amputation status
	MUS17	Musculoskeletal disorders, other
Neonatal	NEW01	Newborn status, uncomplicated
	NEW02	Newborn status, complicated

	NEW03	Low birth weight
	NEW04	Prematurity
	NEW05	Disorders of newborn period
Neurologic	NUR01	Neurologic signs and symptoms
	NUR02	Headaches
	NUR03	Peripheral neuropathy, neuritis
	NUR04	Vertiginous syndromes
	NUR05	Cerebrovascular disease
	NUR06	Parkinsons disease
	NUR07	Seizure disorder
	NUR08	Multiple sclerosis
	NUR09	Muscular dystrophy
	NUR10	Sleep problems
	NUR12	Quadriplegia and paraplegia
	NUR15	Head injury
	NUR16	Spinal cord injury/disorders
	NUR17	Paralytic syndromes, other
	NUR18	Cerebral palsy
	NUR19	Developmental disorder
	NUR20	Central nervous system infections
	NUR21	Neurologic disorders, other
	NUR22	Migraines
	NUR23	Organic brain syndrome
	NUR24	Dementia

	NUR25	Delirium
	NUR26	Autism Spectrum Disorder
Nutrition	NUT01	Failure to thrive
	NUT02	Nutritional deficiencies
	NUT03	Obesity
	NUT04	Nutritional disorders, other
Psychosocial	PSY01	Anxiety, neuroses
	PSY02	Substance use
	PSY03	Tobacco use
	PSY05	Attention deficit disorder
	PSY06	Family and social problems
	PSY07	Schizophrenia and affective psychosis
	PSY08	Personality disorders
	PSY09	Depression
	PSY10	Psychologic signs and symptoms
	PSY12	Bipolar disorder
	PSY13	Adjustment disorder
	PSY14	Psychological disorders of childhood
	PSY15	Eating disorder
	PSY16	Impulse control
	PSY17	Psych-physiologic and somatoform disorders
	PSY18	Psychosexual
	PSY19	Sleep disorders of nonorganic origin
	PSY20	Major depression

	PSY21	Post traumatic stress disorder
Reconstructive	REC01	Cleft lip and palate
	REC02	Lacerations
	REC03	Chronic ulcer of the skin
	REC04	Burns--2nd and 3rd degree
Renal	REN01	Chronic renal failure
	REN02	Fluid/electrolyte disturbances
	REN03	Acute renal failure
	REN04	Nephritis, nephrosis
	REN05	Renal disorders, other
	REN06	ESRD
Respiratory	RES01	Respiratory signs and symptoms
	RES02	Acute lower respiratory tract infection
	RES03	Cystic fibrosis
	RES04	Emphysema, chronic bronchitis, COPD
	RES05	Cough
	RES06	Sleep apnea
	RES07	Sinusitis
	RES08	Pulmonary embolism
	RES09	Tracheostomy
	RES11	Respiratory disorders, other
	RES12	Acute respiratory failure
	RES13	Chronic respiratory failure
	RES14	Aspiration and bacterial pneumonias

Rheumatologic	RHU01	Autoimmune and connective tissue diseases
	RHU02	Gout
	RHU03	Arthropathy
	RHU04	Raynauds syndrome
	RHU05	Rheumatoid arthritis
Skin	SKN01	Contusions and abrasions
	SKN02	Dermatitis and eczema
	SKN03	Keloid
	SKN04	Acne
	SKN05	Disorders of sebaceous glands
	SKN06	Sebaceous cyst
	SKN07	Viral warts and molluscum contagiosum
	SKN08	Other inflammatory conditions of skin
	SKN09	Exanthems
	SKN10	Skin keratoses
	SKN11	Dermatophytoses
	SKN12	Psoriasis
	SKN13	Disease of hair and hair follicles
	SKN14	Pigmented nevus
	SKN15	Scabies and pediculosis
	SKN16	Diseases of nail
	SKN17	Other skin disorders
	SKN18	Benign neoplasm of skin and subcutaneous tissues
	SKN19	Impetigo

	SKN20	Dermatologic signs and symptoms
Toxic Effects and Adverse Events	TOX01	Toxic effects of nonmedicinal agents
	TOX02	Adverse effects of medicinal agents
	TOX03	Adverse events from medical/surgical procedures
	TOX04	Complications of mechanical devices

Hospital risk score

As not all hospital discharge summaries are received in the GP software, nor can the software distinguish between a planned and unplanned admission, Primary Sense uses the secondary criterion used by ACG for making predictions about hospitalisation relating to the age of a person. Persons older than 65 yrs are thought to have an increased likelihood of hospitalisation compared to younger individuals. The ACG System uses age 55 as the threshold for separating two hospitalization risk groups. The hospitalisation prediction model differs from the Hospital Dominant Morbidity Types marker.

Hospital Dominant Morbidity Types represent a small subset of diagnoses associated with high rates of admission in the following 12 months. The hospital prediction model identifies a larger pool of patients at risk for hospitalization. Given Closing the Gap, JHU have been validating the hospital risk score for the Australian context.

There are five predictive model outputs related to the likelihood of hospitalization. These models are intended to be used for the indicated outcome. A value of providing multiple model outputs is greater sensitivity of each model calibrated to a particular outcome, as compared to using a single model.

The model uses standard coefficient weights derived from the selected reference population. These weights are then applied to each patient based on the specific risk factors identified by the ACG System. The weights are additive at the patient level as in the following example. Because this model is based on a logistic regression technique, the final probability is determined with a transformation of the sum of weights.

Predictive Modeling Factors for Patient with Prior Hospitalization		
Demographic	Age: 60	-11.798
	Gender: F	-0.006
Diagnosis-based Markers	2 Hospital Dominant Morbidity Types	0.266
	ACG 5060 – 10+ ADGs, 3 Major	0.340
	END09 - Type 1 Diabetes w/Complications	0.256
	CAR14 - Hypertension w/o Complications	0.092
Pharmacy-based Markers	CARx030- High Blood Pressure	-0.004
	INFx010 – Infections/Acute Major	0.046
Cost Percentile Markers	Total Cost 51-75th Percentile	9.300
Probability of Hospitalization = $\frac{1}{1+e^{-1*sum\ of\ coefficients}}$		0.181

Probability scores indicating the likelihood of a future hospitalization event are generated as a percentage. The probability of an inpatient hospitalization score is the probability score for an acute care inpatient hospital admission excluding admissions for childbirth or injury within the 12 months subsequent to the observation period. Primary Sense presents a hospitalisation risk score of >80% in reports and prompts.

Conditions coded and/or indicated by medication

The ACG System uses condition markers to highlight specific conditions that are high prevalence chronic conditions, commonly selected for disease management or warranting ongoing medication therapy.

- **Diagnosis -** the condition was identified only from diagnosis information, by one or more EDCs.
- **Medication -** the condition was identified only from pharmacy information
- **Both -** the condition was identified by both diagnosis and pharmacy criteria

The ACG System measures adherence for 17 conditions where the chronic administration of medication is, in most instances, appropriate.

Each targeted condition is associated with one or more target drug classes identified by the Johns Hopkins clinician advisors as a subset of drugs that once started, should be given continuously. The resultant condition-drug class pairings are presented in the Condition-Drug Class Pairings table.

Condition	Medications used to indicate the condition	
Bipolar Disorder	Anti-convulsants	Anti-psychotics
Congestive Heart Failure	ACEI/ARB	Diuretics

	Aldosterone receptor blockers	Inotropic agents
	Beta-blockers	Vasodilators
Depression	Anti-depressants	
Diabetes	Insulins	Other Anti-Hyperglycemic Agents
	Meglitinides	Sulfonylureas
	Miscellaneous antidiabetic agents	Thiazolidinediones
	Non-Sulfonylureas	
Disorders of Lipid Metabolism	Bile acid sequestrants	HMG-CoA reductase inhibitors
	Cholesterol absorption inhibitors	Miscellaneous antihyperlipidemic agents
	Fibric acid derivatives	
Glaucoma	Ophthalmic glaucoma agents	
Human Immunodeficiency Virus	HAART* (see below)	
Hypertension	ACEI/ARB	Calcium channel blockers
	Aldosterone receptor blockers	Diuretics
	Anti-adrenergic agents	Vasodilators
	Beta-blockers	
Hypothyroidism	Thyroid drugs	
Immunosuppression/Transplant	Immunologic agents	
Ischemic Heart Disease	Antianginal agents	Calcium channel blockers
	Beta-blockers	
Osteoporosis	Hormones	
Parkinson's Disease	Anticholinergic antiparkinson agents	Dopaminergic antiparkinsonism agents

Persistent Asthma	Adrenergic bronchodilators	Leukotriene modifiers
	Immunosuppressive monoclonal antibodies	Mast cell stabilizers
	Inhaled corticosteroids	Methylxanthines
Rheumatoid Arthritis	Disease-modifying anti-rheumatic drugs (DMARDs)	Immunologic agents
Schizophrenia	Anti-psychotics	
Seizure Disorder	Anti-convulsants	

Please note low back pain, ischemic heart disease, bipolar and schizophrenia do not have medication markers that are sufficient enough to indicate the medication is specifically being used for that condition Primary Sense adds in the following medication markers for COPD and chronic renal failure :

COPD	LAMA, LABA
Chronic renal Failure	Sodium Bicarbonate, Anti-anaemics

Chronic condition count

The ACG System includes a chronic condition count as an aggregate marker of case complexity. A chronic condition is an alteration in the structures or functions of the body that is likely to last longer than twelve months and is likely to have a negative impact on health or functional status.

The ACG System defines a limited set of Expanded Diagnosis Clusters (EDCs) that represent high impact and chronic conditions likely to last more than 12 months with or without medical treatment (see the following table). From this list of EDCs, individual diagnosis codes were tested against the criteria for chronic conditions stated above by Johns Hopkins.

EDCs considered in the Chronic Condition Count Marker	
Acute hepatitis	Hypertension, w/o major complications
Acute leukemia	Hypertension, with major complications
Acute lower respiratory tract infection	Hypothyroidism

Acute myocardial infarction	Impulse control
Acute renal failure	Inflammatory bowel disease
Acute sprains and strains	Inherited metabolic disorders
Adjustment disorder	Irritable bowel syndrome
Administrative concerns and non-specific laboratory abnormalities	Ischemic heart disease (excluding acute myocardial infarction)
Adverse events from medical/surgical procedures	Kyphoscoliosis
Age-related macular degeneration	Lactose intolerance
Anxiety, neuroses	Low back pain
Aplastic anemia	Low impact malignant neoplasms
Arthropathy	Malignant neoplasms of the skin
Asthma, w/o status asthmaticus	Malignant neoplasms, bladder
Asthma, with status asthmaticus	Malignant neoplasms, breast
Attention deficit disorder	Malignant neoplasms, cervix, uterus
Autism Spectrum Disorder	Malignant neoplasms, colorectal
Autoimmune and connective tissue diseases	Malignant neoplasms, esophagus
Benign and unspecified neoplasm	Malignant neoplasms, kidney
Bipolar disorder	Malignant neoplasms, liver and biliary tract
Blindness	Malignant neoplasms, lung
Cardiac arrhythmia	Malignant neoplasms, lymphomas
Cardiac valve disorders	Malignant neoplasms, ovary
Cardiomyopathy	Malignant neoplasms, pancreas
Cardiovascular disorders, other	Malignant neoplasms, prostate
Cardiovascular signs and symptoms	Malignant neoplasms, stomach

Cataract, aphakia	Migraines
Central nervous system infections	Multiple sclerosis
Cerebral palsy	Muscular dystrophy
Cerebrovascular disease	Musculoskeletal disorders, other
Chromosomal anomalies	Nephritis, nephrosis
Chronic cystic disease of the breast	Neurologic disorders, other
Chronic liver disease	Neurologic signs and symptoms
Chronic pancreatitis	Newborn Status, Complicated
Chronic renal failure	Obesity
Chronic respiratory failure	Organic brain syndrome
Chronic ulcer of the skin	Osteoporosis
Cleft lip and palate	Other endocrine disorders
Congenital anomalies of limbs, hands, and feet	Other hemolytic anemias
Congenital heart disease	Other skin disorders
Congestive heart failure	Paralytic syndromes, other
Cystic fibrosis	Parkinson's disease
Deafness, hearing loss	Peripheral neuropathy, neuritis
Deep vein thrombosis	Peripheral vascular disease
Degenerative joint disease	Personality disorders
Delirium	Prostatic hypertrophy
Dementia	Psychological disorders of childhood
Depression	Psychosexual
Developmental disorder	Psych-physiologic and somatoform disorders
Diabetic retinopathy	Pulmonary embolism

Disorders of lipid metabolism	Quadriplegia and paraplegia
Disorders of Newborn Period	Renal disorders, other
Disorders of the immune system	Respiratory disorders, other
Eating disorder	Retinal disorders (excluding diabetic retinopathy)
Emphysema, chronic bronchitis, COPD	Rheumatoid arthritis
Endometriosis	Schizophrenia and affective psychosis
ESRD	Seizure disorder
Eye, other disorders	Short stature
Failure to thrive	Sickle cell disease
Fluid/electrolyte disturbances	Skin keratoses
Gastrointestinal signs and symptoms	Sleep apnea
Gastrointestinal/Hepatic disorders, other	Spinal cord injury/disorders
Generalized atherosclerosis	Strabismus, amblyopia
Genito-urinary disorders, other	Substance use
Glaucoma	Thrombophlebitis
Gout	Tracheostomy
Hematologic disorders, other	Transplant status
Hemophilia, coagulation disorder	Type 1 diabetes
High impact malignant neoplasms	Type 2 diabetes
HIV, AIDS	Vesicoureteral reflux

Active ingredient count

An active ingredient count is calculated as the count of unique active ingredient/route of administration combinations encountered in the patient's prescriptions. This marker is a proxy for identifying poly-pharmacy, with an active ingredient count of 14 or greater get additional weight in the predictive models.