Chronic Disease Management Who Cares?

By
Stephen Kalyniuk
BSc(Health Management), MACS, PCP
Member HISA

The Information Group - Useful software for people in Healthcare

Introduction

- 21 years experience in Health IT
  - IT consultant at Singapore Health Services
    - Commenced with the successful implementation of Sunrise Clinical Manager (SCM) at Singapore General Hospital which lead on to the deployment of SCM across SingHealth.
    - Lead on to designing, developing and implementing the following applications:
      - » The Hospital Integrated Discharge Summary application
      - » A 'Coverage List' application used to alert doctors regarding critical and panic pathology results via SMS
      - » The Chronic Disease Management (CDM) Software
    - Project Director for the Electronic Medical Record upgrade project
  - Held roles with iSOFT and Eclipsys as
    - Product Manager for iCM
    - Manager Eclipsys Australia and Singapore
  - InfoHealth / HDWA
    - Order Entry Alerts using MLMs and the Pharmacy project

Background

Who is Singapore Health Services (SingHealth)?

- SingHealth is the largest provider of acute healthcare in Singapore. It is also known as the eastern cluster of public healthcare institutions in Singapore.
  - Comprised of Changi General (758 beds), KK Women and Children's Hospital (830 beds), Singapore General (1,516 beds) Hospitals, 5 National Specialty Centres and a network of primary healthcare clinics.
  - Each year, SingHealth institutions attend to over 3 million patients. The A&E departments handle about 350,000 cases and they perform over 170,000 surgeries annually, through a team of 12,000 dedicated and professional individuals.
- SingHealth has twice been awarded the prestigious Asia CIO award for their EMR implementation and benefits. First in 2004 and again in 2006.
- In 2004 it was reported that at SingHealth a total of 2,500 workstations had been installed with the EMR software and an estimated 6,200 users trained and accessing the EMR system cluster-wide. The 400 GB data in the EMR database contains 1.4 million records of patients seeking treatment from SingHealth's institutions.

Background

- In 2004, a National Health Survey in Singapore revealed that Diabetes Mellitus (DM) affected 8.2% of the Singapore population and was the 8th most common cause of death in Singapore.
- DM is associated with considerable mortality and morbidity from chronic complications. In Singapore, it is associated with a 3-fold increase in mortality, most of which is related to cardiovascular disease.
- Early diagnosis and aggressive treatment of DM and its associated metabolic derangements can prevent or delay the progression of major chronic complications.
- It is important to detect individuals with DM so that appropriate therapeutic measures can be taken to minimize the morbidity caused by this devastating disease.
- When a diagnosis of DM is made, the clinician must feel confident that the diagnosis is fully established since the consequences for the individual are considerable and life-long.

Background

- Diabetes (Australia)
  - 700,000 Australians diagnosed in 2004/5
  - For every case diagnosed 1 remains undiagnosed
  - By 2030, 3.3 million Australians and 380 million people worldwide are estimated to have diabetes
  - The most common chronic childhood illness in developed nations

  Source: Diabetes Research Foundation of Western Australia (Inc) 2008
- COPD (Australia)
  - Recent Australia Institute of Health and Welfare estimates have doubled from 620,414 to 1.2 M persons aged 45–70 years
  - 4th most common cause of death in males and the 6th in females
  - 3rd leading cause of disease burden after ischaemic heart disease and stroke

Background

- The CDM software was developed through SingHealth's Clinical quality initiatives with funding contributed by the Ministry of Health
- The software was designed to demonstrate capabilities that can help to optimise health care delivery by leveraging:
  - Evidence-based clinical pathways and epidemiologic models.
  - A robust EMR platform.
- One of the goals for the system was that it would make it easier for clinicians and healthcare workers to proactively monitor patients' progress and make better decisions.
- This initiative was part of SingHealth's ongoing efforts to explore better and more cost-effective ways to provide quality and safe healthcare services for patients.

Clinical Practice Guidelines (CPG)

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http://www.moh.gov.sg/mohcorp/publications.aspx?id=16426

Paper based CPG Flow Chart

Figure 1 Flowchart for the diagnosis of diabetes mellitus

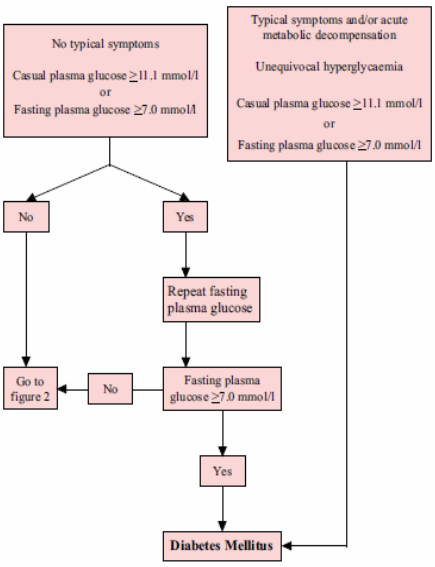
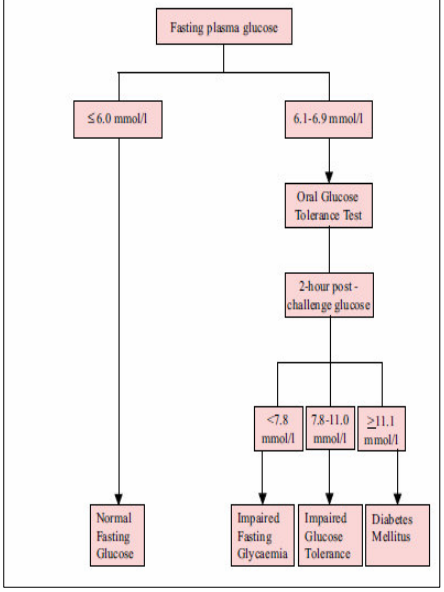
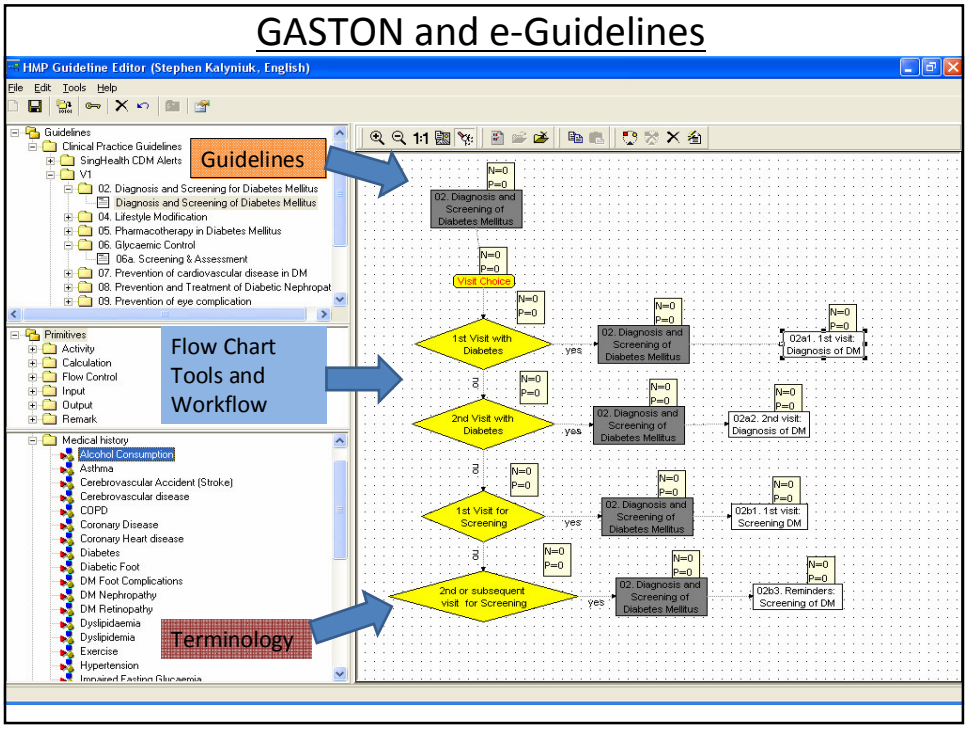


Figure 2 Flowchart for individuals suspected to have diabetes but whose fasting plasma glucose <7.0 mmol/l



GASTON and e-Guidelines



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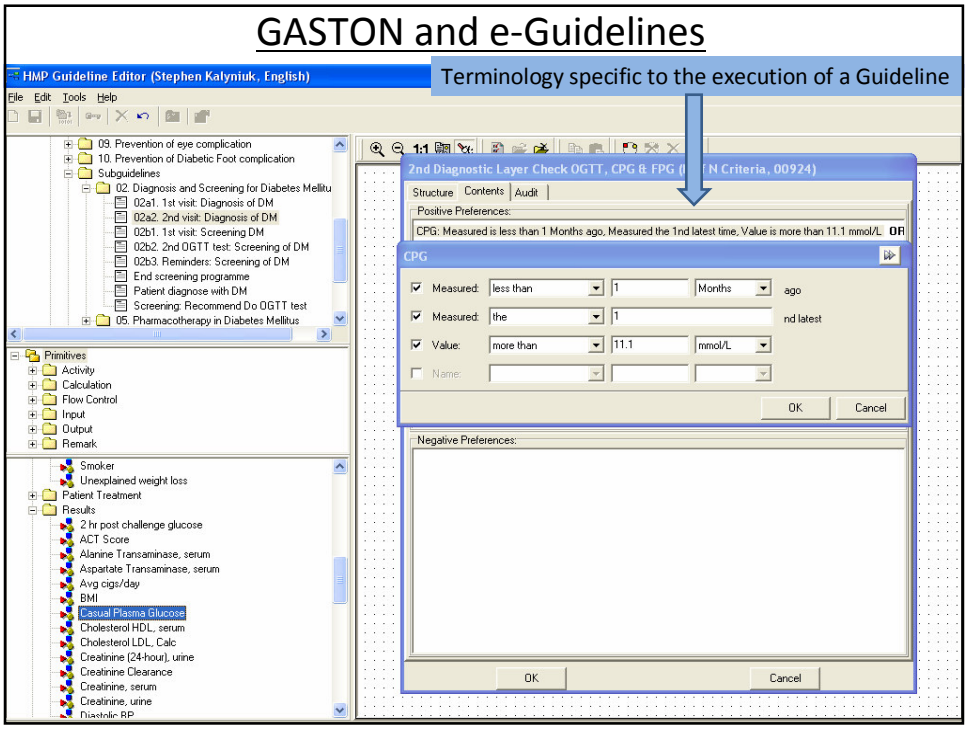

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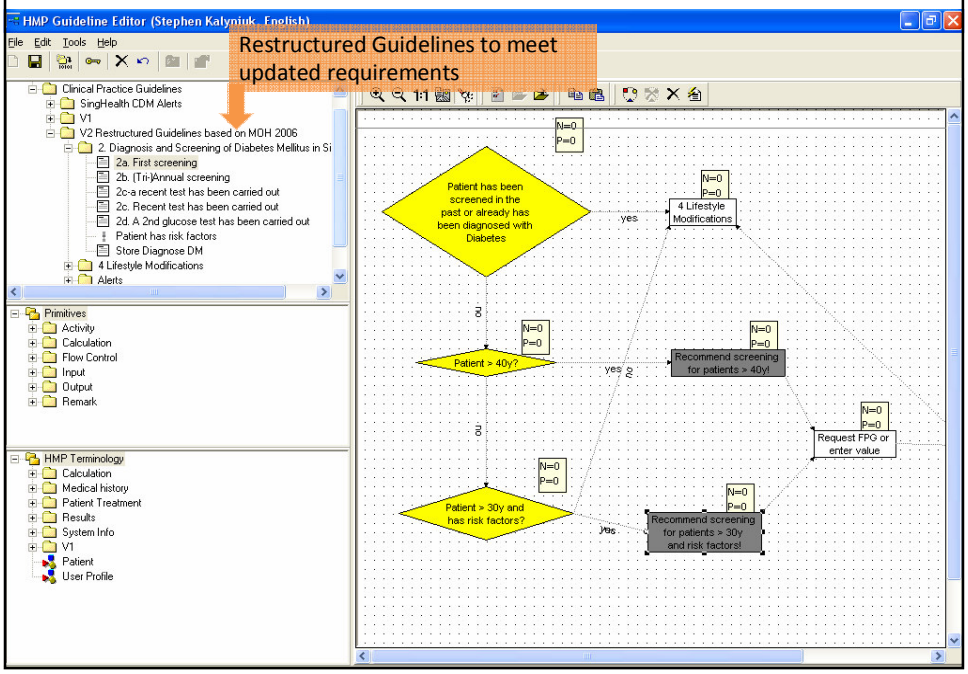

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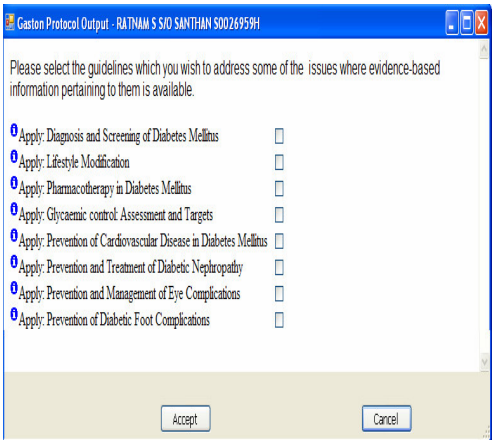

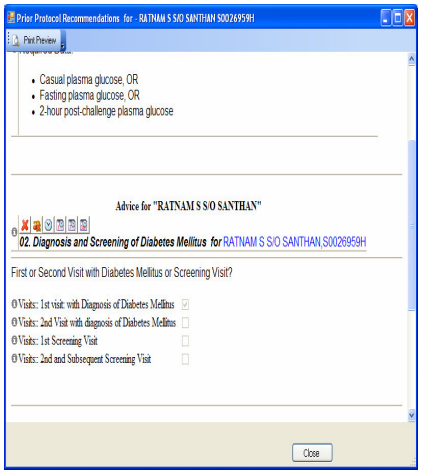

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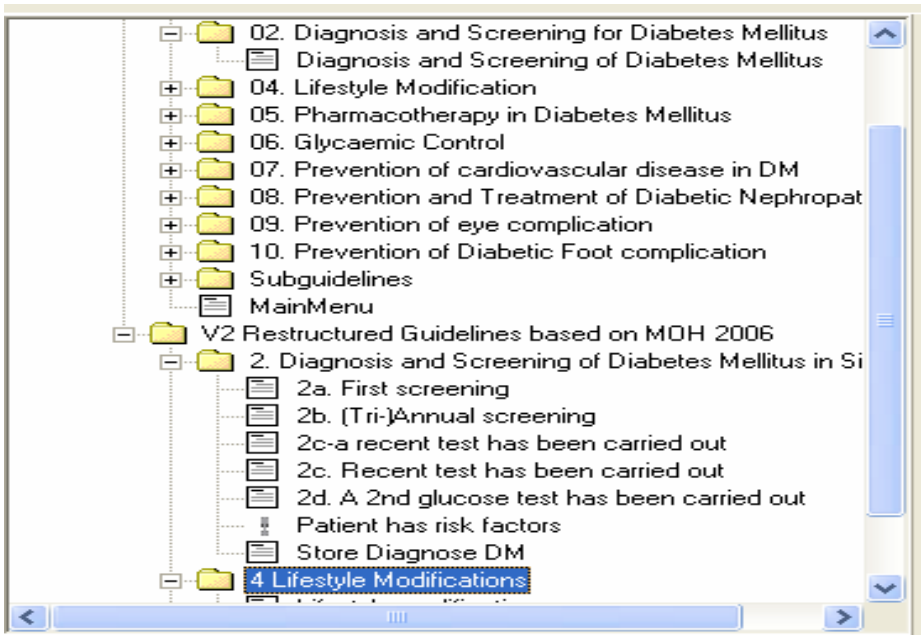

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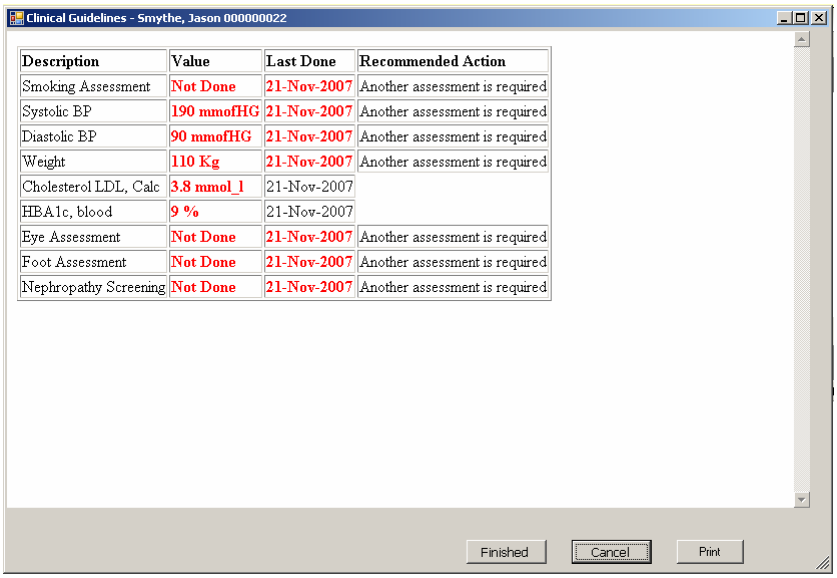
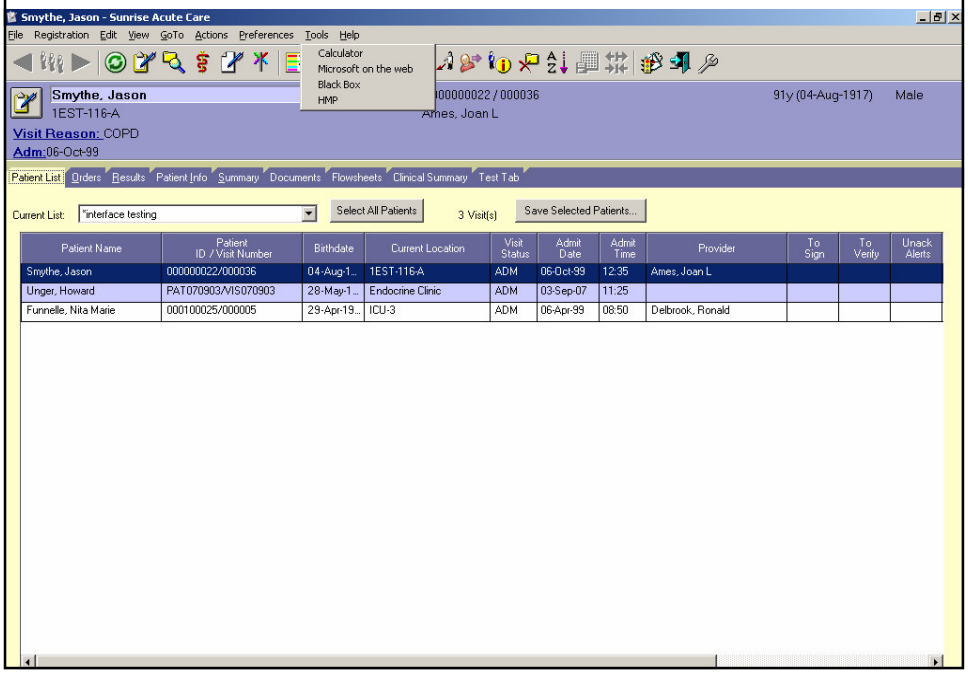
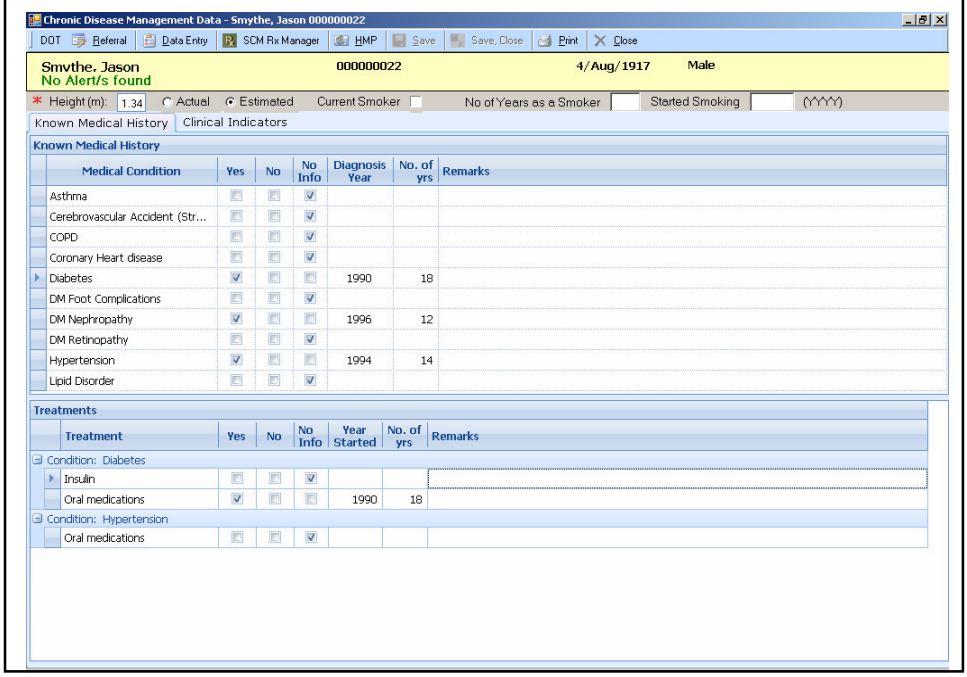


Description	Value	Last Done	Recommended Action
Smoking Assessment	Not Done	21-Nov-2007	Another assessment is required
Systolic BP	190 mmofHG	21-Nov-2007	Another assessment is required
Diastolic BP	90 mmofHG	21-Nov-2007	Another assessment is required
Weight	110 Kg	21-Nov-2007	Another assessment is required
Cholesterol LDL, Calc	3.8 mmol_l	21-Nov-2007	
HBA1c, blood	9 %	21-Nov-2007	
Eye Assessment	Not Done	21-Nov-2007	Another assessment is required
Foot Assessment	Not Done	21-Nov-2007	Another assessment is required
Nephropathy Screening	Not Done	21-Nov-2007	Another assessment is required

CDM -Application Launch



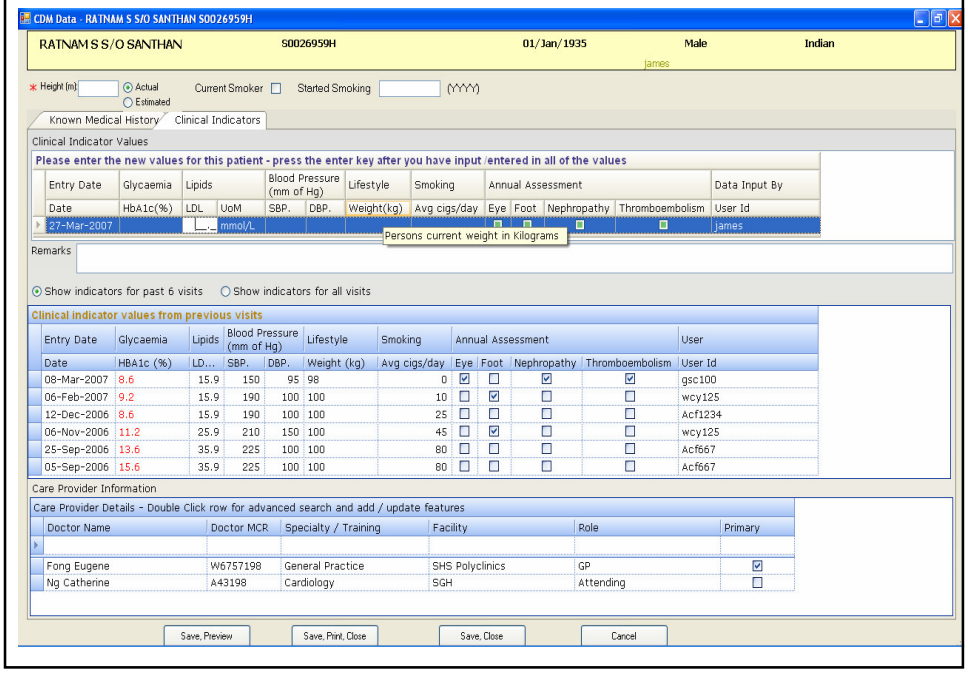
CDM Application – Medical History



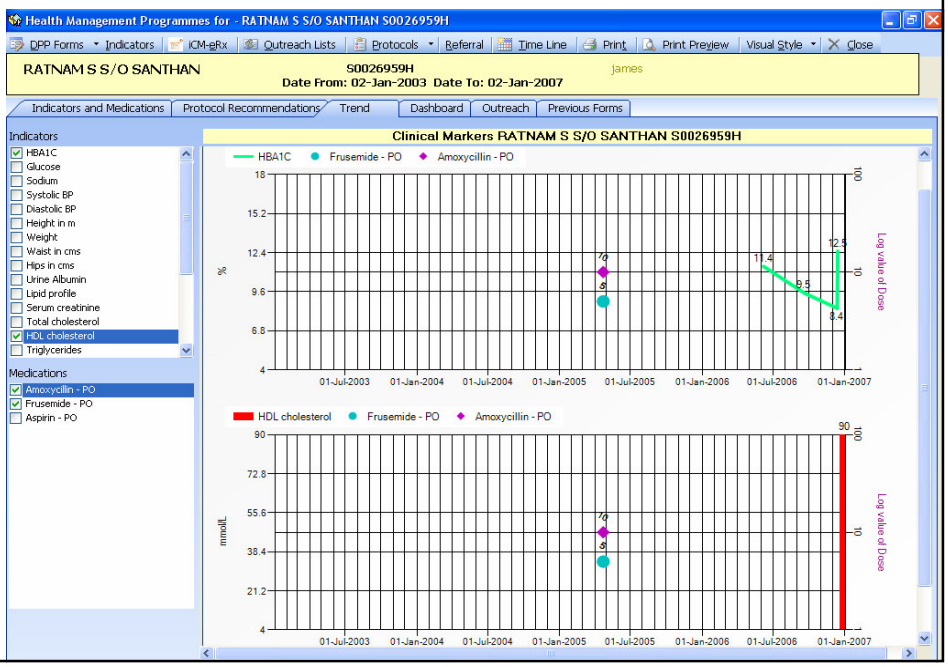
CDM Application and Context Management

- Using a technique called "context management", the CDM application provides the clinician with a view on the information held in iCM/ SCM and that entered and maintained in the CDM application.
- The CDM software is launched for the same person that the user has selected in iCM / SCM. This means that when a user signs on to iCM/ SCM, and opens the CDM software, by using Context Management that same sign-on can be executed on CDM. Similarly, the patient selected in iCM/SCM is the same patient that is opened in the CDM application.
- CCOW works for both client-server and web-based applications. The acronym CCOW stands for "Clinical Context Object Workgroup" (CCOW), a reference to the standards committee within the HL7 group that developed the CCOW standard
- iCM has context management features which have yet to be utilized in Perth.
- CCOW is not to be confused with "screen scrapping". Further information re CCOW is available at http://www.hl7.org.au/CCOW.htm

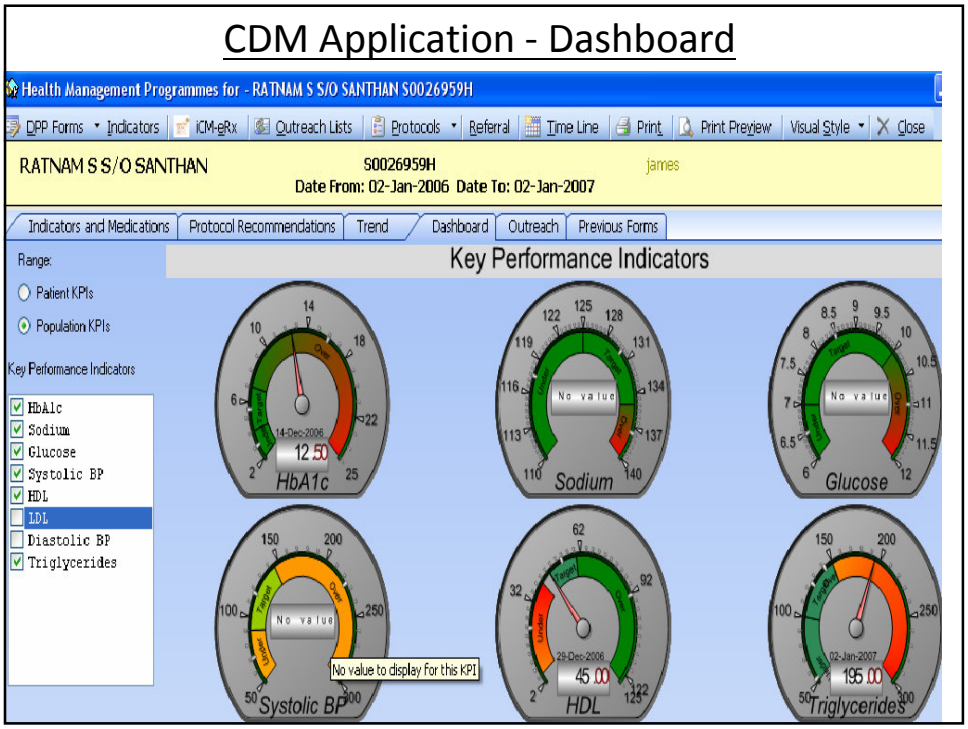
CDM Application – Clinical Indicators



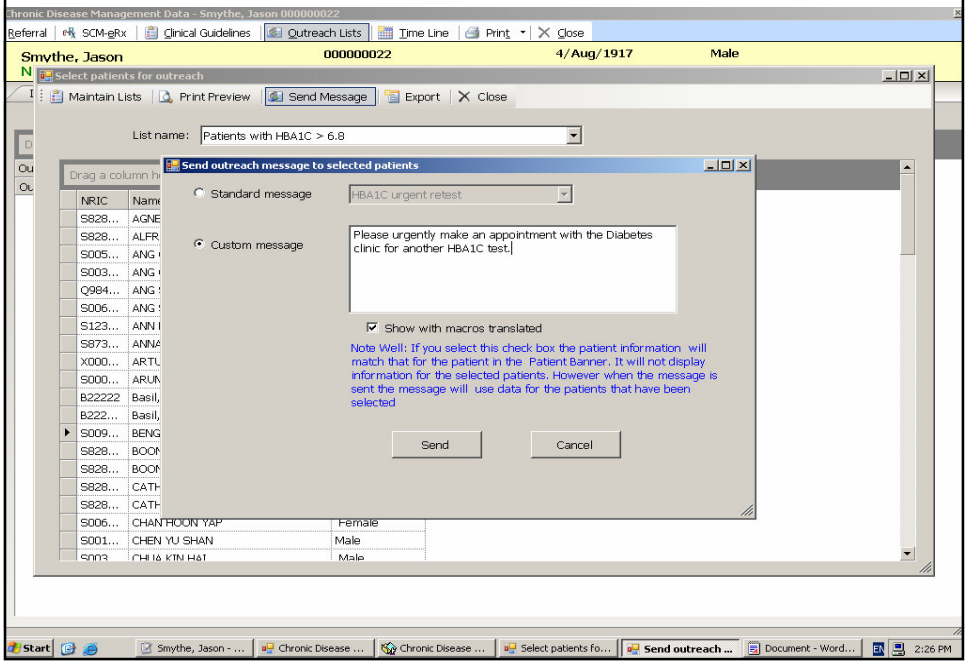
CDM Application - Trend View



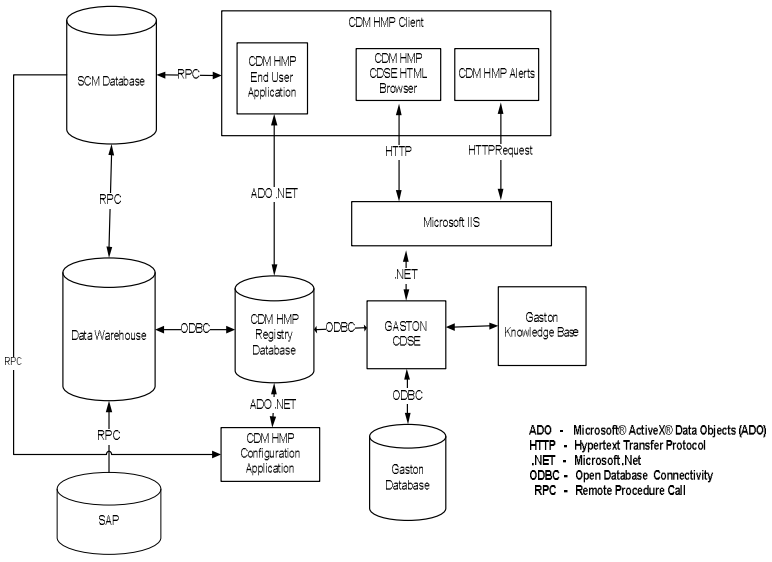
CDM Application - Dashboard



CDM Outreach Lists

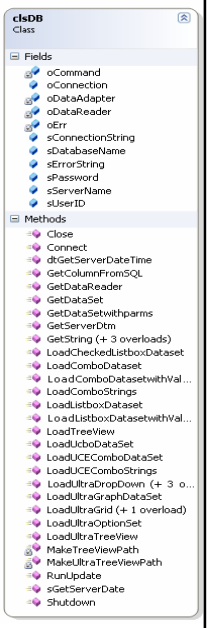


Solution Connectivity Overview



Technical Overview

- Object Orientated framework for:
  - All database access
    - Patient data, User Security
  - All data bound controls are loaded via the framework
  - Benefits
    - Rapid application development
    - Application and data consistency
    - Reusable objects
    - Improves software maintenance timeframe
    - Extended software life
- Developed a Reporting sub system for local report processing (SQL Server Reports without having to have a Report Server)
- VB and SQL Server



Summary

- Keep the individual e-guideline sections small
- Spend time on developing the application framework (i.e. object layer) first
- Project not achievable in the same timeframe (if at all) without Gaston (or similar product).
- Ability to keep e-Guidelines in synch with clinical practice requires a tool such as Gaston. Cannot imagine being able to keep up with changes in clinical practice trying to use traditional development tools such as VB and SQL.
- Technical integration of the guidelines requires IT staff while the content of the guidelines requires clinical staff.
- Able to reuse the CDM object framework as the basis for other applications. For example in a Mental Health Admission Register and Documentation framework
- Establish 'Registers and Register Rules' to replace Outreach lists.
- Regardless of the development platform and or development language the components provided (i.e. Data grids, Calendar controls, List Boxes) within Visual Studio are only a subset of the controls that are required to provide an application that meets the demands of end users. Microway (*www.microway.com.au*) and ComponentSource are suppliers of advanced developer components.