

# Electronic Decision Support The NZ Experience

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**Chief Executive Officer**



Architects of Online Health Knowledge  
for  
Clinical Decision Support

# Introduction

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- " .... To facilitate access to high-quality evidence on what is best-practice health care, electronic decision support systems are essential. They can make a difference to the quality of health care - by giving clinicians and consumers access to relevant, evidence-based information at the point of care. However, for these electronic decision support arrangements to be effective, it is essential that there is a nationally coordinated approach to developing them and that a national governance structure is in place to provide direction and coordination..."

Electronic Decision Support for Australia's Health Sector, Report to Health Ministers by the National Electronic Decision Support Taskforce - November 2002

# EDS: Its Role in Health Strategy

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- Medical practitioners are faced with an explosion in the volume of medical knowledge. A hundred years ago it was possible for a doctor to know the entire compass of medical knowledge. No one would hold that view today.
- Clinicians can no longer rely on memory alone but must use knowledge storage systems. Much of that knowledge is now stored electronically. Because the amount of knowledge is staggering, clinicians must increasingly rely on computer programs to sift or manipulate it.
- Meanwhile consumers often present with reams of information gained from the Internet. But because of the quantity of information, clinicians and consumers are faced with the difficulty of sorting the wheat from the chaff.
- To facilitate access to high-quality evidence on what is best-practice health care, Electronic Decision Support systems are essential. They can make a difference to the quality of health care — by giving clinicians and consumers access to relevant, evidence-based information at the point of care.

# History of EDS In New Zealand

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- Ministry of Health / Core Services Committee
- Explicit benefits
- Use of EBM to assist in prioritisation
- Formation of the New Zealand Guideline Group
- Need to manage and deliver effectively

# Consequences of the Strategic Drivers

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- Knowledge creation
  - Guideline Development
- Knowledge management
  - Updates and localisation
  - Knowledge on Web site
    - NZGG
    - Elective Services
    - GIN
- Knowledge delivery
  - Delivering Knowledge from Websites
  - Delivering knowledge to the point of care



# EDS: The Need

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- Healthcare systems strive for health gain: Improved outcomes, improved quality, improved access, improved throughput, managed expenditure.
- This requires reshaping of the clinical delivery process.
- Necessitates systematised support for care planning:
  - Information overload.
  - Improved application of existing best practice knowledge.
  - Co-ordinated delivery of care: multiple providers and multiple settings.
  - Integrated with clinical workflow.
  - Audit and evaluation.

# EDS: System Elements & Requirements

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- EDS:
  - To date EDS has been regarded as an application.
  - Must be viewed as a system issue for success.
  - Success evidenced by clinical behaviour change leading to improved outcomes
- Key elements of the system:
  - Are humanistic not mechanistic.
  - Require involvement of many players.
  - Applicable to primary and secondary care.
- System requirements:
  - Problem orientated clinical knowledge.
  - Knowledge-based processes.
  - Available within clinical information systems.
  - Delivered at the point of care.
  - Scalable across many diseases and clinical settings.
  - Supported by standards based applications interoperable with related CIS.
  - Quality assurance built in.

# EDS Definition

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- An Electronic Decision Support System (EDS or clinical decision support system CDS) are "active knowledge systems" designed to aid clinicians in decision making by matching individual patient characteristics to computerized knowledge bases for the purpose of generating patient-specific assessments or recommendations.
- Inputs may be derived from many parts of the patient record
- Outputs include:
  - Clinical advice
  - Patient specific care plan or order set
  - Information to patients
  - Disease specific datasets
  - Performance measures: audit and evaluation

# EDS Must be Viewed Systemically

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- To date EDS has been regarded as an application, however success requires it to be viewed as a system issue, where success drives clinical behaviour change leading to improved outcomes
- Key elements of the system are humanistic not mechanistic and require involvement of many players
- System requirements
  - Problem orientated clinical knowledge
  - Available within clinical information systems
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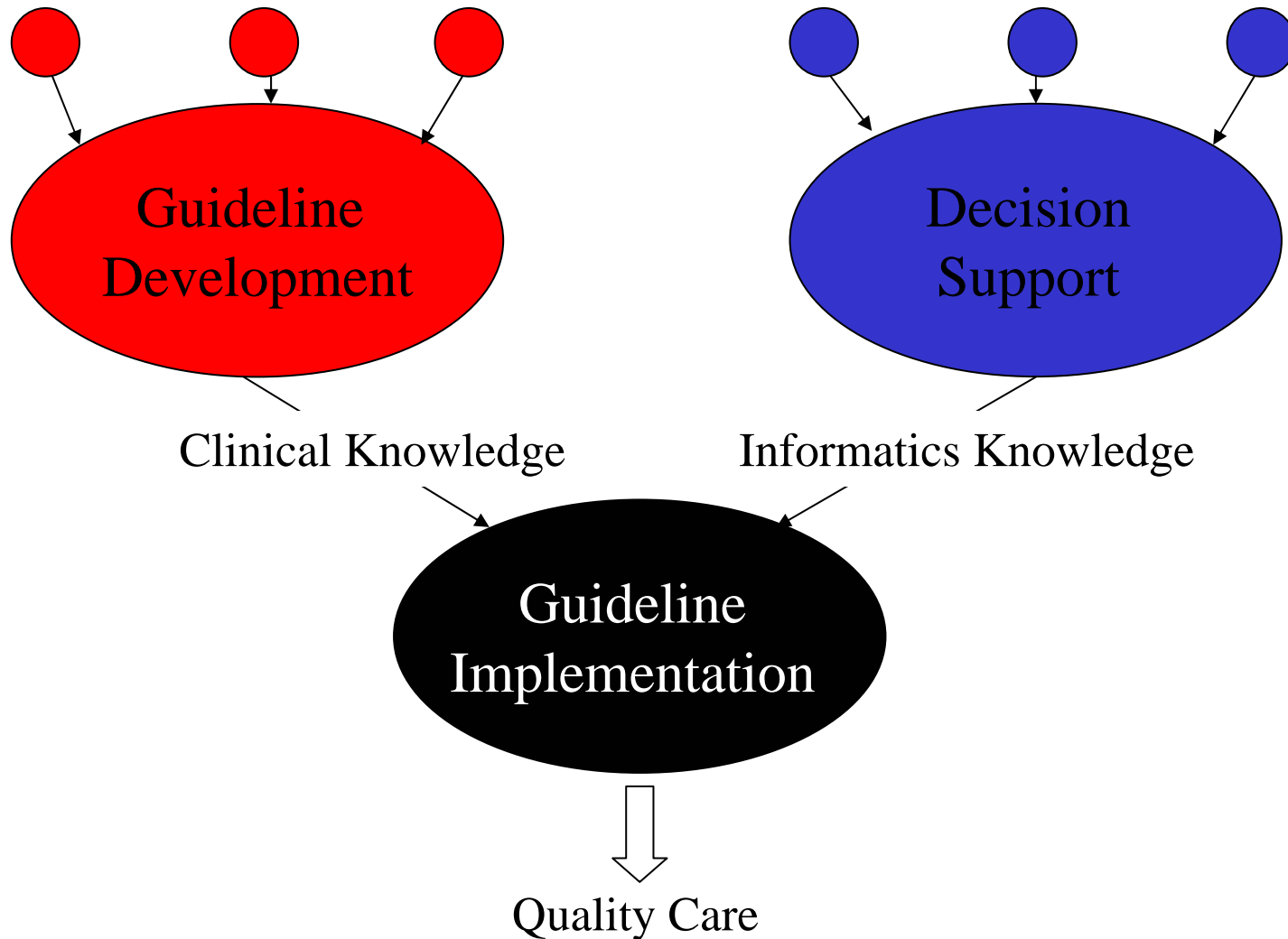
# Issues - Decision Support is Heterogeneous

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- Need better definitions of the family of decision support models
  - Best Practice decision support and systematised care planning
  - Alerts and reminders
  - Workflow enhancement (eg referrals)
  - Advisory information (support for lab results, Rx support, etc)
  - Context relevant reference information (Rx formularies, Guidelines, References)
- Need better understanding of their relevance and clinical applicability
- Need better understanding of the user requirements for each model
- Need better understanding of how guideline knowledge best feeds each model

# Challenges – Integrating Content and Systems Developers!

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# Guideline / Decision Support Development Issues

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- Delivering clinical knowledge based on best-practice guidelines from within clinical information systems is a rapidly advancing customer need
- Strong agreement exists that medical decisions should be made on the best current evidence not on the basis of personal anecdotal experience, to reduce variation in care <sup>1</sup>
- The market is now demanding guideline based knowledge delivered to the point of care through Decision Support Systems
- Successful delivery requires a systemic approach which integrates knowledge with workflow achieved through existing Clinical Information Systems
  - Guidelines > Decision Support System > Point of Care > Improved Clinical Outcome
- System features:
  - Current, reliable knowledge of approved provenance
  - Flexibility to “localize” knowledge
  - Flexibility to handle multiple conditions and clinical settings
  - Interoperable with many CIS
  - Integratable with clinical workflow

1. Crossing the Quality Chasm. Institute of Medicine 2001

# Content Issues

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- Increasing need to integrate guideline content from multiple sources
  - National v local
  - EB decision making v management protocols
  - Multiple diseases and co-morbidities
- Sources of guidelines are large, diverse
  - Variable format and lack of standard architecture
- Varied and potential conflicting content management needs
  - Rigorous approach to evidence based guideline development
  - Diverse approaches to guideline implementation in practice
- Ongoing investment in management and maintenance
  - Quality assurance
  - Refinement and updating

# Content Issues

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- Variation in guideline coverage, depth, richness
  - Content generation - omissions, gaps, ambiguities
  - “Localisation” of content, actionable advice
- Number of approaches to structuring knowledge
  - Which should be followed?
- Process of translation - content to functional form
  - Conceptually sound, reliable, feasible, transparent, testable
- Integration requirements
  - Multiple standards to consider: clinical documents, coding, messaging, interfacing etc

# Systems Developer Issues

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- Key interest is to be able to respond to customer demand for decision support functionality
- Limited interest in the guideline development / management process
- Limited depth to understanding of the clinical issues
- See content as an input to key systems processes
  - Decision support
  - Workflow / order sets
  - Patient information
- Seek ability to integrate content from multiple sources
- Seek reproducible methods for integration which avoid custom programming
- Seek current, reliable sources of content which can simply be “plugged-in” to their applications

# The Needs and Benefits of Standards and Architectures

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- To assist this process implementing a Guideline Formalism is of significant assistance in providing:
  - Content standards; creation, maintenance and dissemination
  - Durability of content; extends beyond the systems which deliver it
  - Transportability and sharing of information between providers
  - Localizable
  - Interoperable within diverse clinical information systems
  - Reusable for other related solutions
  - Efficiency in development and execution

# Guideline Formalism – Requirements

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- To be effective, these tools need to be linked to the patient's record, use standard medical vocabularies and codes, should have clear semantics, must facilitate knowledge maintenance and sharing.
- They need to reflect key elements in the guideline authoring process, such as management goals, evidence levels, and version, while allowing adaptation for local conditions.
- At the same time they must make explicit the “knowledge components”, such as advice, actions or supporting information which need to be interpretable by an information system if decision support is to become realistic and meaningful.

# Challenges - Providing Form and Functionality

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- Formalism must address form (presentation) and functionality (action)
  - Content development system
    - Information Management structure & integrated processes for development, editing & improvement
    - Significant issue of guideline translation > executability
  - Content management system
    - Content database management structure and processes
  - Functionality
    - Application within clinical information systems
  - Integration
    - Communications and exchange structure
    - Available within a wide range of information system from multiple vendors

# Clinical Knowledge Architecture

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- In the last few year increased use of digital medium for guideline management and delivery
  - Savings in time and cost
  - Increase flexibility for updating and delivery
- Raises a number of challenges
  - Content
    - Creation of content; an agreed structure required
    - Ongoing management of content; more frequent update making version control critical
    - Reliability and validity
  - Functionality
    - Delivery of knowledge at the point of care is critical
    - Integral to clinical workflow
  - Interfacing
    - Access to content; needed at the point of care
    - Integration with other CIS
    - Data transfer, messaging and scheduling
- Standards, coding and vocabularies identified as critical to success

# Clinical Knowledge Architecture

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- Need to adopt an agreed international standard - What precedents exist?
- A wide variety of methods to support the computerisation of guidelines have been or are being developed by the Health Informatics community.
  - Historic focus on on guideline representation
  - Urgent need to for delivery of patient-specific knowledge
- Architectures include:
  - Systems which are rule-based eg Arden Syntax, logic- based, eg PROforma, network- based eg PRODIGY, workflow-based, eg GUIDE, or mixed, eg GLIF, GEM and CPGA.
- None is ideal and all have their strengths and weaknesses

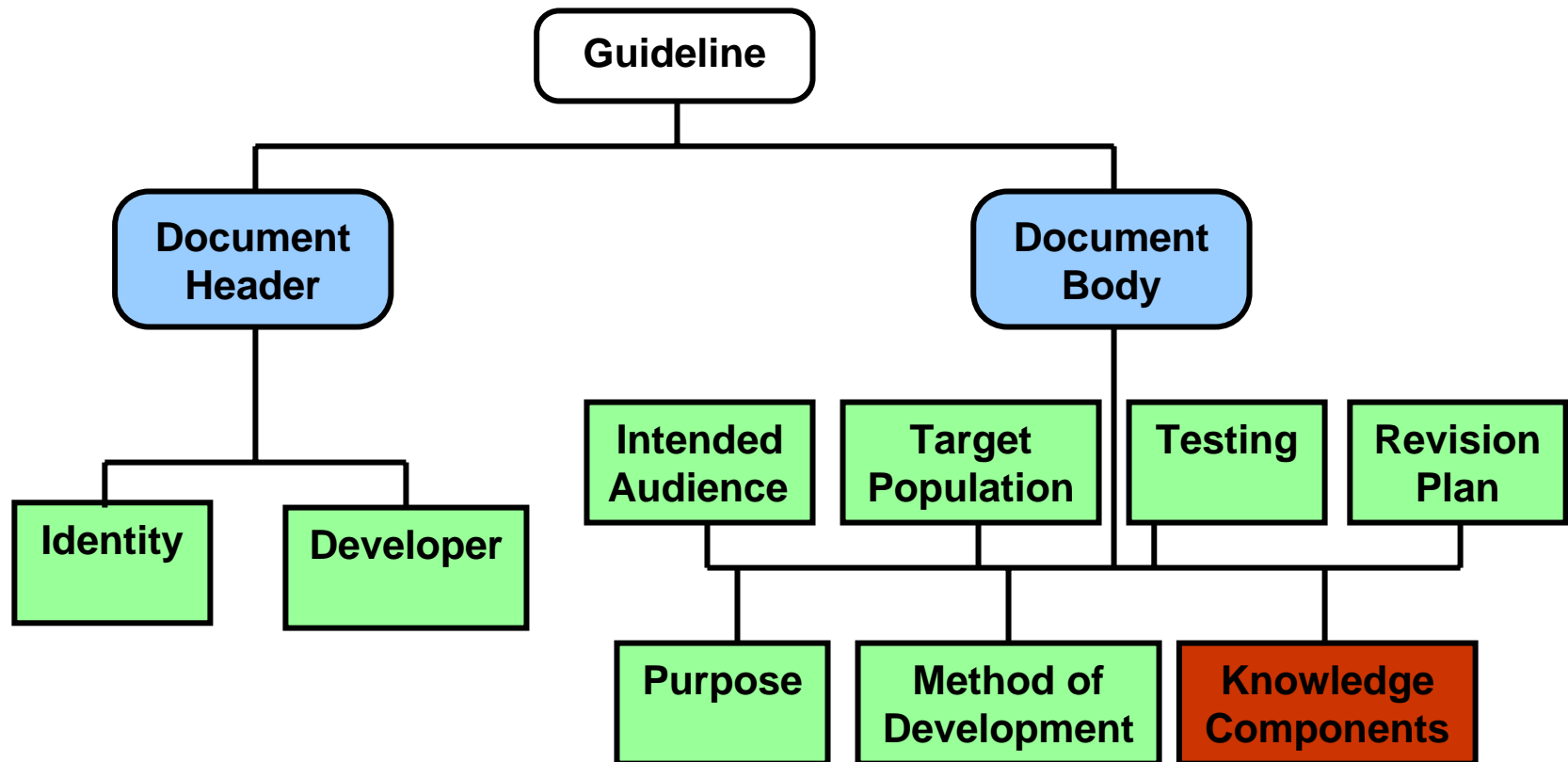
# Appropriate Architecture for Clinical Knowledge

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- HL7 is becoming the de facto standard setter for this area
  - Two directly relevant groups; Decision Support Technical Committee, Guideline Special Interest Group
  - Models derived from GLIF(Guideline Interchange Format)
    - Knowledge model for guideline documents
  - Focus on use of XML (HL7 v3.0)
  - Currently two models under review
    - GEM (Guideline Element Model - Shiffman)
    - Clinical Practice Guideline Architecture (CPGA - Purves)
  - Key Issues
    - Guideline representation ✓
    - Representation of Knowledge Components ?
    - Functionality inherent to architecture ?
    - Interfacing – use of CDA (Clinical Document Architecture)

# A Guideline Architecture – Delivers Form and Functionality

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# Architecture Should Facilitate Editorial Processes

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- Ensure structure is an inherent part of the content creation process
  - Enables end-user to create scenarios and matching recommendations
  - Avoids writing logic strings
- User Friendly; little opportunity for error and low support needs
- Centralised - available Online to ensure version control, compliance with architecture and co-ordination of activity
  - Enable distributed editing to meet capacity and local variation need
  - Facilitates localization
  - Provides editorial authorization, version control, roll back

# Advanced Knowledge Representation – Scenario-based Model

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- Models decision making on a patient scenarios / patient states not algorithms
- These can be written as Knowledge Components in Guideline Schema
- Better approximation to clinical decision making and enables fast delivery of patient specific advice
- PREDICT creates structured evidence-based recommendations, stored in a knowledge base
- Recommendations are linked to specific clinical scenarios (infinitely variable) defined by a template of clinical inputs (BP, cholesterol, etc, etc)
- Builds in the theory of decision tables (Shiffman)



# Platform Development - PREDICT

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- PREDICT – an innovative, flexible decision support system for delivering best practice knowledge at the point of care
- Collaboration between Enigma and the University of Auckland



- Clinical, epidemiology, economics and informatics
  - Guideline development, guideline translation, knowledge representation, systems design
  - Improved risk prediction / risk modification
  - Outcomes analysis

# PREDICT Knowledge Model - Principles

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- Patient specific, best practice advice delivered at the point of care in real time
- “Right knowledge, right place, right time”
- Fully integrated with existing information systems
- Enhances clinical workflow and does not intrude into practitioner / patient interaction
- Adaptable to reflect locally agreed clinical management
- Reflects “real world” clinical management
- Makes content / rules management sustainable and distributable
- Use open standards and agreed architectures
- Able to handle multiple conditions / situations

# Platform Development - PREDICT

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- PREDICT™ - Decision Support System using scenario-based knowledge representation
  - Models decision making on a patient scenarios / patient states not algorithms
  - These can be written as Knowledge Components in Guideline Schema
  - Better approximation to clinical decision making and enables fast delivery of patient specific advice
  - Scenarios encapsulate structured evidence-based recommendations, stored in a knowledge base
  - Recommendations are linked to specific clinical scenarios (infinitely variable) defined by a template of clinical inputs (BP, cholesterol, etc, etc)
  - Builds on the theory of decision tables (Shiffman) and further research in progress

# PREDICT Features

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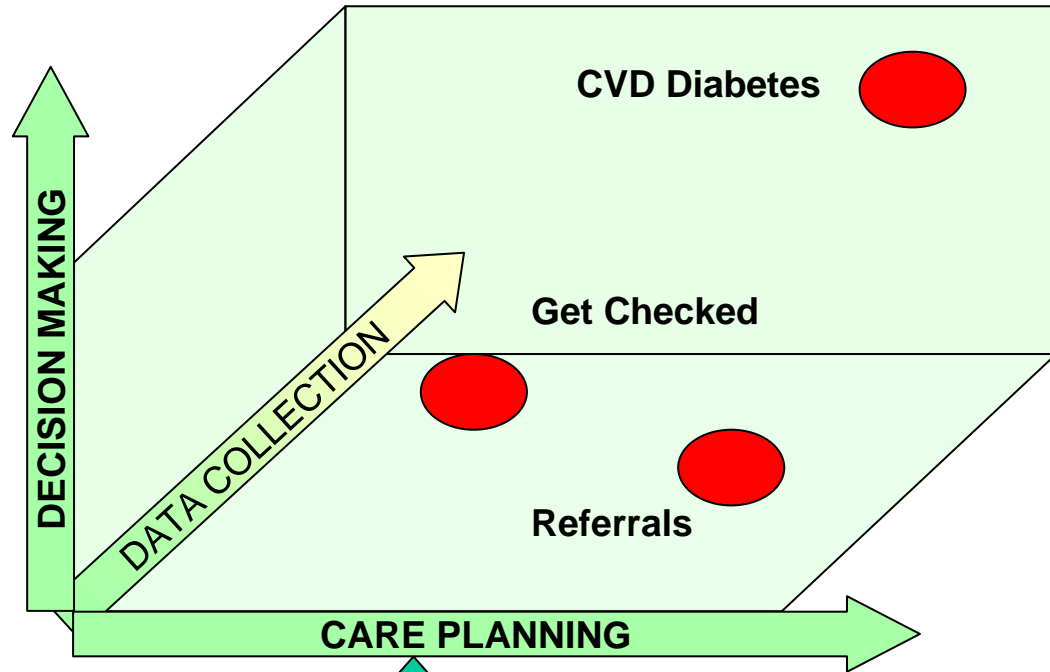
- Provides a structure to develop and "translate" guidelines into specific actions for specific patient populations
- Presents risk stratification and recommendations tailored to individual patients
- Presents evidence / information specific to the recommendations offered.
- Presents a care plan or actionable orders supporting the recommendations offered.
- Presents patient information specific to the recommendations offered.

# PREDICT Platform

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- Predict Platform: The “Platform” comprises core components using solid informatics / IT principles, off which the key requirements for EDS can be delivered, ie:
  - Decision making.
  - Care planning.
  - Data Collection.
- Various sector strategies, actual or contemplated, can be positioned on the platform map to illustrate its wide applicability and ability to support MoH led sector strategies. Illustrated below are:
  - Get Checked.
  - CVD / diabetes.
  - Referrals.

**PREDICT**  
**PLATFORM**  
**&**  
**APPLICABILITY**



PATIENT CARE INFORMATION

PATIENT  
SPECIFIC  
DATA

EDS Platform

CORE  
COMPONENTS

Content/  
Rules base

CIS Integration

Messaging

Delivery/  
Engine

Interfacing

Quality  
Assurance

Reporting

# Experience with the PREDICT System

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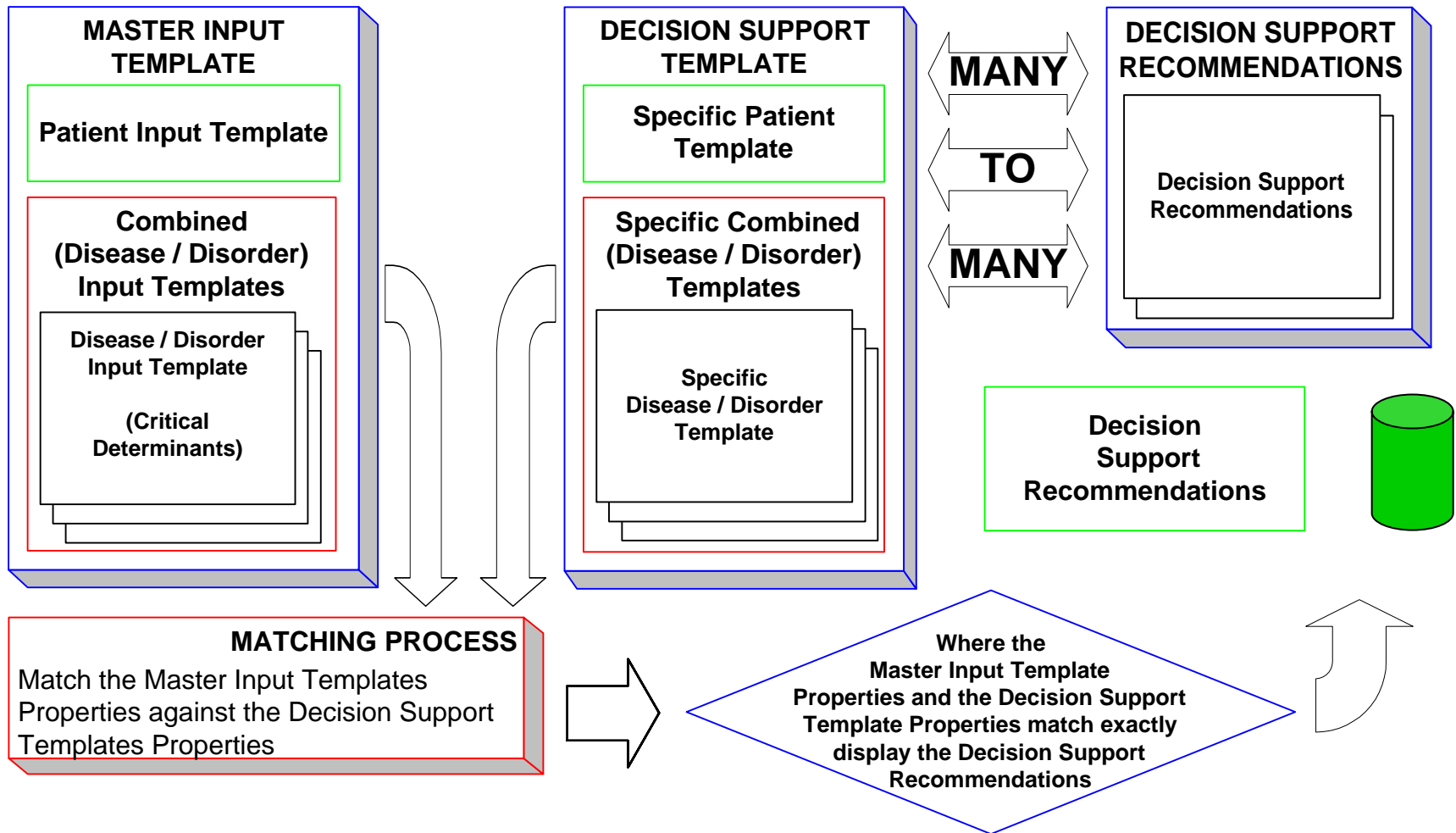
- Now use in a variety of clinical knowledge management projects
  - Chronic disease management; CVD, diabetes
  - Workplace injury and rehabilitation
  - Primary – secondary referral management
  - Prioritisation for secondary / tertiary services
  - Preventative screening
- Variety of clinical delivery system
  - Community, primary and secondary
  - New Zealand, US and Australia
  - Standalone and fully integrated

# Issues – Content Management and Governance

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- Guideline / Evidence Issues
  - Gaps and logic conflicts
- Guideline Translation
  - Technical – Critical Determinants and Knowledge Components
  - Efficiency / Workflow / Skills
- Governance / Management
  - Governance Group – oversight and direction
  - Clinical Quality – sign off on clinical knowledge, rules and guideline localisation
  - Clinical Project Management – co-ordination
  - Training
  - Content management and editorial
  - Technical implementation and ongoing support

# Scenario-based Model



# PREDICT™ Editorial Tool Builds Scenarios – Rapid, Flexible Content Management

PREDICT EDITORIAL TOOL				HEAVY MENSTRUAL BLEEDING		
NEW CASE	CASE	RECOMMENDATIONS	PATIENT INFO	ACTIONS		
BOOKMARKS	SEARCH	DEFAULTS				
CASE: case 1				SAVE	DELETE	BOOKMARK
PERSONAL						
Age Range: 10 - 100 years old						
CLINICAL						
AND Weight:	90 - 300 kg	AND Haemoglobin (Hb):	20 - 200 g/L			
AND Endometrial thickness on TVU:	0 - 23 mm					
AND Inadequate response to hormone treatment:	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> N/A	AND Abnormal pelvic or abdominal examination:	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> N/A			
AND Malignancy ?:	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> N/A	AND Infertility + Nulliparity:	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> N/A			
AND Other hormonal treatment in use:	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> N/A	AND Contraception required:	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> N/A			
AND Irregular or intermenstrual bleeding:	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> N/A	AND Abnormal endometrium on pipelle biopsy:	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> N/A			
AND Iron deficiency:	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> N/A	AND Pain associated with heavy menstrual bleeding:	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> N/A			
AND Exposure to unopposed oestrogen:	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> N/A	AND History of other abnormal bleeding:	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> N/A			
AND Family history of colon carcinoma:	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> N/A	AND Family history of endometrial carcinoma:	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> N/A			
RECOMMENDATIONS:						
ADD NEW UNLINK ALL						
1	<input checked="" type="checkbox"/> R1	Monitor problem in primary care [EDIT]				
2	<input checked="" type="checkbox"/> R9	Pictorial bleeding assessment if appropriate [EDIT]				
3	<input type="checkbox"/> R3	Prescribe (local preferred Rx) [EDIT]				
4	<input checked="" type="checkbox"/> R2	Proforma referral [EDIT]				
5	<input type="checkbox"/> R4	Refer to Gynaecologist or Family Planning Clinic [EDIT]				
PATIENT INFORMATION:						
SAVE						
ACTIONS:						
ADD NEW UNLINK ALL						
1	<input checked="" type="checkbox"/> A0	Give patient information leaflet				
2	<input type="checkbox"/> A12	Iron replacement				
3	<input type="checkbox"/> A8	MIRENA (levonorgestrel intrauterine system)				
4	<input type="checkbox"/> A9	NSAID (24-48 hrs before and during heaviest bleeding days)				
5	<input type="checkbox"/> A10	NSAID (24-48 hrs before and during heaviest bleeding days)				
6	<input type="checkbox"/> A7					

Build case - creates clinical logic / rules

Choose Advice / Actions from PREDICT library - rapid development and updating

# Guideline Translation

## TREATMENT GUIDELINE FOR TYPE 2 DIABETES MELLITUS

### Introduction

Six percent of the U.S. adult population, or 15.7 million people, have diabetes. It is the seventh leading cause of death in the U.S. and leads to a variety of serious complications that affect nearly every major organ of the body. Chronic complications include heart disease, stroke, hypertension, blindness, kidney damage, nerve damage, decreased circulation in the extremities, and dental disease. An estimated \$98.2 billion was spent on diabetes care in 1997. If patients with type 2 diabetes can normalize their blood sugars, they can reduce the risk of these debilitating complications, including a reduction in retinopathy, nephropathy, and possibly neuropathy.

Comprehensive diabetes management programs implemented in managed care organizations have been shown to achieved gross economic adjusted savings of \$50 per diabetic member month (12.3%) with gross unadjusted savings of \$44 (10.8%) per diabetic member per month. Hospital admissions per 1,000 diabetic member years also have been shown to decrease by 18% and bed days fall by 21%. Hospital charges and length-of-stay data collected on 102 pregnant women enrolled in the California Diabetes and Pregnancy Program similarly found that hospital charges were about 30% less for program participants and days in the hospital were roughly 25% less.

Each year 798,000 people in the U.S. are diagnosed with diabetes mellitus. Identifying an asymptomatic individual with diabetes in the general population through random screening is difficult; however, in high-risk groups the likelihood is much greater.

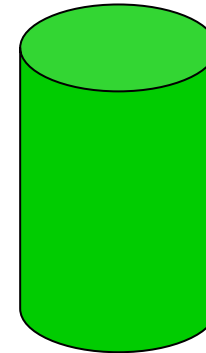
### A. SCREENING THE HIGH-RISK INDIVIDUALS WITH THE FOLLOWING RISK FACTORS IS RECOMMENDED AT EACH PREVENTIVE HEALTH VISIT:

- Family history of diabetes (especially first degree relative: parents or siblings)
- Obesity (i.e.  $\geq 120\%$  desired body weight or BMI  $\geq 27$  kg/m<sup>2</sup>)
- Race/ethnicity
  1. African American
  2. Asian American
  3. Hispanic American
  4. Native American
  5. Pacific Islanders
- Age  $\geq 45$  years
- Previously identified IFG or IGT (impaired fasting glucose, impaired glucose tolerance)
- Hypertension ( $\geq 140/90$  mmHg.)
- LDL cholesterol  $\geq 160$  mg/dL HDL cholesterol level  $\leq 40$ mg/dL and/or triglyceride level  $\geq 250$  mg/dL (2.82 mmol/L)
- HDL  $\leq 40$ mg/dL
- History of GDM (gestational diabetes mellitus) or delivery of babies over 9 lbs.

### B. ROUTINE SCREENING FOR DIABETES

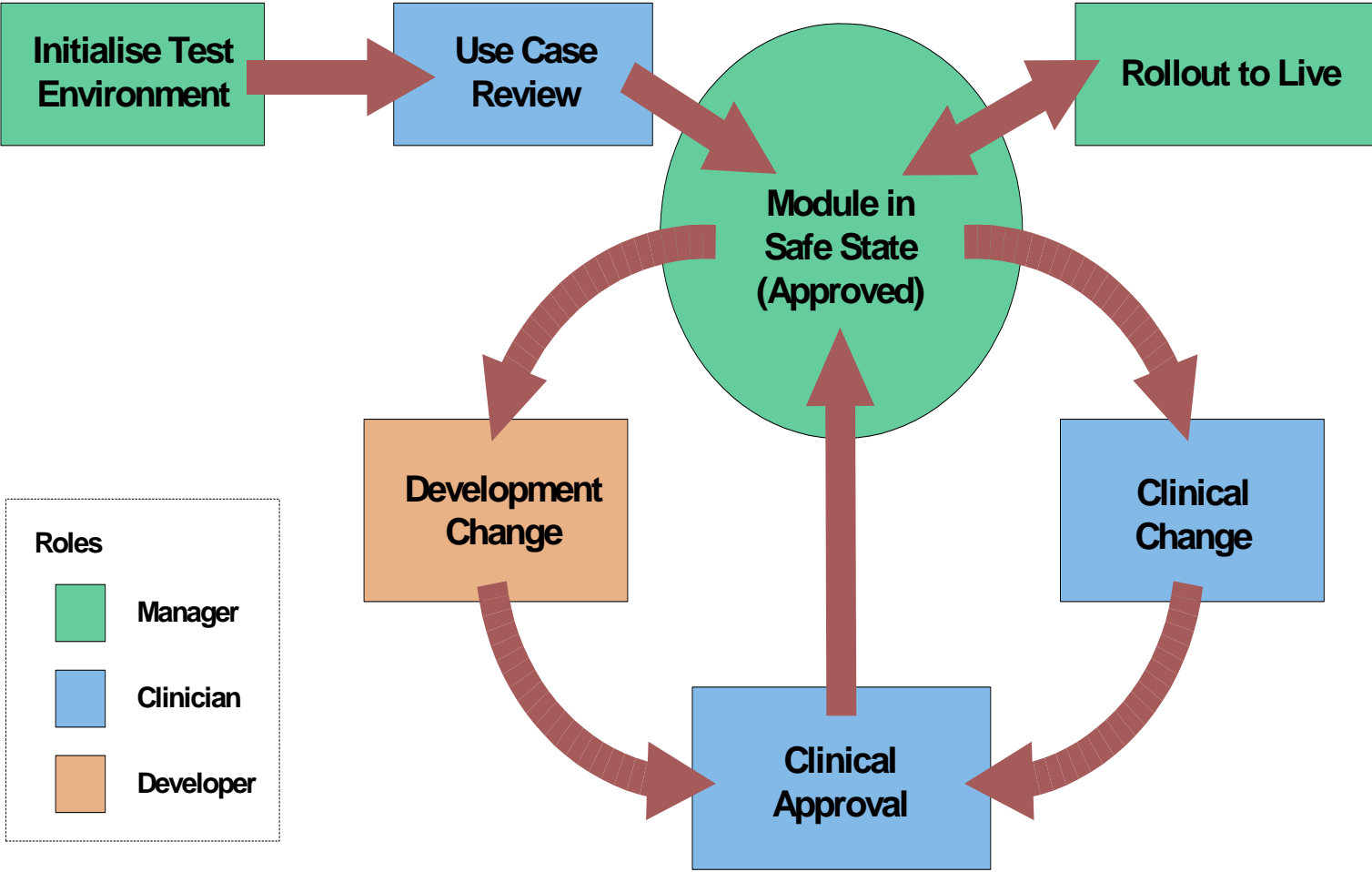
- All adults  $\geq 45$  years and females with a history of gestational diabetes
- 10 - 45 years in individuals with one or more risk factors such as obesity
- Lab Values: FPG  $\geq 126$  mg/dL or Random  $\geq 200$  mg/dL = impaired fasting glucose (IFG)  
2 hour PG  $\geq 140$  and  $\leq 200$  = impaired glucose tolerance (IGT)  
FPG  $\geq 110$  and  $<126$  = impaired fasting glucose

## PREDICT Server



Translate Guideline into  
Structured "Rules" + Tasks  
+ Supporting Information  
for PREDICT

# Change Control Management Tools – QA & Versioning



# Change Control Process

Scenario	Recommendations	Actions	Patient Info	Other	Process Time
19. enrol	⊖	⊖	⊖	⊖	-1%
20. care plan goals	⊕	⊕	⊕	⊕	
21. goals met	⊖	⊖	⊖	⊖	1%
22. <10%risk >150/90	⊖	⊖	⊖	⊖	
23. <10%risk 170/100	⊖	⊖	⊖	⊖	
24. <10%risk 170/50	⊖	⊖	⊖	⊖	
25. <10%risk 120/100	⊖	⊖	⊖	⊖	
26. Prev, NoHT, BP>140/85	⊖	⊖	⊖	⊖	
27. Diab,NoHT, BP>140	⊕	⊕	⊕	⊕	





The colored spots denote the results of comparing the specific data that they are near...

**27. Diab,NoHT, BP>140**      Recommendations | Actions | Patient Info | Other

CONTROL	TEST RESULTS
<input type="radio"/> <b>Lipid Targets</b> LDL <= 2.5 TC / HDL <= 4.5  <input type="radio"/> TC/HDL ratio within acceptable limits for level of patient's risk.  <input type="radio"/> NHF cardioprotective diet and physical activity advice recommended. Diet should be individualised for the diabetic patient (energy intake, meal spacing as well as macro-nutrient composition). [Interim Consensus Statement 2002]	<input type="radio"/> <b>Lipid Targets</b> LDL <= 2.5 TC / HDL <= 8.5  <input checked="" type="radio"/> TC/HDL ratio within acceptable limits for level of patient's risk.  <input checked="" type="radio"/> NHF cardioprotective diet and physical activity advice recommended. Diet should be individualised for the diabetic patient (energy intake, meal spacing as well as macro-nutrient composition). [Interim Consensus Statement 2002]
<input type="radio"/> <b>Blood Pressure Target</b> BP <= 130/80	<input type="radio"/> <b>Blood Pressure Target</b> BP <= 150/80

**Use Case**

SCENARIO	AGE	BPS	BPD	GENDER	ETHNICITY	FAM_HIST	IHD	PTCA_CABG	STROKE_TIA	GLD	PVD	DIABETES	SMOKING
⊕ 27. Diab,NoHT, BP>140	46.0	85.0	150.0	M	11	N	N	N	N	N	N	1	N

-  Unchanged
-  Changed
-  Added
-  Removed

# Development Workstreams – Results

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- Outputs from the EDS workstreams supported by the MoH over the last 3-4 years have already delivered EDS solutions with evidence of the following system capabilities:
- Direct impact on key MoH strategies
  - Primary Care
  - Public Health
  - Referrals
  - Maori Health
  - Chronic Disease.
- Direct impact on DHB strategies
- Integral to clinical workflow
- Generalisable / Scalable
  - Applicable to multiple diseases (CVD, diabetes, gynae, etc)
  - Applicable to multiple clinical settings (Primary, secondary, community)
- System which is discreet / defined / documented (ie it truly is a platform for generalisable EDS)
- Evidence of performance in clinical practice (ProCare, CMDHB, referrals)
- Evidence of Stakeholder Support (ProCare, CMDHB, RGPG, HealthWest etc)
- Improved Data Collation

# Future: Infrastructure Development

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- Objectives:
  - Standards based decision support platform for implementation of systematised care planning
  - Interoperable and integratable with standards based CIS, longitudinal patient record and disease data sets
- Deliverables
  - Completion of current toolkit (documentation etc.)
  - Advances to module development tools
  - Advances to engine to ensure performance enhancements and scalability
  - Advances to localization capabilities
  - Advances to editorial tools
  - Advances to QA system
  - Completion and testing of authoring tool
- Goals
  - End to end solution for sustainable management and delivery of EDS across multiple diseases and clinical settings

# Conclusion - Strategies

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- Shared Strategic vision, top down leadership, widescale sector commitment
- Agreed definition of CDS
- Articulate the strategic value of CDS
- Understand and address barrier to adoption
- Build a strategic plan
  - Confirmation of key systems components
  - Identification of required capabilities
  - Identification of required infrastructure
  - Allocation of roles and responsibilities
  - Coordinated management of development, delivery, implementation, management and evaluation
  - Economics: aligned clinical / financial incentives to speed adoption and drive positive behaviour change + ensure sustainability
  - Standards, Process and Governance
  - Communication, and buy-in

# Conclusions - Standards

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- There has been significant value in evolving the debate on guideline formalisms
  - Development of content
  - Execution / integration
  - Transportability and sharing of information
  - Localizable
- Important to explore related standards
  - EHR, and CDA
  - Messaging
  - Interfacing
- Issues
  - Urgency to gain agreement and commence implementation of guideline standards
  - Need for stability
  - Need for conformity
  - Agree progress / development path

# Conclusions - Process

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- Importance of process and wide scale buy-in (governance)
- Importance of knowledge architecture is hard to grasp
- Ensuring a manageable process is critical but elusive
  - Guideline translation – “real world” gaps in knowledge, logic conflicts
  - Localisation
  - Distributed, ‘non-expert’ authoring
- Issues to be addressed
  - Firm agreement on standards
  - Improved implementation for guideline authoring
  - Quality assurance