

# **Clinical Decision Support (CDS) Roadmap for NHSScotland**

**SCIMP Conference  
23<sup>rd</sup> September 2015**

# Overview

## 1. Outline of CDS Roadmap:

- The need for change
- Definition and scope
- Vision and architecture
- Proposed milestones and deliverables
- Benefits

## 2. CDS in action – demo of national CDS solution in New Zealand

## 3. Discussion

# The Need for Change

# Knowledge-Practice Gap

Knowledge exists but we often fail to apply it correctly.

30-45% of care not based on available evidence  
(McGlynn 2003, Grol 2003, NHS Atlas of Variation, 2014)

17 years to translate research evidence into routine practice  
(Balas and Boren, 2010)



# Variation, Harm and Waste in NHSScotland

- Vale of Leven
- Ayrshire and Arran
- Lanarkshire
- No coherent strategic approach to ensure that relevant healthcare knowledge is always available and used for health care decisions.
- **We need to strengthen our systems for ensuring that decisions about patient care are reliably informed by the best available knowledge.**

# Impact of CDS – the Evidence

## Clinicians with CDS available to them are:

- 1.6 times more likely to prescribe the correct medicines or other therapies;
- 1.7 times more likely to order the required diagnostic tests
- 1.6 times more likely to monitor drug effects in line with evidence
- 1.4 times more likely to take appropriate preventative measures.

## CDS impact on patient outcomes:

- Trend towards reducing, patient mortality.
- Trend toward, higher quality-of-life scores.
- Reduces or prevents adverse events.
- Can improve efficiency and can reduce costs.
- Can improve patient satisfaction.

– 8 systematic reviews – *Implementation Science, AHRQ, Annals of Internal Medicine.*

# Policy commitment

- **Clinical Decision Support an objective within new eHealth Strategy.**

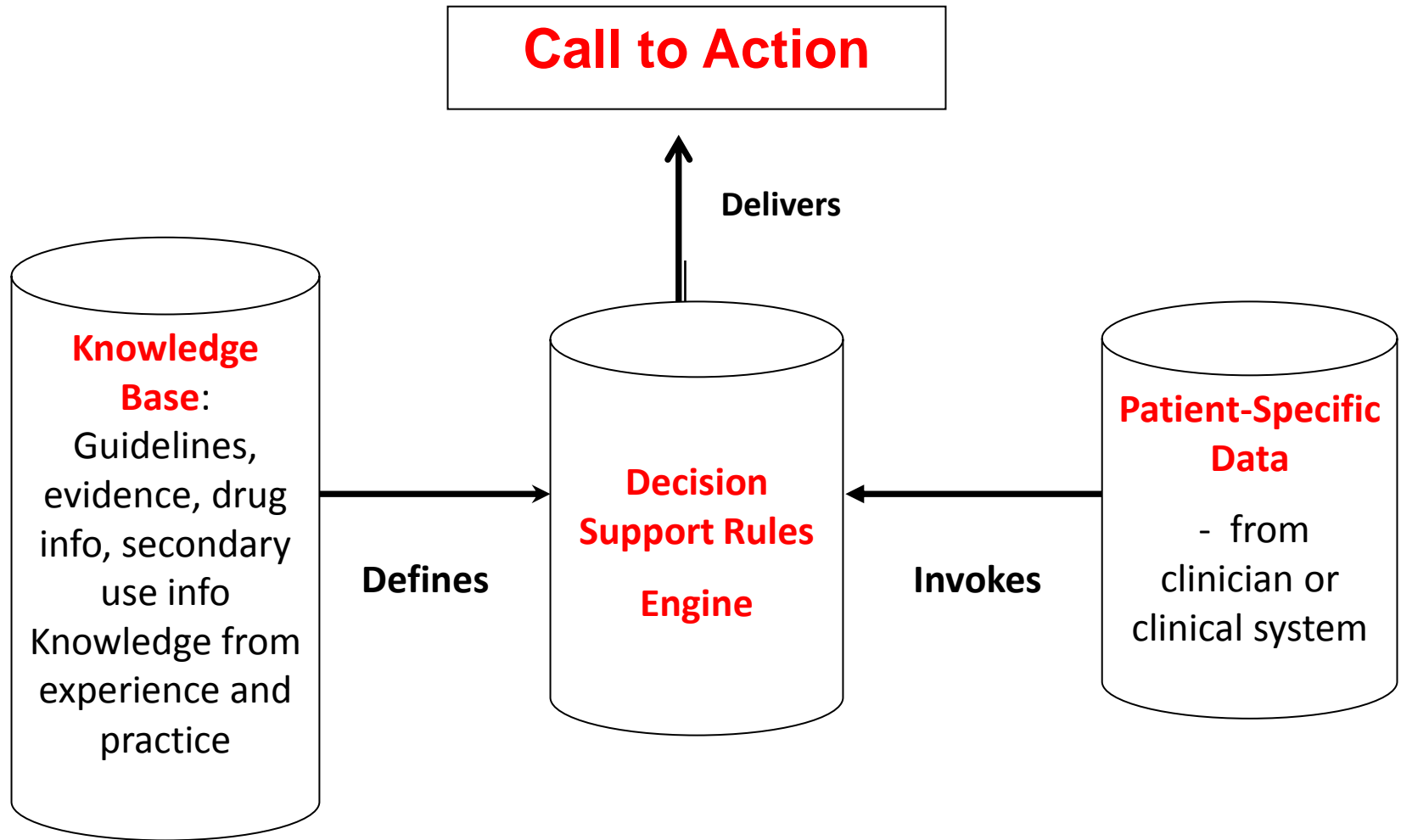
“By 2016 we will have a plan to provide clinicians with quick and easy access to decision support tools that highlight variation from best practice, generate appropriate prompts and alerts, and enable generalists and less experienced clinicians to connect to specialist clinical knowledge and experience at point of care. “

# Defining Clinical Decision Support

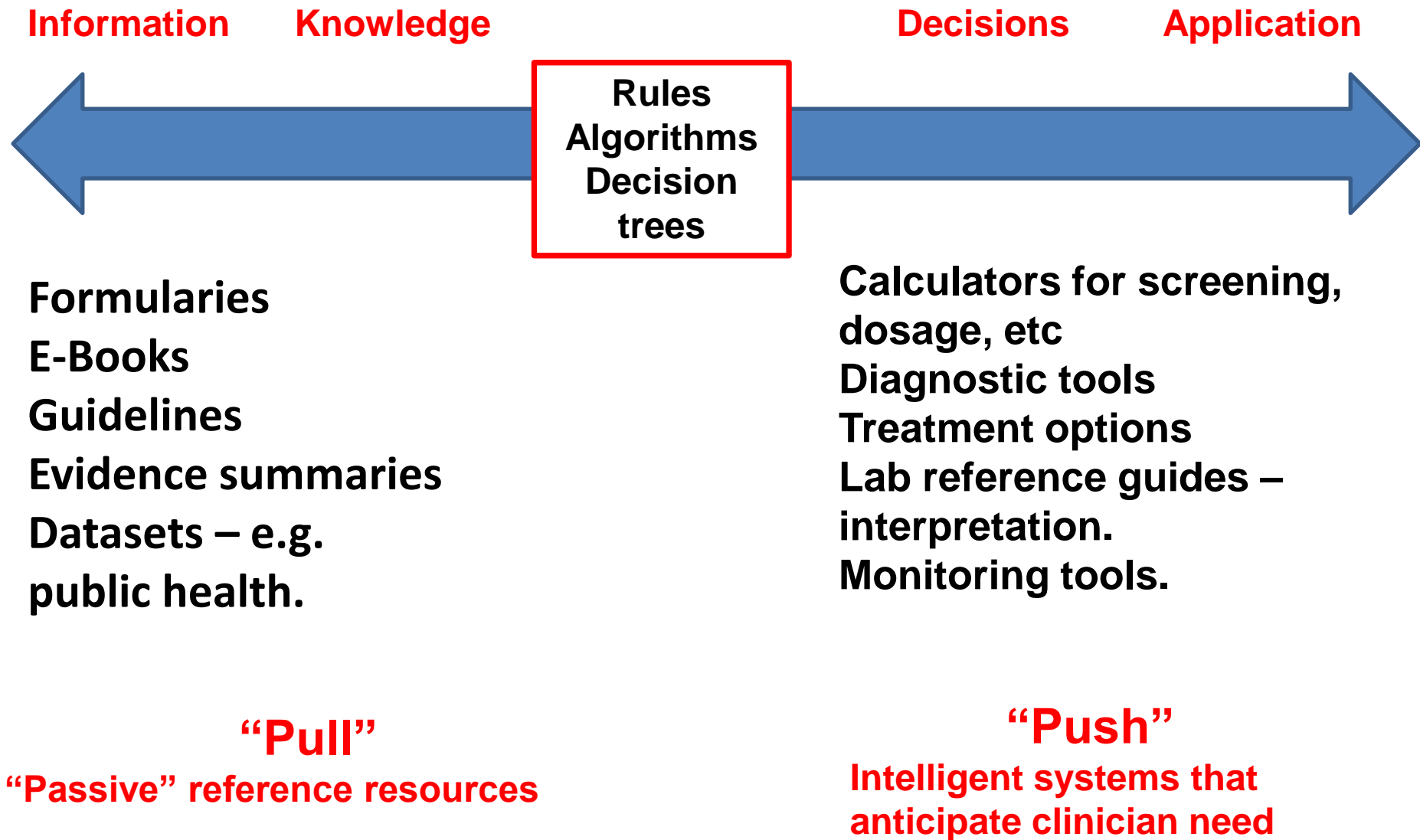
A computer-based system providing “**passive and active referential information as well as reminders, alerts, and guidelines.**” (Bates et al)



# Components of Decision Support



# No “one size fits all” CDS system



# 4 Types of CDS

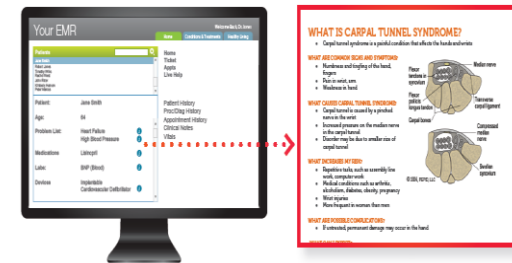
## 1. Standalone:

- Web
- Mobile



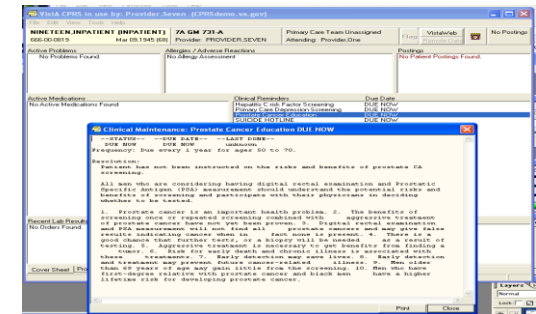
## 2. Linked with clinical systems

- Clinician searches or follows links to evidence/guidance.



## 3. Context-sensitive support

- Business rules “push” patient-specific prompts and alerts to clinician.



## 4. Clinician to clinician knowledge-sharing via technology



# Standalone Clinical Decision Support - Examples

## **Website-Based:**

- Dynamed Plus
- Clinical Pathway Publisher tool

## **Mobile:**

- BNF and SIGN apps
- Sepsis App (MHRA-approval)

# Example – Dynamed Plus

The screenshot displays the Dynamed Plus interface on the EBSCOHealth Calculators platform. The main search bar contains 'atrial fibrillation', and the search results page is shown. The left sidebar includes a 'Spotlight' section with various links and a 'Go To' section with a list of topics. The main content area shows the search results for 'Atrial fibrillation', including a description and a table of links to various resources. A red box highlights the table of links.

**EBSCOHealth Calculators** Sign Up For Remote Access Feedback Help About

## DynaMed Plus

atrial

**Go To**

- Atrial fibrillation
- Thromboembolic prophylaxis in atrial fibrillation
- Rate control in atrial fibrillation
- Atrial flutter
- Rhythm control in atrial fibrillation

**Search For**

- atrial fibrillation
- atrial flutter
- atrial fib
- atrial septal defects
- cardioversion of atrial fibrillation

**Spotlight**

- Introducing DynaMed Plus
- DynaMed is MOST CURRENT
- ... 7-step EVIDENCE-BASED r
- ... WORLD-CLASS editorial te
- Check out the E-Newsletter D
- Mobile App Access – Get the DynaMed Mobile App!

**Results** Images Calculators

### Atrial fibrillation

supraventricular tachyarrhythmia caused by uncoordinated atrial activation and associated with irregular ventricular response

Overview and Recommendations	History and Physical	Guidelines and Resources
Diagnosis	Complications and Prognosis	Patient Information
Treatment	Prevention and Screening	ICD-9/ICD-10 Codes

**Image Results**

More

**Calculator Results**

Atrial Fibrillation and Arterial Thromboembolism Risk

Thromboembolic prophylaxis in

Recommendations Risk Prediction an

**Results** Images Calculators

### Atrial fibrillation

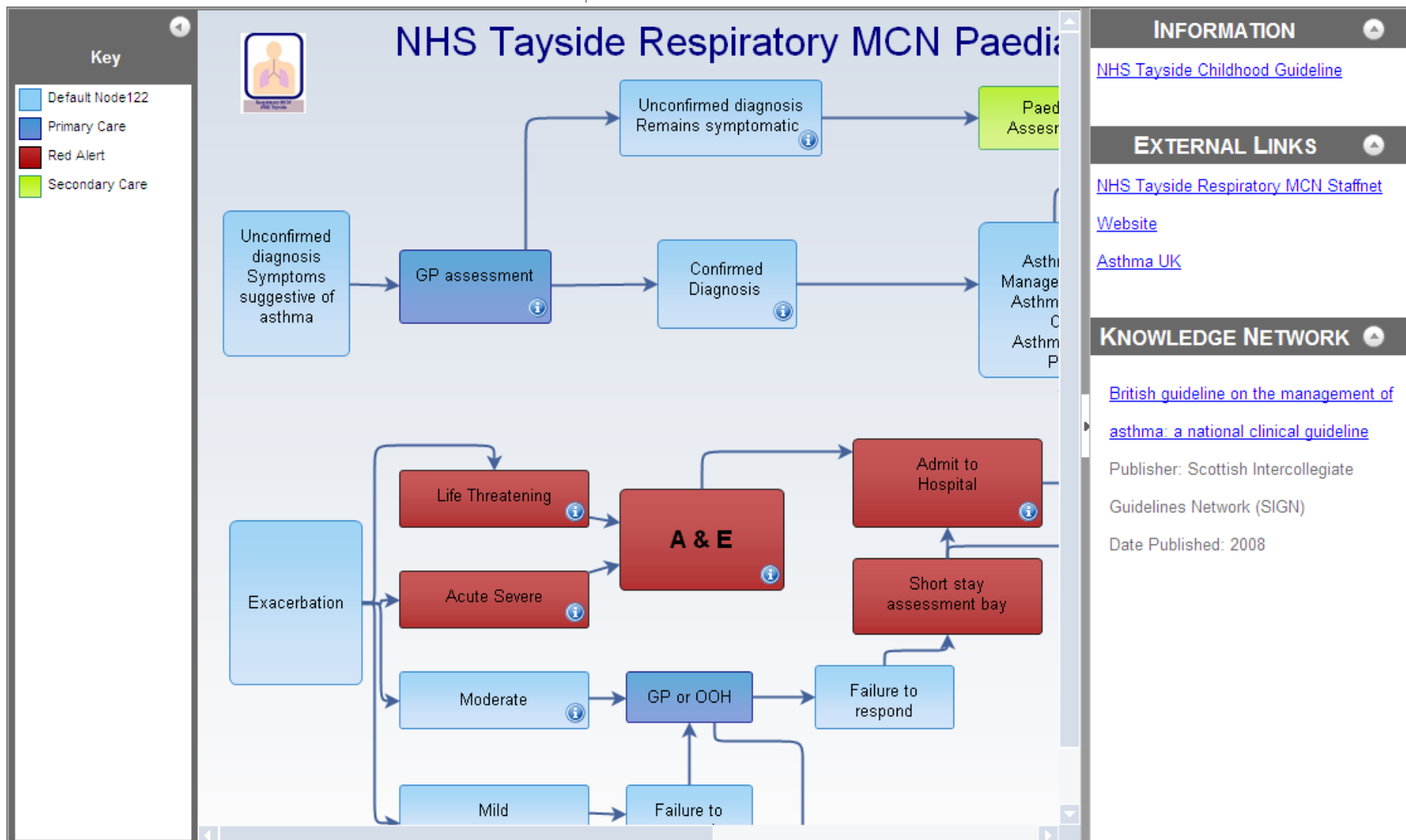
supraventricular tachyarrhythmia caused by uncoordinated atrial activation and associated with irregular ventricular response

Overview and Recommendations	History and Physical	Guidelines and Resources
Diagnosis	Complications and Prognosis	Patient Information
Treatment	Prevention and Screening	ICD-9/ICD-10 Codes

# NHS TAYSIDE RESPIRATORY MCN PAEDIATRIC PATHWAY

Author : Dawn Grogan  
Created : 17/10/2012 15:56:05  
Modified : 22/04/2013 13:16:22  
Review Date : N/A

Email : dawn.grogan@nhs.net  
NHS Board : NHS Tayside  
Modified By : Dawn Grogan



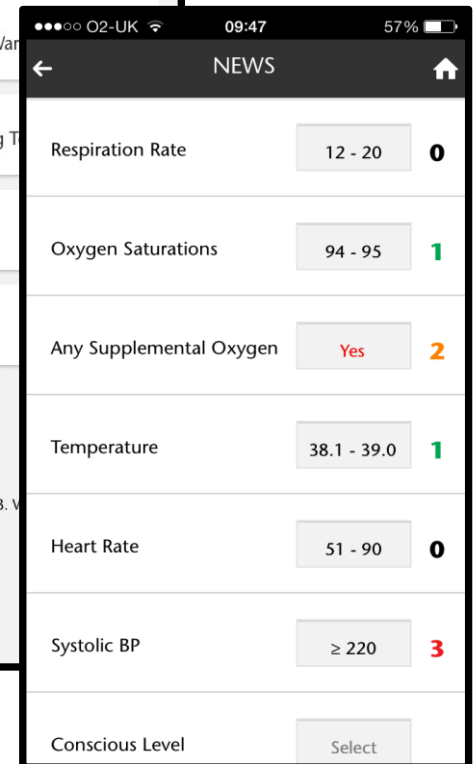
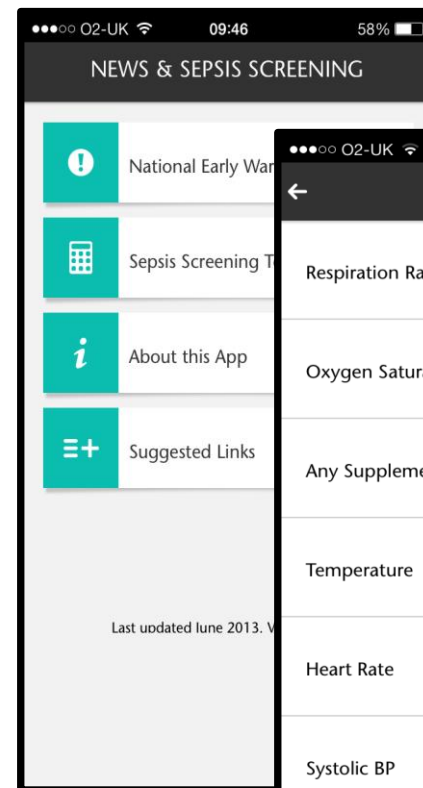
Recent Documents

Information

Knowledge

Decisions

Application



# **Linked Clinical Decision Support - Example**

Search and links to “Dynamed Plus”  
embedded in Clinical System



# Passive Links to Evidence Summaries from EHR

The image shows a screenshot of an Electronic Health Record (EHR) interface. On the left, a 'Problem List' window is open, displaying a list of medical problems. The first item, 'Acute Appendicitis', is circled in red. Below it, a dropdown menu is visible, with the 'LinkB Search' option also circled in red. A red arrow points from this option to the 'DynaMed' search results window on the right. The 'DynaMed' window shows a search for 'Acute appendicitis', with the search term circled in red. The results list includes 'Acute appendicitis' at the top, also circled in red. To the right of the search results, there are links to various evidence summaries, including 'Related Summaries', 'General Information (including ICD-9/-10 Codes)', 'Causes and Risk Factors', 'Complications and Associated Conditions', 'History', 'Physical', 'Diagnosis', 'Prognosis', 'Treatment', 'Prevention and Screening', 'References including Reviews and Guidelines', 'Patient Information', and 'Acknowledgements'. The 'Cochrane Database of Systematic Reviews' and 'Medline with Full Text' are also visible on the right side of the window.

**Problem List**

Create Patient Care Coordination Note

Search for new item

List view: ☐ Class ☒ Hospital ☐ Priority Overview Preview:

Diagnosis

Hospital (Problems being addressed during this admission)

**Acute Appendicitis**

Non-Hospital (Problems not being addressed during this admission)

Multidisciplinary

**DynaMed**

Search Other Services

Browse: ABCDEFGHIJKLMNOPQRSTUVWXYZ Browse Categories

1-50 of 68 Pages: 1 2 Next

**Acute appendicitis**

Appendicitis

Acute abdomen

Acute pancreatitis

Acute pyelonephritis

Acute diarrhea in children

Acute portal vein thrombosis

Acute diarrhea in adults

Abdominal pain - differential diagnosis

Psoas syndrome

Diverticulitis

Cholangitis

ST-elevation myocardial infarction (STEMI)

Acute appendicitis

close x

☐ Related Summaries

☐ General Information (including ICD-9/-10 Codes)

☐ Causes and Risk Factors

☐ Complications and Associated Conditions

☐ History

☐ Physical

☐ Diagnosis

☐ Prognosis

☐ Treatment

☐ Prevention and Screening

☐ References including Reviews and Guidelines

☐ Patient Information

☐ Acknowledgements

☐ Cochrane Database of Systematic Reviews

Laparoscopy for the management of acute appendicitis

Laparoscopic versus open appendectomy

Single incision versus conventional laparoscopy for acute appendicitis

Find More

☐ Medline with Full Text

Diagnostic performance of the Alvarado score for acute appendicitis

Perforated acute appendicitis

Modified Alvarado Scoring System for acute appendicitis

Find More

☐ Rehabilitation Reference Center

appendicitis

# Context-Sensitive Clinical Decision Support

Evidence and guidelines converted into decision support rules that are invoked by specific data in patient record; issue prompts and reminders to clinician in context of EHR.

**Example:** Care-IS used in primary care throughout New Zealand

**Patient Overview**

**Risk of Diabetic Complications - SEVERE**

Calculated CVD Risk: 18% [Launch 'Your Heart Forecast' Tool](#)

**Clinical Details**

Smoker ☐ No ☐ Past ☐ Recently quit ☒ Yes   
 Patient would like cessation advice or support ☒ Yes ☐ No

CVD Risk Factor ☐ CVD Event ☐ [Genetic Lipid Disorder](#) ☐ Nephropathy ☐ Family History

Diabetes ☒ ☐ Type I ☐ Type II Year of Diagnosis  Duration  0

Foot Check Completed On: 19/07/2012  Diabetic foot risk - Low

Retinal Screening Done  25/06/2012  Established Retinopathy

Height  Weight  BMI

Blood pressure 125 / 85 2nd 125 / 85

Cholesterol 5 Triglycerides 3 LDL 2 HDL 3.1 TC:HDL 1.6

HbA1c 65 ACR < 1

**CKD Normal** eGFR 80 Rate of decline Last year -159.4 Last 5 years -55.9

## CVD risk calculator embedded in clinical system

## Screenshots from the BP CARE-IS system embedded in clinical systems

### Clinical Advice

Progressive renal decline, predicted to enter stage 4 soon: consider referral if patient may be affected during their lifetime

Referral may be less useful if patient unlikely to be affected by their renal decline

Offer influenza and pneumococcal vaccinations

Minimise nephrotoxic drugs and consider renal doses of medication

Review every six months with FBC, creatinine, electrolytes, lipids, HbA<sub>1c</sub>, and urine albumin-creatinine ratio

Urinary protein-creatinine ratio is less sensitive but sometimes used to monitor significant levels of proteinuria

No recent serum potassium found: do not implement any advice about starting or increasing ACE inhibitors or ARBs until normokalaemia verified

Target BP is systolic 120 - 139 and diastolic less than 90

Blood pressure above target; consider reviewing antihypertensive therapy with priority to ACE inhibitors or ARBs

Please use the Common Form for more detailed advice on management of hypertension

Urine ACR indicated due to previous proteinuria (no recent ACR or PCR found)

Arrange imaging of renal tract due to persistent invisible haematuria unless benign transient cause of haematuria identified. Recall to monitor haematuria within a year

<http://www.bpac.org.nz/BT/2013/June/urine-tests.aspx> contains advice on investigating haematuria. Risk factors for urological malignancy include smoking, recurrent UTI or other urological disorders, occupational exposure to chemicals or dyes, pelvic irradiation, history of excessive analgesic use, and others

Refer to nephrology due to invisible haematuria with proteinuria in CKD stage 3

### Nephrology Referral



Refer patient to Nephrology

Patient specific advice based on SIGN Guidance – note that this combines guidance for diabetes, CKD, and Stroke management.

# Limitations of Technology-Driven Evidence-Based Practice

- **Inflexible rules and technology driven prompts** may produce care that is management driven rather than patient centred.
- Statistically significant benefits indicated in the research evidence due to may be marginal in real-life practice where the environment – e.g. remote and rural **context - and patients are very different from controlled research studies**.
- **Pathways and guidelines based on single conditions and non-complex patients can encourage over-referral** and over-investigation not tailored to patient needs.

(Greenhalgh 2014)

# A fourth form of decision support

## Clinician to clinician knowledge-sharing

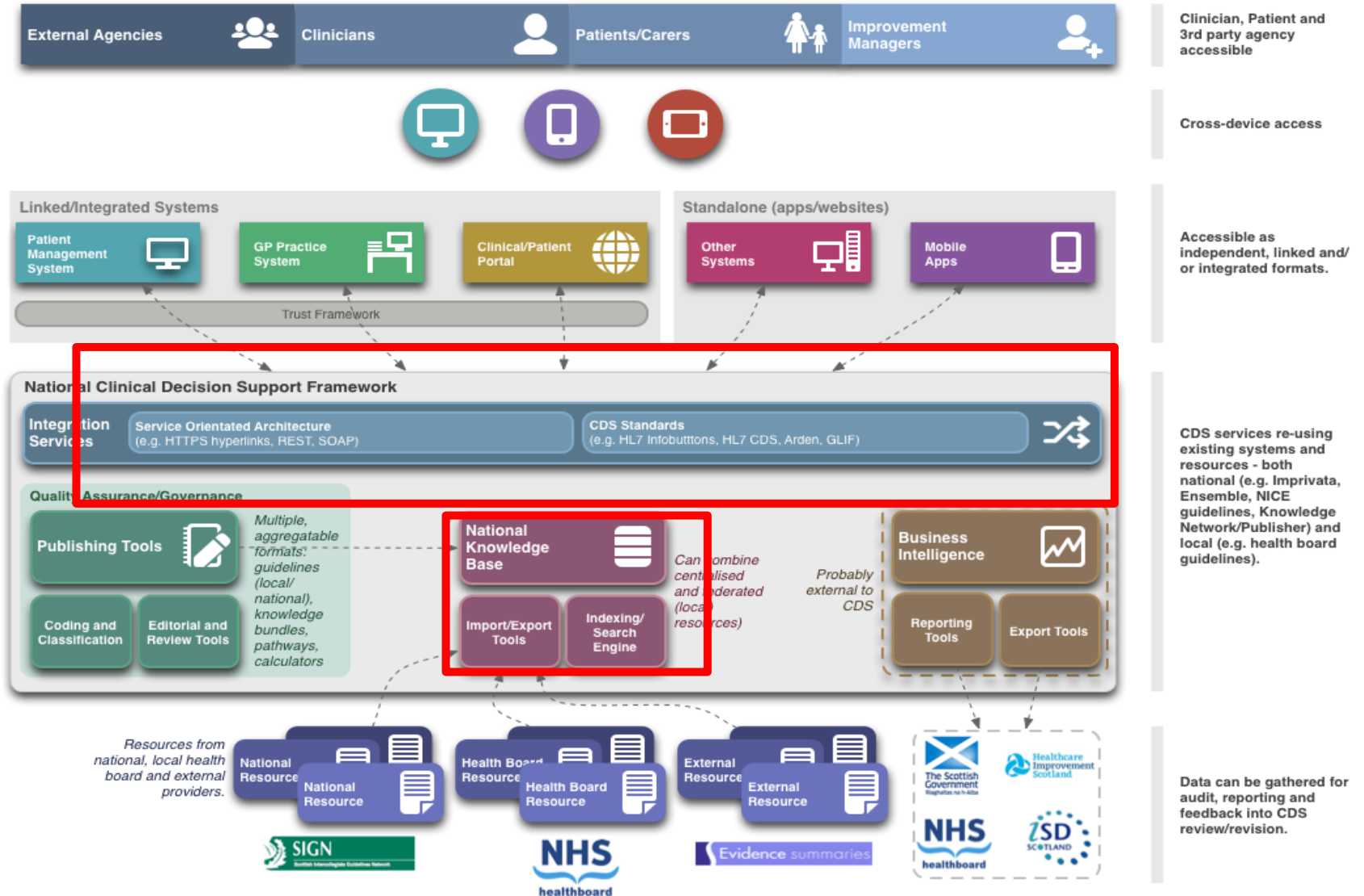
- Messaging, phone and video communication to underpin guideline-driven technology prompts.
- Combines clinician expertise and experience with evidence from research and guidelines.

# Example

## Airedale Hospital – “Immedicare”.

- 200 nursing and residential homes in Cumbria linked to linked to the Communications Hub based at Airedale NHS Foundation Trust.
- Run by specialist nurses, 24/7
- Residents and care home staff can get medical help from hospital consultants or specialist nurses via a secure video link, if and when they need it, without having to leave the home.

# Architecture: Common Knowledge Base, Multiple Channels



# Vision for Roadmap

- **“By 2020, optimal, usable and effective clinical decision support will be widely available to clinicians when and where they need it, and whatever device they are using, as an integral part of their working practice.**
- **This will enable practitioners to translate knowledge routinely and reliably into practice to improve quality of healthcare in Scotland, helping to make NHSScotland a learning system based on continuous generation and use of knowledge.”**



# Milestones and Deliverables

Current Fixtures within an Evolving Roadmap

# Phase 1: By March 2017

1. **Specify, procure and pilot a context-sensitive CDS platform for primary care.** Build the business case for national roll-out in phase 2.
2. **Deliver high-impact Quick Wins - including:**
  - Mobile CDS platform for antibiotic prescribing
  - Decision Support Web Gateway for Paediatric and Child Health.
  - Proof of concept of point of care mobile app for SIGN guideline and generic junior doctors' handbook.
  - Pilot of evidence-based prompts and clinician-clinician communication to reduce over-referral and over-investigation from care home to secondary care settings
3. **Build clinician and policy level engagement** and consult further on priorities for phase 2

# Challenges

- Reluctance to change
- Clinician leadership
- Competencies – data science, evidence-based practice.
- Integration with Safety and Quality agendas.
- Risk management and evidence based practice.

# Making it Real

Demo of Care-IS Decision Support Platform  
National solution for primary care in New Zealand

# Integrated Clinical Quality Solutions

care is



NSS will deliver its mission  
through 4 strategic objectives:

Customers at the heart of  
everything we do

Increasing our service value

Improving the way we do things;  
and

Become a great place to work.

# Areas to Cover

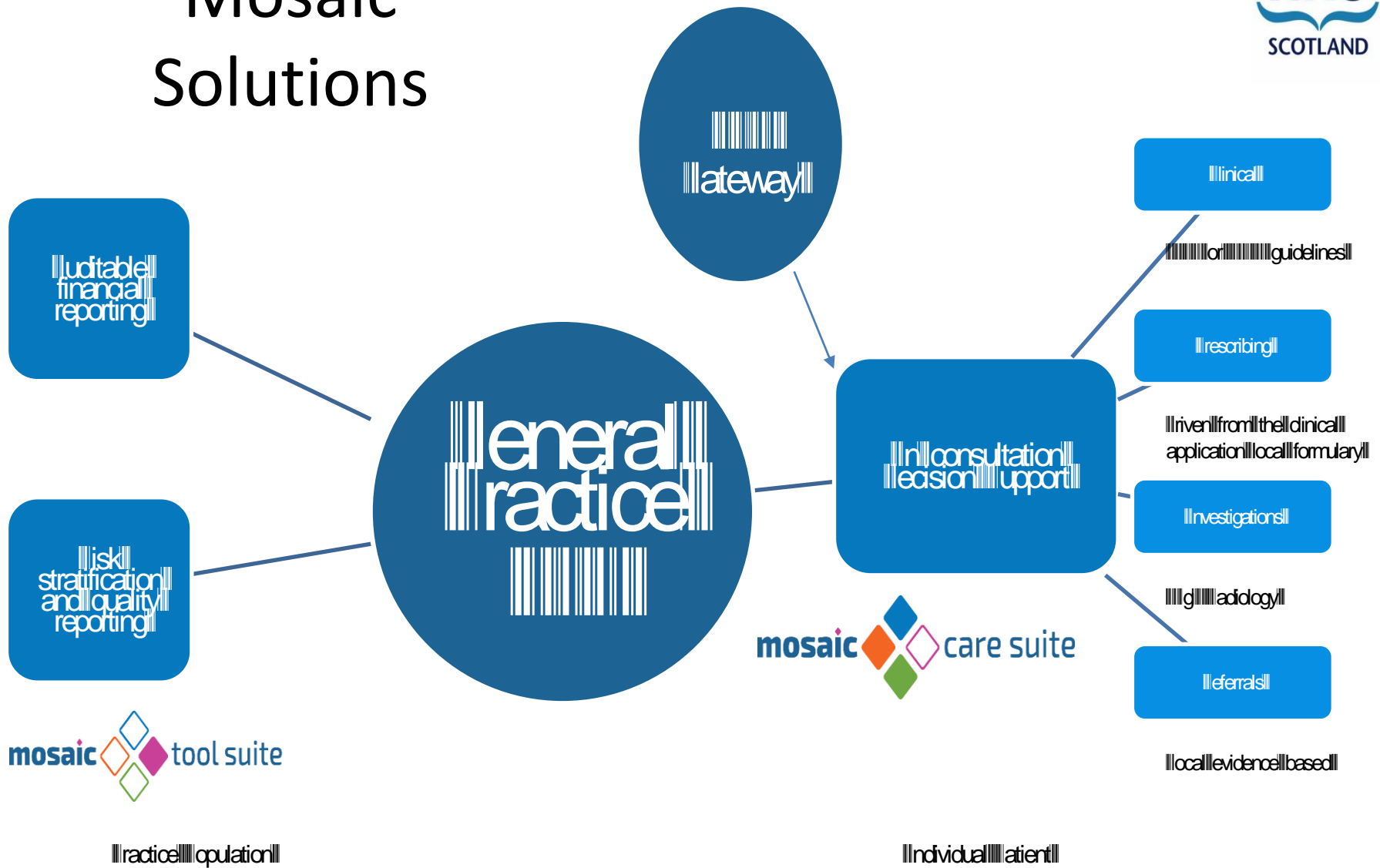
- CARE IS and clinical solutions
- The platform
- PRS Integrations:
  - EMIS
  - Vision
- Opportunities
  - Improve adherence to best practice clinical guidance
  - By doing so raise standards of care and outcomes
  - Reduce costs & efficiencies
  - Referral management and integration with SCI Gateway
  - Facilitate involvement of allied professional HCP's in particular nurse and pharmacy

# Mosaic – Integrated Clinical Duties



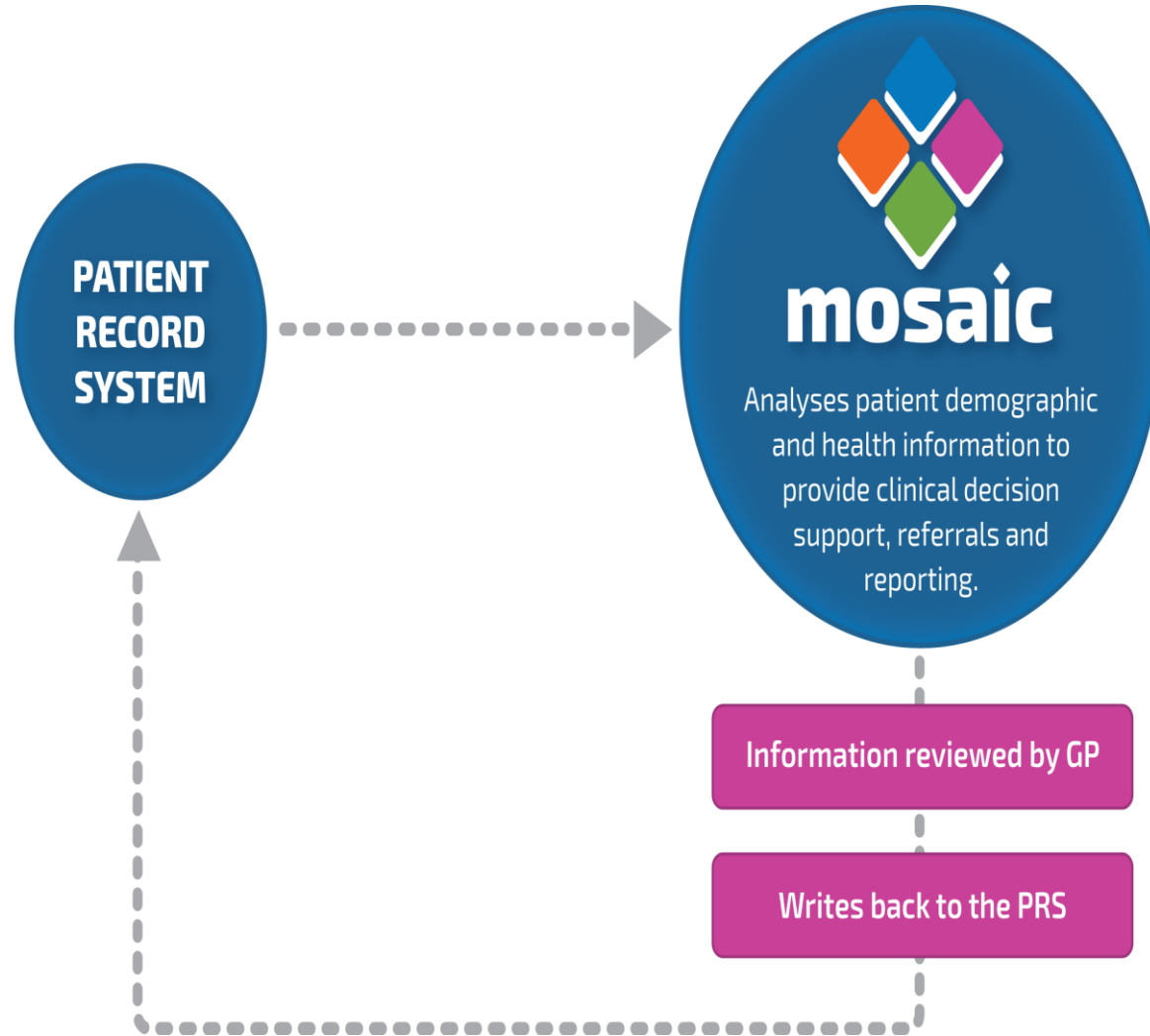
- Launched in New Zealand (population 4.5m) in 2005
- Integrated into the standard workflow
- Most trusted source of medical information by HCPs in primary care
- Average of 118,000 hits per working day or 29.5 million per year
- Used in 98% of practices

# Mosaic Solutions

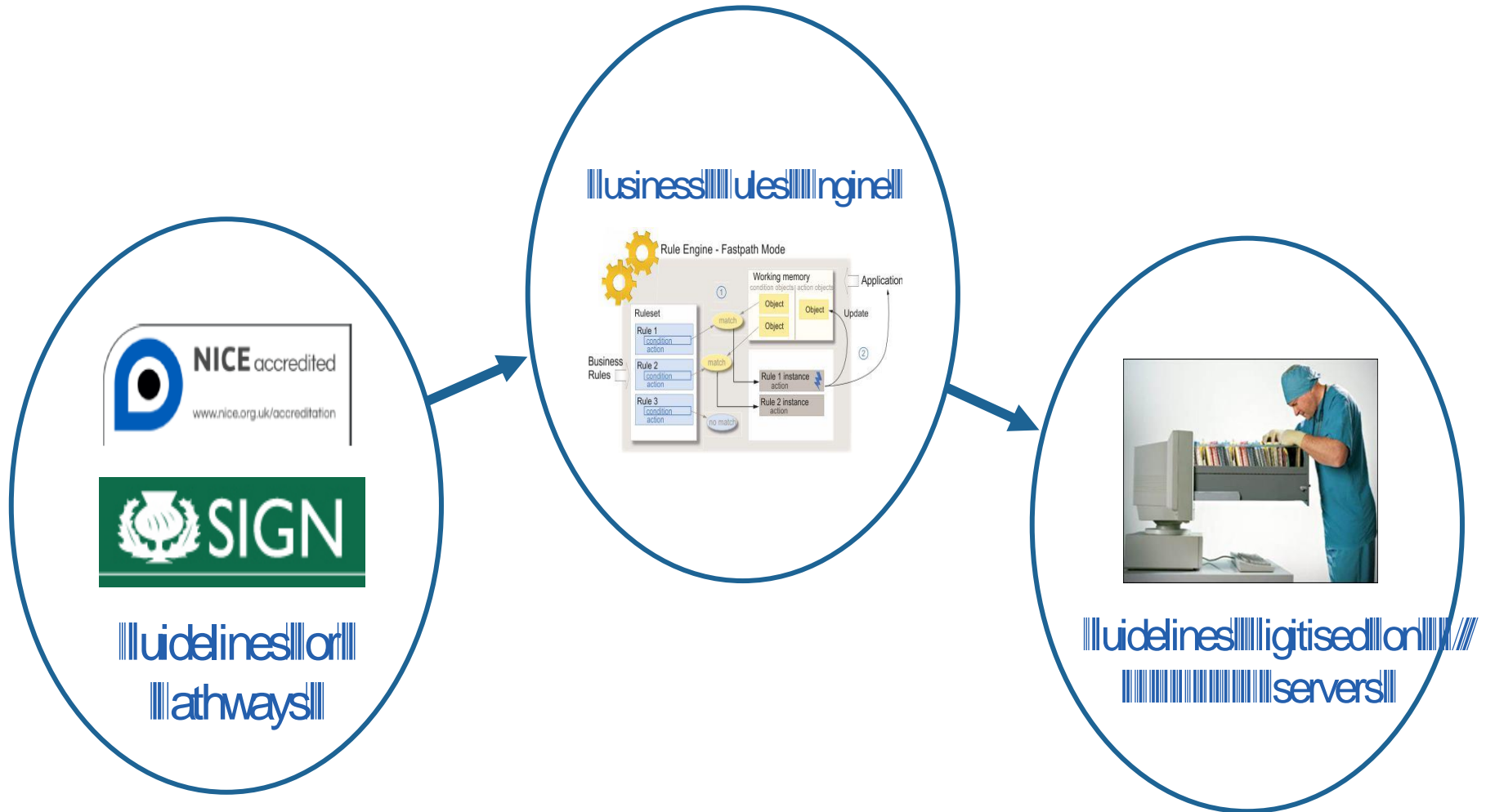




# In Practice



# CARE Suite: How it works

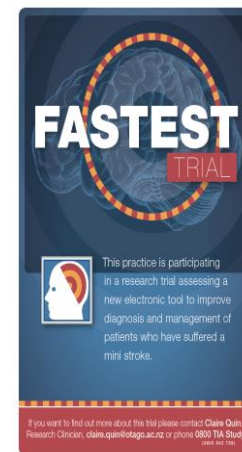


# Efficacy and safety of a new electronic support tool (FASTEST): a cluster randomized controlled trial

Dr Anna Ranta, MD, FRAC  
MidCentral Health and  
University of Otago  
New Zealand  
ANZAN – Adelaide - May 2014



**MIDCENTRAL DISTRICT HEALTH BOARD**  
*Te Pae Hauora o Ruahine o Tairārua*

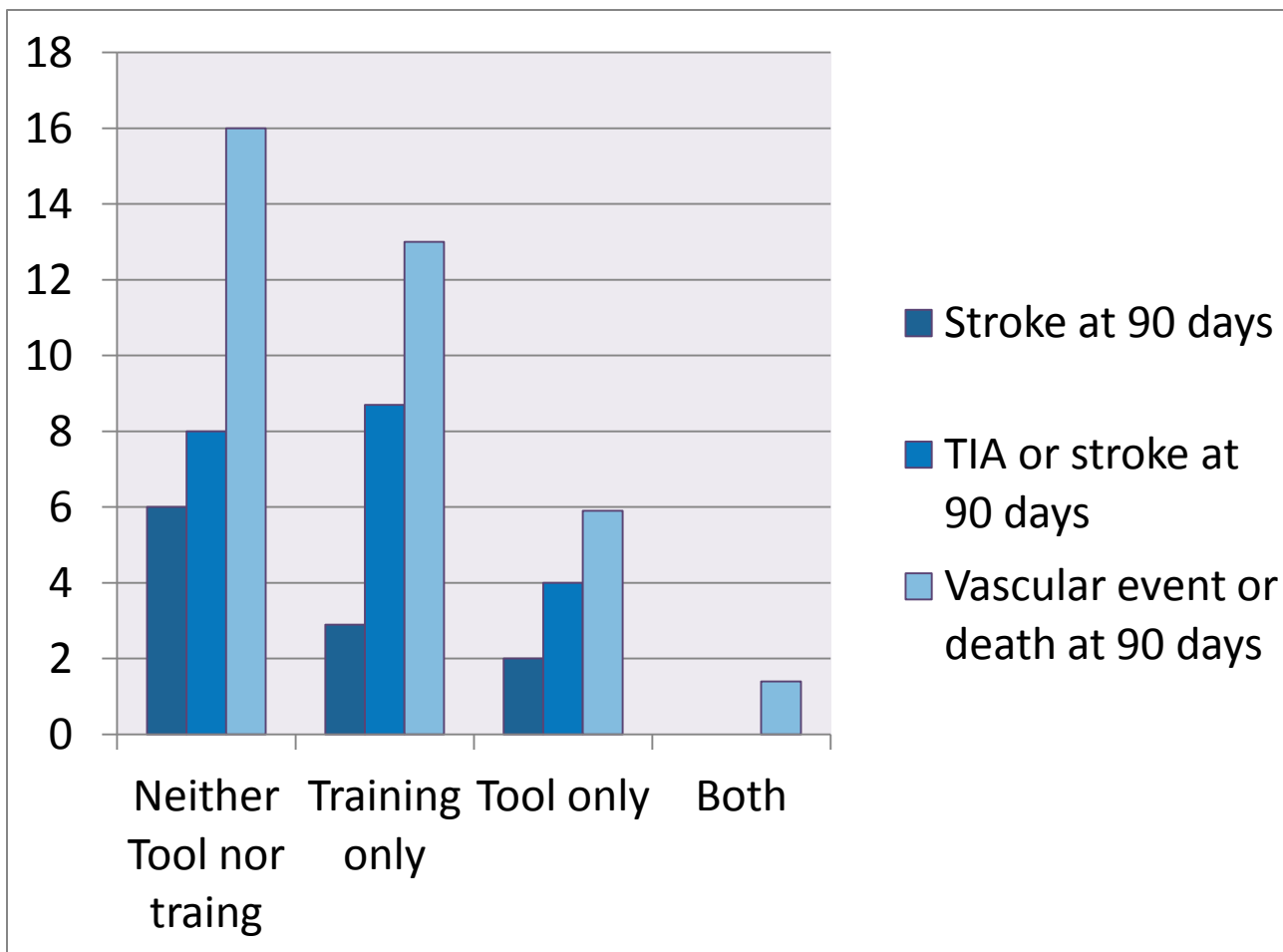


# Efficacy Endpoints

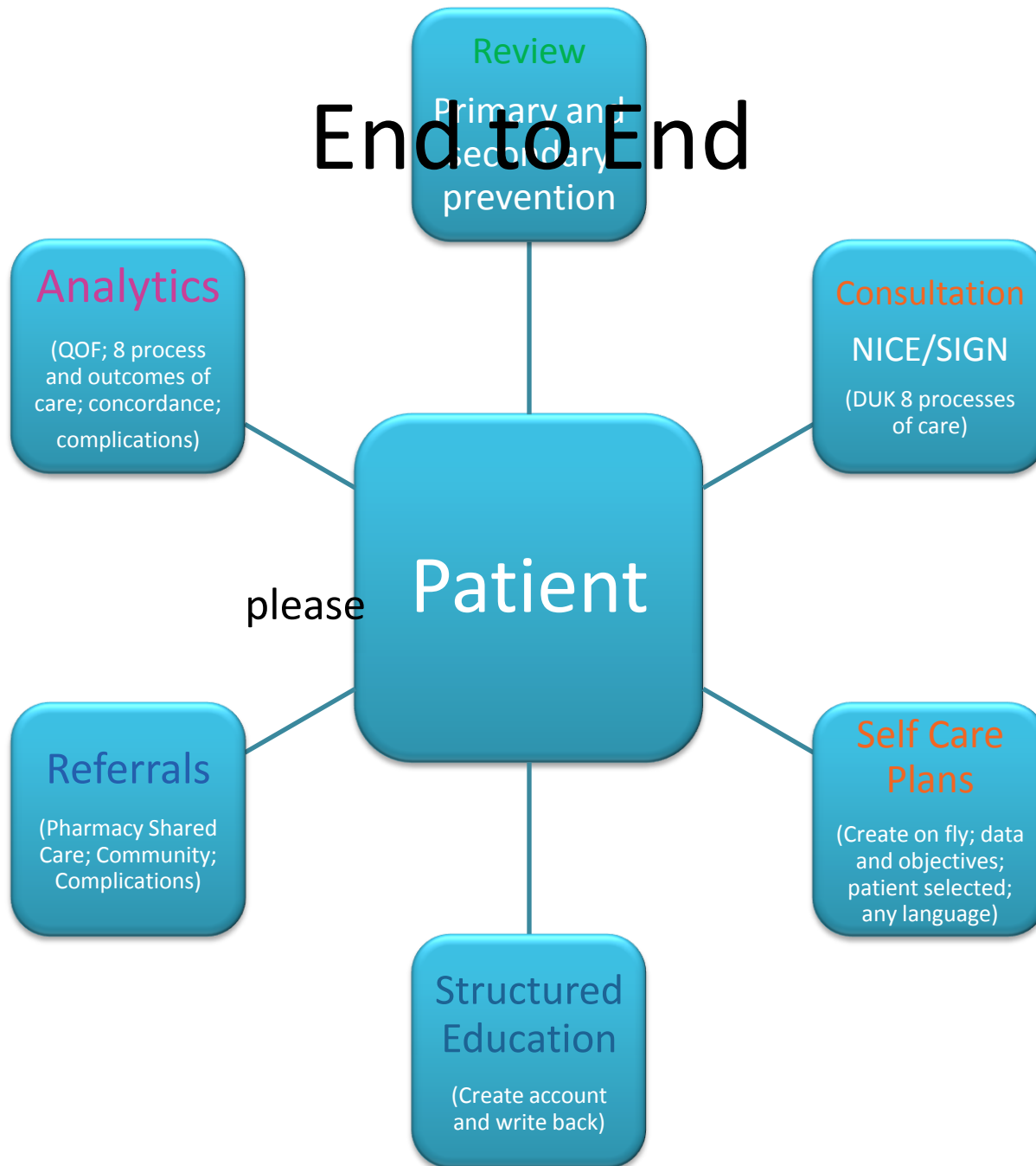
Variable	Intervention (n=)	Control (n=)	Unadjusted for cluster		Adjusted for cluster	
	n (%)		Odds ratio (95% CI)		Odds ratio (95% CI)	
Main endpoints						
Guideline adherence	100% (100%)	100% (100%)	100% (100%)	<0.001	100% (100%)	<0.001
Stroke at 30 days	100% (100%)	100% (100%)	100% (100%)	1.00	Not applicable	Not applicable
Secondary endpoints						
30-day mortality	100% (100%)	100% (100%)	100% (100%)	1.00	100% (100%)	1.00
Vascular event or death	100% (100%)	100% (100%)	100% (100%)	1.00	100% (100%)	1.00
Comprehensive counselling	100% (100%)	100% (100%)	100% (100%)	<0.001	100% (100%)	1.00

Ranta A<sup>1</sup>, Dovey S<sup>2</sup>, Weatherall M<sup>2</sup>, O'Dea D<sup>2</sup>, Gommans J<sup>2</sup>, Tilyard M<sup>2</sup>. Cluster randomized controlled trial of TIA electronic decision support in primary care. [Neurology](#). 2015 Apr 14;84(15):1545-51

# Outcomes



# End to End



# Mosaic Patient Review

Clicking this button saves all the data back into the patient record

This patient is currently being treated on the diabetes and depression applications. Clicking the link opens the application.

Based on the patient's record, Mosaic is suggesting the patient is considered for the CKD and TIA applications

Diagnoses (classifications) and basic examination data ( eg BP or Weight) can be added here

Based on alerts in the patient record and NICE based classifications, coded messages and reminders are included here

The screenshot displays the Mosaic Patient Review interface within a web browser window titled 'bestpractice - pilot (bestpractice)'. The interface is organized into several sections:

- Investigator:** Shows 'SMITH Arnie' with links for 'Main menu', 'Resources', and 'Feedback'. Below this are buttons for 'Nurse Form' and 'Update PMS'.
- Current Pathways:** A red header section containing links for 'Diabetes Pathway' and 'Depression Pathway'.
- Suggested Pathways:** An orange header section containing links for 'Chronic Kidney Disease Pathway' and 'Stroke TIA Pathway'.
- Alerts and Messages:** A series of colored boxes representing different patient alerts:
  - 'Last Message on 08/07/2014' with an 'open' link.
  - 'Personal Health Plan' with an 'open' link.
  - 'Acute kidney injury (decline 33%; stage 4)' with a 'CKD Pathway' link.
  - 'Smoking Status: Non Smoker' with a 'change status' link.
  - 'Smear Overdue'.
  - 'Update Coding' with a checkbox.
- Classifications:** A dropdown menu currently showing 'Patient Screening'.
- Map of Medicine:** A link to 'Home'.
- Footer:** The Mosaic logo and copyright notice '©2005 - 2014'.

At the bottom of the browser window are 'Print', 'Close', and 'Help' buttons.

# Mosaic Consultation: Diabetes Module

Retinal screening results (images) can be uploaded and displayed. Improves patient understanding.

Patient is identified as having CKD stage 3b. Direct link to CKD application.

Click through to generate a personal care plan with patient specific

Common Form (bestpractice)

Web

Diabetes Review

Resources Main Menu Feedback

**Risk of Diabetic Complications - SEVERE**

**Calculated CVD Risk** Patient is at SEVERE Risk of diabetes-related complications (patient has 6 risk factors)

**Clinical Details**

- HbA1c >55 mmol/mol
- Less than 3 HbA1c's recorded in last 36 months
- BP >=130/80 mm Hg
- ACR >=3.5 mg/mmol (Female)
- Current smoker
- eGFR is lower than 45 ml/min/1.73m²

**Smoker**

Patient would like to quit

Brief advice

Prescribed cessation medication ☒ Referral to cessation support ☒

**CVD Risk Factor** ☒ CVD Event ☐ Genetic Lipid Disorder ☐ Nephropathy ☐ Family History

**Diabetes** ☒ Type I ☒ Type II Year of Diagnosis 2004 Duration 11

**Foot Check** Completed On: 20/03/2015 **Diabetic foot risk - URGENT**

**Retinal Screening** Done 09/03/2015

**Height** 164 **Weight** **BMI**

**Blood pressure** 145 / 100 2nd /

**Cholesterol** 7.6 **Triglycerides** 1.6 **LDL** 4.3 **HDL** 1.01 **TC:HDL** 7.5

**HbA1c** 71 **ACR** 31

**CKD Stage 3b(p)** **eGFR** 33 **Rate of change** Last year -1 Last 5 years -5

**Graphs** HbA1c Cholesterol Triglycerides LDL HDL eGFR BP

**Clinical Management Advice** KEY [C] Clinical [R] Medication [L] Lifestyle

Refresh Save View Care Plan Patient Overview Exit

In association with

© bestpractice 2005 - 2015

Print Close Help


Risk of diabetic complications calculated and presented

Hover over any alert and the underlying parameters for the risk calculation are displayed.


Diabetic foot risk assessed. Click in to do assessment. Another click to initiate referral and one further click to complete and send.



# Mosaic Consultation: CKD Pathway



Scottish Intercollegiate Guidelines Network



Quality Improvement  
Journey

Stage	Description	GFR (ml/min/1.73 m <sup>2</sup> )
1*	Kidney damage with normal or raised GFR	≥90
2*	Kidney damage with mild decrease in GFR	60-89
3A	Moderately lowered GFR	45-59
3B		30-44
4	Severely lowered GFR	15-29
5	Kidney failure (end-stage renal disease)	<15

**103** Diagnosis and management of chronic kidney disease

A national clinical guideline

**NICE** National Institute for Health and Care Excellence

Chronic kidney disease

early identification and management of chronic kidney disease in adults in primary and secondary care

Issued: July 2014 last modified: March 2015

NICE clinical guideline 182  
guidance.nice.org.uk/g182

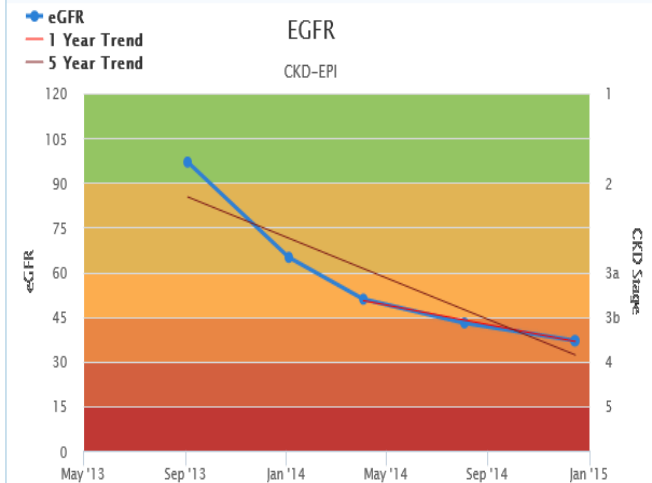
2008

Extracts EGFR results from PRS (calculates EGFR from creatinine)

- Determines stage
- Does regression
- Determines estimated time to stage 4

## Progressive CKD stage 3b

Charts



## Current/Existing Data

### Laboratory Results

① Serum Creatinine (most recent)	175	μmol/l	(15/12/2014)
① eGFR	37	ml/min/1.73m <sup>2</sup>	0% change from previous (15/12/2014)
① Annual Rate of Change	-27	ml/min/1.73m <sup>2</sup> /year	(03/04/2014 - 15/12/2014)
① Five Year Rate of Change	-208	ml/min/1.73m <sup>2</sup> /5 years	(03/09/2013 - 15/12/2014)
ACR (most recent)	45	mg/mmol	(01/09/2014)

# Mosaic Referrals

Consultation notes can be added from the PRS.

Referral generation fully automated

Diagnosis pre-populated

Medications taken from the PRS

Medical warning and allergies added from PRS automatically.

Patient specific letter generated and prepopulated. Can be edited.

Standard set of laboratory investigations added. Others can be selected.

Southern eReferral

Referral Details Patient Details **CKD** Clinical Details Investigations Referrer Details

ACC  
Is this referral the result of an Accident? ☐ Yes ☒ No

Clinical Information  
Reason for referral / Diagnosis / Problem  
Progressive CKD Stage 3

Details  
Review and include consultation notes? ☐

Thank you for seeing this 75 year old male with Progressive CKD stage 3  
His last blood pressure readings were 130/80 mmHg on Thu Jan 9 2014.  
His last two eGFRs show a 15% change.  
His last 12 month eGFR declined by -8mL/min/1.73m2.  
His last 5 year eGFR declined by -28mL/min/1.73m2.  
His protein loss was estimated by PCR as 25 on Fri Dec 9 2011.

Include screening results? ☐

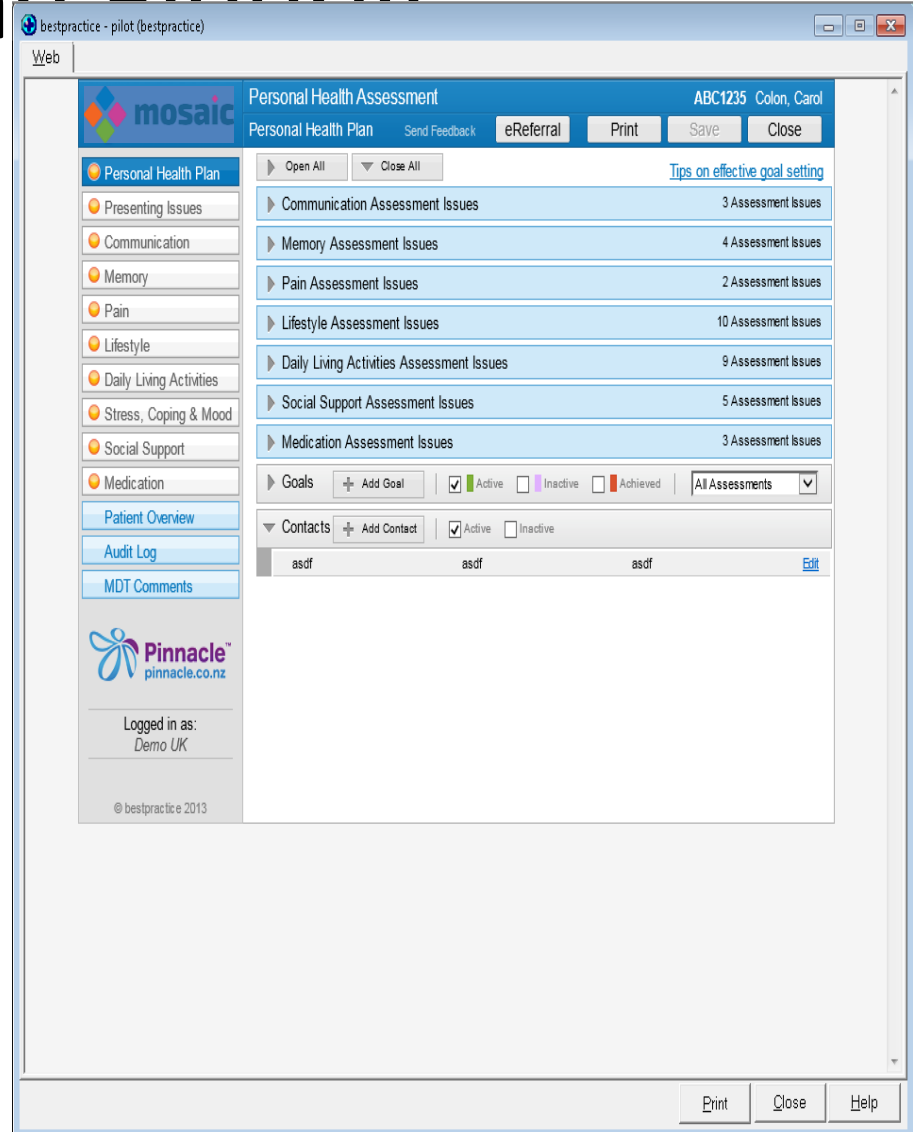
Long Term Medications Recent Medications  
Current Problems History  
Medical Warnings / Allergies

Referral Details Patient Details Clinical Details **Investigations** Referrer Details

Refresh Attach Park Print Send Cancel

# Frail and Elderly

- Healthcare
- Social care
- Medication Use Review
- MDT review notes
- Full audit log
- Key outcomes
  - Reduced unplanned admissions
  - Survival at home



bestpractice - pilot (bestpractice)

Web

mosaic Personal Health Assessment ABC1235 Carol, Carol

Personal Health Plan Send Feedback eReferral Print Save Close

Open All Close All [Tips on effective goal setting](#)

Communication Assessment Issues	3 Assessment Issues
Memory Assessment Issues	4 Assessment Issues
Pain Assessment Issues	2 Assessment Issues
Lifestyle Assessment Issues	10 Assessment Issues
Daily Living Activities Assessment Issues	9 Assessment Issues
Social Support Assessment Issues	5 Assessment Issues
Medication Assessment Issues	3 Assessment Issues

Goals + Add Goal ☒ Active ☐ Inactive ☐ Achieved All Assessments

Contacts + Add Contact ☒ Active ☐ Inactive

asdf	asdf	asdf	<a href="#">Edit</a>
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Logged in as: Demo UK

© bestpractice 2013

Print Close Help

Summary Consultations Medication Problems Investigations Care History Diary Documents Referrals

Add Edit Delete Sharing Trend Latest Only Descriptive Text Abnormal Only Collapse All Values View View Reports Filters Search View Print CR Config Search Patient Report List

Add/Edit View Filter Print Config Knowled... Test Reques...

Tasks - 10 (10)

Your security details have not been logged. [Click here to resolve.](#)

Active **ANDREWS, Anne (Mrs)** Born **09-Feb-1939 (76y)** Gender **Female** NHS No. **677 460 4412** Usual GP **BPAC, Test (Dr)**

»

View -> My Record (No shared data.)

Date	Term	Value	Range Indicator
18-Sep-2015	Albumin / creatinine ratio	35	
14-Sep-2015	Blood glucose level	15 mmol/L	
10-Sep-2015	HbA1c level (DCCT aligned)	2 %	
10-Sep-2015	Serum HDL:non-HDL cholesterol ratio	35	
10-Sep-2015	Urine protein/creatinine ratio	20	
08-Sep-2015	Blood group A Rh(D) positive		
07-Sep-2015	Blood group O		
07-Sep-2015	Rhesus positive		
03-Sep-2015	Serum creatinine	125 umol/L	
01-Sep-2015	Alcohol consumption	35 U/week	
01-Sep-2015	Body mass index	31.02 kg/m2	
01-Sep-2015	O/E - height	175 cm	
01-Sep-2015	O/E - weight	95 kg	
01-Sep-2015	O/E - blood pressure reading	180/95 mmHg	
21-Aug-2015	Full blood count normal		
01-Jul-2014	QAdm rsk emrg hsp adm nx 12mth	4.45	
03-Apr-2014	HTLV-3 antibody positive	Positive Test	
03-Apr-2014	Human immunodeficiency virus test equivocal	Indeterminate Test	
03-Apr-2014	HTLV-3 antibody negative	Negative Test	
02-Apr-2014	TC/HDL	1.5 TC/HDL 1.5	
02-Apr-2014	Serum HDL Cholesterol Level	2 mmol/L Serum HDL Cholesterol Level 2 mmol/L	
02-Apr-2014	QRisk2 Score	22 % QRisk2 Score 22 %	
02-Apr-2014	Fasting blood glucose level	10 mmol/L Fasting blood glucose level 10 mmol/L	
02-Apr-2014	Serum Cholesterol	3 mmol/L Serum Cholesterol 3 mmol/L	
02-Apr-2014	<b>[DEGRADE]</b> QRisk2 Heart Age	75 years QRisk2 Heart Age 75 years	
02-Apr-2014	Value (NK unknown) AUDIT C	0 AUDIT C Alcohol Score Value (NK unknown) AUDIT C 0 AUDIT C	

Detailed View

»

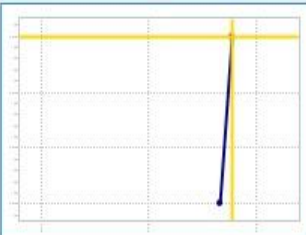
Albumin / creatinine ratio

35

Added by BPAC, Test (Dr)

Read code 44J7


SNOMED-CT 476291000006112



Date	Value
18-Sep-2015	35

Current Patient: Anne Andrews

⚙️ □ ➡️



Chronic Kidney Disease

Show PMS Data

ANDREWS, Anne (Mrs) Born 09-Feb-1939

CKD



Chronic Kidney Disease

Mrs Anne Andrews 9 Feb 1939

demo.ckd

Term	Value
Albumin / creatinine ratio	35
Blood glucose level	15 mmol/L
HbA1c level (DCCT aligned)	2 %
Serum HDL:non-HDL cholesterol ratio	35
Urine protein/creatinine ratio	20
Blood group A Rh(D) positive	
Blood group O	
Rhesus positive	
Serum creatinine	125 umol/L
Alcohol consumption	35 U/week
Body mass index	31.02 kg/m2
O/E - height	175 cm
O/E - weight	95 kg
O/E - blood pressure reading	180/95 mmHg
Full blood count normal	
QAdm rsk emrg hsp adm nx 12mth	4.45
HTLV-3 antibody positive	Positive Test
Human immunodeficiency virus test equivocal	Indeterminate
HTLV-3 antibody negative	Negative Test
TC/HDL	1.5 TC/HDL 1
Serum HDL Cholesterol Level	2 mmol/L Ser
QRisk2 Score	22 % QRisk2
Fasting blood glucose level	10 mmol/L Fa
Serum Cholesterol	3 mmol/L Ser
[DEGRADE] QRisk2 Heart Age	75 years QRis
Value (UK unknown) AUDIT C	0 AUDIT C A

### Laboratory results

Serum creatinine (most recent)	125.00 $\mu\text{mol/L}$	03/09/2015
eGFR	53.64 $\text{mL/min/1.73m}^2$	03/09/2015
Annual rate of change	N/A $\text{mL/min/1.73m}^2$	
Five year rate of change	N/A $\text{mL/min/1.73m}^2$	
ACR (most recent)	35.00 $\text{mg/mmol}$	18/09/2015

### Classifications

Renal transplant	<input type="checkbox"/>
Dialysis	<input type="checkbox"/>
Pregnant	<input type="checkbox"/>
Past/current renal disease	<input type="checkbox"/>
Diabetes	<input type="checkbox"/>

### Blood pressure

Blood pressure (sitting) 180 95 + 01/09/2015

### Urine dip stick test

Persistent microscopic haematuria	<input type="checkbox"/>	
Visible blood	<input type="checkbox"/>	
Blood	<input type="text"/>	
Protein	<input type="text"/>	
Leukocytes	<input type="text"/>	
Glucose	<input type="text"/>	
Nitrite	<input type="text"/>	
View historical data	<input type="button" value="..."/>	

### Smoking status/cessation

Status

### Clinical charts



### Clinical advice for G3a

Save & close

Print

Close



## Laboratory results

## Classifications

## Blood pressure

## Urine dip stick test

Persistent microscopic haematuria



Two out of three positive reagent strip tests, on separate occasions, over a two week period confirms persistent invisible haematuria.

Visible blood



Blood



Non-haemolysed Trace



Protein



++++



Leukocytes



Trace



Glucose



Nitrite



View historical data



## Smoking status/cessation

Status

Smoker



Cessation therapy

Given



Drug therapy

Not given



Education



Referral

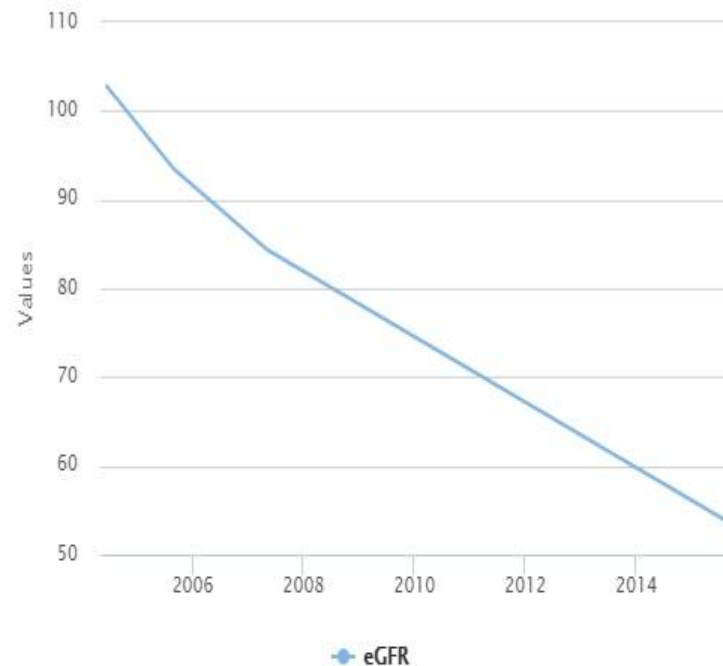
Not referred



## Clinical chart



## eGFR



## Clinical advice for G3a

## Laboratory results

Serum creatinine (most recent)	98.00 $\mu\text{mol/l}$	06/03/2007
eGFR	95.78 $\text{mL/min/1.73m}^2$	06/03/2007
Annual rate of change	N/A $\text{mL/min/1.73m}^2$	
Five year rate of change	N/A $\text{mL/min/1.73m}^2$	
ACR (most recent)	27.00 $\text{mg/mmol}$	18/09/2015

## Classifications

## Blood pressure

## Urine dip stick test

## Smoking status/cessation

Status	Ex-smoker	🔔
Cessation therapy		
Drug therapy	Given	
	<input checked="" type="checkbox"/> Nicotine gum	
	<input type="checkbox"/> Nicotine inhalator	
	<input type="checkbox"/> Nicotine lozenge	
	<input checked="" type="checkbox"/> Nicotine patch	
	<input type="checkbox"/> Bupropion	
	<input type="checkbox"/> Varenicline	
Education		
Referral		

## Clinical charts



## Clinical advice for G1A2

# Demonstration

Please find Neil or I at the CARE IS  
stand



# Discussion

1. From what you have heard in this session, **what seems most interesting or important to you** about national implementation of clinical decision support in NHS Scotland?
2. **Where is there evidence of waste, variation and harm that a CDS solution could help to address?** What would it enable that can't be done currently?
3. Would your organisation be **interested in the piloting of context-sensitive CDS** in primary care?

# **Clinical Decision Support (CDS) Roadmap for NHSScotland**

**SCIMP Conference  
23<sup>rd</sup> September 2015**