An investigation of an integration tool to improve access to information resources in clinical software

Jean-Pierre Calabretto
Bryn Lewis
James Reeve

National Prescribing Service

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National Prescribing Service Limited

Presentation Overview

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- Project aims
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- Prototype
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Background

- Health system challenges
- Increasing reliance on evidence-based information to achieve best practice
- Promise of decision support
  - Variability of implementation approaches
  - Effectiveness
  - Approach in different settings
- Other NPS experience

Challenge of information use

- Amount and complexity

- Challenge of information integration into clinical software
  - Few standard approaches or specifications
  - Low frequency of access of computerised information
  - Little user experience
  - Poorly investigated area

- Clinical software on General Practitioners' desktops
- Potential for improved decision-making

Project Aims

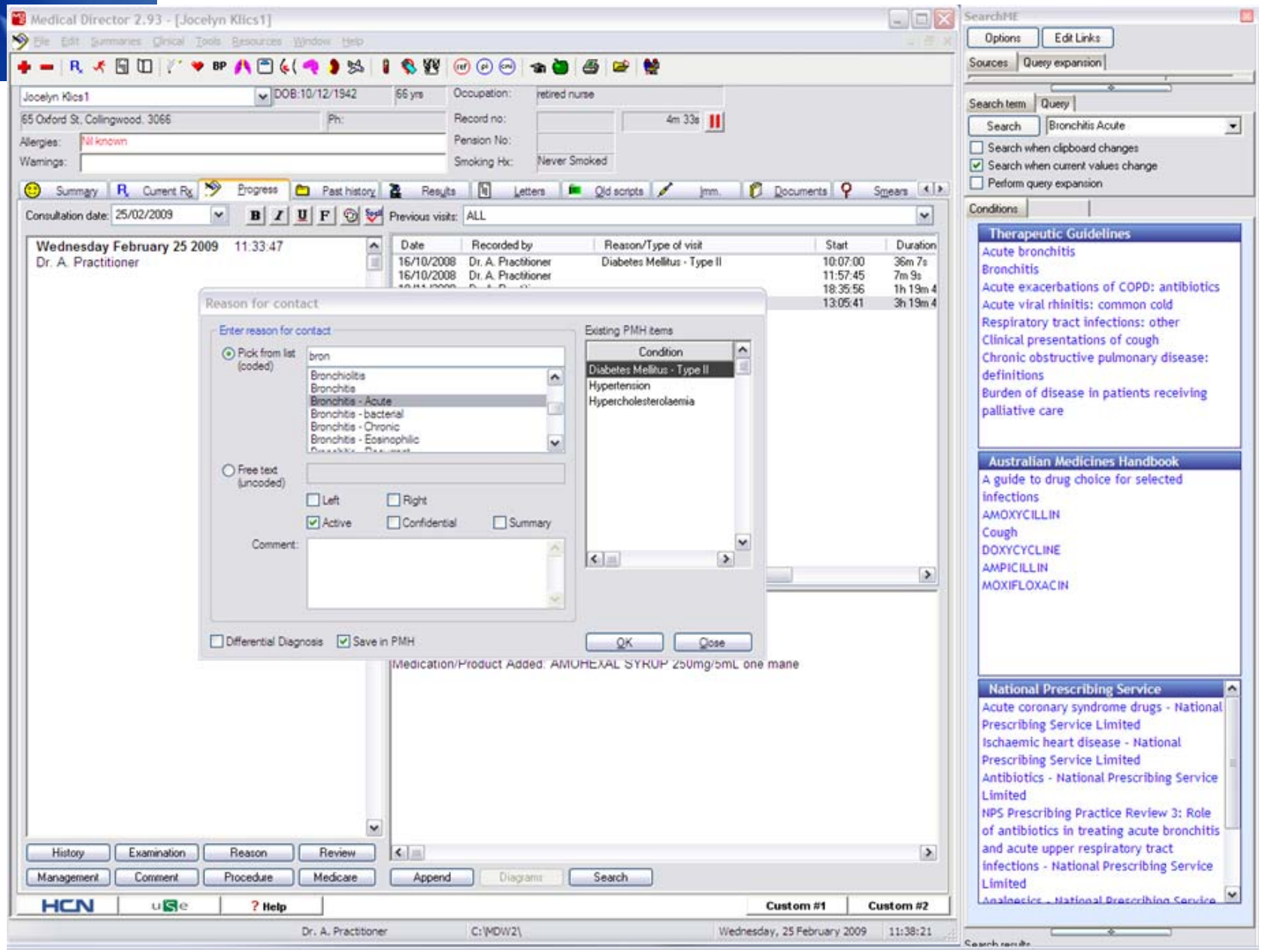
- Enable a context-based information search based on triggers in GP clinical software
- Information from high quality clinical resources
- Inform decision-making at the point of care

Conduct of the project

- Observational study
- Project Reference Group
    - Clinical pharmacologist
    - Two experienced GPs
    - GP Registrar
    - GP Academic
- Prototyping and User Needs Assessment
    - Demonstration
    - Testing using clinical scenarios
    - Observation of workflow and information use
    - Validation of findings

Knowledge Linked into Clinical Software (KLICS) Prototype

- Proof of concept
- Independent information integration
  - Clinical software systems
  - Information resources
- Monitoring of clinical system
  - Unobtrusive
  - Mechanisms transparent to user
- Searching of context relevant information
  - Parameters from ‘triggers’
    - e.g. diagnoses, medication
- Passive information display
  - ‘floating window’
  - No interference to workflow


Medical Director 2.93 - [Jocelyn Klics1]
Jocelyn Klics1
DOB:10/12/1942
66 yrs
Occupation:
retired nurse
65 Oxford St, Collingwood. 3066
Ph:
Record no:
Pension No:
Allergies:
Nil known
Warnings:
Smoking Hx:
Never Smoked
Summary
Current Rx
Progress
Past history
Results
Letters
Old scripts
Imm.
Documents
Smears
Consultation date: 25/02/2009
Previous visits: ALL
Wednesday February 25 2009 11:33:47
Dr. A. Practitioner
Date
Recorded by
Reason/Type of visit
Start
Duration
16/10/2008 Dr. A. Practitioner Diabetes Mellitus - Type II 10:07:00 36m 7s
16/10/2008 Dr. A. Practitioner 11:57:45 7m 9s
18:35:56 1h 19m 4
13:05:41 3h 19m 4
Reason for contact
Enter reason for contact
Pick from list (coded)
bron
Bronchiolitis
Bronchitis
Bronchitis - Acute
Bronchitis - bacterial
Bronchitis - Chronic
Bronchitis - Eosinophilic
Free text (uncoded)
Left
Right
Active
Confidential
Summary
Comment:
Existing PMH items
Condition
Diabetes Mellitus - Type II
Hypertension
Hypercholesterolaemia
Differential Diagnosis
Save in PMH
OK
Close
Medication/Product Added: AMOREXAL SYRUP 250mg/5mL one mane
History
Examination
Reason
Review
Management
Comment
Procedure
Medicare
Append
Diagrams
Search
HCN
? Help
Custom #1
Custom #2
Dr. A. Practitioner
C:\MDW2\
Wednesday, 25 February 2009
11:38:21
SearchME
Options
Edit Links
Sources
Query expansion
Search term
Query
Search
Bronchitis Acute
Search when clipboard changes
Search when current values change
Perform query expansion
Conditions
Therapeutic Guidelines
Acute bronchitis
Bronchitis
Acute exacerbations of COPD: antibiotics
Acute viral rhinitis: common cold
Respiratory tract infections: other
Clinical presentations of cough
Chronic obstructive pulmonary disease: definitions
Burden of disease in patients receiving palliative care
Australian Medicines Handbook
A guide to drug choice for selected infections
AMOXYCILLIN
Cough
DOXYCYCLINE
AMPICILLIN
MOXIFLOXACIN
National Prescribing Service
Acute coronary syndrome drugs - National Prescribing Service Limited
Ischaemic heart disease - National Prescribing Service Limited
Antibiotics - National Prescribing Service Limited
NPS Prescribing Practice Review 3: Role of antibiotics in treating acute bronchitis and acute upper respiratory tract infections - National Prescribing Service Limited

Scenarios for prototype testing

- For GPs
  - Recall for HbA1c result and ongoing diabetes
  - Influenza immunisation & question about osteoporosis
  - New mother, tiredness and fatigue (breast feeding)
  - Otitis media (paediatric)
  - Rash and itching, scabies (pregnancy)

- Clinical pharmacologist

Scenario example

Recall for HbA1c result and ongoing diabetes

Jocelyn, 65 year old retiree presenting for review.

History

- History includes hypertension and Type 2 Diabetes.
- She has no known allergies
- Non-smoker, consuming 2 glasses of wine per week and walks daily. Is careful with her diet.
- Over the last 6 months, self-monitored daily blood sugars have increased to between 11.0 and 13.0 mmol/L in the last three weeks.
- Her HbA1c six months ago was 8.5% but a recent reading two weeks ago was 9%.

Her medications for the past 6 months have been:

- aspirin 100 mg daily, perindopril 4 mg daily, metoprolol 25 mg twice daily, simvastatin 20 mg daily, metformin 850 mg three times a day; and gliclazide 120 mg twice daily with food

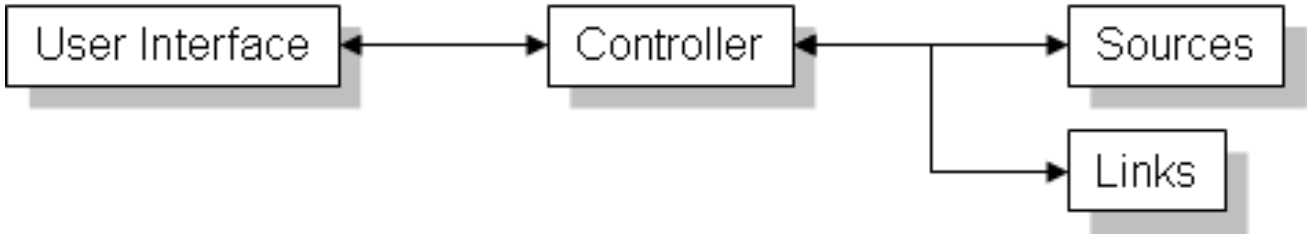
Current presentation

Examination reveals:

- blood pressure is 135/80 mmHg, heart rate regular 65 beats per minute, weight 68 kg, height 170 cm (BMI 23.5 kg/m2), waist circumference 76 cm.

Technology

- Delphi 7 (incorporating XML, XSL, HTML, JavaScript and CSS)
- Four major modules
  - User Interface (presents results to the user and allows the user to control the application)
  - Controller (coordinates search activity)
  - Sources (manages searching and presentation of search results)
  - Links (manages links)



Some key findings - Information resources

- Greater accessibility equates to greater likelihood of use
- Speed and perceived ‘usability’
- This information a complement to that existing in clinical software
- Information resources that best suit inclusion
  - support clinical areas of least experience
  - likely to be updated regularly
- General information resources may be of limited use for specialists

Some key findings - Search tool

- Useful as a combined search over a range of resources

- Potential refinements?
  - Partial string searching, search string completion etc.?
  - Preferences for resources searched?
  - Highlight the search item in the returned document?

- Additional use as an educational tool

Some key findings – Software triggers

- Limited (routine) use for more experienced prescribers
- Decisions about treatment will often be made without use of the clinical software (especially where there is more experience)
- Opportunistic use of triggers will be limited because of the individuals' workflows
- Particular trigger points may often be turned off by individual GPs within a general practice
- Use unlikely to help diagnosis, but more likely to help decisions about treatment
- Input of 'trigger data'
  - retrospectively may improve quality of the patient record?
  - possibly influence workflow over time?

Some selections from the ‘10 commandments’

- Speed is everything
- Anticipate needs and deliver in real time
- Fit into the user's workflow
- Little things can make a big difference
- Recognize that physicians will strongly resist stopping
- Simple interventions work the best
- Monitor impact, get feedback, and respond
- Manage and maintain your knowledge-based systems

Bates, DW et al. 2003, 'Ten Commandments for Effective Clinical Decision Support: Making the Practice of Evidence-based Medicine a Reality', *Journal of the American Medical Informatics Association,* vol. 10, no. 6, pp. 523-530.

Conclusions

- Limitations
  - time frame and small number of participants

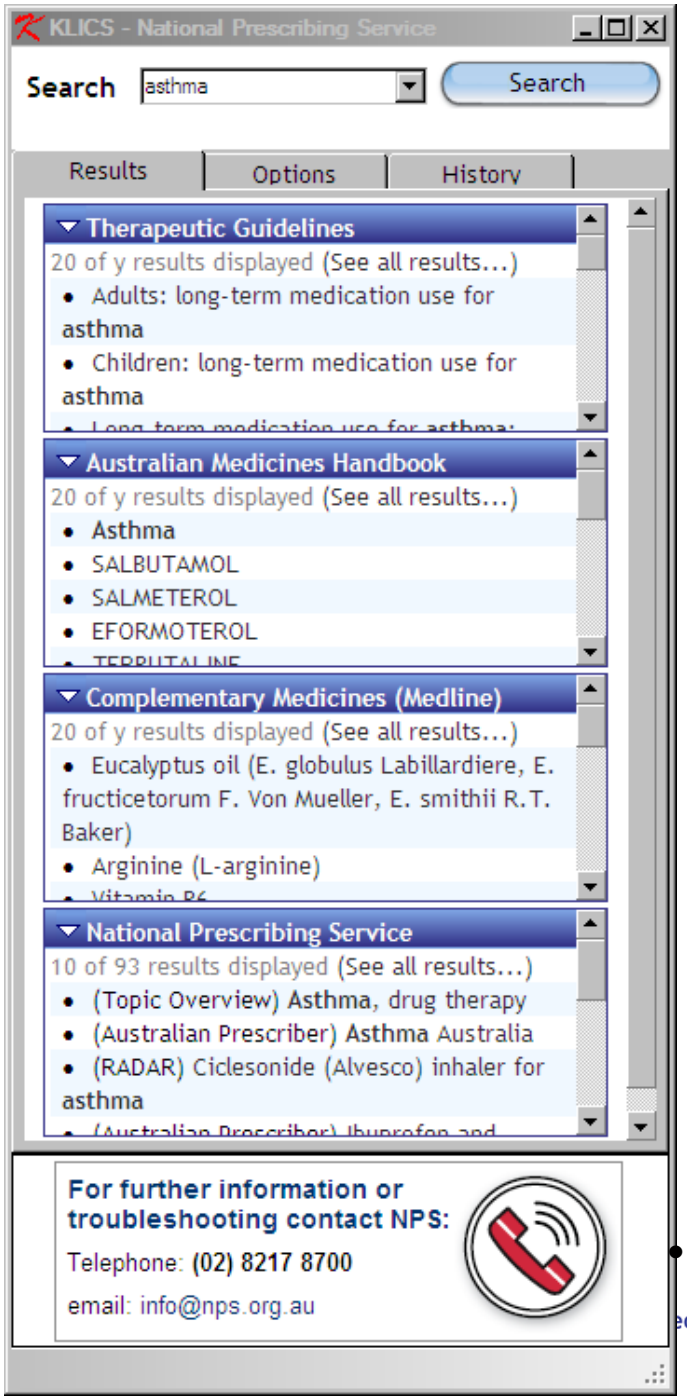
- Independent information is valued by GPs
- Complements existing information in software
- Federated searching over evidence-based information resources is useful
- **Access**, simplicity and speed are critical
- Workflow will be a major determinant of how a tool is used
- Triggers seem to offer few opportunities for information interventions

- The outcomes from this project are first steps towards providing clinicians with independent evidence-based information resources to support decision-making during patient

Update

- Evaluation of the interface
- Redevelopment using .NET

- Pilot project
  - Roll out for field testing
  - Wider GP engagement (up to 50)
  - Additional GP systems
  - Evaluation
    - Use and useability
    - Information use
    - Effect on decision-making



Knowledge Linked into Clinical Software (KLICS) Project

Acknowledgements

- Therapeutic Guidelines Pty. Ltd. (TGL)
- Australian Medicines Handbook (AMH)

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