



Using ICT to Improve Health Outcomes

David Hansen, CEO, Australian e-Health Research Centre

ICT enabled health service

- We are recommending a transforming e-health agenda to drive improved quality, safety and efficiency of health care.

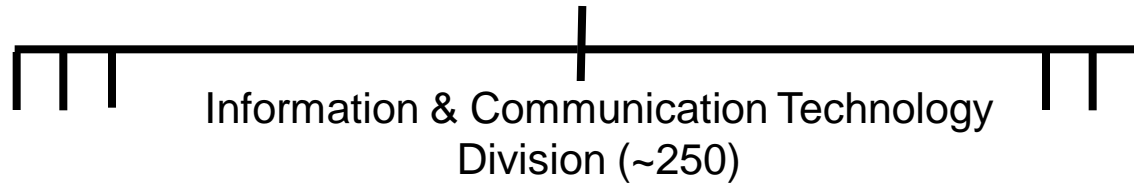
***A Healthier Future For All Australians
National Health and Hospital Reform Commission
June 2009***



Australian e-Health Research Centre



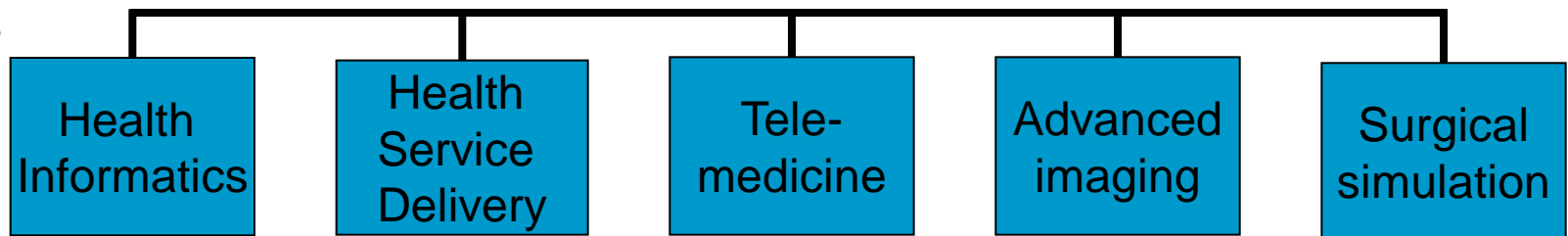
>6500 Staff



Joint Venture
formed 2003



Research
areas



National Research
FLAGSHIPS



The Australian e-Health Research Centre

AeHRC is the leading national eHealth research group in Australia currently 60-70 staff, students, visiting researchers

Funding from

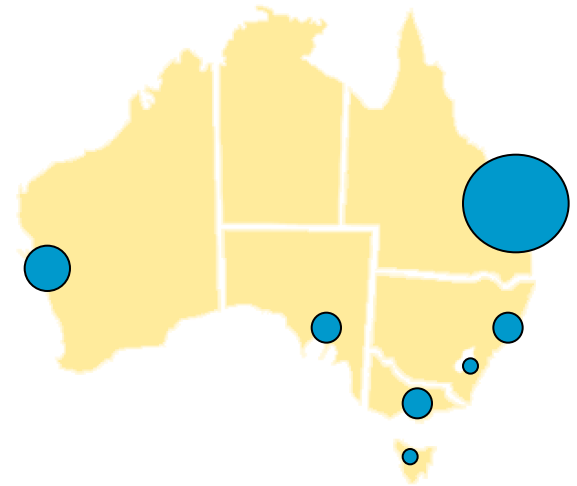
- **CSIRO**
- **Qld Govt - DEEDI, Queensland Health**
- **engagement partners**
- **revenue**

Investment into research programs

National reach - Brisbane HQ, smaller teams nationally - NSW, Victoria, SA, and now WA, and through CSIRO in Tasmania and ACT

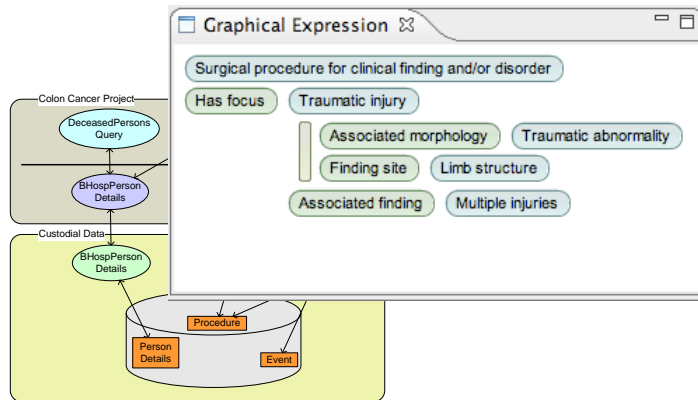
Success built on partnering - Government, clinicians, industry

- **Local engagement to drive national benefit**

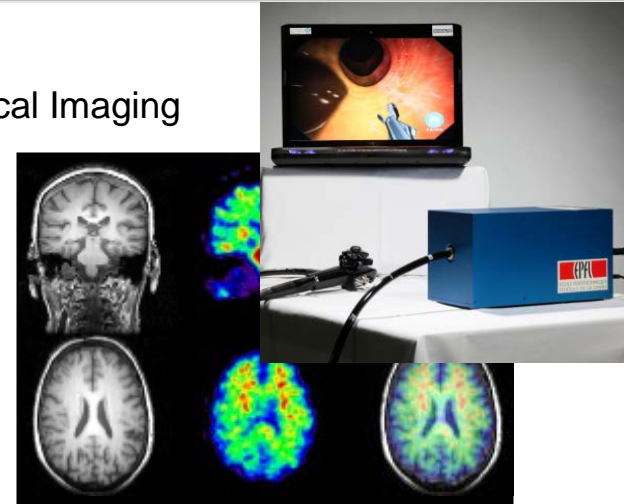


AEHRC Capabilities

Health Data Management and Semantics



Biomedical Imaging

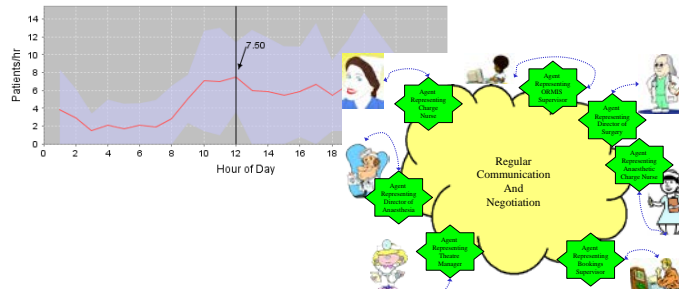


Mobile and Tele-health



Forecasting and Scheduling

ED Presentations

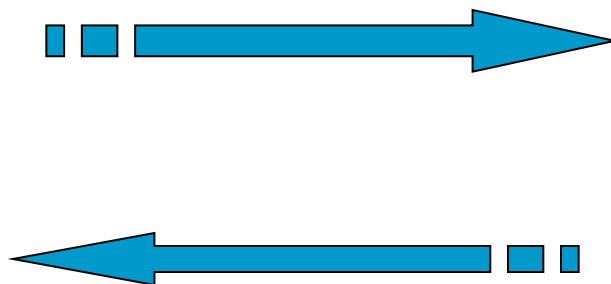


Tele and Mobile Health: Improving access of healthcare services

Care Assessment Platform

Partners: Prince Charles Hospital, Metro North Community
Services

Hospital-Based Cardiac Rehabilitation



Referral: < 11% of patients across Australia

(D.L.Walters et.al. "Variation in the application of cardiac care in Australia" MJA 2008; 188(4))

Uptake and Completion

QLD: 16% of all eligible patients

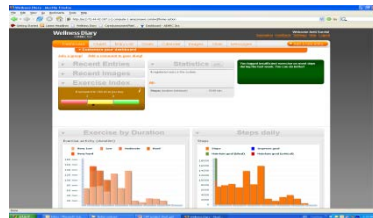
(I.A.Scott et.al. "Utilisation of outpatient cardiac rehabilitation in Queensland", MJA 2003; 179(7))

USA: 18.7% of the eligible patients participate in rehabilitation programs.

Suaya JA et al. (2007) Use of cardiac rehabilitation by Medicare beneficiaries after myocardial infarction or coronary

bypass surgery. Circulation 116: 1653-1662

Mobile Phone based Cardiac Rehabilitation Program



Patient in the Community
 **Queensland Government**

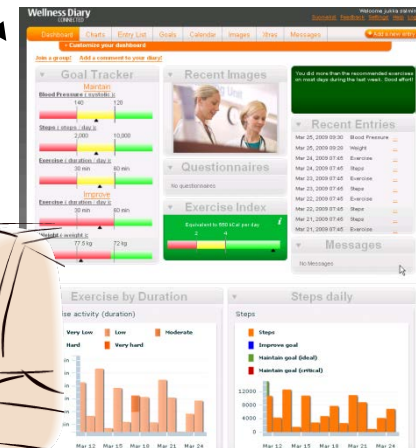
Service Provider

Wellness Diary Connected

Diary data	Measurement data	Health Reports
	Educational material	Discussion, messaging



Community Care Team



THE AUSTRALIAN
E-HEALTH
 RESEARCH CENTRE

National Research
FLAGSHIPS

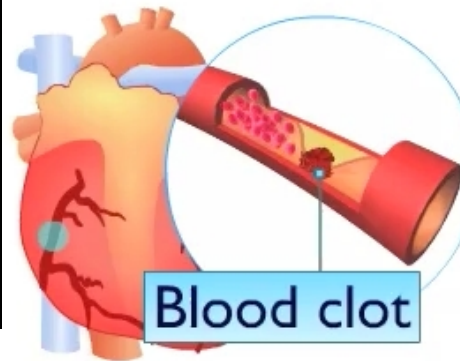


Educational multimedia material on the phone

What is a Heart Attack

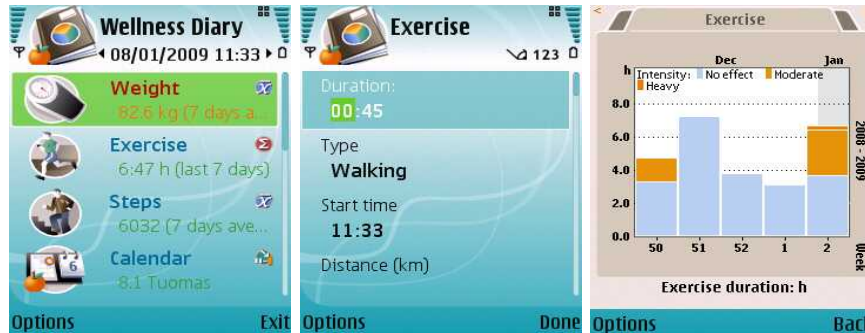
multi-ed

© Multi-ed Medical Inc.



Mobile phone software tools

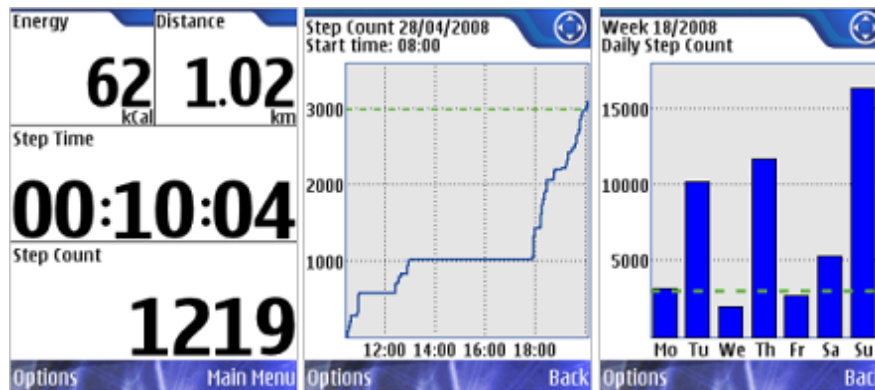
Wellness Diary – health entries



Nokia N96 handset
with a built-in
motion sensor



Step Counter – walking activity



WellnessDiary Connected web service

Mentoring and self- management tool

• End User View

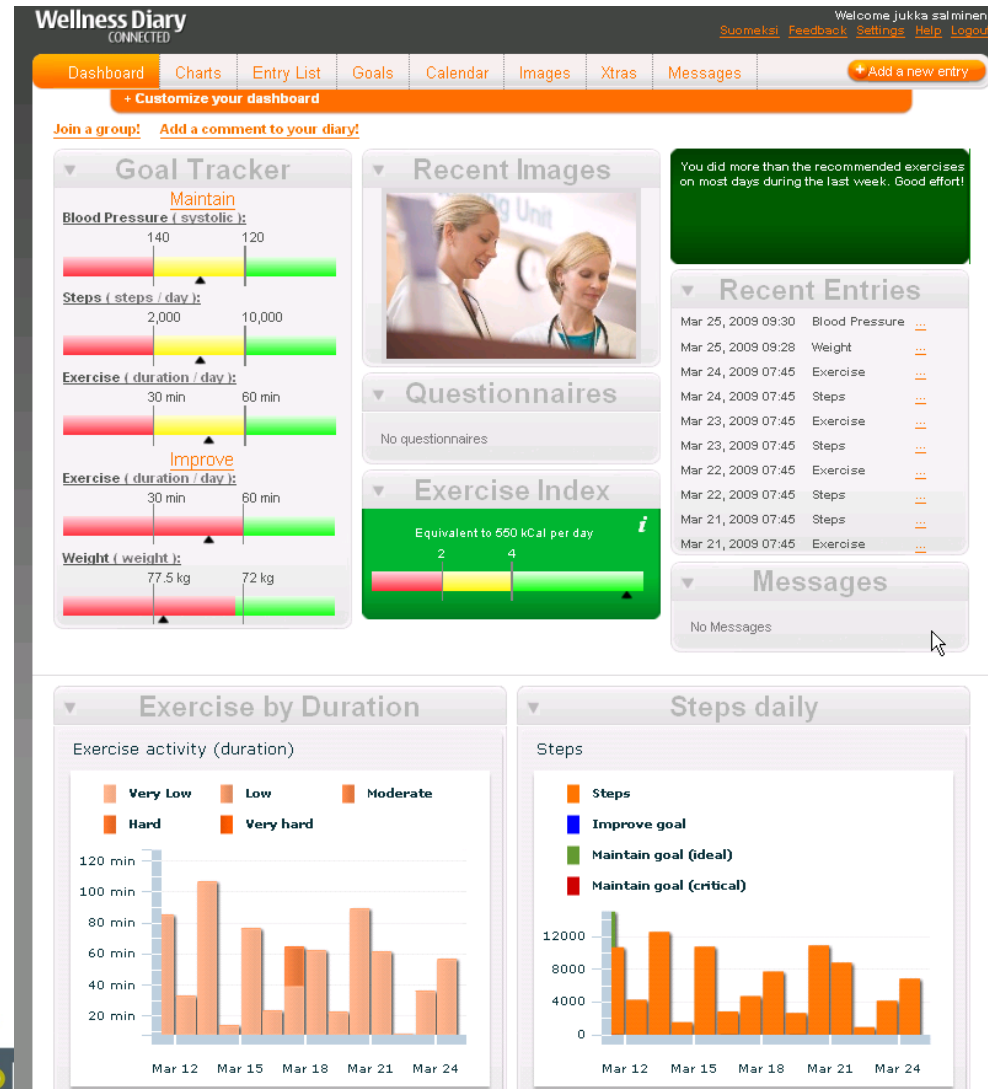
- Dashboard: a single view to all user data
- Four central concepts in the feedback and motivation:
 - traffic light indicators
 - a simple measure of physical activity
 - goal setting
 - verbal feed back

• Professional View, interface for Mentors, Functionalities:

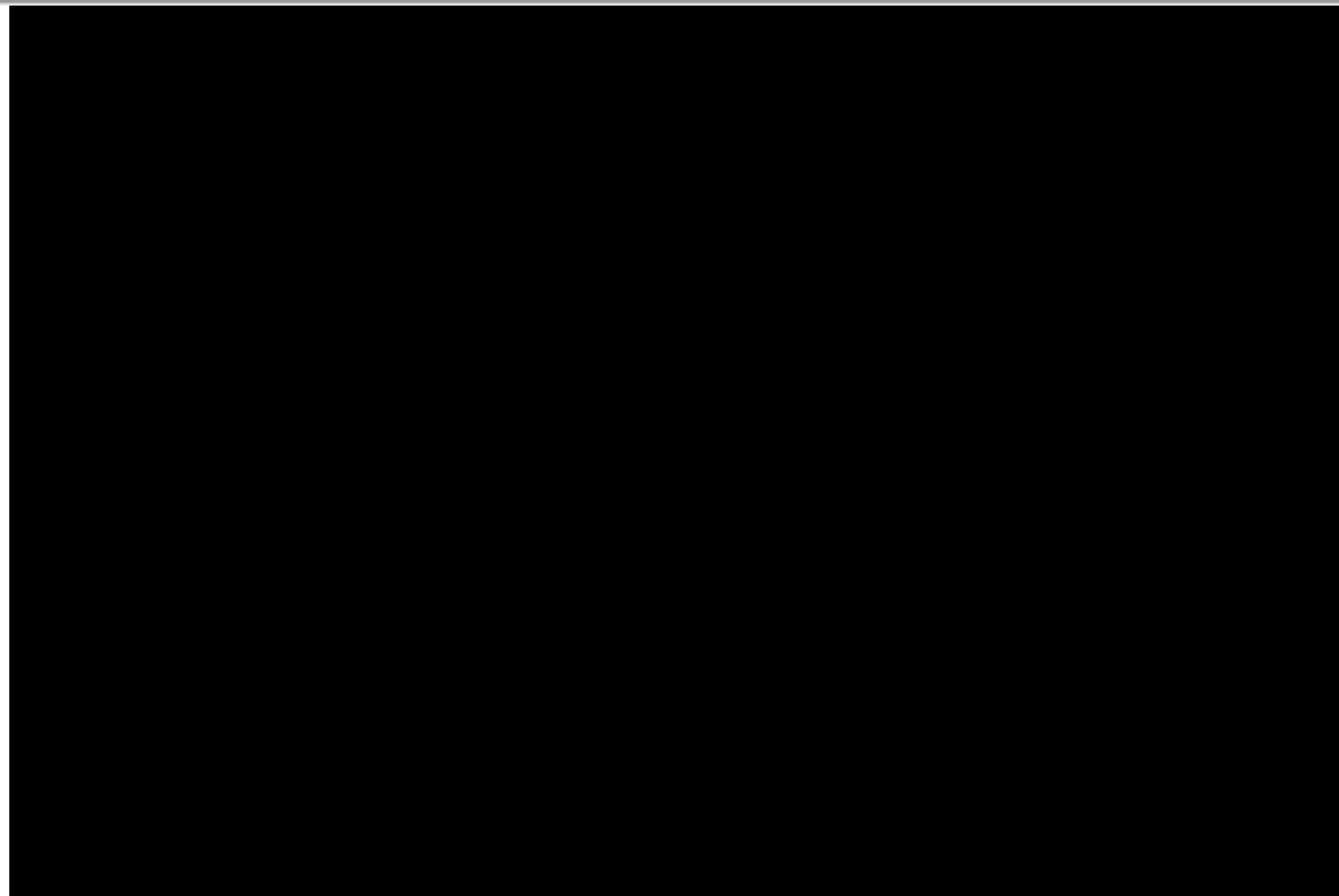
- managing groups
- patient monitoring and analysis
- news postings, system wide messaging with attachments.
- create questionnaires
- access the users' data

• Administrator View

- creation and managing user groups
- providing admin rights



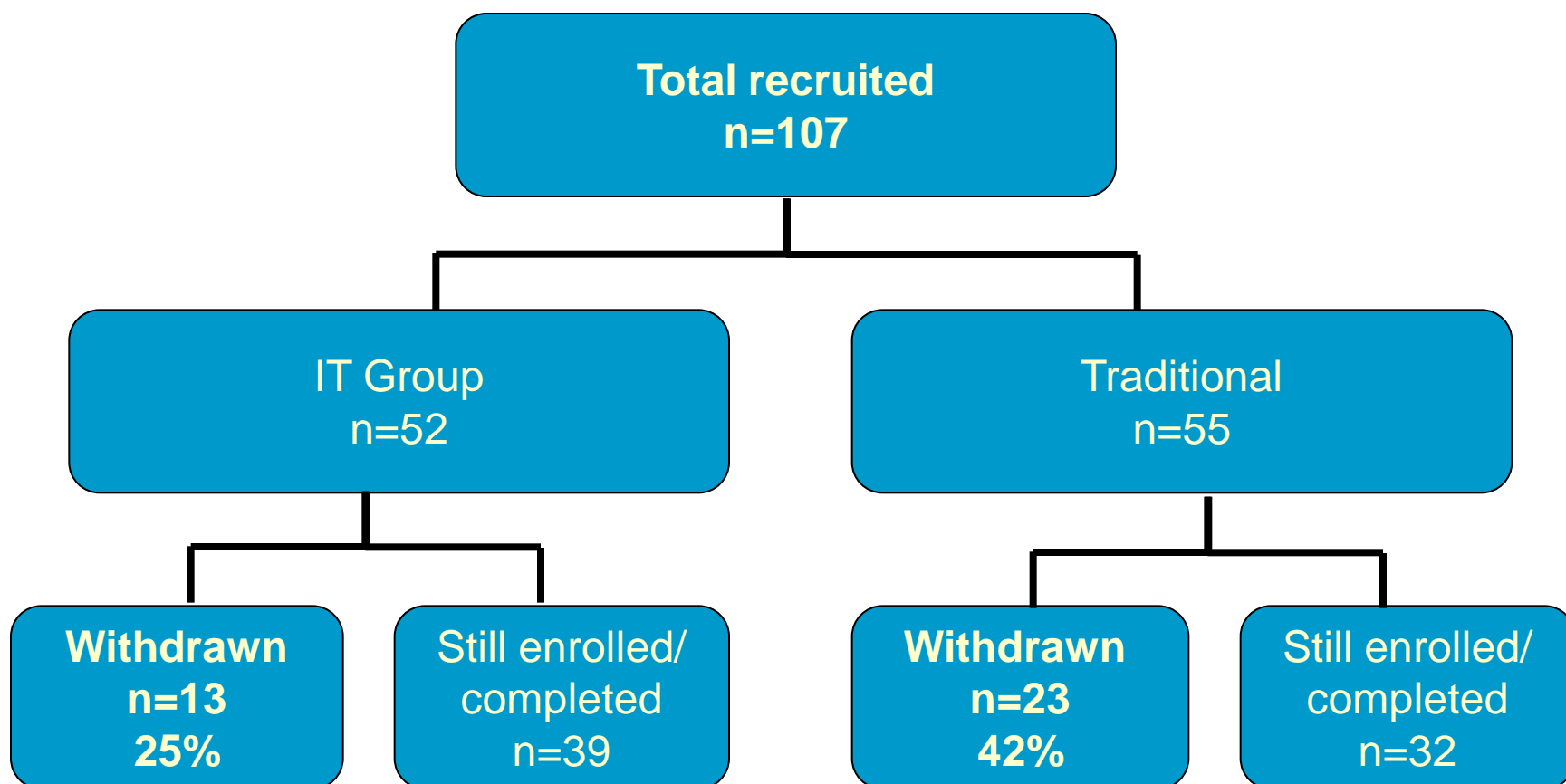
CAP



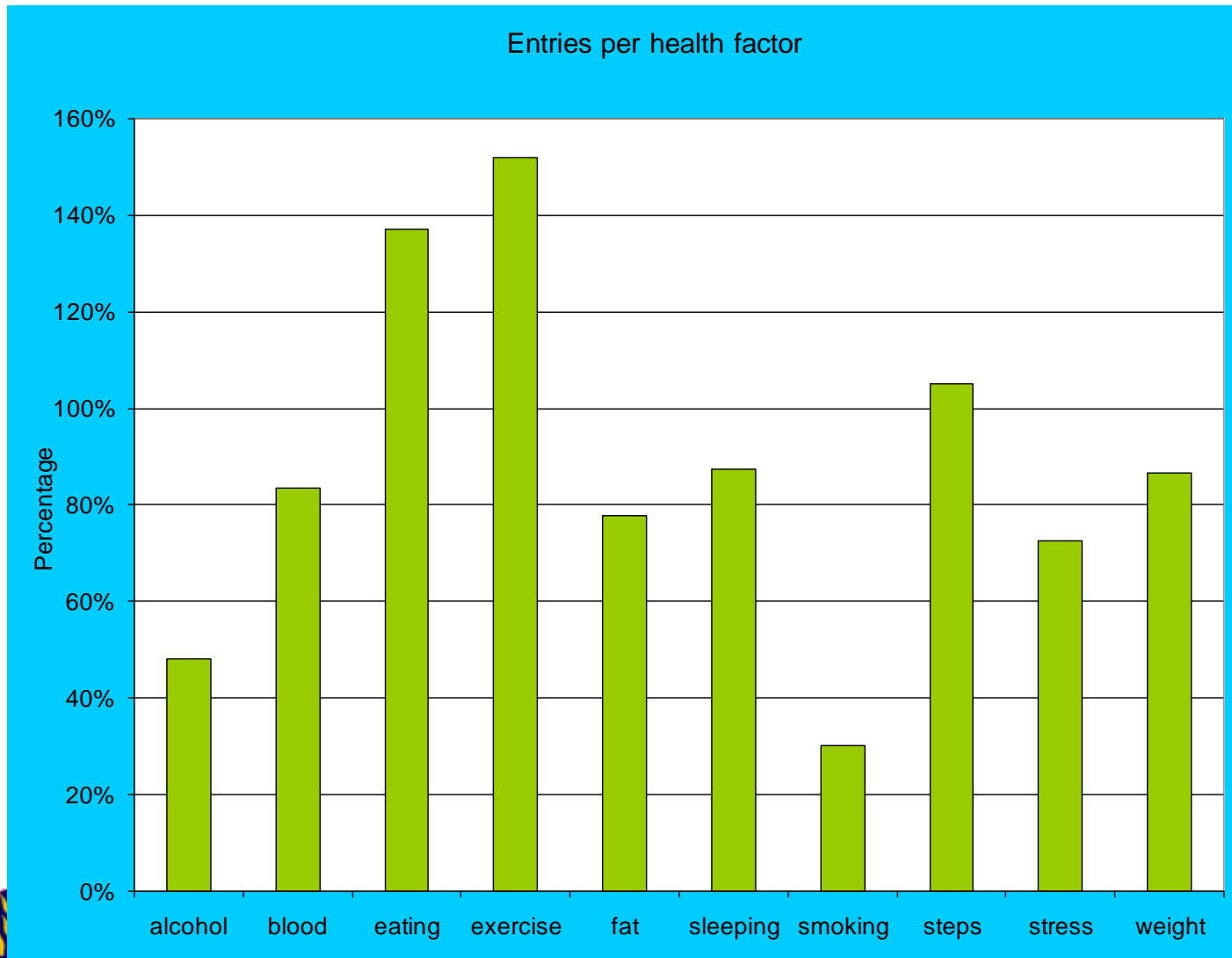
Outcome measures

- Main outcome measure:
 - % Uptake and completion of CR program
- Other measures:
 - Adherence to physical activity guidelines (30 mins moderate level activity each day)
 - Patient satisfaction: is this technology and home-based process the preferred means by patients?
 - Quality of life.
 - Risk factors: BMI, blood pressure, lipids, smoking, alcohol, diabetes
 - Diet/ nutrition status
 - Costs
 - Return to work rate
 - Readmission rate, deaths
 - Psychosocial status
 - Pharmacological management

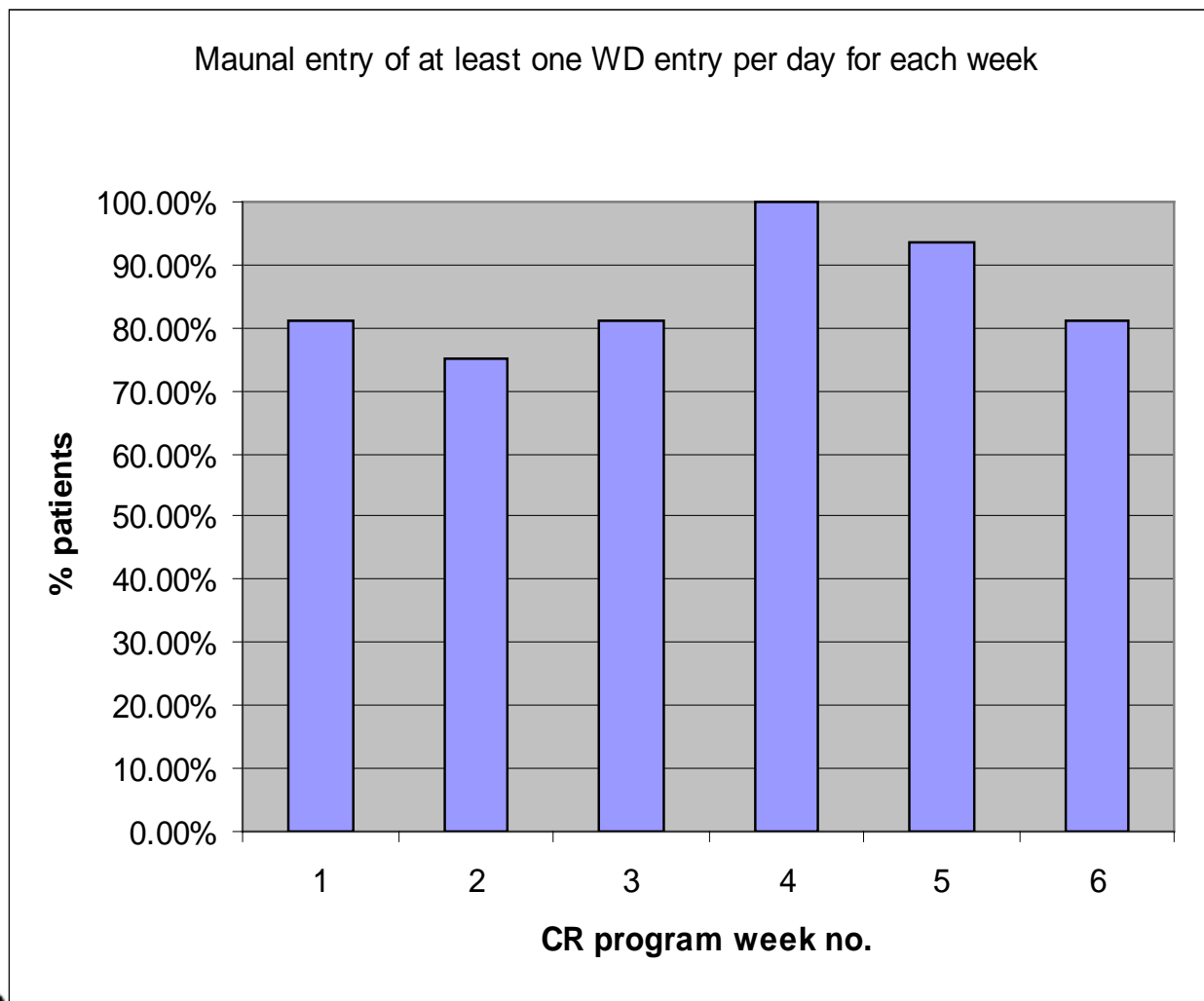
Trial status April 2011



Uptake of WD entries on mobile phone (n=16)



Uptake of WD entries on mobile phone (n=16)



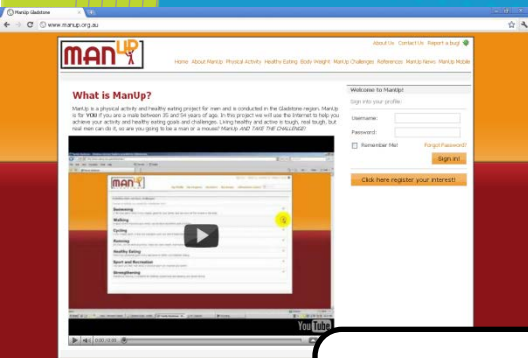
Tele and Mobile Health: Improving access of healthcare services

ManUp

Partners: Health Promotion Qld, Central Queensland University,
University of Western Sydney, CSIRO Food and Nutrition



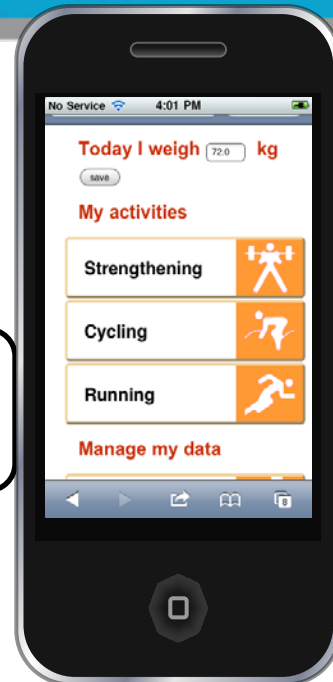
Health Promotion Queensland: *ManUp* project



Website

Information updates

Mobile
Handset



Registration/Data entry
Feedback

Feedback
Data entry

- Access health information
- Self monitoring of PA and nutrition behaviours
- Feedback on PA and nutrition behaviours
- Participate in challenges
- Network with 'mates'

- Self monitoring of PA and nutrition behaviours
- Feedback on PA and nutrition behaviours
- Reminders/Prompts for PA and nutrition behaviours



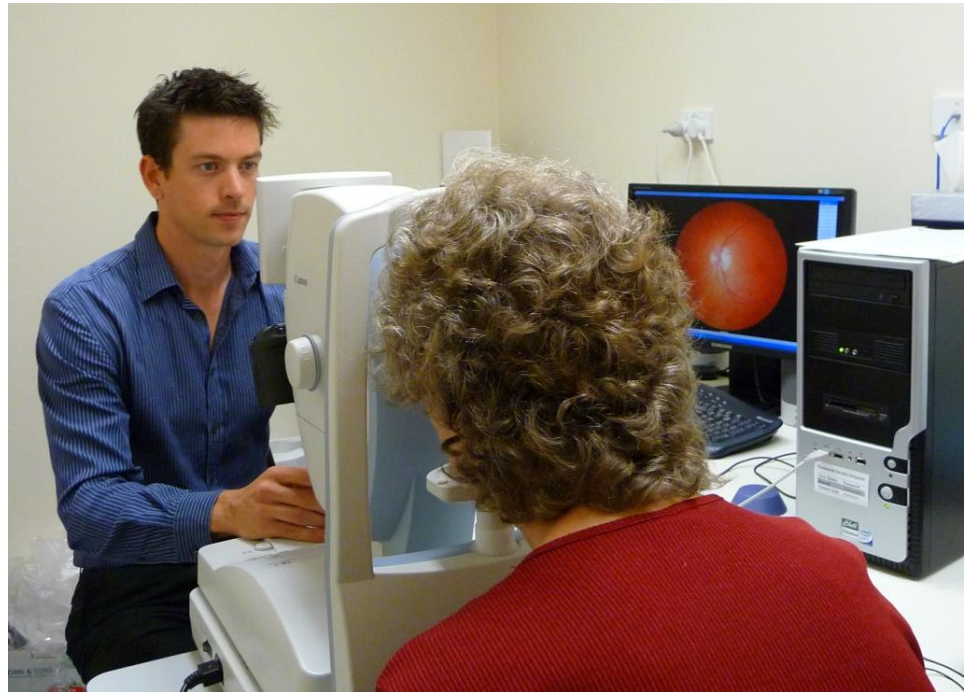
Participant

Tele and Mobile Health: Improving access of healthcare services

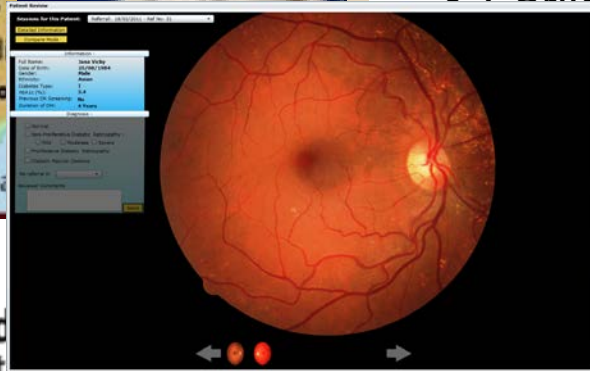
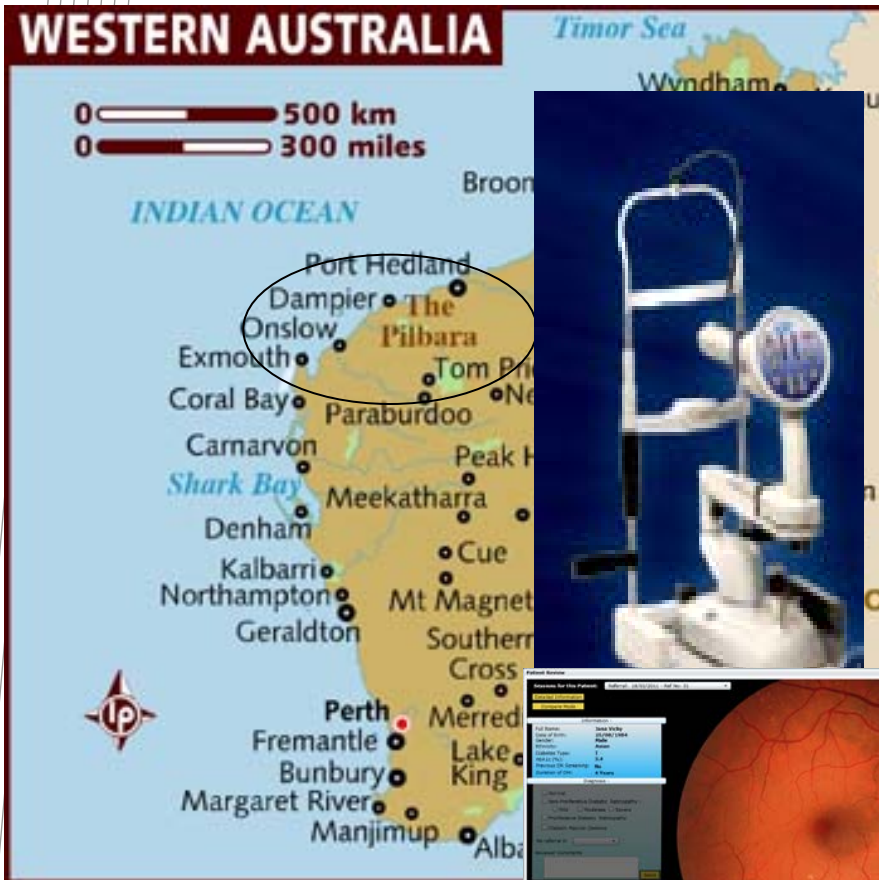
Pilbara Tele-ophthalmology

Partners: Health Promotion Qld, Central Queensland University,
University of Western Sydney, CSIRO Food and Nutrition

The Eye is the Window to the Body



Remote Tele-ophthalmology: Pilbara Pilot



- Eye images taken at Pilbara Hospital
 - 8 images – 2.3MB per image
 - New methodologies being explored – video and 3D viewing of the retinal
- Images uploaded to web EMR for viewing in Perth by Specialist
 - On-going monitoring and diagnosis for diabetic retinopathy, glaucoma and other eye disease
- Follow-up where necessary

• Earlier diagnosis

...primarily aimed at providing vision
...for the children in the region
...to conferencing – such as the
...S system – will then become

Monitoring longitudinal change



A retinal image



A retinal image taken 1-year later

Monitoring longitudinal change

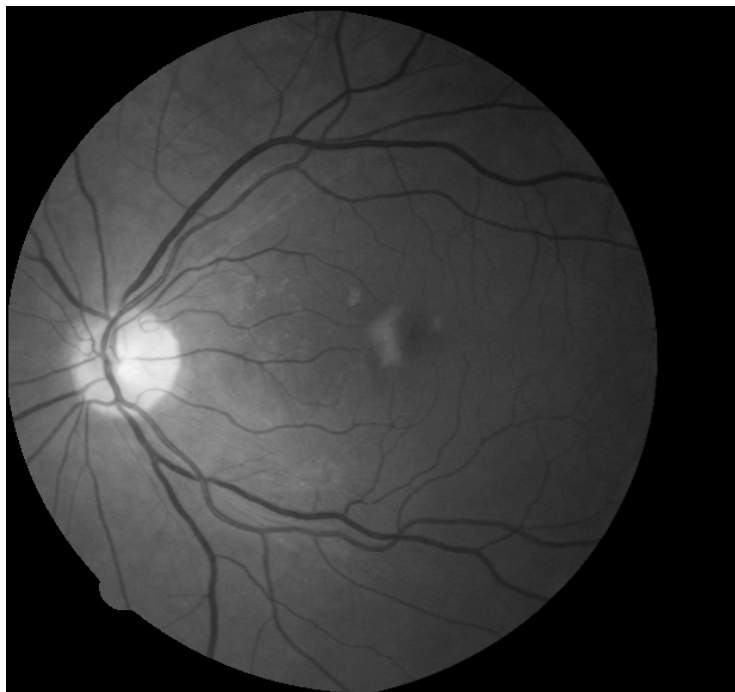


Image flickering

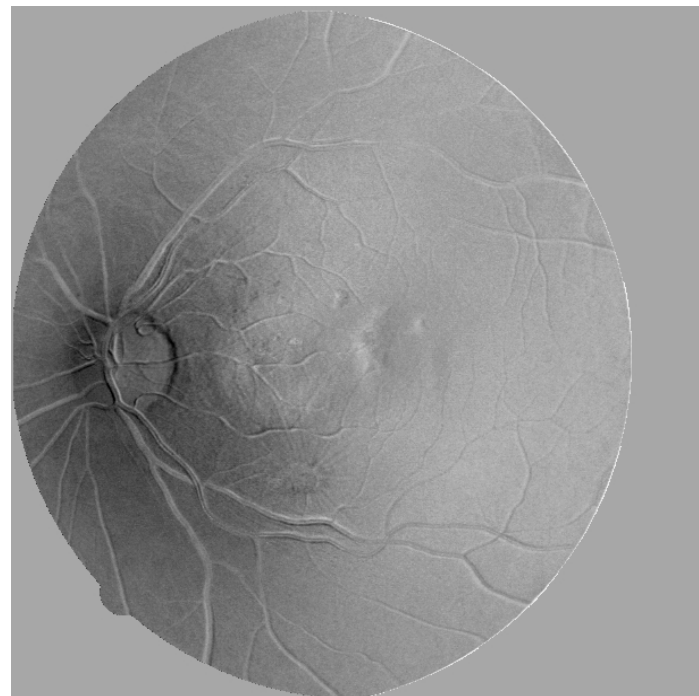
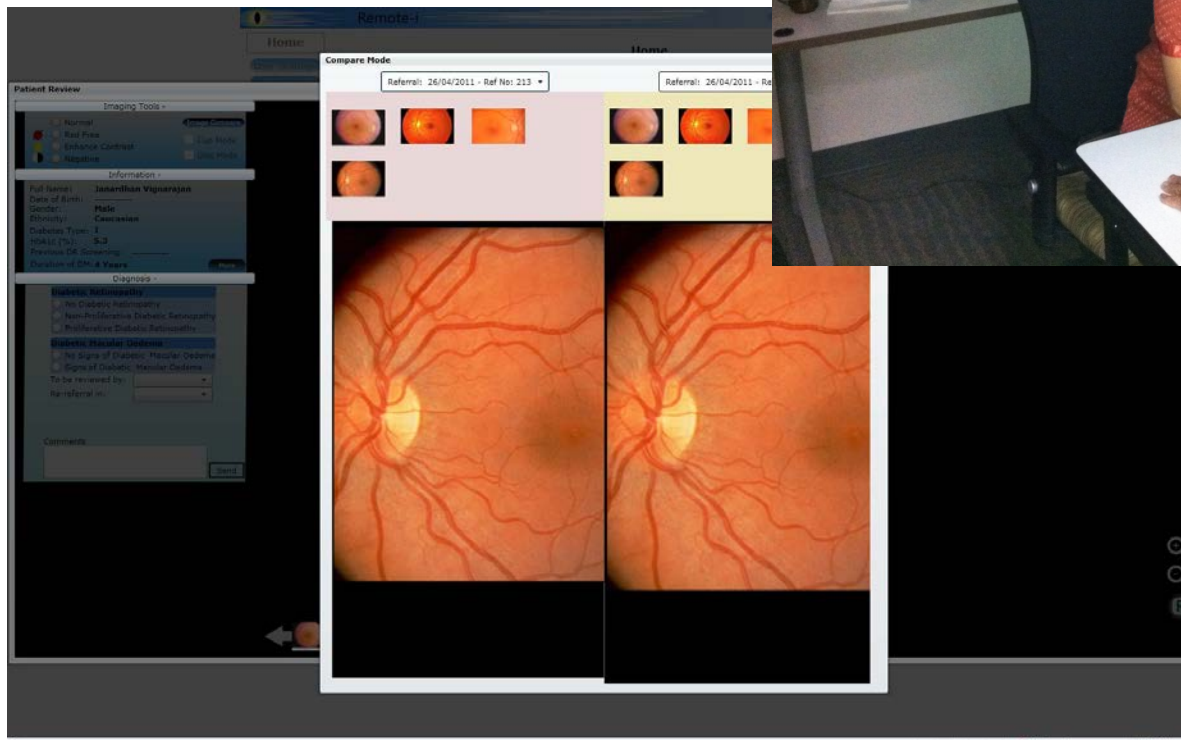


Image subtraction

Remote-I Being Used in Pilbara Region to Prevent Blindness

1. Port Hedland Hospital,
2. OPSM shop in Karratha



Data and Information



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Pre-packaged Snapper

Installation

Instructions

you are here: [home](#) → [software](#) → snapper

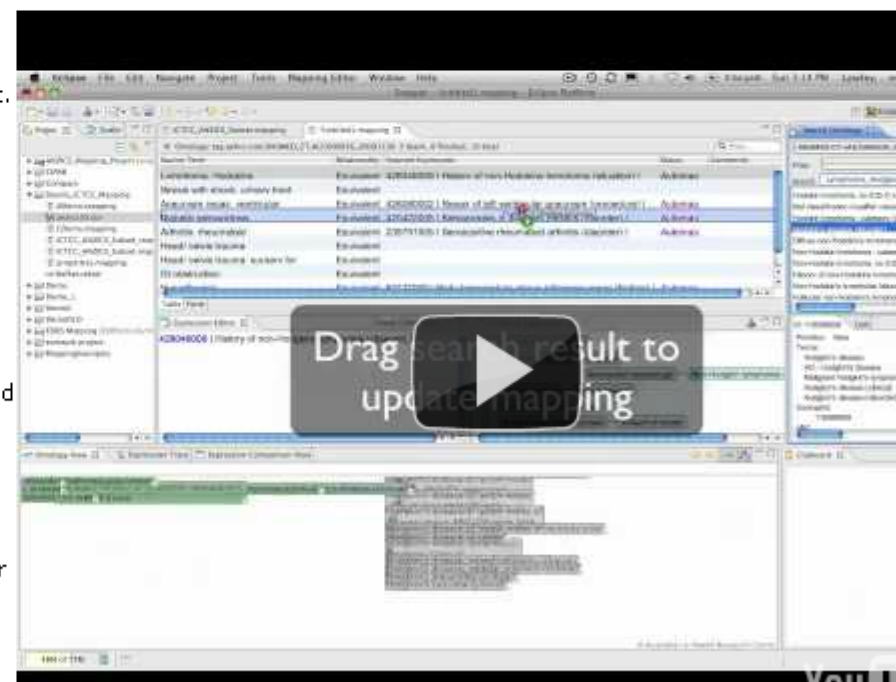
Snapper

Developed at the Australian e-Health Research Centre, CSIRO's Snapper incorporates rich semantic feedback to produce the most fully-featured and easiest to use tool for creating mappings from existing term lists or *value sets* to SNOMED CT and AMT. These semantic mappings enable the meaning of terms in existing clinical terminologies to be described using concepts or expressions from SNOMED CT.

[Download Now](#)

In addition, the intuitive graphical interface allows quick and easy generation and maintenance of customised term lists (Reference Sets) that can then be exported into current software or accessed via an RF2-conformant terminology server.

- All-in-one: Map your existing terminology to SNOMED CT or build SNOMED CT compliant Reference Sets without needing to fiddle around with browsers and a spreadsheet.
- Easy to use: Snapper provides a full browsing experience to enable users to understand the SNOMED CT and AMT content.
- Time-saving: Snapper imports a list of source terms for mapping each term to SNOMED CT and provides an automap feature to provide a "first pass" mapping.
- Fully featured: Snapper supports the full semantics of SNOMED CT and AMT. Full support is given for creation and syntactic and semantic checking of SNOMED CT's post-coordination expression syntax, where required.
- Intuitive GUI: Snapper has unique visualisation features, such as the interactive ontology visualiser and the expression editor. Drag and drop functionality provides for a modern user interface experience.
- Full lifecycle: Ongoing maintenance of Reference Sets is supported through the use of RF2-based timestamps and



Patient Admission Prediction Tool

For Emergency Departments

Patient Admission Prediction Tool

Predictions for 01 August 2011 for Royal Brisbane and Women's Hospital

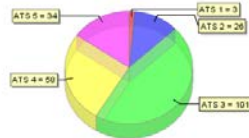
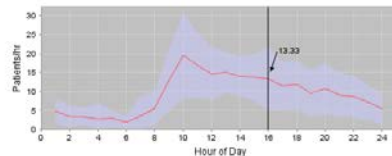
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Royal Brisbane and Women's Hospital

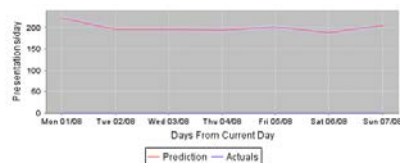
ED predictions

Current day		Next day	
Presentations	222 ± 6	Presentations	196 ± 5
Inpatient Admissions	48 ± 3	Inpatient Admissions	50 ± 3
ED Male Admissions	27 ± 11	ED Male Admissions	26 ± 9
ED Female Admissions	21 ± 10	ED Female Admissions	24 ± 11

ED Presentations



ED 7 Day Forecasts



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Version: 2.0

For Inpatient Beds:

Patient Admission Prediction Tool

Predictions for 01 August 2011 for Royal Brisbane and Women's Hospital

[Prev](#) | [Today](#) | [Next](#)

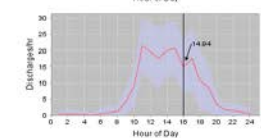
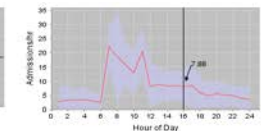
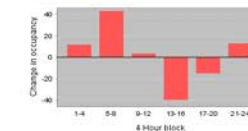
Royal Brisbane and Women's Hospital

Predictions Summary

Current day		Next day	
Inpatient Admissions (all)	192 ± 6	Inpatient Admissions (all)	195 ± 6
Inpatient Admissions (Elective)	102 ± 25	Inpatient Admissions (Elective)	107 ± 25
Inpatient Day Admissions (LOS = 0)	70 ± 23	Inpatient Day Admissions (LOS = 0)	76 ± 20
Inpatient Admissions (from ED)	64 ± 16	Inpatient Admissions (from ED)	63 ± 14
Inpatient Discharges	176 ± 5	Inpatient Discharges	185 ± 5
ED Admissions	48 ± 3	ED Admissions	50 ± 3
ED Male Admissions	27 ± 11	ED Male Admissions	26 ± 9
ED Female Admissions	21 ± 10	ED Female Admissions	24 ± 11

Inpatient predictions

Patient Flow



Inpatient Breakdown



Inpatient 7 Day Forecasts



The Australian e-Health Research Centre

Dr David Hansen - CEO

David.Hansen@csiro.au

Thank you

Contact Us

Phone: 1300 363 400 or +61 3 9545 2176

Email: Enquiries@csiro.au **Web:** www.csiro.au

