Randomised controlled trial of an in-home monitoring intervention to improve health outcomes for type 2 diabetes: trial protocol

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Type 2 diabetes
- Worldwide prevalence of diabetes is on the increase
- Type 2 diabetes accounts for over 85% of cases in Australia
- Annual cost for people with type 2 diabetes is estimated at $6 billion
- Can be controlled through healthy lifestyle and regular monitoring
- The NBN (National Broadband Network) diabetes trial is one approach to managing type 2 diabetes

Townsville

People with type 2 diabetes: HbA1c ≥ 7.5% living in NBN rollout area

Control patients
Usual care

Intervention patients
Remote monitoring + Trial Diabetes Care Co-ordinator + HD videoconferencing to complement GP care

Outcomes measured:
- Change in patient biomedical, psychological, self-management and quality of life
- Patient and GP satisfaction with care model
- Use of technology and HD videoconferencing
- Cost-effectiveness of intervention
Research questions

<table>
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<tr>
<th>Research question</th>
<th>Sub questions</th>
<th>How we will measure benefits</th>
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| Does remote access to clinical staff supported by telehealth technologies over high speed broadband lead to improved diabetes control in a way that benefits patients, carers and clinicians and improves the overall health system? | Does it improve health outcomes?                                               | • Biomedical measures (e.g. HbA1c, BP)  
• Lifestyle measures (e.g. smoking, nutrition, physical activity)  
• Psychological measures (e.g. quality of life, mental health, well-being, social support)  
• Clinical satisfaction  
• Patient satisfaction  
• Carer satisfaction |
|                                                                                  | Does it improve the care in a way that benefits patients, carers and clinicians? | • Patient satisfaction  
• Carer satisfaction  
• Clinical satisfaction (e.g. clinician confidence with telehealth) |
|                                                                                  | Does it improve primary care capacity and integration of care?                | • Access to primary care (e.g. number of Care Coordinator sessions, diabetes educator sessions, allied health professional sessions)  
• Use of chronic kidney and tertiary care (e.g. number of hospital visits)  
• Percentage of clinicians using cycles of care |
|                                                                                  | Does it improve service utilisation and efficiency of the healthcare workforce? | • Cost of care per patient  
• GP visit costs  
• Care Coordinator costs |
|                                                                                  | Does it utilise ubiquitous high speed broadband?                              | • Adoption of technology (e.g. number of video conferences)  
• Acceptability (e.g. ease of use of technology, satisfaction with technology) |

The process

In addition to usual GP care…

Green Alert
- Readings and surveys within normal parameters
- No action necessary

Red Alert
- Clinical Trend review
- Decision made on intervention
- Patient contacted
- Further discussion and advice
- Further contact with other services

USER EXPERIENCE
Patient K

- Male, married, aged 64
- Ex-smoker, moderate drinker, poor diet
- Engages in minimal physical activities
- Personal goal to lose weight and avoid going on insulin
- High blood glucose readings at the start of the trial
- Through education and support from care co-ordinator Patient K reduced alcohol intake and portion size
- More recent readings show a marked decrease in blood glucose
- Patient K has lost weight
- 3 monthly HbA1c reduced by 1.6%

Blood Glucose

Date | HbA1c % | New HbA1c mmol/mol
--- | --- | ---
May 2012 | 8.5 | 6.9
Sept 2012 | 6.9 | 5.2

Patient J

- Male, married, aged 73
- Ex-smoker, occasional drinker
- Engages in minimal physical activities, recently started using a wheelchair due to MS
- Personal goals, better health and take a trip to visit a friend
- Ill health has impacted on achievement of goals
- Focus on more social interaction such as taking trips to local shopping centre and joining local mens group
- Feels reassured that his health is being monitored
- Little or no change in blood glucose levels

Blood Glucose

Date | HbA1c % | New HbA1c mmol/mol
--- | --- | ---
August 2011 | 8.6 | 7.0
April 2012 | 6.6 | 4.9
Sept 2012 | 7.2 | 5.5

Challenges so far?

Government Strategy
- National Digital Economy Strategy/National E-health Strategy
- RACGP Standards for General Practitioners offering video consultations/MBS telehealth items
- Is it enough to drive the change required for widespread implementation?

Technology
- NBN not mainstream yet
- High definition video conferencing very new
- New technology highly sensitive and complex

Organisational factors
- Organisational readiness
- Clinical buy-in
- Relationship building

In conclusion

- The trial aims to provide a robust evidence based to extend this model into other health conditions and into regional areas
- Challenges of implementation similar to other telehealth trials
- Future benefits for:
  - GPs and Allied Health Professionals
  - Rural/remote & multi-cultural communities/ethnic diversities
  - Aged care