Medication Adherence Technologies (MATs)
A Clinical Trial and Survey

Katie Woo[1], Veselin Ganev[2], Julia Vlasenko[2], Lili Liu[1], Ioanis Nikolaidis[2], Eleni Stroulia[2]

[1]Department of Occupational Therapy, [2]Department of Computing Science

CHALLENGES

"Drugs don't work in patients who don't take them."

C. Everrett Koop, M.D.

Medication adherence:

- is the extent patients follow their prescribed medication regime (1)

Among adults 65 years or older:

- 81% have at least one chronic condition(2)
- 62% are taking five or more drugs(3)
- over half a million Canadian seniors are taking multiple medications(4)
- adherence levels as low as 42% to 63.9%(5-7)

Consequences of non-adherence:

- adverse drug reactions
- increased risk of hospitalization
- loss of independence
- lowered quality of life
- mortality (1,8)

In clinical practice:

- clinicians unable to recognize non-adherence in everyday clinical practice(3)
- MATs are rarely utilized in the community

MATs can improve and objectively assess adherence by:

- organizing pills
- dispensing pills
- electronic reminders
- remote monitoring

References

1. Osterberg L, Blaschke T. Adherence to medication. N.Engl.J.Med 2005 Aug 4;353(5):487-497.
2. Gilmour H, Park J. Dependency, chronic conditions and pain in seniors. Health Reports Supplement. 2006;8:33-45.
3. Canadian Institute for Health Information. Drug Use Among Seniors on Public Drug Programs in Canada, 2002 to 2008. 2010.
4. Ramage-Morin PL. Medication use among senior Canadians. Statistics Canada 2009,20(1):1-7.
5. Smith H, Hankins M, Hodson A, George C. Measuring the adherence to medication of elderly patients with heart failure: Is there a gold standard? Int.J.Cardiol 2009; Jul:15.
6. Setoguchi S, Choudhry NK, Levin R, Shrank WH, Winkelmayer WC. Temporal trends in adherence to cardiovascular medications in elderly patients after hospitalization for heart failure.Clin.Pharmacol.Ther 2010 Oct;88(4):548-554.
7. Hayes TL, Larimer N, Adami A, Kaye JA. Medication adherence in healthy elders: small cognitive changes make a big difference. J.Aging Health 2009 Jun;21(4):567-580.
8. McDonnell PJ, Jacobs MR. Hospital admissions resulting from preventable adverse drug reactions. Ann.Pharmacother 2002 Sep;36(9):1331-1336.

Contact:
Katie Woo, 780-735-6059
Katie.Woo@albertahealthservices.ca

CLINICAL TRIAL

Scope:

Can technology be used to assess medication adherence and assist in discharge planning?

Methods:

- **Type**: RCT
- **Treatment:** n=6, visual + auditory alerts
- **Control**: n=6, no visual + auditory alerts
- **Location**: Independent Living Suite, Glenrose Rehabilitation Hospital, Edmonton AB
- **Participants**:
  - in-patients
  - mild to moderate cognitive impairment
  - nearing community discharge
  - questionable adherence
  - limited family support
- **Trial:** 3 day trial in home-like environment with MAT + wireless activity sensor network
- **End of trial:** Medication adherence rate and activity sensor report provided to discharge team
- **Data analysis**: Comparison of adherence rates, participant exit interview and discharge team satisfaction survey

Status:

- RCT currently in progress.
- Results anticipated in Summer 2011

SURVEY

Scope:

What are health care providers' current perceptions and knowledge on the use of medication adherence technologies?

Methods:

- **Type:** Electronic survey
- **Topics:** 15 questions cover clinical challenges with adherence, familiarity and perceived usefulness of MATs
- **Participants:** n=400 for 20% response rate
  - family physicians
  - community care case managers
  - community pharmacists
- **Data analysis:** Responses will be analyzed for perceived barriers and limitations of MATs

Status:

- Survey in circulation, close date: June 30th 2011
- Results anticipated in Fall 2011

Acknowledgements

This work was funded by a grant from Healthcare Support through Information Technology Enhancements (hSITE), NSERC Strategic Networks Grant, Olsonet, Alberta Innovates, NSERC and IBM.