

Reminder Rosie Project Evaluation Report Jan 18, 2016

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Pilot Focus Group

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Acknowledgments

Thank you to the following people that supported the pilot project:

Josie Barbita, Director Client Services, Professional Practice

Gary Rotman, VP Channel Sales, LifeAssist Technologies Inc.

Val Ornoy, CEO LifeAssist Technologies Inc.

Executive Summary

Pilot purpose: To evaluate the impact of Reminder Rosie on medication adherence, resource utilization and client satisfaction and to provide insight into which Toronto Central (TC)-CCAC clients would benefit most from Reminder Rosie.

Method: A PDSA cycle was used to assess Reminder Rosie for a small group of TC-CCAC clients that met the project's inclusion and exclusion criteria. TC-CCAC pharmacists set up the devices for eligible clients, and followed- up after the first reminder, at 1 week, 1 month, 2 months, and 3 months. Outcome measures included improvement in medication adherence, impact on client experience, and the impact on PSW/nursing utilization.

Results: Eleven clients were enrolled in the pilot, with 7 completing the 3 month pilot project. Four clients didn't complete the project due to advanced dementia (3), and client resistance (1). Eighty-six percent of clients achieved a compliance rate of 80% or greater, exceeding our target of 75%. Fifty-seven percent of clients achieved an absolute increase in medication adherence of 30% or more from baseline, exceeding our target of 50%. Most participants had no PSW services during the pilot period. However, we did observe a decrease in time spent on medications by 10 minutes per day (1) and 30 minutes per day (1), discharge of weekly nursing (1), and less time reported on medication reminders (1). A conservative break-even analysis demonstrated that only 7 (14%) TC-CCAC clients using Reminder Rosie would need to have a reduction in PSW hours of 30 minutes daily for the purchase of 50 devices to have a cost-neutral impact. For little or no cost, TC-CCAC clients and caregivers could experience improved medication adherence, positive client experience and satisfaction, a decrease in caregiver burden, and clinical outcome improvements.

Clients were confident using the device and found Reminder Rosie helpful and easy to use. Fifty-seven percent of clients completing the pilot wanted to continue using the device. For those that didn't continue, 1 client moved to long-term care, another found the device annoying and another didn't find the device helpful. Forty-three percent of clients were willing to pay \$50 to keep the device but couldn't afford it. None of the clients were willing to pay \$150 for the device. Seventy-one percent of clients completing the pilot would recommend Reminder Rosie.

Discussion: When used for appropriate clients, Reminder Rosie improves medication adherence. Clients that benefited from the device were those who had mild cognitive impairment or mild dementia, insight into their adherence issues, and were motivated to improve their medication adherence. There were reduced nursing and PSW costs associated with using the device. Although the goal of this pilot wasn't to assess other outcomes such as health status, emergency room visits or health care costs, data from this pilot indicate that other outcomes may be improved with using the device.

Recommendations: The Reminder Rosie device improved medication adherence and had an impact on client well-being which in itself may be grounds for TC-CCAC to consider providing the device to clients in certain circumstances. The overall costs savings to TC-CCAC are difficult to predict, but savings are likely given the break-even analysis. It is expected that reminder devices would also decrease overall health care costs. We would suggest that LifeAssist be invited to present at TC-CCAC to increase awareness of options to assist with medication adherence. A second PDSA cycle could be completed with a larger sample size to obtain more robust findings on the cost benefit of using such a device.

Pilot purpose:

1. To evaluate the impact of Reminder Rosie on medication adherence, client experience, and PSW/nursing utilization for TC-CCAC clients.
2. To provide insight into which TC-CCAC clients would benefit most from Reminder Rosie.

These findings will be presented to TC-CCAC management to inform decision making about funding and support of Reminder Rosie for select TC-CCAC clients.

Overview

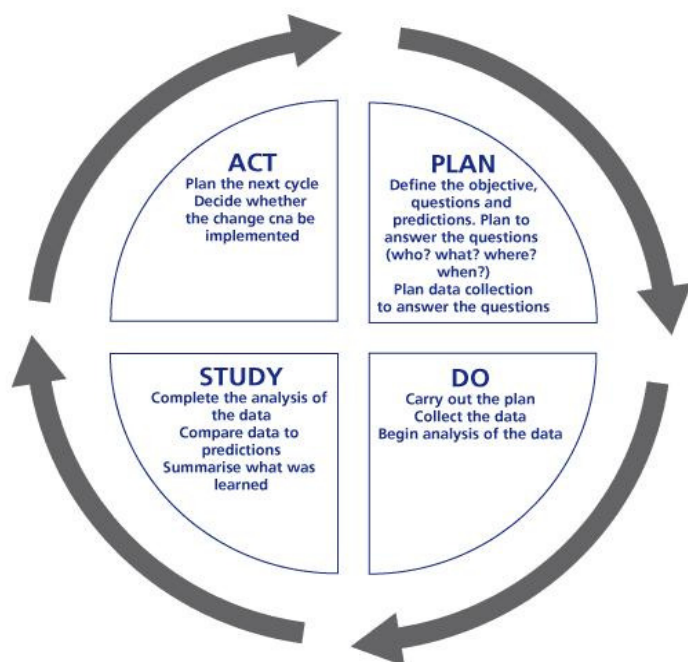
Maintaining independence with ADLs and IADLs is often a significant challenge for people with cognitive impairment or dementia. Without support and assistance with personal care, a client's overall health can be compromised. Medication reminders are a frequent need for TC-CCAC clients, even for those that may not require a personal support worker for personal care. Although some pharmacies and community support services offer telephone medication reminder services, these services are not available to the majority of TC-CCAC clients. Alternative aids to improve medication adherence require assessment.

One method of improving adherence is with a medication reminder device. There are several reminder devices that can assist with medication or other reminders (e.g., personal care, physician appointments, and social activities). Based on our experience, we choose to evaluate the device Reminder Rosie. Reminder Rosie is a voice-activated reminder system that can help clients with dementia maintain their independence with medication administration. The reminders are set using personalized voice recordings by a family member, caregiver or health care professional.

It is well established in medical literature that improved medication adherence can reduce health care costs. (Roebuck MC, 2011; World Health Organization, 2003). Although our objective was not to assess the impact of using Reminder Rosie on Health Care costs, it is something to bear in mind when considering the results of the pilot.

PDSA Improvement Cycle

The pilot utilized the PDSA improvement cycle.



Recruitment Criteria:

To be eligible to participate in our pilot project, TC-CCAC clients needed to meet the following inclusion criteria:

1. Be able to communicate with the device verbally, or have enough mobility and the mental capability to manage the device manually when needed.
2. Be able to physically take medications independently
3. Have medication adherence below 70%
4. Be motivated to improve medication adherence

Clients were excluded if they:

1. Had hearing impairment that affected their ability to interact with Reminder Rosie
2. Experienced auditory hallucinations

Client category targets

1. Mental health (4 max)

2. Dementia and Cognitive impairment
3. Complex Medication regimen

Recruitment Process

1. Referral from TC-CCAC pharmacists, rapid response nurses (RRN), care coordinators (CCs) or nurse practitioners (NPs)
2. All referrals directed to TC-CCAC pharmacists
3. Pharmacists determined client's eligibility based on the abovementioned criteria
4. Pharmacists presented the project to the client and caregivers, received consent and discussed options on how to proceed with device setup
5. Home visit scheduled to meet with the client and caregivers to set up device
6. Phone follow up after the first reminder
7. Home visit to follow up after one week of using the device
8. Home visits at 1, 2, and 3 months to assess usability, troubleshoot any challenges, and collect data
9. Additional follow up with client or caregivers as needed
10. At the end of 3 months, discuss continuation options with client and/or caregivers and additional options

Training

Reminder Rosie training was provided to pilot focus group members by LifeAssist staff. Clients and caregivers received training from TC-CCAC pharmacists.

Measurements/outcomes

The primary measurement outcomes for this pilot project included improvement in medication adherence, impact on client experience, and the impact on PSW/nursing utilization.

Medication adherence

The improvement in medication adherence measurements were:

- Percentage of clients that achieved an adherence rate of 80% or greater
- Percentage of clients that achieved an absolute increase in medication adherence of 30% from baseline

The targets to indicate success were:

- 75 % of clients achieve an adherence rate of 80% or greater
- 50% of clients achieve an absolute increase in medication adherence of 30% from baseline

Client experience

Device training effectiveness evaluated by assessing:

- Confidence using device
- If client found training easy to understand

Client experience with the device was also evaluated in the following domains:

- Device helpfulness
- Device ease of use
- Ease of remembering to take medications
- Ease of remembering appointments

Resource Utilization

Resource utilization measurements were:

- A percent decrease in PSW hours used for medication support that is directly related to the medication reminder device
- A percent decrease in the amount of time PSWs/caregivers spend supporting clients with medication administration

The targets to indicate success were:

- Any decrease in PSW hours directly related to the medication reminder device

Any decrease in the amount of time PSWs/caregivers spent assisting with medication administration

Results

Demographics

A total of 11 clients were enrolled in the pilot project. Pharmacists recruited the majority of clients with some referrals coming from RRNs and CCs. Ten of the clients had a diagnosis of memory or cognitive impairment of various causes (e.g., Alzheimer's disease, vascular dementia, and alcohol -induced dementia) and one client had a mental health diagnosis as the primary reason for enrollment.

Table 1: Client demographics

Client numbers	Number of clients enrolled	11
	Number of clients completing pilot	7
Recruitment Source	Pharmacist	6
	RRN	3
	CC	2
Diagnoses	Memory/cognitive impairment	10
	Mental health issues	1

Reasons for not completing the pilot project included:

- dementia too advanced to properly use device- 3 clients (1 caregiver wanted to keep the device as sound of daughter's voice comforting to client)
- client resistant to device – 1 client- (family member wanted device but client resisted from the beginning and didn't accept device over time)

Medication Adherence

Only clients completing the pilot were included in the medication adherence results. All clients used compliance packaging (i.e., blister packs) and were able to self-administer their medications.

Table 2: Medication Adherence Results

Measurement	Result	Target	Comments
Percentage of clients achieving an adherence rate of 80% or greater	6/7= 86 %	75 %	Target exceeded by 11 %
Percentage of clients that achieved an absolute increase in medication adherence of 30% from baseline	4/7= 57%	50%	Target exceeded by 7%

Client Experience:

TABLE 3: Training Effectiveness and Satisfaction

	Measurement	1 week	1 month	2 months	3 months
Training Effectiveness	Confidence using device*	7/7= 100%	7/7= 100%	7/7= 100 %	6/7= 86%**
	Training easy to understand	7/7= 100%	NA	NA	NA
Client experience	Device helpful	7/7= 100%	7/7= 100%	6/7= 86%	6/7= 86%
	Device easy to use	3/7= 43%	6/7= 86%	4/7= 57%	6/7= 86%
	Easier to remember to take medications	7/7= 100%	7/7= 100%	7/7= 100%	7/7= 100%
	Easier to remember appointments	2/7= 29%	2/7= 29%	2/7= 29%	NA

*Expectation for most clients was using very basic features of the device (turn off reminder, in some instances being able to ask “What time is it?”, “What day is it?”). One client was able to learn how to record a new reminder independently.

** 1 client reported not being confident in ability to record new reminders, but likely wouldn't have been able to due to dementia

Other benefits- comments

- 1 family reported that they were less concerned about client's medication adherence- reduced stress level
- Easier to move- better control of Parkinson's symptoms
- Worrying less about medications
- 1 client reported she remembered medication, insulin and blood sugars checks much more than before- makes client feel more confident and independent in her ability to self-manage her diabetes

New reminders

- New reminders were mostly added by the pharmacists
- 1 client added reminder for weekly support group
- 2 clients had reminders for next pharmacist follow-up at 1 month and 2 month
- 1 client added 2 hr post prandial blood glucose and home visit appointments
- No new reminders added at 3 months

Challenges and other feedback

- 1 client had electrical issues in room that prevented device from working properly initially, resolved by moving to a different outlet and inserting batteries (time and date lost)
- 1 client had difficulty remembering how to turn reminder off at 1 month follow up (despite instructions being provided), no issues after this was reviewed
- 1 client reported that device was too loud on low volume setting
- 1 client's daily routine got off track, was sleeping odd hours and missing reminders
- 1 client had difficulty addressing technical issues and didn't contact pharmacy for support
- 1 client continually relocated the device. She reported the reminders would go off at incorrect times (e.g., 3am). We suspect this may be due to dropping and damaging the device when it was being moved.

Suggested Improvements (from clients)

- Would like reminder to include day of the week for orientation
- Would like all reminders to be listed in the morning so she can write reminders down on paper and know what to expect for the day

Post Pilot Device Use

- 4/7 wanted to continue with Rosie
- 1 client moved to LTC, another found device annoying and didn't want to continue, another didn't find the device helpful.

Device cost

- 3/7 willing to pay \$50 to keep device
- 2/7 client reported that \$50 was a reasonable amount but couldn't afford
- 1 client's pharmacy was willing to pay for device for a client; 1 client had supportive spouse offering to pay for device
- all client reported not being willing/able to pay \$150
- 5/7 would recommend device- one client reported it would depend on the situation

Resource Utilization

The impact on resource utilization was more challenging to measure for the pilot as most participants (5/7) had no PSW services during the pilot period. However, the following impact on resource utilization was noted during the pilot:

- 1 client had decrease in PSW time spent on medications by 10 minutes per day
- 1 client had weekly nursing discharged
- 1 family reported spending less time on medication reminders but were unable to quantify time
- 1 client no longer needed daily PSWs for medication reminders (was originally 15 min each morning and evening)
- Target
 - Any decrease in PSW hours directly related to the medication reminder device
 - Any decrease in the amount of time PSWs/caregivers

If these changes were sustained over 12 months, the savings to TC-CCAC would be \$6268.

Since the ability to generalize the pilot results to a larger group was uncertain, a break-even analysis was performed using four utilization outcomes for 50 clients:

1. No change in PSW or nursing hours
2. PSW reduced by 30 minutes daily
3. PSW reduced by 1 hour daily
4. Nursing reduced by one our daily.

The first scenario (Table 4) demonstrates that if 94% clients had no change in PSW or nursing, 2% had a 30 minute decrease in daily PSW hours, 2% had a 1 hour reduction in daily PSW, and 2 % had a 1 hour reduction in daily nursing hours, the cost to TC-CCAC would be \$232. This would include the cost of the devices and 2 hours of staff time for training and follow-up.

Table 4: Cost analysis 1

Outcome	Number of clients	Cost/Benefit (1 year)	% of clients in each cohort	Cumulative %
No change in PSW or nursing hours	47	\$(8,360.00)	94%	100%
PSW reduced by 30 minutes daily	1	\$ 1,150.00	2%	6%
PSW reduced by 1 hour daily	1	\$ 2,430.00	2%	4%
Nursing reduced by 1 hour daily	1	\$ 5,118.00	2%	2%
		\$ (232)		

The second scenario (Table 5) demonstrates that if 86% of clients had no change in PSW or nursing and 14% had a 30 minute decrease in daily PSW hours, the cost to TC-CCAC would be \$120. This would include the cost of the devices and 2 hours of staff time for training and follow-up.

TABLE 5: Cost analysis 2

Outcome	Number of clients	Cost/Benefit (1 year)	% of clients in each cohort	Cumulative %
No change in PSW or nursing hours	43	\$ (8,170)	86%	100%
PSW reduced by 30 minutes daily	7	\$ 8,500	14%	14%
PSW reduced by 1 hour daily	0	\$ -	0%	0%
Nursing reduced by 1 hour daily	0	\$ -	0%	0%
		\$ (120)		

Discussion

When used for appropriate clients, Reminder Rosie improves medication adherence. Clients with advanced dementia were unable to use the device properly and those who were resistant to the device were not successful. Clients that benefited from the device were those who had mild cognitive impairment or mild dementia, had insight into their adherence issues, and were motivated to improve their medication adherence.

Targets were reached for adherence measurements- 86 % (target = 75%) of clients achieved an adherence rate of 80% or greater and 57% (target= 50%) of clients achieved an absolute increase in medication adherence of 30% from baseline: 4/7= 57%.

Clients were confident in their ability to perform basic functions on the device and one client was able to record reminders, however most clients would require ongoing support through family, caregivers or other healthcare professionals (e.g., social worker, pharmacist) to record and maintain reminders and to troubleshoot device issues. LifeAssist does provide Telephone Support, but more vulnerable clients may require home visits. Most of the device issues related to power supply were due to initially not installing batteries. Batteries were then installed in all devices and this reduced technical issues. Some clients using this device would need ongoing support from TC-CCAC.

Families involved with the device were comfortable using the device, including recording reminders. In most cases, families felt that having the device helped to reduce their stress levels as they were more comfortable knowing the client's medications were being taken more consistently.

Although clients found the device helpful and easy to use, most were unable to pay for the device- even with the lower cost of \$50 through the pilot project. All but one client found the device helped them to remember to take their medications. Fewer clients used the device for appointments and other reminders, but those that did found the device helpful.

As a result of improved adherence, one client reported improved mobility due to better controlled Parkinson's symptoms, another worried less about medications and another felt more confident and independent with diabetes management. Although the goal of this pilot wasn't to assess other outcomes such as health status, emergency room visits or health care costs, some information from this pilot indicates that other outcomes may be improved with using the device.

One of the goals of this pilot was to see a decrease in PSW hours used for medication support that is directly related to the medication reminder device. Most clients (5/7) had no PSW hours dedicated to medication administration. The small number of PSW hours for medication support may reflect that PSWs usually are not solely utilized for medication reminders. Also the clients in the project that responded more positively to the device were those with mild to moderate cognitive impairment. Since medication management is an IADL, clients may not have experienced enough progression in cognitive impairment to necessitate PSW support for ADL's which are more typically supported by PSWs.

Our most conservative break-even analysis demonstrated that only 7 (14%) TC-CCAC clients using Reminder Rosie would need to have a reduction in PSW hours of 30 minutes daily for the purchase of 50 devices to have a cost-neutral impact. In other words, even if 86% of clients resulted in no cost savings to TC-CCAC, we can bring benefit to clients with almost zero cost. In other words, even if the vast majority (86%) of clients receiving a Reminder Rosie Device paid for by the TC-CCAC had no benefit, the benefit seen by a small number of clients would result in almost zero net cost to the organization. Improving medication adherence would likely result in overall health care costs savings and could delay the need for PSW support for certain TC-CCAC clients.

Pilot Limitations

Sample Size

The small sample size of this pilot may have limited our ability to identify the type of TC-CCAC client that would benefit most (from a clinical and resource utilization perspective) from a reminder device.

Adherence measurement

Assessment of adherence was a snapshot based on pharmacy refill history and reviewing medication supply (usually blister packs). Adherence could only be estimated based on these surrogate measures.

Actual adherence may be more or less than what was determined in this pilot. Also, surrogate adherence measurement doesn't necessarily mean that the medications were taken by the client.

Special considerations

During the pilot, several clients improved their adherence considerably. It is important to consider the impact of improving adherence dramatically over a short period of time. Rapid improvements in adherence could, in some situations, increase the risk of side effects and adverse events. The client's clinical status must be considered. For example, if a client is prescribed a blood pressure medication but blood pressure is only slightly elevated, restarting medication may result in hypotension. Also for medications that require titration, restarting the medication at the full dose may increase the risk of side effects (e.g., Parkinson's medications and gastrointestinal effects).

Next steps

Adherence was improved in this pilot project, but the cost effectiveness for TC-CCAC is unclear as most clients didn't require PSW support for medication reminders. The pilot wasn't designed to evaluate the impact to the health care system as a whole (e.g., health care utilization, ED visits etc.), but if savings in this area were evaluated we would expect to see a decrease in overall health care costs as indicated in other adherence literature. This may or may not be enough to justify supporting the use of this device for TC-CCAC clients who can't afford to purchase the device.

Recommendation

The Reminder Rosie device improved medication adherence and had an impact on client well-being which in itself may be grounds for TC-CCAC to consider providing the device to certain clients. The overall costs savings to TC-CCAC are difficult to predict, but savings are likely given the break-even analysis. It is expected that reminder devices would decrease overall health care.

If TC-CCAC were to consider paying for a reminder device, we would suggest the following criteria for coverage:

- Documented medication adherence of 50% or less
- Intrinsic client motivation to use the device
- Mild- moderate cognitive dysfunction
- Client or family unable to pay for device
- Private insurance or other funding unavailable (e.g., Alzheimer's Society)
- 1 month device trial demonstrating an increase in medication adherence of 80% or greater
- Availability of long term support for the device through family, caregivers or other health care professionals (e.g., pharmacist, social worker, case worker)

We recommend that TC-CCAC consider:

- Entering into discussions with LifeAssist Inc. to purchase some devices (e.g., 50 units) to better evaluate the impact on PSW and nursing utilization.
- Engaging with LifeAssist to present at Team Meetings, lunch and learns or divisional meetings so that CC's are aware of options to assist with medication adherence. It would be critical to also present the pilot project results so as to better inform CCs about the types of clients that are most likely to succeed with the device.
- Engaging with service providers regarding the device, its capabilities and limitation.

References

Roebuck MC, L. J. (2011). Medication Adherence Lead to Lower Health Care Use and Costs Despite Increased Drug Spending. *Health Affairs*, 91-99. Retrieved from <http://content.healthaffairs.org/content/30/1/91.full>

World Health Organization. (2003). *Adherence to long-term therapies: evident for action*. Retrieved from WHO: http://www.who.int/chp/knowledge/publications/adherence_report/en/

Appendix

Reminder Rosie Pilot Steps (check when completed)

Determine that client may benefit from reminder device.

Demonstrate Reminder Rosie with simple reminder.

If client/caregiver interested in trying RR, review project with client/caregiver (see Script).

If client/caregiver agrees to participate, complete Reminder List Form (see form), and administer pre-assessment form.

Program device at current visit (usually away from client to reduce confusion) OR schedule another HV and record reminders prior to HV so RR is set up and ready to do at HV. Consider recoding reminders in a different room, but try to record reminders when RR is plugged in.

Complete data collection form.

Leave copy of “How Reminder Rosie Works” with client/caregiver, along with your contact information.

Contact client/caregiver by phone after first reminder to address any problems or questions.

Document any comments or issues.

Contact PSW supervisor (if relevant) to inform of device and project. Offer to meeting with PSW if needed.

Schedule follow-up HV for 1 month and update data collection form.

Schedule follow-up HV for month 2 and update data collection form.

Schedule follow-up HV for month 3 and update data collection form and administer post-assessment survey.