

# **Does PERS and Falls Prevention Information Reduce Stress, Anxiety, Falls Risk, Hospital Admission and Emergency Room Use for Older Adults on the Wait List for Home- and Community- Based Services?**

## **Final Report**

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## Introduction

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The Area Agency on Aging 1-B (AAA 1-B) recognizes that an older adult's ability to function independently is one of the most important quality of life factors. However, functional ability can diminish with increasing age. It is estimated that 80% of persons age 65 and older have at least one chronic health problem, and 50% have two or more debilitating health conditions. Individuals with multiple chronic conditions are at a greater risk of hospitalization. While older adults represented 13% of the U.S. population in 2006, they accounted for 38% of acute care hospital admissions (National Health Statistics Reports, 2008).

A successful technology to help older adults live independently and prevent or avoid premature and/or prolonged hospitalization is a Personal Emergency Response System (PERS). PERS subscribers are often individuals at medical or social risk of various problems such as cardiovascular events, falls, respiratory conditions, immobility, and depression. The PERS program is a 24-hour emergency response service activated by an FM frequency alert transmitter worn by the subscriber. Program subscribers use two pieces of equipment in their home: a small personal help button that is worn on a neck chain or as a wristband, and a home communicator that is connected to the residential telephone line. The communicator is activated when the button is pressed, relaying a "help needed" signal to the Emergency Response Center (ERC) and help is deployed. If the older adult cannot reach the phone, the system has a built in speaker.

PERS can help older adults get immediate assistance when a serious home-based accident occurs, whereas delayed attention can result in a preventable emergency room (ER) visit or hospital admission, prolonged hospital stay, premature nursing home admission, or death. Studies have shown that the installation of a PERS unit has resulted in a significant decline in hospitalizations and hospital stays for at-risk, frail older individuals residing in the community. Additionally, the use of a PERS unit has been associated with increased mental health status and an enhanced sense of personal security, which has the potential to reduce emergency room utilization. Additionally, reductions in the utilization of community support services have occurred. While research has demonstrated the economic, health, and emotional benefits of having a PERS unit, the program is often inaccessible and underutilized by those most in need. Despite its proven benefits, the cost has made the PERS program unaffordable for some low-income older adults residing within the community. The average monthly cost is \$25 - \$35, and a typical installation fee is \$50. Research suggests that utilization would be more widespread if these costs were subsidized (McGadney-Douglass, 2001).

Through its Community Support Services Department, the AAA 1-B provides care management programs that help frail, older individuals and adults with a disability avoid or delay institutional placement while fostering independent living. These programs include community care management, in-home services, and the MI Choice Medicaid Waiver program. However, federal and state funding allocations are insufficient to serve all individuals requesting service through these programs.

In its commitment to preserve the independence and promote the health of older adults to the maximum extent possible given available resources, the AAA 1-B has arranged a discounted monthly PERS unit rate of

\$15 with two southeast Michigan personal emergency response providers, Critical Signal Technologies and Guardian Medical Monitoring. To promote the utilization of this technology, the AAA 1-B has utilized long term care service funds to offer the PERS service for older adults waiting to receive In-Home Services, Care Management, and MI Choice programs for a one-year period at no cost. The project was implemented to test and develop the principles of the agency's Community Living Program, which incorporates partner agencies into the eligibility verification and enrollment process, with the goal of supplanting the need for wait list services and delaying or preventing dependence on long term care services.

In 2009 the AAA 1-B maintained a wait list of 1,627 persons who need in-home services, or assistance in paying for in-home services that include personal care, homemaking, respite, and MI Choice. Beginning on July 1, 2009, the AAA 1-B contacted older individuals residing in Livingston, Macomb, Monroe, Oakland, St. Clair and Washtenaw counties who were waiting to receive service through the AAA 1-B in-home service programs and offered them a PERS unit for a one-year period at no cost. The AAA 1-B contacted 1,200 people, and 83 accepted the offer of a PERS device. All PERS recipients also received fall prevention material produced by the Center for Disease Control (CDC). Benchmark participant data listed below was collected by the PERS Eligibility Specialist at initial enrollment:

- Level of stress and anxiety
- Utilization of falls reduction strategies
- Incorporation of environmental hazard risk reduction techniques
- Frequency of hospital room admissions
- Emergency room usage

Telephone interviews were conducted with participants and/or their caregivers, and data was collected for each measure. Six months and one year after first receiving their PERS device and fall prevention materials, follow-up contact was made with the project participants and the survey instrument was re-administered.

This report contains the findings regarding the 55 participants who have had their devices for one year. The purpose of the report is to determine whether there has been a change within the group six months and one year after the initial assessment. The data was collected and entered into Stata for analysis.

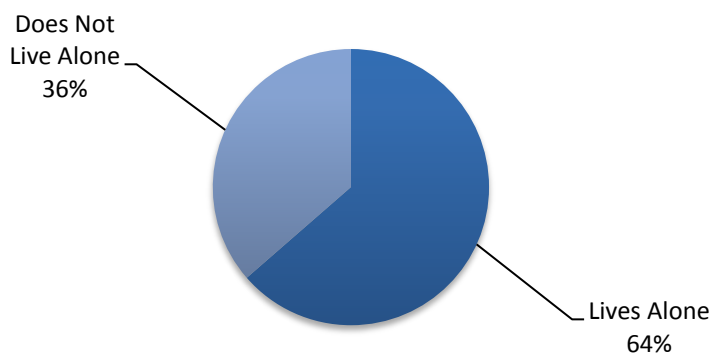
It is important to keep in mind the limitations of this study. The sample was relatively small, and there was no comparison group or individuals that did not receive the intervention. Additionally, the attrition rate was fairly high. For various reasons, only 55 of the 83 individuals initially enrolled in the intervention study maintained the PERS for one year. It was difficult to control for other factors that may have influenced the outcomes of this study, such as changes in respondents' health status or living situation. Despite these limitations, evidence suggests the provision of a PERS unit and falls prevention material materials can potentially lead to decreased hospital admissions, increased wellbeing and feelings of personal safety, and decreased falls risk. Additionally, the deployment of this intervention can help reduce waitlists for care management and in-home services.

## Respondent Characteristics

A total of 55 respondents were interviewed both before and after receiving the PERS and fall prevention material.

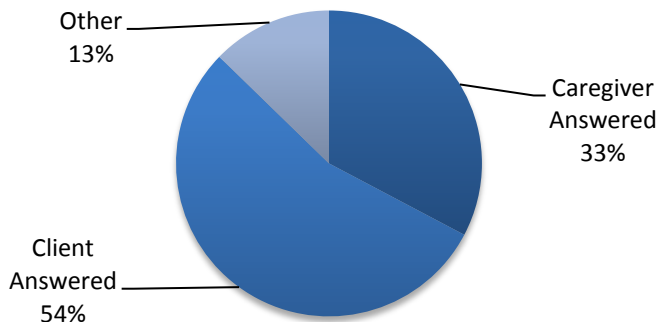
- The respondents ranged in age from 53-110 years.
- The average age of the respondents was 78.2 years.

### Respondents' Living Arrangement



Thirty-five respondents reported living alone, while twenty respondents reported living with at least one other person.

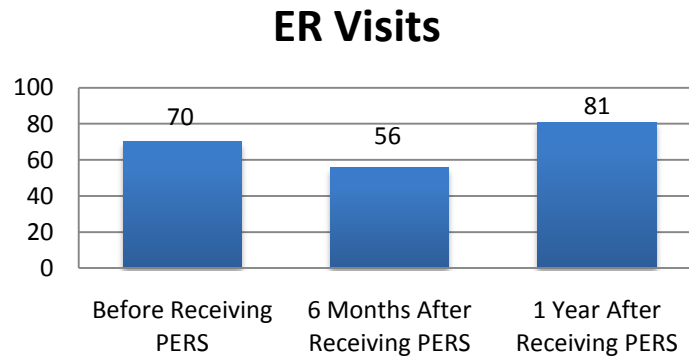
### Who Answered Questions



In 18 of the cases, a caregiver answered all questions on behalf of the client. In 30 cases, the client answered all questions on his/her own behalf. In seven cases, the caregiver answered the questions before receiving the PERS and fall prevention material, but the client answered after receiving the PERS and fall prevention material at six and twelve months.

## Emergency Room Visits

Q 1: “Within the past six months, how many times did you receive treatment from the hospital emergency room?”

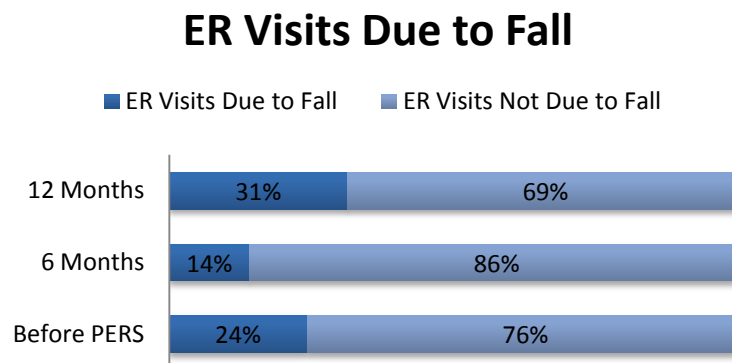


Respondents experienced a 20% decrease in the number of ER visits six months after receiving the PERS unit. However, one year after receiving PERS, ER visits increased 16%. It is therefore difficult to assess the impact of PERS on ER utilization.

Q 1a. “How many of these visits were because you had fallen?”

- Before PERS: 17 of 70 visits
- Six Months After PERS: 8 of 55 visits
- One Year After PERS: 25 of 81 visits

In addition to reporting a decrease in the number of hospital emergency room visits, the number of emergency room visits due to falls initially decreased from 24% to 14% after the participants received the PERS device and fall prevention material, but increased to 31% after one year.

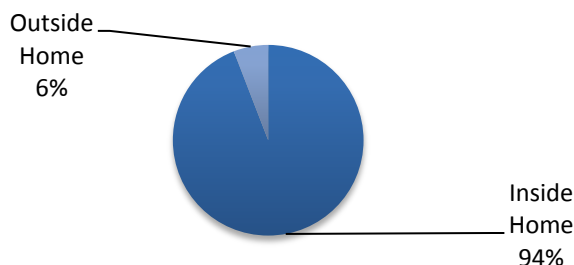


## Fall Location

### Q 1b. “Where did these falls happen?”

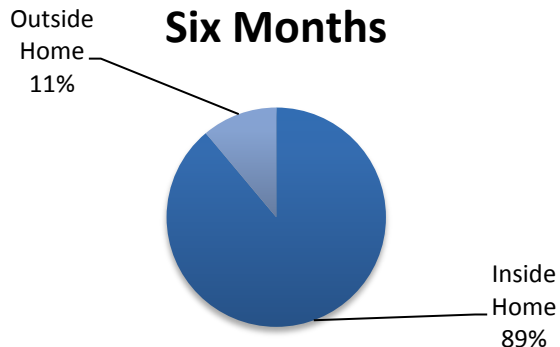
When assessing falls related to emergency room visits, respondents reported a total of 17 falls before receiving the PERS and fall prevention materials. Of these 17 total falls, 16 occurred in the home (bathroom, bedroom, kitchen, living room, hallway, laundry room, partition area, or in-home office), and one occurred outside of the home (grocery store).

### Falls Locations Before Receiving PERS

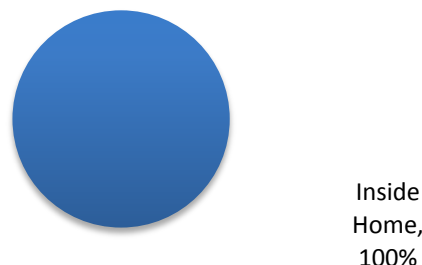


A similar trend occurred six months and one year after receiving the PERS device and the fall prevention material. At six months, respondents reported eight falls inside the home (bathroom, bedroom, kitchen, living room, and hallway) and one fall outside the home (exact location unknown). When assessing the location of falls after one year, all 25 occurred inside the home (bathroom, bedroom, kitchen, living room, and hallway).

### Falls Locations, Six Months



### Falls Locations, One Year



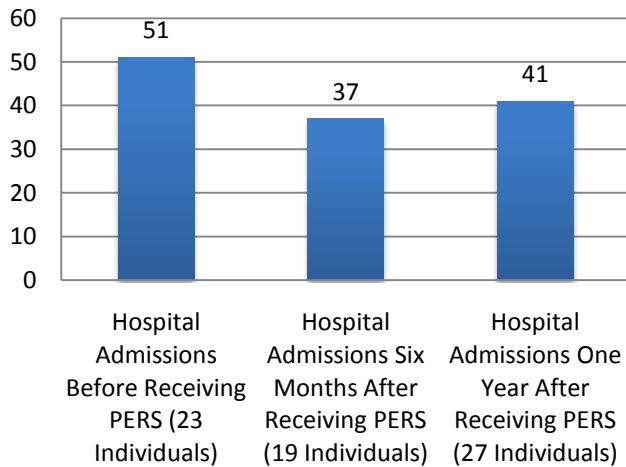
While data indicates that there was an increase in the number of fall-related ER visits, the mean difference was not significant. Because the number of respondents in the sample who experienced a fall-related ER visit is relatively small, a larger sample is needed to analyze whether receiving the PERS and fall prevention material significantly impacts the number and location of falls.

## Hospital Admissions

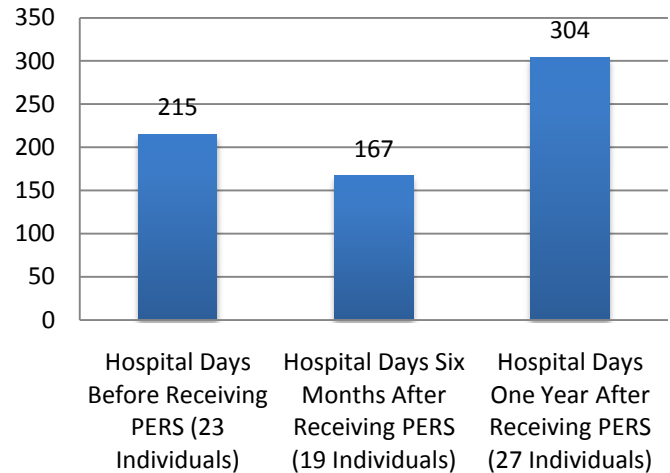
Q 2. “Within the past six months, how many times were you admitted to the hospital?”

Q 2a. “How many days did you spend there?”

### Hospital Admissions



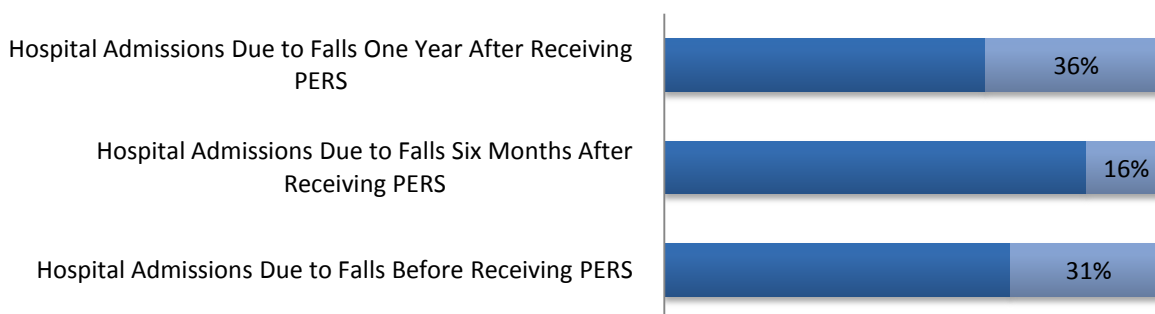
### Hospital Days



The number of hospital admissions **decreased by 27% after six months, and by 20% after one year**. While hospital days decreased by 22% six months after the respondents received the PERS unit, the number of days spent in the hospital increased by 29% after one year. Part of this increase can be attributed to two respondents incurring a substantial number, or 71, hospital days during the latter part of the study period.

Q 2b. “How many of these admissions were due to injuries from falls?”

### Hospital Admissions Due to Falls

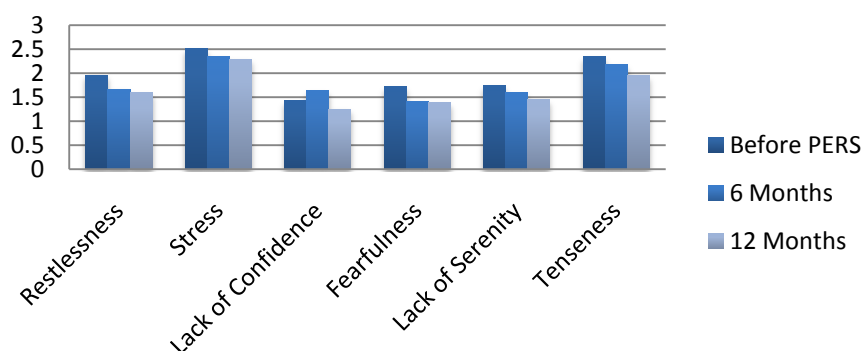


When considering whether hospital admissions were due to falls, preliminary data indicates that the falls decreased from 31 to 16% after six months, and then increased to 36% after one year.

## Well-being and Feelings of Personal Safety

**Q 3-8.** Respondents were asked a series of six questions to assess their overall wellbeing and feelings of stress and anxiety regarding personal safety. A five-point Likert scale was used. Response categories ranged from 0=Never to 4=Very Often, with a lower score being indicative of a lower stress level and anxiety regarding personal safety. It is important to note that a decrease in a respondent's score at six and twelve months suggests that their wellbeing and feelings of personal safety actually improved after receiving the PERS unit and fall prevention materials.

### Wellbeing and Feelings of Personal Safety Indicators



All measures used to assess overall wellbeing and feelings of personal safety demonstrated a decline after the 12-month study period, suggesting that receiving a PERS unit and fall prevention material decreases stress and anxiety regarding personal safety. When analyzing scores respondents' scores before they received their PERS unit to one year later, a T-Test confirmed a significant improvement in the following measures:

- **Restlessness:** Before receiving the PERS and fall prevention material, the average mean score indicating respondents' feeling of restlessness was 1.98. After receiving the PERS and fall prevention material, the average score significantly ( $p < .05$ ) decreased to 1.61.
- **Fearfulness:** Respondents reported feeling fearful significantly ( $p < .05$ ) less often. Before receiving PERS and fall prevention material, the average mean score was 1.69. After receiving PERS and fall prevention material, the average score decreased to 1.38.
- **Tenseness:** When analyzing respondents' mean scores indicating feelings of tenseness, there was a significant ( $p < .05$ ) improvement. Before receiving PERS, the average mean score was 2.35. After receiving PERS and prevention materials, the score decreased to 1.98.

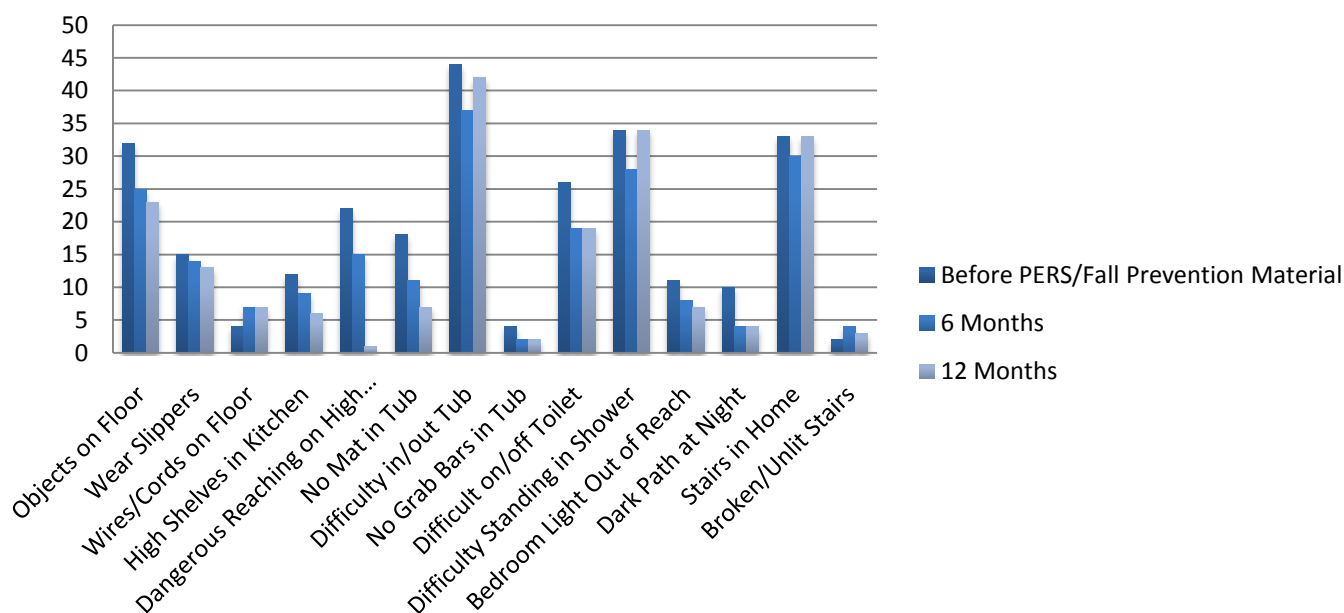
A composite was created by tabulating the scores from all measures (restlessness, stress, confidence, fearfulness, serenity, and tenseness). The overall mean score decreased approximately 15% and demonstrated a significant ( $p < .05$ ) improvement ( $T_1=11.68$ ;  $T_3=10.11$ ). **This supports the AAA 1-B's**

**hypothesis and suggests that receiving the PERS unit and fall prevention information improves respondents' wellbeing and decreases stress and anxiety regarding personal safety.**

## Fall Risks

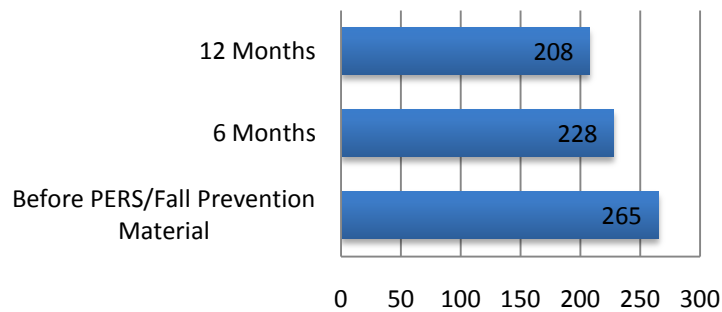
Q. 9-19. Respondents were asked a series of questions about their home environment to measure their fall risks before and after receiving PERS. The chart below shows the number of respondents who indicated that each fall risk or behavior was present in their home before receiving PERS and fall prevention material, and then 6 and 12 months after receiving PERS and fall prevention material.

### Respondents with Falls Risks



After receiving PERS and fall prevention material, fall risks decreased in ten areas, stayed the same in two areas, and increased in two areas. Individual responses were at times inconsistent, answering questions differently at the second interview despite the probability that their environment did not change. Although none of the respondents had moved, three respondents answered the question “Do you have stairs in your home” as “yes,” then after receiving the PERS and fall prevention material, answered the same question “no” at 6 months and “yes” at 12 months. Such inconsistencies could be because specific operational definitions were not provided. For example, it is unclear how a respondent should answer this question if he/she lives in a one-story home with only one or two stairs between a living room and a kitchen, or leading out to a garage.

## Total Number of Fall Risks



Despite the inconsistencies of individual respondents, results show a decrease in fall risks for respondents. As indicated, the total number of fall risks decreased almost 22%, or from 265 identified risks before receiving the PERS and fall prevention materials to 208 identified risks after receiving the intervention. Defined risks were calculated and a composite score was obtained as a fall risk indicator. **A T-Test was conducted, and results demonstrated that the number of fall risks reported by respondents was significantly lower ( $p < .001$ ) at T3 (mean/average=4.10) than T1 (mean/average=5.08).** This suggests that an acquisition of both the PERS unit and falls prevention material can lower overall fall risks.

## Home Injury Control

**Q 20.** Respondents who had the most immediate fall risks (as indicated by positively answering any of the fall risk questions marked with an asterisk) were asked if they would allow the interviewer to send them a referral for a Home Injury Control (HIC) provider to address problems noted in the home. While all respondents had at least two indicators of risk present at baseline, only 16 responded that they would like a HIC referral before receiving PERS and the fall prevention material. Three of the 55 respondents refused to answer this question.

At six months, all 55 of the respondents indicated that they did not want HIC material sent to them (there was missing data for this question for one respondent) although all had identified risks. After 12 months, one respondent requested a HIC referral

Interviewers did not ask the respondents whether they had contacted the HIC provider and received a home assessment; the only data collected pertained to whether or not a referral for a HIC provider was given to the respondents.

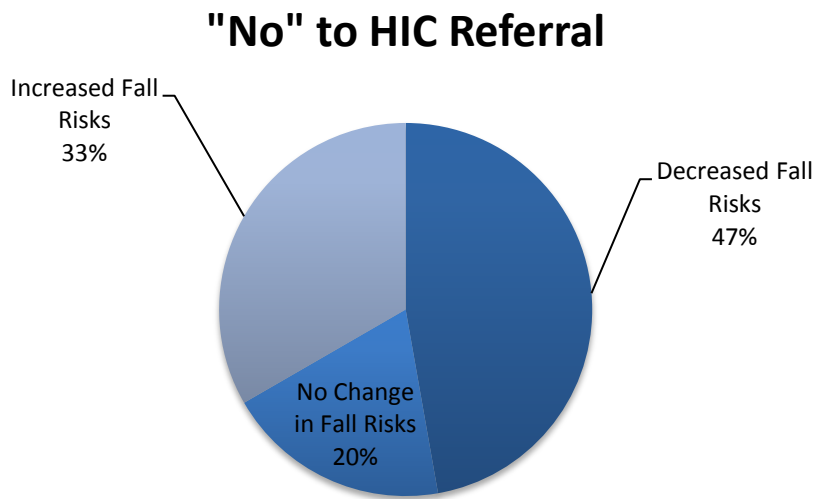
Of the 16 respondents who said they wanted a HIC referral, 13 decreased the number of asterisked fall risk indicators present after they received their PERS device and fall prevention material. For two respondents who answered “yes” to the HIC question, there were no changes in the number of asterisked indicators present; and for one respondent who agreed to the HIC referral, the number of asterisked indicators increased. The changes in the number of fall risk indicators for respondents who wanted to receive a HIC referral is reported in the table below:

"Yes" to HIC Referral	
Decreased Fall Risks	13
No Change in Fall Risks	2
Increased Fall Risks	1
Total Respondents	16



Of the 36 respondents who refused the HIC referral before receiving their PERS device and fall prevention material, 17 decreased the number of asterisked indicators present after they received it. For seven others who refused, there were no changes in the number of asterisked indicators present; and for the remaining 12 respondents who refused the HIC referral, the number of asterisked indicators increased. The changes in the number of fall risk indicators for respondents who did not want to receive a HIC referral is reported in the table below:

"No" to HIC Referral	
Decreased Fall Risks	17
No Change in Fall Risks	7
Increased Fall Risks	12
Total Respondents	36



Although not statistically significant ( $p=.07$ ), there appears to be a substantial impact from accepting or declining a HIC referral on fall risk reduction. While 33% of respondents that replied “no” to the offer of a HIC referral increased their falls risk at T3, only 6% of those responding “yes” to the offer of a HIC referral increased their falls risk during over the same one-year period. These findings suggest that receiving a HIC referral can decrease the risk of a fall within the home, and demonstrates the importance of funding this community service.

## Needs

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### Q 21. “Is your PERS unit meeting your needs?”

This question (and all questions listed hereafter) was asked at six months and one year after the respondents had received their PERS and fall prevention material.

**At six months, all but one respondent (n=54) answered yes—their PERS is meeting their needs.** One respondent answered no; he felt the PERS unit was not working, and was advised to call customer service by the interviewer.

After one year, 88% of respondents reported that their PERS was meeting their needs. Of those indicating that PERS was not meeting their needs, two respondents’ adult children wanted the PERS for their parent but the client did not feel it was needed, one respondent never used the unit, and one individual declined to answer.

### Q 22. “Do you have any additional needs?”

At six months, 43 respondents indicated that they did not have any additional needs or declined answering this question.

Twelve respondents indicated that they had additional needs.

- Five respondents specifically mentioned needing assistance with chores.
- Six respondents also mentioned mobility assistance needs, such as:
  - Help getting out of the bathtub
  - Needing a cane
  - Assistance driving
  - Assistance with Activities of Daily Living (ADLs)
- One client indicated needing assistance because they were recovering from hospitalization due to illness.

Twenty five respondents indicated that they had additional needs at twelve months:

- Six respondents specifically mentioned needing assistance with chores.
- Fourteen respondents cited mobility assistance needs, such as:
  - Help getting out of the bathtub
  - Shopping
  - Assistance with Activities of Daily Living (ADLs)
- Two respondents reported needing financial assistance because of difficulty paying bills.
- Two indicated needing assistance because they were scheduled for surgery.

The increase in needs for assistance after twelve months suggests that the respondents were collectively more fragile twelve months after their initial interview, which is understandable because they are a disabled population with chronic conditions, who for the most part did not receive needed in-home services. This may explain why utilization of some health care services decreased during the six months after first receiving PERS and fall prevention information, but increased from these levels the following six months.

### Q 22a. “How are you meeting those needs now?”

Of the twelve respondents with additional needs at the six month interview, seven were relying on friends, family, or informal caregivers to meet their needs. The other needs are being met independently by:

- Buying a cane for mobility assistance
- Drinking supplement shakes to help gain weight
- Only taking a shower because it is difficult to get out of bathtub
- Calling physician

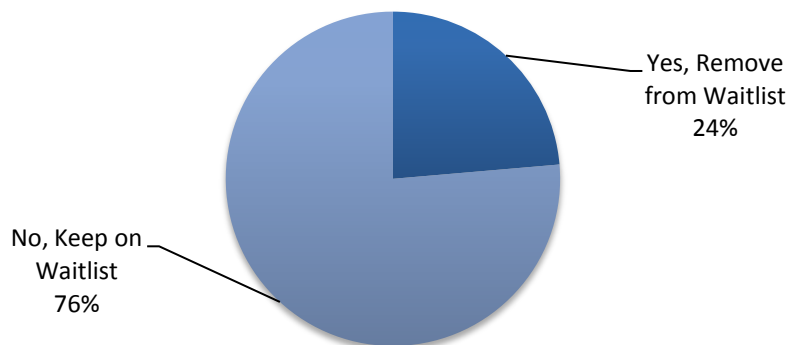
One respondent was referred to the AAA 1-B Information and Assistance program for help with their needs.

When considering how needs are being met at the twelve month interview, 21 of the 25 respondents reported that they are relying on friends, family, formal or informal caregivers to meet their needs. The other needs are being met by independently calling a physician or performing the task, and putting themselves at greater risk.

## Wait List Removal

Q 23. “You’re currently on a waitlist for care management, in-home services, or the Medicaid Waiver program. Should we remove your name from that list?”

### Remove Respondent from Waitlist



Twelve months after receiving their PERS unit, forty-two respondents wanted to remain on the waitlist, while thirteen respondents wanted to be removed from it.

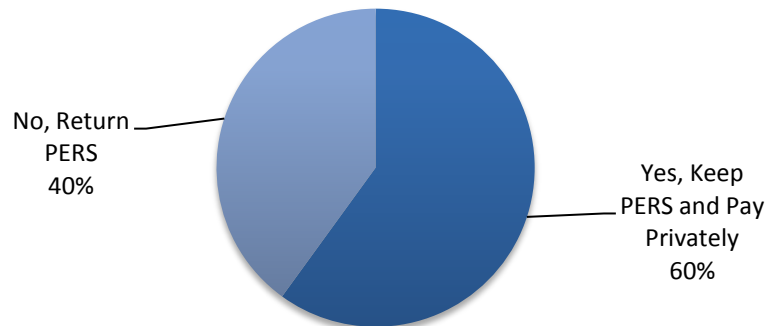
While 24 respondents indicated at the six and twelve month interviews that they did not have any additional needs (Question 22), only 7 or 29% of those 24 were the individuals who requested to be removed from the wait list. Thus, supplying wait-listed individuals with PERS devices was associated with a wait list removal request from just over half of those who asked to be removed.

## Keeping PERS Unit

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### Q 24. “Do you plan to keep your PERS unit?”

#### Keep PERS and Pay Privately

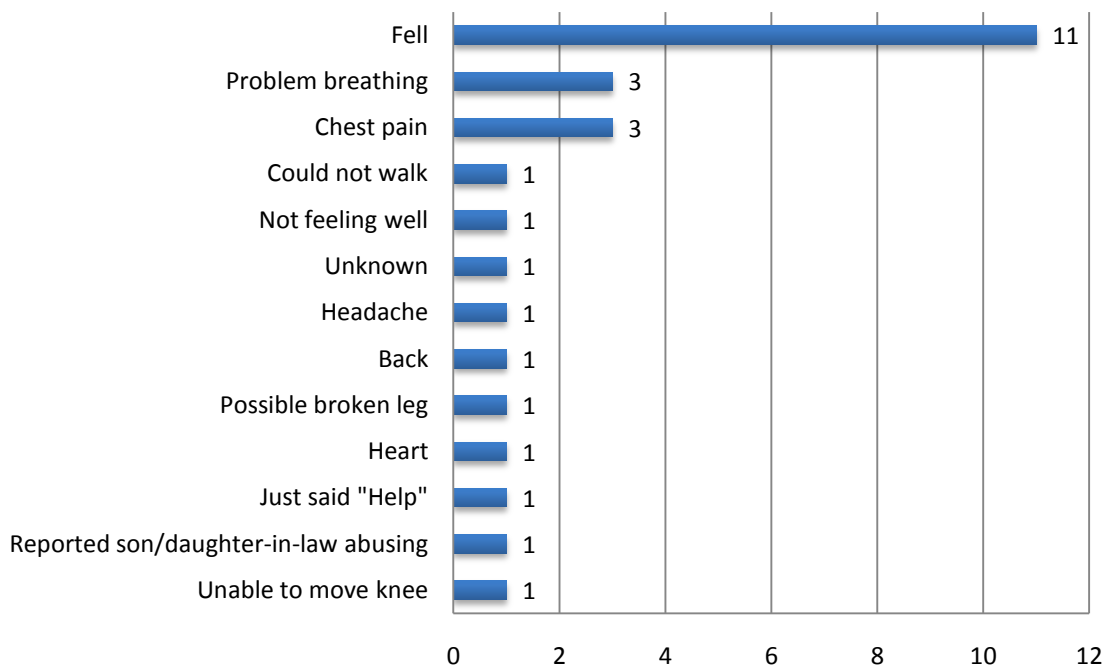


One year after having the PERS unit, respondents were asked whether they would like to keep the PERS device and pay on their own, or return it to their PERS provider. Thirty-three or 61% of respondents indicated that they wanted to keep the PERS device and pay privately. This finding suggests that older adults and their family members recognize the value of PERS service because of their expressed desire to pay for it from their own funds. However, several individuals who expressed a desire to keep their PERS unit were forced to return it because they believed that they could not afford the discounted \$15 per month charge for the second year.

## ***PERS Activation/Emergency Response Center Deployment***

One year after deploying the PERS units to respondents, reports were obtained from the two personal emergency response providers, Critical Signal Technologies and Guardian Medical Monitoring, to assess the number of times the PERS unit was activated by respondents for health-related reasons. During the one-year period, 17 respondents (31%) depressed the button on their unit to call for help. The following provides a depiction of reasons for activating the unit:

### **Reasons for PERS Activation and ERC Deployment**



In total, respondents' PERS units were activated 41 times (mean 2.41) for health-related reasons and the Emergency Response Center (ERC) was deployed. The primary reason for activating the PERS unit was due to a fall within the home (29%). Other reasons involving multiple activations included problems breathing (7%) or chest pain (7%).

## Conclusion

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Based on these results, the AAA 1-B suggests that the provision of PERS and fall prevention material can have a significant impact on decreasing stress, anxiety, and falls risk. Though the measure pertaining to number of hospital admissions was not statistically significant, findings indicate that there was a decline after six and twelve months. It is also important to recognize the impact of accepting or declining a HIC referral on falls risk reduction. As compared to those refusing the HIC referral, those accepting the referral had a substantial decline in falls risk.

In all, thirteen of the respondents wanted their names to be removed from the wait list at the end of the study period. However, the PERS service may not have been the determining variable for some of the wait list removal requests.

Finally, the study demonstrates the importance of maintaining a PERS to study respondents. Sixty percent chose to keep the unit after 12 month and privately pay for service. This finding substantiates the hypothesis that many older adults and their family caregivers will pay for the PERS service after they have used it for a free trial period.

It is essential to keep in mind the limitations documented at the onset of this report, the relatively high attrition rate, absence of comparison group, and inability to control for other influential factors. Additionally, the sample is relatively small, which makes subgroup analysis difficult. It is also important to account for the age of the respondents: with an average age of almost 79, it is reasonable to suggest that the functioning of some individuals may be naturally deteriorating.

**Based on the findings, the AAA 1-B believes that the provision of a PERS and falls prevention materials contributed to lowering hospital admissions; reducing consumer anxiety and sense of personal safety; decreasing falls risk; and reducing the MI Choice and In-Home Service wait lists. The AAA 1-B recommends that the provision of PERS and fall reduction materials to individuals on the AAA 1-B MI Choice and In-Home Service wait lists be continued as a permanent service under its community living program because of the demonstrated outcomes.**

*The Area Agency on Aging 1-B is indebted to Critical Signal Technologies and Guardian Medical Monitoring for their generous contributions of significant subsidies that have allowed this project to help many at risk individuals waiting for the help they need to maintain their independence.*