
Evaluation Report

Remembering When Fire and Fall

Prevention Program for Older Adults

Prepared for:

**The Centers for Disease Control and Prevention
Division of Unintentional Injuries**

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December 29, 2004

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Executive Summary

Background. Falls are the leading cause of injury death among older adults. Residential fires kill nearly 3,600 people, injure 16,000, and cost \$5 billion in direct property damage each year. Remembering When is one of the few “off the shelf” programs available for communities to use to address prevention of fires and falls by older adults. The educational program contains eight messages each on falls and fires. The National Center for Injury Prevention and Control (NCIPC) contracted for an evaluation of this program to determine its effects on participant knowledge and home safety behavior. This report focuses on the evaluation of the group presentation format of the program.

Methodology. The evaluation was conducted over a two year period in the state of Virginia which was deemed to have a stable and well received program. A quasi-experimental design was used to collect data at the treatment site in New River Valley (NRV) and at a control site in Roanoke. Data collection included the following: observations of training at 23 program presentations; pre, post and follow-up (2.5 or 5 month) questionnaires directed at safety knowledge and self-reported safety behavior; and initial and follow-up (2.5 or 5 month) home assessments directed at safety measures in the home. A total of 1913 questionnaires were collected at the treatment and control sites, with follow-up return rates of 83% and 86% respectively. A total of 542 initial and follow-up home assessments were conducted between the treatment and control sites

Analysis. For quantitative data, frequencies and distributions were run by each data collection site. Data were then aggregated by site and comparisons were made between them. T-tests and gain scores were used to compare the differences between the treatment and control sites on items assessed. The level of significance was set at .05. For qualitative data, content analysis was the primary method of analysis.

Subjects: Three-quarters of the participants at the treatment (n=406) and control (n=428) sites were between the ages of 65 and 84. Ninety-six percent of participants at the treatment site were white, compared with 63% at the control site. Approximately 70% of participants at both sites had a high school education or less and 80% were female. At the treatment site 72% of respondents lived in houses vs. 59% at the control site.

Program implementation. Presentations of the program were held in conjunction with community agencies serving seniors, such as nutrition centers or senior associations. Observations of program implementation confirmed that all sixteen key messages were covered by the trainers at each presentation of the program. The average program length was 56 minutes. The amount of time spent on individual messages ranged from 15 to 420 seconds, with the most time spent on the message that “smoke alarms save lives” (162 seconds). Participatory demonstrations accompanied many of the messages. Brochures were distributed to take the messages home. Over 98% of the participants rated the program materials as useful, interesting, and easy to understand. Forty-six percent of

participants rated the “ideal” number of sessions for the program as more than one. A third of the participants requested free home safety equipment, such as night lights, smoke alarms, or bath mats, which were available from related community agencies or services.

Results. The treatment site showed a significant pre to follow-up change on 8 of the 19 knowledge items, while the control site showed a significant pre to follow-up change on 3 of 19 knowledge items. The average increase for fire items from pre to follow-up was more than double in the treatment site vs. the control, i.e., 11.3% vs 4.4%. The average increase for fall items from pre to follow-up was 7.5% for the treatment site and 5.1% for the control site. The treatment site had a significant negative knowledge change on one message, safe footwear; the control site had no change on safe footwear. The treatment site had significant changes in self-reported safety behavior on three messages vs. one significant change at the control site.

The treatment site had significant, positive change on six of 23 home assessment items between initial and follow-up home visits; the control site a significant change on five items. At the treatment site, all three fire related significant changes in the home involved smoke alarms. There were no significant smoke alarm changes at the control site. Both sites had significant changes on the addition of nightlights and grab bars in the shower/tub area. The treatment site had one additional, significant fall related change with an increase in bath mats. There was a 15.7% decrease in the number of program participants wearing correct footwear between initial and follow-up home assessments at the treatment site; there was no change in footwear at the control site.

Discussion. Smoke alarm changes in the home distinguish the treatment and control sites in this evaluation. The treatment site had significant, home safety changes on three smoke alarm messages, including increased number of smoke alarms, working smoke alarm outside the bedroom, and at least one smoke alarm on every level of the home. Home assessments showed no significant smoke alarm changes at the control site.

Both the treatment and control sites had significant, positive changes on fall related messages. An observation at the control site confirmed that “booklets” on how to prevent falls in the home were available to participants. It is unclear to what extent this type of intervention may have influenced fall related results at the control site. The decrease in knowledge and behavior of safe footwear at the treatment site was not found at the control site.

Recommendations. Findings support continuation of the program with the following caveats and considerations. Continue to embed the program in a community context. Reconsider the program length and process as to the “ideal” number of sessions and messages. Change or clarify the message about safe footwear. Continue the smoke alarm messages, with added attention to frequency of testing. Review all messages for priority and clarity. Further explore fall prevention “booklets” at the control site, which might be a useful adjunct to the Remembering When program.

CHAPTER I

INTRODUCTION

Falls are the leading cause of injury death among older adults. Residential fires kill nearly 3,600 people, injure 16,000, and cost \$5 billion in direct property damage each year. Fall and fire prevention among older adults fit within the priorities of the National Center for Injury Prevention and Control (NCIPC), as well as Objectives for the Nation 2010 and CDC’s commitment to program evaluation. The evaluation effort reported here is an outgrowth of that commitment. It consists of a process, outcome, and impact evaluation of Remembering When: A Fire and Fall Prevention Program. The overall purpose of the evaluation was to provide the NCIPC with data about outcomes (e.g., knowledge or skill change) and impact (e.g. fall prevention) of the program, as well as program implementation (e.g., delivery modes) to aid informed decisions by the NCIPC about future support and dissemination of the program.

The Program: Remembering When

Remembering When is one of the few “off the shelf” programs available for communities to use to address prevention of fires and falls by older adults. It was jointly developed by the National Fire Protection Association (NFPA) Center for High-Risk Outreach and the Centers for Disease Control and Prevention. By focusing on both fall and fire risks the program aimed to “prevent injuries among these older adults and help them live safely at home for as long as possible.” .

The program contains sixteen key messages; half directed at fire risks and half at fall risks. These key messages include:

	Key Fire Prevention Messages		Key Fall Prevention Messages
1	Provide smokers with large, deep ash trays	1	Exercise regularly
2	Give space heaters space	2	Take your time
3	Be kitchen wise	3	Clear the way
4	Stop, drop, and roll	4	Look out for yourself
5	Smoke alarms save lives	5	Slippery when wet
6	Plan & practice your escape from fire	6	Throw rugs can throw you
7	Know your local emergency number	7	Tread carefully
8	Plan your escape around your abilities	8	Best foot forward

Embedded within these sixteen key messages are a total of 49 sub-messages (27 sub messages for fire and 22 sub messages for fall). Appendix 1 lists all messages. For example, the message about space heaters includes sub-messages about the distance heaters should be kept from “things that burn,” as well as the message to unplug heaters when not in use.

The program is offered with three basic approaches or some combination of them including group presentations, home visits, smoke alarm installation and fall intervention programs. The group presentation approach works through various religious, social and retirement groups or agencies to offer the program to groups of adults. Home visits extend the program to seniors who are unable to attend group events. Prevention programs combine elements of Remembering When with other types of prevention efforts. The later is offered in recognition that “no single agency should be responsible for reaching all of the older adults in your community with fire and fall prevention messages.” Remembering When is intended to be an interactive and fun program that combines key messages with nostalgic games and materials. Support materials for the program participants include message cards, nostalgia cards, charts, a home safety checklist, brochures, remember sheets, certificates, and evaluation cards. Support materials for program presenters include lesson plans, presentation and equipment tips, and additional resources.

Specific Aims of the Evaluation

The state of Virginia was found by the CDC to have the most robust Remember When program and delivery system in place in 2002. The program was delivered at multiple sites and lessons learned from past implementation of the program were incorporated into design plans for future program sites. The program affiliated with the Area Agencies on Aging, fire prevention workers, and others in a network of program support. With a stable program in place, the NCIPC of the CDC initiated an evaluation of the Remembering When program. The specific aims and questions of the evaluation were to:

- determine the changes in knowledge, beliefs, and behaviors related to preventing fall and fire injuries among older adults who participate in the *Remembering When* program;
- identify potential improvements to the *Remembering When* program;
- describe opportunities or barriers to education for this population;
- establish reasonable expectations of what the program can accomplish and the limits of its effectiveness; and
- inform decisions about the potential use and wider dissemination of this program.

These specific aims guided the selection of data collection methods and guided the evaluation to increase its usefulness in consultation with the CDC, Virginia Department of Public Health, the Area Agencies on Aging (AAA's) and fire prevention representatives. The aims remained relatively unchanged with the overall priority remaining program outcomes based on CDC guidance.

CHAPTER II

EVALUATION DESIGN AND METHODS

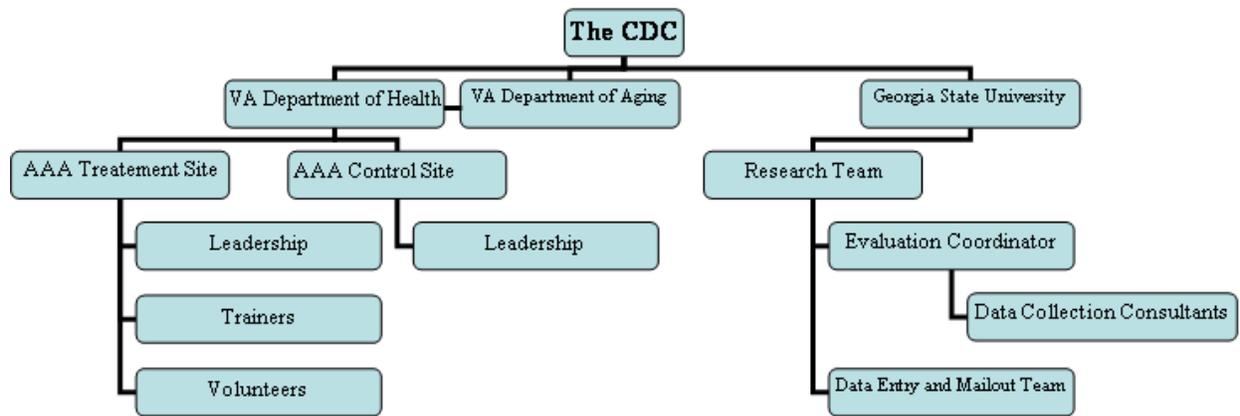
The evaluation of the Remembering When program was a joint effort between a research team at the Andrew Young School of Policy Studies at Georgia State University, the NCIPC at the Centers for Disease Control and Prevention, and the Association of Teachers of Preventive Medicine.

The intervention and data collection occurred in the State of Virginia at two sites, New River Valley in the southwestern part of the state and Roanoke in southern Virginia. The Virginia Department of Health and the Area Agencies on Aging worked closely with the research team and CDC to aid in site selection, coordination with other state programs, and data collection efforts. The research team included Principal Investigator, Judith Ottoson, and Research Associates, Mark Rivera and Craig Gordon. Two GSU doctoral students, Monica La Belle Oliver and Arzu Ari assisted with data entry and project management, as well as several master level Graduate Research Assistants, Goteum Joshi, Sara Hackely, and Rochelle Clark. On-site data collection in Virginia was managed by the on-site Evaluation Coordinator, Joyce Westbrook, with assistance from Scott Daley. The NRV AAA and Roanoke League of Older Americans collaborated in program implementation and data collection.

The study time line extended from October 1, 2002 through November 30, 2004. Presentations of the program were implemented at the treatment site between February 25, 2003 and September 29, 2003, within final data collection (5 months post-training) in spring 2004. Final data collection at the control site ended in August 2004.

Original Research Design

In collaboration with the CDC, the research design was focused on a single experimental site and a single control site, see Appendix 2. This design was not only feasible, but could provide more in-depth implementation information than could be collected from multiple sites. The treatment site received the Remembering When Program, and a control site did not receive the program. The implementation of the design was done in cooperation with the Virginia Department of Health (VDH) and the Virginia Department of Aging. The relationships among the stakeholders are graphically shown as follows:



The original design anticipated 1000 participants at both the experimental and control sites based on information provided by the VDPH and the AAAs administering the program. While this study did utilize a treatment and control site, it has a quasi experimental design. Groups of older adults were identified for participation by the AAA's and were assigned to condition by their geographic location (random selection and assignment were not feasible). Participant groups varied in their purpose. For example, included were congregate meal sites, religious gatherings; professional retiree groups (e.g., teachers), widows, foster grandparents, and groups of seniors in assisted living settings who came together for a variety of activities (e.g., social activities and other health and safety presentations). Since there was no presentation for control site participants, the goal was set with approval from the CDC, to attempt to secure the largest participant groups possible to finish out control group participation.

Questionnaires were to be used as the primary data collection method at both sites. Within the treatment site, seniors received a pre, post, and follow up questionnaires. Selected seniors also received a baseline and follow up home assessments to gauge the impact of participation on their fire and fall prevention knowledge and behavior. Within the control site, seniors received a pre and follow-up questionnaire. Selected seniors also received a baseline and follow-up home assessment for purposes of comparison to the treatment site. The experimental site would collect data from both the group and home bound presentations of the program. Incentives would be provided to for participants to complete and return surveys.

Site Selections

The New River Valley (NRV), Area Agency on Aging (AAA) was selected as the treatment site. The 2002-2003 year was the third year of Virginia's implementation of the *Remembering When* program. That year, the program was implemented in counties falling in the service areas of the Appalachian Agency for Senior Citizens, New River Valley Area Agency of Aging, and Prince William Area Agency on Aging. A treatment site was selected among these with assistance from the Virginia Department of Health (VDH), the Virginia Department of Aging, and the CDC. The NRV AAA was selected as the treatment site by comparing the demographics of the three newly funded sites to state and national demographics and by considering what the VDH knew about the ability of each site to take on the data collection activities required. Appendix 3 compares NRV, other areas, and US data on selected variables.

The Roanoke League of Older Americans AAA was selected as the control site. The control site was selected among those AAA's that had not yet received funding to implement the *Remembering When* program, but had expressed an interest in the program (since this was offered as a benefit of participation as the control site). In addition, only those AAA's were considered that did not border on the geographic area of another AAA currently receiving funding to reduce the likelihood of a diffusion effect. While the final pool of AAA's meeting these criteria was quite small, the demographic match between the treatment and control sites was also considered. Possible control sites were approached starting with the best demographic match. The first three sites approached were not able to commit to participate as the control site during that year.

The fourth site, the Roanoke League of Old Americans AAA was selected because it was the site most similar to NRV that had not received funding for the program in the past, did not border on another site currently receiving program funding, and expressed the capacity and willingness to commit to evaluation data collection activities. Groups of older adults living and gathering in the Roanoke AAA service area were identified by a Roanoke AAA service coordinator. These groups included Foster Grandparents, church groups, congregate meal sites and others. The AAA coordinator contacted the organizers of these groups and requested permission for the GSU evaluation coordinator to administer the fire and fall prevention survey just before or after their planned group activity.

Despite a fourth choice as the control site, most demographic characteristics are similar between the treatment and control sites. For example, the percentage of participants within each age category, level of education, sex, and number of people living in the home, were very similar. One notable difference between the treatment and experimental sites was on race/ethnicity. At the NRV treatment site, 3.4% of the program participants were African Americans; at the Roanoke control site, 37% of student participants were African Americans.

Key Evaluation Methods

Key methods used were questionnaires and observations, including observations of the senior homes and training implementation. The methods were directed at program participants, staff, and the program itself. Document reviews helped set the stage and later tie the program components together. All participants were asked to a complete pre and post presentation questionnaire designed to gauge fire and fall prevention knowledge and self-reported behavior. Participants then received a similar follow-up survey 2.5 and 5 months after the intervention.

In addition, approximately five participants participated from each treatment site presentation (n=32 sites) and each control group gathering (n= 17 sites) in a home assessment. The initial visit was conducted within approximately one week after the group presentation or gathering. A follow-up home assessment was conducted either 2.5 or 5 months later. One might expect the degree of adherence to program safety recommendations to be a good predictor of fires and falls in the home. In addition, Kannus and Kahn (2001) highlight the importance of home visits as part of a more standard “multifactorial” participant assessment—an assessment that enables us to keep tabs on the degree to which older adults continue to adhere to safety measures over time.

Observations of twenty training sessions were also made to better understand the processes used to implement both the program and the evaluation.

Participant Questionnaires

Questionnaires were developed to assess the program’s effect on participant knowledge, self-reported behavior, and program satisfaction. The instruments were adapted from questionnaires used by the VDH and tied to key program messages. In addition, the research team sought content advice from the CDC Technical Advisor regarding item priority and validity. The questionnaires were formatted for Teleform, a software package that contains survey design, scanning, and scanned data verification modules.

Multiple versions of questionnaires were developed to reduce the test taking burden on seniors and to combat a test-retest effect. The instrument versions drew from a pool of twenty knowledge items, ten self-reported behavior items, and six program satisfaction items. A total of eight instruments were developed: five at baseline, two at post-program, and one follow-up.

Copies of the multiple versions are found in Appendix 4 and are summarized in the table below.

Items on Remembering When Instruments*			
Ver	Items on Five Baseline Instruments	Items on Two Post- program Instruments	Items on Follow-up Instruments
1	Demographics only	Post A -1 st half, knowledge (10) - all satisfaction (6)	- F-Up C - all knowledge (20) - all checklist (10)
2	Pre A,C - 1 st half, knowledge (10) - 1 st half, check list (5)	Post B -2 nd half, knowledge (10) - all satisfaction (6)	
3	Pre A,D - 1 st half, knowledge (10) - 2 nd half, check list (5)		
4	Pre BD - 2 nd half, knowledge (10) - 1 st half, checklist (5)		
5	Pre BC -2 nd half, knowledge (10) -2 nd half, check list (5)		
<p>*Note: since the questionnaires were randomly assigned, the table should only be read within columns, not across the rows. For example, a treatment site participant could be randomly assigned any of the 5 baseline instruments and could also be randomly assigned either of the two post-program instruments. The control site participants could be randomly assigned any of the five baseline instruments, but no post-program instruments. All respondents at both sites received the same follow-up instrument.</p>			

Knowledge Items. The knowledge items were designed to determine what participating seniors learned and remembered from the training about core fire and fall messages. Most of the knowledge items were from the original instrument used by the VDH in previous years and at concurrent Remembering When sites. A table providing the eight fire and eight fall messages, the text of each questionnaire knowledge item, and the alignment of items to message appears in Appendix 5

All knowledge items were multiple choice format and nearly all contained four multiple choice response options. Seniors were asked to fill in the questionnaire “bubble” corresponding to the most correct answer for each knowledge item using a special pen that was provided. This Visa Vi overhead pen was identified by the researchers as least likely to bleed through the form and minimized the amount of effort needed by seniors to fill in the 14-pitch bubbles (14-pitch font was used to maximize readability of the surveys).

Self-reported Behavior. GSU included home safety checklist items asked by the VDH in previous years and supplemented VDH items with additional ones that allowed for more complete coverage of the fire and fall safety messages. Home Safety Checklist items required a “yes/no” response and asked participants questions regarding the current status of various aspects of fire and fall safety in their homes and behavior.

Demographic Items. The pre-program knowledge questionnaire asked about participant age, sex, ethnic / racial identity, education level, types of home, number of people living in the home, and the year the participant’s home was built.

Program Satisfaction Items. Participant satisfaction items were taken directly from the VDH questionnaires used at other training sites. They were administered only at the end of the training.

Home Assessment Checklist

A scannable, 62 item checklist was developed to assess changes (or not) that participants made in their home subsequent to participating in Remembering When, see Appendix 6. As with the questionnaires, there was a home assessment instrument already used by the program providers. However, discussions with the CDC and VDH indicated the home assessment instrument was not used consistently and, in many cases, was given to the participants to complete themselves. GSU worked with the Virginia Department of Health, CDC, AAA’s, and trainers to create a unified home assessment survey for the purposes of the study.

The instrument content is tied to the eight fire and eight fall messages given by the program and to knowledge and self-reported behavior items on study questionnaires. The living areas assessed included the main living area (e.g., a living room or den), kitchen, master bedroom, main bathroom, and main stairway (if applicable). While some items were asked in all rooms, e.g., “are all walkways free of clutter”, others were specific to a given room. For example, only in the bathroom did the home assessment specify to look for grab bars and only in the kitchen did it ask whether there were pots and pot lids were stored. The assessment also contained a few observational items regarding the types of footwear the resident was wearing, how quickly the resident got out of a chair (if there was an opportunity to observe), and a small number of interview questions (e.g., did the resident have specific limitations, physical or otherwise, preventing them from making changes to the fire and fall safety of their home). A protocol was embedded within the instrument to foster coding consistency. There was also room for comments next to the assessment items and those completing the home assessments were encouraged to use the comment fields extensively.

Training Observation Form

The Centers for Disease Control voiced an interest in better understanding the relationship between various aspects of the presentations and their impact on participant knowledge, attitudes, and behavior. The key data collection strategy to capture program implementation was a training observation instrument. Several versions of the form were pilot tested. The final version can be found in Appendix 7. The form was completed by the on-site evaluator and focused on the evaluation process, training content and context, home assessment requests, and general observations. Field note comments were often included by the observer. In total, 20 observations (including field notes and/or the completion of an observation instrument) were gathered from training sessions at the experimental site in NRV. Seven of these observations used a piloted version of the form and 13 sessions used the final version of the observation instrument.

Data Collection

GSU hired an on-site evaluation coordinator who lived and worked in the geographic area of the treatment site, New River Valley, VA. GSU was responsible for developing all Teleform questionnaires, managing all data entry activities, and making the training evaluation data routinely available to the Virginia Department of Health for reporting purposes.

Questionnaire Administration

The on-site evaluation coordinator administered questionnaires to all group participants at the treatment and control sites. AAA trainers administered questionnaires to the home bound participants with whom they had scheduled appointments for other service delivery activities (the questionnaires and presentation were added to those activities).

Baseline-questionnaires were administered before the program began, post-questionnaires were administered at the immediate end of the program (for the treatment site only), and follow-up questionnaires were administered 2.5 to 5 months after the training. Participants who completed baseline and post presentation surveys were randomly assigned to complete either a 2.5 or a 5 month follow up questionnaire. This staggered follow-up design allowed examination of treatment duration without asking older adult participants to complete questionnaires at both follow up time points.

At the treatment site, a total of 399 baseline questionnaires were collected, 392 post-questionnaires, and 325 follow-up questionnaires. Approximately 83% of participants who completed a post presentation questionnaire in the treatment site also completed a follow up questionnaire. At the control site a total of 428 baseline questionnaires and 369 follow-up questionnaires were collected. Similarly, approximately 86% of control site participants who completed a baseline questionnaire also completed a follow up questionnaire. This response rate was achieved by GSU conducting follow up

questionnaires via scheduled mail outs using the Total Survey Method (Dillman, 1978). The evaluation consultant placed follow up calls to all non-respondents in a final attempt to maximize the response rate. Appendix 8 provides detailed information by implementation site regarding the numbers of baseline, post, and follow up questionnaires for both sites.

Treatment Site. The GSU evaluation coordinator administered all questionnaires to group treatment site participants using the protocol for survey administration appearing in Appendix 9. All participants were given an envelope that contained both pre and post questionnaires to be completed, special response pen, and a consent form requesting volunteers to participate in two home assessments following the training.

After initial introductions from the site host and trainer(s), the evaluation coordinator typically described the purpose of the study, asked participants to provide basic demographic information on the outside of the envelope in the spaces provided, and then asked participants to complete the green colored pre questionnaire, which requested demographic information and included a pre-test for knowledge and self-reported safety related behavior. After the presentation, participants were asked to complete the red colored post questionnaire which included items to gauge participant satisfaction with the program and a knowledge post-test.

The coordinator then described the purpose of the home assessments, the need for home assessment volunteers, and reviewed the consent form located in their packets. Participants were asked to return their questionnaires and consent forms to their packets and the packets were collected by the evaluation coordinator. For larger groups, the AAA often worked with the group contact to have at least one volunteer available to help older adults who needed one-on-one assistance. The evaluation coordinator forwarded all participant envelopes to GSU approximately every other week.

In the case of home presentations, baseline questionnaires were administered by the trainer as a part of their home presentation. Appendix 8 shows that 109 pre-questionnaires were collected of home-bound participants, 107 post-questionnaires, and 81 follow-up questionnaires.

Control Site. Packets were prepared in advance by the GSU research team to be administered by the on-site evaluation coordinator to control site participants. Since there was no intervention, control group participants completed Form C, a compilation of Form A and Form B. All subsequent survey administration (at 2.5 and 5 months), used a single form of the survey for both treatment and control site participants, Form C. As with the treatment site, control site participants were randomly assigned to receive either a 2.5 or 5 month follow up questionnaire. However, toward the end of the data collection (June 2004), Roanoke expressed an interest in following up with control site participants more quickly. To do this, GSU compressed all data collection activities to meet this request. As a result, there were fewer 5 month follow ups in the control than the treatment condition.

There was some concern by control site participants about the purpose of the home assessments since there was no program being administered--this was confusing to some participants. GSU worked with the VDH and CDC to develop a letter to be given to all study participants that described in very plain language why they were being asked to participate and that the request was in partnership with the CDC. A copy of the “anti-scam” letter (as it was called on-site) given to control site participants appears in Appendix 10.

Home Assessment Administration

For group presentations, a total of 542 home assessments were conducted between the treatment and control sites: 229 at NRV and 313 at Roanoke. Appendix 8 shows a total of 116 initial home visits at the treatment site and 113 follow-up home visits at the treatment site. Of these visits there were 93 matched baseline and follow-up visits. At the control site, there were 154 baseline visits and 159 follow-up visits. In addition, a total of 21 home assessments were conducted for home bound participants: 14 pre and 7 follow-up.

For purposes of consistency, the number of consultants conducting home assessments was limited with the goal of a single consultant carrying out the majority of assessments for both the treatment and control sites. The evaluation consultant conducted over 90% of all home assessments with most of the remaining assessments conducted by a second consultant in Roanoke. The Members of the GSU research team each attended home assessments with the consultants and discussed the assessment process to ensure consistency across assessors.

Treatment site. Home assessments were conducted to help determine whether Remembering When participants took preventive action in their homes as a result of the training. Volunteers for the home assessments were solicited at group presentations. The baseline home assessments were conducted as soon as possible following the training, typically within one week of the presentation. (It was not possible to conduct the assessment before the training because it was not known who would attend the Remembering When program until the day of the training.) Approximately half of the home assessment participants received a follow up home assessment after 2.5 months and half after 5 months.

Control site. An announcement about the evaluation purpose and process was made at the beginning of a group gathering. For example, seniors arriving for a foster grandparent program, would be asked to participate in the evaluation. The protocol used for the treatment site was then initiated with the distribution of random instruments.

Incentives

Treatment participants did not receive an incentive for completing the pre and post questionnaires. They did receive a \$5 WalMart gift card for completing the follow

up survey and received a \$15 WalMart for each home assessment completed in their home. Control participants did receive a \$5 WalMart gift card for completing the pre questionnaire, a \$5 WalMart gift card for completing the follow up questionnaire, and a \$15 WalMart for each home assessment completed in their home. There were approximately 1,330 \$5 WalMart gift cards and 590 \$15 WalMart gift cards purchased and distributed over the course of the study. The consultants administering the group questionnaires requested signatures from all survey participants to account for gift card incentives. Similarly, consultants requested a signature from each home assessment participant to account for home assessment incentives. These gift card logs were sent regularly to GSU along with completed questionnaire and assessment instruments.

Training Observations

The Remembering When program was implemented shortly after the evaluation contract was initiated. Initially, an evaluation consultant accompanied the research staff to trainings and was asked to observe the trainings and take unstructured field notes during presentations from February 2003 to late May 2003. This qualitative research led to the development of a training observation instrument that was used in training observations between late May 2003 and July 2003. Revisions were made following the pilot test of the instrument. A final version of the instrument was used for the last 13 training sessions from July 2003 through September 2003. Observations of the Remembering When program were conducted primarily by the on-site evaluation coordinator, with additional observations by the research staff. The training observation instrument was used to guide the observation of the program.

Data Management

A total of 49 sites had older adults participate in data collection activities, 32 treatment sites and 17 control sites. Approaches used to manage the high level of data collection complexity included:

On-site data management. At the treatment site, the evaluation coordinator managed all instrument administration and collection. Envelopes containing baseline and post-program questionnaires were collected at the end of the training. Following the program, the envelopes (containing the questionnaires) were bundled by site with a training observation form and delivered by express mail to the GSU research team. The same on-site evaluation coordinator managed approximately 90% of the data collected also at the control site, with some additional on-site assistance from a trained consultant at that site.

Creation of a Microsoft ACCESS database. An MS ACCESS database was developed and used to track receipt of all participant data collection instruments and to schedule follow up data collection activities for each study participant

Management Table. A management table was developed and regularly updated that enabled the research team to determine, at a glance, what had been received from each participant group within each site.

Secure filing system. A filing system, based on the unique identifiers assigned to each participant, was located in the secure data room. The filing system housed all data collection instruments that had been logged in the MS ACCESS database and scanned and verified for accuracy using Teleform.

Records audit. Once data collection activities were completed, audits were conducted to identify and fix any inaccuracies in the participant data. An initial audit of the treatment data occurred in last Spring 2004; the audit of control site data occurred in late August 2004. The audits involved matching the data in the MS ACCESS tracking system with participant records in the electronic file that housed all participant data. While accuracy was found to be quite high, there was some data clean up required. The most typical clean up activity involved locating and rescanning data collection instruments.

On-site visits. The research team made multiple visits to Virginia to meet with the on-site evaluation coordinator, as well as the implementing agencies. In addition, the on-site evaluation coordinator was brought to Atlanta to participate in the data audits.

Maintaining open communication. The research team met regularly to discuss all aspects of the evaluation study. These meetings were informed by a regularly updated management table used to track all data collection activities for each group of participants within the treatment and control sites. The project director maintained contact with the evaluation coordinator to address questions regarding data collection activities and to help ensure data were gathered in timely manner. When emerging issues warranted, GSU, the CDC, and VDH had conference calls and face-to-face meetings. Key issues and their resolutions were summarized in quarterly the reports.

Data Analysis

Quantitative Analysis

Quantitative data were derived from questionnaires, training observations, and home assessments. The analysis stayed close to the 16 key messages in the Remembering When program and related home assessment items. Most items were treated individually, but some repeated items, such as wrinkled rugs or clutter, were aggregated across rooms in the home. Frequencies and distributions of data were run by data collection site. Data were then aggregated by treatment and control site and comparisons were made between those sites. T-tests and gain scores were used to compare the differences between the treatment and control sites on items assessed. The level of significance was set at .05. In addition, the research team looked for directions in the data, not solely level of significance, because of the recognized noise in this field-collected data. Analysis was also done to explore the effective of selected demographic variables on knowledge

change and self-reported behavioral change. It was not possible to do a similar exploration with home assessment data because the number of observations was too small. Quantitative data was analyzed with STATA software.

Initial findings were reviewed with the CDC project officers and subsequent analysis were conducted. A follow-up addendum to this report will answer three specific questions asked by the CDC project director: (1) On what items where there knowledge changes only; (2) On what items were there behavior changes only; and (3) on what items were there both knowledge and behavior changes.

Qualitative Analysis

Qualitative data were derived from multiple sources including training observation and home assessments. Content analysis was the primary method used to analyze these data. This method represents a systematic investigation into the meaning of text to ultimately derive its context (Krippendorff, 1980). Content analysis lets a researcher "discover features in the content of large amounts of materials that might otherwise go unnoticed" (Neuman, 2000). Through examining patterns of meaning in written text, we are able to gauge the frequency with which particular words or themes occur (Kerlinger 1986). This type of analysis helped provide an initial understanding of the data and its relationship to quantitative findings.

Variables Not Reported in Final Analysis

Following an initial review of all data with CDC, two variables are not included in the final analysis because of problems with data collection on this item:

- “Two ways out of every room”. This question on the home assessment was not consistently asked or understood. At some points it was understood to mean “two ways out of the *house*,” at other times, it was understood to mean “two ways out of the *room*.” This item was also problematic because some seniors lived in apartment buildings, in which two ways out of their unit was not always possible. Changes in the question exclude this item from the final analysis and reporting.
- “What can you do to improve your balance and coordination?” This item on the knowledge questionnaire for the evaluation was derived from an item asked by the VDH on other trainings. However, the message is not included on the flash cards used to teach the program and one of the lead instructors confirms that she does not remember mentioning anything prescriptions in the trainings at the treatment site. The message about prescriptions drugs appears to be in the planning book for the program.

Limitations of the Study

The initial evaluation plan was developed prior to meetings with the CDC and based on our review of the existing *Remembering When* program and best projections of implementation at future sites. Our ability to carry out the design and timeline of this evaluation study was contingent on the number of presentations, number of participants, and their timing. One goal of early discussions between the Virginia Department of Health, AAA's, and Georgia State University (GSU) was to clarify the method of site identification and program delivery timeline to ensure consistency between the evaluation plan and plans for program implementation.

The proposal made certain assumptions regarding the size and availability of a pool of potential program participants and control group, availability of program staff to assist with the initial round of home assessments, sampling and power estimation, and budget constraints. All assumptions were tested during initial meetings with the CDC. Adjustments to the evaluation plan were made as the needs of the CDC and participating sites became clearer and as circumstances at the participating sites changed. There are several limitations of the study which we note in the following discussion.

First, the design proved more optimistic than the treatment and control sites could deliver with regards to the number of participants. Rather than the initial 1000 projected for each site, the final implemented design had approximately 400 at each site. This limited cells size, paired data, and some of the planned analyses.

Second, the implemented design put less emphasis on the home bound participants in the program than originally planned. That portion of the design was in large part to be implemented by the local AAAs. We found, however, that findings were compromised by the variability with which the data was collected and the added burden of data collection to AAA staff. Further, it was generally agreed that most senior program sites were most likely to use the group presentation format for *Remembering When* and it was wiser to use resources to focus there.

Third, demographics of both the treatment and control site differ from national averages. The treatment site is more rural, less educated and with lower socioeconomic status than the average senior nationally who might participate in the program. Further, the treatment and control side differ along racial lines and type of dwelling, i.e. the control site had more African-Americans and apartment dwellers than the treatment site. These demographic characteristics may influence generalizability of the findings.

Fourth, the hundreds of home assessments proved a challenge. Fortunately, the data collections benefited by having the same person conduct nearly 90% of the initial and follow-up home assessment data. This increased consistency in the data. But the multiple variations of what might be considered a "correct" answer varied even more than anticipated. For example, one message is to "have a telephone in your bedroom." But in this day of cell phones, what counts as a "telephone" in the bedroom – a cell phone with no cradle, a cradle with no cell phone, both cradle and phone, a charged cell phone,

a traditional land line, or a verbal statement from a senior about the location of a cell phone at night? Further, a message to “use night lights to light the path between your bedroom and the bathroom” seems to be straight forward until home visits encounter all sorts of lighting between the bedroom and bathroom, such as a hall light, a street light outside, a flashlight, a lit fish tank, or other sources of light. These data collection challenges have implications for program messages which will be discussed later.

Fifth, there is some question as to who and why seniors chose to participate in home assessments or not. For example, at one site the on-site evaluation coordinator reported that a senior did not sign up for a home assessment saying: “I’m not signing up for a home visit because I have too many extension cords” (Salem, 11/17/03). Although we don’t know how common this response might be, it shed light that some potentially more problematic homes did not participate in the survey.

Sixth, delays in the availability of a control site and the complexity of the data collection process, pushed the study well over the one year and even two year completion dates. The final, cleaned data base was not available for analysis until early fall 2004. By September 2004, the project director and both research associates had left Georgia State University. The final write up of the results depended on the ability of the research team to complete the project in the midst new and competing priorities from three different geographic locations. While committed to seeing the project to its conclusions, it was difficult to do so in a timely manner.

Lastly, one of the participant characteristics for which we do not have solid data is the cognitive faculties of participants. Training observation confirms that some participants were alert and energetic, while others were quite, withdrawn or even confused. Most participants were deemed to be functioning and able to sit through the program.

CHAPTER III

PROGRAM IMPLEMENTATION AND PARTICIPANT SATISFACTION

Recruitment for the Remembering When Program

The Virginia Department of Health, AAA's, and the National Fire Protection Administration were responsible for locating volunteers ("trainers") to lead the program, older adults to participate in the program, and implementation of the program design. The New River Valley Area Agency on Aging (NRVAAA) expressed interest in the program to the Virginia Department of Health, so the motivation to conduct the program existed from the beginning by the host agency at the treatment site. In fact, one of the "rewards" for participating in the study was a release of funding to the NRVAAA following the evaluation study to further conduct the Remembering When program.

At the treatment site, one of the key tasks of the AAA was to locate groups of older adults to participate in the study. For the NRVAAA, this meant working with their own staff and through other local agencies and organizations to schedule a Remembering When presentation. The requirement was that at least one hour be available to deliver the program, administer the questionnaires, and describe the purpose of the home assessments. The AAA Directors worked within their regularly scheduled events and service delivery channels to identify groups of participants. The meeting places were judged adequate by the on-site evaluation coordinator for the presentations and evaluation activities in all except three instances.

All scheduling of Remembering When presentations were handled by the NRVAAA staff. As program sites were secured, the AAA emailed location and date information to the GSU research team. In turn, the on-site evaluation coordinator worked closely with the NRVAAA to ensure she arrived at the most appropriate time and had enough questionnaires. Often, the study activities were done in conjunction with another regularly scheduled event. While this was a convenient means to administer the program and the questionnaires, it did mean that the program was provided and questionnaires conducted within time constraints that, at times, were reported by the coordinator to be a barrier. There were also occasions when communication channels, or changes in other group scheduling arrangements, led to group presentations being rescheduled.

Program locations

The Remembering When program was conducted at 32 sites, in and around the catchment area of the NRVAAA in southwestern Virginia. The NRVAAA is located in the small town of Pulaski, Virginia. Presentations of the program were implemented between February 25, 2003 and September 29, 2003.

Program Participants

The kinds of groups participating in the program varied and included congregational meal sites, church groups, nonprofit organizations, volunteer groups, foster grandparents, and regular gatherings in senior living centers. The number of participants in the Remembering When program ranged from 4 to 45 participants at any one site, with a mean number around 13 participants. Some seniors participated in the program at more than one site, although efforts were taken to exclude them from data collection at more than the original site.

Of the 406 participants at the treatment site and 428 at the control site, pre-survey results show that nearly three-quarters were between the ages of 65 and 84, with nearly equal percentages of participants below 65 and over 85 years of age. Ninety-six percent of participants at the treatment site were white, compared with 63% at the control site. Three percent of respondents were black at the treatment site compared with thirty-seven percent at the control site. Approximately 70% of participants at both sites had a high school education or less. Approximately, three-quarters of participants at the treatment site were women, with a comparable 80% at the control site. More than half the participants lived alone. At the treatment site 72% of respondents lived in houses; while 59% lived in houses at the control site. At the control site a higher proportion of respondents lived in apartments vs. the treatment site, i.e. 38% vs 19%. A summary of pre and follow-up survey demographics is found in Table 1a in the attached set of all study tables.

Program Format

Most Remembering When participation occurred via group-only presentations, as opposed to home bound settings with a single senior. In these group settings, the program was often administered at a senior center in conjunction with some other regularly scheduled activities, such as meal service or social events. There was typically a group facilitator (the organization from which the group was identified by the AAA), NRVAAA trainers, the on-site evaluation coordinator, and sometimes one or more volunteers to assist with questionnaire administration. The facilitator would typically set the stage by introducing the program and guests. There were usually two AAA trainers working in tandem to conduct the program. In presentations where there were two trainers, the trainers divided the presentation such that one trainer primarily delivered the fire messages and the other primarily delivered the fall messages.

The trainers used demonstrations to convey many of the messages. For example, for the message “Give space heaters space”, the trainers asked participants to estimate a three-foot distance and then used a tape measure to determine how close their estimates were. Other kinds of demonstrations including showing problems with floppy bathrobe sleeves when cooking, amount of time one should take to stand slowly, how to test a smoke alarm, appropriate shoes, and ashtrays of proper depth. These demonstrations were often interactive with the participating seniors with their guessing the right answering, commenting on their experiences, demonstrating a technique, looking at their own foot

ware, or showing something to the entire group. In addition, to these message-specific demonstrations, there was a fire safety video (available as part of the fire and fall safety program) that was shown to convey the fire safety messages during two presentations.

Although program format followed a similar format at all sites, there were site differences depending on the group, participants, and other events. Some programs were ended sooner than others, due to unexpected circumstances. Some hosts had competing priorities or forgotten about that program was to be delivered and adjustments had to be made in whether and how the program was delivered. On more than one occasion the program had to be rescheduled because of a conflict by the host organization.

Program materials

The various materials available to support the program were not all used or used equally. The two-sided message cards were most often used to present each of the 16 key messages. They would be held up in front of the group to present a message. The two, four-color brochures were distributed at the beginning of most training sessions to all participants. The on-site evaluation coordinator indicated that there were adequate brochures available for all participants, except at one site.

Despite the trivia game of “Remembering When” for which the program was named, the game itself was not used often or in its entirety during group presentations. The trainers at the treatment site reported that the seniors enjoyed the trivia questions a great deal, but they took up a substantial amount of time and cut into direct fire and fall messages. In addition to delivering the messages, the treatment site had an evaluation process and home assessment recruitment added to the training time, so additional time for trivia questions was reduced. Considering the compression of time in general, however, the trivia questions were used primarily at the treatment site for giving out prizes, such as oven mitts or nightlights.

Program and Message Times

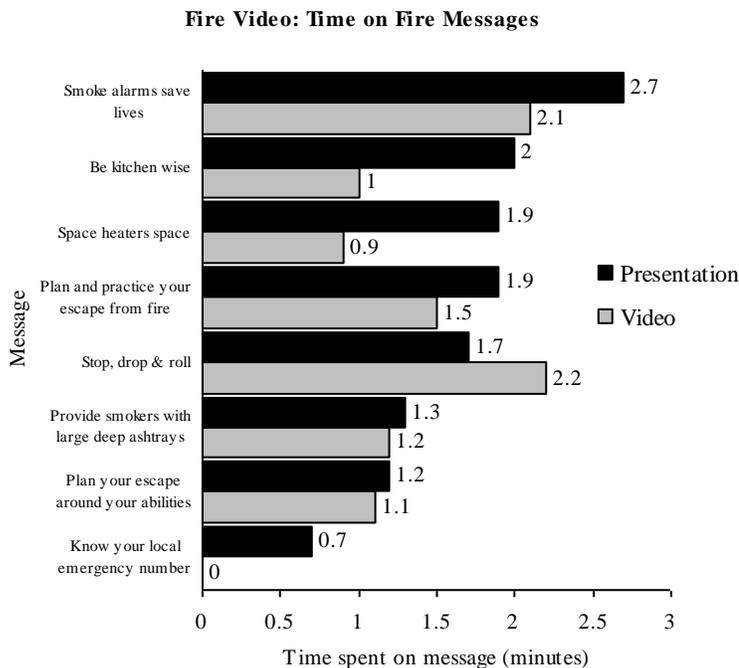
For the twenty programs on which data was available for the length of training, the minimum training time was 45 minutes and the maximum was 73 minutes. The average program length was 56 minutes, excluding the time spent on the evaluation. The training nearly always kept within the intended timeframe.

All nineteen presentations for which we have data on the time spent on individual messages, shows that all sixteen key fire and fall messages were covered in each program. There is a range of time spent on individual messages from 15 seconds/message to 420 seconds/message (7 minutes). The amounts of time spent on fire and fall messages are arranged in the table below from the most to least amount of time. The mean times spent are shown along with the minimum and maximum times in seconds. The message about smoke alarms received the most amount of time among all messages (162 seconds); proper shoe ware received the second most amount of time amount all messages (121 seconds).

Amount of time spent on key messages at 19 treatment presentations

	Minimum Seconds	Maximum Seconds	Mean Seconds
Fire Messages			
Smoke Alarms Save Lives	60.0	420.0	162.1
Be Kitchen Wise	41.0	240.0	121.6
Space Heaters Space	60.0	240.0	116.8
Plan & Practice Your Escape From Fire	30.0	245.0	113.4
Stop, Drop & Roll	60.0	240.0	104.1
Provide smokers with large deep ashtrays	40.0	125.0	78.2
Plan Your Escape Around Your Abilities	15.0	195.0	72.9
Know Your Local Emergency Number	15.0	70.0	41.2
Subtotal (13.5 minutes)			810.3
Fall Messages			
Best Foot Forward	60.0	200.0	126.9
Slippery When Wet	60.0	180.0	102.1
Look Out For Yourself	50.0	205.0	90.0
Throw Rugs Can Throw You	60.0	140.0	78.6
Take Your Time	45.0	115.0	65.8
Exercise Regularly	30.0	70.0	56.9
Tread Carefully	25.0	110.0	48.7
Clear the Way	25.0	75.0	41.6
Subtotal (10.1 minutes)			610.6

The video containing the fire messages was used at only a couple of sites. The following graph compares the amount of message time in presentations and video.



Qualitative data from the on-site evaluation coordinator uncovered other messages or events that were brought to bear on the core messages. For example, a competing message was mentioned at more than one site about a “Nightline” (TV program) investigation into smoke alarms. The show reported that most smoke alarms are ineffective and recommended a Vulcan System 2001 which cost approximately \$2500 for the average house to install (Radford, 5/13/03). This message undermined the value of smoke alarms and the free alarms available for distribution. A positive use of the media at one site used a local news story about a senior in a home fire to reinforce program messages.

Participant Response to the Remembering When Program

The response to the Remembering When program was overwhelmingly positive as indicated by the 392 respondents to the post-program survey. On the following items they agreed or strongly agreed that:

- Material presented was useful (99.8%)
- Materials presented was interesting (99.5%)
- Material presented was easy to understand (98.9%)

Qualitative data from the on-site evaluation coordinator helped explain some of the positive response to the program:

“Seniors were enthusiastic and stayed with the presentation. The RSVP director expressed surprise that the seniors stayed until the end. Their usual behavior is to leave sporadically throughout any presentation. They seemed to really enjoy the active participation, such as “everyone look down at their shoes...are they safe or unsafe? Everyone hold out their sleeve...are they loose or tight? Every one stand up and slowly count to five to get your balance before attempting to walk.” Montgomery: 3/11/03

The respondents were also positive to the format of the program, but more variation in the data showed on these questions. With regard to the length of the program, 97% of respondents indicated the length of the program was “all right,” while 2.5% thought it was “too long” and .5% thought it was “too short.” Nearly 96% of respondents indicated the program contained “enough” information, with the remaining respondents split on whether the program contained “too much” information or “not enough” information.

The most mixed response came when participants were asked “what is the ideal number of sessions for presenting information on fire and fall prevention?” While approximately 54% responded that one program was “ideal,” 30% responded that two programs were ideal, 10% indicated three programs, and 6% indicated four programs. A table presenting these data is found in Table 2.

Qualitative data from the on-site evaluation coordinator identified some common questions emerging from more than one presentation of the Remembering When program. For example, participants asked: “Why don’t you mention the necessity of having a fire extinguisher in the home? Your focus is on getting out of the home.” At other sites, questions were raised about a post survey on the leading cause of home fire deaths nationally. Respondents pointed out this information was not covered in the presentation.

Program Facilitators and Barriers

For those instances in which data were reported, we found the following barriers and facilitators to program implementation

Program Facilitators

- **Confirming audibility and visibility:** Observations indicated presenters regularly confirmed participants could hear and see the presentation and at times requested participants move in order to hear and see the presentation.
- **Frequent Interaction:** Nearly all presentations included frequent interaction between the trainer and participants
- **Illustrations:** provided examples demonstrations to supplement the training materials. The presenters also encouraged participants to provide their own examples. One participant mentioned waking up with an electric blanket that was on fire and putting the fire out with their bare hands. Another participant noted having a short in their TV cord, that “The blaze and smoke woke us up at 3am”. Regarding fall examples, one senior mentioned trying to put away a folding chair and falling over “getting folded up in it”.
- **Alternative modes of message delivery:** When trainers were cut back from two to one, NRV began to use the fire video more frequently to convey the fire messages. The trainer was able to refer seniors to handouts to help address specific questions
- **Encouraging Participants to act.** In some presentations observed, trainers asked participants to identify at least one action step to take when returning home

Program Barriers

- **Outside Distractions.** Outside distractions were reported for 25% of the presentations. These distractions were frequently related to food service and preparation for subsequent use of the space for other unrelated activities.
- **Low turn out:** There were frequently far fewer attendees than expected.
- **Time limitations:** Observations indicated time limitations were a significant barrier. In some instances, there were other activities scheduled and this reduced the available time. This appeared to limit the degree to which trainers were able to address respondent questions.
- **Communication:** In some instances, the site manager forgot the presentation was scheduled, did not fully understand the purpose of the program, or arranged the

presentation with non-target participants. These appeared to be the result of miscommunications.

- **Provide local resources:** Participants were almost never provided a list of relevant, local resources.

Requests for home equipment

At the end of the program, participants were able to request free equipment available to them through the NRVAAA to prevent fires and falls. Such equipment included, oven mitts, night lights, smoke alarms, and bath mats.

Of the 23 presentations for which we have training observation summaries, the number of requests for equipment from participants in trainings ranged from 0 to 17 per presentation, with an average number of requests at 5 per presentation. Of the 312 participants in these programs, 102 (33%) made requests for any type of equipment. When looking at specific home equipment, 81% did NOT request free smoke alarms, 77% did NOT request free bath mats, and 70% did NOT request night lights. These requests are found in Table 3.

Evaluation data collection activities

Evaluation activities engaged participants at the beginning and end of the Remembering When program. In more than 80% of the presentations, the site management began by introducing the AAA trainers and voiced their support for the program. In turn, the AAA trainer(s) provided a brief overview of the purpose of the presentation and introduced the evaluation coordinator. The coordinator then provided a brief overview of the content and purpose of the evaluation activities that would accompany the presentation.

The median amount of time needed by the coordinator to provide an introduction of the evaluation study and the pre-questionnaire was 2 minutes. The median amount of time required for seniors to complete the pre-questionnaire was 18 minutes and for the post-questionnaire was 15 minutes. Because some of these participants were not identified until the day of the program, pre-program visits for home assessments to collect baseline data were adjusted for the spontaneity of registration.

There were rarely volunteers present to assist older adults to complete the questionnaire. However, the observer indicated that in only two instances was assistance less than adequate.

For the control site, there was no program to present so the demands placed on the AAA and participants were considerably less, but still real. At the control site, the AAA had to recruit agencies and organizations and seniors to participate in a data collection process without any program.

CHAPTER IV

RESULTS

This chapter is divided into three sections to report results for knowledge (questionnaires), self-reported behavior (checklist), and observation (home assessments). Knowledge assessment in this study focuses primarily on pre to follow-up changes, since other studies of the Remembering When program have already demonstrated significant pre to post knowledge changes. A reminder to the reader that Tables 1-3 and Tables A-M are found in the attached appendices.

Knowledge Assessment

Knowledge Items

Following an initial analysis of the data and review with the CDC program officers, a total of 19 knowledge items were kept in the analysis. Among these there are 12 fire items and 7 fall items. As discussed previously, one fall item was eliminated because non-prescription drugs were not routinely included in the training presentations. The reader is reminded that a copy of all questionnaires, with exact wording of knowledge items and multiple choices options are found in Appendix 4.

Comparability of Treatment and Control Site

Overall, the treatment and control sites scored similarly on baseline pre-survey fire and fall knowledge items. As can be seen from the paired data in Table D, the two sites did not significantly differ on 80% of the knowledge items on the pre survey. On the four items in which they differed significantly, New River Valley (NRV) scored significantly higher on “best way to stop a grease fire” and “how stairways should be lit;” they scored significantly lower on “best thing to do if your clothing catches on fire” and “best phone number to call in case of fire.”

Treatment site: New River Valley Pre to Follow Up Knowledge Comparisons

The data for paired, New River Valley knowledge results is grouped on the following pages in a series of tables. These include changes of knowledge that show significant positive change, non-significant positive change, no change, and significant negative change. These data are drawn from Table B which shows the percentage of respondent answers that are correct at pre and follow-up (2.5 to 5 months following training). Following the presentation of the NRV data are a series of tables that show comparable items for the control site at Roanoke. Those data are drawn from Table C.

As shown in the table on the following page, paired t-tests revealed statistically significant increases for eight of the 19 knowledge items. Six of these are fire items and two are fall related items. The items in the table are ordered from largest to smallest percentage change in knowledge increase, although all are significant. Among the fire

related items, the largest pre to follow up increase (22.3 percentage points) was for the question “How far should space heaters be kept from things that can burn, including yourself?” and the smallest (9.7 percentage point) increase was for the question “What is the best thing to do in most cases if your clothing catches on fire?” Across these fire related items, there was an average 15.8 percentage point increase from pre to follow up.

**% of paired, treatment respondents with positive significant change*
by item between pre and follow-up knowledge assessments**

Fire Items	N	Pre	Follow-up	Chg
How far should space heaters be kept from things that can burn, including yourself?	63	31.7	54.0	22.3
What is the safest clothing to wear when you cook?	65	58.5	76.9	18.4
What is the safest ashtray smokers should use?	68	69.1	85.3	16.2
If you get a burn or scald, what should you do first?	68	69.1	83.8	14.7
What is the best way to stop a grease fire in a pan?	73	46.6	60.3	13.7
What is the best thing to do in most cases if your clothing catches on fire?	72	86.1	95.8	9.7
Fall Items				
What can you do to reduce the risk of falling in the bathtub or shower?	65	69.2	92.3	23.1
What is a common situation that causes older adults to fall?	64	87.5	98.4	10.9

* p < .05 (2 tailed test)

Two fall-related items also showed statistically significant pre to follow up changes. Across these fall items, there was an average 17 percentage point increase from pre to follow up. Note that the first fall related item, about reducing the risk of falling in the bathtub or shower, was not only statistically significant, but had the largest percentage point increase from pre to follow-up among any of the nineteen knowledge items. (The correct answer included grab bars and bath mats.)

**% of paired, treatment respondents with positive but not significant change
by item between pre and follow-up knowledge assessments**

Fire Items	N	Pre	Follow-up	Chg
A complete home fire escape plan should have which of the following?	66	50.0	65.2	15.2
Where in the house should smoke alarms definitely be installed?	72	69.4	81.9	12.5
Under most circumstances, what is the first thing you should do if a smoke alarm goes off?	72	56.9	66.7	9.8
Fall Items				
What, if any, is the safest throw rug to use?	70	68.6	82.9	14.3
What is the best way to improve safety of a stairway?	62	74.0	86.3	12.3
How often should you have your eyes examined by an eye specialist?	70	71.4	78.6	7.2
How should stairways be lit?	62	77.4	80.6	3.2

Although there was no significant change in the knowledge items in the previous table, changes in knowledge were moving in a positive direction. Of these seven items, three are fire-related and four are fall-related messages. Across all positive change items, there is an average of a 10.2 percentage point increase from pre to follow-up; with a 12.5 percentage point average for fire items and a 9.25 percentage point increase for fall items.

**% of paired, treatment respondents with no change
by item between pre and follow-up knowledge assessments**

Fire Items	N	Pre	Follow-up	Chg
How often should you test your smoke alarms?	67	34.3	35.8	1.5
What telephone number is best to call in case of fire?	73	93.2	94.5	1.3
Nationally, what is the leading cause of home fire deaths?	64	60.9	60.9	0

These items showed no pre to follow-up knowledge change, which was defined as a change of 1.5 percentage points between pre and follow up knowledge assessments. The three fire related items are each in a different third of a possible range of answers. The first item, about frequency of testing the smoke alarm, is quite low at both the pre and follow-up assessments, despite immediate post program knowledge changes on this item. During the training, the most time spent on all messages was on smoke alarms, which often included testing of the alarms.

The second item, about the phone number to call in an emergency, is in the highest one-third of the scale at both pre and follow-up. There may be a ceiling effect with this item relative to additional possible change with the training.

The third item is in the middle range on knowledge with no change. There is some concern about the extent to which this item was directly covered by the training. Like the prescription message discussed earlier, this knowledge item may have been carried over from the Virginia Department of Health questionnaires. It is not one of the messages on the flash cards used to guide the Remembering When training. The fact that there was no movement at all on this item may validate its lack of coverage in the course.

**% of paired, treatment respondents with significant, negative change*
by item between pre and follow-up knowledge assessments**

Fall Item	N	Pre	Follow-up	Chg
Which shoes are the best choice so you don't slip or trip when walking?	65	55.4	36.9	-18.5

* p < .05 (2 tailed test)

Finally, there was one fall-related item, about shoe choice, that showed a statistically significant pre to follow up *decrease* of -18.5% correct. A review of the questionnaires in Appendix 4 shows that the question and multiple choice answers for this question were posed as follows:

- “Which shoes are the best choice so you don’t slip or trip when walking?”
- a. thick soled athletic shoes
 - b. comfortable slippers or sticking feet
 - c. thin-soled, well-fitted, how-heeled shoes
 - d. unsure

About half of the respondents answered correctly before the training (response “c”) and about a third of the respondents got the answer right at follow-up. As discussed in Chapter III, the second largest amount of time spent in message-specific training went toward shoe choice. The message was often accompanied by a demonstration of showing a good shoe choice or having participants look at their own shoes to access safety. The significantly negative change on this item suggests the need to review presentation and knowledge item content.

Overall Pattern of Pre to Post to Follow up Results for New River Valley

The data discussed to this point has been of paired data, taking the most conservative approach to the analysis. Table A in the accompanying set of tables shows corresponding data for unpaired respondents at NRV. It shows the substantial pre to post increases and the general decrease in knowledge from post to follow-up.

Fire knowledge. As shown in Table A, there was an increase on all fire related items between pre and follow up. The average correct increase across fire items at follow up was 10.9%. The level of knowledge gain that was maintained between pre and follow up varied from a 1.4% increase (“how often should you test your smoke alarm?”) to 18.6% (“How far should space heaters be kept from things that can burn, including you?”).

Fall knowledge. For all fall related items, except one, there was a higher percent of participants answering each item correctly at follow up than at the pre assessment. One fall-related item showed a pre to follow up decrease of 3.2% (“Which shoes are the best choice so you don’t slip of trip when walking?”). The average percent increase between pre and follow up was 9.9%. The smallest pre to follow up gain in percent correct was 4.9% (“How often should you have your eyes examined?”) and the largest percent gain was 24.2% (“What can you do to reduce the risk of falling in the bathtub or shower?”).

Control site: Roanoke Pre to Follow Up Knowledge Comparisons

The analysis now turns to a look at comparable items for the control group in Roanoke. With reference to Table C, the data for paired Roanoke respondents is grouped below by significant positive change, non-significant positive change, and no change.

**% of paired, control respondents with positive significant change*
by item between pre and follow-up knowledge assessments**

Fire Items	N	Pre	Follow-up	Chg
What is the best way to stop a grease fire in a pan?	95	28.4	49.5	21.1
If you get a burn or scald, what should you do first?	87	59.8	71.6	11.8
Fall Item				
What, if any, is the safest throw rug to use?	95	65.3	78.9	13.6

* p < .05 (2 tailed test)

Paired t-tests showed statistically significant increases (p<.05) between pre and follow up percent correct for three of the nineteen knowledge items for Roanoke participants. Two of these were fire-related for which the largest pre to follow up significant increase was 21 percentage points (for the question “What is the best way to stop a grease fire in a pan?”) and the smallest significant increase was 11.8 percentage points (for the question “If you get a burn or scald, what should you do first?”).

**% of paired, control respondents with positive but not significant change
by item between pre and follow-up knowledge assessments**

Fire Items	N	Pre	Follow-up	Chg
What is the first thing you should do if a smoke alarm goes off?	95	53.7	68.4	14.7
How often should you test your smoke alarms?	88	30.7	37.5	6.8
A complete home fire escape plan should have which of the following?	88	39.8	45.5	5.7
What is the safest ashtray smokers should use?	93	71	73.1	2.1
What is the best thing to do in most cases if your clothing catches on fire?	96	94.8	96.9	2.1
Fall Items				
What is the best way to improve safety of a stairway?	95	74.7	82.1	7.4
How should stairways be lit?	86	64	70.9	6.9
What is a common situation that causes older adults to fall?	86	83.7	87.2	3.5
What can you do to reduce the risk of falling in the bathtub or shower?	87	80.5	82.8	2.3
Which shoes are the best choice so you don't slip or trip when walking?	88	43.2	42	2.1

Although there was no significant change in these knowledge items, changes in knowledge were moving in a positive direction. These increases were split between fire- and fall-related items. The largest of these (a 14.7 percentage point increase) was for the fire-related item “What is the first thing you should do if a smoke alarm goes off?” and the smallest (a 2.1 percentage point increase) was for the two fire related items and one

fall related item. Overall, the average percentage point gain for these items was 5.3 percentage points; fire items increased and average of 6.3 percentage points and fall related items increased and average of 4.4 percentage points.

**% of paired, control respondents with little or no change
by item between pre and follow-up knowledge assessments**

Fire Items	N	Pre	Follow-up	Chg
Where in the house should smoke alarms definitely be installed?	93	79.6	80.6	1
Nationally, what is the leading cause of home fire deaths?	86	61.6	61.6	0

These items showed no change from pre to follow-up knowledge, which was defined as less than a change of 1.5 percentage points between pre and follow up knowledge assessments.

**% of paired, control respondents with negative change
by item between pre and follow-up knowledge assessments**

Fire Items	N	Pre	Follow-up	Chg
What telephone number is best to call in case of fire?	95	100	97.9	-2.1
What is the safest clothing to wear when you cook?	87	56.3	52.9	-3.4
How far should space heaters be kept from things that can burn, including yourself?	82	39	34.1	-4.9
Fall Item				
How often should you have your eyes examined by an eye specialist?	94	81.9	79.8	-2.1

Although none of these items are statistically significant, they show knowledge moving in the “wrong” direction at Roanoke. For a couple of the items, the percent correct at baseline was relatively high and it is therefore more difficult to determine whether these items would have shown a change for the control group had there not been a ceiling effect.

Treatment and Control Comparison: Gain Scores

A statistical comparison of paired data on pre to follow up gains made between the treatment and control conditions (Table D) indicates that New River Valley had significant gains for three items:

- “How far should space heaters be kept from anything that can burn?”
- “What is the safest clothing to wear when you cook?”
- “What can you do to reduce the risk of falling in the bathtub?”

Gains scores for the two sites indicate larger pre to follow up percent correct for New River Valley than Roanoke on the majority of the nineteen knowledge items. Also,

New River Valley pre to follow up comparisons previously reported showed three times as many knowledge items with statistically significant pre to follow up differences, while Roanoke did not.

Knowledge by Demographics

Statistical Significance

Paired t-tests were conducted to compare pre to follow differences for each knowledge item by each demographic variable collected. Relatively few statistically significant differences by demographic variable were detected. The area showing the most significant differences was that of participants with less than a high school education. Roanoke showed significantly larger gains for these participants for one fire item (“What is the first thing you should do if a smoke alarm goes off?”) and two fall items (“What is a common situation that causes older adults to fall?” and “How should stairways be lit?”). Similarly, New River Valley showed a significant gain over that of Roanoke for these participants for one fire item, (“How far should space heaters be kept from things that can burn?”) Average pre to follow up knowledge gains were examined further in Table E to identify more general patterns for each item type (fire or fall) and level of demographic variable.

Fire knowledge. New River Valley participants showed larger pre to follow up gains than Roanoke across the key demographic variables including age (all levels), education (high school education or less), sex (both male and female), type of home (house, apartment, or other) and number of residents living in the home (1, 2, or 3+).

Fall knowledge. New River Valley participants showed larger pre to follow up gains than Roanoke for participants for age ranges “under 65” and “65 to 74 years of age.” Roanoke showed larger gains for those participants 75 years and older across conditions.

New River Valley participants with a high school education or less showed larger pre to follow up gains than did Roanoke participants of the same education level.

Female New River Valley participants showed larger pre to follow up gains on fall-related items than Roanoke female participants. Average pre to follow up gain for male participants on fall-related items was the same for both sites.

Regardless of type of home, New River Valley showed larger pre to follow up gains than Roanoke participants on fall related knowledge items. Regarding type of home, average gains were nearly identical between New River Valley and Roanoke for participants living alone. However, New River Valley showed larger gains when participants reported two persons living in the home and both New River Valley and Roanoke participants showed average negative gains for fall related items when participants reported 3 or more people living in the home.

Self Reported Safety Behavior: Home Safety Checklist

Treatment Site: New River Valley Pre to Follow up Self-reported Behaviors

Table G summarizes New River Valley pre-follow up paired comparisons for each of 14 home safety checklist item. These items indicate self-reported steps respondents took (or note) to increase the fire and fall safety at home. Pre-follow gains indicate a change in the desired direction for most self-reported home safety items. Nearly all of the items where a higher percentage reflects positive behavioral changes, e.g., having a vision or eye test at least once a year, increased in the direction the program would have predicted. Similarly, there were decreases in self-reported behaviors for which a decrease was the desired outcome, e.g., falling down. Overall, there was approximately a 4.7 percentage point average change in the incidence of positive self-reported safety behavior from pre to follow up.

Self-reported fire safety behavior. Paired pre-follow up comparisons showed positive self-reported behavioral change for six of the seven fire items on the home safety checklist for New River Valley participants. Two of these self-reported behavioral changes achieved statistical significance including “Have you developed an escape plan in case of a fire in your home?” and “If you have a smoke alarm, do you know how to check the smoke alarm to see if it is working?” The only home safety fire item not showing a pre-follow up gain was “do you have a telephone in your bedroom?”

% of paired, treatment respondents with significant positive change* by item between pre to follow-up on self-reported behavior

Fire Items	N	Pre	Follow-up	Chg
Have you developed an escape plan in case of a fire in your home?	138	58.7	78.3	19.6
If you have a smoke alarm, do you know how to check the smoke alarm to see if it is working?	137	85.4	94.2	8.8
Fall Items				
Do you have grab bars on the wall near the bathtub, shower, or toilet?	142	29.6	44.4	14.8

* p<.05 (2 tailed test)

Self-reported fall safety behavior. Paired pre-follow up comparisons showed positive self-reported behavioral change on four of the seven fall safety items. A statistically significant pre-follow up change consistent with increasing home safety did emerge for the fall item, “Do you have grab bars on the wall near the bathtub, shower or toilet?” Two fall-related home safety items showed pre-follow up reductions home safety including “Have you had a vision or eye test in the last year?” and “Do you keep loose objects on your stairs or at the bottom of your stairs?”

Control site: Roanoke Pre-Follow up Comparison

Table H summarizes Roanoke pre-follow up paired comparisons for each home safety checklist item. Pre-follow gains indicate a change in the desired direction for nine of the fourteen self-reported home safety items. Overall, there was approximately a 2.5% average change in the incidence of positive self-reported safety behavior from pre to follow up.

Self-reported fire safety behavior. There were no statistically significant increases for the fire home safety items. However, five of the seven items showed a pre-follow up gain. The fire items not showing a pre-follow up gain were “If you have a smoke alarm, do you have one or more on every level of your home?” and “Within the past twelve months, have you had a burn or a scald?” The average pre-follow up percent increase in positive home safety fire-related behaviors was 3.3%.

% of paired, control respondents with significant positive change by item between pre to follow-up on self-reported behavior

Fall Items	N	Pre	Follow-up	Chg
If you have throw rugs, do they all have a rubber backing?	166	71.1	78.9	7.8

Self-reported fall safety behavior. There was one statistically significant increase for the fall home safety item “If you have throw rugs, do they all have rubber backing?” At the same time, three of the seven fall-related items showed self-reported decreases in home safety. These included pre-follow up increases in percent of respondents indicating “yes” to the questions “Within the past three months, have you fallen in your home?” and respondents indicating “no” to the questions “Do you exercise regularly” and “Have you had a vision or eye test in the past year”?

Comparison of New River Valley to Self-reported Behaviors

New River Valley showed an average pre-follow-up gain of 6.2 percentage points for self-reported fire behaviors compared to a 3.7 percentage point increase for Roanoke. For self reported fall behaviors, New River Valley showed 6.7 percentage point increase compared to a 5.6 percentage point increase for Roanoke. While this is not a statistical comparison, it does indicate New River Valley participants reported more home safety behavior than Roanoke. It is also worth noting, while New River Valley reported a 2.9 percentage point decrease in falls in the home in the last three months, Roanoke reported a 1.1 percentage point increase. In the opposite direction, New River Valley reported approximately a 1 percentage point increases in fire in the home and burns/scalds while Roanoke reported comparable decreases.

Demographic Comparison for Self-reported behavior

Table J reports on the home safety checklist items by demographic variable. On average, New River Valley participants showed higher pre-follow up gains.

Home Assessment Findings

A total of 542 home assessments were conducted between the treatment and control sites: 229 at NRV and 313 at Roanoke. The purpose of these observations was to determine whether safety related actions were taken in the home. The observations were conducted by an independent, on-site evaluation coordinator. She used a 23 item checklist to indicate the safety status of the resident's living situation in line with items covered in the training.

Treatment Site: New River Valley Home Assessments

The treatment group showed varying kinds of home changes between initial and follow-up home assessments. All data for unpaired and paired respondents on home assessment items is found in Table K. The data for paired respondents is grouped below by significant positive change, non-significant positive change, no change, and significant negative change.

% of paired, treatment respondents with positive, significant change* by item between initial and follow-up home assessments

Fire Items	N	Pre	Follow-up	Chg
Test the smoke alarm outside the [main] bedroom. Does it work?	37	83.8	97.3	13.5
Is there at least one smoke alarm on every level of the home?	80	76.3	88.8	12.5
How many smoke alarms are in the home?	61	1.57	1.92†	.35
Fall Items				
Are there one or more nightlights that light the path between the bedroom and bathroom?	91	64.8	84.6	19.8
Does the shower/tub have at least on grab bar?	87	57.5	65.5	13.5
Is there a nonslip mat for the shower/tub?	87	57.5	70.1	12.6

* $p < .05$ (2 tailed test)

† This row is numeric, not percentages, i.e. number of smoke alarms

Of the six items with significant, positive changes, three relate to smoke alarms and three relate to fall messages, i.e. nightlights, non-slip mats, and grab bars. The presence of smoke alarms showed the most change among all items including increases in the number of tested, working alarms outside the main bedroom, levels on which alarms exist, and over all number of smoke alarms.

**% of paired, treatment respondents with positive, but non-significant change
by item between initial and follow-up home assessments**

Fire Items	N	Initial	Follow-up	Chg
Are there potholders within two feet of the stove?	61	67.2	72.1	4.9
Is there a smoke detector outside the [main] bedroom?	87	67.8	71.3	3.5
Where are the lids [for pots and pans] stored when you are cooking? (within two feet)	59	76.3	79.7	3.4
Fall Items				
Is there an easy to grip handrail the full length of both sides of the stairway?	20	20.0	25.0	5.0
Do throw rugs have a rubber non-skid backing? (combined)	72	68.5	72.9	4.4
Does the toilet have at least one grab bar?	91	42.9	45.1	2.2

Although there was no significant change in these home assessment items, changes in the home were moving in a positive direction. The throw rug item is combined data from three rooms, living room, bedroom, and bathroom. All other items were relevant to specific areas. Again, the items show a mixture of changes related to fire and fall messages.

**% of paired, treatment respondents with little* or no change
by item between initial and follow-up home assessments**

Fire Items	N	Initial	Follow-up	Chg
Are space heaters at least three feet away from anything that can burn? (combined)	6	0	0	0
Is there a telephone in the [main] bedroom?	89	74.2	74.2	0
Are ash trays used in the house deep sided?	6	16.7	16.7	0
Do you wet your cigarette or cigar butts before disposing of them?	7	28.6	28.6	0
Fall Items				
Do you have emergency numbers posted?	91	29.7	30.8	1.1
If there is carpeting [in the main bedroom], is it free of wrinkles?	72	93.1	93.1	0
Observe: Does the resident move slowly and get his/her balance before getting out of the chair?	91	98.9	98.9	0
Is the stairway well lit from the top and the bottom?	17	70.6	70.6	0
Are walking areas free of clutter? (combined)	92	95	94.2	-0.8

*less than 1.5 percentage point change

These items showed no change from initial to follow-up home assessment, which was defined as a 1.5 percentage point change or less. Again, the combined items covered several rooms. Several circumstances may account for this lack of change besides the program. First, many of the initial and follow-up home visits were made in the summer

time. This made for a limited number of space heaters to observe (n=6). Winter visits may have revealed a different behavior pattern. Second, three of the items have means over 93% which suggests a ceiling effect. Lastly, the small number of respondents on two of these items makes change measurement dubious.

% of paired, treatment respondents with negative change and significant negative change* by item between initial and follow-up home assessments

Fall Items	N	Initial	Follow-up	Chg
Observe: Is the resident wearing sturdy, well fitted, low heeled shoes with non-slip soles?	89	83.1	67.4	*-15.7
Is there an easy to grip handrail the full length on one side of the stairway only?	15	73.3	66.7	-6.6

*p < .05 (2 tailed test)

There was a significant, negative difference, i.e., the data went in the “wrong” direction, on two items. First, a significantly larger percentage of respondents did NOT wear the recommended shoes at follow-up. The reason for the non-significant reduction in the number of handrails on one side of the stairwell is not clear. It may be related to the increase in railings on both sides of the stairways.

Control Group: Roanoke Home Assessments

The control group showed varying kinds of home changes between initial and follow-up home assessments. All data for unpaired and paired respondents on home assessment items is found in Table L. The data for paired respondents is grouped on the following pages by significant positive change, non-significant positive change, no change, and negative change/significant negative change.

% of paired, control respondents with positive significant change* by item between initial and follow-up home assessments

Fire Items	N	Initial	Follow-up	Chg
Do you have emergency numbers posted?	111	9.0	20.7	11.7
Where are the lids [for pots and pans] stored when you are cooking? (within two feet)	110	70.9	81.8	10.9
Fall Items				
Observe: Does the resident move slowly and get his/her balance before getting out of the chair?	115	73	86.1	10.9
Are there one or more nightlights that light the path between the bedroom and bathroom?	118	66.1	75.4	9.3
Does the shower/tub have at least one grab bar?	116	44.8	53.4	8.6

* p < .05 (2 tailed test)

Respondents at the control site showed significant, positive change on five home assessment items. Three of the changes related to fall messages, i.e. nightlights, grab

bars, and moving slowly; two of the significant changes were related to fire messages, i.e., storage of pot and pan lids and posting emergency numbers.

% of paired, control respondents with positive, but non-significant change by item between initial and follow-up home assessments

Fire Items	N	Initial	Follow-up	Chg
Test the smoke alarm outside the bedroom. Does it work?	57	84.2	89.5	5.3
Is there a telephone in the [main] bedroom?	117	73.5	76.9	3.4
Is there at least one smoke alarm on every level of the home?	106	85.8	87.7	1.9
Fall Items				
Is there a non slip mat for the shower/tub?	114	36.8	41.2	4.4
If there is carpeting [in the main bedroom], is it free of wrinkles?	82	86.6	90.2	3.6
Is there any easy to grip handrail the full length on one side of the stairway only?	39	61.5	64.1	2.6

Three fire-related items and three fall related item show a positive, but non-significant change. It is in this category of change that the first items related to smoke alarms appear.

% of paired, control respondents with little* or no change by item between initial and follow-up home assessments

Fire Items	N	Initial	Follow-up	Chg
Is there a smoke detector outside the [main] bedroom?	117	44.4	45.3	.90
How many smoke alarms are in the home?	112	1.71	1.8†	.09
Do you wet your cigarette or cigar butts before disposing of them?	17	23.5	23.5	0
Fall Items				
Observe: Is the resident wearing sturdy, well fitted, low heeled shoes with non-slip soles?	116	71.5	64.7	0.9
Does the toilet have at least one grab bar?	119	35.3	36.1	0.8
Are walking areas free of clutter? (combined)	119	86.4	87.2	0.8
Is there an easy to grip handrail the full length of both sides of the stairway?	40	25	25	0
Do throw rugs have a rubber non-skid backing? (combined)	105	61.9	60.5	-1.4

* less than 1.5 percentage point change

† This row is numeric, not percentages, i.e. number of smoke alarms

The items on clutter and throw rugs are combined data from several rooms. Two of the items on which there is no change relate to smoke alarms.

% of paired, control respondents with negative change and significant negative change* by item between initial and follow-up home visits

Fire Items	N	Initial	Follow-up	Chg
Are space heaters at least three feet away from anything that can burn? (combined)	6	33.3	0	-33.3
Are there potholders within two feet of the stove?	115	67.0	63.5	-3.5
Are ash trays used in the house deep sided?	44	13.6	9.1	-4.5
Fall Items				
Is the stairway well lit from the top and the bottom?	40	45	42.5	-2.5

* p < .05 (2 tailed test)

The same issues as noted previously for the treatment group apply to the control group, e.g. summer time assessments did not find an adequate number of space heaters to judge behavior change.

Cross- methodology Analysis

Two messages were picked for cross methodology analysis. This analysis looks at both sites for one message and compares knowledge, checklist, and home assessment findings. In addition, the time spent on the message during training is included for the treatment site. The two messages picked for this type of analysis were “smoke alarms save lives” and “best foot forward.” These messages respectively received the first and second most amount of time on message in training. The former message was selected because it was one area in which there was significant change in the home for the treatment site vs the control site. The later message was selected for its significance, as well, but most specifically because that significance was in the “wrong” direction of intended knowledge and behavior.

Smoke Alarms Save Lives

The table on a following page compares NRV and Roanoke on all assessments for the item about Smoke Alarms. This message received the most time of any message in the training. It had a mean of 161.2 seconds per training or 2.7 minutes. Although there was no significant knowledge change from pre to follow-up at either the treatment or control site on this item, NRV had a 12.5 percentage point gain on this message and Roanoke had a 1 percentage point gain. Both groups remain low in the percent of correct responses about how often smoke alarms should be tested.

On the check list assessment of self-reported behavior, over 90% of both groups report having one or more smoke alarms in the home. There was no significant change in either group on this item. However, there is a significant change at the treatment site in the percentage of seniors reporting that they “know how to check the smoke alarm to see if it is working.” No change is found at the control site. There was also no difference between the groups in self-reporting a smoke alarm on every level of the home.

The home assessment data shows significant changes in three of the four smoke alarm items assessed at the treatment site and no changes at the control site. The treatment site had significantly more working smoke alarms outside the bedroom, an increased number of smoke alarms, and at least one working smoke alarm on every level of the home. The one area in which there was no significant change at either site was having a smoke detector outside the bedroom.

Best Foot Forward

Following the smoke alarm table is a table about footwear comparing NRV and Roanoke across all methodologies. Safe footwear was the message that received the second most amount of time during training, an average of 126.9 seconds or 2.1 minutes per training session. Despite the time spent on this message, there was a significant *decrease* in knowledge about the correct footwear among the treatment group, as well as a significant *decrease* in the correct footwear worn from initial to follow-up home assessments. There was no significant change – positively or negatively – at the control site.

Smoke Alarms Save Lives data across all study methods for paired respondents at New River Valley and Roanoke

	New River Valley							Roanoke					
	Mean Sec.	Pre %	F-up %	Cklist Initial %	Cklist f-up %	HA1 %	HA2 %	Pre %	F-up %	Cklist Initial %	Cklist f-up %	HA1 %	HA2 %
Smoke Alarms Save Lives													
Seconds on message in training	161.2												
Where in the house should smoke alarms definitely be installed?		69.4	81.9					79.6	80.6				
How often should you test your smoke alarms?		34.3	35.8					30.7	37.5				
Do you have one or more smoke alarms in your house?				90.7	92.9					94.4	95.6		
If you have a smoke alarm, do you know how to check the smoke alarm to see if it is working?				85.4	94.2*					82.7	84.9		
If you have a smoke alarm, do you have one or more on every level of your home?				75.2	83.2					82.1	81.8		
Is there a smoke detector outside the bedroom?						67.8	71.3					44.4	45.3
Test the smoke alarm outside this bedroom. Does it work?						83.8	97.3*					84.2	89.5
How many smoke alarms are in the home?						1.57	1.92*					1.71	1.80
Is there at least one smoke alarm on every level of the home?						76.3	88.8**					85.5	87.7

Best foot forward data across all study methods for paired respondents at New River Valley and Roanoke

	New River Valley					Roanoke			
	Mean Sec .	Pre	F-up	HA1	HA2	Pre	F-up	HA1	HA2
Best Foot Forward									
Seconds on message in training	126.9								
Which shoes are the best choice so you don't slip or trip when walking?		55.4	36.9*			43.2	42.0		
Observe: Is the resident wearing sturdy, well-fitted, low-heeled shoes with non-slip soles?				83.1	67.4**			71.5	64.7

Chapter V

Discussion and Recommendations

This section of the report combines a discussion of the study's methodology (Chapter II), program implementation (Chapter III), and knowledge and behavioral changes (Chapter IV). Recommendations regarding the evaluation close out this report.

The Methodology

- It is possible that the 549 home visits, 1913 questionnaires, and 23 training observations were important aspects of intervention effectiveness. Since both sites received home visits and questionnaires, their effects were distributed among both treatment and control sites.
- It may be helpful to weight pre-follow up changes in fire and fall knowledge and behavior. This might be done in consideration of the relative impact of each change on projected injury reduction, along with associated expenses or quality of life measures. For example, the control group shows significant changes on the location of pots and pan lids. Is that equal in importance to working smoke alarms changes for the treatment group? Should this be a consideration in the analysis?
- The control site was not without some intervention in educating seniors about safety. On-site observations confirmed that brochures about preventing falls in the home were found at the control site. The extent to which this intervention affected outcomes at the control site is unclear.

The Program

- The implementation of the Remembering When program studied in this evaluation is intertwined with equipment and support that extends beyond the materials, teaching methods, and content of the program. Seniors were not only predisposed to make changes as a result of the educational intervention, they were enabled to do so with free equipment, and reinforced to do so with other forms of community support.
- It was possible for trainers to get through all sixteen key messages in the Remembering When program in approximately one hour. The evaluation documented the amount of time spent on each of the 16 key program messages.
- Embedded within the 16 key messages are 49 sub-messages. The study did not track all these sub-messages. Are all these sub-messages of equal priority? Are all these messages feasible, useful, and effective? Some guidance of priorities can be

useful to trainers with limited time and resources to deliver the program.

- Participants give overwhelmingly positive satisfactory ratings to the program. There is little question that respondents enjoyed the program. Qualitative data in Chapter III suggests that the Remembering When program retained senior participation long after they would have left other kinds of interventions.
- The educational program was often run in conjunction with other senior center activities, e.g. nutrition centers or social programs, which got the program in the door, but often pressed the trainers for time.
- The key messages in the program need review. The footwear item led to negative knowledge and behavioral change. Some messages show no change because of already high knowledge, e.g. emergency number. In an age of cell phones, what does the message to “have a telephone in the bedroom” mean, e.g., a land line phone, the cell phone itself, the cradle for a cell phone, a cell phone in your pocket, or a cell phone and a cradle?
- Does the name of the program, Remembering When, have meaning if trainers have little or no time to ask trivia questions? The trivia game was used in this study primarily for awarding “prizes” such as nightlight or oven mitts. Trainers indicate that seniors enjoyed the trivia game, but that there was little time to use it. Even if the evaluation activities were removed, trainers are pressed for time to complete the program within an hour.
- Half of the participants (54%) thought the program was “ideal” at one session. The remainder thought the program should be expanded to 2 or more sessions.
- A third of the respondents asked for free home safety equipment that was available through the program. These requests may have contributed to the approximately twenty percentage point increase in night lights and bath mats at the treatment site (significant change). But why did more program participants not ask for free equipment to increase the presence of such equipment even more?
- If reviewing prescription drugs with a doctor is a key fall prevention message, it should appear on the program flashcards and should be more fully integrated into other aspects of the program. As it is, this message is currently found tucked into the program booklet only.
- The six New River Valley knowledge items where the treatment group showed significant changes in knowledge and the control group did not, indicate areas where the program was particularly effective. Nearly all these areas lent themselves to demonstrations, such as measuring space heater distance, in a way that other items, such as a fire safety plan, did not.

Knowledge Change

- Overall, the treatment site at New River Valley showed significant knowledge changes on more items than the control site at Roanoke. Specifically, NRV showed a significant pre to follow-up change on 8 of the 19 knowledge items, while Roanoke showed a significant pre to follow-up change on 3 of 19 knowledge items.
- The average increase for fire items from pre to follow-up was more than doubled in NRV vs Roanoke, i.e., 11.3% vs 4.4%. The average increase for fall items from pre to follow-up was 7.5% for NRV and 5.1% for Roanoke. (If the correct shoe item is not included in the average, the increase for NRV would have been 10.1% for fall items or double that of Roanoke).
- Except for the item on correct footwear, NRV had no negative pre to follow-up changes in knowledge; Roanoke showed a negative knowledge change on four items.
- Gain scores also showed an advantage to knowledge change at NRV over Roanoke. A comparison of the pre to follow-up gains between the two sites showed NRV with a significant difference on three items: space heater distance, safe clothing for cooking, and grab bars as a way to reduce falls in the bathroom. On the first two of these items Roanoke had a negative pre to follow-up knowledge change.
- The treatment and control sites both had significant knowledge gains on two fire items: “What is the best way to stop a grease fire in a pan?” and “If you get a scald or a burn, what should you do?” There are several possible explanations for these increases at the control site. First, information may have come from other injury prevention materials or activities with the fire department or other community agencies. Second, some of the qualitative data in Chapter III identifies newspaper stories and television programs about fire related hazards that were discussed at the treatment site. It is possible that some of these messages were broadcast at the control site as well. Third, there may have been something about the knowledge or the wording of these questionnaire items that did not differentiate between groups, or, in fact, even educated in the absence of an intervention.
- The third knowledge item on which there was a significant change at Roanoke – “What if any, is the safest throw rug to use?” – showed a positive, but not significant change at NRV. A qualitative comment found in one of the training observations at the control site might help explain this change: “Several booklets provided by the Roanoke LOA were lying on the table titled ‘Preventing Slips and Falls in the Home.’ These booklets could influence the answer to question #9.” This observation confirms that there were some prevention materials at Roanoke that had potential to increase awareness and knowledge, especially related to falls.
- Demographic analysis for NRV showed the program worked best for those with less than a high school education, those under 74 years of age, and women.

- Comments on some of the individual knowledge items
 - Reducing the risk of falling in the bathtub or shower (grab bars and bath mats) was the item that showed the largest pre to follow-up significant change at NRV. There was no change on this item at Roanoke. It is unclear if the previously mentioned brochures at Roanoke contained information about grab bars. The program did include this information and presented it with demonstrations of equipment.
 - Knowledge about correct footwear showed a significant *negative* change at NRV. There was no change at Roanoke. Treatment participants had more correct answers about footwear than the control respondents at the pre assessment, but significantly fewer correct answers about footwear at the follow-up.
 - The placement of space heaters was the knowledge item with the second largest pre to follow-up change at NRV. There was a negative change at Roanoke. This item was accompanied by a participatory, measurement demonstration during the program. Knowledge change on this item supports the effectiveness of the program for changing knowledge related to this message. Unfortunately, this knowledge change could not be verified in practice because home assessments were largely conducted over summer months, when space heaters were not in use.
 - Knowledge about the frequency for testing smoke alarms is a stubbornly low percentage correct for both the treatment and control sites. NRV showed no change on this item from pre to follow up and Roanoke showed a positive, but not significant change. At both sites only about a third of the respondents knew the correct answer.
 - Over 90% of New River Valley and Roanoke participants answered the emergency number question (“What telephone number is best to call in case of fire?") correctly at the initial assessment. Given this ceiling effect, it is unclear whether this message is worth keeping or whether more time might be spent on other priority messages, e.g. frequency of smoke alarm testing or safe footwear.

At the same time, participant knowledge regarding the appropriate emergency telephone number does NOT translate into actual posting of phone numbers in homes. The message may need to be changed regarding the difficulty of remembering emergency telephone numbers in emergency situations. Participants who know the number may not perceive a need to post it.

- The question about the leading cause of death showed no change at either site. (NRV 60.9% correct at pre and follow-up; Roanoke had 61.6% at pre and follow-up). We believe this item was a carry over from the VDH

questionnaires and that the material was not covered in the training. This item has the potential to show the effects of no treatment at both sites.

- New River Valley started with average fire knowledge lower than average fall knowledge. By follow up, average fire knowledge was higher than fall knowledge. This supports the overall conclusion that the program may have been more impactful for fire knowledge than fall knowledge.

Checklist

- Overall NRV had nearly double the positive, self-reported behavior change that Roanoke did, i.e. 4.7% vs 2.5%, from pre to follow-up.
- NRV had a significant, positive increase on three self-reported safety behaviors between pre and follow-up. Roanoke had a significant, positive increase on one item
- There were no statistically significant differences on self-reported fire related behavior at Roanoke; There were two items of statistical significance on fire related items at NRV
- There is correspondence between knowledge changes and self-reported behavior:
 - The largest knowledge increase at NRV (on any item) was about ways to reduce the risk of falling in the bathtub or shower. The correct answer was to install bath mats and grab bars. NRV had a significant increase in self-reported grab bars in the home; Roanoke has a positive, but non-significant change in self-reported grab bars in the home.
 - Neither NRV nor Roanoke did well on knowing *how often* they should check their smoke alarm, but NRV self-reported a positive, significant change in knowing *how* to check the alarm. Roanoke showed only a slight, non-significant increase on this item.
 - Both NRV and Roanoke reported a positive, but non-significant knowledge change about the contents of a complete home fire escape plan. Only NRV, however, had a significant increase in self-reported behavior about actually developing a plan.
 - The only significant increase in self-reported behavior at Roanoke was on having rugs with a non-skid backing. This matches the significant knowledge increase at Roanoke on this item. The booklets on slips and falls at this site may be a factor in understanding this change.

Home Assessment

- “Smoke Alarms Save Lives” is one message that distinguishes the treatment and control sites in home assessments. NRV had significant changes on three smoke alarm items, including increased number of smoke alarms, working smoke alarm outside the bedroom, and at least one smoke alarm on every level of the home. Home assessments showed no significant smoke alarm changes at the control site.
- NRV and Roanoke both had three significant, changes on fall related messages.
 - Each site showed significant increases in nightlights and grab bars in the tub/shower.
 - NRV showed a significant increase in non-slip bath mats
 - Roanoke showed a significant increase in residents moving slowly to get out of a chair.
- The “best foot forward” message showed a significantly, negative change at the treatment site, but no change at the control site. Participants in the treatment had a significantly negative knowledge change on correct footwear from pre to follow-up questionnaire. This negative knowledge appears to have carried over into home assessments where program participants were more likely to wear the “wrong” footwear at the second home assessment than the first.
- Both groups had 6 items on which there was positive, but non-significant change. There was an average 3.9 percentage point increase at NRV and 3.5 percentage point increase at Roanoke. It is in this category – positive, but non-significant change – that any item about smoke alarms first appears at the control site.
- Although both the treatment and control groups had significant changes, the changes are different. Hence, here are some comments on some of the individual home assessment items
 - There were no significant changes related to smoke alarms in the control group, only in the treatment group.
 - Nightlights between the bedroom and bathroom and grab bars in the shower/tub are two items that showed a significant change from initial to follow-up at both the treatment and control sites.
 - Although change on night lights was significant at both sites, the percentage of change at the treatment site was nearly double that of the control site (19.8% vs 9.3%).
 - Grab bars showed a larger percentage change at the treatment site than control site (13.5% vs 8.6%).

Recommendations

Based on our review of the data, we recommend continuation of the Remembering When program. It has demonstrated more long-term knowledge change in the treatment group than found in the control group. The program also demonstrated significant behavioral change in the home with regard to smoke alarms in the treatment group than in the control group. With this recommendation, however, come several caveats and considerations for future implementation of the program:

1. Embed the program in a community context

The program studied was not simply a one hour training session. It was a one hour health education intervention embedded in a community context that involved relationships among multiple agencies, availability of materials that would enable participants to change their behavior, and follow-up support. In keeping with health education models, such as the Precede-Proceed model (Green & Kreuter, 2005), the program not only predisposed participants to change with knowledge gains, but enabled them to make changes with equipment, such as night lights and bath mats, and reinforced them to make changes with home visits or continued support through strong and ongoing agency relationships.

2. Re-consider program length and process

Weigh program length, teaching methods, and message effectiveness together. First, nearly half of the Remembering When participants thought the “ideal” number of sessions for presenting information on fire and fall prevention should be more than one session. Many participants wanted more time. Second, the messages that carried visual demonstrations tended to show more long term knowledge change and even home safety changes, e.g. safe clothing to wear when cooking and testing smoke alarms. Third, seniors enjoyed the trivia game after which the program is named, but had little chance to play it because of the rush to get through all of the fire and fall messages. The game could help retain senior interest. Fourth, the fall messages received less time during the training than fire messages and showed fewer significant knowledge changes. Taking these factors *together*, consideration might be given to splitting the program into two sessions (perhaps separate fire and fall sessions) or, at least, extending the length of the program beyond the time available at the treatment site in this study. (Without the evaluation activities, this may be possible).

3. Change the Best Foot Forward message

Despite the numerous positive significant changes from this program, the footwear message underscores a reality that educational interventions can make things worse. Not only did knowledge change about correct footwear decrease from pre to follow-up at the treatment site, this carried over into seniors wearing less correct footwear at the second home assessment. It is not certain that is the

message were clear to program participants that they would be able to find correct footwear to purchase.

4. Keep up the smoke alarm messages

The significant changes between the treatment and control group on this message are confirmed. The one sub-message that needs clear attention for both groups is “how often should you test your smoke alarm?” Some additional intervention is needed, e.g. stickers with a reminder message, calendars with the test message monthly, or a mnemonic slogan. (For example, ALARM = **a**larms love **a** review **m**onthly!)

5. Review fire and fall messages for priority and clarity

Although the program emphasizes sixteen key messages, eight for fire and eight for fall, there are a total of 49 sub-messages. For example, the message about smoke alarms has five sub-messages, e.g., install smoke alarms outside all sleeping areas, install smoke alarms on every level of your home, test your smoke alarms once a month, test your smoke alarm by pushing the test button, and make sure everyone in our home can hear your smoke alarms. This evaluation did not assess all these sub-messages, instead focusing on at least one sub-message for each key message. We cannot say whether trainers covered all 49 sub messages. Considering the average length of the program was 56 minutes, full coverage of these sub messages is doubtful. Further, 49 sub messages in 56 minutes raises questions about what “cover” the message means.

In consideration of all these messages, we recommend reviewing the messages on several levels. First, what are the priority messages? Are all messages of equal importance? If they are not, then trainers and future evaluations need to attend to the most important messages. Second, some messages show a ceiling effect, such as the number of residents who already know what emergency number to call. Should this and similar messages continue as part of the key program messages? Third, consider ways in which messages need to be updated. For example, in an age of cell phones what does it mean to have a “telephone in the bedroom?” Does this mean a land line? A cell phone charging cradle only? A cell phone only? What about the charge on the phone?

6. Further explore fall changes at the control site

What happened at the control site that contributed to significant, positive changes in fall related behavior on home assessments? The treatment site “covered” the message about ways to prevent falls and distributed nightlights to participating seniors who requested them. As expected, there was a significant change in nightlights and grab bars at the treatment site, but so was there significant change at the control site. Perhaps the knowledge questionnaires or

home assessments themselves contributed to this change at both sites. But we also know from a written note by the on-site evaluation coordinator that booklets about preventing falls and slips in the home were found at the control site. Is it possible that these booklets were sufficiently effective to produce comparable change on these messages to the program? We do not know, but would certainly suggest that the booklets Roanoke had on display be reviewed. Perhaps they might make a useful addition to the Remembering When program or serve as supplemental material.