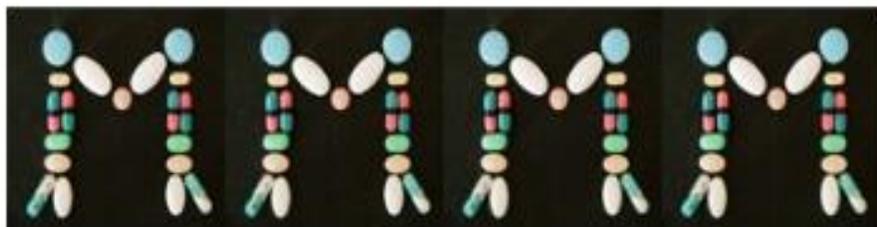


The ManageMed Screening©

A Quick Assessment of Medication
Management Skills

Second Edition

Regi Robnett & Jessica Bolduc



ONLINE EDITION

Disclaimer

The ManageMed Screening© was designed as a quick screening to determine if someone can manage a moderately difficult medication routine (i.e. three different medications and three different schedules and doses).

The ManageMed Screening© kit contains only ordinary materials that could be purchased off the shelf in a retail store. However, as an assessment tool, the ManageMed Screening© should only be used by health care professionals who are qualified to assess patients or clients. Although perhaps not 100% inclusive, the following list of professionals are those deemed appropriate users of the tool:

- Neuropsychologists
- Occupational therapists
- Physicians and physician assistants
- Registered nurses and nurse practitioners
- Social workers
- Speech and language pathologists

When administered properly, the ManageMed Screening© offers a lot of information about a specific activity of daily living (ADL) skill (basic medication management) and an instrumental activity of daily living (IADL) skill (medication routine management) in a short period of time. The results are meant to be incorporated into a more comprehensive client evaluation completed by the health care professional, who will help the client in making health care decisions. The screening does not, and cannot, offer direct information about the client's level of motivation or commitment to follow a prescribed medication routine. The ManageMed Screening© merely provides a snapshot of the client's ability to comprehend information related to prescription use at the time of testing. Since many variables come into play with regard to medication routine compliance, the results need to be interpreted cautiously.

This manual should be thoroughly perused prior to using the ManageMed Screening©. We hope that you will find the screening helpful. Information towards the end of the manual may be helpful in determining level of motivation and in exploring the client's medication-related belief systems.

The user of the ManageMed Screening© is responsible for any harm or damage that may result from the use of this product.

If you wish to be involved in research on this tool or have any questions, please contact the authors.

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Overview

The ManageMed Screening©²⁰⁰³ is an assessment tool that can help various clinicians, such as nurses and rehabilitation specialists, to determine if a client can manage a moderately difficult medication routine (i.e. three different medications, all with different dosages and schedules). It is a quick screen although it generally requires at least 20-30 minutes to administer. The client counts and manipulates simulated pills and verbally answers a number of questions about real-life medications. The screen has been validated on a number of community dwelling, independent functioning adults (N=100) and a smaller number of older people who were determined to need assistance with their medication routines. The screen was found to have adequate internal consistency and inter-rater reliability and has been determined to have a high level of ecological or real-life validity by a number of health care experts. The kit itself consists of a plastic carrying case containing simulated prescriptions, prescription information sheets, “pills” and vials. In addition the screen includes a test booklet with reproducible forms, a magnifying glass, and a weekly pill organizer. The screen holds promise for use in rehabilitation by healthcare professionals who are responsible for assessing independent living skills.

Development History

For many people, being able to manage their medication routine is a daily skill that may be crucial for successful independent living (and deficits in this realm can frequently lead to exacerbation of the impairment, hospitalization and even in a few instances, death). There are currently few cognitive tests that focus specifically on this common task. With this in mind, several years ago a small group of community occupational therapists (Robnett, Ellis, Lewis, & Gautreau) developed a prototype of the current medication management screen with assistance from a student research group (Robnett, Steward, Akladiss, Carmill, & Kravats, 2000). The original research group completed initial pilot testing. In 2003-2005 a second graduate student team again led by Regi Robnett, refined the original sreen and completed the initial standardization process. An article in *The Clinical Gerontologist* by Robnett, Dionne, Jacques, LaChance, and Mailhot (2007) provides an overview of the testing process and describe the initial psychometric properties of the ManageMed Screening ©2003.

Items Needed to Make Kit:

- Plastic carrying case (can be used as tray for pills, when open)
- 1 simulated prescription form (laminated or sheet protector)
- 3 prescription information sheets (laminated or sheet protectors)
- 1 magnifying glass with case
- 1 weekly pill organizer (Sun-Sat, morning, noon, evening, night slots)
- 1 test manual with reproducible forms
- 3 vials of “pills” vial size minimum of **1/2 dram** (2” diameter, with and without childproof caps)
 - A—“Androciplin” with 21 pink pills
 - B—“Betroprolen” with 21 green pills
 - C—“Cyclonoprol” with 21 white pills
- 2 packages of candy to use as simulated pills (recommend Good’N Plenty and Tic Tacs)

To prepare your kit for use you need to add “pills” to the vials. The A—“Androciplin” vial should contain 21 pink pills (Good’N Plenty—Pink), the B—“Betroprolen” vial should contain 21 green pills (Tic Tacs—Green), and the C—“Cyclonoprol” vial should contain 21 white pills (Good’N Plenty—White).

Introduction to Medication Management

Retail sales of prescription medications have increased dramatically over the past decade, with costs exceeding 260 billion dollars in 2012 (Cohen & Villarroel, 2015). Over the counter medications have also seen an enormous rise in usage, with sales reaching over 360 billion dollars in 2014 (Schumock et al., 2015). The IMS Institute for Healthcare Informatics, estimated that in 2013, over 4.2 billion prescriptions were dispensed, with antihypertensives, mental health medications, analgesics, antibacterials, and lipid regulators as the most frequently prescribed medications (Lindsley, 2015).

While proper medication management is pertinent for all age groups, it may be especially crucial for those 65 years of age and older. This age group consumes proportionately more medications than younger age groups, largely due to the increased prevalence of chronic medical conditions (Maddigan, Farris, Keating, Wiens, & Johnson, 2003). In 2010, adults over 60 years old consumed over 70% of all prescription medication, and 37% of this group used 5 or more medications; this is indicative that prescription drug use increases with age (Gu, Dillion & Bert, 2010; Werner, 2011). The rate that elders report non-adherence with prescription medication routines ranges from 20% to 50% (Hanlon, Fillenbaum, Schmader, Kuchibhatla, & Homer, 2000; Murray, Birt, Manatunga & Darnell, 1993) citing reasons such as cost, forgetting to take medications or lack of understanding (Ho, Bryson, & Rumsfeld, 2009). Given that self-reports are likely to yield lower rates than actual non-adherence, these statistics are alarming, especially considering the potential consequences of medication errors, such as hospitalization or even death.

There are myriad reasons for not following medication recommendations including lack of rapport with the prescriber, cost (Cohen & Villarroel, 2015), lack of understanding, and decreased memory. However, while the authors of the ManageMed Screening© acknowledge these various reasons, the ManageMed Screening© primarily focuses on the cognitive impairments that preclude a person from carrying through a medication routine. Other potential reasons for non-adherence are important, but these are not a part of the standardized portion of the screen.

Conceptual Model

Sixteen million people live with mild cognitive impairment, and with the increase in the aging population, this number will only increase (Centers for Disease Control, 2011). Neuropsychological assessments such as the Mini Mental State Exam (Folstein, Folstein, & McHugh, 1975; Folstein, Folstein, White, & Messer, 2010) are unable to specifically predict medication adherence (Conn et al., 1994), although those with scores in the impaired range have higher odds of being non-compliant (Miura et al., 2007). In addition, there is likely to be an interaction effect between cognitive impairments and complexity of medication regimen (Maddigan, et al., 2003).

Every person taking any number of oral medications falls somewhere in the bounds of Figure 1 (adapted from Robnett et al., 2007). This figure depicts, in simplistic two dimensional terms, the interaction between the cognitive functioning of the medicated individual and the complexity of the medication routine. When prescribing medications this concept should be at the forefront of the prescriber's (or the health care team's) thought process, because if it is ignored, as it surely sometimes is, tragic consequences can occur. In the lighter shaded area A, the client's abilities are very high functioning in the realm of cognition, so there is very little risk of inability to understand the medication routine no matter how complex. In the lower shaded area (B) the cognitive level of the client is so low that assistance is always provided. It is the darker shaded area which depicts cognitive levels and complexity levels that are in the range of questionable. In the area C, the client's cognitive abilities exceed the minimum cognitive capacity required to understand and carry through the specific medication routine prescribed. In the lower section (D), the opposite is true. The client's cognitive abilities do not reach the minimal level required to be able to safely manage the routine prescribed. It is likely that at least one of the following problems exists:

- The medication routine has too many components (too many pills or too many different kinds of pills have been prescribed),
- The schedule for taking the pills may be too complicated for the client to comprehend,
- The dosage may not be clear to the client,
- The preparation for taking the pills may be difficult (e.g. having to cut the pills, pills being too small, and therefore easily lost, too large and hard to swallow), or
- A combination of these components, which on their own would have been manageable but which together, can overwhelm the person.

If the regimen is too complex for the individual, there are still viable options to improve adherence, including simplifying the routine, using rehabilitation specialists such as nurses or occupational therapists to teach the routine until it is mastered, or ensuring that the person receives the necessary assistance from a capable caregiver.

One needs to take the two dimensional figure (1) and superimpose a number of other mediating variables, such as those described, into the model to truly understand the complexity of medication compliance. In addition, one's cognitive capacity can change relatively quickly, for example due to fatigue, trauma, and even the impact of medications (or lack thereof). Patterson and his colleagues (2002) in a study of out-patients with schizophrenia, clarify some of these factors:

- 1) Client-related factors (such as physical abilities, more severe symptoms or concurrent substance abuse)
- 2) Medication-related factors (such as lack of therapeutic response or intolerable side-effects)
- 3) Environmental factors (such as lack of funds and cultural beliefs), and
- 4) Clinician-related factors (such as a lack of a therapeutic relationship or lack of proper teaching) (Robnett et al., 2007)

Although the focus here is on the cognitive aspects of the client-related factors, one needs to consider the additional factors listed (and others as well). For example, a helpful and knowledgeable caregiver could move a client from a point in sector (D) (in the figure below) up to (C) by providing needed support. Or the opposite could occur if the person currently in (C) has taken a combination of medications that subsequently impacts the clarity of his/her thinking skills (as many medications do). All the barriers and environmental supports that could impact medication compliance need to be considered by the health care professional in charge of the medication routine. (Refer to Appendix C.)

A Conceptual Model of Medication Management

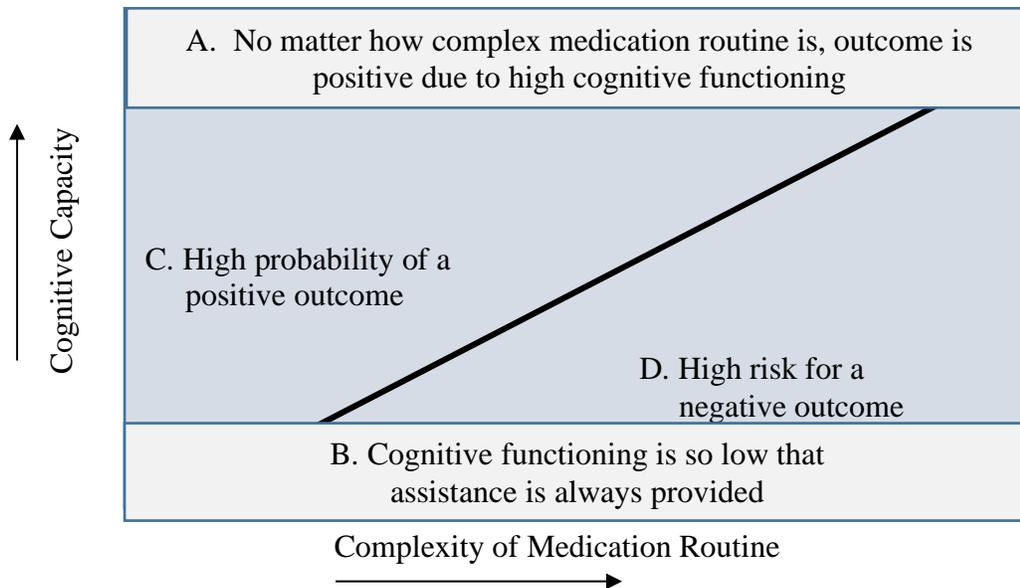


Figure 1. The interaction between the client and the prescribed medication routine

If the medication routine is too complex for the person there are several options that might help. The health care provider might want to consider the following:

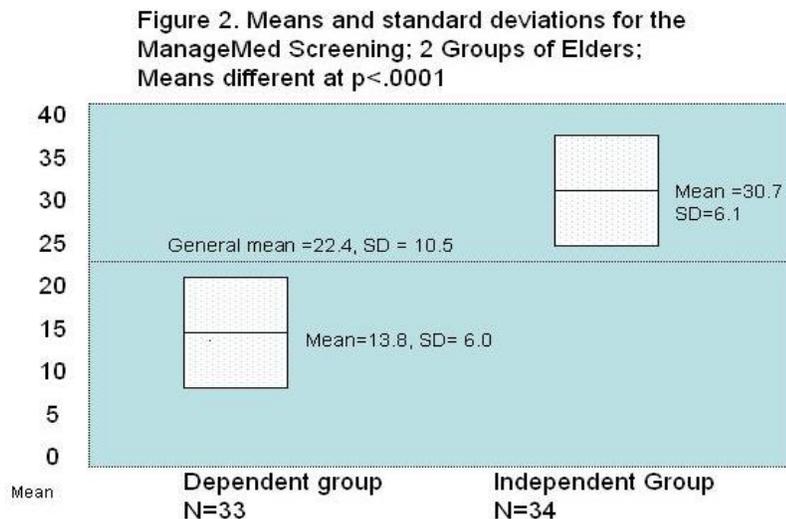
- Can we advocate for a simpler routine (one that is just as effective)?
- Can the person get consistent assistance from someone in his or her support network?
- Does the person just need help with set-up (e.g. setting up a pill minder, cutting pills, other memory aids)?
- With education, training, and practice, could the person learn the components of the routine?
- Is there a technological application which could help with compliance? (e.g. smartphone app.)

Overview of ManageMed Screening© Research Findings

In 2003-2004, the ManageMed Screening© was given to 67 elders who were age 65 and over. Thirty-four were community dwelling and independent in their medication routine and 33 were deemed by nursing staff, to need assistance with their medication routine. The mean age of participants was 76. The mean ages of the two living-situation groups were not significantly different. The number of medications used by the test subjects ranged from 0 to 22 with a mean of 8. Persons with moderate or severe dementia and poor vision were excluded from the study. Forty of the participants also completed the Cognistat (Kiernan, Mueller, Langston, & VanDyke, 1987), a brief cognitive test often used in place of the Mini Mental State Exam due to its higher level of sensitivity in detecting mild cognitive impairments (Schwamm, Van Dyke, Kiernan, Merrin, & Mueller, 1997). The intention of giving both assessments was to be able to compare their scores within the test population.

The metacognitive questions revealed that the participants tended to feel confident in their ability to think and remember (7.4 –7.85 on a scale of 1 to 10, with 10 being excellent); however this confidence level in one’s self was not highly correlated to actual performance. Only the self-assessment score predicting how well one would do on the test (prior to taking it, [question 3]) was significantly correlated to total score (Pearson Correlation =0.419, p=.01). We determined that the metacognitive questions were more closely associated with self-awareness or self-esteem, rather than being able to accurately predict performance. Since awareness is an important component of cognition, noting the level of metacognition can offer the clinician valuable information. This is especially true for participants who show great discrepancies (i.e. high self-assessment/low performance or vice versa).

Scores on the ManageMed Screening of this initial test group ranged from 3 to 40, with a mean of 22. Most importantly, a t-test revealed a significant difference between the older two groups as shown in Figure 2.



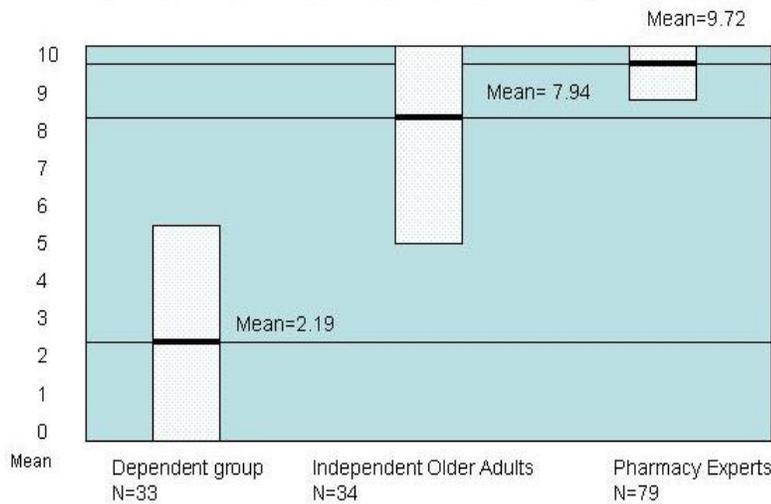
A Pearson correlation coefficient showed a moderate correlation between the ManageMed Scores and the Cognistat (.696). This means that although the tests are somewhat similar, they both test different aspects of cognition. If the correlation were very close to .9 or 1.0, we would have concluded that developing another test was not necessary.

Reliability analysis on the internal consistency of the ManageMed Screening © demonstrated a Cronbach’s Alpha of 0.89 (42 items). Since this reliability coefficient is approaching 0.90, it is considered high, and therefore the scale can be considered reliable (Portney & Watkins, 2000, p. 577). Kendall’s tau nonparametric statistic for interrater reliability demonstrated reliability measures on individual questions ranging from 0.859 to 0.965. While these ranges were in the satisfactory to high range, following the initial interrater reliability study, the scoring instructions on two of the questions were further clarified to make the questions less ambiguous. Three initial questions were dropped because they were found to be too easy or too hard, and therefore did not discriminate between high and low functioning participants (as determined by classical test theory and Rasch analysis).

Age was a statistically significant ($p=0.03$) but very weak predictor of total ManageMed Screening© score ($R^2=0.07$). A Pearson correlation between age and total score was $-.264$, with younger participants tending to outperform older participants but only slightly, approximately one-quarter point per year. The correlation between number of medications and total score was $-.353$ ($p=0.01$) with those taking more medications tending to obtain lower scores.

This initial study also had “experts,” 72 pharmacists and 7 pharmacy technicians, who completed (only) the pill organizing segment of the screening (the IADL task worth 10 points). The mean of this group was 9.72, which was significantly different from the other two groups: the older community dwelling group and the older group needing assistance ($p<.001$). See figure 3.

Figure 3. Means and Standard Deviations of the Pill Organizing Segment, Range 0-10; all 3 groups significantly different; $p<.002$



In a second study, 100 community dwelling adults were given the ManageMed Screening© to establish initial norms and possible age associated differences. Table 1 shows the results of this study.

Table 1.

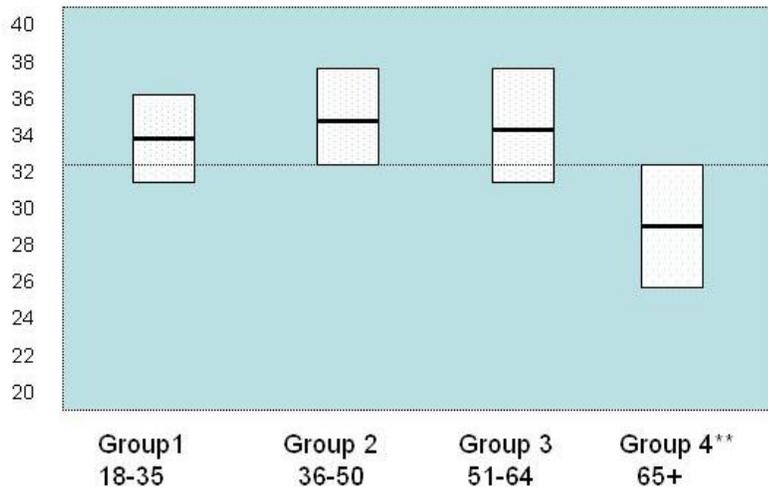
Age differentiation in performance on ManageMed Screening© with 100 independent living adults

Age	# of Respondents	Mean	Standard Deviation
18-35	20	34.10	2.38
36-50	23	34.87	2.90
51-64	22	34.14	3.29
65+	35	29.00**	3.39
Total	100	32.50	4.96

**significantly different from all other groups at $p < .001$ level.

Figure 4. shows the same information pictorially.

Figure 4. Means and standard deviations of independent living Adults; Same information as Table 1. Group 4 different; $p < .001$



Both studies were subject to the same limitations. They were carried out in Maine, which lacks diversity in its population. They were based on relatively small sample of convenience. These were tests of capacity and did not measure level of motivation, which is often a key factor in medication management performance. Larger studies with more diverse composition will allow more sophisticated statistical analysis.

Although elders tend to take more medications and therefore have more complex regimens, the ManageMed Screening © has been initially standardized on all ages of adults.

In the spring of 2015, Robnett, Hanrahan, Jerdan, and Grisham conducted an IRB approved content validity study on the ManageMed Screening (MMS). The research team completed an on-line survey, in-person focus groups and interviews with clinicians, primarily occupational therapists and speech language pathologists (N = 28). The aim of the project was to garner expert opinions from clinicians who had used the MMS to determine if the assessment tool was (still) effective and what changes need to be made to the tool to keep it up to date and useful for the field of rehabilitation. The results indicated that the respondents had given the MMS an average of 35 times (range 5 to 101 [100+]). Most were seasoned therapists with many years of experience although one respondent was a level-II fieldwork student.

The respondents had used the MMS with clients having a variety of diagnoses including dementia, stroke, mental health conditions, and mild cognitive impairment. The clinicians stated that it took an average of 35 minutes to administer the test (range 20-52 minutes). When asked about how well the MMS results matched their clinical judgment (on a 1-10 scale where 10 is “extremely well”) the lowest score was 5 (“moderately well”), with nearly half of the respondents (46%) rating it at an 8 out of 10. When asked how helpful the MMS is in determining the client’s performance in managing their medications, on a 1 to 10 scale with 10 being extremely helpful, the lowest response was 4 (1 respondent; a little less than moderately helpful). Eighty-four percent marked 8, 9, and 10. Although most items in the MMS were viewed positively, occasionally the respondents found certain tasks not necessary. The most commonly cited task (five) was the prospective memory task (“it doesn’t give enough information about the client’s prospective memory”), while four respondents stated that opening the vial of medication was not necessary, and two did not think it was necessary to have the clients self-assess their own skills. Based on this study changes have been made to the MMS based on item suggestions.

Participant quotes included:

- “Sometimes clients do better/worse than anticipated. Usually there are deficits that are unknown that come to light using this assessment”
- “[The MMS] correlates well to my clinical judgement while being even more sensitive than my judgement.”
- “[The MMS] is just a screen, but does give a lot of information in a short period of time. [We] still need to assess how well they do with their own medications.”

Screen Description:

The ManageMed Screening© was developed with the purpose of being an easy-to-use, quick, valid, and reliable screening tool that quickly informs healthcare professionals about the participant's life skills in the realm of medication management. However as a screening tool and therefore should not be used to evaluate a client's individual medication routine.

Format and Scoring:

The ManageMedScreening© is a standardized functional assessment. It consists of three distinct segments:

- Four metacognitive questions (No points towards final score. See explanation below.)
- Twenty-nine questions, each worth one point, tapping various cognitive abilities such as reading, medication knowledge base, problem solving, short term and prospective memory, and calculations (related to pill taking) (29 points)
- Setting up a weekly medication organizer (10 points)

No writing is required of the participants, but they are asked to complete functional tasks such as reading, opening pill containers, counting and distributing pills. All cognitive questions are given a score of 1 for correct, or 0 for incorrect. The instrumental activity of daily living task of setting up a pill organizer is worth a total of ten points. A perfect score would be 39 overall. Although administration time is not a factor when tallying the final score, the participant may want to consider timing the client, to determine if slowed responses are a crucial issue. Time needed to complete the screen was not shown to be a significant correlate to the accuracy of responses.

Scores for the metacognitive questions can range from 1 (extremely low) to 10 (very high self-image). The metacognitive questions are included because they offer information about a person's level of self-awareness (both self-knowledge of capacity and on-line awareness or judgment of and self-monitoring of activity performance). Deficits in self-awareness are often associated with acquired brain injuries and other cognitive disorders (Toglia, 2011). Through clinical reasoning the test administrator can determine if the person's answers to these questions indicate that level of self-awareness is a potential support or barrier to intervention and address these aspects in treatment as needed.

Population:

Adults ages 18 and up
Vision adequate to allow reading with or without use of a magnifying glass
Able to read English at 6th grade level
Able to count and do simple division
No greater than mild dementia

Setting: Quiet area with client seated at a table or desk

Time: Approximately 15 to 45 minutes

Reliability:

Interrater reliability: .859-.965

Internal consistency: Chronbach's Alpha =.89, a very good level

Validity:

Face validity: High. Screening is based on actual functional task

Construct validity: Determined by experts in the field of rehabilitation (occupational therapists and speech and language pathologists).

Concurrent validity: Pearson Correlation Coefficient of .696 showed moderate correlation to the Cognistat, a common measure of cognitive performance.

Ecological validity: Good approximation of the real life activity and setting was determined by several experts.

On-going research on this tool is being conducted by the authors and is encouraged among others in the field of rehabilitation.

Administration of the Screening/Answer Key—(Use Appendix A p. 25 for general use)

General Guidelines:

Client Appropriateness: This screen is designed for adult clients who may be responsible for managing their own medication routine now or in the future.

Setting and Positioning: Administer the screen in a quiet area free of visual clutter and other distractions. Seat the client at a table. The screening administrator should sit either next to or at an angle to the client.

General: After using this detailed form a few times, you will be able to give the assessment by using just the screen form (Appendix A)

Read the **BOLD** portions aloud to the client.

Paraphrasing is acceptable. Be sure to mark the participants' answers on the form.

Introduction:

“It has been recommended by your (family, doctor, therapist) that we measure your ability to manage your own medications. Safe medication management is crucial to your health and well-being. This simple task is called the ManageMed Screening and it should only take about 20-40 minutes to complete. I am first going to ask you some general questions about your abilities and then you will be asked to answer questions about specific prescriptions and pills. Later you will be asked to follow instructions to put the pills in a weekly organizer. Do you have any questions?”

If there are no questions, then proceed to the following questions:

A.

1. On a scale of 1 to 10 (10 is perfect), how would you rate your thinking skills?

1 2 3 4 5 6 7 8 9 10

2. On a scale of 1 to 10 (10 is perfect), how good is your memory? (In general)

1 2 3 4 5 6 7 8 9 10

3. You are about to take a test about managing medications. On a scale of 1 to 10 (10 being the best score), how well do you think you will do?

1 2 3 4 5 6 7 8 9 10

4) At the end of the test I would like you to remind me to refill my prescription at the [local pharmacy] on my way home from work. Do you think you can do that? Y/N If no, why?

Refused _____ “Won’t be able to remember” _____

Other _____

Place the vials and the pharmacy information sheets in front of the participant, and point to vials as needed. The following includes the answer key, so be sure to keep hidden from the participant.

“Please answer the following questions about the pills in front of you. Try to remember what these pills are for as I will ask you this later. They are for blood pressure management (B), pain control (C) and the treatment of an infection (A).” (Point out A, B, and C to client)

B. Question	Comments/Answers	Points
5) Pretend that this is a prescription from your doctor. (hand prescription slip to client) Does the prescription match any of these pill bottles? (A) (then remove slip)	The name is the same--yes	1
6) If this (hand vial A) were a prescription from your doctor, would it be safe to take?	Give person a point if they notice that the pills have expired.	1
Do you usually read the handouts from your pharmacist?	Just note	-----
7) Read the highlighted portion aloud. (hand prescription sheet B)	OK if one word is slightly off. Note L neglect or skipping words etc.	1
8) If you miss a dose of this medication (hand vial A) by 23 hours, what should you do?	Skip it and resume schedule (Note this info is on the pharmacy sheet)	1
9) Which medication is for blood pressure management?	B	1
10) What is normal blood pressure?	Less than 140/90	1
<i>C. Remove handouts now.</i>		
11) Are there any side effects of this medication (hand vial B)? If yes...	Yes	1
12) What is or are the side effects?	Drowsiness, dizziness, driving hazard	1 1 1
13) Under what conditions should you take this medication? (Hand vial A)	1 hour before eating or 2/3 hours after eating. (Or do not take, pills have expired)	1
14) Which of these pills should you take with food?	C	1
15) Which medication should you avoid if you needed to drive somewhere right away?	B or C	1
16) What would you do if you could not open the containers?	Ask for easy open tops, Have someone help....	1
17) Which medication should NOT be taken sprinkled over applesauce?	C (This is the best answer, do not give score for A or B)	1

18) Which pill should you NOT take first thing in the morning before breakfast?	C	1		
19) What would you do if you had severe difficulty breathing after taking medication B?	Call 911/ambulance/rescue OK—call Dr. right away!	1		
20) Can you open these containers? (Open all vials)	Note physical impairments such as tremor or weakness	1		
21) Count the number of pills (hand vial C).	21— test case lid may be used for pills, to keep them from rolling off table	1		
22) How long will these pills (in vial C) last if taken as prescribed?	7 days or 1 week	1		
23) After 3 days of taking this medication (hand vial A), you feel fine but you still have 15 pills left. What should you do?	Keep taking them OK—call Doctor to find out if I should continue taking them	1		
24) If you feel a little drowsy after taking this medication (hand vial C), what should you do?	Take a nap, sit and relax, don't drive or do strenuous task	1		
25) What do you think this test was designed for?	Medication management—seeing how I could manage pills...	1		
26) What were the 3 different kinds of pills for?	Blood pressure, pain, and infection	BP 1	P 1	I 1
<i>D. Remove pills now.</i>				
27) How many pills did you count in the container?	21	1		

Total points ____ /27

Setting up a Medication Routine

E. Medication Organizer Setup

Open a random assortment of compartments in the organizer.

The examiner should read the **BOLD** statements.

**“Please pretend that you eat your meals at: 8am noon 5:30 pm
Set up the pill organizer for one week, following the directions on the labels of the three prescriptions here in front of you.”**

Morning	A ----- B ----- C -----	-----	-----	-----	-----	-----	-----→
Noon	C -----	-----	-----	-----	-----	-----	-----→
Eve	B ----- C -----	-----	-----	-----	-----	-----	-----→
Bed	(A and B are ok here)	-----	-----	-----	-----	-----	-----
<i>Feel free to color code your responses for easy scoring (A,B,C is the alternative).</i>							

A=Pink 1 cap 2X daily on empty stomach
B=Green 1 tab 2X daily morning and evening
C=White 1 tab 3X daily with food

If the client did not include the pink pills [A] due to the expiration date indicated on the pill vial, inform the client to pretend that the pills have not expired.

The “A” pills can be taken almost any time - 1 hour before or 2-3 hours after a meal. However, if the person puts an “A” (pink) pill in the noon slot, please ask him/her when he/she would plan to take that pill. The “noon” compartment is ONLY correct if the pill is taken at or before 11 am or after 2 pm (therefore noon is usually not the best answer).

If the client is highly organized and appears to be doing a specific color pill (A, B, or C) correctly, you may stop the person after he/she doles out two or three days worth of pills. However be sure you have the client open and dispense each of the 3 pill vials. Do not assume the person can complete all 3 pill types if he/she has only completed one color.

Note: For the schedule, the person must get 6 out of 7 pills correct to get the point. Total pill numbers must be exact. If person is approaching the task in an organized way, it is OK to have him/her just do the first couple of days. (If you are not sure, have him/her do the entire week!)

The points are assigned as follows:

PINK	A---	# of pills correct=14-----1 point
		First pill schedule correct-----1 point
		Second pill schedule correct-----1 point
GREEN	B---	# correct =14-----1 point
		#1 morning-----1 point
		#2 evening (night OK)-----1 point
WHITE	C---	# correct=21-----1 point
		#1 correct-----1 point
		#2 correct-----1 point
		#3 correct-----1 point

TOTAL pill organizer score _____/10

F.

28) “Now that you’ve finished, how well do you think that you did on this task?” _____(out of 10, with 1 being very poor and 10 being perfect.)

“It’s the end of the test, thank you.” (Wait ten seconds...if no response, ask: “Is there anything else you were going to do at the end of the test?”)

29) Remembered reminder task correctly (*without cue*) _____ (2 points)

30) If participant needed cue and answered correctly _____ (1 point)
Forgot task _____ (0 points)

Points for memory section: _____/2

(Note: The participants get 2 points if they remember without a cue, only 1 if they needed a cue to remember.)

Total points: _____/27(part 1)
+ _____/10(pill organizer)
+ _____/2 (questions 29 & 30)
TOTAL = _____/39

Interpretation of Results

The results obtained through the ManageMed Screening© offer the clinician the opportunity to better understand several aspects of a client's cognitive functioning in relation to the independent living skill of oral medication management. The follow up questions listed in Appendix C can also be helpful in establishing the motivation level of the client and his or her level of knowledge about his own personal medication routine. The results of the screening are useful in several ways.

First, compare the ManageMed Screening© form you just gave with the scoring template (Appendix B). The total score can be compared with the adult independent norm groups to determine if the client fits into the average range of functioning in this area. It is important to note that perfect scores are extremely rare, and yet only a perfect score would be an indicator that there are no deficits in the realm of medication management (at least for a routine at this level of difficulty). Each question that has been marked as incorrect can then be used in follow-up intervention or education as needed. The norms are on page 11 (Table 1 and Figure 4). Note that just over 68% of a normally distributed population have scores that fall within 1 standard deviation of the mean (as shown in figure 4) and over 95% have scores that fall within 2 standard deviations of the mean. You can now compare how your client did with the independent living test population.

For example, if the memory questions indicate that the client has impaired memory skills, the clinician would want to follow-up this finding by working with the person to make sure this memory impairment does not interfere with remembering the dosage and the schedule of the medication routine. This may entail seeking out the services of an occupational therapist or speech pathologist to find appropriate compensatory measures or adaptive equipment (e.g. setting up standard routine, pill minder, alarms, smart phone applications, etc.). The following list details a few of the potential impairments which could be revealed by the ManageMed Screening© as well as examples of interventions. This is far from an inclusive list. Often, especially with complex cases, the services of a rehabilitation specialist in this area would be warranted.

- Decreased vision (e.g. unable to read standard prescription labels and information)—enlarge information, color code vials.
- Decreased prospective memory (e.g. forgets to remind participant to pick up prescription at end of screen)—will need to set up routine to ensure medications are taken regularly on schedule. (A further recommendation is to use other prospective memory tasks throughout intervention to gather further information in this realm.)
- Decreased recognition of specific medication information (e.g. cannot match Rx to correct vial)—someone may need to check prescriptions to make sure they are exactly what was prescribed, as the participant may not note errors.
- Decreased safety awareness or decreased attention to safety (e.g. person does not recognize that pills have expired or may not read label or pharmacy information)—person may need to be educated (and understanding needs to be assured) that person will note important information and check vials prior to

ingesting pills.

- Decreased attention to detail when making observations (e.g. person does not note small labels of information such as “to be taken with food”)—person needs to be educated about the importance of reading labels thoroughly.
- Decreased physical ability (e.g. person cannot open vials or pill minder compartment lids)—either remediation of strength and coordination or compensation, perhaps by getting physical assistance or easy open tops.
- Decreased counting or mathematical ability (e.g. person cannot count pills or cannot figure out how long they should last)—may need to compensate by setting up pill routine for person.
- Decreased retrospective memory (e.g. person cannot remember what the pills were for)—make sure that the person repeats back any important information; multimodal input increases the probability that the person will remember (for example, most participants will remember the number of pills they counted [question #27], because they manipulated the pills while counting them). Self-talk may help.
- Decreased organizational skills (e.g. person was unable to organize the task of setting up pill minder)—person will need assistance with setting up and following a medication routine.
- Carelessness or inattention to detail during task completion (e.g. careless mistake during setting up weekly pill routine task)—education can help make the person more aware of importance of exact medication compliance.
- Decreased level of insight (e.g. person gives self high scores on perceived abilities but then does poorly on screen)—person will probably not comprehend the need for assistance, so assistance will need to be given gently but firmly.

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Appendix A

ManageMed Screening© Form

The following screen sheets may be copied by owner as often as needed but must be used with the ManageMed Screening© ²⁰⁰³ Kit.

ManageMed Screening© ²⁰⁰³ Examiner: _____

Number/Name: _____ Date: _____

Occupation: _____ # of Medications: _____

Age: _____ Gender: _____ Dx: _____

Visual Status (best corrected vision): _____

1) On a scale of 1 to 10 (10 is perfect), how would you rate your thinking skills?

1 2 3 4 5 6 7 8 9 10

2) On a scale of 1 to 10 (10 is perfect), how good is your memory? (In general)

1 2 3 4 5 6 7 8 9 10

3) You are about to take a test about managing medications. On a scale of 1 to 10 (10 being the best score), how well do you think you will do?

1 2 3 4 5 6 7 8 9 10

4) At the end of the test I would like you to remind me to refill my prescription at the local pharmacy on my way home from work. Do you think you can do that? Y/N If no, why?

Refused _____ "Won't be able to remember" _____

Other _____

Please answer the following questions about the pills in front of you. Try to remember what these pills are for as I will ask you later. They are for blood pressure management, pain control, and the treatment of an infection.

B.

Question	Comments/Answers	Points		
5) Pretend that this is a prescription from your doctor. (hand prescription slip to client) Does the prescription match any of these pill bottles? (A) (then remove slip)				
6) If this (hand vial A) were a prescription from your doctor, would it be safe to take? *see answer key				
Do you usually read the handouts from your pharmacist?				
7) Read the highlighted portion aloud. (hand prescription sheet B)				
8) If you miss a dose of this medication by 23 hours, (hand vial A) what should you do?				
9) Which medication is for blood pressure management?				
<i>C. Remove handouts now</i>				
10) What is normal blood pressure?				
11) Are there any side effects of this medication (hand vial B)? If yes...				
12) What is or are the side effects?				
13) Under what conditions should you take this medication? (hand vial A)?				
14) Which of these pills should you take with food?				
15) Which medication should you avoid if you needed to drive somewhere right away?				
16) What would you do if you could not open the containers?				
17) Which medication should NOT be taken sprinkled over applesauce? *see answer key				
18) Which pill should you NOT take first thing in the morning before breakfast?				
19) What would you do if you had severe difficulty breathing after taking medication B?				

20) Can you open these containers? (open all vials).			
21) Count the number of pills (hand vial C).			
22) How long will these pills (hand vial C) last if taken as prescribed?			
23) After 3 days of taking this medication (hand vial A), you feel fine but you still have 15 pills left. What should you do?			
24) If you feel a little drowsy after taking this medication (hand vial C), what should you do?			
25) What do you think this test was designed for?			
<i>D. Remove pills now.</i>			
26) What were the 3 different kinds of pills for?			
27) How many pills did you count in the container?			

Total points ____ /27

E. Setting up a Medication Routine

“Please pretend that you eat your meals at:

8am

noon

5:30 pm”

“Please set up the pill organizer for one week, following the directions on the labels of the three prescriptions here in front of you. “ (10 points)

Morning							
Noon							
Eve							
Bedtime							
<i>Feel free to color code your responses for easy scoring (A,B,C is the alternative)</i>							

Draw in results of task.

F.

28) **Now that you’ve finished, how well do you think that you did? (10 is best.)**

1 2 3 4 5 6 7 8 9 10

It’s the end of the test, thank you. (Wait ten seconds...if no response, ask “Is there anything else you were going to do at the end of the test?)

29) Remembered reminder task correctly (without cue) _____ (2 points)

30) If participant needed cue and answered correctly ____ (1 point)

Forgot task ____ (0)

(Note: The participants get 2 points if they remember without a cue, only 1 if they needed a cue to remember.)

Total points : ____/27(part 1)
 + ____/10(pill organizer)
 + ____/2 (questions 29 & 30)
TOTAL = ____/39

Appendix B

Scoring Template (same as form as in screen administration section, without directions for administration)

ManageMed Screening© 2003 Answers Do Not Use During Testing

A.

1. On a scale of 1 to 10 (10 is perfect), how would you rate your thinking skills?

1 2 3 4 5 6 7 8 9 10

2. On a scale of 1 to 10 (10 is perfect), how good is your memory? (In general)

1 2 3 4 5 6 7 8 9 10

3. You are about to take a test about managing medications. On a scale of 1 to 10 (10 being the best score), how well do you think you will do?

1 2 3 4 5 6 7 8 9 10

4) At the end of the test I would like you to remind me to refill my prescription at the local pharmacy on my way home from work. Do you think you can do that? Y/N If no, why?

Refused _____ “Won’t be able to remember” _____

Other _____

Please answer the following questions about the pills in front of you. The pills are for blood pressure management (B), pain control (C) and the treatment of an infection (A).

B.

Question	Comments/Answers	Points
5) Pretend that this is a prescription from your doctor (hand prescription slip to client). Does the prescription match any of these pill bottles? (A) (then remove slip)	The name is the same--yes	1
6) If this (hand vial A) were a prescription from your doctor, would it be safe to take?	Give person a point if they notice that the pills have expired.	1
Do you usually read the handouts from your pharmacist?	Just note	-----
7) Read the highlighted portion aloud. (hand prescription sheet B)	OK if one word is slightly off. Note L neglect or skipping words etc.	1
8) If you miss a dose of this medication (hand vial A) by 23 hours, what should you do?	Skip it and resume schedule (Note this info is on the pharmacy sheet)	1
9) Which medication is for blood pressure management?	B	1
10) What is normal blood pressure?	Less than 140/90	1

<i>C. Remove handouts now</i>			
11) Are there any side effects of this medication (hand vial B)? If yes...	Yes	1	
12) What is or are the side effects?	Drowsiness, dizziness, driving hazard	1	1
13) Under what conditions should you take this medication? (hand vial A)?	1 hour before eating or 2/3 hours after eating. (Or do not take, pills have expired)	1	
14) Which of these pills should you take with food?	C	1	
15) Which medication should you avoid if you needed to drive somewhere right away?	B or C	1	
16) What would you do if you could not open the containers?	Ask for easy open tops, Have someone help....	1	
17) Which medication should NOT be taken sprinkled over applesauce?	C (this is the best answer, do not score with A or B)	1	
18) Which pill should you NOT take first thing in the morning before breakfast?	C	1	
19) What would you do if you had severe difficulty breathing after taking medication B?	Call 911/ambulance/rescue OK—call Dr. right away!	1	
20) Can you open these containers? (Open all vials).	Note physical impairments such as tremor or weakness	1	
21) Count the number of pills (hand vial C).	21— test case lid may be used for pills, to keep them from rolling off table	1	
22) How long will these pills (in vial C) last if taken as prescribed?	7 days or 1 week	1	
23) After 3 days of taking this medication (hand vial A), you feel fine but you still have 15 pills left. What should you do?	Keep taking them OK—call Doctor to find out if I should continue taking them	1	
24) If you feel a little drowsy after taking this medication (hand vial C), what should you do?	Take a nap, sit and relax, don't drive or do strenuous task	1	
25) What do you think this test was designed for?	Medication management—seeing how I could manage pills...	1	
<i>D. Remove pills now</i>			
26) What were the 3 different kinds of pills for?	Blood pressure, pain, and infection	BP 1	P 1
27) How many pills did you count in the container?	21	1	

Total points ____ /27

E. Setting up a Medication Routine

Morning	A-----	-----	-----	-----	-----	-----	-----→
	B-----	-----	-----	-----	-----	-----	-----→
	C-----	-----	-----	-----	-----	-----	-----→
Noon	C-----	-----	-----	-----	-----	-----	-----→
Eve	B-----	-----	-----	-----	-----	-----	-----→
	C-----	-----	-----	-----	-----	-----	-----→
Bedtime	(A and B are ok here)	-----	-----	-----	-----	-----	-----

Feel free to color code your responses for easy scoring (A,B,C is the alternative)

A=Pink 1 cap 2X daily on empty stomach
 B=Green 1 tab 2X daily morning and evening
 C=White 1 tab 3X daily with food

If the participant did not include the pink pills [A] due to the expiration date indicated on the pill vial, inform the participant to pretend that the pills have not expired.

The "A" pills can be taken almost any time - 1 hour before or 2-3 hours after a meal. However, if the person puts an "A" (pink) pill in the noon slot, please ask him/her when she would plan to take that pill. The "noon" compartment is ONLY correct if the pill is taken at or before 11 am or after 2 pm (therefore noon is usually not the best answer).

If the participant is highly organized and appears to be doing a specific color pill (A, B, or C) correctly, you may stop the person after he/she doles out two or three days worth of pills.

However be sure you have the participant open and dispense each of the 3 pill vials. Do not assume the person can complete all 3 pill types if he/she has only completed one color.

Note: If person gets 6 out of 7 pills for the schedule correct, he/she gets the point. Total pill numbers must be exact. If person is approaching task in an organized way, it is OK to have him/her just do the first couple of days. (If you are not sure have him/her do the entire week!)

The points are assigned as follows:

PINK	A---	# of pills correct=14-----1 point
		First pill schedule correct-----1 point
		Second pill schedule correct-----1 point
GREEN	B---	# correct =14-----1 point
		#1 morning-----1 point
		#2 evening (night OK)-----1 point
WHITE	C---	# correct=21-----1 point
		#1 correct-----1 point
		#2 correct-----1 point
		#3 correct-----1 point

TOTAL pill organizer score _____/10

F.

28) Now that you've finished, how well do you think that you did? _____(out of 10)

**It's the end of the test, thank you. Wait ten seconds...if no response, ask
"Is there anything else you were going to do at the end of the test?"**

29) Remembered reminder task correctly (**without cue**) _____ (2 points)

30) If participant needed cue and answered correctly _____ (1 point)
Forgot task ____ (0 points)

Points for prospective memory section: _____/2

(Note: The participants get 2 points if they remember without a cue, only 1 if they needed a cue to remember.)

Total points: _____/27(part 1)
+ _____/10(pill organizer)
+ _____/2 (questions 29 & 30)

TOTAL = _____/39

Appendix C
(May be copied for interview purposes)

Potential Discussion Questions Related to the Person's Specific Medication Routine:

Before beginning the discussion, first make sure the clients know what they need to know about the condition they have and the need for the medications they have been prescribed.

1. Have you ever forgotten to take your medicine in the past? (Elaborate.)*
2. Do you have a specific method for remembering to take your medication? (Explain)
3. Do you have any routines that occur every day (e.g. breakfast at 7 am or brushing teeth immediately after breakfast)? What are these?
4. Do you understand the purpose of each type of pill (you need to take)?
5. What are the potential side effects (of each medication prescribed)?
6. Discuss dosage and scheduling to make sure these are clear.
7. Do you think you will have any physical issues, which would interfere with taking these medications?
8. Are finances an issue in purchasing your medications?
9. How do you feel about taking these pills?
10. Have you discussed all your medication concerns with your doctor? This should include any over-the-counter medications being taken. (If not, how can we support this level of communication?)

* Note, most people do occasionally forget their pills, so if the person states “never” this may raise a red flag of concern.

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Assembly Instructions

1. Print off the manual and extra score forms (Cover is in color). You may want to put the manual in a 3 ring binder.
2. Print off, in color, the vial labels and prescription direction forms
3. Cut out the labels and sample prescription form
4. Laminate prescription, place other prescriptions directions in sheet protectors or laminate.
5. Place labels on vials, use clear packing tape to secure labels to vials
6. Fill vials as instructed with candy
7. Place all items in plastic carrying case or tote

follow sanitary practices, wipe down forms between use and replace candy as needed

Sample Pill box:

