Holistic Assessment and Treatment of Older Adults

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Abstract

In 2014 a newer model of assessment and treatment for older adults was promulgated. This chapter explicates a Watch and Wait model that pays attention to the nuanced differences in treatment (one antidepressant vs another, one psychotherapy vs another, meds vs psychotherapy), but more importantly devotes time to the whole older person and their “real world.” In effect, we expand on this model (and book) and argue that knowledge and actuarial foundations are necessary but not sufficient for treating older adults. We explicate the two parts of this model; (1) A case-based and deliberative unfolding of a plan, applying psychoeducation, assessment, validation, alliance building, monitoring, and use of treatment modules; and (2) The five areas of “just-sufficient” concern involving depression, anxiety, cognition, health (especially morbidities and pain and sleep, as well as lifestyle habits), and life adjustment (unmet needs in the community). We base this model on Primary Care Clinic data of 500 older patients. We elaborate on an assessment battery for each area using standard screens and a short neuropsychological battery, and secondly a metric for designating whether the patient met criteria for each domain; Mild, Moderate, or Problem. After the identification of the profile, we apply an empirically supported plan of selected modules for each domain and monitor these.

Keywords

Aging Assessment and Treatment; Health; Cognition; Psychological Problems; Life Adjustment

Introduction

Clinicians who care for older adults have long been frustrated by the limitations of the prevalent disease-oriented approaches [1]. The medical model serves as a taxonomy for defining health, disease, and payment for care and narrowly focuses on individual organ systems. Pointedly, it is inadequate to characterize older persons who generally show a combination of multiple diseases, limitations of function, and cognitive and psychosocial problems. Conditions, such as cognitive impairment, delirium, falls, dizziness, syncope, urinary incontinence, depression, and frailty, are generally multifactorial in etiology. These problems germinate with frailty. In the U.S., the average older adult being treated in primary care is 73 years of age with significant health concerns; many ill-equipped to manage health due to limits as a result of SES, education, environment, and co morbidities. Additionally, patients with complex diseases have a higher risk of developing others. Multi-morbidity represents a huge problem in everyday clinical practice.

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Healthcare is not like manufacturing computers or cars. Optimal treatment involves empirically supported knowledge, a holistic care model, and a value transformation of systems that addresses the long journey of the older patient. Incremental improvement and progress are slow but ineluctable and reasonable, given better empirically supported care. How older adults improve is now more understandable: Improve the life style and avoid negative behaviors. We now also know more about aging itself. Biological aging is largely determined by the internal biological clock and accumulation of insults through living. Where the lifespan of the organism is closely related to the biological aging, individual longevity is always a function of specific environmental circumstances, accumulated insults. The two operate at every level of the bio-hierarchy - genes, proteins, cells, organs, and organisms. In this contest epigenetics reigns as it accounts for change in gene expression not mediated by mechanisms of the DNA. In fact, we are products of the biopsychosocial model where there are varying levels of physical, cognitive, emotional, behavioral and environmental factors that contribute the formulation of the older person [2].

The complexities of the psychosocial variables responsible for better later life issues are now more apparent. The reality constraints of living at any age make outcomes worse for older adults: Patient’s readiness to change; acceptability of the treatment and preferences of the patient; caregiver acceptance; availability of desired or needed services; tolerance of incongruous recommendations; prior treatment failures or successes; and side effects; etc. Health now rests on our daily behavioral routines. Unfortunately, the average health care costs per year were directly related to income: In the US those living in poverty cost $21,033 compared with those with more means at $12,440. Of these monies, inpatient healthcare was 25% (down from 32% in 1994) and prescription costs were 16% (up from 8% in 1997). Older adults paid 60% of prescription costs out-of-pocket, compared with public programs at 35% and private insurers at 38%. Finally, virtually every older person was paying some out-of-pocket expenses (95%). From 1977 to 2006 the percentage of household income that people aged 65 years and older allocated to out-of-pocket spending for healthcare services increased from 12% to 28%. Today, over 50% of monies are going toward medication [3].

In this chapter we address a newer model of treatment and assessment for older adults. Initially, we provide an overview, discussing the changes in the last two decades and the need for a new care model. We then consider some special features of later life, distinct cognitive decline features and function. Next, we discuss The Watch and Wait model itself and outline its importance and process. Finally, we delve into the five domains and their assessment. We present a case in each domain.

**Overview**

The model for the care variables for older adults optimally involves both gerontology and geriatrics (below). The slow alteration in the accommodation and assimilation of life is first attached to the elements of gerontology, meaning that the epigenesis of culture and psychosocial factors impact the phenomenology of living. This is most influenced by lifestyle. Health care providers need to give respect to both gerontology and geriatrics: Homage to the latter masks the subtle power of the former. We are then most often in the gerontology and less the geriatrics business: Knowledge, prevention and discipline in the vagaries of just living before medical treatment. The former is the biopsychosocial dynamic of life; the latter is the secondary (or tertiary) prevention of its maladies. The dynamic for both is to optimize the culture of positive living and growth. This includes a healthy lifestyle and a positive attitude. But age and disease eventually win out and how this interaction is slowed and softened is the key to better living. Damage will occur and have to be attended to. The unfolding of problems leads to aspects of the disability model and negative consequences mandating secondary and tertiary care.

This dynamic is not without its influences. From a more macro perspective there are many metatrends that have been operating in the background. They include a brain focus and its influence on science, epigenesis and the alteration of genes independent of DNA (by just living), a biopsychosocial imprint (as discussed) where life becomes a summation of many influences, powerful and living constructs, like MCI, cerebrovascular health and its modeling on longevity, the pursuit of lifestyle (also already noted), prevention and precision medicine (age x disease interactions), and psycho- or social-therapies, as well as meaning in life, the psychological influence on behavior. Indeed, society is changing as medicine is now more flexible and seeks more than one solution, the number of effective drug compounds is low and dwindling especially for problems like depression. Strikingly over 94% of people over 75 have chronic diseases. Costs of course are excessive and limits care.
We are living longer and better. For 160 years we have gained 3 months/year in average life span. Roughly 83% will reach 65 and, if so, that person will likely live on average 18.5 years. In the UK, a person born in 2011 stands a 30% chance of living to 100. Similarly chronic diseases are increasing but death rates are in decline; diabetes up 43% in 20 years but death is 8%. Aubry de Grey coined the phrase “longevity escape velocity” to suggest that people will live better and considerably longer in middle life than in old age. Perhaps there is no simple model of decline in this context. Looking at just brain health, there are at least two areas of brain efficiency at later life; neurophysiological decline (e.g., gray matter loss) and efficiency of the accommodation process, the scaffold networks (more frontal lobe activation, for example). There are also youth-like older adults who respond like younger adults and have a solid neurobiology. They compensate little. But most older adults compensate, have a poorer memory, use the default network dysfunction excessively, dedifferentiate excessively, have specific gray matter loss, show white matter hyper-intensities, and borrow from the frontal lobes more. There are also several other aging markers that are just now confessing their influence.

**Table 1: Features of Aging**

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<th>Aging Features</th>
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<tr>
<td>• Delay initiation of cell senescence</td>
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<tr>
<td>• Lifestyle Habits (smoking, ETOH use, exercise, cognitive training, diet)</td>
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<tr>
<td>• Stabilize telomere length</td>
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<tr>
<td>• Control of apoptosis</td>
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<tr>
<td>• Explore caloric restriction</td>
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<tr>
<td>• Intervene in insulin-like growth factor 1 pathway (IIS)</td>
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<tr>
<td>• Enhance adenosine monophosphate-activated protein kinase and forkhead (FOXO)</td>
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<tr>
<td>• Promote systemic antioxidant activities</td>
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<tr>
<td>• Inhibit target of rapamycin signaling</td>
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<tr>
<td>• Diminish activation of inflammatory cytokines</td>
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<tr>
<td>• Express longevity enhancing genes</td>
</tr>
<tr>
<td>• Identify new candidate genes and pathways [4]</td>
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Aging is not a causal variable. Rather it is a marker on a temporal axis along which various exposures and disease processes operate. Aging then is not a meaningful explanation for why one might experience cognitive decline or impairment. Yes, there are reasonable declines in speed of processing, episodic memory and executive function, but older adults can compensate. Dementia itself is a non-event. It is an end stage of a process of a “brain at risk,” a poor accumulation of health, behaviors, and genetics. Synaptogenesis represents synaptic density which is the most accurate biophysical correlate of cognitive impairment. Hippocampal atrophy especially is a marker of change as lifetime levels inversely related to cognitive activity in healthy adults. All of us have a slew of brain reserves and this profile is idiosyncratic and represents the unique decline rate and type of each of us. Additionally, up to half of all AD cases are attributable to modifiable risk factors including subclinical cardiovascular disease [5].

Neuroscience is the new religion. It accounts for everything (behavior, thinking, emotions), even in the nuance of unplanned events. Neuroscience increasingly emphasizes a view of the brain as a set of information processing circuits of systems, not isolated neurons or regions. Brain disorders then are not deficits in one brain region but a problem of information flow across circuits. Deep brain stimulation (DBS) is a good model for this. Circuit-guided interventions have the potential to become more widespread. There are always newer interventions including monoclonal antibody (e.g., aducanumab reducing amyloid plaques in the brain); intranasal insulin spray (20mg IUs of insulin 2x/day over 4 months, preserved general cognition, no side effects); AD vaccine (CAD106
shows no vascular side effects and Phase II moderate level AD and attacked beta amyloid); intravenous infusions (gammagard as human immunoglobulin. Brain shrinkage slowed); and genetic manipulation to improve Nerve growth factor (NGF--CERE-110 injected into brain stimulates NGF).

That said, two studies are noteworthy test this reality: Pathology is not destiny. In study 1 at Rush Memory and Aging Project and the Religious Order Study 3000 older adults were tracked over 2 decades [6]. Their brains were assayed and monitored. After looking at brains at autopsy, the authors said this:

“Autopsies showed that some mentally spry individuals had extensive signs of cellular damage and others with substantial problems of cognitive decline in their later years had few signs of these cellular abnormalities. There was then a disconnect with cellular pathologies and cognitive decline.”

Clearly there are issues with any one model of the degeneration.

In study 2 results have pointed to a mixed pathology for dementia as well. Dementia is not a single disease. White and colleagues followed 334 nuns and 774 Japanese American men had multiple cognitive assessments and autopsied [7]. Average age was 90. Five different brain pathologies are studied: AD (plaques and tangles), Lewy Bodies, hippocampal sclerosis, microinfarcts, and brain weight. Of the 279 with AD, ¾ had at least two of the brain pathologies; half who had AD had no AD-type abnormalities. The authors conclude that a combination of impairments correlated best with cognitive impairment with worse outcomes related to having greater than one type of pathology. Perhaps Gary Small has it correct.

Special Factors: Lifestyle, MCI and Function

There are two overall trends that have influenced all aspects of aging in the last decade. These are lifestyle and MCI, the borderland between health and degeneration. For lifestyle life discipline is now common sense. Lifestyle especially matters. The positive features are good diet, moderate exercise, good body fat %, and non-smoker; only 2.7% of U.S. achieves all 4; 16% had 3; 37% had 2; and 34% had 1; 11% had 0. (N=4745). Convincingly positive lifestyle habits assist biomarkers of cardiovascular health. Psychosocial habits (attitude, connection, gratitude) count also. The value of exercise, cognitive training, leisure pursuits, stress reduction, diet, positivity, and good general health monitoring, vie for the relative influence of their impact on longevity and quality of life. Even self-rated health matters. The Million Women Study is a prospective study of UK women recruited between 1996 and 2001 and followed electronically for cause-specific mortality. Three years after recruitment, the baseline questionnaire for the present report asked women to self-rate their health, happiness, stress, feelings of control, and whether they felt relaxed. During 10 years follow-up, 4% of participants died. Self-rated poor health at baseline was strongly associated with unhappiness: Better health, better life satisfaction. Aging requires many factors to maintain and to survive in a happy way.

One example of seemingly less relevant variables makes the point. Worry and subjective memory evaluations matter. Adults (N=2415) were asked if memory were a problem and, if so, did they worry. The outcomes were WMH volume. Cohorts starting at age 60 and evaluated every five years were evaluated pre and post subjective memory impairment (SMI) and ratings were clear: WMH volume increased over a five year period especially for those who has somatic concerns five years prior. Specifically, subjects with SMI and worry were six times more likely to develop AD as no SMI; subjects with SMI and no worry were only two times more likely to develop AD as no SMI; and subjects with MCI were at a ten-fold risk for any dementia and twenty times for AD. Simply ranking ones somatic problems has an impact on WMH volume. Of course, not all people with SMI convert to dementia and not all people with dementia went thru SMI [8].

In another study (BIOGARD) the combination of symptom onset, cognition, brain structure, brain proteins that predict MCI conversion to dementia was evaluated.

Bad Things: Future is Now !!!

• “The problem with a drug in development is that it is not specific to the AS-YET unidentified primary mechanism that underlines AD neurodegeneration. The process that accounts for the cell selectivity characterizing the disease is unknown !!!”

• Gary Small, 2016
In 1995, 349 Ss with a mean age at admission at 57 were followed for 17 years. The average education for the sample was 17 years. They were given biannual CSF punctures, MRI, clinical evaluations as well as cognitive testing. In that time AD pathology developed. The results showed that several scan features, baseline lower A-beta and higher tau, lower right entorhinal cortex and lower hippocampal volume are associated with onset of AD. Importantly, paired associate learning and digit symbol speed were best predictors with a sensitivity = .85 and specificity = .75. How one thinks and behaves matters substantially. The Sperling group concluded that the upstream evaluation and treatment of a degenerative disease is folly. Begin downstream. The criteria are noted below. Importantly the best markers of AD need watching over time beginning at younger ages. This involves cognition along with biomarkers.

MCI has been influential in the prediction and formation of degenerative diseases. In general, life spent with cognitive impairment is fairly constant with increasing age at around 1.4 years in men and 2.5 in women. Luck et al. was one the first population-based studies on the prevalence of MCI using the new DSM-5 criteria [9]. They reported a weighted prevalence of 20.3% in a large population without dementia and the age was between 60 and 79 years. There were no differences in sex, but not surprisingly a strong correlation was found with age. Importantly, education reduced this by 13% for men and 22% for women. Five to 10 year rates of decline do go down but are different for cohorts and each individual is different. Gait, IADL, ADL, depression, grip strength, cognition, hospital time, feeling positive about life, and Digit Symbol all matter but the first three (gait and activities of living) declined most.

We note too that we also have problems with the oldest old, generally considered to be 85 or older. Biomarkers are not assessed. We know little about AB42, tau, and phosphor-tau. PET fMRI are not well assessed in this age group. Even vascular data are missing. A reasonable question is whether the oldest old have atrophy rates like normal aging or do they look like pathological processes. It is even the case that dementia rates are higher than MCI prevalence rates. Clearly there are information problems here. The oldest old do have functional problems over other age groups. In Sweden, for example, 48% of residents 95 and > needed help with ADLs. These are normal adults and not demented.

Finally, function is critical. Hall et al. assessed the physical performance across the adult lifespan and noted correlates with age and physical inactivity [10]. The results of their study emphasized the importance of lifespan approach to studies of function and aging. This work points to the need for a physical performance screener that spans across adulthood as a clinical tool for identifying functional decline. Both rapid and unusual gait were assessed in this study. Physical performance was worse with each increasing age decade. Although men performed better than women across the ages, the decrement by age group was similar between genders. Worsening physical performance was observed as early
as the 5th decade for chair stands and balance and the 6th decade for gait speed and aerobic endurance. The number and strength of significant associations between physical performance and physical activity increase with greater age. That is, the greater number of significant associations was seen in the 60-79 age groups with fewer reported in the 30-59 or 80-90+ age groups. More physical activity was associated with better physical function.

Unmet needs are a special concern for older adults. Community living older adults have more than 17 million admissions to the emergency department annually. Older adults at greater risk for frequent ED admissions have multiple comorbidities and functional disabilities and characteristics that are also associated with unmet ADL need. A study of older adults admitted to the ED concluded that nearly 40% of ED visits are potentially preventable, including visits for injuries or skin breakdown. These reasons for ED utilization are similar to older adult self-reported consequences of unmet ADL need. Age is a predisposing characteristic that increases the risk of ED utilization. Chronic diseases such as heart disease and diabetes create need for emergency care. Unmet need for ADL assistance is considered an enabling characteristic that increases the risk for future healthcare utilization. In summation, older adults who report unmet ADL needs (as already IADL markers are deficient) have more problems.

As sort of summary, two studies are highlighted. Douma, Steverink, Hutter, and Meijering used a participant-generated word method to obtain a lay view understanding of social wellbeing from 66 older adults of different gender and age with different housing arrangements in the Netherlands [11]. In a detailed empirically grounded knowledge of aspects categorized under domains of the participants’ views of social wellbeing, results found that 15 main domains were important to the participants: Social life, activities, health, space and place, independence, mobility, financial situation, societal criticism, political situation, personal characteristics, way of life, religion, healthcare and support, personal development, and others. The large variety of domains identified indicates that social wellbeing is a multi-dimensional concept. Social wellbeing is also contextual in nature because the participants related their social wellbeing, not only to individual characteristics, for example health, but also to the characteristics of their social, physical, and political environments that is their space and place and political situation. Similarly, Kok, Aartsen, Deeg, and Huisman studied the prevalence of successful aging from a holistic definition [12]. Successful trajectories of change were characterized by stability, limited decline, or even improvement of functioning over time. The implications of this study are that many older adults age relatively successfully, but the character of successful functioning over time varies between indicators and the combination of successful indicators varied between individuals. Subjective assessments and respect for considerable individuality are important in the quality of life for older adults.

**Watch and Wait**

In 2005, Boyd et al. showed the excessive “best practice” interventions perpetuated by best practice providers [13]. When these health care professionals were asked about what to apply in the treatment of a 79 y/o female with these symptoms. This represented an excess of treatment as well as no coordination of care. The problem here was the application of “best practice.” Here the medical model forced the providers hand to address symptoms according to best practice. This medical operation was limiting because it ignored other problems and placed the focus on symptom reduction. This is a good idea when there are acute problems.

**Table 2:** Case example

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<tbody>
<tr>
<td><strong>Too Much Love: Boyd et al. JAMA 2005</strong></td>
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<tr>
<td>79 y/o Female: Osteoporosis, Type 2 Diabetes, Arthritis, HTN, COPD and Depression.</td>
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<tr>
<td>• 13 Meds: 21 times/day</td>
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<tr>
<td>• &gt;$400.00/month</td>
<td></td>
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<tr>
<td>• 18 non-pharmacological activities such as diet, monitoring</td>
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<tr>
<td>• 6 conditions have 100% chance of drug/drug interactions and 100% for non-pharmacological intervention interactions</td>
<td></td>
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<tr>
<td>• Guidelines do not comment the time or burden making self management a problem</td>
<td></td>
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<tr>
<td>• Boyd et al.2001(JAMA)</td>
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Perhaps the model below best accounts for change of a more progressive medical model. It is not a disease model. It does not operate in the world where not being mentally ill is healthy. The absence of depression is not happiness. The ideal is not going from -1 to 0 but -1 to +1. It thrives on baby steps with a new habit taking many days. Worse, languishing is the status of chronic human imperfection and one of many negative and few positive emotions. The ideal is to flourish, to be optimally responsive to live, to be happy.

Figure 3: Model of quality of life

The goal is a positive quality of life, flourishing. The necessary and at times sufficient elements are included in a conservative model, Watch and Wait. Here are the core conditions of soft assessment, empathic listening, measuring, and slowly finalizing a plan. The essential features of “psycho”therapy are then considered. These include case handling and managing of the person and family as necessary. The requisite features of monitoring and working with the patient/family to assure that external care markers are in order. Case formulation unfolds. Behavioral activation is applied. This is both logical and easy to apply. Always some information is garnered. A core problem then is the narrow focus on care, on general ideals of care and on specific targets. Several years ago we noted that the modal person who came to our outpatient clinic, almost all ostensibly for memory problems, had several other concerns. The table below provides a summary of 325 patients. The average problem was 3.1 and the percentages for all at or above 50%. It became clear that the best way to understand this phenomenon was to provide a profile of the relevant problems – cognition, depression, anxiety, health, and life adjustment.

Table 3: Mercer Archive Data

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<th>Mercer Archive Data  N=325</th>
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<tbody>
<tr>
<td>Factor</td>
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<tr>
<td>Depression (GDS&gt;4)</td>
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<tr>
<td>Anxiety (SAST&gt;21)</td>
</tr>
<tr>
<td>Health Problems (SF-12)</td>
</tr>
<tr>
<td>Pain (Pain scale&gt;4)</td>
</tr>
<tr>
<td>Social Problems MBMD</td>
</tr>
<tr>
<td>Stress-Illness App (Social)</td>
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<tr>
<td>Stress-Functional Def MBMD</td>
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The guiding principle is that treatment should start not from a narrowly focused disorder, but from a detailed analysis or deconstruction of the patient’s life or, if needed, breaking apart psychopathology into domains of dysfunction. Treatment methods are selected on the basis of what works for a specific problem and domain that are the focus of the therapeutic intervention. A global diagnosis based on current diagnostic categories is insufficient. In order to select appropriate interventions, a psychiatric entity needs to be decomposed into different functional domains. This reveals an additional benefit of integration (Holistic Care) and accommodates the considerable heterogeneity among patients with a given disorder and permits treatment to be tailored to the individual.

“Making a diagnosis on that first visit may completely miss the point. So the single most important lesson is to take time. You can’t do it in seven minutes, and often you can’t do it in one meeting. Sometimes you can’t do it in a month. When in doubt, wait, watch, provide support, normalize the situation, see what resources there are from within the individual’s own resiliency.” Alan Francis, 2014, Psychotherapy Networker

Watch and Wait obviates other problems also. Doing nothing is different from doing no harm. You can do a lot of things in the clinical setting that involve preparation for the clinical plan. It does no harm - and often not much good either, each effort accomplishing little enough that the sum total remains at zero. In physical terms this is done all the time; often by that time the leg or the back or the virus has taken care of itself. Importantly, the application of this model hinges on the challenge of when to shift from the wait point to the activate point: When does the therapist pull the trigger for more active care. Watch and Wait holds to the ideal that the patient is not broken, is not a medical anomaly, and does not need to be rescued. The patient is
trapped in rigid patterns of living that at later life prevent the pursuit of normal lives. One does not postpone living, even in the throes of a dementia. Life is a journey and this is but one experience on the road.

Table 4: Usual Care Problems

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<th>Why Watch and Wait: Usual Care Problems</th>
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<tbody>
<tr>
<td>Failure Points:</td>
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<tr>
<td>1. Deciding too quick to initiate care</td>
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<td>2. Under-dosing</td>
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<td>3. Inadequate trial duration (6 weeks necessary)</td>
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<td>4. Frequency of follow up</td>
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<tr>
<td>5. Lack of monitoring</td>
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<tr>
<td>6. No team or family involvement</td>
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<tr>
<td>7. Wrong Roc: Depression and SSR’s or CBT</td>
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<tr>
<td>8. Insufficient time: Noncompliance with meds, dropout of psychotherapy</td>
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<tr>
<td>9. Wrong dosage: Too little or not in the “Window”</td>
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<tr>
<td>10. Interference from other RxS: Med side effects</td>
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<tr>
<td>11. Adherence issues: Pt does not do tasks</td>
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<tr>
<td>12. Complex families</td>
</tr>
<tr>
<td>13. Use of Substances: Opioids, other meds</td>
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<td>14. Wrong diagnosis</td>
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There are precedents for this. The IMPACT, PRISM, and CALM, and several other acronym-based studies showed that a careful assessment and case-based process with teams can make a difference in primary care. The Lust for Life program is a promising program designed to relieve depressive symptoms of older adults in primary care in the short term. vanBeljouw et al. examined the effects of Lust for Life and usual care on depressive symptoms in older adults in a community [14]. Eighteen general practices in a home-care organization in the Netherlands were assessed; 263 community-dwelling 65-year-olds with depressive symptoms according to patient PHQ-9. After three months of watchful waiting, participants who experienced a Watch and Wait program (self-guided, self-help program problem solving versus an active general practitioner) improved. Results showed that Watching and Waiting was highly effective. It decreased risk of relapse and treatment resistance, reduced psychosocial limitations, decreased workplace unproductivity, and sustained remission of depression.

The Watch and Wait process involves three or four sessions of assessment. Assessment of course continues beyond that but the case-based plan is enacted. Diagnosis is but one factor. We espouse a problem-based approach. Problems include the five domains (below). The stage is set with care and monitoring, assessing, and even borrowing from other models. We use the traditional predictors but also personalize treatment for a given patient. Accordingly, a patient with one or more predictors of poor outcome may receive interventions targeting each modifiable predictor, as well as more vigilant follow-up.

Figure 4: Watch and Wait Rx Process

A word about assessment. We start with screens. Screens are a necessary evil and have some limits. They do not form a diagnosis. They do not tell us definitively about the quantity of the problem. They also do not reflect the strengths either. With testing, especially with multiple parts, validity and reliability are most important but incremental validity is the real world indicator. What value is added? Good tests add value. Additionally, assessment needs reasonable anchoring beyond usual scales. All testing for Mr. X applies to Mr. X and his specific issues; his age, his education, his marriage, his occupation or lack thereof, his place in the country, his comorbidities, his nuanced ethnicity… you get the picture. There are no valid norms then for anyone of us. We get a person-picture, a helpful view of complexity, and a series of targets that, with other data, apply to Mr. X in a way that we know more about him than otherwise. This involves heuristics. It is part of treatment, part of the unfolding story somewhere between a marker of the specifics of a blood pressure and the general trend of an A1C. The goal then is to take a variety of test-derived pieces of information obtained from multiple sources and place them in a context of historical information, referral information, and behavioral observations to obtain a cohesive and comprehensive
understanding of the person being evaluated. Tests are imperfect tools representing the construct variability of the variable of interest (intelligence for example), the interaction of age (with its moderating variables), and real world or practice effects. They are, however, a good enough approximation of real world of the older adult.

Sir Archie Cochrane

“It is better to be roughly right than precisely wrong.”

We provide a metric to the five domains. As we will see each patient has a profile. For each person there are five markers; a Problem, a Moderate issue, or a Mild/Normal issue. The problem suggests that immediate attention is in order. This is causing problems in the person’s life now. For Moderate rating, attention is also in play but is less emergent and less intense than Problem. For a Mild/Normal rank, the focus is reduced but always this is an issue. The Watch and Wait mode is always in play, as each domain interacts with the other core problems. We apply a 1-10 metric with >8 as a Problem, 5-8 as Moderate and <5 as Mild or Normal. The problem is rated on the basis of the screen and is updated continuously. In the case of EM then a primary focus is on Life Adjustment, less so with health and anxiety, and a monitoring of cognition and depression.

I. Cognition

Cognitive decline in late adulthood is one of the nation’s primary health concerns. Approximately 5.2 million Americans suffer from Alzheimer’s disease (AD); 200,000 who are younger than 65 years of age. Self-report surveys conducted in 21 states by the CDC showed 12.7% of Americans 60 years of age and older reported memory loss or increased confusion and functional difficulties. Eighty-one percent of these individuals did not consult a health care provider [15].

The normal aging process can lead to cognitive difficulties. The continuum of cognitive decline is a progression from normal cognition to age associated memory impairment (AAMI) followed by MCI and dementia. AAMI is considered to be a normal progression of age that presents with little conversion to dementia. MCI; now labeled as Mild Neurocognitive Disorder (NCD) in the 5th edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5); has several definitions but collectively presents as either an amnestic or non-amnestic decline with normal instrumental activities of daily living (IADLs). Specifically, DSM-5 criteria of Minor NCD are characterized as modest cognitive decline from a previous level of performance in one or more cognitive domains [16]. Modest level of decline is defined as “typically 1-2 standard deviation range”[16]. Comparatively, dementia, now defined as Major NCD, presents mostly with problems in memory and IADLs; it can also include deficits in other cognitive domains and ADLs. Areas that are most impacted from degeneration sub-serve fluid intelligence that is subject to mediators such as social economic status, education, and life habits. It is typical for the average person to be deficit in at least one are of functioning, without the presentation of organic impairment. Thus, the mediation process between these levels of functioning is often difficult, requiring clinical judgment.

Alzheimer’s disease (AD) is the most prevalent neurodegenerative dementing disorder. Approximately 95% of AD is sporadic or late onset [17]. The most studied biomarkers to date include histopathological counts of plaques and tangles, oxidative stress, genetic markers (APOE4), white matter hyperintensities, global cortical atrophy, dopamine receptor binding, and amyloid loadings. Additionally, several cerebrospinal fluid biomarkers have demonstrated some efficacy in identifying the disease: 42 amino acid B-amyloid peptide, total tau protein, phosphorylated tau [18]. Ferreira et al. postulate that the combination of cerebral spinal fluid biomarkers can be
used to diagnose MCI, more accurately for amnestic MCI [19]. Cognitive assessment is almost always pertinent in the diagnosis of dementia and the differentiation of the several classifications of the disease.

The modal presentations of the dementias include but are not limited to: AD, vascular dementia, frontotemporal dementia, dementia with Lewy bodies, Parkinson’s dementia, and normal pressure hydrocephalus. Each of these dementia types presents with varying cognitive and affective profiles. It is relatively common for AD to overlap cerebrovascular disease (vascular dementia), as much as up to 84% in recent epidemiological data. Thorough descriptions and research relating to these dementias can be found in Lichtenberg (2010) and Parsons and Hammeke (2014) [20, 21]. Decline in cognitive processes leads to difficult decisions for care providers and family members.

### Table 5: Cognitive presentation by diagnosis

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Cognitive Presentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alzheimer’s Disease</td>
<td>Insidious, memory deficits first emerge (e.g., consolidation of information, rapid loss of new information), gradual involvement of other cognitive areas (e.g., confrontational naming and verbal memory).</td>
</tr>
<tr>
<td>Vascular Dementia</td>
<td>Onset similar to vascular event(s), diminished complex attention, reduced processing speed, deficits in executive functioning.</td>
</tr>
<tr>
<td>Frontotemporal Dementia</td>
<td>Early stages: personality changes, reduced executive functioning, behavioral disinhibition, emotional blunting, and changes in language. Later stages: Apraxia, apathy, extreme agitation, reduced memory.</td>
</tr>
<tr>
<td>Lewy body Dementia</td>
<td>Early stages: hallucinations and delusions, daily fluctuation in cognition, syncope, falls, transient loss of consciousness, neuroleptic sensitivity, spontaneous parkinsonism. Later stages: reduced executive functioning and visuospatial abilities.</td>
</tr>
<tr>
<td>Parkinson’s Dementia</td>
<td>Early stages: Dysexecutive syndrome. Later stages: Deficits in memory, visuoperception, and verbal fluency; language deficits and apraxia.</td>
</tr>
</tbody>
</table>

Conversion rates from MCI to AD are highly variable in the literature. Systematic review of longitudinal studies found an overall rate of 10% per year; high variability was present in the studies reviewed. This variability can be attributed to differences in samples, measures, and interrater reliability of diagnosis [22]. For example, Morris et al. found that 100% of MCI subjects in Memory Disorders Clinic progressed to a diagnosis of dementia over a period of 9.5 years, 84% met criteria for AD type [23]. Comparatively, a systematic review of the epidemiological studies found an average reversion rate from MCI to normal functioning of 20% [24]. However, those who have met criteria for MCI and reverted back to “normal” have a greater likelihood of progressing to MCI or dementia than those who never developed MCI. These findings further support the importance of awareness of symptoms and provider intervention.

It is important to recall here: Dementia is not a single disease. As noted above, White et al. studied five different brain pathologies and three quarters of AD subjects had at least two of the brain pathologies. Half who had clear AD in the final years had no AD-type abnormalities. The authors concluded that combination of impairments correlated best with cognitive impairment and most of the impaired had more than one type of pathology [7]. Similarly, the Rush Memory and Aging Project and the Religious Order Study showed that pathology was variable for people who were previously identified as normal or with AD.

### Assessment

In general, neuropsychological measures serve as biomarkers for illness (i.e. serves as an indicator of biological processes and can detect treatment response); serve as potent predictors for development of AD and other dementias [26]. Can capture other mediating influences on disease trajectory; are proxies for important functional deficits (DRS and ADLs correlate highly [27] and can suggest treatment targets. Neuropsychological measures capture the competing forces of pathological burden and
cognitive reserve. In fact, they are equal or greater than other biomarkers.

Cognitive decline is based on patient’s self-report, often knowledge of a third party informant, or an objective observation, as well as mild deficits on objective cognitive assessment. When serial measures are available as significant, that is 0.5 standard deviations assigned from the patient’s own baseline, it would serve as a more definitive evidence of this decline. A particularly powerful approach to dementia severity assessment is the combination of information from cognitive testing, a knowledgeable informant and a clinician’s impression. The mix of cognition and function as well as the trajectory of the problem can be persuasive for accurate data on a particular patient. We need to know exactly what needs to be evaluated. For AD, the fundamental focus is memory on a unidimensional continuum. A dementia syndrome may appear heterogeneous due to disruption of diverse cognitive processes until the underlying vulnerable factor is determined. We know that variables such as recall and orientation are often sufficient for an eventual dementia diagnosis. Part of problems is there are individuals who have dementia and do not test as such; others have the opposite problem as they fail a test and have no AD or other dementia diagnosis. There are ethnic and cultural differences causing norming problems as well.

Table 6: General rubrics of MCI/AD cognition measurement

<table>
<thead>
<tr>
<th>General Rubrics of MCI/AD Cognition Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Cognition falls early: memory and EF largely but attention and EF also. Memory plateaus</td>
</tr>
<tr>
<td>• Cognitive variables at baseline are comparable or better predictors of progression than other biomarkers. Memory measurement trumps biomarkers for dementia identification.</td>
</tr>
<tr>
<td>• MCI counts in the service of cognitive decline but is variably measured.</td>
</tr>
<tr>
<td>• Biomarkers are helpful but expensive and not available.</td>
</tr>
<tr>
<td>• General above average fluid intelligence may be protective of neuro degeneration</td>
</tr>
<tr>
<td>• Nuanced neuropsychology is relevant; category fluency, new learning vs recall, differences between verbal and visuo-spatial</td>
</tr>
<tr>
<td>• Common, normal findings of older adults may be wrongly attributed to disease.</td>
</tr>
</tbody>
</table>

Cognitive assessment is essential to fully understand the dynamic presentation of elderly adults, regardless of reason for referral. This is especially true within the elderly population in the differentiation between affect and cognitive changes (e.g., in years past labeled “pseudo dementia”), functional changes, progression of cognitive dysfunction, capacity, and prognosis. There are a plethora of cognitive assessment measures that cover the gamut of functioning. As competent clinical practitioners, it is pertinent to have a thorough understanding of the appropriateness of the tests and their merits and weaknesses. Meyer et al. maintain that psychological assessments are as valid as most medical tests; therefore, it is essential to have a thorough understanding of the nuances of test features and the implications of the different populations being assessed [27]. Specific to the elderly population, cognitive assessment is a key marker for adjustment in almost all areas of life [1]. Neuropsychological outcomes are strongly correlated with activities of daily living, especially instrumental activities of daily living [28]. Thus, cognitive assessment within the elderly population should be routine despite the referral question; the reduction of cognitive functioning may account for presentation of difficulties within other areas of functioning.

Practitioners may not have the time or expertise to administer, score, and interpret lengthy neuropsychological assessments. Therefore, it is important to be aware of the strengths and weaknesses of the highly used screening measures. The measures utilized in our clinic are reviewed below. Based on our model, we specifically recommend the combination of both the Mini-Mental Status Examination, the Montreal Cognitive Assessment, and Trail Making Tests, which will be applied to the case example presented.
The Montreal Cognitive Assessment (MoCA) serves as another screening tool that utilizes other popular neuropsychological assessment components including a shortened version of Trail Making Test Part B, clock drawing task, construction of a cube, serial 7’s, letter fluency and similarities [29]. The measure assesses several areas of cognitive functioning: Visuospatial/Executive, Naming, Memory, Attention, Language, Abstraction, Delayed Recall, and Orientation. Three English versions are freely available online for retesting purposes. Since education was found to be a factor in performance, the assessment adds one point to the score for individuals that have 12 years of education or less when comparing scores to the MMSE. These scales highly correlate with each other \( r = 0.87 \) [30]. Virtually every study has found the MoCA to have better correct classification ratios than the MMSE [1]. The measure has less of a ceiling effect and stronger association with functional status post-discharge of inpatient stroke patients [31].

One of the most widely used assessments within this population is the Trail Making Test. Trails B was also found to be the single best neuropsychological predictor of the conversion from MCI to AD with a 64.6% prediction accuracy [32]. The meta-analysis conducted by Martyr and Clare demonstrated that commonly used executive functioning assessments; including Clock Drawing Test, Trails B, and Letter Fluency, had a significant moderate association with activities of daily living as well as driving ability [33].

Of course, we should note that the Mini Mental State Examination (MMSE) [34]. is the most used scale in the world [35]. This assessment is comprised of several sections: Orientation, Registration, Attention and Calculation, Recall, and Language. The measure takes approximately 5 to 10 minutes to complete and is easy to administer and score. Age and education can influence scores such that stratified norms have been developed to provide a better normative structure [36-37]. The measure is most effective in assessing moderate or severe deficits [30]. Therefore, despite its popularity, the MMSE it is not recommended as a stand-alone screening measure to assess cognitive functioning when MCI is suspect. This recommendation echoes the findings of the most recent Cochrane Review in utilizing the MMSE in detecting Minor NCD [35]. Further, meta-analysis conducted by demonstrated the MMSE offers modest accuracy for ruling-out dementia presentation in community and primary care settings; suggesting the measure should be combined with other measures [38].

### Complete Assessment

The armamentarium of neuropsychological tests are filled with tests and batteries. We chose two. The Repeatable Battery for the Assessment of Neuropsychological Status (RBANS) was developed to assess for dementia [39]. The screening measure takes approximately 25 minutes to administer and has normative data for patients’ ages 20 to 89 years. Unlike other memory assessments, the RBANS was developed specifically for elderly adults and therefore may allow for finer distinctions of memory compared to others [30]. The measure assesses five different indices: Immediate Memory, Visuospatial/Constitutional, Language, Attention, and Delayed Memory. Four different versions are available to allow for repeated assessment. A large advantage of the RBANS, which most screening measures lack, is the assessment of non-verbal memory and story memory. Sensitivity and specificity in the detection of cognitive impairment associated with Alzheimer’s disease (AD) are excellent; 0.96 and 0.98, respectively [40].

<table>
<thead>
<tr>
<th>Measure</th>
<th>Description</th>
<th>Healthy</th>
<th>Moderate Problem</th>
<th>Problematic or Syndromic</th>
</tr>
</thead>
<tbody>
<tr>
<td>MoCA</td>
<td>Normal memory and fully oriented, these patients will display good judgment and problem solving skills.</td>
<td>27-30</td>
<td>22-26</td>
<td>≤21</td>
</tr>
<tr>
<td>MMSE</td>
<td>27-30</td>
<td>21-26</td>
<td>≤20</td>
<td></td>
</tr>
<tr>
<td>Trails A</td>
<td>≤46s</td>
<td>47-70</td>
<td>≥71</td>
<td></td>
</tr>
<tr>
<td>Trails B</td>
<td>≤115s</td>
<td>116-182</td>
<td>≥183</td>
<td></td>
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Another popular screening assessment within the elderly population is the Dementia Rating Scale-2 (DRS-2) [41]. The measure is intended for individuals 55 years of age and older. Administration time is typically 10 to 15 minutes for healthy adults, and up to 45 minutes for demented patients. The DRS-2 has 24 subtests that are combined into 5 subscales: Attention, Initiation/Perseveration, Construction, Conceptualization, and Memory. Given that performances vary by age, education, and IQ, it is recommended for individuals to use age and education normative data [42]. The original total cut-off score of 137 out of 144 from the developers has been considered to have limited value, since sample sizes of the score is based on an extremely small sample of 31 [42]. Subsequent norm recommendations have posed similar issues; thus, it is recommended to utilize the Mayo’s Older Americans Normative Studies (MOANS) norms available in Strauss et al [42] which also provides cut-off scores for subscales [43]. The DRS-2 was designed with the intention of discriminating between healthy adults with dementia. The measure has shown to be sensitive in detecting early stages of dementia and has been used as a tool to track the progression of cognitive decline [42]. Individual subscale performance can also assist with differing neuropathological conditions [30].

Importantly we need some indication of premorbid functioning. An important factor in the differentiation of cognitive impairment and dementia from normal functioning is the estimation of premorbid intellectual ability, which has demonstrated to be resistant to brain insult [42]. These tests require the patient to read aloud phonetically irregular words to assess premorbid intellectual ability, which has demonstrated to be resistant to brain insult [42]. These reading tests have been found to be effective in the estimation of premorbid function in elderly adults [44–47].

Additionally, the NART in combination with the Barona Index of Intelligence; a premorbid functioning measure that is solely based on background factors (i.e., age, sex, race, education, occupation), accurately predicted IQ for individuals with mild to moderate AD [48]. However, sole use of the Barona Index has presented with systematic under- and overestimate of WAIS-R FSIQ across the intelligence continuum [49]. Equally problematic, the standard error associated with the Barona FSIQ estimate is quite high, leading to suggestions that it be used to provide only a general estimate of the range of premorbid functioning. Thus, utilization of either of the standardized assessment measures in conjunction with demographic information can assist in the estimation of premorbid function with individuals presenting with memory complaints.

The Wechsler group has recently published their newest version, the Test of Pre-morbid Functioning (TOPF), which has been revised and re-normed with the WAIS-IV and WMS-IV. Unfortunately, developers have not provided normed data for the WASI-II; requiring practitioners to administer certain portions of the WAIS-IV for computer software to generate profile interpretation.

We note one more aspect of assessment. Neuroimaging can be incrementally beneficial in the differentiation of cognitive impairment diagnosis and monitoring of progression. Despite the progress made in identifying different neuropathological processes and their detection through different neuroimaging techniques, there is significant overlap of neuroimaging findings with AD, other dementing processes, Minor NCD, mixed dementias, and non-dementing adults [30, 50]. Longitudinal and cross-sectional neuroimaging studies have revealed predictive markers. Pertaining to Minor NCD, a study examining 129 amnestic MCI patients established baseline MRI measures and compared to imaging studies conducted 36 months post. Predictive accuracy of MCI conversion to Alzheimer’s disease was 60.4% examining hippocampal volumes. Subtests of the ADAS-Cog better predicted conversion rate at 78.8% and the addition of neuroimaging did not enhance predictive ability [51]. In general, cognitive measures have demonstrated to be more sensitive in predicting progression of cognitive impairment [52].

Prevention and Treatment

Studies have demonstrated protective brain factors pertaining to the degenerative process. These factors include life skills such as intelligence, occupational complexity, active engagement of leisure, computer games, stress reduction, and healthy lifestyles [53]. The Centers for Disease Control and Prevention’s Healthy Brain Initiative developed a Public Health Road Map for the promotion of cognitive health [54]. The recommendations included several areas of intervention including cognitively stimulating activities, physical activity, and healthy vascular function. There are several interventions that can be recommended to patients at varying levels of cognitive
functioning. These recommendations should be provided as regular guidelines to patients, even as preventative care. We address cognitive training, exercise, diet and medication. To this, we could add other background factors (e.g., education), socialization, and leisure to name a few.

Cognitive Training: Cognitive training (CT) has become a popular intervention for this demographic to assist in the development of compensatory strategies and to strengthen and reinforce neural networks by repetitive challenging activities of increasing difficulty. The National Institute of Health Conference for Alzheimer’s Disease and Cognitive Decline assessed 6,713 studies on risks and protective factors related to cognitive functioning. Results demonstrated that CT and behavioral factors were the most influential components associated with risk reduction for cognitive decline [55]. Recently, two consensus statements about brain training offered conflicting views on the validity. One argued that no compelling evidence exists to support the claims of brain-training companies that brain games (Cognitive Training (CT)) enhance cognition or stave off the cognitive consequences of aging (Stanford Group); the other noted extensive support for scientifically grounded brain-training interventions (John Hopkins Group). Reading between the lines, it was evident that strict science (adequate controls, far transfer effects, sample size, etc.) cannot support its validation, yet clinical application is probably warranted. Factually, most studies have reported relative benefits of cognitive training in regard to narrow transfer and are experienced as positive for completers. Additionally, subjects who are motivated, have some skills to start with, and have support, do well.

CT has traditionally been offered in two different formats; pencil and paper and computer-based. Given the ease in access, computer based CT programs are on the rise (e.g., Lumosity, Happy Neuron, Cogmed); thus, more recent studies have focused on this format of intervention. There is increasing evidence suggesting that older adults who are impaired can benefit from CT. A review of the literature by Hyer, Mullen, and McKenzie provides information of recent major studies of CT in adults with MCI or mild AD [53]. General results reveal that interventions show positive effects on cognition, affect, and overall functioning; regardless of treatment modality (i.e., pencil and paper or computer-based). However, studies vary in type and duration of intervention, as well as population samples. Effect sizes are generally small but significant, and comparison non-intervention groups even demonstrated some non-significant improvements.

Recent meta-analysis demonstrated that computerized CT is efficacious in the improvement on global cognition as well as varying domains of cognitive functioning within minor NCD populations [56]. As a point of finality, the Alzheimer’s Association has concluded cognitive training may reduce the risk of cognitive decline, based on population-based analyses [57].

Medication: In regards to pharmaceutical intervention, several medications are routinely prescribed within this population. Specifically, the medications of choice to assist with memory performance are cholinesterase inhibitors (ChEIs) (e.g., donepezil, galantamine, rivastigmine) and low-affinity N-methyl-D-aspartate (NMDA) (i.e., antagonist memantine). These medications have not received approval for treatment of MND. Several investigations have assessed whether ChEIs can improve cognitive functioning or delay onset of dementia. Research has failed to show any significant difference in cognitive functioning; however, the medications demonstrated to have significant adverse reactions: gastrointestinal side effects, cardiac syncope, and headaches [58].

ChEIs are marketing approved for the treatment of mild to moderate dementia. Unfortunately, almost all published trials on ChEIs in the dementia population were industry sponsored. Systematic evidence reviews concluded that ChEI treatment has a small statistically significant improvement in cognitive functioning in dementia patients, yet is not considered to be clinically important [59].

Comparatively, studies pertaining to the efficacy of memantine were all short-term and industry sponsored. Meta-analysis demonstrates small cognitive benefits in patients with moderate to severe AD and vascular dementia at three months of treatment, which was not observed at six months. However, when memantine was added to ChEI treatment, there was no statistical improvement in cognitive, functional, or behavioral outcomes [58]. There were no significant benefits observed in mild dementia or Lewy body dementia. Side effects were significantly less compared to ChEIs.

The American College of Physicians and American Academy of Family Physicians developed guidelines pertaining to these medications within the elderly population [59]. Specifically, they recommend that potential initiation of a trial of either ChEIs or memantine should be based on individualized assessment. Decision of medication selection should be based on the patient’s
tolerability, medication side-effect profile, ease of use, and cost. Additionally, authors stated there is an “urgent need for further research on clinical effectiveness of pharmacological management of dementia” [59].

**Exercise:**

Several reviews demonstrated that exercise in older individuals with and without cognitive decline have beneficial effects [60-62]. Lee and colleagues demonstrate a dose-response gradient with exercise and risk factors associated with cognitive decline, Alzheimer’s disease, and cardiovascular disease: diabetes, hypertension, obesity, depression, sedentary lifestyle, and current smoking [61]. Authors recommended that prevention for both cardiovascular disease and cognitive decline should be coupled. Even more revealing, meta-analysis conducted by Sofi et al., evaluated the impact of exercise on cognitive decline in a non-demented populations [63]. Results of 33,816 patients suggest a significant protection against cognitive decline for physical activity ranging from high to low-to-moderate levels.

The Alzheimer’s Organization recommends individuals to engage in cardiovascular exercise to reduce potential dementia risk factors [64]. The association concluded that regular physical activity and management of cardiovascular risk factors (diabetes, obesity, smoking, and hypertension) reduce the risk of cognitive decline [57]. Even though they did not provide a specific optimal duration, level of intensity, or activity, most studies suggested regular and more rigorous exercise. Comparatively, current recommendations based on analysis of existing research presented during the International Conference on Nutrition and the Brain suggests aerobic exercise equivalent to 40 minutes of brisk walking thrice per week [65].

**Diet:**

Research supports lifestyle and dietary factors for AD that are congruent with recommendations for cardiovascular diseases and diabetes [65]. Currently, the Alzheimer’s Association recommends two different types of diets: Diet Approaches to Stop Hypertension (DASH) and Mediterranean Diet [66]. Similar to the recommendations of Lee et al, these diet interventions target both high blood pressure and cognition [61].

DASH consists of eating foods low in saturated fat, total fat, cholesterol, and decrease intake of fats, red meat, salt, and sugar. The diet focuses on consuming more fruits, vegetables, low-fat dairy, whole grains, poultry, fish and nuts. The Mediterranean diet is quite similar, with slight differences - replace butter with healthy fats, use herbs to flavor food instead of salt, eat fish and poultry

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Figure 6: Case profile, cognition as a concern
at least twice a week. The Mediterranean diet has become very popular within the health field. Multiple studies have been conducted across several populations. Specific to minor NCD and AD, meta-analysis demonstrates those with highest adherence to the diet had 33% less risk of cognitive impairment and reduce risk of minor NCD [67].

Preliminary guidelines were developed regarding diet and lifestyle for the prevention of AD from the International Conference on Nutrition and the Brain [65]. In addition to the dietary recommendations outlined above, several other factors were included: (1) vitamin E should come from food, (2) consistent intake of vitamin B12, and (3) only consume iron supplements when directed by physician.

Cognitive performance cannot be captured within a vacuum. Many elements can impact cognitive presentation on assessment. Therefore, it is critical for clinicians to conduct thoughtful and thorough clinical interviews, as well as assess other areas of functioning, as outlined in subsequent chapters: depression, anxiety, health, and life adjustment. Each of the five factors also impact decision making pertaining to treatment. As discussed in the chapter, if other factors outside of cognition present as problematic – these should be addressed first and cognition re-assessed once the areas have been addressed. However, some of the potential interventions for cognitive functioning can benefit other areas, such as the impact of cognitive training and social engagement on affect.

**Chief Complaint:**
Evaluation for cognitive impairment; referred from neurologist

**History of Present Illness:**
The patient is an 87 year old Caucasian male who reported memory issues. Memory difficulties started approximately six years prior to visit, with a slow progression of symptoms. Mr. DM was driven by his wife to the interview. Both he and the wife were interviewed. Primary problems indicated

<table>
<thead>
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<tbody>
<tr>
<td>MoCA</td>
<td></td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>MMSE</td>
<td></td>
<td></td>
<td>16</td>
</tr>
<tr>
<td>Trails A</td>
<td></td>
<td></td>
<td>81</td>
</tr>
<tr>
<td>Trails B</td>
<td></td>
<td></td>
<td>D/C</td>
</tr>
</tbody>
</table>

Relevant Developmental History:
The patient is a Florida Native, and youngest of three children. At a young age, he was sent to live in Alabama and grew up on a farm. He did not complete high school, but received his GED. Mr. DM served in the military for three years, discharged in 1953. He completed some education at both a community and state college, yet did not obtain a degree. He worked within the consumer transaction technologies industry for nine years and later for a forest products company for 15 years. Subsequently, he was self-employed for approximately 13 years and owned a local newspaper. Mr. DM retired in 1997. He married in 1957 to his current wife, and has 3 children from the marriage. He currently lives with his wife and son. Reportedly, Mr. DM is very inactive during the day, but is compliant and supportive of his family and tasks around the house.

Relevant Medical History:
Mr. DM received multiple surgeries throughout his life: spinal fusion 1985 and 2007, prostate 1990, rotator cuff 2004, hernia repair 2011 and 2013, rotator cuff 2013, wrist 2014, skin cancer 2015. Reportedly, the patient has been forgetting conversations and repeating himself for approximately 6 years, resulting in initiation of psychiatric treatment. He also loses chunks of time in the past. According to his neurologist, the headaches and dizziness are idiographic and have no specific etiology. He is currently on numerous medications including Celebrex, Synthroid, Optivite, Soma, pravastatin, cyanoocobalamin injections, tamsulosin, meclizine, and Norco, as well as psychiatric medication Aricept, Lexapro, Xanax, and Namenda. Mr. DM is currently seeing a neurologist yearly and a psychiatrist bi-annually. He does not consume alcohol or tobacco products.

Mental Status:
The patient is an 82-year-old Caucasian male who was driven to this appointment. He was dressed professionally and looked younger than his age. Mr. DM
indicated that he is not able to provide answers to many specific questions; however, had a sense of the conversation and gravity of the situation. He denied depression and anxiety. There was no evidence of perceptual anomalies or delusional thinking. He does not show very good judgment and has very little insight into the situation.

Test Results:

Mr. DM’s intelligence score fell into the severely impaired range as well as all subtests (WAIS-IV). Comparatively, estimated premorbid functioning was in the low average range (WRAT-4). Total RBANS Index was 52, falling into the severely impaired range (.13 %ile), as well as MoCA performance 12/30. RBANS results indicated severely impaired attention (Index=53, .1%ile), visuospatial/constructional (Index=62, 1%ile), immediate memory (Index=57, .2%ile), delayed memory (Index = 44, .1%ile); and low average language performance (Index=80, 9th %ile). He had significant difficulty completing Trail Making Test Part A (180”), and could not complete Part B nor was able to draw clock on MoCA. He did not present with any problems with Picture Naming on either the RBANS or MoCA. However, verbal fluency was severely impaired (RBANS SS=3). He was not oriented and could not prove a reasonable description of his life currently.

Life Adjustment:

There were deficits on the FAQ, a mixture of executive functions in activities of daily living, due to abilities. He had problems with all IADLs where some problem solving is required. His wife reported similar impairment of the patient, which is furthered by his level of inactivity in daily life. Mr. DM’s education is average and has high SES. His environment is good and has an active support system. His stress is low, outside of the concern of cognitive functioning. His sleep is problematic and is currently sleeping more than 12 hours per day. His meaning in life is fair to poor.

Emotional:

Emotional self-report scales indicated mildly problematic depression (BDI-II = 9, GDS-SF = 4) and little anxiety (GAD-7 = 4).

Watch and Wait Summary:

This is an 87 y/o male who was referred for an evaluation for his cognitive status. He is in a moderate dementia. This is true in almost all areas of functioning, with no relative strengths. He shows very mild evidence of depression. He has a loose realization that he is in a state of decline and has difficulty tracking conversations.

Mood and cognitive functioning are currently being managed by pharmaceutical intervention. He does not engage in daily living, staying to himself in the basement and sleeping for more than 12 hours a day. The situation is complicated by chronic headaches and body pain (which he rates as an 8 out of 10), and dizziness that results in falls. He has little insight into his situation.

In sum, he is currently presenting with cognitive difficulties that require intervention. His cognition is a paramount concern. Additionally, it reflects the need of more direct intervention surrounding IADL’s, which his wife agreed to redress and take over full responsibility of medication and financial management. He does not currently drive, so this is not at issue. Given the number of medications, it would typically be recommended for a patient presenting as such to receive intervention from a psychiatrist for medication management in order to reduce potential polypharmacy effects on cognition. However, he already is receiving such services from a psychiatrist who specializes in the geriatric population. Further, it is strongly recommended that he have an evaluation conducted on his current presentation of headaches and dizziness, due to their reported contribution of the patient falling.

Depression

Depressive disorders are among the most common mental illnesses, only second to anxiety disorders and often comorbid with them. Depressive disorders are also the leading contributor of disability adjusted life years [68]. Major depressive disorder (MDD) peaks in prevalence between 30-44 years with an overall 12 month prevalence of 7%; the rate of depression among adults >60 years is significantly lower than any other age group [69]. That being said, significant subsyndromal depression affects 15%-25% of older adults [70]. Unfortunately, depressive disorders tend to be recurrent across the lifespan such that people who have one episode are more likely than not to experience another. This can be more complicated in older adults because of the reciprocal relationships between depression, social functioning, cognition, and higher disease burden. Identification of depression and treatment of it can also be complicated by age related factors and tacit social expectations of older adults to display behaviors characteristic of depression.
Major depression is characterized the presence of at least 5 of the 9 criteria in the DSM-5; these criteria must cause distress or impairment in some realm of functioning. One additional criterion which may be especially relevant to older adults is that depression due to substances or another medical condition. The disease burden of older adults, more specifically chronic illness, can complicate the diagnosis of depression. The defining criteria for depression on older adults is slightly different than that of younger people due to differences in physiology and stages in life. For examples, a noted slowness in movement in older adults may be cautiousness, deliberativeness, drug induces, or depression. Teasing out when a symptom of depression is actually depression is more challenging in older adults because of additional influences on the person as a whole. The DSM-5 criteria for depression sometimes falls short of accurate for older adults in the face of further scrutiny.

There are several important Issues. First, depression does not have a modal type. There is heterogeneity of phenotypes. Factor analyses reveal many forms of depression. There is increasing evidence that symptoms of elderly depression may be etiologically distinct (e.g., more psychomotor retardation and anhedonia in vascular depression) and that focusing on subclusters of depressive symptoms, rather than relying on general depression assessment tools may help enhance construct validity. Second, there are subsyndromal states (MinD, SSD). Over time these states are impactful. Subsyndromal depression is a high predictor to depression itself as well as functional problems and neurodegenerative diseases. The CASPR and COBRA studies validated this issue [71]. Third, the presence of anxiety is pervasive. The Mixed Depression and Anxiety is most characteristic in other countries. Fourth, late life depression is comorbid with executive functioning problems. The inability to think clearly is critical and reduces the impact of therapies, both pharma- and psycho-logical. Cognitive impairments have a special place tyhen in the understanding and care, and medications warrant special considerations when conceptualizing and treating patients. Fifth, it is apparent that the ‘oldest old’ (>75) present different from the ‘young old’ [72]. Sixth, comorbidities are pervasive: Cardiac disease – 20%-33% MDD: Cancer – depressive symptoms 25%-50%: neurological disorders: Alzheimer dementia at 50%: Parkinson’s disease at 25% and stroke at 20%-25% [73]. Seventh, there are many MRI changes in late-life depression (WMH) involving inflammation, GABA, Glutamate, BDNF, IL-6, cardiovascular disease, platelet activation, T-cell response (lower), elevated homocysteine levels, and high WMHs, but none are definitive for diagnosis and treatment. Eighth, there is a response to treatment but little remission. This is worse for older adults. Also, the placebo rate among older adults treated for depression is high and CBT and its clones are competitive. Ninth, depressive symptoms are associated with obesity, diabetes, as well as vascular disease, becoming risks for stroke and heart disease. They also relate to sympathetic tone, dysregulation of the H-P-A axis, and increased inflammatory responses. The opposite is also true: Vascular and other body problems lead to depression. This is most notable in WMH, subcortical vascular lesions, lacunes, and microinfarcts. We note as well that the progression of WMH and EF problems predict a poor response to the course of depression.

There are several theories as to how depression might be linked to dementia. These involve cortisol, reduced brain volume, a depletion of one’s cognitive reserve, and lifestyle factors. Depression, as noted, is highly related to chronic diseases, like cardiovascular disease. Adults who have more severe depression or whose depression increases also have an increase in the probability of a dementia. Depression may also be an expression of some underlying neurodegenerative process, but it also is related to some biological changes such as inflammation, vascular disease, and high stress hormone levels that may be toxic to the brain in some respect. Depression can also worsen mild dementia by making it more difficult for a person to concentrate and set down new memories. Studies often link late-life depression with subsequent development of Alzheimer’s disease and other dementias. Depression may do something to the brain that increases the risk of Alzheimer’s, or it may represent the first signs of Alzheimer’s - or both could be true. It’s important to treat depression aggressively in older people, and not assume that depression symptoms are not just part of dementia [74].

There are a number of cognitive pitfalls that clinicians are susceptible to when it comes to diagnosis. Many therapists have their own conceptualizations of disorders and they may lack flexibility enough to widen those conceptualizations to a new population or client. Other therapists will take a less personalized and no less ridged approach to diagnosis of depression wherein meeting the ICD and DSM criteria or being one point above the cutoff on an assessment is the necessary and
sufficient criteria for depression. Both the conceptual approach and criteria based approach do not take into account the totality of patient experience. That is to say; a symptom of depression in one hundred patients may just be a normative process in the hundred and first patient. That hundred and first patient may also report an apparently benign thought or behavior or even world view that, for that person, is indicative of a problem. It is because of that patient that clinicians must exercise some degree of flexibility informed by clinical experience and research to properly identify and treat depression.

Table 9: Recommended measures and cutoffs

<table>
<thead>
<tr>
<th>Measure</th>
<th>Healthy</th>
<th>Moderate Problem</th>
<th>Problematic or Syndromic</th>
</tr>
</thead>
<tbody>
<tr>
<td>MINI</td>
<td>No positive Hits</td>
<td>Borderline MDD or Dysthymia</td>
<td>MDD or Dysthymia</td>
</tr>
<tr>
<td>BDI-II</td>
<td>≤10</td>
<td>11-22</td>
<td>≥23</td>
</tr>
<tr>
<td>PHQ-9</td>
<td>≤6</td>
<td>7-11</td>
<td>≥12</td>
</tr>
<tr>
<td>GDS-SF</td>
<td>≤5</td>
<td>6-10</td>
<td>≥11</td>
</tr>
</tbody>
</table>

Assessment

A useful measure of depression is the Mini International Neuropsychiatric interview (MINI) which is a brief structured interview meant to aid in the assessment of 16 DSM-III disorders and was later updated to be current with the DSM-IV [75]. The MINI shows good agreement with the composite international diagnostic interview (CIDI; kappa = .73); the MINI accomplished this in less than one fourth of the time on average. The Beck Depression Inventory is likely the most commonly used screen for depression; it consists of 21 items and is recommended for use in people 13 years and older. The BDI-II was a significant improvement over the BDI in terms of validity in older populations [76, 77]. The inclusion of older adults while assessing the properties of the BDI-II contributed to the revision, deletion, and creation of a number of items. The resulting test displays high internal consistency; coefficient alphas of .84-.90 in older adults with the lowest correlating item relating to sexual interest (r = .05) [78]. When BDI-II items are compared across age groups older adults endorse the following items less often: sadness, guilty feelings, punishment feelings, self-dislike, self-criticalness, crying, agitation, and irritability. Loss of interest in sex and loss of energy were endorsed more often than younger adults [76, 77]. Steer et al. compared the BDI-II factor structure and found that the factor structure was different in older adults than in a younger sample [79]. Crying is a cognitive factor in older adults and that pessimism was a non-cognitive factor, though similar studies have shown pessimism to be a cognitive factor in older adults [76, 80].

The Patient Health Questionnaire (PHQ-9) is 9 items, from the full Patient Health questionnaire, which relate to depression [81]. The PHQ and PHQ-9 were developed to be useful in a variety of medical settings and are easy to understand self-report questionnaires. Scores on the PHQ-9 range from 0-27, each of the items can be scored from 0-3, each number reflects the prevalence of specific depression symptoms (0-not at all; 1-several days; 2-more than half the days; 3-nearly every day) in the past two weeks. There is an additional question: “How difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?” The PHQ-9 had regularly displayed high internal reliability between .86-.89. Manea, et al., conducted a meta-analysis of the psychometric properties of the PHQ-9 and determined that cutoff scores between 8-11 for strongly considering a diagnosis for depression [82]. Finally, the GDS-SF is also a reliable and much used depression measure. It has been used in lieu of the longer form for many years. A cut-off of 5 seems best for mild depression.
Complete Assessment
A complete evaluation applies some of the following measures in addition to the screen. Other rating scales are applied especially when a careful diagnosis is required. Omnibus scales are especially helpful as they provide a profile of the patient with a view of competing domains. Personality is also provided. Other self report scales are gratuitous to the screen but clinicians often have a bias toward one or more. For depression in the context of a dementia, three scales are noteworthy. Overall a reading of quality of life or satisfaction is in order.

Treatment
We have addressed the treatment of older adults in the previous book [1]. Treatment models that are empirically supported consist of CBT, PST, ACT, IPT, as well as emanating from one or more of these, such as relaxation and mindfulness. In fact, evidence based psychotherapies based on the Committee on Scientific and Practice of the Society for Clinical Psychology (Division 12) of the American Psychological Association identified behavioral therapy, cognitive therapy, cognitive bibliography, PST, CBT, brief psychodynamic therapy, and reminiscence therapy. Cuijpers et al. analyzed 25 randomized studies and found that the psychosocial treatments had a moderate to large effect size [83]. There were no significant differences in the effects among the psychological interventions.

We highlight these models in the process of Watch and Wait. This slow treatment is dependent upon the unfolding after assessment including monitoring and the application of simpler tried and true interventions of behavioral activation and extended family, as well as motivational interviewing. The process is one of using assessment as treatment and then monitoring, and applying upfront interventions of behavioral activation, somatic softening (relaxation), use of medications, introduction of family, and MI. The application of CBT, PST, IPT or ACT can be applied in time. Use of a case manager, Follow-up is the logical extension of this process.

Note too that treating late life depression is also respecting and treating cognition. Mild cognitive impairments have consistently been documented in up to 60% of individuals with late-life depression and these cognitive impairments contribute to increased mental healthcare costs, disability, and poor treatment outcomes. Executive dysfunction and informal processing speed deficits are often considered to be the hallmark of cognitive features in late-life depression. However, impairments in memory and verbal learning are also frequently noted. Given the heterogeneity of cognitive impairments exhibited by individuals with late-life depression, differentiating the direct impact of late-life depression on cognition from the effects of other concurrent conditions such as neurodegenerative diseases represents a significant challenge. But, addressing cognitive problems in late life depression may very well assist with depression [84].

### Table 10: Recommended assessment for depression

<table>
<thead>
<tr>
<th>Assessment for Depression</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Omnibus Measure: MBMD, PAI, MMPI-2 (RF)</td>
</tr>
<tr>
<td>• Clinician Ratings: HAM-D (17 or 24, use 10), MINI, PHQ-2 (use 3), GDRS (use 20), MADRS</td>
</tr>
<tr>
<td>• Self Report scales: PHQ-9 (10), BDI-II (10), GDS (11), GDS-SF (5), CESD (20 item, cut-off 6), Zung Depression Self Rating Scale (50).</td>
</tr>
<tr>
<td>• Dementia and Depression</td>
</tr>
<tr>
<td>• Cornell Scale for Depression in Dementia (19 items use to get severity after depression is established)</td>
</tr>
<tr>
<td>• Dementia Mood Assessment Scale (17 items)</td>
</tr>
<tr>
<td>• Provisional Depression in Dementia [73]</td>
</tr>
<tr>
<td>• Overall:</td>
</tr>
<tr>
<td>• OQ-45, BASIS-32</td>
</tr>
<tr>
<td>• Assess medical and psychiatric comorbidities. Charlson Index</td>
</tr>
<tr>
<td>• Assess social support, cognition, sensory, sleep, pain, meds</td>
</tr>
</tbody>
</table>
Medication has a place. In one widely reported med analysis, a researcher dismissed antidepressant efficacy in all but the most severe cases of depression. Then another research team tackled the very same idea and reached a very different conclusion: Antidepressants are effective in all but the mildest cases of depression. Whatever the truth, long-term use of antidepressant medication has is place in treatment. But, drugs in general can cause problems. They fuel an “oppositional tolerance,” as well as antidepressant-induced tardive dysphoria. Roughly 80% of those maintained on an antidepressant experience symptom reoccurrence and the longer people use them, the greater the risk of relapse. This has actually been labeled as tardive dysphoria. So through treatments, often people will get worse. People acclimate to the medications and often take them for granted. Additionally, some 73% of improvement with antidepressants is now attributed to the placebo effect.

It has been said that antidepressants are to mental health medicine what antibiotics are to physical medicine when it comes to overuse. More is not more. So it is best that antidepressant users realign their expectations and that prescribers reinforce the limitations of their drugs when it comes to what users want from them. Think a shorter period of time rather than longer periods of time. No one antidepressant or antidepressant class consistently outperforms another. Allowing the patient to choose his or her antidepressant based on acceptable side effects and general information is reasonable. By acceptable side effects, it is meant that the patient is willing to put up with or tolerate problems related to getting a better response to the medication. Additionally, the patient needs to be prepared for an antidepressant trial by first focusing on the drug’s side effects and not the therapeutic effects. Then they can share their selections with the prescriber where they are not likely to get much pushback unless there are threatening contraindications. Proceeding in this manner helps put side effects as first place. Also getting the patient involved in the selection process has them believing that they are part of the process when it comes to their own care. There is a great advantage to this.

In sum, real depression is likely far too complex for a pill to solve regardless of how novel future agents may be. Given the multidimensional nature and complexity of what influences depression, is it at all reasonable to conclude that an antidepressant or for that matter any other medicinal substance will be able to arrest it or at the least manage it better than the agents available today. A careful Watch and Wait approach is in order.

### Table 11: Recommended treatment regimen

<table>
<thead>
<tr>
<th>Treatment Regimen</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Assess with screen and cognition</td>
</tr>
<tr>
<td>• Watch and Wait Initial Phase</td>
</tr>
<tr>
<td>Monitor</td>
</tr>
<tr>
<td>Behavioral activation / Somatic Softening</td>
</tr>
<tr>
<td>Introduce Meds or Psychotherapy (CBT, IPT, ACT, PST)</td>
</tr>
<tr>
<td>Spouse/Family/Kids/Friends/Enemies</td>
</tr>
<tr>
<td>If problems: Motivational interviewing</td>
</tr>
<tr>
<td>• Watch and Wait Treatment</td>
</tr>
<tr>
<td>Monitor over time and watch for changes (response)</td>
</tr>
<tr>
<td>CBT, PST, ACT, IPT</td>
</tr>
<tr>
<td>Use case manager for home help/phone/email/text</td>
</tr>
<tr>
<td>• Follow-up: Assume slow recovery and involve family</td>
</tr>
<tr>
<td>• Response WILL be slower than in younger patients</td>
</tr>
</tbody>
</table>

Table 11: Recommended treatment regimen
Patient indicated that for the past two years she has been complaining of memory problems, forgetting things that she does during the day, and on occasion losing her keys. She also indicated that she forgets issues like cooking rituals and recipes. She was divorced in 2009 from her husband. This was after 50 years of marriage. He has a schizophrenic diagnosis. She has been out of work since 1991 and continues to have Workers’ Compensation over this period of time. She lives alone.

She graduated from high school and was married shortly after. She was married for just about 50 years. She has two children, a boy and a girl, and they are very supportive. She herself worked over the years, first at a school, then at the Post Office. She was let go on disability in 1991 and filed for Workers’ Compensation. She is reasonably healthy. She does not use tobacco or alcohol. Indications are that she sleeps roughly 6 hours at night, but it is disrupted across the night. She does not have an exercise program, but plans on doing one. She is an active member of a church, both on Sundays on 2 occasions per day and on Wednesdays. She takes several medications, including Synthroid, Cardizem HCT, a
Statin, as well as Tylenol. She also takes Coumadin, psychiatric medications including Wellbutrin, Zoloft, and an anxiolytic. She has had 1 psychiatric hospitalization roughly in 1991.

**Premorbid Functioning and Overall Cognitive Functioning:**

Her WASI Full Scale is 107 (68%): Verbal = 109 (73%) and Performance = 103 (58%). This suggests a normal intelligence and skills now. Currently Mrs. R had a MoCA at 27/30, normal. Her RBANS was 103 (58%), also normal.

**Function:**

She scored in the normal range on the FAQ, indicating few problems on this measure of executive functions in activities of daily living. She was rated as one needing no help with transferring, cooking, shopping, managing meds, housework, doing laundry, driving, and managing finances.

**Affect:**

Her MINI indicated that she is currently depressed and has anxiety. She receives considerable help from her significant other. Her Mood scale was 8; he PHQ-9 was 10; her BDI-II was 29, all depressed. She has an anxiety rating on the GAD-7 at 11. She has been treated by psychiatrists for over 20 years and has one psychiatric hospitalization.

**Pain and Sleep:**

She rated her pain at present as 4/10; average 4/10. She has back problems.

**Summary:**

Cognitively she has many strengths. At base, she is depressed. She has a long psychiatric history. The quality of her depression seems primarily marked by physiological features, such as a disturbance in sleep pattern, a decrease in level of energy and sexual interest, and a loss of appetite and/or weight. However, she does not appear to be reporting a significant degree of dysphoria or thoughts of worthlessness and hopelessness. Her interpersonal style is worth noting. She seems best characterized as self-effacing and lacking confidence in social interactions. She is likely to have difficulty in having her needs met in personal relationships and instead will subordinate her own interests to those of others in a manner that may seem self-punitive. Her failure to assert herself may result in mistreatment or exploitation by others, although, at this point, it appears that the strategy has been effective in maintaining her important relationships.

**Watch and Wait:**

She is living well and seems to be enjoying her life. Her health is also stable. She is best treated for depression and anxiety. She may benefit from better perspective taking and support. She is benefiting from on-going psychiatric care (medications). She may benefit from some counseling as she seems unsure of herself and has self doubt. She may benefit also from an exercise program also. She is active in the church. Sleep and pain are not issues. Her GAF is ~65.

We will provide psychoeducation, validate her, and suggest the above interventions. We will also consider other medications. She will be given several behavioral activations strategies. Her social support connectors will be supported. She will be requested to increase her exercise. We will monitor her over time.

**III. Anxiety**

If depression is complex, anxiety is complex-er. It is a syndrome, a sign and a symptom. It is also comorbid with depression, somatization, and dementia. In general, at later life the cohort trajectory of anxiety is curvilinear (up (before 65), down (after 65) and up again (75)). There are also clear phenotypic differences that do not adhere to DSM-5. Perhaps a real problem for clinicians is what is “true anxiety” and “secondary anxiety.” Medical problems confound its expressions and causality. Also subthreshold worry is a concern. In fact, worry and anxiety seem independent factors in the expression of the tension and causality. They arrive from differing brain mechanisms and are mediated by a cerebral vascular component. Anxiety and executive dysfunction have a special relationship. About half of older adults incur worry) later in life. This certainly applies to MCI/Dementia relationship also.

As with younger adults each anxiety disorder has a unique component; GAD has chronic uncontrolled worry; panic shows a somatic overconcern/avoidance; phobias involve fearful avoidance; social anxiety has a cognitive self evaluation and avoidance expression; OCD has requisite obsessions and compulsions; and PTSD involves numbing, re-experiencing, avoidance and arousal. Again, these are starting points for some understanding and typing of nervousness and what to treat. Fear is more than one emotion, however.
Background

For older adults, anxiety itself is the most common diagnosis [85]. Generalized anxiety or worry is the best marker of the problems experienced by older adults. Anxiety is often seen at subthreshold levels and is more prominent than depression [86]. Even at subthreshold levels, the anxiety can be problematic, more so over time. As many as 20% of older adults may experience clinical anxiety in some form [87]. This is double the occurrences of dementias and more widespread than MDD [88]. Unfortunately though, these prevalence rates may be underestimated because older adults may minimize the anxiety symptoms or not recognize them to begin with [89], and physicians may not recognize the symptoms when presented [90]. A diagnosis of depression typically includes comorbid anxiety disorders in about half of the cases. When anxiety is diagnosed primarily, this number is less [91]. For older adults, anxiety and depression are seen frequently in primary care clinics where visits and medication use has increased [92].

In many cases, older adults may report their problems as concern or worry, and they may also misattribute their somatic anxiety symptoms to a medical problem. Concerns that follow anxiety include physical complications, decrease in overall well-being, increased mortality, and an extensive over use of services. Anxiety disorders in older adults occur frequently with other conditions, both psychiatric and medical, with somatic symptoms being the hallmark component. Cardiovascular disease, pain disorders, lung disease, and gastrointestinal problems are all found to be significantly associated with anxiety disorders. As a result, older adults are likely taking multiple medications, and some of these medications can worsen anxiety symptoms [88]. As might be expected, anxiety complicates these issues and the physical concerns exacerbate the anxiety as well [93].

For the most part, psychiatric illnesses are early-onset disorders with late-life exacerbations [91]. However, of those with current or lifetime GAD, half experience their first onset after age 50. In late onset GAD, older adults report more functional impairment and poorer health than those who have an earlier anxiety onset [88]. We should note too that common problems are avoidance and excessiveness (that is out of proportion to an actual danger). That said, the DSM anxiety features of impairment and work related anxiety, as well as the absence of fear of falling, does not apply [94].

When looking for a differential diagnosis, overlapping symptoms between anxiety, depression, and dementia complicate the picture. When GAD is diagnosed in patients with AD, the anxiety symptoms are primarily hoarding, agitation, and/or aggression. It is often considered a symptom of depression. Research to differentiate GAD from dementia has resulted in a proposed symptomology of anxiety in AD to include irritability, muscle tension, fears, restlessness, and respiratory problems [95]. Up-stream, research has suggested that anxiety may be a predictor of cognitive decline [91].

Anxiety and Cognitive Decline

Anxiety has been shown to result in poor cognitive performance in older adults [85]. As adults age, reduced working memory and processing speed occur. This may mean that older adults in particular may be more vulnerable than their younger counterparts to the effects of anxiety on cognitive functioning [1]. Anxiety and depression together also predict more rapid decline in memory later in life than depression by itself [96].

In a study by Andreescu et al., the authors attempted to assemble the complex associations of depression and anxiety with MCI at the population level [97]. They assessed just under 2,000 individuals aged 65 and over. They defined MCI in several ways; simply by amnestic and non-amnestic MCI, by markers of both cognition and function, or by markers of just function. Importantly, they assessed both recent and chronic anxiety and both recent and chronic depression. Over time, results suggested that recent-onset anxiety was associated with MCI only when all markers were present; chronic anxiety was associated with MCI on all conditions. On the depression protocols, the core mood profile was associated with function only. The results of this study, therefore, show that subgroups with different anxiety and depression profiles had different relationships with cognitive and functional definitions of MCI.

Mah et al. assessed anxiety symptoms in amnestic MCI [98]. This was shown to predict conversion to AD and beyond the effects of depression, memory loss, and atrophy within the AD neuroimaging biomarkers. These findings together with a greater executive function atrophy rate predicted by anxiety are comparable with the hypothesis that anxiety is either a prodromal cognitive feature of AD or may accelerate the decline toward Alzheimer’s disease through direct and indirect effects, perhaps executive function. It is worth noting too that in this study, anxiety severity in amnestic MCI increased...
rates of conversion to AD independent of depression. The change rates for anxiety for AD risk was increased by 33%, 78%, and 135% for mild, moderate, and severity anxiety respectively. The association between anxiety and AD remain significant even with the inclusion of baseline hippocampal volume, amygdala markers, executive function or their extent of atrophy over time in the model. If anxiety in amnestic MCI accelerates progression toward AD, it is possible the anxiety is simply a prodromal symptom of AD because of its presence of AD pathology in the limbic brain regions. Perhaps anxiety also is a subjective reaction to worsening memory. Anxiety is associated with AD over and above memory decline baseline or region of interest volumes. Anxiety has been shown to be associated with increased rate of atrophy in the entorhinal cortex volume, suggesting that anxiety may accelerate decline to AD through multiple different pathways.

Patients with MCI and dementia have similar rates of anxiety (77% and 80% respectively), and anxiety may also be affected by the progression of the impairment. The identification of the role of anxiety in dementia is crucial because symptoms dictate the treatment and overall prognosis. For those patients with anxiety, a lower quality of life, decreased functioning, increased caregiver burden, and increased risk of placement outside the home are likely. Furthermore, the presence of anxiety increases the likelihood of a depressive disorder in this population, and the combination of anxiety and depression is associated with more severe impairment and more rapid decline in cognitive functioning compared to patients with only depression.

We note two added problems. One, in healthy older adults, worry was a predictor of the onset of MCI over the course of two years [99]. This is then a prodromal issue on the continuum. Two, decreases in functional motor skills are often seen in conjunction with anxiety and depression [100]. For many older adults the fear of falling leads to a drastic decrease in the quality of life possibly because they restrict their lives as a result of the fear [101]. Agoraphobia also occurs frequently in this population and often happens after a traumatic event like falling. Fear of falling can result in increased isolation, increased depression, and interference with rehabilitation [88].

PTSD:

This is a special case of anxiety and the DSM-5 reviews PTSD as distinct but with myriad anxiety features. In DSM 5 important changes were made to the diagnostic criteria for PTSD. It’s not clear how this may influence detection in older adults. Results of the National Health and Resilience in Veterans Study showed that in US veterans the probability of PTSD, and odds of psychiatric comorbidity were similar to prior findings with DSM-IV based measures [102]. It has been pointed out that in the case of early life traumatization avoidance and arousal symptoms are more prominent in older adults with PTSD [103] and that dissociation is decreased [104]. Among older adults in the United States the prevalence of current PTSD ranges from 1.5-4% [105]. Compared with younger adults, prevalence rates of PTSD are lower [69,106] while prevalence rates of subclinical PTSD are significantly higher in older adults [107, 108].

Cohort factors represent unique features of the trauma response at later life. The influence of early life trauma is no doubt important but its measurement and phenomenology are difficult to unfold [108]. Many older adults but especially the older old (>75) are not used to talking about psychological complaints due to feelings of shame and fear of negative reactions to self-disclosure [109]. Psychological symptoms are difficult to recognize because older adults may be more likely to report physical concerns or pain instead. Furthermore, negative life events can trigger unprocessed past grief. Avoidance-based coping strategies are prevalent but become less available or effective with advancing age [110]. PTSD is also known to have a high rate of diagnostic comorbidity which complicates recognition and treatment decisions. In addition, diseases of old age such as dementia, cerebrovascular accident or Parkinson’s disease may cause cognitive impairment, which may complicate communication.

Importantly, cognitive impairment is more common in adults with PTSD compared with subjects exposed to trauma without PTSD [111]. It is reported by several studies that pre-existing cognitive problems due to brain abnormalities may be a risk factor to develop PTSD [112]. The National Health and Resilience in Veterans Study suggest that exacerbated PTSD symptoms in late life in 1 out of 10 US veterans may be associated with executive dysfunction [113]. Cognitive deficits can also be a product of neurobiological changes caused by PTSD [114]. Especially learning disabilities, memory dysfunction and attention deficits, have been described to be associated with PTSD [115, 116].

Co-occurring medical problems hamper assessment and treatment due to symptom overlap,
additional symptoms or exacerbation of symptoms. PTSD can induce or further worsen somatic disorders. PTSD is associated with a phenotype of accelerated senescence and targeted conditions known to be connected with normal aging such as cardiovascular disease, type 2 diabetes mellitus and dementia [117]. Approximately 80%-90% of people with PTSD have at least one co-occurring psychiatric disorder. Approximately two third have two or more co-occurring psychiatric disorders [118]. Pietrzak et al. confirm that PTSD and partial PTSD in a representative sample of U.S. older adults (60+) are associated with significant elevated odds of lifetime mood, anxiety, drug use and borderline and narcissistic personality disorders [106].

Assessment

We suggest use of the GAD-7, BAI, and STAI. Anxiety follows depression like a fever does a bad flu. These measures are reasonably sensitive and specific for screen use. We note here several problems. Anxiety is highly comorbid but also assert problems in their own way. The fact that anxiety goes underground (subsyndromal) can also be a problem. This is especially insidious for an older population. Remember that worry is pan-diagnostic and can impact on life in ways that seem to bi-pass typical measures. David Barlow often uses one item as an assessment. At the least it provides incremental validation. Additionally we use PTSD scales, if necessary. In addition to the MINI we use the Hamilton Anxiety Scale.

<table>
<thead>
<tr>
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<th>Moderate Problem</th>
<th>Problematic or Syndromic</th>
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<tbody>
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<td>MINI</td>
<td>No positive hits</td>
<td>Subsyndromal hits</td>
<td>Syndromal hits</td>
</tr>
<tr>
<td>GAD-7</td>
<td>≤6</td>
<td>7-14</td>
<td>≥15</td>
</tr>
<tr>
<td>BAI</td>
<td>≤9</td>
<td>10-16</td>
<td>≥17</td>
</tr>
<tr>
<td>STAI</td>
<td>≤29</td>
<td>30-44</td>
<td>≥45</td>
</tr>
</tbody>
</table>

Table 13: Recommended measures and cutoffs

Table 14: Descriptions of measures

*Generalized Anxiety Disorder-7:* The GAD-7 is a brief assessment using the seven most correlated items of 13 original diagnostic criteria items for GAD itself. The GAD-7 has excellent internal consistency, good test-retest reliability, good convergent validity, and good criterion validity. The tool includes a measure of severity, and it is able to distinguish between depressive and anxious symptoms [119].

*State-Trait Anxiety Inventory:* The STAI is a self-report questionnaire with 20 questions about how the person feels “right now, at this moment” (p. 6) and 20 questions about how the person “generally” (p. 6) feels. The STAI is designed to measure apprehension, tension, nervousness, and worry. The STAI was normed for high school students, college students, working adults, and military recruits through age 69. [120]. Kvaal, Ulstein, Nordhus, and Engedal have been able to provide specificity and sensitivity of the STAI for adults 60 years old and older when compared to the DSM-IV-TR criteria [121].

*Beck Anxiety Inventory:* The BAI is designed to discriminate between anxiety symptoms and depression symptoms when examining the symptoms present in the previous seven days. Although the BAI has been shown to have adequate reliability and validity for older adults, some concerns have been noted about the 14 somatic focused questions. This is a concern in general because these symptoms may not be present in patients with GAD. Secondly, older adults may not experience the same type of physical arousal as younger adults. Although the BAI was found to have good internal consistency, there was no discriminant validity found between the BAI and measures of depression [122]. It has been suggested that the BAI could distinguish older patients with anxiety versus control [123].

Barlow: Do you worry excessively about minor matters?

*Hamilton Anxiety Rating Scale:* The HARS is commonly used to detect anxiety. It is a 14-item scale in which an observer rates each item on a scale from 0 (none) to 4 (severe). A score of 18 or higher would indicate the presence of clinical anxiety. It has been suggested that the HARS can detect GAD in the elderly versus control [123].

*Clinician Administered PTSD Scale:* The CAPS is widely used interview designed to diagnose PTSD. Although it was originally designed to be used with veterans, it is currently used with a variety of traumas. It is based on the DSM-IV PTSD criteria for PTSD. For each PTSD symptoms, a severity rating is determined using a five point rating scale (0-4) for frequency and duration. A literature review indicated that the CAPS has outstanding psychometric properties [124].
Complete Assessment

The scales below are used over time for a more complete assessment. Other rating scales can be applied. They tend to have reasonable reliability and distinct validation even for older adults. These often include behavioral evaluations and monitoring. Diaries can also be used. They are most helpful in PTSD and panic reactions.

<table>
<thead>
<tr>
<th>Table 15: Recommended measures</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ratings</strong></td>
</tr>
<tr>
<td>ADIS-IV, SCID, MINI, HRSD (17 items) or HARS (13 items)</td>
</tr>
<tr>
<td>Behavioral Assessments and Self Monitoring</td>
</tr>
<tr>
<td><strong>Self Report Measures</strong></td>
</tr>
<tr>
<td>PSWQ, MAQ, SAST, Worry Questionnaire, Worry Scale for Older Adults, DASS, ASI, POMS, PANAS, ATQ (Automatic Thoughts Quest, 21 items)</td>
</tr>
<tr>
<td><strong>Diary</strong> (interpersonal avoidance issues)</td>
</tr>
<tr>
<td>Omnibus Measures: MBMD, PAI</td>
</tr>
<tr>
<td>Unique Measures: Anxiety and Aging Scale (AAS), Death Anxiety Scale (DAS)</td>
</tr>
</tbody>
</table>

Treatment

As with depression we have reviewed this in the previous book [1]. It will not be adequately covered here. Research indicates that anxiety medications are effective for providing quick relief for older adults [125], and have increased effectiveness compared to psychotherapy [126]. Benzodiazepines and SSRIs are often recommended for the treatment of GAD, Panic Disorder, and PTSD in the elderly. Medication and psychotherapy are also likely to be recommended when anxiety and depression are presented together [127]. Although benzodiazepines may be effective relief for anxiety symptoms, in the older population they may also present with some risks such as cognitive decline and fall [128]. Because of the risks with benzodiazepines, especially with long term use, selective serotonin reuptake inhibitor (SSRI) medications may prove be a safer alternative, but studies on the long-term effects for the elderly are still limited [129].

The number of studies examining the effectiveness of medication combined with psychotherapy at later life are limited. Pinquart and Duberstein conducted a meta-analysis of 32 studies that focused on the effectiveness of behavioral interventions versus pharmacotherapy in older adults with anxiety disorders [130]. The results indicated that both pharmacotherapy and behavioral interventions are reasonably effective even though more robust effects were found for pharmacotherapy. Goncalves and Byrne found that for older adults, nonspecific, non-pharmacological, group treatment for GAD may be key factors for an effective intervention [131].

The most effective models of treatment include the implementation of many different components [123]. Ayers, Sorrell, Thorp, and Wetherell reviewed the literature for geriatric anxiety treatment and identified 17 studies with evidence-based treatments (EBTs) for older adults with GAD or mixed anxiety disorders: relaxation training, cognitive-behavioral therapy (CBT), supportive therapy, and cognitive therapy [132]. CBT for late-life GAD has attracted the most consistent support [133], and relaxation training can be utilized as an effective but low-cost intervention [134]. Studies have shown promise for the use of CBT and executive function (EF) training in older adults with anxiety and cognitive decline [84]. Similarly, mindfulness [135], well-being therapy [136], and positive psychotherapy [137] are treatments that have shown to be effective for anxiety but not specifically researched with older adults. Acceptance and Commitment Therapy (ACT) has been applied to older clients with GAD with some positive results [138]. A special, stand-alone treatment is exercise, and it can be effective [139]. It can be used to treat depression, cognitive decline, medical problems, and anxiety as well as increase quality of life [1].

More recently, Hall et al. conducted a meta-analysis of several studies on anxiety that indicated that at
the end of treatment in a six-month follow-up, significant treatment effects favoring CBT were found in comparison to a weight-list or treatment as usual controls [140]. When the CBT was compared with active controls, a small nonsignificant treatment advantage was found for CBT at the end of treatment with equivalence of outcomes at follow-up. CBT is more helpful than having no treatment for GAD at later life. Nevertheless, whether CBT shows long-term durability or superior to other comparable available treatments, such as supportive psychotherapy, remains to be tested.

**Table 16: Common Anxiety Treatments**

<table>
<thead>
<tr>
<th>Common Anxiety Treatments</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Meds both anxiolytic and SSRI [130, 141]</td>
</tr>
<tr>
<td>• CBT [142]</td>
</tr>
<tr>
<td>• Integration of CBT and IPT [143]</td>
</tr>
<tr>
<td>• Problem Solving Therapy [144]</td>
</tr>
<tr>
<td>• ACT [145]</td>
</tr>
<tr>
<td>• Attention Training [84, 146]</td>
</tr>
<tr>
<td>• Intolerance of uncertainty [147]</td>
</tr>
<tr>
<td>• Emotional dysregulation [148]</td>
</tr>
<tr>
<td>• Metacognition [149]</td>
</tr>
</tbody>
</table>

The underlying structural and functional neural anatomy of late-life GAD is relatively understudied and received little attention. This gap in knowledge is problematic since the treatment response to late-life GAD is relatively poor, especially when compared to midlife GAD treatment with cognitive behavioral therapy. To date there are no published studies addressing the neural changes following pharmacotherapy in late-life GAD, but the identification of these changes would be very beneficial. Andreescu et al. showed that functional connectivity during worry and reappraisal indicates deficits in both the generation and reappraisal of worry [97]. With pharmacologic treatment, they found greater connectivity in the prefrontal nodes of the executive control network during reappraisal of memory. Compared with nonanxious participants, elderly GAD participants showed multiple differences in the neural networks involved in emotional generation and regulation. Pharmacology treatment of late-life GAD also produced significant changes in the same networks.

In sum, medication seems efficient and under some conditions more effective than psychotherapy. Psychotherapy adds the feature that there can be a disaggregation of the problems presented. This leads to a module-based care based on empirically supported interventions. These can range from relaxation to exposure techniques, to worry modules. Treatment modules are superior to manuals. Importantly, problems should be sensitive to a functional attachment with symptoms and real world issues (medical, social, financial, family). Having the option of an effective behavioral intervention as an alternative to medication is important for many, but this is especially true for older adults. This population presents with unique issues that makes the use of medication much more complicated. Overall, medication can be effective by itself, and it can enhance the effectiveness of behavioral interventions. On the other hand, the behavioral interventions also enhance the effectiveness of the medications [1].

The treatment format applied is given below. Note that treatment unfolds as other modules with the exception that medication is given some preference. Relaxation or somatic softening is applied at the gate along with psychoeducation. Monitoring is also frequently applied. Motivational interviewing is also an early intervention. The core modules involve CBT, PST and ACT subparts along with worry interventions. Again follow-up and booster sessions are important. Recall that the placebo response is robust in this population [141].

**Patient** is a 60-year-old Caucasian male who was interviewed in his hospital room. He was admitted for evaluation for the LVAD procedure. He indicated that in 1998, while he was employed as a principal, he had a massive myocardial infarction that altered his life measurably. Over the years, this heart problem got worse. Sometime after, he had to retire. He had 4 stents in 1998. In 1999, he had a bypass and he was able to handle things reasonably well up until recently. Three weeks ago, he was given the information that he had less than 1 year to live. He resides locally with his wife and is optimistic about the LVAD procedure.

**Patient** is a native of Georgia, where he was born. He was the second of 4 children. His father was a truck driver and farmer and currently has dementia. His mother raised the family. He indicated that his life on the farm was good and positive, and he thrived. He also went to a local college and then transferred to the University of Georgia where he graduated with a bachelor’s degree and then went received a master’s degree in education. He was employed as a teacher and elementary school principal for 22 years. He retired in and around the year 2000 and worked part-
time for Cerebral Palsy Foundation for a period of time up to 2004. He married to his current wife who also is a teacher. They have children. He indicates that these days, he is reasonably active for one with heart problems. He works around the house; he drives, cuts grass, works in the garden, and keeps sharp with following the newspapers, television, and computer.

Recently he has been given an LVAD. It is noteworthy that he does not use alcohol to any degree, but he smoked up until 1998 after his MI and stopped smoking at that point. He is not in pain. He sleeps at night reasonably well, but also sleeps during the day. He is able to do minimal activity, which is frustrating for him. He has recently been placed on an antidepressant, Effexor, which seems to help. He denies any problems with depression and indicates that his memory is sharp. He is upbeat in his presentation.

Table 17: Treatment format

<table>
<thead>
<tr>
<th>Treatment Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Assess in usual way plus cognition</td>
</tr>
<tr>
<td>• Watch and Wait.</td>
</tr>
<tr>
<td>• Monitor and assess</td>
</tr>
<tr>
<td>Set stage for treatment is SSRI/SNRI</td>
</tr>
<tr>
<td>Consider relaxation training/ACT</td>
</tr>
<tr>
<td>• Treatment Phase</td>
</tr>
<tr>
<td>• Modules: Worry Control, Assertiveness, Sleep Modules,</td>
</tr>
<tr>
<td>• CBT/PST/ACT</td>
</tr>
<tr>
<td>If problems: Motivational interviewing to encourage a medication trial</td>
</tr>
<tr>
<td>Always: Supportive contact and communication with prescriber/case mgr</td>
</tr>
<tr>
<td>• Monitor other domains and watch for relapse</td>
</tr>
<tr>
<td>• Use case manager for frequency and follow up</td>
</tr>
<tr>
<td>Follow up and Boosters</td>
</tr>
<tr>
<td>• Response WILL be slower than in patients with depression</td>
</tr>
</tbody>
</table>

Figure 8: Case profile for TG, anxiety as a concern
Overall Cognitive Functioning:

Mr G has a Barona Index of Intelligence at high average.

His Total RBANS was 98, 45% or average. His MoCA 30/30. He has no problems with recall. He is able to do simple problem solving and has the ability to do simple arithmetic. He has a skill at fluency but has minor problems drawing. He has reasonable attention skills. He has no problems with IADLs (including meds and finances), ones that is that he does not have physical limits. He scored 0 on the FAQ, indicating no problems on this measure of executive functions in activities of daily living, again in areas where he can use his thinking and not ones where he is limited due to heart problems.

Emotional Assessment

He registered one hit on the MINI, anxiety. He scored in the anxiety range on the BAI (16), GAD-7 (16), and SAI (46). On the GDS-SF he scored 4, 10 on the BDI-II and 5 on the PHQ-9, indicating no or very mild depression. There were no markers of depression also on the MBMD.

On the MBMD he registers as normal for all Axis I problems. He has a personality profile of one who is inhibited as well as cooperative. This is a modal personality pattern of one who is more detached and cooperates as one would hope and expect.

Sleep

Patient indicates that he has no problems sleeping. His ESS was 6, indicating that he is not tired during the day.

Pain

Pain is an issue for him. His average pain is 4/10. He rated pain at present as 6/10. He has problems with activity (5/10), mood (4/10), walking (0/10), work (NA), relations with people (3/10), sleep (5/10), and enjoyment with life (4/10), as a result of pain.

WATCH and WAIT

This 60 y/o male was referred for an evaluation for an LVAD procedure. He has severe cardiomyopathy. He has received the LVAD. Health is therefore an issue, as he must comply with his heart problems, and monitor several medical problems He is a school principal but has had to quit. He is married and lives locally in Central GA. Cognitively he is high average premorbidly. Currently he has no noted problems with cognitive tasks, including memory and executive functioning. Regarding mood, he shows evidence of anxiety as he worries about his health, his life style and his choices in life. His sleep is a minor problem, and pain is an issue. His personality is a positive one as he is cooperative and somewhat inhibited.

For treatment a slow anxiety program was initiated. This will include anxiety monitoring, worry control, relaxation, and a group (CBT) that meets weekly. He agreed. His health is also a primary problem. His LVAD team is consulted and involved. His INR, meds, and cardiac markers will be especially.

IV. Health

Globally, the pattern of disease has changed in developed countries from acute illnesses with high mortality (e.g., pneumonia, sepsis) to chronic medical conditions.

### Table 18: Case profile for TG, anxiety as a concern

<table>
<thead>
<tr>
<th>Measure</th>
<th>Healthy</th>
<th>Moderate Problem</th>
<th>Problematic or Syndromic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Daily functioning is not impaired by worry or fear</td>
<td>Some activities are impaired by worry or fear, but the person is still functional work and inter personally</td>
<td>Some activities are impaired by worry or fear, but the person is still functional work and inter personally</td>
</tr>
<tr>
<td>MINI</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GAD-7</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BAI</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STAI</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
that are slow-developing and usually do not kill for a long
time (e.g., type 2 diabetes), but do diminish quality of
life, require ongoing medical management at substantial
cost to the individual and society, cause complications on
multiple levels, and lower the threshold for development
of psychiatric symptoms. Indeed, psychological and social
factors largely undergird the development of chronic
diseases at middle and older ages. We therefore argue that
Behavioral Health providers can be integral to improving
the health trajectory of older adults.

As previously noted, lifestyle behaviors are
enormously influential on long term health and quality of
life: overeating, low quality diet, smoking, lack of exercise,
chronic alcohol use, and environmental stress all chip
away at health in subtle fashion with most patients barely
aware of the effects of their ‘misconduct’ until confronted
with a serious and irreversible medical condition. Starting
in middle age, more than 25% of US citizens live with two
or more chronic medical conditions previously associated
only with older ages. By age 65 years, 80% will have at
least one chronic medical condition, 68% will at least 2
of these, and 24% will have 4 or more chronic conditions.
The most common chronic diseases seen in older adults
today are [150]:

1. Hypertension (HTN) 58%
2. Hyperlipidemia 47%
3. Arthritis 31%
4. Coronary heart disease (CHD) 29%
5. Type 2 diabetes (T2D) 27%
6. Chronic kidney disease (CKD) 18%
7. Heart failure 14%
8. Depression 14%
9. Dementia 11%
10. Chronic Obstructive Pulmonary Disease (COPD) 11%

What is missing from this list? Obesity. Obesity
is a chronic condition that many healthcare providers and
scientists now view as a disease in its own right. Thirty
eight percent (38%) of older adults qualify as obese; over 70% are overweight or obese [151]. That places
obesity in the #3 spot of the top 10 chronic diseases list!
Excess adiposity, especially visceral fat that infiltrates the
abdominal organs, promotes systemic inflammation and
alterations in hormone production. Obesity is not just a
major contributor to the development of type 2 diabetes
and cardiovascular disease, but it also is linked to 11
different cancers, depression, and dementia. On the other
side of that coin, chronic stress, as measured by sustained
elevated cortisol (HPA axis overactivation), promotes
deposition of visceral fat, which in turn, contributes to the
development of obesity and other chronic lifestyle-based
diseases [153].

Notice that depression is ranked #8 in the top
10 chronic diseases list. Unrecognized or inadequately
treated depression and other behavioral health problems
are known to exacerbate the other chronic diseases on
the list through poor self-care, social isolation, poor
stress tolerance, and addictions to tobacco, alcohol, and
prescription drugs. Indeed, the relationship between
chronic medical and behavioral health problems is
circular (some might say “a vicious cycle”), promoting a
premature loss of functional independence and even early
mortality [154]. Stress intolerance, mentioned above, adds
to disease burden by altering and weakening the immune
system and gut microbiome. These biological changes are
increasingly linked to sleep and appetite dysregulation,
fatigue, anhedonia, major depressive and anxiety
disorders, and even suicide [155, 156]. As an example,
stress eating, a common complaint among people who
have trouble controlling their weight, appears to be tied to
lower sensitivity of the brain’s central food reward circuits
during periods of stress. When this happens, we tend to
seek out highly palatable, energy-dense foods that in turn
promote more weight gain.

So good health relies on healthful habits. We have
noted that five habits account for 70% of our morbidity
and mortality: what we eat, how much we eat, whether
we exercise, whether we smoke, and how much we drink
[157]. If sleep quality and prescription drug (mis)use are
included, it is clear that lifestyle habits go a long way
toward enhancing or weakening health. This is one of the
reasons why Behavior Health is so integral to the treatment
of chronic diseases.
Assessment

A number of the screening components listed above are completed in the primary care physician’s office (BMI, pain assessment, tobacco use, review of medical problems, and medication reconciliation) and are self-explanatory. That said, unless the behavioral health practitioner is embedded in the Primary Care Clinic, these data may not be readily available and therefore should be discussed with the patient in the initial visit or obtained from the medical record.

Diet

Special attention is now being paid to the brain-gut microbiota axis; gut integrity appears to play an important role in stress tolerance, mood regulation, cognitive function, obesity, and visceral pain [158]. An unhappy gut affects neuroimmune function, altering the production of inflammatory cytokines, and the neurotransmitters serotonin (95% of which is produced in the gut), dopamine, norepinephrine, and GABA [159]. Older adults have a less diverse microbiome profile than that of young people, which is thought to help shape the aging process. Altered composition of gut microbiota in the elderly has been linked to poor health and frailty [160]. Unfortunately, many elders, especially those living alone, do not eat well, relying on microwaveable frozen foods, Meals on Wheels, and fast food eateries as the mainstays of their daily diet, further compromising the integrity of the brain-gut axis. Older adults in long term care are at even higher risk of having inadequate gut microbiota in spite of adequate nutritional care. The loss of community type microbiota has been correlated with increases in proinflammatory biomarkers, as well as lower mental state exam scores, more depressive symptoms, and decreased functional independence [161].

<table>
<thead>
<tr>
<th>Measure</th>
<th>Healthy</th>
<th>Moderate Problem</th>
<th>Problematic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bodily function is normal. Patient has few pain complaints and few chronic conditions that will likely shorten life or reduce QOL</td>
<td>Minor health concerns which may include lesser chronic conditions. Quality of life is impacted, but not debilitating so.</td>
<td>ADL/IADLs are compromised. Excessive comorbidities or meds</td>
<td></td>
</tr>
<tr>
<td>Health Rating</td>
<td>Good</td>
<td>Average</td>
<td>Poor</td>
</tr>
<tr>
<td>No. Chronic Illnesses</td>
<td>≤1</td>
<td>2-3</td>
<td>≥4</td>
</tr>
<tr>
<td>Pain Scale</td>
<td>≤44 mm</td>
<td>45-74 mm</td>
<td>≥75 mm</td>
</tr>
<tr>
<td>BMI</td>
<td>18.5 – 24.9</td>
<td>25-29.9</td>
<td>Under 18.5 or over 29.9</td>
</tr>
<tr>
<td>Dietary Screening Tool</td>
<td>&gt;75</td>
<td>60-75</td>
<td>&lt;60</td>
</tr>
<tr>
<td>Exercise</td>
<td>&gt;30 minutes everyday</td>
<td>&lt;30 min/ 1-2 days week</td>
<td>Housework, inactive</td>
</tr>
<tr>
<td>Physical Activity Readiness-Q</td>
<td>0</td>
<td>≥1 discuss with MD</td>
<td>≥1 discuss with MD</td>
</tr>
<tr>
<td>Insomnia Sleep Inv</td>
<td>0-7</td>
<td>8-14</td>
<td>≥15</td>
</tr>
<tr>
<td>Epworth Sleep Scale</td>
<td>0-10</td>
<td>11-15</td>
<td>≥16</td>
</tr>
<tr>
<td>Stop-BANG (sleep apnea)</td>
<td>0-2</td>
<td>3-4</td>
<td>5-8</td>
</tr>
<tr>
<td>Alcohol Consumption</td>
<td>≤7 drinks per week if the patient is not on medication</td>
<td>≥7 drinks per week if the patient is not on med</td>
<td>≥7 drinks/ week if patient is on med that interacts with alcohol</td>
</tr>
<tr>
<td>Short Mich/Alcohol Screen Test-G</td>
<td>0-1</td>
<td>0-1</td>
<td>≥2</td>
</tr>
<tr>
<td>Tobacco Use</td>
<td>Never smoked</td>
<td>Smoked 100+ but quit</td>
<td>Current smoker</td>
</tr>
</tbody>
</table>
Screening for adequacy of diet in older adults can be accomplished with the Dietary Screening Tool (DST) [162], which characterizes three levels of nutritional risk: At Risk, Possible Risk, and Not At Risk using a scale of 0-105; the higher score the higher the risk for poor nutrition. Individuals that are At Risk nutritionally have poor diet quality, including: low protein intake; inadequate micronutrients, dietary fiber, fruit, and vegetables; and relatively higher intakes of fats and refined grains.

Activity Level

The American Heart Association/American College of Cardiology [163] has published updated physical activity guidelines appropriate for older adults. General recommendations are for 150-180 minutes/week of moderate intensity aerobic exercise, which can be accomplished in as little as 10 minute segments throughout the day to achieve a beneficial effect. A simple screening such as the Physical Activity Readiness Questionnaire (PAR-Q) [164] can be given prior to recommending exercise to check for the presence of cardiovascular, pulmonary, renal, and metabolic risk factors that might require a medical clearance [165]. Short of this, the professional care giver can query about exercise and how this is carried out.

Sleep

As many as 80% of elders report some kind of sleep disturbance such as insomnia, excessive daytime sleepiness, and parasomnias [166]. That said, sleep problems are not fundamental to aging. There are common sleep changes that occur with age: older adults tend to get less sleep overall; they often display an advanced shift in circadian rhythm with an earlier bedtime and earlier wake-up time; sleep architecture also changes so that more time is spent in light sleep (stages N1 and N2) and less time in deep, restorative sleep (stage N3) and REM sleep. It is worth noting that insomnia is often comorbid with other medical and psychiatric conditions. Indeed, poor sleep in general has a powerful influence on the immune system, augmenting the risk of infectious disease, cardiovascular and other inflammatory diseases, cancer, and depression.

Sleep apnea is both common in older adults and underdiagnosed. Obstructive sleep apnea occurs secondary to obesity, anatomic factors, or drugs that may relax airway muscles (alcohol, sedatives); apneas and hypopneas are present in spite of intact respiratory drive. Central sleep apnea, on the other hand, is caused by reduced respiratory drive secondary to neurologic impairment, heart failure, or CNS depressants such as opioids. Untreated sleep apnea has wide ranging adverse consequences, including advancing hypertension and coronary artery disease, insulin resistance, appetite stimulation and weight gain, cognitive impairment and psychopathology, cerebrovascular events, motor vehicle accidents, and death.

A focused evaluation of sleep and daytime functioning should be performed on every older adult in whom sleep disturbances are suspected. A sleep log, in which wake/sleep times are tracked as well as individualized variables such as alcohol and caffeine use, exercise, medication administration, electronics use, and pain, is imperative for appropriate diagnosis and intervention planning. The role that depression and anxiety play in sleep initiation, maintenance, and early awakening also must be assessed. Not only can depression and anxiety prevent sleep onset, but the ‘witching hours’ between midnight and 2am are prime time for physiologic arousal, anxiousness, and rumination. The Insomnia Severity Index (ISI) is a quick way to quantify insomnia symptoms. Scores range from 0-28. This measure shows high sensitivity and specificity [167]. The Epworth Sleepiness Scale (ESS), a standard screener in Primary Care quantifies daytime sleepiness and risk of falling asleep during daytime activities, such as driving. Scores range from 0-24 [168]. The Stop-BANG questionnaire is another Primary Care screener for sleep apnea. It consists of eight Yes/No questions and scores range from 0 to 8. A score of score of 5–8 suggests a high probability of moderate/severe OSA [169].

Tobacco use

Perhaps the most important question a behavioral health provider can ask a patient who smokes is, “Have you thought about quitting?” On average, tobacco users will die 10 years earlier than their non-smoking peers [170]. However, quitting by age 64 years can buy back 4 of those 10 years given up to early death from tobacco use, and quitting at any time will surely improve quality of life. The majority of smokers (69%) want to quit, but these are more likely to be adults younger than age 65 years. In fact, the most recent CDC statistics show that tobacco use has decreased in the U.S. except for adult men ≥65 years. There are more older men smoking today than a decade ago (9.7% vs. 8.9%). Low education level, low SES, inadequate access to healthcare, physical disability, and high psychological distress are associated with continued
tobacco use. Not surprisingly, just the combination of poor diet, sedentary lifestyle, and tobacco use accounts for 35% of morbidity in the U.S. [171].

Alcohol Misuse

The 2012 National Health Interview Survey [172] highlighted the drinking patterns of those ages 60 years or older: of those who reported drinking during the year before the survey, 50% of men and 39% of women drank almost daily; and 5.9% of the men and 0.9% of the women reported binge drinking once a month or more. Although alcohol abuse is less common among older adults than in younger cohorts, as more baby boomers reach older adulthood, with their generally greater acceptance of alcohol and recreational drug use, there likely will be a greater need for alcohol treatment services than in previous generations. Alcohol misuse not only exacerbates chronic medical conditions, but it also causes poor sleep, contributes to weight gain, compromises cognition, and can cause potentially dangerous drug interactions.

The National Institute on Alcohol Abuse and Alcoholism guidelines for adult men and women aged 65 and older defines 7 drinks in one week as moderate drinking [173]. Risk factors for development of an alcohol use disorder at older ages include a highly stressful event such as loss of a spouse, family history of alcohol abuse, chronic pain, predisposition to affective or anxiety disorders, and decreased alcohol metabolism. The Short Michigan Alcohol Screening Test (SMAST-G) is recommended for older adults because it addresses issues unique to older problem drinkers. It consists of 10 Yes/No questions that address the physical signs of excessive drinking, the relationship between drinking and emotional states, problems controlling consumption, and reactions of others to the person’s drinking. The screener has good sensitivity and specificity. A score of 2 or more indicates hazardous drinking [174].

Complete Assessment

A complete evaluation should incorporate both neuropsychiatric measures, such as the PHQ-9, GAD-7, FAQ, and MoCA, and some or all of the health screeners above. Additional disease-specific measures may be indicated when a more discerning case formulation is required. For example, a patient with chronically uncontrolled type 2 diabetes should receive extra scrutiny if no medical cause for chronically elevated blood sugar can be discerned. A measure of diabetes distress such as the PAID-5 (Problem Areas in Diabetes-5) could be added to assess the degree to which diabetes management and/or feelings about diabetes are problematic [175]. Omnibus scales of personality style and coping are also advised and have been described earlier in this chapter. We especially like the Millon Behavioral Health Diagnostic (MBMD) for this population [176]. In some cases, the complete assessment will necessarily include referring to medical specialties for diagnosis clarification. For example, suspicion of sleep apnea based on Stop-BANG will require polysomnography for accurate diagnosis. Concerns about a patient’s ability to exercise based on the PAR-Q will require referral to the patient’s primary care physician for further evaluation.

Table 20: Assessment of health problems

<table>
<thead>
<tr>
<th>Assessment of Health Problems</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Omnibus Measure:</strong> MBMD</td>
<td></td>
</tr>
<tr>
<td><strong>Health measures</strong></td>
<td></td>
</tr>
<tr>
<td>No. of chronic medical conditions</td>
<td></td>
</tr>
<tr>
<td>Analog Pain Scale</td>
<td></td>
</tr>
<tr>
<td>BMI</td>
<td></td>
</tr>
<tr>
<td>Exercise</td>
<td></td>
</tr>
<tr>
<td>Tobacco use (history and current)</td>
<td></td>
</tr>
<tr>
<td>Sleep problems: ISI, ESS, Stop-BANG (sleep apnea)</td>
<td></td>
</tr>
<tr>
<td>Alcohol use: SMAST-G</td>
<td></td>
</tr>
<tr>
<td>Depression: PHQ-9 or GDS-SF</td>
<td></td>
</tr>
<tr>
<td>Anxiety: GAD-7</td>
<td></td>
</tr>
<tr>
<td>Cognition: MoCA, FAQ</td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td></td>
</tr>
<tr>
<td>QO-45, BASIS-32</td>
<td></td>
</tr>
</tbody>
</table>

Assess social support, cognition, sensory, sleep, pain, meds

Treatment

Addressing lifestyle (mis)behaviors is no easy task, but there now are a number evidence-based interventions that can be applied in the Primary Care and Behavioral
Health settings with good success. In the Watch and Wait model, health-related lifestyle interventions are delivered slowly and with a strong dose of Motivational Interviewing techniques to enable the patient to get ready for change. It takes time for health markers to show improvement and the behavioral health practitioner must be part coach and part cheerleader to help the patient experience accomplishment with change.

Table 21: Treatment regimen

<table>
<thead>
<tr>
<th>Treatment Regimen</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Assess with screens, engage medical and allied health providers as needed for case formulation and medication review</td>
</tr>
<tr>
<td>• Watch and Wait Initial Phase</td>
</tr>
<tr>
<td>Adjust medications or medical devices if indicated</td>
</tr>
<tr>
<td>Introduce one lifestyle change that will have the greatest immediate impact on health</td>
</tr>
<tr>
<td>Monitor</td>
</tr>
<tr>
<td>• Watch and Wait Treatment</td>
</tr>
<tr>
<td>Introduce easily manageable activity (e.g., walking) if sedentary</td>
</tr>
<tr>
<td>Involve Spouse/Family/Kids/Friends/Enemies</td>
</tr>
<tr>
<td>If problems: Motivational interviewing</td>
</tr>
<tr>
<td>• Monitor over time and watch for response</td>
</tr>
<tr>
<td>Introduce another lifestyle change as needed</td>
</tr>
<tr>
<td>If problems: Motivational interviewing</td>
</tr>
<tr>
<td>Use case manager for home help/phone/email/text</td>
</tr>
<tr>
<td>Follow-up: Assume slow progress and backsliding; continue to involve family</td>
</tr>
</tbody>
</table>

Diet and Exercise

Obesity in older adults is best tackled with a combination of weight loss and exercise to prevent worsening sarcopenia and osteopenia/osteoporosis, decrease fall risk, and improve strength and stamina [177]. There is now ample evidence that a high quality varied diet, such as the Mediterranean or DASH diets, and moderate daily exercise will improve symptoms of CVD, gastrointestinal problems, T2D, and as a bonus, depression [178]. Recommended goals for sustained weight loss can be as little as 3%-5% of body weight to see a reduction in cardiovascular risk factors. Rather than delineating absolute calorie limits for weight loss, emphasis should be on food quality (i.e., elimination of processed, energy-dense and “junk” foods/drinks with high glycemic and carbohydrate indices).

Moderate intensity exercise at 150-180 minutes per week is sufficient for maintaining good health. Moderate exercise is defined as “an intensity that causes noticeable increases in heart rate and breathing [179].” Vigorous walking, jogging, dancing, or playing an active sport such as tennis qualify as moderate exercise. Strength or resistance training that addresses all muscle groups, along with at least 10 minutes of flexibility and balance activities, such as yoga or tai chi, also is recommended for at least two days/week to mitigate against sarcopenia and osteopenia/osteoporosis while improving postural stability, mobility, flexibility. To increase motivation and decrease fear of exercise (or pain), a paced activity chart can be created with patient input that lays out a graduated time schedule for a given activity. In this way, patients can start slowly and gradually increase exercise without excessive pain or fatigue.
There are a number of evidence-based programmatic options that address weight loss and exercise in older adults. The longest studied program is The American Diabetes Association’s Diabetes Prevention Program (DPP), which has been running for over 2 decades, targets adults ≥65 years, and is designed to delay conversion (or worsening) to T2D [180]. The DPP’s components are: 1) a minimum 7% weight loss goal with emphasis on self-monitoring via weigh-ins and calorie tracking; 2) 150 minutes/week physical activity, typically vigorous walking; 3) 16 session core curriculum sequenced over 24 weeks in 30-60 minute sessions; 4) ability to tailor program to meet individual medical and cultural needs; and 5) monthly telephone or mail/email contact over the maintenance period.

Sleep
Best practice for the treatment of insomnia is psychoeducational and behavioral. Treatment with pharmacologic agents such as hypnotics and sedatives is no longer seen as safe for older adults, even for a short period of time. That said, a substantial portion of all hypnotic prescriptions go to elderly patients. Older adults on these sleep aids run the risk of nighttime disorientation, increased fall risk, daytime altered mental status, and respiratory depression leading to death during sleep. Of note, risk of early mortality is even higher in obese individuals prescribed sleep aids. These patients are more likely to have obstructive sleep apnea and sleep aids can prolong an apneic event because of respiratory depression, leading to death by respiratory arrest.

Alcohol Misuse
Brief intervention techniques have been shown to be effective for many problem drinkers [182]. Personalized feedback is offered to the patient based on AUDIT or SMAST-G responses, then the clinician guides conversation toward cutting back or quitting alcohol using nonjudgmental language, psychoeducation, and motivational interviewing principles to help the patient gain awareness, insight, and motivation for behavioral change. SAMHSA [183] offer brief intervention programs for substance abuse appropriate for Primary Care and Behavioral Health settings. Patients identified as needing more assistance than a brief intervention should be referred to specialty treatment. The SAMHSA Substance Abuse Treatment Services Locator [184] provides pertinent information about state-licensed substance use treatment facilities throughout the United States.

Tobacco Cessation
Simply stated, the combination of smoking cessation counseling and pharmacotherapy is the most effective way to help people quit tobacco. Alternative interventions such as acupuncture and hypnosis do not work and should not be encouraged. Counseling is best delivered individually or in a group format in multiple sessions; programs offering 4 or more sessions have been shown to improve abstinence rates [185]. The most effective counseling approaches combine problem-solving skills training, motivational interviewing, and social support as part of the treatment. The American Lung Association, American Heart Association, and CDC all offer guidelines to create an evidence-based tobacco cessation program. To be maximally effective, a tobacco cessation program should be staffed with a behavioral medicine specialist and prescriber to improve delivery and monitoring of pharmacotherapy in the context of the counseling program.

Case: Mr. E
Mr. E is a 66 yo African American man who complains to his Primary Care Physician: “I’m falling apart.” Two years ago, he was involved in a motor vehicle accident that fractured his pelvis and left ankle. After multiple surgeries, he now suffers chronic ankle pain and limps with a cane. He was a passionate basketball coach and official, and no longer officiates in sports because of limited movement.
Mr. E is a high school graduate who served 20 years in the military, then worked with the Dept of Corrections until retirement at age 62yo. He has been married for 40 years and has two adult daughters, one of whom lives in the family home with her child. Mr. E’s wife has physical limitations secondary to obesity. The marriage is contentious and the couple has few common interests. Mr. E is financially strained from supporting his daughter and grandson. He is dissatisfied with his home life, but finds joy in taking care of his grandson.

Mr. E’s health is poor. He has uncontrolled T2D (HbA1c = 10.1 on insulin) and peripheral neuropathy. He also has hypertension, atrial fibrillation, hyperlipidemia, reflux, and obstructive sleep apnea, for which he is treatment noncompliant. He has multiple nighttime awakenings secondary to pain, gasping for air, and averages 5 hours of sleep/night. He is prescribed 11 medications: pioglitazone and insulin for T2D; gabapentin for neuropathy; lisinopril, felodipine, and hydrochlorothiazide for hypertension; atorvastatin for hyperlipidemia; rivaroxaban and metoprolol for A-fib; esomeprazole for reflux; and mirtazapine for insomnia and depressed mood. Lastly, he has been prescribed CPAP for sleep apnea, but the machine remains unused because the mask is uncomfortable.

Table 22: Case profile for Mr. E

<table>
<thead>
<tr>
<th>Measure</th>
<th>Healthy</th>
<th>Moderate Problem</th>
<th>Problematic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Bodily function is normal</td>
<td>Minor health concerns</td>
<td>ADL/IADLs are compromised.</td>
</tr>
<tr>
<td>Health Rating</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>No. Chronic Illnesses</td>
<td>X</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Pain</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>BMI</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>DST</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Exercise</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>ISI</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>ESS</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Alcohol</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Tobacco Use</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Additional Measures</td>
<td>PHQ-9</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>GAD-7</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>MoCA</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
Because of Mr. E’s sedentary lifestyle since the car accident, he has gained substantial weight. Furthermore, 3 of his medications: insulin, pioglitazone, and mirtazapine, promote weight gain. His BMI is 42, which qualifies him for a diagnosis of morbid obesity.

Premorbid Functioning And Overall Cognitive Functioning

Mr. E’s MoCA is 29/30 (normal).

Function

He scored in the normal range on the FAQ, indicating no problems on this measure of executive functions in activities of daily living.

Screenings

No. of chronic diseases: 7 and Health rating: Poor “I’m falling apart” (problematic)

Pain: 6/10 = (moderate problem)

BMI: 42 (problematic)

DST: 50 (problematic)

ISI: 9 (moderate problem)

ESS: 11 (moderate problem)

Alcohol: no

Tobacco: never

Exercise: Swims occasionally, encouraged to exercise by Primary Care Physician

PHQ-9: 18 (problematic)

GAD-7: 7 (moderate problem)

Behavioral Health

Mr. E is depressed and dejected. He sees himself as old and broken and has lost his zest for life. Anxiety manifests as worry. The quality of his depression is experienced as both physiologic (sleep dysregulation, low energy, no sexual interest) and psychological (anhedonia, thoughts of worthlessness and hopelessness). He frequently eats “comfort foods” from fast food eateries to assuage his low mood. However, his medical symptoms are entwined with his psychiatric symptoms and are difficult to disentangle – Mr. E prefers to “blame” his state of mind on his physical problems, minimizing psychiatric contributions because of stigma. In fact, Mr. E will only see the psychologist in the Primary Care Clinic exam room to avoid being identified as “crazy.”

Watch and Wait

Areas of Opportunity

• Health
  
  Medications – obesogenic drugs: gabapentin, mirtazapine, T2D drugs
  
  Pain and chronic diseases - Lifestyle – increase activity, improve eating
  
  OSA – CPAP mask re-evaluation and CPAP pillow
  
  Insomnia – CBT-I

• Depression
  
  Activation: ADA exercise program of 150 min/wk mod. Exercise (swim, stationary bike)
  
  Pleasant events: contact VA adaptive sports director for volunteering
  
  Change medication to Wellbutrin (weight neutral) or Duloxetine (Pain)
  
  Challenge core beliefs “I’m broken” “I’m not a man anymore”

• Anxiety – reinforce behavioral activation for now

• Life Adjustment
  
  Bring wife and daughters on board
  
  Get grandson ready for school (motivation to get out of bed and exercise)

V. Life Adjustment

Life Adjustment is a rather complicated area as it can encompass many variables. Aging attracts life adjustment problems and challenges. There are several factors also that are highly related. We chose to target core features but appreciate the bandwidth the construct and its many parts. We highlight SES, functional needs, environment, stress, socialization/relationship, leisure, and happiness/life satisfaction and meaning. We note this because there are always other variables and always something not covered with the measures applied here. We end with a special section on caregiving as it is so important where life adjustment is at issue.
Assessment

SES

There is an SES gradient of health. It is a cascade that undergirds the power of socioeconomic influence. This factor starts early. The poorer you are, the worse your health. In the United States, over 20% of children under the age of 18 are officially poor. This means that they live in a household with incomes below the federal poverty level. Another 20% of children are near poor, living in households with incomes between 100 and 200% of the federal poverty line. Poverty is a critical risk factor for many of the mental, emotional, and behavioral disorders of children and youth. Family poverty is complex and intertwined with the large number of what most researchers refer to as poverty cofactors. These are correlates of poverty, some of which may determine prior generations and some of which may be mediators of the effects of poverty and children. For example, low school attainment and teen parenting both increase adolescent chances of raising children in poverty. Education, achievement, family structure in one generation can therefore be determinants of family poverty and then children’s health and development in the next generation. Other correlates of poverty can represent mechanisms to which family poverty affects children. These can include distressed neighborhoods, persistently low performing schools, less nutritious food supplies, and much more. These exposures to poverty risks are sometimes viewed as rival explanations for the association between poverty and children’s health and development. There is then loose agreement that the correlates of family income, such as parenting quality, family structure, and parent psychological factors, may be responsible for observed associations between income and children’s attainment.

Robert Putnam in his book *Our Kids; The American Dream in Crisis* argues that children in poverty are at high level for elevated levels of cortisol, impaired emotional regulation, and potentially decreased ability to concentrate[186]. Affluent children are estimated to be exposed to many million more words by kindergarten than working class or welfare children. This seems to be just the beginning of a negative cascade of effects that poverty sets off in children. Also the opposite effect of a positive cycle is set in motion by stable family structures, intensive parenting style, and a host of resources, both financial and social. The results of all this intermingling was the availability of large amounts of what Putnam called “social capital” in members of the socioeconomic classes. This type of capital is measured by social webs, interpersonal networks, and other types of connections that link one person to another. The more the social web you weave, the denser the web of social relationships you possess, allowing you to reach out and call someone who can help.

This applies to older adults. Older adults do have more money but are stuck in their social setting. They often have poor social capital. A necessary subsection of SES involves retirement. Often it is forced. Regardless, it changes life and the factors necessary for life satisfaction. The presence of additional stressors, such as those correlated with low SES, are likely to increase the overall levels of stress, individual’s faith, and may exacerbate

---

Table 23: Recommended assessments and cutoffs

<table>
<thead>
<tr>
<th>Measure</th>
<th>Healthy Intact</th>
<th>Mildly Problematic</th>
<th>Problematic or Syndromic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Overall lifestyle is positive, patient engages in the core components of lifestyle without major problems</td>
<td>Lifestyle choices are likely to contribute to disorder or have begun to do so.</td>
<td>Lifestyle is compromising patients mental and/or physical health. Self-care is lacking or not present</td>
</tr>
<tr>
<td>Education and SES</td>
<td>College or professional certificate and continuing interests</td>
<td>HS education or extension interest in reading/leisure</td>
<td>No HS education and little intellectual interests</td>
</tr>
<tr>
<td>FAQ (or AD-8)</td>
<td>≤10</td>
<td>11-18</td>
<td>≥19</td>
</tr>
<tr>
<td>Safe/supportive env</td>
<td>Safe</td>
<td>Limited safety</td>
<td>Unsafe</td>
</tr>
<tr>
<td>Relationship status</td>
<td>Married/in a Relationship</td>
<td>Single/divorced</td>
<td>Windowed in the last five years</td>
</tr>
<tr>
<td>Meaning in life</td>
<td>Purpose in life/happy</td>
<td>Limited purpose or happiness</td>
<td>No purpose/unhappy</td>
</tr>
<tr>
<td>Stress(1-10)</td>
<td>0-3</td>
<td>4-7</td>
<td>&gt;7</td>
</tr>
</tbody>
</table>
the effects of race-based social stressors. Increased exposure to neighborhood stress, such as exposure to violence, pollution, and toxins, disturbances by neighbors, in addition to daily life stressors, such as high levels of financial strain and associated increases in family conflict, may combine additively and synergistically with race-based stressors to influence educational outcomes. Things pile up. Even changes in stress hormones and sleep processes are important factors to consider in the understanding of ethnic disparities in at least academic achievement. Disparities in stress and sleep compliments previous theoretical work that applies a stress and coping approach to understanding the consequences of social stressors. Specifically, in addition to focusing on coping responses that have been identified previously as important for educational achievement attainment, we should also consider the role of biological response, namely the HPA axis activity and sleep in the emergence of racial ethnic academic achievement gaps.

There is of course a connection between a poor life experience and depression. Brinda et al. in a study from the World Health Organization on Global Aging and Adult Health, WHO-SAGE, showed that geriatric depression is reliably associated with poverty, economic insecurity, and national indicators of economic disparity across 6 low and middle income countries [187]. Significant correlates of depression include female gender, illiteracy, poverty, indebtedness, past informal-sector occupation, bereavement, angina, stroke, which all increase the odds of depression, as well as pension support and health insurance, which lower the odds. An index of wealth, ownership of durable assets, house dwelling and characteristics, type of toilet access, and source of drinking water was also associated with geriatric depression. Brinda et al. drew on 2 conclusions. First, social economic factors play an important role in the idiopathogenesis diagnosis and management and prevention of geriatric depression, and second, the key to lowering the risk for geriatric depression is not individual therapy, but rather broader efforts.

Education is the gift that keeps on giving. As we previously reported, researchers at the Centers for Disease Control and Prevention on a national health and interview survey showed that 145,000-plus deaths could be saved in 2010 population if adults who had not completed high school went on to earn their GED or high school degree, which is comparable to the estimated number of deaths that could be averted if all current smokers became former smokers. In addition, 110,000-plus deaths could be saved if adults who had some college went on to complete their bachelor’s degree. The disparities of mortality across different levels of education widen substantially over time. For example, mortality rates fell modestly among those with high school degrees, but mortality rates fell much more rapidly among those who had college degrees. As a result then of encouraging high school completion among adults who have not finished high school could save twice as many lives among those born in 1945 as compared with those born in 1925. These results suggest that policies and interventions that improve educational attainment could substantially improve survival in the U.S. population.

The net worth of college educated American households with children rose by almost 50% between 1981 and 2013, whereas among high school educated households, the net worth actually fell by 17%. The upshot of this, although we would like to think otherwise, is the playing field of opportunity today has not just become uneven, it is getting worse as time goes on. That is because in the same way the stacking of one economic or educational advantage upon another amplifies the possibilities for successful lives in affluent kids, each economic family or educational disadvantage experienced by poor children increasingly narrows an already larger range of possibility. Finally, it is noteworthy that the opportunity gap that Putnam identified has less to do with race than with education level obtained, which in turn is associated with socioeconomic status.

Education leads to leisure. Nimrod and Shrir explored the relationship over time between participation in leisure activities and quality of life in later life among almost 8,000 retirees, aged 80 and older [188]. This was done in the SHARE data set, the Survey of Health, Aging, and Retirement in Europe. Although many studies of participation of leisure activity demonstrate positive effects on health and wellbeing, most of these have been cross-sectional rather than longitudinal. In addition, increasing the barriers of pursuing leisure activities with increasing age may impact on the significance of involvement in meaningful leisure activity in later life. The Nimrod and Shrir study (where they combined cross-sectional and longitudinal analyses) found that the association between leisure activities and quality of life increased over time and this effect remains significant after controlling for the social demographic characteristics, medical conditions, and cognitive functioning.

Parisi, Roberts, Szanton, Hodgson, and Gitlin assessed the issue of valued activities among individuals
with and without cognitive impairments [189]. Growing evidence suggests that continued participation in leisure activities is associated with positive health outcomes in later life. Leisure activities that are distinct from functional activities of daily living vary widely and may include those that are inherently socially and cognitively engaging, such as visiting friends and family and participation in clubs, classes, and other organized activities. Using the National Health and Aging Trend Study, NHATS, this group examined the activity preferences and participation of individuals without cognitive impairment. Respondents were classified as having no dementia, possible dementia, or probable dementia. Respondents rated the importance of an actual participation in 4 activities, visiting friends and family, religious services, clubs, classes, and going out for enjoyment. It also examined transportation or health limited participation. Overall, visiting friends and family was most important, although relative importance of activities varied with cognitive status. Compared to cognitively healthy individuals, those with possible or probable dementia were less likely to indicate activities were important and engage in valued activities. Additionally, poor health limited participation in activities for those cognitively intact or with possible dementia. This was not true for those with probable dementia. Transportation difficulty limited going out for enjoyment for a greater percentage of those with cognitive impairment than those without such impairment. The implications of this study for this group were that regardless of cognitive level, older adults highly value activities. However, actual participation may decrease with greater impairment in cognitive and physical health and with transportation challenges. Developing tailored interventions, therefore, makes considerable sense in health.

SES is then formidable in adjustment and quality of life. We measure this construct in several ways. Education is easy as it is assessed by the amount of schooling. Naturally this is a straw man variable as education can mean a number of things. Regarding SES we ask about the objective facts of money and problems at home. Subjectively this is as valuable and one’s view of their situation tends to be as reliable. Second, we also assess their occupation and education. This involves the level of education, partner’s education, and occupational prestige [12]. We also ask about the past, growth years; mother and father’s education and occupation as well as perception of their growth situation.

These are both a current and distal marker. We target then both the economic feature and living situation as well as education. We especially look for a sense of safety and satisfaction in living. These involve basic living requirements, life quality, and overall satisfaction. Education enhances this. This especially applies to mental health (and low SES). There are significant correlations between female gender, illiteracy, and poverty especially. Depression itself is reliability associated with lower SES, poverty and economic insecurity.

“…the key to lowering the risk of geriatric depression is not individual therapy but rather broader efforts to reduce economic disparity. They are critical of Western psychiatry. By medicalizing psychosocial distress, we have shifted the focus from the responsibilities of the states for poverty and structural violence, and transferred pathology and burden to individuals.” Albert [190]

Environment:

Obviously the environment is related to SES. This can take several forms. From the macro-level, the influence on life quality can be subtle but noteworthy. The WHO estimates that in 2012 household air pollution caused 43 million deaths, ambient air pollution caused 37 million deaths, and unsafe water or poor sanitation and inadequate hygiene caused 842,000 deaths. Contaminated soil at active and abandoned mines, industrial facilities, and hazardous waste sites have killed 10s of thousands of people and injured 100s of thousands of others. In recent years too, the impact of a dirty environment has been causative for deaths due to cancer, lead poisoning, and COPD problems. Obviously this is hard to practically measure for any person.

Aging in place serves a number of issues related to environment. It refers to the ability to live in one’s own home and community safely, independently and comfortably regardless of age and common ability level. Promoting aging in place is a policy objective in developed countries. It contributes to the wellbeing of older adults by providing a sense of attachment, connectedness, security, familiarity, identity, independence, and autonomy. Lawton and Nahemow long ago suggested in their ecological theory of aging that a decision to relocate can be determined by the balance between the environment of the person and the individual’s competencies [191]. Theoretically, therefore, aging in place preference can be modified with increased neighborhood support. Although previous research emphasized individual competencies, recent studies have directed more attention to ecological frameworks and the
role of neighborhood support and aging in place. These studies focused on actual relocation or expectations to relocate. For example, community support networks were found to be an important social, economic, and environmental element for aging in place. Perceived availability of community services is related to anticipation of aging in place or relocation. If community ties are in place, knowing many neighbors by name and personal ties are important, then relocation is less appealing. Evidence for the impact on neighborhood support in aging in place preference, however, is lacking.

Preference of course is central to the concept of aging in place in distinguishing a choice to stay versus being stuck in place. Although it is recognized that older adults generally prefer to stay in their home and local community for as long as possible, the situation is more complicated for elders with low income, who lack financial resources and care support. Their preferred mode of living alters when faced with physical decline. Older adults consistently prefer aging in place, which requires a high level of community support and services that are currently lacking. With a rapidly aging population, however, this priority may change. This will need to play out. Regardless, the present infrastructure for healthcare will prove even more inadequate to meet seniors’ physical and mental health needs. A paradigm shift away from the sole focus on delivery of interventions at an individual level to more prevention-focused, community-based approaches may become essential. Recent initiatives have been proposed to promote healthy lifestyles and preventive care to enable older adults to age in place.

Jeste at al. outlined several challenges to such an effort [70]. The core ideas are reasonable housing options, pleasant and clean environments, transportation options, Respectful interface with the community, encouraging active participation in the community, and providing accessible care including preventative services. These are the practical issues but no doubt depend on the following for a real presence.

It appears that the influence of the old-old especially results in problems that are contaminated by both older age and rural living (as one example). Adults ages 85 or older who are rural residents have significantly higher levels of chronic disease, take more medications, and die several years earlier than their urban counterparts. The research confirms some of the special challenges facing older populations in rural or remote areas, who often have less access to physicians, long distances to travel for care, sometimes a lower socioeconomic and educational level, and other issues. It also reflects health problems that might have been reduced if they were treated earlier or more aggressively, researchers say. Data from several different study groups found that rural residents measured significantly higher on the Modified Cumulative Illness Rating Scale, with about an 18 percent higher disease burden. There are fewer physicians, fewer specialists, and higher caseloads. Doctors have less support staff and patients have less public transportation. A patient sometimes might need to wait months to see a doctor, and have to drive significant distances. Adverse effects can increase from taking multiple medications. It’s of particular concern that rural older adults start with more disease burden, which significantly increased over the next five years.

Our interest here is on the place where one lives, its safety, and the degree to which this environment can foster quality of life – mobility, transportation, medical issues, shopping, socialization, and other issues.

### Functional Needs:

Function and cognition as well as health are highly related. A problem with cognition or health, however, translates into poor function and functional cognition becomes the problem. This is the status of poorer activity transactions in the real world. Again, this category is rather inclusive. We have addressed it in cognition. From an archive at Mercer of over 500 people 65 or older, and being referred for a possible memory problem, the average rate for older adults with functional problems was high.
70%; most had multiple functional problems. On the SF-12 70% had clear mobility problems and most could not perform at least one activity of daily living. Many needed Meals-on-Wheels, transportation, in-home care, and other supports. Below is the breakdown of problems by age. In fact, it is at age 80 that the negatively decelerating curve declines measurably in percent with no disability, percentage in LTC facilities and percentage married.

Table 25: What are older people like?

<table>
<thead>
<tr>
<th>Age</th>
<th>% No Disability</th>
<th>% LTC</th>
<th>% Married</th>
</tr>
</thead>
<tbody>
<tr>
<td>65-69</td>
<td>83</td>
<td>3</td>
<td>70</td>
</tr>
<tr>
<td>70-74</td>
<td>83</td>
<td>5</td>
<td>60</td>
</tr>
<tr>
<td>75-79</td>
<td>78</td>
<td>7</td>
<td>52</td>
</tr>
<tr>
<td>80-84</td>
<td>62</td>
<td>10</td>
<td>38</td>
</tr>
<tr>
<td>85-89</td>
<td>45</td>
<td>17</td>
<td>24</td>
</tr>
<tr>
<td>90-94</td>
<td>35</td>
<td>32</td>
<td>16</td>
</tr>
<tr>
<td>95-99</td>
<td>20</td>
<td>42</td>
<td>10</td>
</tr>
<tr>
<td>100+</td>
<td>18</td>
<td>48</td>
<td>9</td>
</tr>
</tbody>
</table>

We highlight one function problem here. Driving is a key marker of function. The reasons older adults stop driving are such things as age-related declines in cognition, functional and/or visual spatial capacities, or health crises such as stroke or fractures from a fall. The negative effects of driving cessation on older adults’ physical, mental, cognitive, and social functioning have been extensively studied [192]. The inability to drive and resulting poor mobility can significantly restrict older adults’ instrumental activities of daily living and social integration and can lead to further physical and functional and mental decline and reduce friendship networks. Several studies have found that mobility restrictions affect older adults’ social relationships and participation more than engagement in paid employment or other formal activities. Former drivers and those who have never driven also have higher risks of long-term care entry after adjusting for demographic and health variables than drivers, and both former and never-drivers are at increased risk of death.

We highlight the FAQ as a marker of function, notably executive function in the adjustment realm. This marker provides a rating of one’s instrumental activities of daily living necessary for quality of life. The FAQ had a direct relationship with the level of cognitive decline; better with normal aging, worse with subject memory impairment, and most impaired with MCI and then dementia. Additionally, we often apply the AD-8 [193] or the FAQ [194]. The family member or other informer is asked to discuss the target patient who has experienced change over the last few years in each of eight areas. These include judgment, less interest in activities and hobbies, repeating themselves, trouble learning about how to use tools, gadgets, and appliances, forgetting correct month or year, trouble handling complicated financial matters, trouble remembering appointments, and daily problems of thinking and memory. For detecting milder levels of cognitive impairment, use of standard questionnaires involve everyday cognitive function [195] and cognitive change checklist is recommended [196].

Relationships and Socialization. These result in a largely supportive environment. The real issue, however, is social connectiveness. The link between social relationships and cognitive limitations at later life has received substantial attention. Larger social networks seem to be protective against increases in cognitive limitations. In contrast, social isolation and loneliness are associated with increased cognitive limitations irrespective of education, physical and mental health status, and health behavior. However, past studies have predominantly focused on the size of social networks and/or the frequency of social engagement and do not consider how the quality of any particular social relationship might influence cognitive limitations. A significant literature establishes that the quality of relationships, particularly marital relationships, is important in shaping health outcomes.

People who report feeling lonely have a 26% increased risk of early death and those with fewer or no social contacts or activities have a 29% increased risk [197]. A simple embrace from a loved one would improve resistance to catch a common cold. Social support can even lower the likelihood of experiencing excess levels of stress-related hormones, such as cortisol, epinephrine, norepinephrine, disturbed sleep, cardiovascular disease, high blood pressure, and diabetes, as well as Alzheimer’s disease.

Whether social support is available to individuals or not makes a difference in a number of health outcomes. However, social support should be differentiated. Available social support, that is whether the person has someone who is able to provide support, is consistently related to better health outcomes. The stress buffering model proposes that social support unfolds its beneficial
effect via direct and buffering effects. There is empirical evidence for both pathways. Available social support influences directly health or physical functioning and it seems to buffer, that is, dampen age-related declines in physical health associations between stressors, depressive symptoms, blood pressure, or inflammatory processes [198]. Choi, Yorgason, and Johnson have applied this finding to marital quality. Negative marital quality, such as marital strain and conflict, is associated with the deterioration of functional health and higher risk of mortality over time [199]. Researchers have shown that for some time the social relationships in different social class groups are not the same. The social forces that shape social relationships in different social economic groups are quite dissimilar. For example, a considerable number of studies have pointed out that rundown neighborhood environments play in determining the nature of social relationships that residents form within them.

Happiness/Life Satisfaction and Meaning: In the Proceedings of the National Academy of Science, researchers questioned 800 adults age 52 or older [200]. They assessed the specific personal attributes that are linked to health and wellbeing in older age. The results suggested that life skills of optimism, conscientiousness, emotional stability, control and determination significantly boosted the odds of wellbeing. No single attribute was more important than another. The effect was seen to be a function of the accumulation of life skills. Only 6% of those with 4 or more skills had reported poor health, relative to 33% of those in the lowest quartile.

Aging requires many factors to maintain and to survive in a happy way. Meaning in life is one marker for longevity. Regarding psychological approaches to meaning in life, it is portrayed simultaneously as a necessity of life or something that is next to impossible to obtain. It simply cannot be both of these. If meaning in life is essential to our survival in about the same sense as sunlight or calcium, then it must be available to us. Otherwise, human beings would have long since been rendered extinct. If we take seriously the notion that meaning in life is a human necessity, then we must tolerate and understand that meaning in life is a relatively common but critical experience. Large scale representative surveys and numerous studies of meaning in life suggest that meaning in life is indeed wide-spread and relatively high.

Consider the types of manipulations that seem to matter very much in meaning in life. These are social relationships, the experience of pleasure, and the detection of a reliable pattern of coherence in the environment. If one believes that what they do has a purpose and that their life will outlast their physical presence, the person feels connected to others, has a positive mood, and they can deal better with difficult times. In fact, there is good evidence that meaning-constructed existence can be created and is natural to the functions of living. It may be evolutionary and one cause for existence [201]. A meaningful life is associated with many positive things - better self-reported health, decreased mortality, and higher quality of living. Meaning means that one has a purpose and has significance. It involves social relationships, positive mood, environmental coherence, as well as positive illusions, response biases, and more adventurous living.

Purpose in Life has arms that reach beyond its area. Mota, et al. evaluated the incidence and determinants of physical disability in a contemporary nationally representative sample of U.S. Military veterans [113]. The focus here was on purpose in life. Two-year incidence of any physical disability, that is an IADL or ADL problem, among veterans age 55 revealed an incidence of ADL and IADL disability was 3% and 11% respectively. Older age, being married or cohabitating, number of medical conditions, specifically diabetes, heart attack, and chronic pain were associated with increased risk for any potential physical disability and incident IADL disability. Purpose in life was found to be protective for incident IADL.

Related, generativity refers to a concern for establishing, guiding, and contributing to the welfare of future generations. It is commonly manifested within a family through tangible support exchanges and transmission of values or outside family through volunteerism and societal engagement. Providing emotional support predicts greater self-esteem and control beliefs among elderly adults with comorbid health conditions. Provisions of practical support through volunteerism and civic engagement are associated with a higher quality of life for older adults. Psychological functions of giving each type of support have appeared to be quite important.

Religion and spirituality are also relevant. They certainly create meaning or foster it. In a review of research on some of the topics in terms of how they might be protective and produce healthier aging, Vahia et al. concluded that “of all the positive traits discussed, spirituality/religiosity may be the most extensively used to promote clinical outcomes” [202]. Religion, spirituality, and psychotherapy do intermingle. There are several therapies involving meaning-centered counseling, spiritually sensitive
psychotherapy, religious accommodative therapy, value-based psychological treatment, and religiously integrative psychotherapy. There is a sense in positive psychology with the recognition that there is a limit to how much a person can control and that spirituality helps people come to terms with human limitations. Typically spirituality addresses a sense of significance. This includes a reliance on religion to conserve their sense of significance or sometimes a radical religious change is required because of the person’s meaning and value system.

Stress:
We have discussed stress in the context of health. It is also applicable here. We have suggested that simple stress scales like the PSS (Personal Stress Scale) also can be applied. Essentially, we are assessing how older persons are frequently exposed to various stressors. It is estimated that about 25% of healthy older adults experience one stressful life event within a 3-month period. Life events include acute, as well as ongoing stressors, such as a death of a close relative, severe disease of a beloved one, and relocation. Comijs et al. found differential associations for different negative life events with cognitive decline, none of which were mediated by depressive symptoms [203]. The death of a child or grandchild, which may be considered a highly stressful event, was associated with a higher risk of cognitive decline, where more chronic stressors, such as illness of a partner or relative or serious conflicts, were associated with better cognitive function. The associations between life events and cognitive function were stronger in ApoE4 carriers compared to non-carriers suggesting this gene plays a significant role in the association between stress and cognitive function. Negative affect or neuroticism also is a key marker reflecting problems in life. It is an indicator of the person’s adjustment. Stawski et al. showed that individual differences in neuroticism were associated with higher levels of cognitive impairment and accounted for the between-person effect of daily stress [204]. At the within-person level, neuroticism and daily stress were each equally associated with higher levels of cognitive impairment. Co-varying for daily physical symptoms did little to draw to the association between daily stress and cognitive impairment at level of analysis.

We assess stress by use of a simple metric – 1-10 on a stress dimension. We will also use the Perceived Stress Scale which is longer and more accurate as it includes many aspects of living.

Care giving:
Care giving is always implied in the management of the older adult. This is real life. We have lamented about the lack of health coordination and, because of this, lack of life quality. It is in this context that we have discussed care giving [1]. Translating evidence-based dementia care giving interventions into real practice has been an issue. For the more than 5 million persons in the United States living with dementia, there are 15 million family members providing ongoing support, including care coordination, transportation and accompaniment to healthcare visits, daily assistance with bathing and feeding, and end-of-life care. The consequences for families providing protracted care for this complex condition are extensive and well documented. With disease progression, families are at elevated risk for many problems, including financial, impaired quality of life, physical morbidities, and suicidal ideation, as well as dementia itself.

In recent years, interventions for caregivers have been summarized suggesting that a strong evidence base exists. It suggests that there are many interventions that are effective for caregivers. A wide array of proven interventions then exist. Maslow, for example, identified 44 interventions targeting individuals with dementia and/or their family caregivers and suggested more publications of tested programs were forthcoming [205]. Brodaty and Araratram identified 23 caregiver interventions demonstrating positive outcomes for families [206]. Gitlin and Hodgson identified more than 200 interventions reviewed and 24 meta analyses and systemic reviews conducted between 1996 and 2013 [207]. Exemplars of interventions that could address problems include care management (maximizing independence at home [208]; Partners in Care [209]), disease education (Savvy Caregiver [210]), skills to manage functional independence (Care of Persons with Dementia in Their Environments, Cope [211], and Skills Care [212]), strategies to address behavioral symptoms (Advancing Caregiver Training [213]), and activities to effectively engage (Tailored Activity Program [213] and Counseling and Support [214]).

We consider this state to be intrinsically stressful and note it as a living state. That said, we can assess more molecularly as time unfold.

She was referred by her sister and driven to the appointment by her. She is a 71 year old female who has been functioning marginally at home. On February she was in an accident on Interstate, having driven from Macon to Swainsboro, Georgia, in an apparent dissociative
She was confused as to why this episode took place. She had no previous episodes. She is a retired teacher who lives by herself. From all indications she has been reasonably functional in the community.

The patient is a native of Georgia. Her father was a physician, and her mother had a master’s degree. She graduated from college after a few tries. She also worked in New York being an evaluator of hotels. She spent roughly 30 years as being a language teacher and the retired a year ago. She never married. She lives alone. She has had one unexplained episode. Her blood chemistries were normal, as her MRI of the brain. She did however have hypothyroidism and fatigue. On the day of the event she indicated that she had not eaten, and possibly had low blood sugar. She takes a statin medication, and a blood pressure medication. She also has been on an antidepressant for 10 years. She drinks wine nightly. Does not use tobacco. She indicates that she is not in pain. She has had 2 knee replacements, but this does not bother her now. She does not have an exercise program. It is also noteworthy that she has a number of pets in the house, 9 cats, and apparently a few dogs. As noted, she lives alone.

Table 26: Case profile of EM, Life adjustment is a concern

<table>
<thead>
<tr>
<th>Measure</th>
<th>Healthy</th>
<th>Moderate problem</th>
<th>Problematic or Syndromic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Overall lifestyle is positive, patient engages in the core components of lifestyle without major problems</td>
<td>Lifestyle choices are likely to contribute to disorder or have begun to do so</td>
<td>Lifestyle is compromise patients mental and/or physical health. Self-care lacking or not present</td>
</tr>
<tr>
<td>Education and SES</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FAQ(or AD-8)</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Safe/Supportive environment</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meaning in life</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Relationship Status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stress(1-10)</td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
Premorbid Functioning and Overall Cognitive Functioning

Ms. M has a 112 IQ placing her at the 73% level. She has a 112 (79%) on the WASI Verbal and 106 on Performance (61%). This suggests a good educative process (Intelligence above average). Currently Ms. McMillan scored low normal on the MoCA (24/30). She had problems on memory. She had an RBANS index of 95 placing her at the 37% level for other people her age. Based on these scores, she is responding commensurate to her per-morbid abilities. That said, she has defined problems in her memory (verbal and nonverbal), executive functioning (low scores on 3/5 scales), and attention (she scores as one with attention deficit problems - issues with poor commission and variability).

Emotional self-report scales indicated no current psychiatric problems. She scored normal on all scales. The MBMD indicates that her personality is one of a confident and social style. She is concerned about her cognitive status.

Function

Her FAQ was higher (14). She has had problems with driving, meds, and adjustment in the house with so many pets.

Pain and Sleep

She has low pain sensitivity on the MBMD. She rated her pain at present as 1/10; average 1/10. Sleep is also not a problem (ESS=6).

Summary

This female was referred for an evaluation for her cognitive status. She suffered a unique experience recently and drove over 100 miles away from her destination. She was in an accident. She was on autopilot and had no LOC. She has no explanation and this was a single event. There were no medical reasons. She has a master’s degree, has taught school for many years, and is retired. She has never married. She lives alone and does all ADLs and IADLs.

Cognitively she is high average premorbidly but has difficulties now. She had notable problems in memory, attention, as well as in executive functioning. She qualifies for one with mild cognitive problems (mNCD). From all indications then, she is responding less accurately and sharply than her premorbid state. At home she functions but has problems with pets and managing her life. By report she has had some problems with finances in addition to the driving incident. She has a normal psychological/psychiatric profile. It is unclear why she dissociated. She had a lower DES suggestive that this was physical in origin. She relates that she was tired and had not eaten. This had not happened before or since. She is distractible, may have had a low blood sugar or hypothyroid state, or was under stress.

Watch and Wait

Two domains were targeted, cognition and life adjustment. As she is resistant to any psychotherapy we have initiated motivational counseling and soft validation, as well as periodic sessions for practical targets (adjustment at home). She agreed that her sister manage her medications, finances, and to assist with the handling (finding homes) of the pets. We invited her to the Memory Clinic and she accepted. She also agreed to look at an ALF and report back. Both sibs were in agreement. We will monitor her status over time.

Conclusion

We believe this to be a simple but encompassing model. It is flexible and holistic. It seeks to address the practical needs of older adults in a slow and deliberative way. It is intended to be thorough and humane. There is no manual for its practice and no data for its practice but it is built of the shoulders of massive data in the field of geriatrics and gerontology. It is evolving also, given changes in the area.

We have seen that dementia is in decline. In the US the prevalence of dementia dropped from 11.6 percent for people over 65 to 8.8 percent in 2012 [215]. Importantly this is now a disease mostly takes time to unfold, and is psychological in nature with the brunt of the diagnosis and treatment behavioral and psychological. Despite inhalers, sprays, vaccines, more targeted monoclonal antibodies, and new elegant molecules, for now real care is best done by prevention. Effective medicaments are anemic or off in the distance. As if this were not bad enough, we have learned also that dementia is (usually) caused by a mixture of pathology [7]. The mess is such that people (as many as one third) who die with no apparent symptoms of cognitive impairment have AD in their brains, enough to meet criteria for AD itself [216]. Cognitive reserve and MCI, the two friendly faces in the dementia arena, have actually masked the nuanced diagnosis itself. When the brain alters, however, behavioral change rushes in. In fact, the bottom line is not what your biomarkers (plaques/...
Behavioral and psychological stuff matter! Exercise especially matters, altering BDNFs, serotonin levels, vascular health, well-being, depression, and may even prevent plaques and tangles from formation [217]. This is best done at mid age and done with verve and consistency. Additionally, people who deal with more complex work, who have skilled or professional jobs, have a formal education (at least 9 years), and practice several healthy habits (Mediterranean diet, no obesity, not smoking, reasonable health, sleep well, stress free life (good luck!)), and are reasonably “good people” (altruism/gratitude, socialization, practice religion, meditation, volunteer) seem to be protected at least for a while.

One intervention that is somewhat unique and more related to later life is cognitive training (CT). Despite concerns (Stanford group), it works in several situations (John Hopkins group). It does best with complex training, speed of processing activation, less transfer tasks, and with consistency. It requires practice and probably some training (adaptive tasks). In fact, probably all older adults should be mandated to apply all the above behaviors but especially CT as part of the “job” of aging. We know what to do; how to get people to do this is another issue.

This is an added feature. A core feature of lifestyle change is the extent to which the person is committed to change. The person does best at a task if they really enjoy it and appreciate the reason for their efforts. Cognitive flexibility ascends in importance. This involves the ability to recognize that the current strategy is not working and needs to be reconsidered. At times this means to tackle the problem; at times, the target is acceptance. This is not unlike other problems that are stress-related. Lifestyle needs to be chronic extending over many years. This raises the need to optimize motivation, wanting not liking.

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