

## Montefiore-Einstein Center for the Aging Brain: Preliminary Data

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Given the multifaceted nature of dementia care management, an interdisciplinary comprehensive clinical approach is necessary. We describe our one-year experience with outpatient based dementia care at the Montefiore-Einstein Center for the Aging Brain (CAB) involving an multispecialty team of geriatricians, neurologists, and neuropsychologists, supported by geriatric psychiatrists, physiatrists, and social services. The goals of the CAB is to maximize dementia outcomes, including regular monitoring of patient's health and cognition, education and support to patients, their families and caregivers; initiation of pharmacological and non-pharmacological treatments as appropriate, and the facilitation of access to clinical trials. The CAB follows a consultative model where patients referred to the center receive a comprehensive three step evaluation and management plan from Geriatric, Neuropsychology and Neurology specialists that is shared with patient, caregivers and primary care physicians. Of the 366 patients seen for cognitive complaints in our first year, 71% were women with a mean age of 74 years. Self-identified ethnicity of patients included Caucasian (26%), African-American (25%), Hispanic (18%) and multiracial (5%). Common final diagnoses assigned at the CAB included mild cognitive impairment syndromes (31%), Alzheimer's disease (20%), mixed dementia (11%), vascular dementia (9%), Frontotemporal dementia (4%) and dementia with Lewy bodies (4%). Our one-year progress report indicates that an interdisciplinary clinical dementia care model is feasible in the outpatient setting as well as highly accepted by patients, caregivers and referring physicians. *J Am Geriatr Soc* 2016.

**Key words:** Dementia; Alzheimer's disease; clinical assessment

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Individuals with cognitive disorders present a complex management challenge, with symptoms that extend beyond the cognitive realm. They have a high prevalence of comorbid illnesses; are frail; are often taking multiple or inappropriate medications; and are at risk of falls, disability, and death.<sup>1,2</sup> Given the multifaceted nature of dementia care management and need for coordinated efforts to provide medical, behavioral, and social services, an interdisciplinary comprehensive clinical approach is necessary.<sup>3-5</sup>

Collaborative care models are team-based, multicomponent interventions that provide a pragmatic strategy to deliver integrated health care to individuals and families.<sup>5</sup> Dementia care and delivery needs vary across the country, and exploration of different clinical models will help provide viable alternatives to adapt for local needs. Outpatient dementia care models usually reside in single specialties such as geriatrics, neurology or psychiatry,<sup>3,6-8</sup> which serve a gatekeeper function.<sup>9</sup> Barriers that primary care physicians who evaluate most individuals with cognitive complaints have identified include insufficient time, low reimbursement, difficulty accessing specialists, lack of social services, and shortage of interdisciplinary teams.<sup>9,10</sup> To address some of these barriers, an outpatient-based dementia consultative model involving an interdisciplinary team of geriatricians, neurologists, and neuropsychologists supported by geriatric psychiatry, rehabilitation medicine, and social services was started at the Montefiore-Einstein Center for the Aging Brain (CAB). Herein, the first year's experience at the CAB is described.

### METHODS

The Montefiore-Einstein CAB follows a consultative model in which people referred to the center receive a comprehensive three-step evaluation and management plan from geriatrics, neuropsychology, and neurology that is shared with them, and their caregivers and referring physicians.

## Staffing

The CAB staff consists of three neurologists, four geriatricians, and two neuropsychologists. The three CAB specialties are staffed at 0.5 full-time equivalents (FTE) per specialty. Individual CAB clinician's sessions vary from 0.5 (0.1 FTE) to 2 (0.4 FTE) days per week. One social worker is available for 2 days per week. One geriatric psychiatrist and one physiatrist have clinical sessions for 0.5 to 1 day per month.

## Previsit Assessment

Before their visit, all patients are mailed or directed online (<http://www.montefiore.org/documents/geriatrics/Questionnaire-Center-for-the-Aging-Brain.pdf>) to the CAB's prehealth visit questionnaire in English and Spanish, which assesses activities of daily living, medical illnesses, medications, function, and goals of care. If caregivers score positive on the caregiver stress inventory in the questionnaire, an appointment is arranged with the CAB's social worker, as previously described.<sup>11</sup>

## CAB Assessments

The geriatrician conducts a full evaluation that includes review of the previsit questionnaire, collection of information on demographic characteristics and comorbid conditions, a medication review, and a general examination to diagnose dementia-associated medical conditions such as frailty, fall risk, and polypharmacy. The licensed neuropsychologist conducts a neurobehavioral interview and administers a cognitive test battery in English or Spanish to probe general mental status (Blessed Information-Memory-Concentration test and AD-8); premorbid abilities (Wechsler Test of Adult Reading); and specific cognitive domains such as memory (Hopkins Verbal Learning Test), attention (digit span test), executive function (letter fluency, Rey complex figure copy, clock drawing tests), language (category fluency, Boston Naming Test), and mood (Geriatric Depression Scale, Beck Anxiety Index). Additional tests are used depending on clinical presentation. A summary report is prepared within 2 weeks. The neuropsychologist provides a preliminary read when the neurologist appointment is within 1 week or if there are unusual aspects to the cognitive profile. The geriatric and neuropsychology assessments are scheduled for 1 hour each on the same day. The geriatrician refers individuals for imaging studies and blood work for reversible causes of dementia. An appointment on a second day is made with the CAB neurologist for the final clinical assessment, neurological examination, diagnosis, and management. The median interval between first and second assessment days was 36 days. Follow-up appointments are made with the neurologist to monitor clinical progression or medication management.

To avoid overwhelming resources, consultations are restricted to cognitive complaints and related concerns. Primary care services or follow-up for noncognitive problems is not offered, but appropriate referrals are made if these services are required.

## Feedback

The neurologist prepares a comprehensive care plan that not only addresses the person's cognitive symptoms, but also incorporates recommendations that other team clinicians make to address medical, behavioral, or psychosocial concerns. The plan is discussed with the individual and caregiver, and a printed summary sheet with recommendations is provided at the end of the visit. All CAB assessments, test results, plans, and summary are available in the Montefiore electronic medical record system. Reports are also sent to the referring physician.

## RESULTS

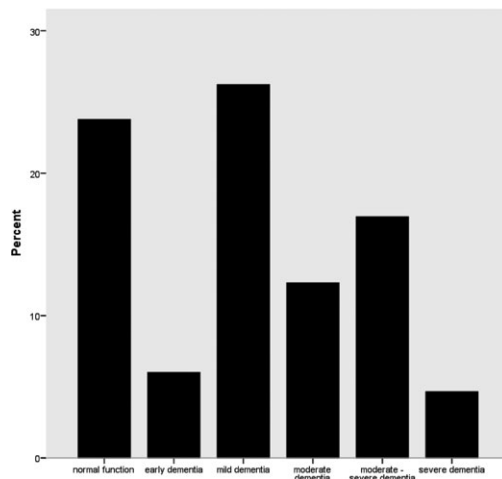
The CAB is located in the city of Yonkers, Westchester County, New York State, and opened in June 2014. The

**Table 1. Characteristics of 366 Individuals Seen in the First Year of the Montefiore-Einstein Center for the Aging Brain**

Variable	Value
Age, mean (range)	74.6 (37–96)
Female n (%)	259 (70.9)
Race and ethnicity, n (%)	
Caucasian	96 (26)
African American	91 (25)
Hispanic	66 (18)
Multiracial	18 (5)
Insurance, n (%)	
Medicare, managed Medicare	221 (60)
Dual Medicare and Medicaid	84 (23)
Private	37 (10)
Medicaid	22 (6)
Cognitive syndrome diagnoses, n (%)	
Alzheimer's disease	70 (20)
Mixed dementia	40 (11)
Vascular dementia	32 (9)
Dementia with Lewy bodies	16 (4)
Frontotemporal dementia	16 (4)
Amnesic MCI	72 (20)
Nonamnesic MCI	40 (11)
Pseudodementia	28 (8)
Parkinsonian syndromes	6 (1)
Traumatic brain injury	5 (1)
Other <sup>a</sup>	19 (5)
Cognitively normal	22 (6)
Geriatric syndromes addressed, n (%)	
Weight loss	137 (37)
Unsteady gait	147 (40)
Falls	102 (28)
Psychiatric	172 (47)
Sleep problems	97 (27)
Referrals, n (%)	
Social worker	138 (38)
Geriatric psychiatry	27 (7.4)
Rehabilitation medicine	16 (4.5)
Laboratory testing, mean (range)	
Thyroid-stimulating hormone level, mU/L	2.41 (0.03–25.8)
Vitamin B-12 level, pg/mL	751 (131–2,000)

<sup>a</sup>Alcohol brain disease, brain tumor, delirium, developmental delay, encephalopathy, ataxic gait, and multiple sclerosis (<5 cases each).

MCI = mild cognitive impairment.



**Figure 1.** Functional status of 366 individuals seen at the Montefiore-Einstein Center for the Aging Brain (CAB) in the first year. The CAB geriatrician assessed function using the Functional Assessment scale, which ranges from normal (no functional limitation) to severe dementia.

opening was publicized within the Montefiore network and to local providers and the public through internal newsletter mailings, electronic newsletters, news features in local newspapers, and outreach to community-based organizations and the local chapters of the Alzheimer's Association.

The experience with 366 individuals evaluated in the first 12 months (June 2014 to June 2015) is reported. Referrals were from Montefiore primary care physicians (57%), other specialists (32%), and a small number of self-referrals (11%). Of the 366 individuals, geriatricians evaluated 284 (78%), and 310 (85%) completed neuropsychological evaluations. Main reasons for missing these evaluations was younger than age 60 and received geriatric or neuropsychological evaluations elsewhere recently. Fifty-five (15%) individuals did not see the neurologist. Reasons included acute medical events or hospitalization ( $n = 7$ ), death ( $n = 2$ ), homebound ( $n = 2$ ), newly diagnosed brain tumor ( $n = 2$ ), only wanted psychiatric evaluation ( $n = 4$ ), and loss to follow-up ( $n = 38$ ). Table 1 provides basic demographic features and insurance status.

A wide spectrum of cognitive diagnoses was assigned (Table 1), including primary dementia syndromes (48%), mild cognitive impairment syndromes (31%), and cognitive impairment due to psychiatric and other nondementia syndromes (16%). A small number (6%) of individuals with cognitive complaints but normal neuropsychological and neurological assessments were seen. A broad functional spectrum is seen at the CAB according to the Functional Assessment Staging scale;<sup>12</sup> ranging from normal function (patients with MCI or normal cognition) to severe dementia (Figure 1). The main problems identified in the geriatric evaluation included weight loss (37%), unsteady gait (60%), falls (28%), and sleep disturbances (26.5%) (Table 1). Complex disease management and individualizing appropriate pharmacotherapy for chronic diseases was part of the geriatric assessments. The geriatricians identified and addressed the individual's ability to participate in advance care planning. A detailed report of geriatric

assessments in the context of dementia evaluation is planned.

Forty-seven percent of patients studied had behavioral problems, depression, or anxiety. The geriatrician or neurologist evaluated and managed the majority of individuals with behavioral problems, psychiatric illnesses, and unsteady gait. Only a few individuals who needed additional specialist input in the judgment of the geriatrician or neurologist were referred to the CAB psychiatrist ( $n = 27$ ) or psychiatrist ( $n = 16$ ) in the first year.

The CAB social worker saw 138 patients. Many caregivers and family members had questions and concerns about eligibility and availability of home care services for chronic progressive dementing illnesses. All individuals with dementia and their caregivers were referred to the Alzheimer's Association for additional support. Patient and caregiver stress management experience at the CAB was recently reported.<sup>11</sup>

Electronic medical records were examined after the visit to monitor for clinical outcomes. Individuals who attended CAB were high users of the healthcare system, with 114 (31%) emergency department visits, 97 (27%) hospitalizations, and six (1.6%) deaths in the year after their CAB visit.

## DISCUSSION

The Montefiore-Einstein CAB dementia outpatient consultative model involving core assessments by neurology, geriatrics, and neuropsychology is described. This 1-year progress report indicates that this interdisciplinary consultative model is feasible in outpatient settings. Although dementia clinics exist in single specialties, the CAB model helps bring a novel multidimensional consultative perspective to individuals with cognitive disorders. For instance, CAB geriatricians address comorbid medical illnesses, frailty, polypharmacy, and falls that may not be addressed in neurology clinics. All CAB attendees receive neuropsychological testing and comprehensive neurological assessment and diagnosis—services that may not be available in primary care settings and not all geriatric clinics because of limited resources or training.<sup>9,10,13</sup> Unlike typical geriatric practices, the CAB also evaluates younger individuals with early-onset familial dementia or with cognitive manifestations of nondementia syndromes. Although most people with cognitive disorders are seen in primary care settings,<sup>14</sup> the breadth and variety of cognitive diagnoses at the CAB supports the need for specialized centers to refer people with early, unusual, or complex cognitive syndromes.

Other collaborative outpatient dementia care models have been described. The University of California at Los Angeles (UCLA) Alzheimer's and Dementia Care program uses a co-management model with a nurse practitioner dementia care manager as the point person, who prepares personal care plans with input from a geriatrician.<sup>7</sup> Consultations were arranged with neurology, geriatric psychiatry, psychology, or geriatrics for additional diagnostic evaluation or management of refractory complications in 21% of the first 150 individuals seen.<sup>7</sup> Indiana University developed a team-based approach that uses dementia care coordinator assistants with at least a high school diploma for initial screening and evaluations of individuals with

dementia.<sup>3,14</sup> The National Institute on Aging designated and funded Alzheimer's disease research centers, which are mostly based in departments of neurology. Although the primary mission of these centers is research, they also offer outpatient services, but collaborative clinical care models are not the norm. The referral pattern will depend on the dementia care model. For instance at UCLA, 42% of individuals were diagnosed with Alzheimer's disease, in contrast to a wider diagnostic spectrum at the CAB, with Alzheimer's disease accounting for only 20% of cases. A wider spectrum of cognitive diagnoses, including mild cognitive impairment syndromes, was reported from memory clinics based in primary care settings.<sup>15</sup>

Cooperation between traditionally siloed specialties is necessary for the success of the CAB multispecialty model. Having all three specialties present at the same time during clinic hours facilitates professional interactions and discussions about cases. Complicated cognitive cases with challenging diagnostic or management issues are discussed at bimonthly CAB clinical case conferences where all specialties are represented, and additional experts are invited depending on the nature of the case presented.

The CAB is a young operation and has several limitations. Although the first-year experience is positive, there is much to improve. There are plans to learn and adopt features from other dementia care models to improve efficiency and effect. Additional services such as nutritional assessments, cognitive rehabilitation, and quantitative mobility assessments are planned.<sup>3,7</sup> Formal feedback procedures were not included, but there has been positive informal feedback from patients, caregivers, and providers that the comprehensive multidisciplinary assessment is more valuable than traditional dementia evaluations based in single specialties. No systematic cognitive screening was instituted in the catchment area because the personnel and infrastructure to evaluate a much larger volume of people that these efforts might generate was not available. Several challenges were identified while coordinating care at the CAB. Individuals who did not have a designated caregiver or primary care physician found it difficult to follow CAB recommendations. Psychotropic medication use limited neuropsychological evaluation in some cases. Financial viability is a major concern. The CAB was set up with support from Montefiore Medical Center, which also provided space for the center. The CAB bills through insurance plans, mostly Medicare. CAB members spend time on activities that are not usually reimbursed, such as counseling, coordinating care with referring physicians, and contacting family members to provide feedback or answer queries. Steps to supplement CAB finances such as seeking drug trials and applying for grants have been planned or instituted. A financial analysis of the CAB model is planned.

The unique, integrated approach at CAB may offer an effective model for comprehensive elder care and an

innovative approach to teaching the next generation of clinicians.

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