









# The Georgia Memory Net: Implementation of a statewide program to diagnose and treat Alzheimer's disease and related dementias

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## Abstract

**Objectives:** The number of people living with dementia is growing and most patients go years without receiving a specific diagnosis or support services, leading to suboptimal care, negative impacts on the quality of life, and increased costs of care. To address these gaps, the State of Georgia Department of Human Services collaborated with academic and community partners to create the Georgia Memory Net (GMN).

**Design:** GMN is a hub and spoke model partnered with Emory University's Cognitive Neurology Clinic and Emory Goizueta Alzheimer's Disease Research Center to provide training and support for best practices in diagnosis and management to Memory Assessment Clinics (MACs) throughout the state.

**Setting:** Communities across the State of Georgia.

**Participants:** GMN is a mix of academic and community providers, hospital systems, state and community agencies. Patients and families are evaluated at the MACs and connected to community services.

**Intervention:** A dedicated clinic workflow: primary care providers (PCPs) identify a memory problem and refer to the MACs for diagnostic evaluation; meeting with a community services educator, and development of a care plan. The patient is reconnected with the PCP for continuity of care.

**Measurements:** Initial metrics include numbers of unique patients, total patient visits, and referrals to state agency partners for community services.

Alexis A. Bender and Rebecca L. McIntosh contributed equally to this study.

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### Funding information

This project is funded by the Georgia Department of Human Services, Division of Aging Services.

**Results:** GMN established five MACs across Georgia with annual state funding. Partners at Emory University provided initial training; refined patient workflows for best practices; and provide ongoing support, guidance, and continuing education for MAC teams. Local PCPs and community services partners demonstrated strong engagement with the new model.

**Conclusions:** GMN is an innovative care model to improve access to accurate and timely diagnosis in patients with memory loss. GMN may help improve the quality of life for patients and families through preventive and early care.

### KEYWORDS

Alzheimer's disease and related dementias, community partnerships, systems of care

## INTRODUCTION

The number of Americans with Alzheimer's disease and related dementias (ADRD) is expected to grow to 14 million by 2050.<sup>1</sup> Several states, including Georgia, have established mechanisms to address the need for Alzheimer's care. Georgia's aging and ADRD advocates, academic institutions, community organizations, and state leaders have enthusiasm for forging new models and improving the quality of life for persons with dementia and their care partners. Discussions across these diverse, multi-institutional groups resulted in the establishment of a codified dementia state plan in 2014: the Georgia Alzheimer's and Related Dementias State Plan (GARD). This plan is undergirded by a coordinated team of state agencies, nonprofit organizations, businesses, and academic institutions known as the GARD Task Force.

In 2018, Georgia legislators funded the "Georgia Alzheimer's Project" as a clinical intervention arm of the GARD State Plan.<sup>2</sup> The program was renamed "Georgia Memory Net" (GMN) to include non-Alzheimer's dementias and connote a security net. The Georgia Department of Human Services, Division of Aging Services (DHS DAS), serves as GMN's administrative governing body; the program is managed by the Cognitive Neurology Program in the Emory University Brain Health Center. GMN seeks to improve screening, diagnosis, and care of Georgians with cognitive impairment indicative of ADRD. GMN has benefited from its position in the State Plan, DHS DAS oversight, and engagement with community services organizations, including Aging and Disabilities Resource Connections (ADRC), sister state agencies (e.g., Department of Public Health), and policymakers statewide.

Herein, we describe the development of GMN, organizational infrastructure, best practices model,

### Key points

- There are limitations with recognizing memory problems and ADRD diagnoses in Georgia.
- The Georgia Memory Net (GMN) was established as a novel care model for Georgians and their families living with ADRD.
- GMN is built on a foundation of close partnerships between the state, an academic medical center, interdisciplinary memory assessment center teams, primary care providers, community services organizations, marketing, and information technology experts.

### Why does this paper matter?

The project has demonstrated how a state plan to address the rising prevalence of ADRD coupled with vision and expertise from an academic medical center and state leadership led to the creation of the unique GMN hub-and-spoke model. GMN provides an opportunity to improve the quality of life for patients and families through preventive and early care.

anticipated outcomes, and challenges. Information will be useful for other states and entities replicating this model for AD and ADRD care. As GMN began its fifth year of funding in mid-2021, the program is at a pivotal moment of pushing growth with an eye toward the quality improvement. There are also implications of future therapies available to patients in earlier stages of the disease.

## PROGRAM DESIGN AND IMPLEMENTATION

### Setting

#### GA demographics

Three hundred eighty-five thousand adults in Georgia indicated concern with cognition in 2015, however, most (80%) had not discussed concerns with a healthcare provider.<sup>2</sup> Approximately 150,000 individuals live with AD in Georgia, a number expected to climb to 190,000 by 2025.<sup>3</sup> Older Georgians, particularly those with ADRD, are susceptible to poor outcomes relating to social determinants of health and access to services. In 2014, 13.5% of Georgians were over 65 (30% minorities and 32.2% rural).<sup>4</sup> Studies show associations between rural living and increased risk of AD-related death rates.<sup>4-6</sup> Disparities in care experienced by African Americans and other minority populations underscore Georgia's need for services.<sup>7-11</sup> Over 30% of older adults in Georgia are ethnic minorities.<sup>4</sup> Georgians who self-identify as African Americans or Black are almost 2.5 times higher than the national average. Among beneficiaries over age 65, the prevalence of ADRD was highest among African Americans.<sup>2</sup>

#### Clinical services availability

There are limitations to making ADRD diagnoses in Georgia. This requires informed primary care providers (PCPs) to identify the cognitive problem and specially trained providers to determine accurate diagnoses. The complexity of care management for cognitively impaired patients requires support tools for these providers to effectively manage care following a dementia diagnosis. Thirty-five percent of Georgia's counties are full or partial primary care Health Professional Shortage Areas: 73% as high-need geographic and 56% as low-income population. Nearly 90% of Georgia's counties meet the criteria for Medically Underserved Areas (MUAs) and Medically Underserved Populations (MUPs).<sup>12</sup>

There are not enough providers to conduct exams and testing to accurately diagnose ADRDs. Historically, this has fallen to a few specially trained neurologists and advanced practice providers; however, out of 402 neurologists in the state (3.8/100,000),<sup>13</sup> fewer than 20 focus on ADRD.<sup>2,13</sup> Over half work at the Emory Brain Health Center, where wait times are often many months for new patients. The confluence of PCP shortages, limited ADRD screening, and mismatch between the Georgia population and cognitive specialists, highlights the need for a program to address these gaps.

#### Community services availability

Georgia has strong community services for older and at-risk adults, persons with disabilities, and their families. DHS DAS assists these groups in achieving safe, healthy, and independent lives through the 12 Area Agencies on Aging (AAA). As Georgia's primary access point for older adult social services, the AAAs and ADRCs link Georgians to services, however, they are often underutilized. A structured program is needed to ensure longer-term use of these vital community services<sup>14</sup> that can help improve the quality of care for people with dementia. Dementia best practice models recommend referral to service agencies,<sup>15</sup> yet these are often underutilized and lack health care system coordination.<sup>16</sup> Georgia is home to many organizations, including the NIH-recognized Goizueta Alzheimer's Disease Research Center (GADRC) and the Georgia Alzheimer's Association (AA), one of the largest chapters in the country. GMN was designed as a solution to forge linkages between primary care and existing dementia care service organizations and to combat ongoing widespread challenges of underutilization of community services.

#### Rationale

The combination of an aging population in Georgia, increasing patient numbers, rising disparities, limited access to ADRD diagnostic specialists, and underutilization of existing resources have led to lengthy delays in diagnosis (estimated at 6 years) and connection to services.<sup>3</sup> Delays contribute to avoidable emergency visits, hospitalizations, earlier admission to subacute nursing facilities, and impacts from social determinants of health.<sup>3</sup> Rising ADRD rates have consequences for state Medicaid programs, which are responsible for long-term care for many older residents with dementia. Healthcare costs are 23 times higher for people with ADRD, often due to hospital admissions, skilled nursing facility stays, and emergency department visits.<sup>3</sup>

Other states face similar ADRD burdens and shortages of health care professionals. One approach used to address these needs is through care consultations. North Dakota instituted care consultations, resources, and referrals to caregivers to people living with dementia. These consultations demonstrated effective rural outreach and showed decreases in hospitalizations, ambulance use, emergency department visits and 911 calls.<sup>17</sup> A New York University-developed counseling program showed effective reductions in nursing home placement by providing support to families living with AD in New York.<sup>17,18</sup> Wisconsin and Florida also created state-wide memory diagnostic clinics to improve the treatment of dementia. Cost analyses in Wisconsin showed that early diagnosis and

treatment, family counseling, and access to social services resulted in savings of \$10,000 per patient and reduced institutionalization by 28%.<sup>19</sup>

Better alignment of social, medical, and health Information Technology (IT) systems in GMN may positively impact services delivery, cost, and health equity statewide. Early diagnosis and intervention for ADRD coupled with linkage to wrap-around community services may help mitigate the challenges noted above. GMN is an opportunity to improve the quality of life for patients and families through preventive and early care with the potential for cost savings to the State.

## Program design

### Primary objectives

The GMN contract held by Emory University states the program will: increase awareness of cognitive impairment screening among PCPs; develop a network of Memory Assessment Clinics (MACs) to expand access to diagnostic services statewide and enhance connectivity for Georgians with ADRD to community services; and deploy an IT infrastructure to facilitate program evaluation, patient-level data capture, analysis of the statewide impact and return on investment.

### GMN workflow

The workflow consists of a two-visit model with integral PCP and community services partnerships for longer-term care management (Figure 1). Identification of cognitive impairment (without previous dementia diagnosis) by a PCP is the referral trigger to a MAC for evaluation and neuropsychological testing on the first visit. Referral for additional tests (e.g., brain imaging, cerebrospinal fluid biomarker testing) may also occur during this visit. A specially trained community services educator (CSE) conducts a psychosocial needs assessment for the care partner. Validated tools (Table SS1) are used to identify areas of caregiver burden and in-home function. Ideally, MACs utilize healthcare professionals from social work or nursing backgrounds (LPN, RN) for the key CSE role. When personnel is not readily available, MACs identify candidates with relevant knowledge of elder care, dementia care, or community services. A robust, standardized training program for CSE's is further described below in *Partnerships*.

During the second visit, the patient, care partner, and provider review results and discuss diagnosis, treatment, and clinical trajectories. The patient and care partner also meet with the CSE to discuss service needs and create a

care plan. The care plan and medical record are sent back to the patient's PCP. As GMN has grown and the needs of PCPs are better understood, we developed various tools to embed in the patient transition packet to aid PCPs in medication management and disease-specific care. GMN patients are automatically referred (with consent) to local AAA/ADRC and AA offices for quick linkage to community resources. The GMN care plan covers patient-centered goals for care and immediate needs of patients and care partners; a cover sheet is included in the referral to AAA and AA so that community services are aware of needs and urgent issues. These plans and cover sheets were developed in collaboration with AAA leadership and GMN Community Services Core leads. Similar PCP cover sheets are used to convey medical and psycho-social information in one view.

After 1 month, the CSE contacts the patient or care partner to confirm connections to PCP and community services. To ensure long-term connectivity between PCPs and community services, the GMN Primary Care Core and Community Services Core work closely with the evaluation team to develop sustainable long-term follow-up of GMN patients and care partners. Tools include surveys (mailed, digital, telephone) to monitor community service use, the quality of life, and ways to identify high-risk patients requiring referral to clinical or community services.

## Participants

### Leadership

Dedicated support and commitment from State legislature and Governor's office champions, DHS administrative oversight, Emory Neurology leadership, and aging and ADRD advocates were able to energize the Georgia Assembly to fund policy for GMN. The GMN program director worked with DHS leadership to structure an ongoing contract that ensures transparent, actionable, and measurable objectives. Other Emory personnel, including multi-specialty team members (neuropsychologists, physicians, social workers, and gerontologists) from across the university were recruited along with IT specialists and support staff to develop, refine, and deploy the GMN model. The established infrastructure of the National Institute on Aging-funded GARDC served as the initial base of GMN, though the rapid maturation of GMN ultimately demanded its own structure as a unique entity within Emory's Cognitive Neurology Program. Close ties with the Emory Cognitive Neurology Clinic and the GARDC ensured access to evidence-based models of care, outreach efforts, and the latest research. Collaboration

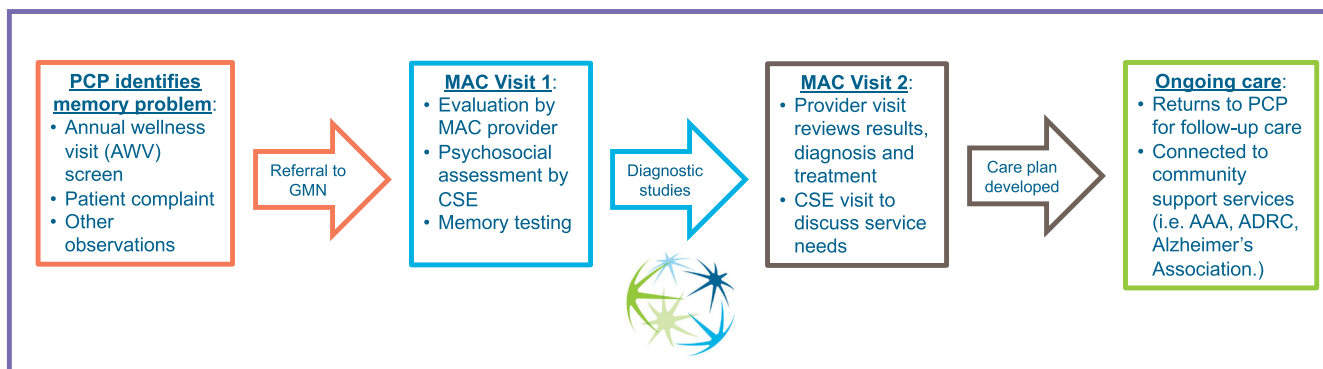


FIGURE 1 Georgia Memory Net workflow design. PCP, primary care provider; CSE, community services educator; GMN, georgia memory net; MAC, memory assessment clinic; AAA, area agency on aging; ADRC, aging disability resource center

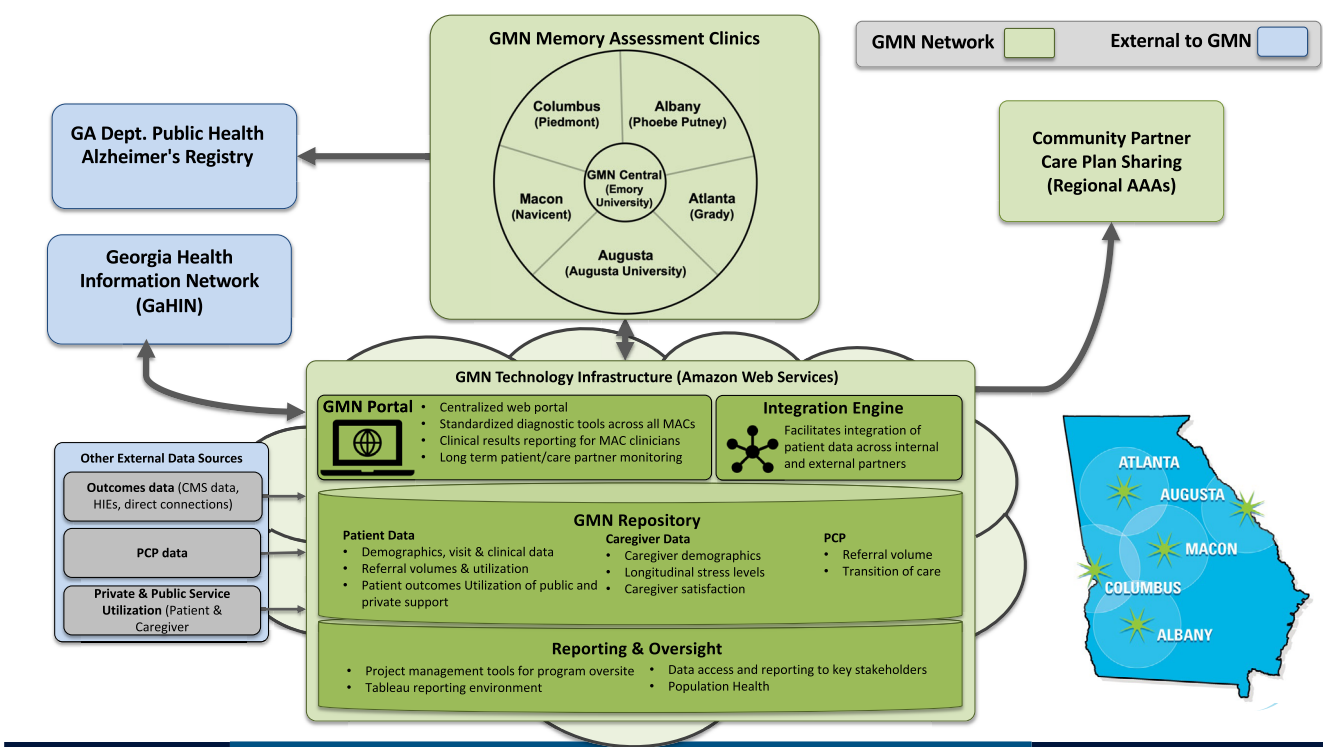


FIGURE 2 Georgia Memory Net technology overview with hub and spoke model

with leadership from the Emory Integrated Memory Care Clinic (IMCC), a specialized nurse practitioner-led primary care service for dementia patients, was central to the development of care transitions processes and primary care education to bolster continuity and the quality of care for GMN patients.

Partnerships

GMN leadership selected MAC locations via geographic diversity (Figure 2; lower right) and identification of

engaged medical providers with appropriate infrastructure (e.g., contract management, brain imaging, laboratory). Sites included private, safety-net, and academic health systems with interdisciplinary MAC teams embedded in family medicine, geriatrics, and neurology practices. Emory University established ongoing sub-contracts and training from experts in the Emory Cognitive Neurology Clinic. GMN engaged private industry partners with expertise in health informatics<sup>20</sup> and brand identity and marketing<sup>21</sup> to work alongside university-based IT and communications resources. Initially, GMN collaborated closely with the AA, Rosalyn Carter Institute for Family Caregiving (RCI), and

TABLE 1 MAC staffing

Title	Role	Training	Additional notes
MAC Provider	<ul style="list-style-type: none"> <li>• Comprehensive evaluation of patient</li> <li>• Orders necessary brain MRI, labs, and biomarker testing</li> <li>• Reviews all available data</li> <li>• Provides comprehensive discussion of data, diagnosis, management, and treatment to patient and care partner</li> </ul>	<ul style="list-style-type: none"> <li>• Licensure in medical specialty</li> <li>• Training developed by Emory cognitive, neuropsychology, social work specialists in partnership with Augusta MAC and community organization partners.</li> <li>• Monthly case conferences, consultations with Emory cognitive specialists</li> <li>• Initial and ongoing training include seminars, day-long conferences, workshops, and informational booths at chapter meetings.</li> <li>• Topic areas include dementia management and care, patient needs and communication strategies, Annual Wellness Visits and cognitive screening, and GMN referral workflows.</li> </ul>	Physician or Advance Practice Provider(s)
Community services educator	<ul style="list-style-type: none"> <li>• Provide initial support and education</li> <li>• Assess initial care needs with validated instruments (Table SS1)</li> <li>• Develop written care recommendations</li> <li>• Link patients and care partners with community resources for ongoing support and address individualized needs</li> <li>• Coordination of state-wide agencies, harmonization of clinical and community-based services and caregiver education</li> <li>• Transfer of services back to primary care following diagnosis</li> </ul>	<ul style="list-style-type: none"> <li>• GMN developed standards and curricula to meet the need for facilitated linkage to community services, especially when licensed social workers were not available.</li> <li>• Ongoing case conferences and connections with Emory social work faculty</li> <li>• Initial and continuing education curricula are for all CSE's program-wide to ensure baseline knowledge of dementia, dementia care needs, and GMN workflow responsibilities.</li> <li>• Ongoing training, developed and delivered in collaboration with community partners, includes monthly and semi-annual CSE continuing education sessions, care plan auditing, and individual CSE professional development.</li> </ul>	Embedded in and vital to the workflow to help facilitate handoffs to community partners and PCPs.
Neuropsychological technician	<ul style="list-style-type: none"> <li>• Administer neuropsychology battery initially developed via publicly available NIH Toolbox augmented with other tests of memory to ensure adequate cognitive assessment.</li> <li>• Utilize visual tools developed by Himforatics to summarize data and interpret results.</li> <li>• Provide results to MAC provider</li> </ul>	<ul style="list-style-type: none"> <li>• GMN developed standards and curricula</li> <li>• Ongoing assessment of skills for batter administration</li> </ul>	

the Georgia Physicians Orders for Life-Sustaining Treatment (POLST) for development and content needs for CSE onboarding and curricula, which have transitioned to central GMN Community Service Core activities with the consolidation of CSE educational initiatives. Continuing CSE education is jointly delivered with community partners. Table 1 shows detailed information on staffing, team roles, and training for each role. Ongoing training includes

monthly and semi-annual CSE continuing education sessions coupled with care plan auditing and focused individual CSE professional development. Establishing close collaborations with PCPs was identified as a key partnership to promote memory screening and GMN referral as well as to provide continued care after MAC evaluation. Patients with memory problems are referred to the MACs by local PCPs. Patients receive expert evaluation, diagnosis,

and individual care plans followed by referral back to the PCP and community services for continued care.

## Implementation

### Governance and infrastructure

During year one, GMN leadership established a central administration and training hub including various Cores (MAC Provider, PCP, and CSE) coupled with cross-cutting support teams (Communications, IT, and Evaluation) to facilitate the development of program areas. First, the Augusta MAC team, embedded in active neurology practice, piloted the GMN workflow, which was critical for showing feasibility and model refinement. Four additional MACs were established across Georgia with a hub and spoke model (Figure 2; top center). Monthly case conferences, data review sessions, and annual summits were established to provide continuing medical education on data interpretation, diagnosis, and optimal management of patients. Regularly scheduled operations meetings were held (virtually, by phone, in person) to optimize workflows and processes. Although the main goal focused on standardized practices, it was also important to recognize that individual sites had unique needs and challenges.

To jumpstart education and supports for PCP's, GMN engaged with the Georgia Academy of Family Physicians (GAFFP) to conduct basic needs assessments and focus groups to understand needs PCPs. The collaboration continued with GAFFP, the Georgia Chapter of the American College of Physicians, and the Gerontological Advanced Practice Nurses Association to provide necessary education (Table 1). As needs of referring PCPs became better understood and with anticipated further support needs following aducanumab approval, GMN Primary Care Core began surveying referring providers to develop targeted long-term PCP support mechanisms, such as a Project ECHO-style peer-to-peer education<sup>22</sup> and a consultation mechanism facilitated by cognitive leads at Emory and MAC providers.

### Branding and outreach

The marketing strategy team, Reckon, and website developers from Helium were key partners during the first year. Reckon brought creativity to assist with program naming and branding, flyers, and website development. Reckon was crucial to patient and PCP

engagement including the “Go Annual” campaign that focused on memory screening in the annual wellness visit. We also employed outreach through PCP professional organizations to broaden GMN messaging on the importance of PCP engagement and to educate early-career physicians through broad-spectrum advertising, mobile application development, caregiving blogs, and PCP “Welcome Kits” for new referring providers.

### Information technology

Vital to program success was the development of a robust technology platform to manage GMN referrals and patient data aimed at tracking outcomes. During the first year, GMN's technology team worked with DHS Chief Information Officer to select a HIPAA-compliant data storage system (i.e., “the GMN Portal;” hosted on Amazon Web Services) to manage MAC data (Figure 2). Standard diagnostic protocols used in the Emory Cognitive Neurology clinic and GADRC were codified in Portal for clinical support with additional operational modules. Portal tools include (but not be limited to): patient and care partner data direct entry; dedicated REDCap environment for neuropsychological testing and CSE data; custom reporting for psychometric testing, CSE data and care planning; PDF document export for scanning into the local electronic medical record. User interface and security penetration testing were conducted to assess end-user satisfaction and remediate security risks before dissemination to MACs. The system has the flexibility to interact with local electronic medical record systems to support documentation needs for compliance and billing. Tableau Server was deployed in Amazon Web Service as a foundation for GMN reporting and analytics. Metrics dashboards were generated to monitor performance indicators, driver and quality metrics, and financials. Dashboards allow specialized views for GMN central staff, State reporting, and individual MAC sites.

### Program costs

An initial \$4.12 million annual line item was drafted into the DHS budget to fund GMN. Each MAC is allocated a subcontract capped at \$350,000, with specific language that \$50,000 per subcontract be reserved for CSE or similar community services support. The subcontract amount was estimated based on additional funds needed by the Emory Cognitive Neurology Clinic to support operations since the types of services rendered (diagnostic, social services) often exceed what

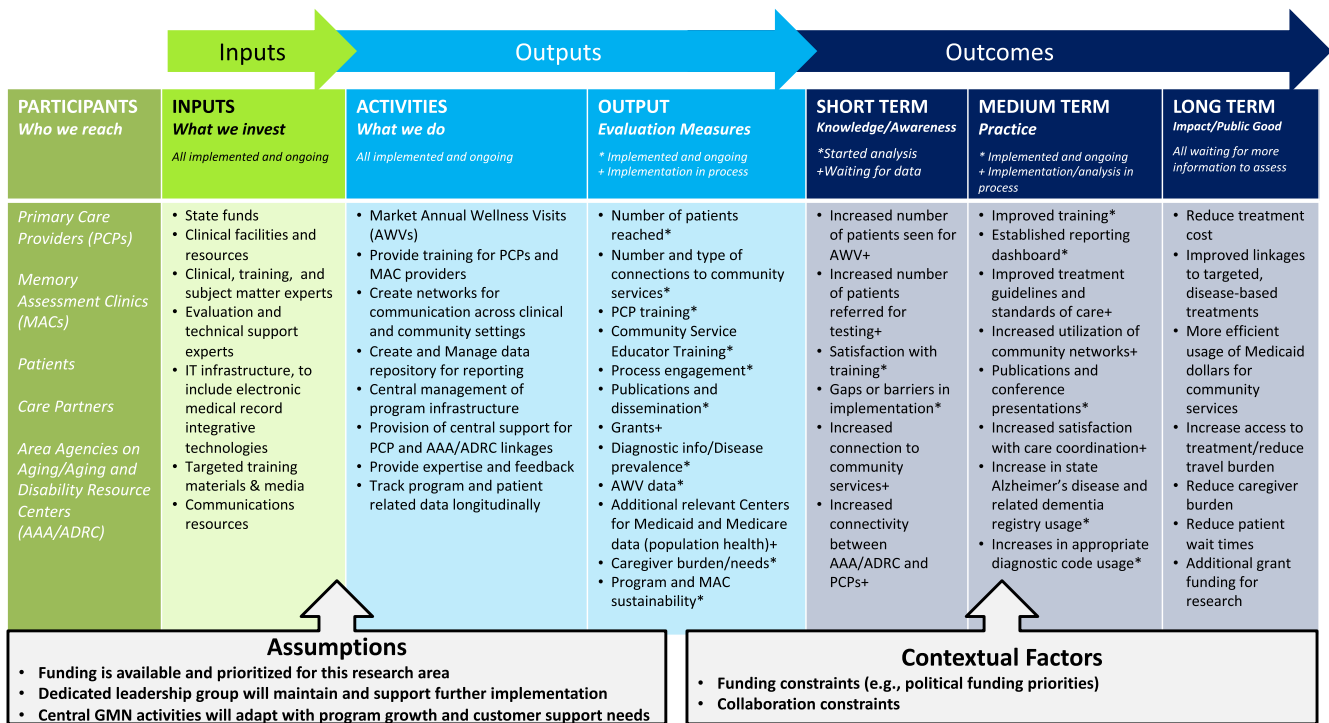


FIGURE 3 Guiding logic model

can be captured in billable revenues. The remaining funds are used to support GMN central administration, project organization, training tools, GMN Portal, branding and outreach.

### Barriers

Sites required various levels of training across roles given the variability in cognitive evaluations, data interpretation, diagnostic thought processes, and referral patterns to community services. Dedicated training materials, patient care apprenticeships, case conferences and other continuing education opportunities were utilized to mitigate gaps in knowledge and experience. Administrative barriers included lengthy delays in subcontract negotiation and challenges regarding assurances of patient privacy in the GMN workflow. Increased vigilance from central GMN staff and influence by MAC healthcare system leadership was needed to navigate processes across healthcare systems to ensure timely subcontract processing and execution. Close collaboration with local MAC, Emory, DAS legal, and external counsel afforded the development of a patient authorization signature process to ensure privacy protection. Recruitment difficulties, provider leave, other duty priorities, and system issues (e.g., credentialing delays) added uncertainties that are

still present today. Including projected provider schedules to standard MAC metrics and bi-weekly MAC calls improved the ability to alert DAS and GMN central to lower monthly volume metrics. Access to ancillary diagnostic services (e.g., imaging, lumbar puncture) also proved challenging and results in ongoing problem solving within GMN central and local MACs/ leadership.

Unforeseen, major natural and public health disasters have had significant negative impacts, including a hurricane that directly affected the Albany MAC and the ongoing COVID19 pandemic. However, pivoting care models in the wake of COVID19 broadened telehealth services. The transition to telehealth generated additional challenges including telehealth-specific training, provider reluctance, adjusting billing models, patient access to compatible devices, MAC access to supportive technology (i.e., tablets, computers with webcams), and appropriate screen-sharing platforms and state-wide inadequacies in internet infrastructure.

### MONITORING AND EVALUATION

GMN evaluation includes resources for personnel, mass data purchase, IT resources, and reporting tools. The evaluation structure consists of a multi-level, mixed-methods model that employs the expertise of



research partners at Emory. It follows elements including utilization of local- and county-level health disparities data, qualitative feedback from stakeholders, creation of trend metrics over time, and development of dashboards to improve transparency.<sup>23</sup> The approach employs validated methods and analysis across systems and process evaluation, population health, and mixed methodology.

An overarching logic model (Figure 3) with quality improvement metrics guides implementation, evaluation, modification of the workflow (process evaluation), and improvement of care and satisfaction for patients and care partners living with ADRD (outcome evaluation). Collaborative advocacy of GMN and community partners continues for expanded funding to augment return on investment, health outcomes, and other evaluations related to program effectiveness. The process evaluation is achieved through in-person or virtual site visits, online MAC personnel (quarterly) and GMN core managers (annually) surveys, monthly data reporting and calls with each MAC team and local AAA representatives, and ongoing review of meeting notes. MACs operate in five different healthcare systems with regional and population variations that require slight modifications to the general workflow. Having flexibility allows the program to work for each partner, while central monitoring and evaluation are important to ensure appropriate referrals and the highest quality of care.

A component of our outcome evaluation strategy leverages Medicare claims data from all fee-for-service Georgia beneficiaries and providers to assess the longitudinal impact of GMN activities on statewide population health and service use. We will assess the current state and changes in emergency department visits, SNF placement, and provision of cognitive impairment screening, diagnosis, and treatment by all Georgia providers, with a focus on differences between MAC and non-MAC patients. Short-term metrics include numbers of unique patients, total patient visits, and referrals to community services. Figure 3 highlights additional medium- and long-term quality improvement and return on investment outcomes.

## CONCLUSIONS AND FUTURE IMPROVEMENTS

GMN is a novel care model for Georgians and their families living with ADRD. The project demonstrated how a state plan to address the rising prevalence of ADRD coupled with vision and expertise from an academic medical center and state leadership led to the creation of the unique GMN hub-and-spoke model. This model is recognized in national forums<sup>24</sup> and could revolutionize the

standard of care for the growing population with ADRD. Expected short-term advantages of GMN include timely and accurate diagnoses for patients and families, increased PCP ADRD awareness and knowledge, and reduced numbers of hospitalizations and potential cost savings to the state. We anticipate new initiatives and unrealized future benefits.

An important next step for GMN includes next-generation IT support (GMN Portal) to provide seamless integration between PCP, MACs, community partners and GMN central. GMN Portal will consolidate medical information and care plans into one location for all involved care partners. GMN Portal will allow GMN central to follow metrics and begin quality improvement projects aimed at optimizing the GMN model. These data will drive innovative research questions and lead to novel funding opportunities. Clinical research opportunities will be improved because the portal will have created a trial-ready cohort. Advanced research and disease-modifying therapies that were once relegated to academic centers and private companies may be accessible to all those who are interested, including rural participants.

Demand for GMN services is expected to increase over time. Although the COVID19 pandemic has challenged health care systems on multiple levels,<sup>25</sup> it has moved telemedicine to the forefront as alternative effective care delivery.<sup>26,27</sup> GMN will broaden access by instituting telemedicine as an alternative model to reach patients who may not be geographically close to regional MACs. This approach reveals challenges with internet access, though this could be an unseen benefit that highlights the importance of striving for broadband access to every Georgian. Another access improvement initiative includes setting up additional MACs in the state. To ensure highly engaged sites, the implementation may involve a “request for proposals” model that allows other physician groups the opportunity to apply for funding to establish a MAC.

As we are entering a new era in the diagnosis and treatment of ADRD it is critical to have the infrastructure and workforce in place to fully realize potential benefits. In addition to appropriately using and interpreting current biomarkers like amyloid and tau in spinal fluid, amyloid PET, MRI brain, and neuropsychological testing, novel biomarkers are appearing. Although recent guidelines did not find sufficient rationale to support or oppose cognitive screening based on available published clinical trials, current and future disease-modifying therapies for AD will require accurate diagnosis and appropriate monitoring.<sup>28</sup> MACs, with full support from GMN central, have the knowledge and expertise to utilize biomarkers, make diagnoses, and deliver novel therapies. GMN improves care and provides hope for Georgians living with ADRD.

## CONFLICT OF INTEREST

The author declares that there is no conflict of interest that could be perceived as prejudicing the impartiality of the research reported.

## AUTHOR CONTRIBUTIONS


Alexis A. Bender, Rebecca L. McIntosh, Sean Sudduth, Michaela Harris, Kathy Tuckey, John C. Morgan, Abby Cox, Miranda A. Moore, Bryshia Ingram, Theodore M. Johnson, Abby Cox, David W. Loring, Kenneth Hepburn, Laura Medders, Allan I. Levey, James J. Lah, and Chadwick M. Hales were involved in program concept and design, interpretation of program features, and preparation of the manuscript. Joanna M. Jungerman and Ellyn Pier were involved in the preparation of the manuscript. This project and subsequent implementation overview could not have been completed without the numerous state, community, and faculty partners involved in this process. We would like to thank Commissioner Robyn A. Crittenden, Sheila Humberstone, Representative Terry England, Senator Jack Hill (deceased), Victoria Helmly, Diane Gramann, Julie Hall, Molly Perkins, and Lindsay Prizer. We also thank each participating health system (Augusta University, Grady Health System, Navicent Health, Phoebe Putney, and Piedmont Columbus Regional) and the patients and care partners who trusted us to provide this service.

## SPONSOR'S ROLE

The Georgia Department of Human Services provided feedback on the manuscript as well as critical insights for developing the GMN and connecting it to the existing community services.

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## REFERENCES

- Weuve J, Hebert LE, Scherr PA, Evans DA. Prevalence of Alzheimer disease in US states. *Epidemiology*. 2015;26(1):e4-e6.
- Georgia Department of Human Services Division of Aging Services. Georgia Alzheimer's Disease and Related Dementias Report 2015.
- Alzheimer's Association. 2019 Alzheimer's Disease Facts and Figures 2019.
- United States Census Bureau. 2014 National Population Projections Tables. <https://www.census.gov/data/tables/2014/demo/popproj/2014-summary-tables.html>. Published 2014. Accessed December 18, 2018.
- Kramarow EA, Tejada-Vera B. Dementia mortality in the United States, 2000-2017. *Natl Vital Stat Rep*. 2019;68(2):1-29.
- Russ TC, Stamatakis E, Hamer M, Starr JM, Kivimäki M, Batty GD. Association between psychological distress and mortality: individual participant pooled analysis of 10 prospective cohort studies. *British Med J*. 2012;345:e4933.
- Brewster GS, Bonds K, McLennon S, Moss KO, Epps F, Lopez RP. Missing the mark: the complexity of African American dementia family caregiving. *J Fam Nurs*. 2020;26(4):294-301.
- Cothran FA, Paun O, Strayhorn S, Barnes LL. 'Walk a mile in my shoes': African American caregiver perceptions of caregiving and self-care. *Ethn Health*. 2020;1-18:1-18.
- Yearby R. Structural racism and health disparities: reconfiguring the social determinants of health framework to include the root cause. *J Law, Med Ethics*. 2020;48(3):518-526.
- Dilworth-Anderson P, Moon H, Aranda MP. Dementia caregiving research: expanding and reframing the lens of diversity, inclusivity, and intersectionality. *Gerontologist*. 2020;60(5):797-805.
- Cooper C, Tandy AR, Balamurali TBS, Livingston G. A systematic review and meta-analysis of ethnic differences in use of dementia treatment, care, and research. *Am J Geriatr Psychiatry*. 2010;18(3):193-203.
- Health Resources & Services Administration (HRSA). Shortage Area Information. <https://data.hrsa.gov/tools/shortage-area>. Published 2021. Accessed.
- Georgia Board of Health Care Workforce. Georgia Physician Workforce Report Based on 2017-2018 Licensure Renewal Data and New Licensees Primary Care and Core Specialties 2019.
- Weber SR, Pirraglia PA, Kunik ME. Use of services by community-dwelling patients with dementia: a systematic review. *Am J Alzheimers Dis Other Dement*. 2011;26(3):195-204.
- Wiener JM, Gould E, Shuman S, Kaur R, & Ignaczak M. Examining models of dementia care. (ASPE Final Report No. 0212704.017.000.001). Washington, D.C.: RTI International. 2016.
- Reuben D, Levin J, Frank J, et al. Closing the dementia care gap: can referral to Alzheimer's Association chapters help? *Alzheimers Dement*. 2009;5(6):498-502.
- Muus K, Volkov B, Klug MG, Mueller J & Haley-Franklin H. Dementia Care Services project: Supporting Caregivers in North Dakota. *Center for Rural Health Alzheimer's Association*. <https://ruralhealth.und.edu/pdf/alzheimerspolicybrief1210.pdf>. Published 2010. Accessed September 23, 2021
- Mittelman MS, Haley WE, Clay OJ, Roth DL. Improving caregiver well-being delays nursing home placement of patients with Alzheimer disease. *Neurology*. 2006;67(9):1592-1599.
- Weimer DL, Sager MA. Early identification and treatment of Alzheimer's disease: social and fiscal outcomes. *Alzheimers Dement*. 2009;5(3):215-226.
- Himformatics. Himformatics LLC. <https://himformatics.com/>. Published 2021. Accessed 2021.
- Reckon Branding. <https://reckonbranding.com/>. Updated 2021. Accessed 2021.

22. Arora S, Kalishman S, Thornton K, et al. Expanding access to hepatitis C virus treatment-extension for community healthcare outcomes (ECHO) project: disruptive innovation in specialty care. *Hepatology*. 2010;52(3):1124-1133.
23. Institute of Medicine National Academies of Sciences Engineering Medicine. *Metrics that Matter for Population Health Action: Workshop Summary*. The National Academies Press; 2016 978-0-309-39153-5.
24. Hales C, Dillard R, Sudduth S, et al. Improving Alzheimer's disease Care for the Citizens of Georgia: the Georgia Memory Network. Presented at the 143rd annual meeting American neurological association. *Ann Neurol*. 2018;84(S22):S168-S280.
25. Mok VCT, Pendlebury S, Wong A, et al. Tackling challenges in care of Alzheimer's disease and other dementias amid the COVID-19 pandemic, now and in the future. *Alzheimers Dement*. 2020;16(11):1571-1581.
26. Betancourt JA, Rosenberg MA, Zevallos A, Brown JR, Mileski M. The impact of COVID-19 on telemedicine utilization across multiple service lines in the United States. *Healthcare*. 2020;8(4):380.
27. Klein BC, Busis NA. COVID-19 is catalyzing the adoption of teleneurology. *Neurology*. 2020;94(21):903-904.
28. Patnode CD, Perdue LA, Rossom RC, et al. Screening for cognitive impairment in older adults: updated evidence report and systematic review for the US preventive services task force. *JAMA*. 2020;323(8):764-785.

## SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.

**Table S1** Cognitive and Psychosocial Instruments used by the Georgia Memory Net

**How to cite this article:** Bender AA, McIntosh RL, Sudduth S, et al. The Georgia Memory Net: Implementation of a statewide program to diagnose and treat Alzheimer's disease and related dementias. *J Am Geriatr Soc*. 2022; 70(4):1257-1267. doi:10.1111/jgs.17690