Addressing Challenges in Payment and Access to Treatments for Early-Stage Alzheimer’s Disease
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Abstract
Alzheimer’s disease (AD) impacts a broad section of society, and while there are some treatments and behavioral interventions to address the symptoms of disease, there are currently no drugs that can modify disease progression. However, new treatments are on the horizon, and there are concerns that our current healthcare system is unprepared to provide the diagnostic capabilities, treatment access, or data capture that will be needed to benefit the number of individuals who are impacted by this disease. This issue brief covers the challenges associated with AD diagnosis, potential treatment coverage, and paying for treatment, then describes how reforms to payment mechanisms could improve access to innovative treatments. Data infrastructure to support additional evidence and new payment arrangements, as well as patient identification and treatment, will be needed and will require multi-stakeholder input.

Introduction
Alzheimer’s disease (AD) is a progressive neurodegenerative disorder that affected 5.7 million Americans in 2018. The number of people living with AD continues to grow, and it is estimated that almost 14 million people will be living with AD in the US by 2050. The cost of health care and long-term care for individuals with AD or other dementias is high, accounting for approximately $290 billion in direct costs to the U.S. healthcare system. AD also leads to immense caregiving burden, which often fall to patients’ families, leading to financial, physical, and emotional strain.

While there are currently no options to prevent or modify disease progression, the scientific advancement of understanding of AD progression and diagnosis has led to increased drug development targeting populations in the early stages of disease. The developmental focus has shifted to disease-modifying AD treatments that target earlier stages of disease, which are delineated in newer frameworks from the National Institute on Aging (NIA), Alzheimer’s Association (AA), and the U.S. Food and Drug Administration (FDA). The earliest phase is termed “preclinical”, with mild/prodromal, moderate, and severe following as symptoms worsen. Currently there are 14 phase III trials enrolling populations with preclinical AD and mild cognitive impairment due to AD. These therapies may enable interception of disease progression long before irreversible symptoms develop, holding potential to slow or even stop disease progression.

However, once an AD drug has been approved, there will be outstanding questions about appropriate patient populations and mechanisms for screening and treatment, appropriate coverage and reimbursement, and how to develop additional evidence on effectiveness and cost-effectiveness that could help answer these questions. Current research suggests heterogeneity in AD progression and in treatment response, so limited evidence upon drug approval may present barriers to use in the real world. For example, labeled indications may include people with mild cognitive impairment as measured through cognitive testing, but could exclude others due to uncontrolled co-morbidities. A narrow target population in clinical trials would lead to early-stage AD drugs approved for relatively specific indications. In addition, biomarkers may be used to diagnose disease, but in most clinical trials, biomarker changes are not used as a primary endpoint, and little is understood about biomarkers and treatment effects in diverse populations that are typically underrepresented in clinical trials. There will also be questions about the long-term effects of a new drug since clinical trial results are not monitored beyond a few years. These uncertainties, coupled with the number of potentially eligible individuals and the expected cost for these drugs, may make prescribing and coverage decisions difficult, leaving appropriate patient populations with limited access.

While disease-modifying treatments have not yet been approved by the FDA, questions are already arising from both payers and biopharmaceutical manufacturers regarding future payment and appropriate access for these medications. These challenges may come soon. Biogen recently announced that they would be submitting data on their anti-amyloid beta drug, aducanumab, to the FDA following a revised analysis of previous phase 3 trials. This drug candidate was tested on people with mild symptoms or MCI, and while not targeted toward pre-symptomatic individuals, some of the data were generated in genetically predisposed individuals, raising questions about how broad the impact of this treatment might be.

To better prepare for challenges around the desire for more evidence on outcomes, and for payment and access, this article describes likely reimbursement issues and potential new payment approaches. Uncertainties about long-term benefits and actual treatment impact could be mitigated through the use of value-based payment arrangements. Additional data infrastructure considerations needed for such payment models, as well as continued real-world evidence generation of these AD medications, will also be discussed.
Impact of diagnosis on AD treatment

Before new treatments can be widely used by patients, physicians will determine appropriateness of the drug for the patient based on the available evidence and the patient's needs and preferences, and payers will need to reach agreements with manufacturers on coverage and reimbursement contracts. Current diagnostic strategies do not reflect availability of these drugs, creating an opportunity to update care pathways to limit progression of dementia.

When making care decisions, physicians and payers may restrict access to drugs because of lack of evidence and uncertainty about the safety or efficacy in a given population. For drugs targeting a symptomatic population, this decision process will be less complex as symptoms will be present and can be measured through relatively inexpensive cognitive testing. In contrast, identifying appropriate pre-symptomatic patients will be a more difficult and expensive process.

To help with these decisions, providers and payers will need risk stratification protocols to characterize patient benefits and risks related to these future treatments. Both mild (early-stage) and pre-symptomatic disease treatments will be dependent on whether individuals seek or request screening for treatment of cognitive issues, which may significantly narrow the number of patients who are considered for treatment. In addition, the labeled indication of the drug may influence support for use of diagnostic screens.

There are several screening options that a physician might perform to help her determine whether an individual is at risk for AD development, including examination of family history, genetic screening for APOE-4, cognitive or functional screening, analysis of claims data, or analysis of medical history and comorbidities (Figure 1). If any of these tests are positive, then the individual might undergo a blood-based biomarker test, a PET scan, or cerebral spinal fluid (CSF) draw to screen for amyloid beta build up.\textsuperscript{10,11} Positive reads on these tests might indicate the drug for this patient. However, more evidence will need to be gathered once a drug is on the market to better understand what markers and comorbidities are most predictive of disease development and progression, what types of patients would benefit most from treatment, and what are the long-term impacts.

Figure 1. Potential pathway for diagnosis and treatment of early-stage Alzheimer’s disease

Without a disease-modifying treatment (DMT) for AD currently on the market, it may be difficult to understand the potential impact of therapies on the healthcare system, and what diagnostic tools will be most important for providing access to these treatments. For symptomatic patients, these drugs will likely have incremental impacts on the development of AD – potentially delaying progression to later disease stages by several months. For drugs targeting pre-symptomatic patients, there may be more uncertainty about how effective this drug might be because the pre-symptomatic period can last many years, and not all pre-symptomatic individuals go on to develop full-on disease.\textsuperscript{12,13} As a first step to delineating patient impact, the potential patient populations are described below (Box 1). These descriptions were developed with input from attendees at a Duke-Margolis expert workshop (a multi-stakeholder group comprised of industry, payers, physicians, and regulators).
The role of patient comorbidities in disease and their interaction with the new drug may also impact treatment and coverage decisions. Clinical trials may have tested a limited set of patients, and many trials would not have included patients who have uncontrolled comorbidities (e.g. heart disease or diabetes). In the real world, many dementia patients have at least four comorbid conditions, and physicians and payers will want additional evidence on whether these conditions impact the safety or effectiveness of drug use. However, these comorbidities may also have an impact on the progression and severity of AD, and use of drugs in the pre-symptomatic setting may also benefit from additional evidence on how comorbidities influence AD development. For example, the SPRINT MIND study indicated hypertension as a risk factor for AD development.

In addition to uncertainties around patient population and eligibility, there are financial barriers to the risk stratification process itself. PET scans can be expensive and CSF testing is invasive, and payers may not provide coverage and reimbursement for these tests. Further, if patients are eligible for these types of drugs while they are still covered by commercial insurance (before they are eligible for Medicare), health and financial benefits from delayed onset of disease would likely only accrue years later, after the patient has transitioned into Medicare coverage. Early treatment might thus have little financial offsets for commercial payers and employers.

These available risk stratification strategies clearly have cost limitations and may impact access. To help address these risks, improve evidence, and maximize the value of potential pre-symptomatic and early-stage AD treatments, alternatives to fee-for-service payment should be considered.

**Box 1. Potential Patient Populations**

Current epidemiology estimates and participation criteria from clinical trials were used to make assumptions about the expected patient populations and potential challenges in screening and diagnosis.

**Symptomatic populations:** Given the current state of drug development, the first AD therapy to be approved will likely target individuals with mild cognitive impairment (MCI) and/or mild AD. While there are some populations with early-onset disease, those who are age 65 and older will make up the majority of the target patient population, meaning most of the costs will fall to Medicare. It is estimated that 15-20% of people over the age of 65 have MCI, yielding a potential target population of 7-10 million people. However, significantly fewer individuals would likely gain access to these drugs because they do not initiate screening, because of potential interactions with existing medications, or because of uncontrolled comorbid conditions, which might pose a safety risk or reduce the expected benefit. Patients might be prescribed these drugs based on cognitive symptoms, and screening criteria might include a mini-mental state exam (MMSE) score of 22 or more, or a Clinical Dementia Rating (CDR) score of 0.5 or 1. Depending on the label indications and biomarkers used, a PET scan may also be necessary to confirm pathology and help confirm a diagnosis. On average, patients might expect to see delayed progression of two to six months.

**Pre-symptomatic populations:** Drugs designed to delay the onset of AD before symptoms are apparent would be targeted for pre-symptomatic populations of patients. These patients might have biomarkers of disease, such as a heightened genetic risk profile with elevated levels of amyloid beta in the cerebral spinal fluid (CSF) or within the brain, but will not have measurable cognitive impairment (e.g. MMSE score of 25-30 or a CDR score of 0). As a result, patients may be expected to start taking a drug as early as 50 years of age, potentially being covered by both commercial and public payers, and the pool of potential patients will be considerably larger than in symptomatic populations (if prevalence is ~20% in those >50, an estimated 24 million people may have preclinical AD). In addition to seeking care, patient eligibility for treatment will likely depend on factors like having a genetic risk factor, and positive amyloid beta pathology as measured through a PET scan or CSF draw. Considering these criteria, less than a million patients might access this drug once it is available.
Strategies for payment

Under the current payment system, most drugs are paid for on a fee-for-service (FFS) basis, with the price of the drug negotiated by the payer (or pharmacy benefit manager) and the manufacturer. Many of the Alzheimer's drug candidates are provided as an infusion once a month, meaning that a patient will receive an administration by the physician on an outpatient basis with coverage through medical benefits. Unlike with retail drugs sold in pharmacy, providers take possession of these drugs and then bill the patient's insurance for their administration. For Medicare beneficiaries, outpatient drugs are reimbursed at a rate of average sales price (ASP) plus a percentage of ASP to cover delivery of care.

The size of the potential patient population will likely be substantial, and it is likely that payers will closely scrutinize coverage of these drugs. Due to questions about magnitude and duration of these future drugs' impact relative to their FFS price, it is possible that payers may restrict coverage of these drugs to patients, similar to initial payer reaction following the approval of PSCK9 drugs for lowering cholesterol.¹⁶

Applying value-based payment arrangements to AD drug payment

Value-based payment (VBP) arrangements for medical products are intended to align the payment for a drug with the expected or observed value of the drug, based on clinical trials data or evidence generated with post-market use. VBP arrangements would be designed to encourage development of further real-world evidence on patient outcomes because effectiveness might vary based on patient characteristics, and further evidence accumulation could help to determine appropriate payment. VBP arrangements can help address several of the uncertainties associated with new drugs, including the risk that the drug does not result in its potential long-term impact across a range of patients and that the FFS price might not match those realized benefits.

There are two main categories of VBP arrangements: evidence-based pricing and outcomes-based contracts (OBC). When setting a payment amount for a product, evidence-based pricing considers existing evidence, particularly evidence generated through clinical trials. In these arrangements, pricing may adapt over time as evidence of benefit becomes stronger or weaker. In contrast, OBCs are directly linked to evidence on results generated through real-world use of the product in the covered population. These types of payment contracts may utilize rebates or credits between manufacturers and payers depending on whether product use achieves pre-defined outcomes in a given patient or population. Coverage with evidence development is one type of model that links payment for a product to post-market studies or continued evidence generation. OBCs also include population-based payments, where payment is like a “subscription” or per-member per-month payment at the covered population-level, with an adjustment for population-level outcomes. Outcome-based payments depend on the reliable collection of meaningful performance measures, and may also benefit from aligned alternative payment models for providers to support their involvement in screening and treatment reforms to advance the outcome goals.

The features of the treatment and the characteristics of the intended patient population should guide the type of arrangement that is implemented. For example, if clinical trials reveal distinct responses in sub-populations of patients, differential evidence-based pricing might increase access, with risk of disease development adjusting the price for treatment. Another consideration for designing VBP arrangements might include where the drug will be administered. If the drug is administered by a physician, there may also be an opportunity to coordinate reimbursement of the drug with other services administered, such as diagnosis or other related aspects of care. Payments for physician-administered drugs might also be able to incorporate quality measures into outcomes assessment and tracking, which will be discussed further in the next section.

OBCs work best when there is considerable uncertainty about a key benefit or outcome, when additional evidence on measurable benefits is feasible to collect from practice or studies in the post-market setting, and when the manufacturer is willing to share accountability or risk of actually achieving that benefit. OBCs might also be appropriate when there is an expectation that additional data will improve the use of the treatment, for example by leading to more effective targeting or dosing or better side effect management.
Payment dependent on population-based outcomes could be appropriate when the marginal or incremental cost of a product is low relative to its market price, and when the FFS market price is significantly limiting access for people who could benefit. Under these arrangements, manufacturers could get a risk adjusted per-member per-month payment linked to outcomes in the covered population (e.g. better achieved outcomes would result in a higher payment rate). This type of contract would likely work best if providers also were paid partly on an episode- or population-basis, creating aligned incentives for more appropriate value-based screening and treatment (Table 1, “Potential Payment Models”).

Factors contributing to successful implementation of VBP arrangements

The success of OBCs depends on an ability to measure outcomes. Difficulties in reaching agreement on relevant outcomes and measures, challenges in data collection, or in assessing the impact of the treatment versus other factors on outcomes may all limit the feasibility of such payment arrangements. Outcome measures for AD might include evaluation of cognitive or functional decline, or could incorporate caregiver- or patient-reported outcomes (PROs). Outcomes that can be achieved in 1-3 years may be most useful. Initially, these outcomes measures will likely align with the endpoint measures used in clinical trials, though over time, payers may want to see additional evidence of clinical utility. Because the target patient populations will likely be sizable, reliability, scalability and standardization of measures will be important.

Table 1: Potential payment models

<table>
<thead>
<tr>
<th>Payment method</th>
<th>Definition</th>
<th>Advantages to use</th>
<th>Timeframe and measures</th>
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<tr>
<td>Value-adjusted evidence-based pricing</td>
<td>Pricing based on existing evidence (e.g. clinical trials) that may vary based on indication or subset of patients, and/or include contingency for price adjustment as longer-term or stronger evidence of benefit emerges.</td>
<td>This pricing arrangement requires limited infrastructure to implement, and may be less complicated to monitor compared to other outcomes-based arrangements, while still reflecting product value.</td>
<td>This type of pricing can be implemented immediately, with no additional outcome measures required. However, prices may be adjusted if real world outcomes reflect those that were achieved with limited populations in clinical trials.</td>
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<tr>
<td>Coverage with evidence development</td>
<td>Payment is linked to implementing an infrastructure to address key unresolved evidence questions.</td>
<td>This type of contract may be useful when there is a great uncertainty about the benefits of a treatment in the real world. By conditioning payment on post-market data collection, payer risk is reduced without impacting appropriate patient access.</td>
<td>Coverage with evidence development may last as long as it takes to develop the required evidence, which may last several years in the case of AD treatments. Evidence questions may include those around the durability of treatment or impact on patients with co-morbidities.</td>
</tr>
<tr>
<td>Outcome-based payment</td>
<td>Links payment for medical products to that product’s actual performance in a patient or a population</td>
<td>For most patients, evidence will be collected over time. Positive results might trigger a bonus payment to the manufacturer, and if results were negative, then the manufacturer could provide a rebate to payers. This type of model could mitigate the financial risks associated with expanded patient coverage, and as evidence is generated over time, improve patient selection and understanding of the drug’s impacts. This model would also be intended to share financial risks associated with broader patient access near approval.</td>
<td>Timeframe can be adjusted based on outcome measures; for AD, may consider 1-3 year periods. Potential outcomes measures could include cognitive scores or amyloid beta concentrations.</td>
</tr>
<tr>
<td>Subscription payment</td>
<td>Provides access to the medical product for a flat and predictable recurring payment that is linked to product performance in target population</td>
<td>The price of the drug would be significantly higher and access would be substantially narrower through non-subscription purchases. Over time, the payment price might be adjusted or rebated based on the outcomes of the treated population. This type of payment model would require tracking the health of a population of patients over time.</td>
<td>This type of arrangement could enable a longer contract period, potentially extending 3-5 years. Potential outcome measures could include cognitive or functional scores.</td>
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To facilitate these contracts, stakeholders should work to address the feasibility challenges ahead of time to the extent possible. Real world data collection, which is being developed for regulatory purposes in many sectors, could ease the implementation of OBCs: the same data collection mechanisms that support post-market (phase 4) regulatory study requirements could potentially support additional evidence development relevant to coverage. It will be critical to identify key outcome measures for different levels of patient disease risk, which would allow greater, appropriate patient access earlier than under FFS payment.

For OBCs, stakeholders will need to determine how much risk each party will assume, and what aspects of treatment, clinical outcomes, and patient populations are most meaningful to measure. In cases where there is suggestive but not definitive evidence that a treatment could reduce a range of downstream medical costs, it might be reasonable for manufacturers to take on some risk associated with these costs of care, which might include AD-driven complications. Stakeholders might also consider shifting responsibility for other non-financial factors, such as patient adherence to prescribed regimes.

One of the biggest challenges to paying based on outcomes associated with the drug is the long time-horizon expected for AD progression. Development of disease may take years, and if these early-stage disease drugs work as anticipated, the amount of time needed to confirm effectiveness would likely fall outside a feasible timeframe for reimbursement; changing market conditions or entry of competing drugs means that contract length might be restricted to one to five years. This issue is especially relevant for the pre-symptomatic scenario (see “Potential Patient Populations”) as time for progression can be variable in the very early stages of disease. Variability in progression compounds the inherent difficulty in isolating the effect of the AD treatment on the outcome of interest (e.g., cognition), distinguishing the impact from other treatments, behaviors, and lifestyle changes.

**Facilitating payment reforms, better evidence, and better care through improved data collection**

In order to reduce uncertainty and ensure access to future early-stage AD treatments, better infrastructure for post-market evidence collection is needed. Currently, there are no agreed upon, feasible sets of key data that can be readily extracted from either claims or electronic health records (EHRs) that could capture the full picture of brain health. In contrast, for other disease areas, registries exist to track patients who have undergone certain procedures. In the AD space, this infrastructure would support the development of needed post-market evidence as well as the implementation of VBP arrangements, while generating better information on meaningful outcomes for patients, and identifying measures to evaluate outcomes will be an important part of this process.

Improving infrastructure support could start with centralizing and standardizing data to identify patients’ treatment indications and capture individual- or population-level outcomes after treatment use. This data infrastructure can be built alongside or leverage a variety of data sources, including EHRs, administrative claims data, and data captured to calculate quality measures. This collection of data would be useful to clinical and managed care for identification of patients at highest risk of AD, as well as those patients that would benefit most from treatment. These data could reside in or connect with an EHR system that captures vitals and tests for diagnostic purposes in primary care. Such a system could identify patients who have mild cognitive impairment based on MMSE, CDR, or other tests. Such a system could also identify asymptomatic patients at high risk of Alzheimer’s disease based on family history, genetic screening results, and/or PET or cerebral spinal fluid screening results.

However, systemic changes and improvements need to be made to enable adequate scale of AD data collection and evidence development. Currently, much of the dementia cognitive testing, genetic screening, and PET scan or CSF data are unstructured. When unstructured data are largely hidden in consult notes, they are more difficult to extract from EHRs for point-of-care use by clinicians. The incompleteness of data is also a significant problem. Patients move between health systems, from clinics to hospitals to skilled nursing facilities, and these facilities generally do not share data with each other. Administrative claims data capture all care paid for by a given payer, but if patients switch health plans, then the data needed for multiyear follow up will be incomplete. Improved standards and centralization will enable fuller use of the available data; for example, there are ongoing studies using natural language processing to examine both claims and EHRs for signals to diagnose Alzheimer’s disease. Table 2 illustrates the desired types of data, and potential challenges to accessing them. Recent U.S. Department of Health and Human Services (HHS) and Centers for Medicare and Medicaid Services (CMS) regulatory reforms that aim to make EMR and claims data accessible to patients, may also provide a foundation for patient-focused longitudinal data collection and analysis.
Table 2: Challenges to accessing desired data for AD care and treatment

<table>
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<tr>
<th>Needed Data</th>
<th>Data Holder/Location</th>
<th>Challenges to Accessing Data</th>
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<tbody>
<tr>
<td>Dementia screening results</td>
<td>Providers – patient record</td>
<td>Privacy concerns and interoperability issues may limit access</td>
</tr>
<tr>
<td>Results from cognitive and potential biomarker testing</td>
<td>Providers – patient record</td>
<td>Tests results may not be directly comparable if different testing methods used</td>
</tr>
<tr>
<td>Comprehensive notes on visits to physicians or healthcare facilities</td>
<td>Providers – patient record</td>
<td>Privacy concerns and interoperability issues may limit access; full notes may not be recorded in EHR; data is not structured for extraction</td>
</tr>
<tr>
<td>Quality measures for patient care</td>
<td>Center for Medicare and Medicaid Services</td>
<td>No specific measures for AD</td>
</tr>
<tr>
<td>Healthcare utilization</td>
<td>Payer – claims data</td>
<td>Different payer systems may lack interoperability; private payers may be reluctant to share data</td>
</tr>
<tr>
<td>Patient- and caregiver-reported outcomes</td>
<td>Reside with patients/caregivers, though not often collected. If they are, data are in patient records, digital health applications</td>
<td>May not be formal channels for collection; responses are subjective and may not be directly comparable between patients</td>
</tr>
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Developing consensus on needed data

While most patient interactions and data collection take place within a healthcare facility, clinicians are often overburdened by administrative tasks, and they may need updated financial and infrastructure support to support capturing needed AD-related information more reliably.20 Thus, alongside development of early-stage Alzheimer's disease treatments, modules within EHR systems should be piloted, and clinicians should be supported to measure cognitive function as part of the collection of vital signs for at-risk patients in a standardized manner. As AD treatments improve, such capabilities may become more integral parts of health homes, accountable care organizations, and other patient-focused care models that emphasize effective primary care, early diagnosis, and prevention. One payment reform for clinicians to measure cognition as part of vital signs could include a per-person payment tied to appropriate screening and the collection of key performance measures through quality measures at the provider-, clinic-, or health system-levels. Detection of cognitive impairment is already covered within the initial Medicare wellness visit; tying a quality measure to this interaction could increase overall cognitive screening.21,22

To incorporate measures of cognitive health in an EHR module, physicians and other stakeholders would need to develop consensus on a core set of data elements that can be used to identify patients and potentially evaluate treatment effectiveness. When assessing efficacy, current preclinical AD trials are examining changes in baseline cognition (through a variety of measures), function, neuropsychological status, biomarkers, and/or time to disease progression. The measures selected for this module will likely include primary efficacy endpoints used in the trials for FDA approval of AD treatments, but will need to be augmented to address payer and clinician concerns around appropriate use.

There are a variety of real-world outcomes that could be included as data elements and that should be built as structured data into the EHR system, for easier use in clinical operations. Potential outcomes might include comorbidity burden, quality of life, resource use, direct medical costs, and caregiver burden. These outcomes will be critical components of post-market evidence collection, and those that can provide significant readouts within three to five years with be the most useful for implementation of coverage with evidence and VBP arrangements. Additional technology solutions, such as dashboards for clinicians and reports for patients and caregivers, could further facilitate use of these outcome data elements in risk stratification, patient identification, assessment of treatment effectiveness, monitoring for side effects, or payment.

One challenge to selecting outcomes is that there are many different measures for each category of outcome. A public-private advisory partnership, termed ROADMAP, developed a Datacube that provides a listing of available data and the specific measures that are currently being captured in real-world settings in Europe; this may serve as a tool for future decision-making.23 Ideally, a collaboration including healthcare providers and systems, public and private payers, manufacturers, the FDA, patients, and caregivers should work together to develop these modules. Identifying stakeholder priorities for outcome evaluation would be a next step, as well as exploring whether new or existing technologies could help with implementation or data tracking.
Building systems to enable longitudinal care

Within the current healthcare system, there will be challenges with data sharing, data interoperability, and tracking patient outcomes if they change insurers. However, these issues are not specific to AD care, and opportunities to develop solutions are increasing based on recent trends and policy initiatives.

The ongoing development of health information exchanges could help to address the fact that administrative claims often do not include details on clinical findings that would help to identify Alzheimer's disease and assess disease progression. The State Health Information Exchange Cooperative Agreement Program has been providing funding to help states build capacity to exchange health information across health care systems both within and across states. Many of these health information exchanges are still under development; however, in the future, perhaps there will be the opportunity to have more complete data, even when patients move between health care systems.

For data portability issues, lessons could be learned from CMS's Blue Button initiative, which allows Medicare beneficiaries to access their health information. This initiative encourages patients to connect their Medicare claims data to applications, services, and research programs that they trust. Since 2010, more than one million beneficiaries have downloaded their CMS information. This initiative is still in the early stages; however, if other commercial payers provided similar opportunities, and patients gave permission to use their long-term medical records, then it could one day be feasible to have all of a patient's claims data that would be needed to assess long-term outcomes. Medicare could also address the issue of beneficiaries shifting plans by including risk adjusters in Part D payments based on AD risk status (which would provide incentives for plans to develop and potentially share reliable data on risks). A condition-based payment model or inclusion of AD screening and early-stage management related measures in medical home and provider alternative payment models could also provide supporting incentives.

Conclusion

There has been great focus and investment in early-stage Alzheimer's disease treatments. Even after these therapies are approved and available on the market, the long time horizon for treatment effects, especially in pre-symptomatic Alzheimer's disease, is likely to be a barrier to payment and access for these therapies. Different types of value-based payment arrangements exist and could serve as potential solutions. However, a data platform to support such payment arrangements, as well as to develop better evidence and advance more efficient care models for screening and treatment, needs to be developed to fulfill the potential of new treatments for AD without excess costs. Given the magnitude of the public health burden of AD and the potential availability of new treatments in the coming years, public and private collaboration is needed now to address this challenge.
References

23. AD Measurements VS Data Sources [Internet]. ROADMAP’s Interactive Data Cube. Available from: https://datacube.roadmap-alzheimer.org/data.php?measurements=1