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Health System Readiness for Disease-Modifying Therapies for Alzheimer Disease: Summary for Carers

Key Messages

- Alzheimer disease (AD) is a degenerative condition that reduces everyday functioning. It is the leading cause of dementia. People who experience mild symptoms in the early stages of the disease may be diagnosed with early-stage AD.
- Many individuals are unaware of the symptoms of early-stage AD, and there is a shortage of health care providers trained to screen and diagnose the disease. This can contribute to long wait times for services.
- New treatments, known as disease-modifying therapies (DMTs), aim to slow the progression of early-stage AD. Right now, none of these treatments are approved for use in Canada outside of clinical trials, although they are available for use in some countries.
- Brain imaging is needed to confirm a diagnosis of early-stage AD and to check if individuals are eligible for treatment with DMTs. Brain imaging is also needed to monitor for possible side effects and adverse events of the therapy. Adverse events are unexpected and harmful effects that may happen during or after receiving therapy.
- There are a limited number of these imaging scanners available in Canada, and they are already in high demand for other uses. This demand is expected to increase if DMTs are approved in Canada.
- Some individuals may face extra barriers to diagnosis and treatment because of limited access to health care, stigma associated with their condition, and fears of racism or discrimination when interacting with the health care system. This could include members of Indigenous communities, individuals from racialized groups, newcomers to Canada, and those living in rural areas. Should these new treatments receive approval in Canada, these groups may experience even greater challenges in accessing care.
- Changes in the health system may be needed to help individuals receive timely access to services for screening, diagnosing, and possibly treating early-stage AD. Some of these changes may include:
    - ensuring an appropriate number of health care professionals, dementia specialists, and social care staff are available to support earlier screening and diagnosis
    - providing culturally sensitive and respectful care, including using screening tools and medical tests that respect individuals' diverse backgrounds, which could lead to more accurate results and diagnosis
    - improving access to diagnostic imaging to screen and monitor patients receiving treatment with DMTs.
- New technologies and digital tools are being developed that may help with some of these health care challenges. These include blood tests that are less invasive than current methods to screen for AD and computer-based screening tools. AI tools are also being developed to help diagnose AD. These AI tools analyze large and complex health, laboratory, and imaging data to find patterns that can help diagnose AD earlier.

What Is Dementia?

Dementia is a set of symptoms that affect a person's everyday activities, including memory loss, changes in mood and behaviour, and difficulties with communicating and problem-solving.[1,2] AD is a leading cause of dementia, accounting for up to 70% of dementia diagnoses.[3-5]

AD is a degenerative brain disease that causes gradual changes in the brain, leading to dementia and reducing everyday functioning. An individual may first experience mild cognitive impairment, which is a disorder that causes mild difficulties with memory and thinking and does not usually interfere with everyday activities.[1,2] Up to 15% of individuals with AD will first experience mild cognitive impairment that can progress to AD. If an individual starts to experience symptoms of AD that makes it hard for them to manage everyday tasks, they might be diagnosed with mild dementia caused by AD.[6] Early-stage AD refers to both mild cognitive impairment and mild dementia caused by AD.

In Canada, the current pathway for diagnosing and treating early-stage AD usually starts when an individual or their caregiver notices symptoms, such as memory loss or disorientation. The individual and their caregiver will typically visit their primary care provider (e.g., family doctor) who may diagnose the patient with AD or refer them to a dementia specialist. After early-stage AD is diagnosed, doctors will usually prescribe treatments that are focused on managing the symptoms of AD. Right now, there are no available treatments in Canada to slow the progression of AD.

What Is the Issue?

DMTs are treatments designed to slow the progression of AD by delaying further damage to the brain caused by AD. That is, rather than managing the symptoms of early-stage AD, DMTs address the root cause of the disease.[7] These therapies mainly focus on lowering the amount of amyloid-beta, a protein that forms plaques in the brain, which at abnormal levels can damage the brain. Most DMTs are intended for individuals with early-stage AD.

In some cases, DMTs can cause serious adverse events, which are unexpected and harmful effects that may happen after receiving therapy. Because of this, individuals receiving treatment with DMTs need regular scheduled MRI brain scans and health care appointments to make sure that the treatment is safe for the patient. This may put pressure on existing health care resources that are already in high demand.

Two DMTs are currently being reviewed by Health Canada to determine if they should be approved for use in Canada, and by Canada's Drug Agency to assess whether public drug plans should cover them.[8,9] In several countries, DMTs have received regulatory approval for use in the health care system, and new DMTs are being developed. If DMTs are approved in Canada, the way early-stage AD is screened for, diagnosed, and treated may need to change. Therefore, understanding how ready Canada's current health care system is for these changes will help policy-makers prepare for the potential use of DMTs.

What Did We Do?

We looked at publicly available information about Canada's health care system and care pathways for treating early-stage AD to prepare for the potential use of DMTs in Canada. The current report is intended for a general audience and summarizes a more comprehensive report that was published in December 2024.

What Did We Find?

We found that, if DMTs are approved for use in Canada, the current pathway may need to change in order to provide timely access to services for diagnosing and treating AD. The new, proposed pathway has 4 steps:

1. **Screening and Diagnosing Early-Stage AD:** If someone has symptoms of AD, they or their caregiver may schedule a visit with their health care provider. The health care provider, based on their assessment of the symptoms, might diagnose the patient with early-stage AD. If the health care provider thinks that DMTs could be of benefit, they may refer the patient to a dementia specialist for further testing.

2. **Determining Eligibility for Treatment With DMTs:** The dementia specialist performs tests to determine if DMTs are a suitable treatment option for the patient. If the specialist concludes that DMTs could be beneficial, the patient decides whether to start treatment. However, because there are a limited number of specialists and most work in urban areas, wait times for appointments could be lengthy.

3. **Providing Treatment With DMTs:** To receive treatment with DMTs, the patient may need to travel to a clinic up to 2 times per month. A caregiver may accompany the patient to their appointments.

4. **Monitoring the Safety and Effectiveness of Treatment:** The patient would need to have regular check-ups and brain imaging scans to monitor for any adverse events and side effects and to ensure the treatment is working as expected.

Step 1: Screening and Diagnosing Early-Stage AD

In the first step of the proposed pathway, health care providers would use specific tests and tools to screen and diagnose early-stage AD. It is important for individuals can be assessed and diagnosed at an early enough stage to benefit from treatment with DMTs.

The symptoms of early-stage AD can be hard to recognize because they may present as “normal” signs of aging.[10] Symptoms may include forgetting names and places and feeling disoriented.[1,11] Many people experiencing these symptoms may not recognize something is wrong or they may hesitate to seek professional help because of the stigma or fear linked to dementia.[12]

Public education and advocacy campaigns can play a big role in helping individuals better understand early-stage AD, its symptoms, and how to manage it.[13] When individuals know more about the condition and feel less ashamed or afraid to talk about it, they are more likely to seek screening earlier.

Caregivers often play a crucial role in noticing the early symptoms of AD and providing support.[14-16] Investing in education initiatives and resources that help caregivers to identify these early signs may enable individuals with symptoms to seek appropriate care and support earlier in the disease progression.

Step 2: Determining Eligibility for Treatment With DMTs

Once the diagnosis of early-stage AD is confirmed, a dementia specialist may order more advanced tests to determine if DMTs are a suitable treatment option.

Some of these tests measure the amyloid-beta protein. An abnormal buildup of this protein is believed to cause damage to the brain.

- Specialists may order a cerebrospinal fluid test that checks the amount of amyloid-beta using a needle that is inserted into the spine in the lower back of the patient. This is called a lumbar puncture.
  - Some individuals may be uncomfortable or scared to have a needle inserted into their spine.[17] However, explaining how safe and effective the test is and involving patients in the decision-making may help to ease these concerns and reduce any discomfort or fear.[18,19]
- Specialists may instead order a PET-CT scan to check the amount of amyloid-beta in the brain.
  - PET-CT uses special radioactive chemicals, called radiotracers, which are injected into the body to measure the amount of amyloid-beta in the brain. This scan confirms that a patient has high enough levels of amyloid-beta to qualify for treatment with DMTs.[20]
- Specialists may also order an MRI exam to assess a patient’s risk of experiencing adverse events. An MRI scanner is a type of machine that uses powerful magnets and radio waves to take pictures of the body.[21,22]
- In countries that have approved the use of DMTs, at least 1 MRI brain scan is required before a patient can start treatment.[23] This exam confirms that the treatment is suitable for the patient.[24,25]
- DMTs may cause brain changes that can lead to serious adverse events, such as brain swelling and brain bleeding.[23,26] Research has shown that people who carry a specific gene called APOE4 are

more at risk for these adverse events. Because of this, the specialist may order genetic testing to help understand the potential risks involved with treatment and the potential side effects.[23] This test can be done by taking a sample of blood or saliva.

Step 3: Providing Treatment With DMTs

If an individual is confirmed to have early-stage AD and they agree to DMT treatment, then they will receive the treatment during regular appointments.

- Patients receiving treatment with DMTs will travel to a clinic to have the medication provided as an intravenous drip (i.e., IV), which is a tube that is usually placed into a vein in their arm. The treatment is given every 2 to 4 weeks and a session can take from 1 to 2 hours to complete.[27]
- Patients receiving the treatment will need to wait at the clinic after the infusion is finished in case there are any adverse reactions.[23,27]
- In Canada, more than 50% of treatment infusions completed outside of hospitals are provided at private clinics that are supported by drug companies.[28,29] It is unclear if these private clinics will have permission to provide DMTs to treat early-stage AD.[30] Developing a system to track which clinics can provide these therapies may help with treatment planning and ensure that patients have access to the care they need.

For the DMTs that are currently under review, there are safety guidelines that determine how DMTs should be administered. However, the way DMTs are delivered to patients may change as new versions of these therapies are developed and approved.

Step 4: Monitoring the Safety and Effectiveness of Treatment

Once an individual has begun treatment, they will need to be monitored over time by their health care provider and possibly their caregiver.[5] This would ensure that any potential side effects are detected early and that the treatment is working.

Side Effects and Adverse Events

Up to 25% of individuals treated with DMTs may experience temporary symptoms like dizziness, headache, and nausea. More serious adverse events like brain swelling, brain bleeding, and in rare cases, death, can occur.[23,26]

In countries where DMTs are currently used, regular brain imaging scans are required during treatment to check for adverse events. The doctor may pause treatment if side effects or adverse events are observed, or they may stop treatment altogether if there are serious adverse events.[5,31]

If DMTs are approved in Canada, health care providers may benefit from additional training on how to notice and treat these adverse events.[27]

Treatment Length

Right now, it is unclear how long individuals should stay on treatment with DMTs. Clinical studies have focused on its short-term use in patients with early-stage AD, so it is not well known how useful these treatments are as the disease progresses.[32,33]

Patients will need to have regular check-ups with their care provider to monitor disease progression. This could include regular tests and brain scans to ensure they are still benefiting from the treatment.[33]

Challenges and Barriers

Accessing Health Care Services

For many individuals experiencing early-stage AD symptoms, getting the right medical care can be a challenge. In Canada, approximately 17% of people do not have a family doctor and rely on walk-in clinics or emergency departments for care.[34-36] Without a primary care provider, symptoms of early-stage AD are more likely to go unnoticed, leading to delays in diagnosis and treatment and allowing the disease to progress untreated.[37,38]

The following sections describe the several barriers and challenges that may make it difficult for individuals to receive timely care and treatment with DMTs.

Geography

- It may be hard for people living in rural areas to find a health care provider because less than 10% of family doctors work in these regions.[39,40] Also, dementia specialists and treatment clinics are typically located in cities, making it difficult for rural residents to obtain local care and support.[2,41,42] Often, individuals will need to travel long distances to access these services, which can be expensive and cause delays in initiating treatment.[30,43-45]

Access to Specialists

- There are a limited number of dementia specialists trained to diagnose early-stage AD, so individuals may have to wait a long time to get an appointment. On average, it can take more than 2 years. During this time, an individual's symptoms may worsen as the disease progresses, making them no longer eligible for treatment with DMTs.[2]

Unequal Access to Services

- Members of Indigenous communities may face challenges when it comes to accessing health care, and many do not have regular access to a primary care provider.[46,47] People from these communities may hesitate to seek care because of historic and ongoing systemic barriers, along with experiences of racism and discrimination in the health care system.[48]
- Similarly, individuals from racialized groups and newcomers to Canada may struggle to find medical care that aligns with their cultural beliefs and values.[49-51] There may be a stigma around dementia that makes it more difficult for individuals from these communities to seek help.[48]

Navigating the System

- In many regions of Canada, there are limited networks of health care professionals to guide individuals through the diagnosis process, making it harder for individuals showing early signs of dementia, and possibly their caregivers, to access the health care system.[52-55]
- For individuals located in rural areas or those who do not speak English or French, finding the right support can be even more challenging.[48] Without guidance to navigate the health care system, individuals with early-stage AD symptoms and their caregivers often face the overwhelming and confusing task of managing the system on their own.[55]

Advocating for Care

- People with early-stage AD symptoms and their caregivers often need to be persistent in seeking a diagnosis and potential treatment. Family doctors have been reported to overlook early signs of AD or dismiss concerns raised by patients or caregivers.[10,56-59] As a result, patients and their caregivers often must advocate vigorously for themselves, investing significant time and effort to schedule multiple appointments to receive the best care.[57,60,61]

Health Care System Challenges

There are challenges within the health care system that could make it difficult for individuals to get screened, diagnosed, and treated for early-stage AD. The following sections describe some of these challenges.

Dementia Training

- Diagnosing early-stage AD requires specific tests, like memory and reasoning assessments, that are completed by professionals with knowledge of the condition. Many doctors may not have training to spot the early signs of AD or conduct these tests, which can lead to delays in diagnosis and potential treatment.[34-36] By providing doctors with more training on the symptoms and available treatments, they will be better equipped to diagnose the disease sooner.
- Professionals conducting imaging scans may need extra training to better spot brain changes caused by possible adverse effects related to DMTs. Part of this training may include creating clear methods and tools to understand how the results of the scans can influence treatment.[62]

Tools for Diagnosing Early-Stage AD

- Many of the assessments and exams used by medical professionals to diagnose early-stage AD may have a cultural bias. This means that the test results may not be accurate for individuals from some ethnic or racial groups.[63-65] How individuals view and think about early-stage AD may differ between cultures, and doctors may not always be trained to recognize these differences.[66-68]
- Using diagnostic tests that consider cultural differences, and providing care that respects individuals' backgrounds, can lead to more accurate results and ensure that everyone gets an accurate diagnosis.[69,70]

Coordinating Care

- Getting screened, diagnosed, and treated for early-stage AD may take a lot of time, effort, and organization for patients and their caregivers.

- It can be difficult to coordinate care and monitor treatment side effects for patients who use both public and private services. For example, people being treated for early-stage AD may be monitored by their primary care provider or dementia specialist in the publicly funded health care system while receiving treatment at a privately funded clinic. More effective communication between these 2 sectors may better support patient care.
- Collaboration between doctors, dementia specialists, social workers, and other health care providers with dementia training may make it easier and faster for individuals to get screened, diagnosed, and possibly treated.

Access to Brain Imaging

- To confirm a diagnosis of early-stage AD, a doctor or dementia specialist may refer patients for a brain scan that uses imaging equipment. In Canada, most imaging machines are located in cities. Patients who live far away from these imaging machines may need to travel long distances to attend imaging appointments, which can add extra costs and travel time.[43,45,71] These costs and time would be even greater if a caregiver accompanies a patient to their appointments.
- The MRI and PET-CT imaging machines used to take brain scans are in high demand, and often other types of scans, like those for cancer, may be prioritized.[72] This means that individuals may have to wait longer to have a scan, which could delay the start of treatment.
- There is a shortage of staff trained to operate these imaging machines.[73-76] If DMTs are approved, the demand for these imaging services will grow, potentially leading to an increased workload and staff being overworked.[5,77-79]
- PET-CT is a special type of imaging scanner that needs chemicals, called radiotracers, to take pictures of the brain. There are only a few machines in Canada that produce these radiotracers. These machines can be far from where patients have their brain scans, and it can be expensive to ship the radiotracers over long distances. If there are delays in producing or shipping the radiotracers, patients eligible for treatment with DMTs might have their appointments rescheduled or cancelled.[80] Increasing the number of machines that produce radiotracers may help ensure appointments stay on schedule.

Opportunities for the Future

New and advanced tools are being developed to help address some of the challenges of early-stage AD. These tools can help screen, diagnose, and treat people earlier, while also overcoming some of the challenges within the current health care system. Examples of these tools include:

- **Special blood tests that can diagnose and monitor AD:** These tests can be performed through a standard blood draw and are less invasive than a lumbar puncture and a PET-CT scan.[81,82] These tests are meant to be used alongside memory and reasoning assessments to diagnose early-stage AD.

- **More sophisticated imaging tools:** New imaging machines may be smaller and more portable, which means they could be used in clinics and rural areas that normally do not have access to sophisticated imaging equipment.
- **New treatment options:** Several new DMTs are in development that may allow treatment to be administered in the patient's home.
- **Tools to help with diagnosis:** New diagnostic tools are being developed, including computer-based screening, that are more accessible and user-friendly for patients. There are also tools in development that use artificial intelligence to improve the screening and diagnosis of early-stage AD.

Final Thoughts

Our review of how ready the public health system in Canada is to adapt to the potential approval of DMTs shows that a new health care pathway may be needed to make sure individuals have fair and timely access to this treatment. The pathway could include 4 steps:

1. screening and diagnosing early-stage AD
2. determining eligibility for treatment with DMTs
3. providing treatment with DMTs
4. monitoring the safety and effectiveness of treatment.

Several changes may be needed to implement this new health care pathway. Some of these changes involve ensuring that there are appropriate numbers of social support and medical imaging staff as well as providing specialized training. Other changes that may be needed include increasing the inventory of imaging equipment and the capacity of laboratory services and public treatment clinics.

Certain groups in Canada may face additional challenges in accessing the professionals, services, and resources needed to diagnose early-stage AD, including barriers to beginning treatment and to receiving follow-up care.

DMTs have the potential to improve patient care for early-stage AD. The full report informs policy-makers about the various factors that may be considered when preparing for the potential use of DMTs in Canada.

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Canada's Drug Agency (CDA-AMC) is a pan-Canadian health organization. Created and funded by Canada's federal, provincial, and territorial governments, we're responsible for driving better coordination, alignment, and public value within Canada's drug and health technology landscape. We provide Canada's health system leaders with independent evidence and advice so they can make informed drug, health technology, and health system decisions, and we collaborate with national and international partners to enhance our collective impact.

Questions or requests for information about this report can be directed to Requests@CDA-AMC.ca.