Practical Considerations in the Administration of Aducanumab for the Neurologist

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Overview

Aducanumab (Aduhelm®), developed by the biotechnology firm Biogen in Cambridge, Massachusetts, was approved using the less common accelerated approval pathway by the Federal Drug Administration (FDA) reserved for treatments that fill a significant unmet need.1 Its approval on June 7, 2021 has been met with an outpouring of opinions from prescribers, insurers, advocacy groups and hospital systems regarding its risk benefit profile.2-4 Originally approved for all forms of Alzheimer’s disease (AD), the FDA updated aducanumab’s labeling on July 8th, 2021 for “treatment in patients with mild cognitive impairment or mild dementia stage of disease, the population in which treatment was initiated in clinical trials.”5 With six million people nationally in the United States who suffer from AD and an anticipated one third of those who may now fulfill the criteria under the revised labeling, the implications of aducanumab’s approval continue to generate national interest.6

Aducanumab (Aduhelm) is a monoclonal antibody targeting amyloid deposits in individuals with mild Alzheimer’s disease. After titration, infusion of 10mg/kg over one hour occurs every 4 weeks. After titration, infusion of 10mg/kg over one hour occurs every 4 weeks of removing toxic amyloid beta from the brain of patients. There are no guidelines for treatment cessation other than development of severe amyloid related imaging abnormalities (ARIA). Neurologists will have to consider the availability of amyloid beta (aβ) positron emission tomography (PET) scans or lumbar puncture to detect abnormal levels of cerebrospinal fluid (CSF) biomarkers, learn how to infuse their patients and familiarize themselves with several aspects related to the coordination of care in administering aducanumab. Here we outline several aspects of current coverage policies and practical considerations for initiating treatment with aducanumab.

Introduction:
The amyloid hypothesis postulates that that deposition of β-amyloid peptide (AβP) is the primary event in AD pathogenesis.7 Aducanumab is high-affinity, recombinant, human immunoglobulin G1 (IgG1) monoclonal antibody targeting soluble amyloid beta (Aβ) aggregates and insoluble fibrils. Aducanumab was evaluated in three studies: a phase 1b (PRIME) and two phase 3 trials (EMERGE and ENGAGE). The PRIME study showed a time-and dose dependent reduction in brain Aβ levels plaque and comparatively less cognitive decline in the aducanumab 10 mg/kg arm.8 Both EMERGE and ENGAGE trials were halted after futility analysis. The ENGAGE trial showed no benefit of aducanumab versus placebo in both doses tested.9 However, a reduction in clinical decline was noted in EMERGE and this finding was supported by ad hoc analysis of a subset of patients receiving aducanumab 10 mg/kg.10 Both studies showed dose- and time-dependent reduction in amyloid pathology.9,10
Patient eligibility

**Cognitive impairment:** Based on the criteria used in clinical trial, patients with mild cognitive impairment (MCI) due to AD or mild AD would be candidates to receive aducanumab (Mini Mental State Examination Score (MMSE) between 24-30 and Clinical Dementia Rating Scale (CDR) of 0.5). Even though aducanumab was initially approved for treatment of any individual with AD, the labeling was modified in July 2021 to reflect this narrower indication. Others have suggested a Montreal Cognitive Assessment (MOCA) score ≥17 or MMSE ≥ 21 as test-retest reliability of the MMSE score is 3 points, hence a score of 24 and 21 are virtually identical.

**Amyloid positivity:** Presence of amyloid pathology was a criterion for inclusion in clinical trials, but this criterion is not included on the aducanumab label. In the clinical trials, Aβ positron emission tomography (PET) was utilized to detect the necessary pathology but other tests, including cerebrospinal fluid (CSF) analysis of Aβ 42, total tau (t-tau)/ Aβ 42 ratio and phosphorylated tau(p-tau) 181/Aβ 42 ratio, have good concordance with results of Aβ PET scans. Special handling is required for CSF samples. The sample must be collected in low-binding polypropylene tubes (not polystyrene collection tubes typically included in lumbar puncture collection kits) and the sample must be kept and shipped between 2-8 degrees Celsius after collection. Biogen has instituted a provider support program for processing of CSF AD biomarkers which will provide the appropriate tubes for sample collection. Blood tests to detect AD biomarkers are also being developed.

**Magnetic Resonance Imaging (MRI):** A baseline MRI with appropriate sequences: fluid-attenuated inversion recovery (FLAIR) T2*-weighted gradient-recalled-echo (T2*GRE) or susceptibility weighted imaging (SWI), quick diffusion-weighted imaging (DWI) is needed to determine if there are contraindications to receiving aducanumab. Potential contraindications include acute or subacute hemorrhage, macrohemorrhage, ≥4 microhemorrhages; presence of cortical infarction > 1.5 cm or lacunar infarction > 1.5 cm; 1 area of siderosis; and diffuse white matter disease.

**Exclusion criteria:** Participants were excluded from the trials for use of anticoagulants or antiplatelets other than aspirin. A complete listing of the exclusion criteria for the phase 3 trials compared to the limitations included on the aducanumab label are detailed in Table 1. Additional practical considerations regarding patient selection may include presence of coagulopathy, unstable psychiatric condition, unstable medical or cardiovascular disease, organ failure, active neoplasia (other than low grade basal and squamous cell cancer), contraindications to completing PET scans or brain MRIs (including the presence of an MRI incompatible implanted device) and if the patient has a reliable caregiver or informant to ensure accurate reporting of their response to intervention. Although not a contraindication, others have recommended against treatment in patients with Down Syndrome, dementia with Lewy bodies and cerebral amyloid angiopathy regardless of amyloid positivity status since data regarding the potential risks and benefits of treatment with anti-amyloid therapy is scarce in these patient populations. Caution should be exercised also on patients with autosomal dominant AD and those with atypical syndromes for similar reasons.

**APOE-4 testing:** Patients heterozygous or homozygous for APOE-4 may have different responses to aducanumab and are at higher risk to develop ARIA. Consider testing when discussing risks and benefits of treatment with patients, including lack of insurance coverage for testing and additional genetic counseling.
Imaging Recommendations During Course of Therapy:
A baseline MRI of the brain should be obtained no more than 12 months prior to the first infusion. While the labeling comments that the safety of aducanumab in patients with any pre-treatment superficial siderosis, 10 or more brain microhemorrhages, and/or a brain hemorrhage greater than 1 cm within one year of treatment has not been studied, participants were excluded from the PRIME trial if they had more than 4 microhemorrhages on baseline MRI, a cortical infarct or greater than 1 lacunar infarct.

Greater than 40% of participants in the Phase 3 trials experienced ARIA events. The majority were asymptomatic (24% symptomatic at the 10mg/kg dose). Thirty five percent of individuals had edema (ARIA-E) but a significant proportion also had hemorrhagic events (ARIA-H). Hemorrhagic events included microhemorrhage 19.7%, superficial siderosis 13.3%, and cerebral hemorrhage 0.5%. ARIA-E was more common in ApoE-4 carriers (42% vs 20%) and the majority of events occurred within the first 8 doses. The aducanumab labeling advises MRI imaging before the 7th and 12th aducanumab infusions which differs from the clinical trials where surveillance MRIs were completed at weeks 14, 22, 30, 42, 54, 66 and 78. A recent expert consensus recommendation suggested brain MRI prior to 5th, 7th and 12th infusions as well as imaging prior to the 10th dose in APOE-4 carriers.

Possible ARIA-related symptoms include headache, confusion, acute changes in cognition, dizziness, visual changes and nausea. Seizures, gait changes and alterations in consciousness have also been reported. Additional brain MRI’s should be obtained if any new neurological symptoms develop while an individual is receiving aducanumab. Dosing was suspended in the trials for participants with symptomatic ARIA or moderate to severe asymptomatic ARIA and was stopped for any participant with severe ARIA-H. (Moderate ARIA-E: FLAIR hyperintensity of 5-10cm or more than 1 site of involvement each measuring<10cm; Severe ARIA-E: One or more areas of FLAIR hyperintensity>10cm with significant subcortical white matter and/or sulcal involvement; Moderate ARIA-H: 5-9 new microhemorrhages or 2 areas of superficial siderosis; Severe ARIA-H: 10 or more new microhemorrhages or >2 focal areas of superficial siderosis)

ARIA-E resolved in 68% of the participants in 12 weeks and 91% by 20 weeks. Currently, monitoring is recommended for any patient continuing infusions with mild to moderate ARIA. One may wish to consider monthly MRI in patients with symptomatic ARIA or moderate to severe asymptomatic ARIA after dosing is suspended, with resumption after symptom resolution in ARIA-E and after stabilization of imaging changes in ARIA-H. Patients with asymptomatic ARIA that is mild may be able to continue dosing with monthly MRI surveillance.

Practical considerations:
Patient selection: Once an individual has been identified as a potential candidate for aducanumab, the provider needs to have a detailed discussion with the patient, their family and care partner to help manage therapeutic expectations. In post hoc analysis of the trial data, aducanumab did not reverse cognitive dysfunction. Analysis of the data only demonstrated a modest degree of protection against the progression of cognitive decline in a subset of individuals receiving the highest dose of medication. The burden of Aβ pathology is reduced with use of this medication, but no correlation between biomarker change and cognitive benefits has been demonstrated. The populations included in these trials were not ethnically diverse, and many populations, including Blacks, Hispanics and indigenous people, were not well represented. Therefore, safety and efficacy in these populations is not known.
Neurologists should be aware of the dosing window and need for monthly infusions and ensure that patients have reliable transportation to infusion and imaging appointments. Patients and care partners should be counseled to inform treating physicians of any symptoms or changes in status that could indicate adverse treatment effects. Shared decision making and informed consent should occur with the patient, care partner and physician ensuring that the treatment has the potential to meet the patient’s desired goals of care. Patients should also be aware of their potential financial responsibility associated with infusions and diagnostic testing as well as clinical and radiographic monitoring.

**Dosing for Aducanumab:** The titration schedule for aducanumab is shown in Table 2. The recommended dosage of aducanumab is 10 mg/kg given intravenously over approximately one hour every four weeks. Aducanumab is available as 170 mg/1.7 mL (100 mg/mL) and 300 mg/3 mL (100 mg/mL) solution in single-dose vials. The wholesale acquisition cost (WAC) of aducanumab is $952 for the 1.7 mL and $1680 for the 3 mL package size resulting in an estimated cost of $4,300 per infusion for an 80 kg patient. The yearly cost at the maintenance dose of 10 mg/kg is estimated at an average of $56,000 by the manufacturer which will vary based on patient weight and first year titration costs.

The actual costs of administering aducanumab go beyond the cost of the drug and include infusion related -administration costs, nursing time, clinical and imaging monitoring. Both clinical and MRI monitoring will increase in frequency should ARIA be detected. The drug pricing watchdog group, the Institute for Clinical and Economic Review (ICER) health-benefit price benchmark range for aducanumab is $3,000-$8,400 per year for patients with early Alzheimer’s disease – which would require an 85-95% discount off the treatment’s US list price of $56,000. Members of the California Technology Assessment Forum an independent appraisal committee of ICER voted 15-0 against both safety and efficacy of aducanumab.

**Treatment Monitoring and treatment cessation:** Monitoring of cognitive and functional status should use objective assessment tools such as the MMSE, MOCA, Dementia Screening Interview (AD8), Neuropsychiatric Inventory (NPI) and the Functional Activities Questionnaire (FAQ). Other than the development of severe ARIA-H, it is unclear when and how to stop treatment. An honest discussion with patients and care partners should ensue when a patient progresses to moderate or severe stages of Alzheimer’s as aducanumab was not tested in these patient populations. Difficulties adhering to treatment protocols or other adverse effects may also result in discontinuation of this medication.

**Imaging:** Patients must be referred to facilities able to perform MRIs with appropriate sequences to detect microhemorrhages and ARIA, and who have radiologists with experience and comfort in ARIA identification. Quick and reliable communication of abnormal results between radiologist, neurologist and patient is important to ensure patient safety.

**Infusion considerations:** When choosing an infusion center, consider proximity of the infusion site to the patient’s home or workplace, participation with the patient’s insurance plan, environment, responsiveness of the infusion nurses and efficiency of the scheduling. Infusion locator services provide the most convenient way to locate an external infusion center. Outreach to a few local external infusion centers to gather more detailed information about these factors will provide a smoother transition for patients and providers when utilizing an external infusion site.
**Workflow:** Patients will need baseline MRI and CSF analysis or Aβ PET imaging to establish treatment eligibility, but they will also require repeat surveillance and possible unscheduled MRI exams. Neurologists should ensure that a system is in place to track overdue and missing test results and communicate quickly with patients in cases of ARIA. Offices will need to consider whether to provide infusion services in-house or use an outside facility; factors to consider include drug purchase and storage, patient monitoring, and infusion chair capacity and turnover.

**Coverage for Aducanumab:**

While the debate about aducanumab’s efficacy, safety profile and mechanism of action shows no signs of abating, some health insurers and hospitals are moving forward with coverage and access related decisions. Most notably, on July 12th, 2021, the Center for Medicare and Medicaid Services (CMS) opened its National Coverage Determination (NCD) analysis period for aducanumab. The NCD is a process that allows CMS to determine whether Medicare will establish a national coverage policy for monoclonal antibodies targeting amyloid for the treatment of AD including aducanumab and future class related therapies. The first of two public listening and commentary sessions was held on July 22nd and CMS anticipates the final NCD policy to be published sometime in April, 2022.

Some hospitals have taken a definitive approach regarding access to aducanumab. At the time of this writing, the Cleveland Clinic, Mount Sinai Health System in New York and Providence Hospital in Renton, Washington State have announced that they will not be administering aducanumab in their facilities. Several Blue Cross Blue Shield (BCBS) Health plans have already adopted the position that aducanumab is considered investigational due to insufficient evidence of clinical benefit and is therefore not eligible for coverage under medical necessity. Most recently, the US Veterans Administration has decided not to cover aducanumab on its National Formulary. In summary, few health care institutions have announced their policies concerning access to aducanumab and several insurers have made public their plans related to coverage before CMS has finalized its coverage policy.

**Practice and Patient Expenses:**
The FDA approval of aducanumab could present multiple challenges to clinical practice. One immediate challenge is the increased demand for screening using cognitive tools and AD biomarker testing to provide a formal diagnoses of AD dementia for an undiagnosed, symptomatic population and older adults worried about their subjective memory losses. The capacity of academic memory disorder centers to absorb this demand may be stretched as indicated by a recent analysis. Similarly, the increased demands on diagnostic Aβ PET imaging and MRI based surveillance monitoring may further burden imaging facilities. For private practices entering into the world of infusible therapies for the first time, consideration of how insurers reimburse infusible therapies, which infusion sites are covered under a patient’s insurance benefit and familiarizing themselves with infusion billing codes are critical.

The decision to prescribe aducanumab may be especially difficult for small and solo practitioners. Before the medication is even prescribed, appropriate resources need to be identified. The coordination of the many tests required to identify and monitor patients prior and during therapy, scheduling monthly infusions and arranging for the frequent required clinical visits will place an undue burden on practices who may not have extra patient care and administrative resources to devote to a select patient population. Table 3 contains an estimate of additional time both a practitioner in solo or a small group practice and their support staff may need to incorporate into their clinical schedule if a patient is determined to be a candidate for aducanumab therapy. Small and solo practitioners may also face an unanticipated financial burden since both CMS and private payers are still determining coverage not only for the...
medication itself but also the multiple additional imaging studies and clinical visits required to monitor patients who are taking aducanumab. Coordination of care for the patient between the neurologist’s practice, the patient’s insurer and the external infusion site may present unforeseen challenges, as well.

As insurers are still grappling with coverage decisions, potential out of pocket expenses for patients insured under CMS can be hefty due to the cost of their deductible and the 25% coinsurance associated with costs in the initial coverage period. Patients will have to accrue up to $7050 out of pocket costs before they reach the catastrophic benefits period in 2022 when their out of pocket expenses dramatically decreases. Currently, Medicare beneficiaries in Part D plans can only access copay assistance programs known as Pharmaceutical Assistance Programs or PAPs by operating outside the Part D benefit. Eligibility is based on several determinations and may be restricted to low income enrollees who have been defined all other options.

In summary, the decision by the FDA to approve aducanumab remains controversial and its administration will pose many challenges that will be new to neurologists, despite extensive experience with prior intravenous medications.

**Glossary of Terms:**

**AD**: Alzheimer’s disease: progressive neurodegenerative disease characterized pathologically by the presence of β amyloid containing plaques and tau containing neurofibrillary tangles

**Aβ PET scan**: Amyloid beta positron emission tomography scan: imaging technique which visualizes Aβ plaques in the brain

**CSF**: Cerebral spinal fluid: fluid which surrounds the brain and spinal cord

**ENGAGE Trial**: One of two Phase 3 clinical trials of aducanumab

**EMERGE Trial**: One of two Phase 3 clinical trials of aducanumab

**MCI**: mild cognitive impairment: intermediate stage between the expected changes in cognition due to aging and dementia

**MMSE**: Mini Mental State Examination Score: screening test which evaluates orientation, memory, attention, language and visuospatial skills

**CDR**: Clinical Dementia Rating Scale: numeric scale to evaluate the severity of cognitive symptoms and includes measurements of orientation, memory, judgment as well as ability to participate in community affairs and home life and complete self care needs,

**CDR-SB**: Clinical Dementia Rating Scale-Sum of Boxes: numeric scale which utilizes the same measures as the CDR (see above) but involves addition of the individual values given to each measure

**MoCA**: Montreal Cognitive Assessment: cognitive screening test which evaluates visuospatial/executive functioning, naming, attention, language, abstraction, delayed recall and orientation

**MRI**: Magnetic Resonance Imaging: scan which produces images of the body using magnetic and radio waves
ARIA: amyloid related imaging abnormalities: abnormalities seen by MRI in the brains of patients associated with amyloid modifying therapies

ARIA-E: amyloid related imaging abnormalities-edema: ARIA characterized by vasogenic edema and sulcal effusions

ARIA-H: amyloid related imaging abnormalities-hemorrhagic: ARIA characterized by intracerebral hemorrhage

Institute for Clinical and Economic Review (ICER): ICER is a private, non-profit Boston based institution whose mission is to evaluate whether the cost of new drug aligns with the value it offers to patients. ICER develops models using clinical trial data, published literature and economic evidence to establish a value-based price threshold for a new drug. ICER proposes a target price range for the new drug based on the extension of life benefits the drug offers considering its risk-benefit profile.

AD8: Dementia Screening Interview: 8 item screening interview that helps to distinguish between individuals with dementia vs patients with cognitive changes due to aging

NPI: Neuropsychiatric Inventory: measure of dementia related behavioral symptoms which evaluates for the presence of 12 neuropsychiatric disturbances

FAQ: Functional Activities Questionnaire: measure of instrumental activities of daily living including ability to prepare meals and manage personal finances

Center for Medicare and Medicaid Services (CMS): Federal agency within the department of Health and Human Services that administers Medicare program and works in partnership with states governments to administer Medicaid.

National Coverage Determination (NCD) Policy: NCDs is a Medicare coverage determination process limited to drugs, procedures, services that are within the scope of a Medicare benefit category. NCDs are made through an evidence-based process with opportunities for public comment. NCDs are developed and published by CMS and apply to all states.

References


8. 21AD301 Phase 3 Study of Aducanumab (B11B037) in Early Alzheimer’s Disease (ENGAGE).

9. 221AD302 Phase 3 Study of Aducanumab (B11B037) in Early Alzheimer’s Disease (EMERGE).


**Tables**

**Table 1:** Comparison of indications and contraindications in EMERGE and ENGAGE and current aducanumab label

<table>
<thead>
<tr>
<th>Clinical Trials</th>
<th>Current Label</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Indications</strong></td>
<td></td>
</tr>
<tr>
<td>MCI due to AD or mild AD (MMSE 24-30 and CDR 0.5)</td>
<td>MCI due to AD or mild AD (MMSE 24-30 and CDR 0.5)</td>
</tr>
<tr>
<td>Proof of amyloid pathology (positive Aβ PET)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Contraindications</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiographically severe ARIA-H</td>
<td>Radiographically severe ARIA-H</td>
</tr>
<tr>
<td>Hypersensitivity reaction including urticaria and angioedema</td>
<td>Hypersensitivity reaction including urticaria and angioedema</td>
</tr>
<tr>
<td>TIA, stroke or unexplained loss of consciousness within 1 year prior to screening for use of medication</td>
<td></td>
</tr>
<tr>
<td>History of bleeding disorder</td>
<td></td>
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<tr>
<td>Uncontrolled hypertension, unstable angina, myocardial infarction, chronic heart failure or significant conduction abnormality</td>
<td></td>
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<tr>
<td>Impaired renal or liver function</td>
<td></td>
</tr>
<tr>
<td>History of HIV</td>
<td></td>
</tr>
<tr>
<td>Contraindication to MRI or PET scans</td>
<td></td>
</tr>
<tr>
<td>Significant systemic illness or infection in the past 30 days</td>
<td></td>
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<tr>
<td>Use of any blood thinners other than aspirin</td>
<td></td>
</tr>
<tr>
<td>Alcohol or any substance abuse in the past year</td>
<td></td>
</tr>
</tbody>
</table>

Abbreviations: MCI: mild cognitive impairment, AD: Alzheimer’s disease, MMSE: mini mental status exam, CDR: clinical dementia rating scale, ARIA-H: amyloid related imagining abnormality-hemorrhagic

**Table 2: Estimated Cost of Aducanumab Treatment**

<table>
<thead>
<tr>
<th>IV Infusion-4 week intervals</th>
<th>Aducanumab dosage (mg/kg)</th>
<th>Approximate cost of infusion for 80 kg patient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infusion 1 and 2</td>
<td>1 mg/kg</td>
<td>$950</td>
</tr>
<tr>
<td>Infusion 3 and 4</td>
<td>3 mg/kg</td>
<td>$1900</td>
</tr>
<tr>
<td>Infusion 5 and 6</td>
<td>6 mg/kg</td>
<td>$2600</td>
</tr>
<tr>
<td>Infusion 7 and on</td>
<td>10 mg/kg</td>
<td>$4300</td>
</tr>
</tbody>
</table>
Table 3: Estimated burden of aducanumab administration for a solo or small practitioners

<table>
<thead>
<tr>
<th>Activity</th>
<th>Estimated Time</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Provider</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary discussion with patient and care partner regarding aducanumab eligibility including discussion of risks and benefits and completion MMSE and CDR</td>
<td>45-60 minutes</td>
<td>once</td>
</tr>
<tr>
<td>Review of screening studies (brain MRI, βamyloid scan or CSF studies), review aducanumab administration</td>
<td>45-60 minutes</td>
<td>once</td>
</tr>
<tr>
<td>Routine clinical follow up to monitor for adverse effects</td>
<td>30 minutes</td>
<td>Every other month during titration and then at provider discretion</td>
</tr>
<tr>
<td>Emergency follow up if new neurological symptoms develop</td>
<td>30-40 minutes</td>
<td>Provider discretion</td>
</tr>
<tr>
<td><strong>Support Staff</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coordination of screening studies (brain MRI, βamyloid scan or CSF studies)</td>
<td>1 week for brain MRI and 2-3 weeks for Aβ PET scan or CSF studies</td>
<td>Once</td>
</tr>
<tr>
<td>Prior authorization of aducanumab</td>
<td>1-2 weeks</td>
<td>Once a year</td>
</tr>
<tr>
<td>Coordination of aducanumab infusions (insurance authorization and ensure patient able to access infusion site)</td>
<td>1-2 days</td>
<td>Ideally once, but may vary depending on insurance issue and patient’s ability to access infusion site</td>
</tr>
<tr>
<td>Coordination of brain MRIs before infusion 7 and 12</td>
<td>1 week</td>
<td>Twice</td>
</tr>
<tr>
<td>Regular check in via phone or portal communications with patient and care partner</td>
<td>15-20 minutes</td>
<td>At least monthly, but may be more depending on patient’s status</td>
</tr>
<tr>
<td>Regular meetings with provider to update regarding patient status and determine plan of care</td>
<td>30 minutes</td>
<td>At least weekly, but will depend on patient’s status</td>
</tr>
<tr>
<td>Coordination of brain MRIs as needed to monitor for development of ARIA</td>
<td>1 week</td>
<td>Depends on patient status</td>
</tr>
</tbody>
</table>
*Based on estimations from Rocky Mountain Neurology, Denver, Colorado. The duties detailed for Support Staff may be completed by one individual or shared among several staff members depending on the practice’s resources. Abbreviations: MMSE: mini mental status exam, CDR: clinical dementia rating scale, MRI: magnetic resonance imaging, CSF: cerebrospinal fluid and ARIA: amyloid related imaging abnormalities
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