N-MOmentum—Study Design for a Placebo-Controlled Study of MED-551 in Neuromyelitis Optica

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Background: Neuromyelitis optica (NMO) is a rare inflammatory disease characterized by episodic optic neuritis and transverse myelitis, and is in clinical and immunological terms distinct from multiple sclerosis (MS). Placebo-controlled trials of NMO treatments are an important area of research. Despite designing clinical trials that meet national standards and balanced patient safety and scientific integrity, in many trials, meeting these standards is still challenging. This trial aims to develop a placebo-controlled trial of a new NMO drug, MEDI-551, an anti-CD19 antibody.

Objectives: The aim of this study is to develop a randomized controlled trial (RCT) of a novel drug treatment for patients with NMO, with the following objectives:

1. To develop a novel RCT design that incorporates patient safety and scientific integrity.
2. To develop a new NMO attack criteria set for use in placebo-controlled trials.
3. To evaluate the efficacy and safety of MEDI-551 in NMO.

Introduction

NMO is typically characterized by severe and recurrent optic neuritis, longitudinally extensive transverse myelitis, and, less commonly, brain and spinal cord inflammation.

Key inclusion criteria:

1. Aged ≥18 years
2. A new RAPD in one eye
3. A new Gd-enhanced lesion in the spinal cord
4. Presence of AQP4-IgG antibodies
5. Absence of active inflammatory lesions in a cross-sectional imaging modality

Key exclusion criteria:

1. Active infection or sepsis
2. Active malignancy
3. Severe psychiatric illness
4. Recent surgery, radiation therapy, or immunosuppressive treatment

Table 1. Summary of Challenges and Solutions for the Design of the N-MOmentum Study

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Solution</th>
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<tr>
<td>Patient safety</td>
<td>Use standard diagnostic criteria for the inclusion of patients, ensure that all patients are aware of the treatment arm they are assigned to</td>
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<tr>
<td>Scientific integrity</td>
<td>Define NMO attack criteria, use standard diagnostic criteria for the inclusion of patients, ensure that all patients are aware of the treatment arm they are assigned to</td>
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<tr>
<td>Data transparency</td>
<td>Use standard diagnostic criteria for the inclusion of patients, ensure that all patients are aware of the treatment arm they are assigned to</td>
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<td>Randomization and treatment</td>
<td>Patients are randomized to N-MO-01 or placebo at a 1:1 allocation rate and undergo cross-sectional imaging at baseline and endpoints</td>
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<td>Treatment arm</td>
<td>N-MO-01 or placebo for 28 weeks</td>
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Table 2. NMO Attack Criteria in the N-MOmentum Study

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<th>Attack Type</th>
<th>NMO Attack Criteria</th>
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<tr>
<td>Optic nerve</td>
<td>New visual field defect in one or both eyes</td>
</tr>
<tr>
<td>Brainstem</td>
<td>New evidence of brainstem involvement</td>
</tr>
<tr>
<td>Spinal cord</td>
<td>New evidence of spinal cord involvement</td>
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Conclusions

The N-MOmentum study design has garnered regulatory, ethical, clinical, and patient approval in more than 100 clinical sites from more than 100 countries. The study is ongoing and expected to be completed in 2026.

References


Author Details

B.A.C. Cree is an Assistant Professor at Alpert, Brown, and Davis, GMU Science, Medicine, Novartis, Genentech, and NOSM and has received research funding from Biogen Idec, Merck, and Neurosurgical products, and other commercial entities. The other authors declare no conflicts of interest. A. Pittock has served as a consultant for Genentech, Merck, and Neurosurgical products, and other commercial entities. The other authors declare no conflicts of interest.

Figure 1. N-MOmentum Study Overview

- Randomized, controlled period 28 weeks
- Primary end point: Time to NMO attacks after 28-week treatment
- Open-label (MEDI-551)
- MEDI-551
- Placebo
- Total of 67 attacks reported