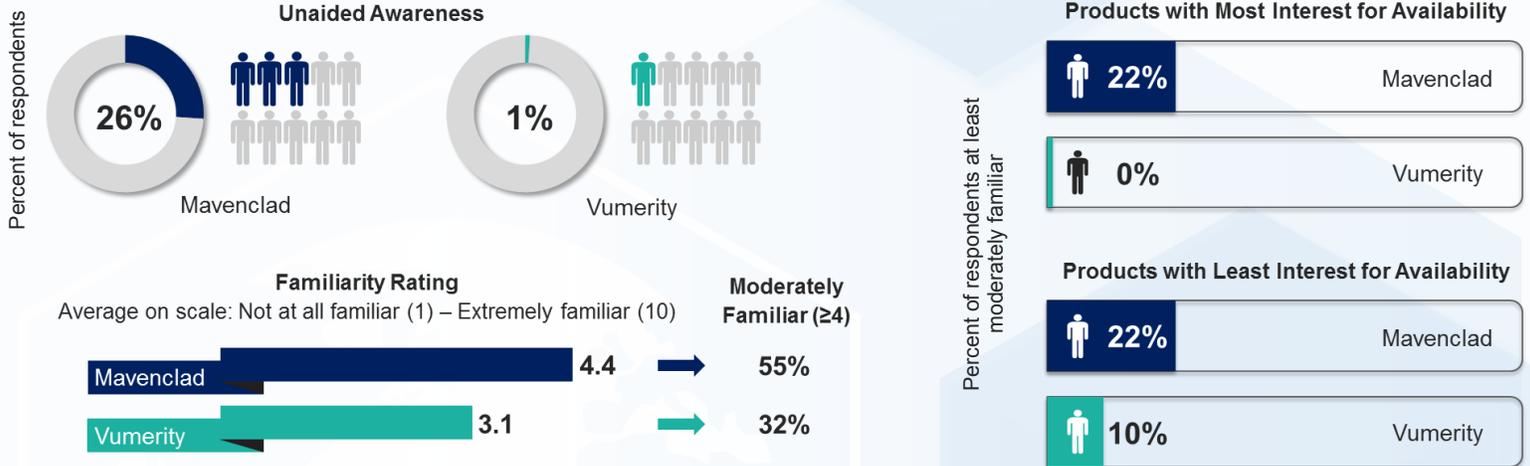


## RealTime Dynamix™: Multiple Sclerosis (US) Q4 2018

With the announcement by Alkermes and Biogen that Alkermes has submitted an NDA to the FDA for Vumerity (diroximel fumarate; BIIB098), there are now two disease-modifying therapies (DMTs) with potential 2019 launches for the treatment of relapsing forms of MS (RMS). The second DMT, whose NDA resubmission was accepted by the FDA in July 2018, is EMD Serono's Mavenclad (cladribine tablets). Although both are potential treatments for RMS, awareness, familiarity, and interest among US neurologists (n=100) vary widely for these two pipeline DMTs.

### Pipeline Comparison: Mavenclad vs. Vumerity

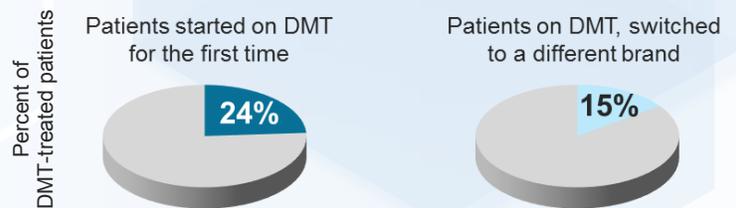


The two DMTs are also slated to be used at different points in the RMS treatment algorithm. Insights from the Mavenclad prelaunch section in the most recent *RealTime Dynamix* report suggest a later line role for Mavenclad among DMT-refractory RMS patients with aggressive disease activity. Vumerity, on the other hand, will most likely be used earlier in the treatment algorithm in Tecfidera candidates where avoidance of tolerability issues is key.

### Percent of Neurologists Who Are At Least Somewhat Willing to Prescribe Mavenclad by Patient Type

- 65%** RRMS patient transitioning to SPMS based upon confirmation of relapse-related disability accumulation
- 63%** RRMS patient transitioning to SPMS based upon confirmation of disability accumulation independent of relapse activity
- 63%** RRMS patient requiring a switch due to lack of efficacy

### Tecfidera Brand Share by New Business Source

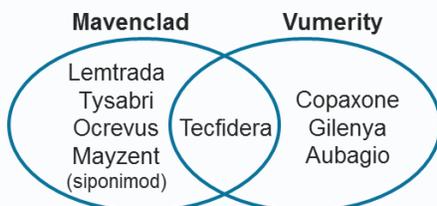


**34%** of neurologists surveyed agree with the statement, "The gastrointestinal tolerability issue has limited my use of Tecfidera."

According to a recent patient chart audit, **28%** of switches from Tecfidera were due to tolerability issues.

As a result, competitive pressure from these two upcoming launches will be mostly spread out across currently marketed DMTs and near-term pipeline agents.

### DMT Brands Most at Risk of Displacement by:



**Tecfidera will be firmly in the cross hairs for both new products** — a scenario that Biogen has surely planned for with their own Vumerity launch. However, Biogen may not be as prepared for the potential pressure from Mavenclad on efficacy-related first switches among RMS patients.



## Multiple Sclerosis (US)

### OVERVIEW

The US multiple sclerosis (MS) market is more dynamic and complex than ever with several clinically distinct disease-modifying therapies (DMTs) currently available, including Genentech's Ocrevus for primary progressive MS (PPMS) as well as relapsing forms of MS (RMS), and an active late-stage DMT pipeline. In addition, building on the first generic DMT launch in 2015, the availability of multiple generic glatiramer acetate options, as well as the possibility of oral generics over the next few years, will result in a major future shift in the landscape in the face of increasing payer pressure.

**RealTime Dynamix™: Multiple Sclerosis (US)** provides a close-quarters analysis of key performance metrics, focusing on brand gains and losses, industry contact rates, familiarity and adoption rates of recently launched products, and awareness of products in development. Product perceptions, disease awareness and attitudes, practice management and other topics are rotated throughout the year to provide an ongoing probe of the crucial drivers of change. This ongoing, independent insights series allows marketing professionals to keep abreast of and quickly react to market changes by providing critical information that will support their commercial strategies in the MS space.

### SAMPLE & METHODOLOGY

Each quarter, ~100 US neurologists provide their responses to an online survey. Respondents are recruited from the Spherix Network, a proprietary group of clinical neurologists meeting our strict screening criteria. Our relationship with this network leads to more engaged respondents resulting in higher quality output. Additionally, this gives us the opportunity to more easily revisit physicians in order to uncover even more insight on strategically important findings.

### KEY QUESTIONS ANSWERED

- How is the current and near-term landscape for the MS market evolving?
- What are the critical opportunities and barriers to growth for each brand and class?
- How is Ocrevus impacting the RMS and PPMS markets?
- How is the availability of multiple generic glatiramer acetate agents impacting the market? To what extent is use driven by neurologist choice versus payer mandate?
- How is the treatment algorithm changing with increasing oral DMT experience and expanding options within the monoclonal antibody DMT class?
- To what degree do neurologists have strong preferences for specific brands within the DMT classes? How are the DMTs delivering on the key attributes and on typical patient types?
- With fewer opportunities for personal interactions, what the best channels for industry to share product information with neurologists?
- How often are patients requesting specific DMT brands?
- What are neurologists' perceptions of late-stage pipeline assets and how do they anticipate incorporating these products into their MS treatment?

### Products Profiled

#### Commercial Products

Bayer (Betaseron), Biogen [Avonex, Plegridy, Tecfidera, Tysabri, Zinbryta (with AbbVie)], EMD Serono (Rebif), Genentech (Ocrevus, Rituxan), Genzyme (Aubagio, Lemtrada), Mylan (generic glatiramer acetate), Novartis (Gilenya, Extavia), Sandoz (Glatopa), Teva (Copaxone)

#### Pipeline Agents

AB Science (masitinib), Biogen [opicinumab, ALKS 8700 (with Alkermes)], Celgene/Receptos (ozanimod), J&J/Actelion (ponesimod), MedDay (MD-1003), Merck Serono (Mavenclad), Novartis (siponimod, ofatumumab), TG Therapeutics (ublituximab)

### Key Dates

- Q1 March
- Q2 June
- Q3 September
- Q4 December

*Note: a three day embargo is placed on delivery to non-manufacturers allowing clients time to digest the findings before public dissemination*

### Deliverables

- PowerPoint report
- Frequency table & summary statistics
- On-site presentation
- Proprietary questions (for purchasers of the annual series)

### Related Reports 2018

- *RealTime Dynamix™: Multiple Sclerosis EU*
- *RealWorld Dynamix™: DMT Switching in Multiple Sclerosis US*
- *RealWorld Dynamix™: DMT New Starts in Multiple Sclerosis US*
- *RealWorld Dynamix™: Progressive Forms of Multiple Sclerosis US*