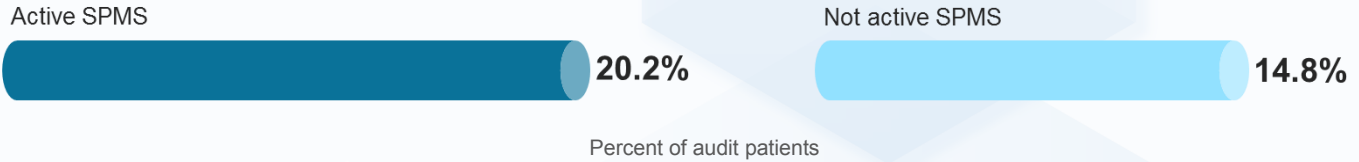


RealWorld Dynamix™: Progressive Forms of MS (US) 2018

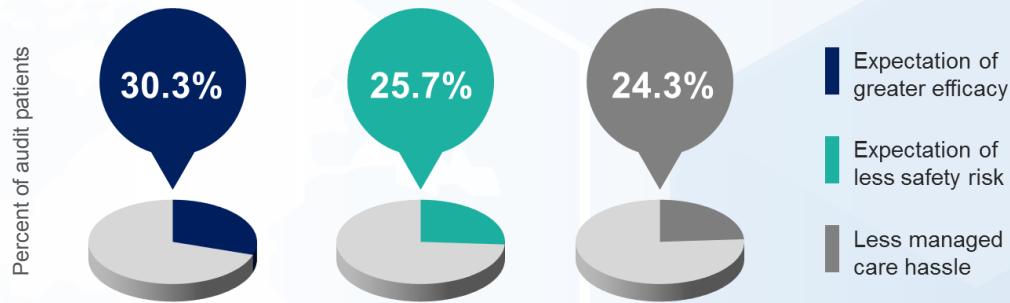
In the recent *RealWorld Dynamix: Progressive Forms of MS (US)* patient chart audit (n=755 patients), Genentech's Ocrevus was a common alternative or "back up" DMT for SPMS patients that went on to be treated with a different DMT.

Ocrevus Would Have Been the DMT Selected if Current Agent Unavailable



SPMS patients' current DMTs were preferred over Ocrevus primarily due to better efficacy expectations, reduced safety risk, and easier managed care access.

Most Frequent Reasons for Preference for Current Agent Over Ocrevus: SPMS Patients



Among Ocrevus-treated patients, neurologists believe that not active SPMS patients are more likely to discontinue all therapy in the next six months compared to active SPMS patients. Likelihood of a switch FROM Ocrevus in the next six months does not differ between SPMS subtypes.

Likelihood of Switching from Ocrevus in the Next Six Months

Average on scale:

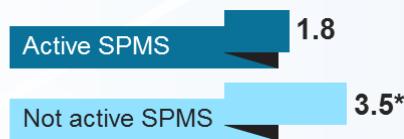
Not at all likely (1) - Extremely likely (10)



Likelihood of Discontinuing All DMT Therapy in the Next Six Months

Average on scale:

Not at all likely (1) - Extremely likely (10)



*Statistically significant difference

Satisfaction of Patient's Response to Ocrevus

Average on scale:

Not at all satisfied (1) - Extremely satisfied (10)



Assuming a positive FDA decision in Q1 2019, Novartis' Mayzent (siponimod) appears to represent a greater competitive switch threat to Ocrevus within the active compared to the not active SPMS segment.

Highly Likely Siponimod Candidate Among Ocrevus-Treated Audit Patients





Progressive Forms of Multiple Sclerosis (US)

OVERVIEW

Multiple sclerosis (MS) patients with progressive forms of MS (PfMS) have historically low disease-modifying therapy (DMT)-treatment rates due to a lack of therapies approved for PfMS and an anticipated lack of response to DMTs approved for relapsing forms of MS (RMS). With the FDA approval of Genentech's Ocrevus as the first DMT for the treatment of primary progressive multiple sclerosis (PPMS), US neurologists now have an option for one of the PfMS subtypes. However, an unmet need remains for DMTs shown to be effective for secondary progressive MS (SPMS), a niche that products in the late-stage SPMS pipeline, including Novartis' siponimod, MedDay's MD-1003, and AB Science' masitinib, are attempting to address. With the availability of an approved DMT and potentially more on the horizon, it is imperative to understand the current treatment algorithm for PfMS including how patient characteristics and neurologist perceptions influence the decision to initiate or switch DMT and the resulting brand selection. Understanding when, why, and to which product a neurologist will prescribe for a PfMS patient is critical to building an effective commercial strategy for both first-line and later-line therapies targeting this patient population.

RealWorld Dynamix™: Progressive Forms of MS (US) blends attitudinal and demographic physician survey data with patient record data to uncover how practice type and setting and certain beliefs influence the treatment pathway and to understand how marketed DMTs are being used by physicians and for what PfMS patient types. The report also captures physician's perspectives about products in development and the impact they will have on the current treatment paradigm among PfMS patients.

SAMPLE & METHODOLOGY

Spherix Global Insights conducts an online survey with ~200 US neurologists combined with a large-scale patient record audit of over 750 of their MS patients that are diagnosed with a PfMS (n=±250 each for active SPMS, not active SPMS, or PPMS) and are currently treated with a DMT. Each neurologist completes an in-depth retrospective review of their last 3-7 patients who meet specific study criteria. 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

- What is the self-reported treatment rate for active SPMS, not active SPMS, and PPMS? What are the reasons for not treating patients with a DMT?
- What clinical assessments or tests are used to help identify when a relapsing-remitting patient has transitioned to SPMS?
- What are the most frequently prescribed agents for active SPMS, not active SPMS, and PPMS? How does line of therapy for these DMTs differ between secondarily progressing MS versus primarily progressing MS?
- What are the key drivers (e.g., efficacy/safety/tolerability/patient/payer) for DMT selection?
- What is the profile of a previously treatment-naïve PPMS patient being started on an injectable vs. oral vs. monoclonal antibody DMT?
- Among patients on a second line or later DMT, how does switching decisions differ between active SPMS, not active SPMS, and PPMS patients? If previously treated, are SPMS patients typically switched to a different DMT following confirmed transition from RRMS to SPMS?
- What is the opportunity cost for each brand (e.g., where would their brand have been selected if the first choice was not available)?
- Are neurologists willing to sacrifice safety for more efficacy in certain populations of MS patients?
- What is the patient profile for a likely patient candidate for siponimod? ozanimod? MD-1003? Masitinib?

Products Profiled

Commercial Products

Bayer (Betaseron), Biogen [Avonex, Plegridy, Tecfidera, Tysabri], 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, BIIB098 (with Alkermes)], Celgene/Receptos (ozanimod), J&J/Actelion (ponesimod), MedDay (MD-1003), Merck Serono (Mavenclad), Novartis (siponimod, ofatumumab), TG Therapeutics (ublituximab)

Key Dates

- November Publication

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
- Access to de-identified database through Spherix analytics team
- Proprietary questions

Related Reports 2018

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