

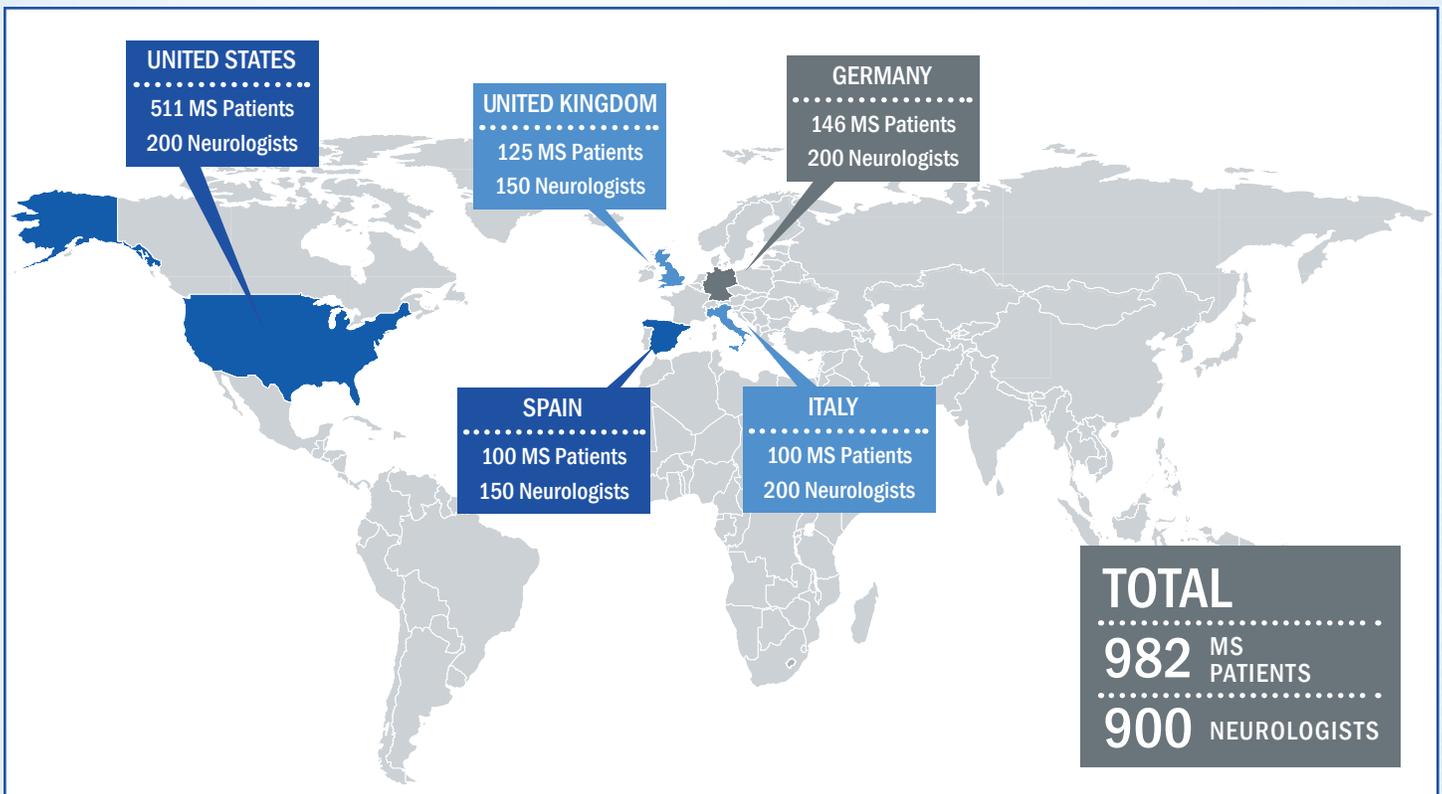
STATE OF MS

Multiple sclerosis (MS) is a chronic, often disabling, disease that **attacks the central nervous system**, which is made up of the brain, spinal cord, and optic nerves. Symptoms may be mild or severe, ranging from numbness in the limbs to paralysis or loss of vision.

The progression, severity, and specific symptoms of MS are **unpredictable** and vary from one person to another.

MS is estimated to affect approximately **2.3 million** people worldwide,ⁱ with an estimated **500,000** sufferers in the European Unionⁱⁱ and **400,000** in the United States.ⁱⁱⁱ

GLOBAL SURVEY FACT SHEET



STATE OF MS SURVEY

As part of its ongoing commitment to the MS community, Biogen Idec commissioned Harris Poll to conduct the **State of MS** survey in an effort to identify new and innovative solutions to improve care for MS patients.

The State of MS survey is a global assessment of the needs, experiences, and attitudes of people living with MS and neurologists who treat the disease in five countries (Germany, Italy, Spain,

the United Kingdom, and the United States). The purpose is to better understand the current MS experience worldwide, including an assessment of communication between patients and physicians.

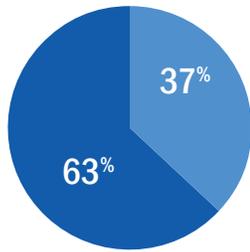
Survey development was guided by the State of MS Consortium, an international steering committee composed of neurologists and patient advocacy group representatives.

PATIENT DEMOGRAPHICS^{iv}

GENDER

BASE
n=982

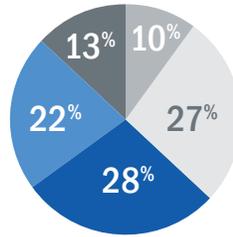
37% MALE
63% FEMALE



AGE

BASE
n=982

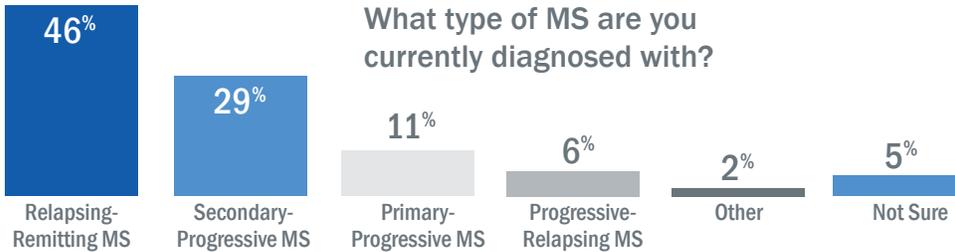
Mean:
44.9



10% 18-29 years
27% 30-39 years
28% 40-49 years
22% 50-59 years
13% 60+ years

TYPE

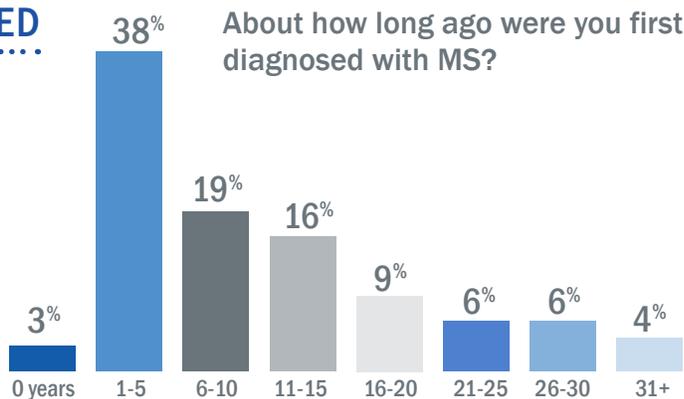
BASE
n=982



FIRST DIAGNOSED

BASE n=982

Mean: 10.8 years
Median: 8 years



Percentages may not always sum to total due to computer rounding.

SURVEY METHODOLOGY

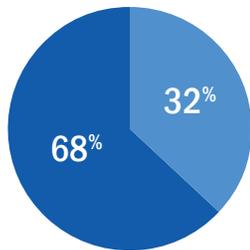
- Conducted online between 18 March – 25 April 2014
- Included MS patients 18 years of age or older in Germany, Italy, Spain, the United Kingdom (UK), and the United States (U.S.)
- MS patient responses from the U.S. were weighted for gender, age, region, race/ethnicity, education, and income where necessary to align with actual proportions within the country
- Surveyed neurologists specializing in MS and who practice within the surveyed countries
- Neurologist responses in the U.S. were weighted for gender, region, and years in practice to align with actual proportions in the U.S. neurologist population
- The remaining countries were not weighted individually; however, a global post-weight was applied to the total data in order to give each country equal weight

NEUROLOGIST DEMOGRAPHICS^v

GENDER

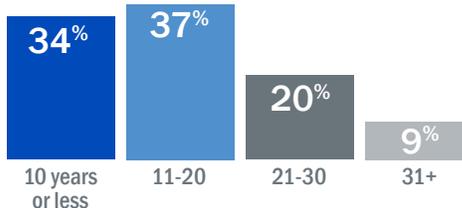
BASE n=900

68% MALE
32% FEMALE



YEARS IN PRACTICE

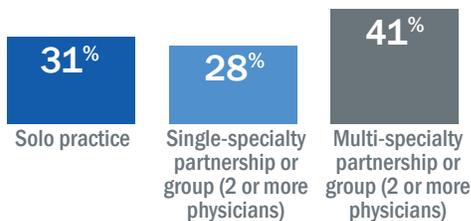
BASE n=900



OFFICE

How would you describe your office or clinic?

BASE n=418



Understanding Communication Between MS Patients and Their Neurologists

Patient and neurologist respondents were asked to respond to questions about patient/physician interaction with one another (for example, quality and comfort of relationship) and potential barriers to communication

MS patients and physicians are generally satisfied with their conversations related to the disease:^{vi}

- More than 8 in 10 patients who have seen a neurologist in the past year said they felt comfortable talking about their MS with their neurologists, characterizing their relationship as honest, open, comprehensive, and helpful
- Nearly all neurologists (96%) felt that they had an open dialogue with their patients, and 90% indicated that they have a good understanding of all aspects of their patients' disease
- When asked if his or her neurologist is accessible and spends enough time with them, close to three-fourths of surveyed patients responded positively (71% and 74%, respectively)

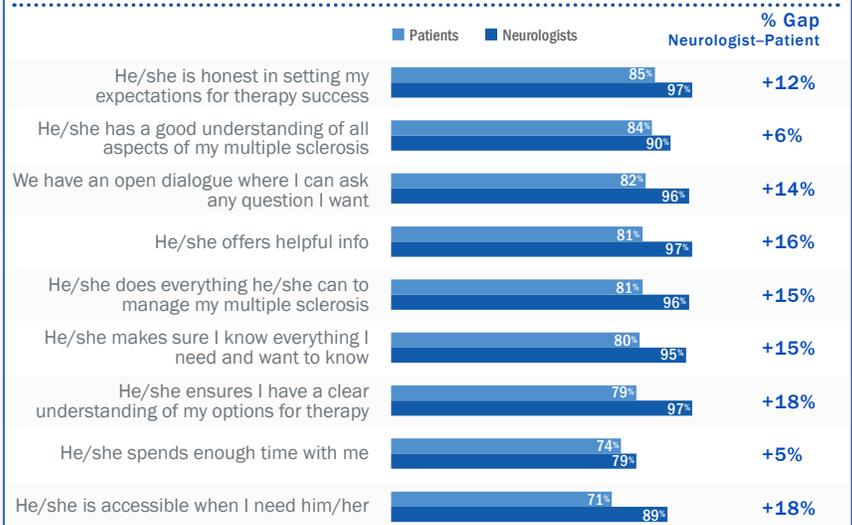
NEUROLOGISTS VIEW THEMSELVES VERY POSITIVELY

Even more so than patients, neurologists also rate themselves very positively in terms of communication and relationships with patients

PATIENTS VIEW COMMUNICATION POSITIVELY

In general, patients rate their neurologist/healthcare provider (HCP) well for honesty, openness, comprehensiveness, helpfulness, and knowledge—and also for accessibility and availability, though slightly less so

Patient/Neurologist Agreement With Statements About Communication and Relationships Percentage That Strongly/Somewhat Agree



BASE: QUALIFIED MS Patients and Saw an HCP in the Past Year (Total n=927)

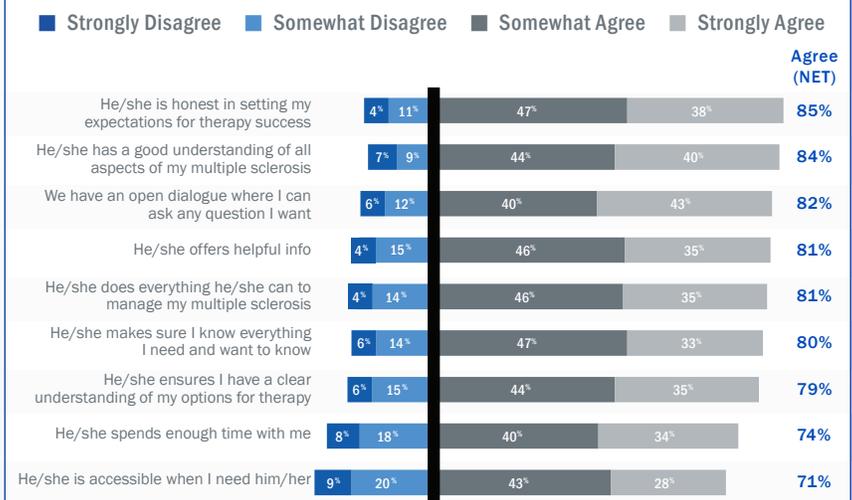
Q930 How much do you agree or disagree with each of the following statements about your communication and relationship with your neurologist / the HCP you see the most for your MS?

BASE: QUALIFIED NEUROLOGISTS (Total n=900)

Q930 How much do you agree or disagree with each of the following statements about your communication and relationship with your multiple sclerosis patient?

Please note that the patient responses are shown

Patient Agreement With Statements About Communication and Relationship With Neurologist/HCP



BASE: QUALIFIED MS Patients and Saw an HCP in the Past Year (Total n=927)

Q930 How much do you agree or disagree with each of the following statements about your communication and relationship with your neurologist / the HCP whom you see the most for your MS?

Percentages may not always sum to total due to computer rounding

Neurologists in the U.S. and Spain are more likely than their counterparts to agree that they are accessible when their patients need them

Patients in the UK are the most likely to say that their neurologist/HCP is not accessible when they need him/her

Patients who are optimistic about their future, and those who are currently on a disease-modifying therapy (DMT), are more likely to agree with all statements than their respective counterparts

Patients in the U.S. are the most likely to say that their HCP spends enough time with them (87%)

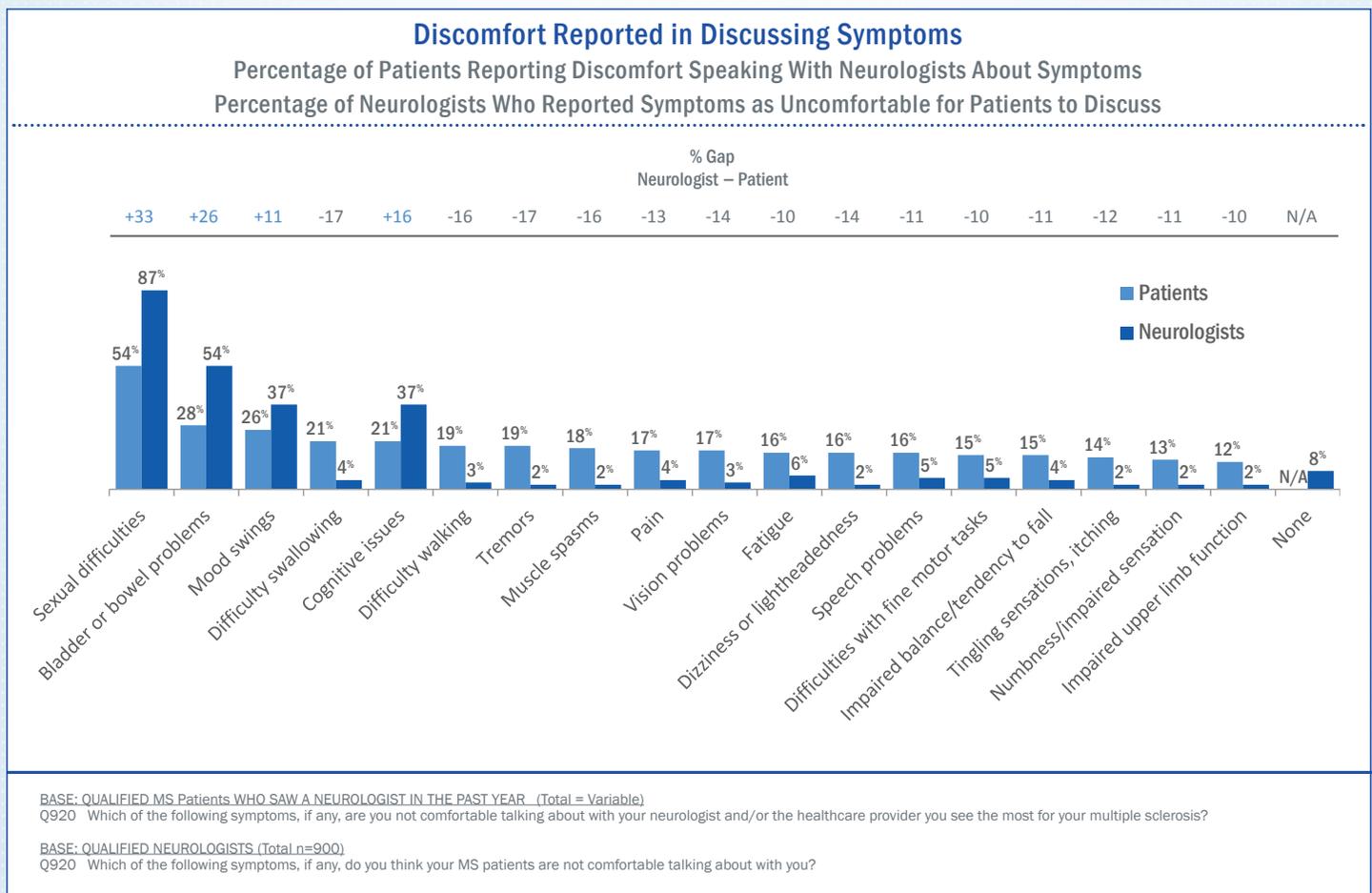
Despite Open Communication, Discomfort Remains in Discussing Typical Symptoms, Including Those That Are Private and Sensitive

Nearly 1 in 5 patients who experience MS symptoms reported being uncomfortable speaking about difficulty walking (19%), tremors (19%), and muscle spasms (18%), which are characteristic symptoms of MS^{vii}

Neurologists tend to overestimate their patients' discomfort talking about more sensitive and private topics such as sexual difficulties, bladder or bowel problems, mood swings, and cognitive issues, but tend to underestimate their discomfort discussing all other topics

In addition, MS patients said that they are uncomfortable discussing more sensitive and private symptoms with their doctors, such as:^{vii}

- Sexual difficulties (54%)
- Bladder or bowel problems (28%)
- Mood swings (26%)
- Cognitive/memory issues (21%)



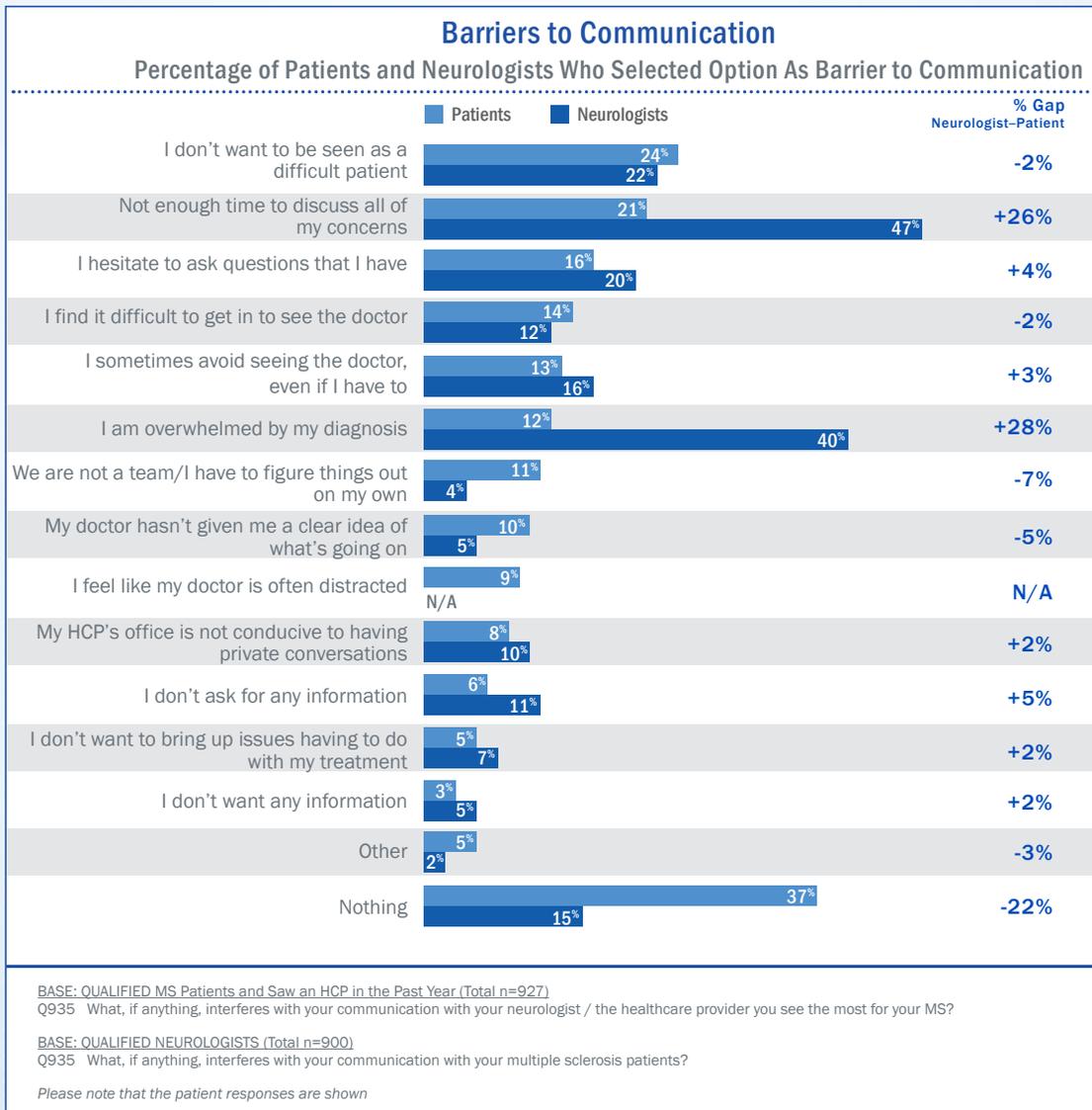
MS Patients and Neurologists Identify Barriers to Effective Communication

Nearly half of neurologists (47%) identified time as a barrier to effective communication with their patients. However, for patients, not wanting to be perceived as being difficult was cited as the most common barrier to effective dialogue (24%)^{viii}

- **Patients in the U.S.** are the least likely to say that they don't want to be seen as a difficult patient (14%)
- **Patients in Spain** are the most likely to say that they hesitate to ask questions that they have (30%)

- **Neurologists in the U.S.** are the least likely to say that they don't feel like they have enough time to discuss all of their patients' concerns (35%), and **patients in the U.S.** are among the least likely to cite a lack of time to discuss their concerns as a barrier (14%)

Neurologists who feel that time is a communication barrier are more likely to wish that they had more information on most aspects of MS to provide to their patients than their counterparts



Information Is Accessible, but More Is Needed

Patients want more information on new developments in MS treatment and research (44%)^{ix}

Seventy-two percent of patients find online and social media resources most helpful for finding information about MS

Neurologists indicated a desire for additional resources about more private symptoms to provide to their MS patients, such as:

- Maintaining cognitive function (49%)
- Managing the emotional challenges of having MS (45%)
- Being sexually active (43%)^{ix}

Nearly 3 in 4 neurologists (72%) recommend patient support organizations to their patients who wish to learn more about the disease^x

SO WHAT INFORMATION IS DESIRED?

Patients most commonly want more information on new developments in MS treatment and research, but neurologists say that they would like to be able to provide their patients with more information on means for maintaining cognitive function

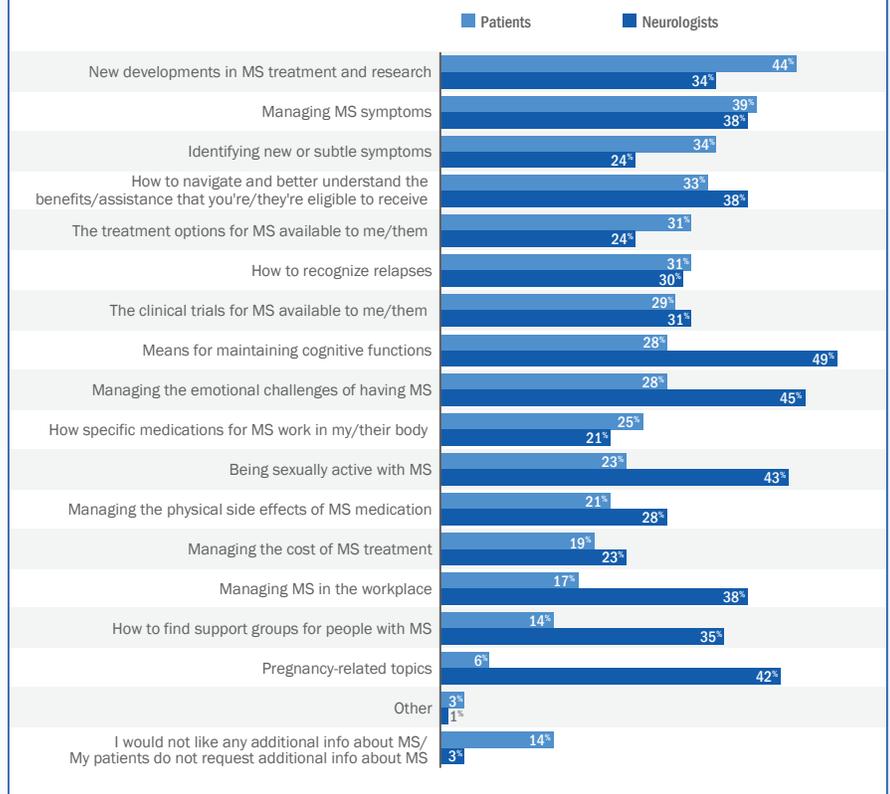
Neurologists in Germany and Spain are the most likely to mention means for maintaining cognitive functions (57% Germany, 52% Spain)

Neurologists in Spain are the most likely to say that they wish they had more information about how to find support groups for people with MS (49%)

Neurologists in the U.S. are the most likely to say that they wish they had more information about managing the cost of MS treatment (44%)

Perhaps this is because U.S. patients most frequently mention cost when it comes to the greatest challenges that they face in managing their DMT (47%)

What Information Is Desired by Patients and Neurologists? Percentage of Patients and Neurologists Who Indicated Desire for More Information on Aspects of MS



BASE: QUALIFIED MS PATIENTS (Total n=982)

Q945 Which of the following aspects of multiple sclerosis, if any, would you like more information about?

BASE: QUALIFIED NEUROLOGISTS (Total n=900)

Q947 Which of the following aspects of multiple sclerosis, if any, do you wish you had more information about to provide to your multiple sclerosis patients?

86% of patients would like more information about at least 1 aspect of MS

Further, the lower the patients' overall health, the more likely they are to want more information about aspects of MS:

Excellent/Good: 81% Fair: 85% Poor: 92%

STATE OF MS CONSORTIUM

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Patient Advocacy Group Representatives:

Europe:

- Maggie Alexander, chief executive, European MS Platform, represents 39 MS societies from 34 European countries

United States:

- Nancy Law, executive vice president, National MS Society

Neurologists:

Germany:

- Robert Weissert, M.D., Ph.D., senior physician and researcher, university professor of Clinical Neurobiology, University of Regensburg

Italy:

- Antonio Uccelli, M.D., associate professor of Neurology and head of MS Clinic and Neuroimmunology Unit, University of Genoa

Spain

- Mar Tintore, M.D., Ph.D., senior consultant neurologist, Neurology-Neuroimmunology Department, MS Centre of Catalonia, Hospital Vall d'Hebron

United Kingdom:

- Martin Duddy, M.D., consultant neurologist, Department of Neurology, Royal Victoria Infirmary, Newcastle upon Tyne

United States:

- David E. Jones, M.D., assistant professor, University of Virginia Health System, Charlottesville, Virginia
- Sibyl Wray, M.D., director, Hope Neurology MS Center, Knoxville, Tennessee

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- i. Multiple Sclerosis International Federation, Atlas of MS 2013. *Epidemiology of MS*. Page 8. Date Accessed: July 9, 2014. http://www.msif.org/includes/documents/cm_docs/2013/m/msif-atlas-of-ms-2013-report.pdf?f=1
- ii. Multiple Sclerosis International Federation. Atlas of MS 2013. *Epidemiology of MS*. Date Accessed: July 9, 2014. <http://www.atlasofms.org/query.aspx>
- iii. NMSS. *MS Prevalence*. Date Accessed: July 9, 2014. <http://www.nationalmssociety.org/about-the-society/msprevalence/index.aspx>
- iv. Data on file with Harris Poll. DSQ Q268, Q280, Q607, Q705. *Data available upon request*
- v. Data on file with Harris Poll, DSQ Q8702. Q8712, Q8719. *Data available upon request*
- vi. Data on file with Harris Poll, DSQ Q930 *Data available upon request*
- vii. Data on file with Harris Poll, DSQ Q920 *Data available upon request*
- viii. Data on file with Harris Poll, DSQ Q935 *Data available upon request*
- ix. Data on file with Harris Poll, DSQ Q945 *Data available upon request*
- x. Data on file with Harris Poll, DSQ Q940 *Data available upon request*