MSJ Experimental Translational Clinical

Original research article

Use of optical coherence tomography in the care of people with multiple sclerosis in Switzerland: A national survey among neurologists

Multiple Sclerosis Journal—Experimental, Translational and Clinical

January–March 2026, 1–9

DOI: 10.1177/20552173261419951

Veronika Kana, Marina Herwerth, Konstantin Gugleta, Raphaël Bernard-Valnet, Stefanie Mueller, Giulia Mallucci, Fabienne C Fierz, Cristina Granziera, Jens Kuhle, Patrick Roth and Athina Papadopoulou

Abstract

Background: Optical coherence tomography (OCT) can assess optic nerve involvement and facilitate the diagnosis of multiple sclerosis (MS).

Objective: To evaluate the current use of OCT for MS care among neurologists in Switzerland.

Methods: Nationwide online survey with Swiss neurologists, comprising 11 questions on availability, use of OCT, and its role in diagnostic workup and monitoring.

Results: Thirty-four neurologists from all main Swiss regions responded (53% hospital-based, 47% private practice). Only 26.5% had access to OCT in their clinic/practice, all of whom were MS specialists, mainly hospital-based (66.7%). All respondents assess the visual pathway in first demyelinating event and optic neuritis (ON), primarily using magnetic resonance imaging (MRI: 88.2% and 91.2%, respectively), often in combination with visual evoked potentials (VEP). OCT use was reported by 32% (first demyelinating event) and 44% (ON) of respondents. OCT was infrequently used for monitoring (20.6%), the most frequent reasons being "lack of availability" or "insufficient evidence."

Conclusions: Despite the scientific evidence, OCT availability and routine use by neurologists is limited in Switzerland. Awareness, education and guidelines on its clinical use in MS care are needed, while ongoing real-world research should shed more light into its role for personalized disease monitoring in people with MS.

Keywords: OCT, MS, demyelinating event, optic neuritis, McDonald diagnostic criteria

Date received: 25 October 2025; accepted 14 January 2026

Highlights

- OCT access is currently limited among neurologists in Switzerland
- Routine OCT use is largely restricted to academic MS centers
- MRI and VEP are mainly used to assess the visual pathway in a first demyelinating event
- Education, training and multicenter, interdisciplinary research on the additive value of OCT in personalized MS care are needed

Introduction

The addition of the optic nerve as a fifth region to assess dissemination in space in the 2024 McDonald criteria[1,2] improves diagnostic performance for individuals presenting with a clinically isolated syndrome (CIS), particularly in patients with optic neuritis (ON).[3–6] Thus, the evaluation of optic nerve pathology has become a clinical need to diagnose multiple sclerosis (MS).

One of the techniques used to assess optic nerve involvement in patients with CIS and MS is optical coherence tomography (OCT). OCT allows non-invasive, high-resolution measurement of distinct retinal layers. Thinning of the peripapillary retinal nerve fiber layer (pRNFL) and the composite macular ganglion cell-inner plexiform layers (GCIPL) are established markers of neuroaxonal

Correspondence to:
Athina Papadopoulou,
Multiple Sclerosis Centre and Research Center for Clinical Neuroimmunology and Neuroscience (RC2NB), Departments of Biomedicine and Clinical Research, University Hospital and University of Basel, Basel, Switzerland.
Email: **athina.papadopoulou@usb.ch**

Veronika Kana,
Department of Neurology, University Hospital Zurich, Zurich, Switzerland

Marina Herwerth,
Department of Neurology, University Hospital Zurich,

Zurich, Switzerland
Neuroscience Center Zurich, University of Zurich and ETH Zurich, Zurich, Switzerland
Institute of Pharmacology and Toxicology, University of Zurich, Zurich, Switzerland

Konstantin Gugleta, Department of Ophthalmology, University Hospital of Basel, Basel, Switzerland

Raphaël Bernard-Valnet, Service of Neurology, Department of Clinical Neurosciences, Lausanne University Hospital (Centre Hospitalier Universitaire Vaudois) and University of Lausanne, Lausanne, Switzerland
Department of Neurology, University Hospital Münster, Münster, Germany

Stefanie Mueller, HOCH Health Ostschweiz, University Teaching and Research Hospital, Clinic for Neurology, St Gallen, Switzerland

Giulia Mallucci, Multiple Sclerosis Center, Department of Neurology, Neurocenter of Southern Switzerland, EOC, Lugano, Switzerland

Fabienne C Fierz, Department of Ophthalmology, University Hospital Zurich, Zurich, Switzerland

Cristina Granziera, Multiple Sclerosis Centre and Research Center for Clinical Neuroimmunology and Neuroscience (RC2NB), Departments of Biomedicine and Clinical Research, University Hospital and University of Basel, Basel, Switzerland
Department of Neurology, University Hospital and University of Basel, Basel, Switzerland

Jens Kuhle, Multiple Sclerosis Centre and Research Center for Clinical Neuroimmunology and Neuroscience (RC2NB), Departments of Biomedicine and Clinical Research, University Hospital and University of Basel, Basel, Switzerland
Department of Neurology, University Hospital and University of Basel, Basel, Switzerland

Patrick Roth, Department of Neurology, University Hospital Zurich, Zurich, Switzerland
Neuroscience Center Zurich,

damage in MS,[7] and inter-eye difference thresholds allow identification of previous clinical or subclinical optic nerve pathology.[8,9]

Moreover, OCT can be used as a marker of neurodegeneration in people with MS (pwMS). pRNFL and GCIPL are associated with gray matter atrophy[10] and the risk of physical and cognitive disability progression,[11] including progression independent of relapse activity.[12,13] Thickness of GCIPL is discussed as a potential biomarker for cognitive function[14,15] and for response to treatment[16] in pwMS.

Hence, OCT is increasingly being incorporated in clinical routine in MS centers worldwide for the purpose of diagnosing, stratifying and managing pwMS. In Switzerland, a country with high economy resources, MS care is considered advanced. However, systematic data regarding the use of OCT among neurologists are lacking.

Methods

We conducted an online survey among neurologists working at university hospitals and non-university hospitals as well as in private practice within three main language regions (German, French, Italian) in Switzerland. Potential participants were contacted directly, through local networks and through an invitation sent by the Swiss Neurological Society (SNG) reaching Swiss neurologists (total of 1100 contacted). Inclusion criterion was a specialist in neurology or neurologist in training (resident) practicing in Switzerland. There were no specific exclusion criteria. Multiple responses from one center were possible. The questionnaire was designed to allow respondents to leave items unanswered or to select the "other" option without providing additional details. Per-question and overall item-level response rates were calculated.

The questionnaire was published on 22 March 2024 and remained open until 31 December 2024. The online tool Google Forms (www.google.com/forms) was used for creating the survey. The survey was fully anonymized. IP addresses were not collected. The questionnaire included 11 single- or multiple-choice questions about 1) diagnostic workup of the visual pathway in a first demyelinating event, 2) diagnostic workup in ON, 3) use of OCT in general, 4) access to OCT, 5) use of OCT for general MS monitoring, 6) extracted OCT parameters/layers, 7) inclusion of OCT parameters in treatment decisions, and 8–11) participant characterization (institution, localization, function, specialization). The questionnaire was provided in English only.

Supplementary Note 1 contains the full lists of questions and possible answers.

Microsoft Excel (version 2023) and GraphPad Prism (Version 10.5.0) were used for analysis and generation of graphs and figures.

Results

Participants in the survey

Thirty-four participants responded to the survey (response rate 3.1% (34/1100 invited neurologists)). The per-question response rate was 100% (34/34) for 9 of the 11 questions. Two items (questions 3 and 10) had responses from 33 of 34 participants (97.1%). Overall, 372 of 374 possible item responses were recorded (99.5%). A majority of respondents worked in hospitals (total 53%, 18/34), with more respondents practicing in academic settings (32.4%, 11/34 in university hospitals vs. 20.6% (7/34) in regional hospitals; Figure 1(a)). Forty-seven percent (16/34) of respondents worked in practices, of whom 32.4% (11/34) in group practices and 14.7% (5/34) in a single private practice (Figure 1(a)).

Most respondents practiced in cantons with large populations and tertiary hospitals (canton of Zurich (29.4%, 10/34), canton of Vaud (17.6%, 6/34), canton of Basel-City (11.8%, 4/34), and canton of Aargau (11.8%, 4/34; Table 1). The survey reached participants in the German-, French-, and Italian-speaking regions (Table 1). Most respondents were neurology specialists (76.5%, 26/34), and 20.6% (7/34) were neurology residents (Figure 1(b)). One respondent did not report their training level, but identified as an MS specialist, implying certification as a neurology specialist. The questionnaire was answered equally by neuroimmunologists/MS specialists and by neurologists who had no specialization in MS (both 50%, 17/34).

Availability and use of optical coherence tomography among Swiss neurologists

We asked the participants about their access to an OCT device and OCT use for their diagnostic routines. Most respondents (73.5%, 25/34) did not have access to an OCT device at their neurology clinic or private practice (Figure 2(a)) but rather referred pwMS to ophthalmologists when an OCT was needed (67.6%). Of those with access to a device, 66.7% (6/9) use the Spectralis system (Heidelberg Engineering; Figure 2(a)).

Regarding the use of OCT in clinical practice, most participants responded that they did not perform

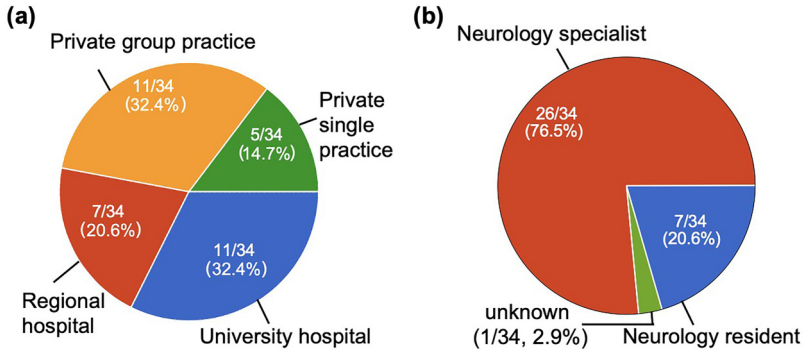

Figure 1. Characteristics of survey participants: workplace (a) and specialization (b). (a) Pie chart representing the percentage of respondents working at university hospitals, regional hospitals, private groups practices, or private single practices. (b) Pie chart showing the specialization of respondents.

Table 1. Survey participant's location and institution.

Canton	Language region	Total number	*University hospital*	*Regional hospital*	*Private group practice*	*Private single practice*
Fribourg FR	French	1 (2.9%)		1 (2.9%)		
Neuchâtel NE	French	1 (2.9%)			1 (2.9%)	
Vaud VD	French	6 (17.6%)	4 (11.8%)		1 (2.9%)	1 (2.9%)
Aargau AG	German	4 (11.8%)		2 (5.9%)	2 (5.9%)	
Basel-Stadt BS	German	4 (11.8%)	3 (8.7%)		1 (2.9%)	
Bern BE	German	2 (5.9%)	1 (2.9%)			1 (2.9%)
Luzern LU	German	1 (2.9%)	1 (2.9%)			
St. Gallen SG	German	2 (5.9%)		2 (5.9%)		
Schwyz SZ	German	1 (2.9%)				1 (2.9%)
Solothurn SO	German	1 (2.9%)				1 (2.9%)
Zurich ZH	German	10 (29.4%)	2 (5.9%)	1 (2.9%)	6 (17.6%)	1 (2.9%)
Ticino TI	Italian	1 (2.9%)		1 (2.9%)		

Number of survey participants and their percentage (in parentheses) showing the canton of Switzerland of their workspace (left panel) and the type of institution (right panel). No participants practiced in the following cantons: Appenzell Ausserrhoden AR, Appenzell Innerrhoden AI, Basel-Land BL, Genève GE, Glarus GL, Graubünden GR, Jura JU, Nidwalden NM, Obwalden OW, Schaffhausen SH, Thurgau TG, Uri UR, Valais VS, Zug ZG.
German-speaking cantons: Aargau, Appenzell Ausserrhoden, Appenzell Innerrhoden, Basel-Land, Basel-Stadt, Bern, Glarus, Graubünden, Jura, Luzern, Nidwalden, Obwalden, St Gallen, Schwyz, Solothurn, Thurgau, Zug, Zürich
French-speaking cantons: Fribourg, Genève, Jura, Neuchâtel, Vaud, Valais
Italian-speaking cantons: Ticino, Graubünden
Romansh-speaking canton: Graubünden

OCT as part of a regular diagnostic process in people with an established MS diagnosis (22/34, 64.7%). Six respondents (6/34, 17.7%) used OCT for assessment of new visual symptoms in pwMS, such as suspected ON, and only five respondents (5/34, 14.7%) use OCT regularly for disease monitoring (Figure 2(b)). One participant (1/34, 2.9%) left this question unanswered.

University of Zurich and ETH Zurich, Zurich, Switzerland

Athina Papadopoulou, Multiple Sclerosis Centre and Research Center for Clinical Neuroimmunology and Neuroscience (RC2NB), Departments of Biomedicine and Clinical Research, University Hospital and University of Basel, Basel, Switzerland
Department of Neurology, University Hospital and University of Basel, Basel, Switzerland

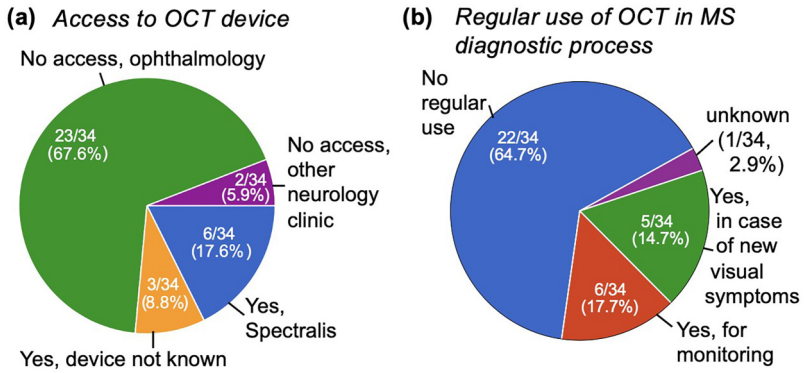

Figure 2. Access (a) and routine use of OCT (b) by neurologists in Switzerland. Pie charts showing percentages of participant's access to an OCT device (a) and purposes of regular use of OCT (b). OCT: optical coherence tomography.

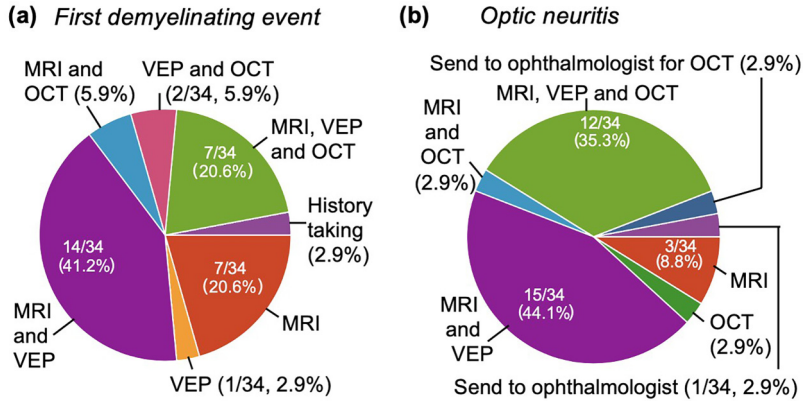

Figure 3. Diagnostic techniques used by Swiss neurologist to assess the visual pathway in a first demyelinating event (a) and optic neuritis (b). Pie charts showing percentages of participants using different diagnostic techniques to assess a first demyelinating event (a) and an optic neuritis (b). MRI: magnetic resonance imaging; OCT: optical coherence tomography; VEP: visual evoked potentials.

Diagnostic workup of the visual pathway

To further explore the use of OCT, we asked the participants about how they performed routine diagnostic workup of the visual pathway, both in case of a first demyelinating event and in case of acute ON. To assess a first demyelinating event, all respondents (100%, 34/34) searched for a pathological involvement of the visual pathway (Figure 3(a)). Most respondents (88.2%, 30/34) used MRI, either alone (7/34, 20.6%), or in combination with VEP (14/34, 41.2%), while 20.6% (7/34) use all three procedures (MRI, VEP and OCT). In total, 32.4% (11/34) participants reported to include OCT in the workup of patients with first demyelinating event, and this was always performed in combination with other procedures (MRI and/or VEP, Figure 3(a)).

In case of acute ON, all respondents (100%, 34/34) searched for affection of the visual pathway (Figure 3(b)). Of those, 91.2% (31/34) performed MRI, with the majority combining MRI with VEP (44.1%, 15/34), and 35.3% (12/34) combining MRI, VEP and OCT. Two participants (5.8%, 2/34) reported sending the patients to ophthalmologists for diagnostic workup (Figure 3(b)). In total, 44% (15/34) participants reported use of OCT as a diagnostic procedure in acute ON, which was higher than in case of any first demyelinating event (Figure 3).

Inclusion of optical coherence tomography parameters in monitoring and treatment decision making in multiple sclerosis

Among neurologists using OCT in their clinical practice (38.2% of all respondents (13/34, Figure 4(a)), MS specialists were more prone to OCT than non-specialists (84.6%, 11/13). Among the regular OCT users (13/34, 38.2%), 53.8% assess pRNFL and

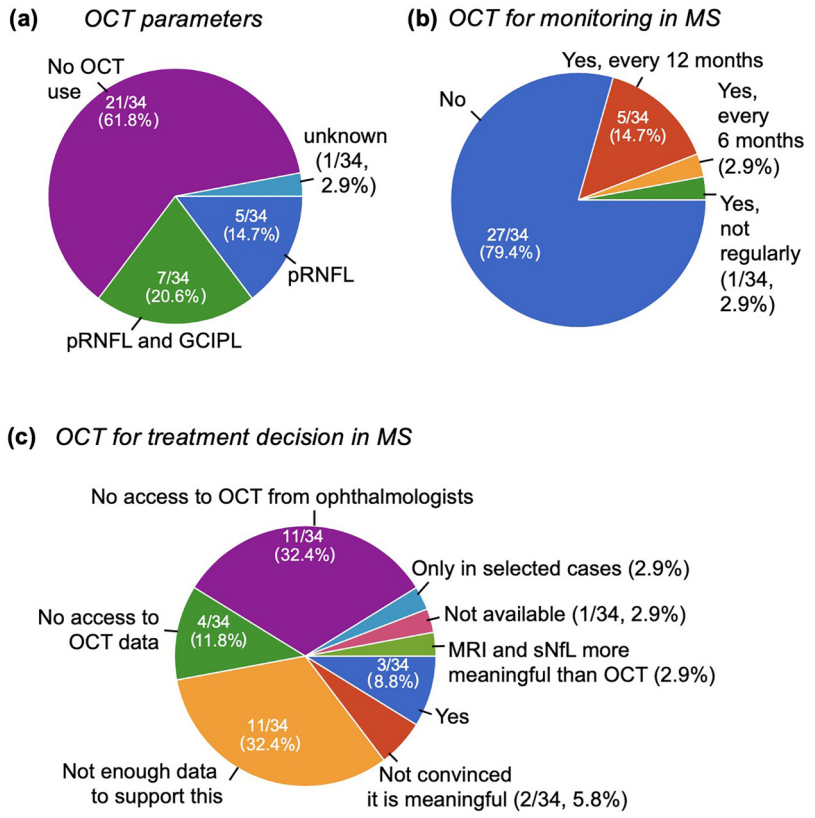

Figure 4. Assessment of OCT parameters used in MS care by neurologists in Switzerland (a) as well as the frequency of OCT use for disease monitoring (b) and treatment decision making (c). Pie charts representing percentages of participants assessing different OCT parameters (a), using OCT for monitoring in MS (b) and treatment decision making (c). GCIPL: ganglion cell-inner plexiform layer; MRI: magnetic resonance imaging; OCT: optical coherence tomography; pRNFL: peripapillary retinal nerve fiber layer; sNFL: serum neurofilament light chain; MS: multiple sclerosis.

GCIPL values (7/13), and 5 consider only pRNFL values (5/13, 38.5%; Figure 4(a)).

Most reporting neurologists (27/34, 79.4%) did not use OCT for regularly monitoring pwMS (Figure 4(b)), while 5/34 (14.7%) respondents monitored patients using OCT every 12 months, and 1 respondent (1/34, 2.9%) every 6 months (Figure 4(b)). All neurologists using OCT for patient monitoring were MS specialists practicing in the cantons of Basel-City ($n = 2$) and Zurich ($n = 4$).

Lastly, we asked the participants about their use of OCT for treatment decision making in the care of MS. Only 8.8% (3/34) participants, all MS specialists (100%, 3/3), included OCT values (e.g. progressive thinning of retinal layers) into their treatment decision processes (Figure 4(c)). The reasons for not considering OCT included limited access to OCT data (47.1%, 16/34), and insufficient evidence of its usefulness (41.1%, 14/34; Figure 4(c)).

Discussion

With the inclusion of the optic nerve in the 2024 McDonald criteria,[1,2] OCT is emerging as a key non-invasive tool for assessing optic nerve involvement in MS. In this national survey, we found that OCT access and routine use *by neurologists* is still limited in Switzerland. In fact, only 32.4% of participants reported to include OCT in the workup of patients with first demyelinating event, and they did this only in combination with other procedures (MRI and/or VEP). A slightly higher proportion (44%) reported using OCT for patients with acute ON (Table 2).

However, OCT, particularly the inter-eye asymmetry, is known to exhibit a high sensitivity to detect both symptomatic (in case of acute ON) and asymptomatic optic nerve lesions in patients with first demyelinating event.[5] In this prior multicenter prospective study, the sensitivity of pRNFL inter-eye asymmetry in patients with ON-CIS was similar to MRI of the optic nerve

Table 2. Summary of key outcomes on the use of OCT in the care of PwMS in Switzerland.

Use of OCT by neurologists in Switzerland – Key outcomes
67.6% without access to OCT, referral to ophthalmology 64.7% do not use OCT during MS diagnostic process 41.2% use MRI and VEP for diagnosis of first demyelinating event 44.1% use MRI and VEP and 44% use OCT for diagnosis of acute optic neuritis 61.8% do not know OCT parameters 79.4% do not use OCT for monitoring in MS Only 8.8% use OCT for treatment decisions in MS

OCT: optical coherence tomography; MS: multiple sclerosis; VEP: visual evoked potentials.

and to VEP, while in patients with non-ON-CIS, pRNFL and VEP were the most sensitive measures to detect asymptomatic lesions (both with sensitivity of 19.1%).[5] Compared to MRI of the optic nerve, which requires specific protocol and sequences,[17] OCT is a very quick, easy, and patient-friendly examination. The value of OCT to improve the performance of diagnostic criteria in MS was confirmed in a monocentric prospective study,[18] which showed increased accuracy of the criteria after inclusion of inter-eye asymmetry based on OCT alone. Importantly, the performance was similar among patients with and without ON as clinical presentation.[18]

These data support the use of OCT metrics in the evaluation of patients with any first demyelinating event, as a sensitive and convenient examination, providing relevant structural information on visual pathway pathology. Our survey suggests that better availability of OCT for neurologists/MS specialists, as well as awareness about its diagnostic accuracy, are unmet needs in MS care in Switzerland. At the same time, rigorous quality control of the OCT images[19,20] and exclusion of better explanations for interocular asymmetry, including ophthalmological disorders, are crucial, to ensure that diagnostic specificity remains high in clinical practice.[2]

Regarding the use of OCT in patients with acute ON (reported by 44% of the participants in our survey), it should be noted that the timing of the examination is highly relevant, as OCT sensitivity increases in the subacute and chronic phase after ON, as retrograde degeneration leading to pRNFL and GCIPL thinning becomes detectable after approximately 4 weeks, and is most pronounced after 3–6 months.[21,22] Thus, some respondents may view OCT as less relevant in the acute phase of ON. Nevertheless, OCT is included as supporting paraclinical examination in the proposed diagnostic criteria for ON[23] and can be particularly useful for the differential diagnosis. For example, pronounced pRNFL thickening is suggestive of ON in the context of myelin oligodendrocyte glycoprotein antibody-associated diseases, rather than MS.[24]

Next to the investigation of the visual pathway, OCT is often used in clinical research, to capture neurodegenerative processes in the *entire* central nervous system, since it is associated with gray matter atrophy[10] and risk of progression[11,15,25,26] in MS. However, its reported use in clinical routine as a biomarker for disease monitoring was low among Swiss neurologists: Only 20.6% of the survey participants use OCT in disease monitoring of PwMS, all of which identified as MS specialists, while only 8.8% considered OCT values in their treatment decision-making processes. The main reported reasons for this included limited access to OCT data (47.1%), and insufficient evidence of its usefulness (41.1%). Nevertheless, the prognostic value of OCT measures for monitoring disease progression and predicting disability in MS was demonstrated in numerous cohorts, with very similar results. A recent meta-analysis[27] including 14 longitudinal studies demonstrated that a mean pRNFL thickness $\leq$88 µm, and a mean GCIPL thickness $\leq$77 µm, are associated with an increased risk of future disability progression in MS.[27] Moreover, annual thinning rates exceeding 1.5 µm/year for pRNFL and 1.0 µm/year for GCIPL significantly predicted disease worsening.[27] Regarding the latter, it is important to note, that a recent multicenter study including longitudinal OCT measurements collected during routine clinical practice in five German MS centers, questioned the utility of annual thinning rates for individual prognostication and risk stratification of PwMS.[28] In that study, the overall annualized thinning rate over time was low, while the measurement variability often exceeded the change rates observed in this multicenter cohort. The latter could also be due to the inclusion of

heterogeneous data from different centers, at different time-points and with variable (in general short) lengths of follow-up.[28] Still, further technological developments on the hardware and post-processing of the images[28] may contribute to decrease this variability in longitudinal OCT assessments. In addition, the development of Z scores, adjusted for age, sex and potentially even also relevant comorbidities may further increase the predictive accuracy of OCT metrics in clinical routine[29,30] and facilitate its use for stratification and personalized decision making. Most importantly, guidelines regarding a standardized protocol as well as education on OCT-performance, quality control and interpretation could facilitate an evidence-based, broader implementation of OCT among neurologists and MS specialists.

To address these needs and enhance awareness and accessibility of OCT in neurological practice across Switzerland, as well as to promote scientific and clinical exchange, the Swiss Neurological Society recently established an "OCT Task Force in Continuing Education" (https://www.swissneuro.ch/en/about-us/organisation/committees). This initiative aims to support the systematic integration of OCT-related knowledge into education, postgraduate training, and clinical routine. By fostering interdisciplinary collaboration and developing structured educational resources, the task force seeks to advance the standardized use of OCT in the diagnosis and management of neurological disorders, including MS. OCT Task Force trainings will include topics such as standardized reporting, establishment, and improvement of shared neurology-ophthalmology workflows and advice on cost and logistics considerations.

Our study has merits but also some limitations. The first one is the low response rate of our survey, with a potential selection bias among neurologists in metropolitan regions with focus in neuroimmunology and MS care. The small sample size and the survey's descriptive design without inferential testing may restrict the generalizability of the findings, specifically in other countries with different health-care systems. Despite this limitation, the balanced representation of participants from all major Swiss language regions, as well as an even distribution between hospital-based and private practice neurologists, supports the validity of our findings. Moreover, we did not include ophthalmologists in the survey, which may underestimate OCT availability, e.g. via referral pathways. Our data suggest that OCT is often clinically performed by ophthalmologists in Switzerland. However, our aim was to focus on the neurologists' perspective, since pwMS are usually monitored by neurologists, who assess diagnosis, risk stratification and treatment response. Having said this, a close collaboration between neurologists and (neuro)ophthalmologists is essential for the good clinical use of OCT in MS and similar disorders.

In summary, the use of OCT in the clinical management of MS remains limited among neurologists in Switzerland, particularly outside of specialized MS centers and academic institutions. Broader, evidence-based implementation of OCT in routine neurological practice will require targeted efforts to improve clinician training, standardization, systematic integration of OCT into medical education and clinical workflows. In addition, ongoing real-world research should shed more light on its exact role and additive value in MS diagnosis, personalized disease monitoring and assessment of treatment response in PwMS.

Acknowledgments

The authors thank all the colleagues who participated in this survey.

Author contributions

VK contributed to concept, design, acquisition, analysis and interpretation of data, and drafting the manuscript. AP contributed to design, analysis and interpretation of data, and comments on the manuscript. MH, FF, JK, and PR contributed to comments on survey questions. All authors contributed to the interpretation of data, revised the draft clinically for intellectual content, and approved the final version of the manuscript for publication.

Consent for publication

Not applicable.

Consent to participate

Not applicable.

Data availability statement

All data will be made available upon request from any qualified investigator.

Declaration of conflicting interest

VK received honoraria for advisory roles and/or lectures for Biogen, Merck, Novartis, Neuraxpharm, Roche, Teva, travel support from Biogen, Merck, Roche, an unrestricted grant from Roche, and is supported by the Promedica Foundation.

MH served on scientific advisory boards of Biogen, Merck Serono, Alexion, Roche and Horizon Therapeutics

(Amgen), received speakers honoraria from Biogen and received travel funding from Roche, unrelated to this study. Her institution received a research grant from Roche. She was supported by the Swiss National Science Foundation and by the Olga-Mayenfisch-Foundation.

KG has served on advisory boards from Santen, AbbVie, AZAD. His research is supported by the Swiss National Research Foundation (Weave) Grant 212656.

RBV served in advisory boards, speaker and/or received conference travel support from Merck, Sanofi, Juvisé and received support for activities from Novartis Foundation outside of this work.

SM received honoraria for travel, honoraria for lectures/consulting and/or grants for studies from Almirall, Alexion, Bayer, Biogen, Bristol-Myers Squibb SA/Celgene, Genzyme, Merck-Serono, Teva, Novartis and Roche.

GM declares no conflict of interest.

FCF declares no conflict of interest.

CG has not received any personal compensation. As the employer of the University Hospital Basel (USB) and Research Center for Clinical Neuroimmunology and Neuroscience Basel (RC2NB), she has received the following fees which were used exclusively for research support: (i) advisory boards, and consultancy fees from GeNeuro, Actelion, Novartis, Genzyme-Sanofi, Biogen, Hoffmann La Roche and Siemens; (ii) speaker fees from Biogen, Hoffmann La Roche, Teva, Novartis, Merck, Jannsen Pharmaceuticals and Genzyme-Sanofi; (iii) research grants: Biogen, Genzyme Sanofi, Hoffmann La Roche, Novartis, GeNeuro.

JK received speaker fees, research support, travel support, and/or served on advisory boards by Swiss MS Society, Swiss National Research Foundation (320030_189140/1), University of Basel, Progressive MS Alliance, Alnylam, Bayer, Biogen, Bristol Myers Squibb, Celgene, Immunic, Merck, Neurogenesis, Novartis, Octave Bioscience, Quanterix, Roche, Sanofi, Stata DX.

PR has received honoraria for lectures or advisory board participation from Alexion, Bristol-Myers Squibb, Boehringer Ingelheim, CDR-Life, Debiopharm, Galapagos, Laminar, Midatech Pharma, Novartis, OM Pharma, QED, Roche, Sanofi and Servier and research support from Merck Sharp and Dohme and TME Pharma.

AP received speaker-fees/fees for advisory boards/consulting activities from Sanofi- Genzyme, Eli Lilly, AbbVie, Lundbeck and TEVA and travel support from Bayer AG, Teva and Hoffmann-La Roche. Her research was supported by the University and University Hospital of Basel, the Swiss Multiple Sclerosis Society, the "Stiftung zur Förderung der gastroenterologischen und allgemeinen klinischen Forschung sowie der medizinischen Bildauswertung," the "Freie Akademische Gesellschaft Basel" and the Swiss National Science Foundation (Project number: P300PB_174480). During the current research work, A. Papadopoulou was supported by the Swiss National Science Foundation (PZ00P3_216468).

Ethical considerations

This fully anonymized expert's survey did not require ethical approval.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: VK is supported by the Promedica foundation. AP is supported by the Swiss National Science Foundation (grant number PZ00P3_216468).

ORCID iDs

Veronika Kana https://orcid.org/0000-0002-9362-3156
Konstantin Gugleta https://orcid.org/0000-0002-3520-2791
Giulia Mallucci https://orcid.org/0000-0002-0031-9594
Cristina Granziera https://orcid.org/0000-0002-4917-8761
Jens Kuhle https://orcid.org/0000-0002-6963-8892
Patrick Roth https://orcid.org/0000-0003-3897-214X

Supplemental material

Supplemental material for this article is available online.

References

1. Montalban X, Lebrun-Frenay C, Oh J, et al. Diagnosis of multiple sclerosis: 2024 revisions of the McDonald criteria. *Lancet Neurol* 2025; 24: 850–865.
2. Saidha S, Green AJ, Leocani L, et al. The use of optical coherence tomography and visual evoked potentials in the 2024 McDonald diagnostic criteria for multiple sclerosis. *Lancet Neurol* 2025; 24: 880–892.
3. Brownlee WJ, Miszkiel KA, Tur C, et al. Inclusion of optic nerve involvement in dissemination in space criteria for multiple sclerosis. *Neurology* 2018; 91: e1130–e11e4.
4. Vidal-Jordana A, Rovira A, Arrambide G, et al. Optic nerve topography in multiple sclerosis diagnosis: the utility of visual evoked potentials. *Neurology* 2021; 96: e482–ee90.
5. Vidal-Jordana A, Rovira A, Calderon W, et al. Adding the optic nerve in multiple sclerosis diagnostic criteria: a longitudinal, prospective, multicenter study. *Neurology* 2024; 102: e200805.
6. Bsteh G, Hegen H, Altmann P, et al. Validation of inter-eye difference thresholds in optical coherence

tomography for identification of optic neuritis in multiple sclerosis. *Mult Scler Relat Disord* 2020; 45: 102403.
7. Petzold A, Balcer LJ, Calabresi PA, et al. Retinal layer segmentation in multiple sclerosis: a systematic review and meta-analysis. *Lancet Neurol* 2017; 16: 797–812.
8. Nolan-Kenney RC, Liu M, Akhand O, et al. Optimal intereye difference thresholds by optical coherence tomography in multiple sclerosis: an international study. *Ann Neurol* 2019; 85: 618–629.
9. Petzold A, Chua SYL, Khawaja AP, et al. Retinal asymmetry in multiple sclerosis. *Brain* 2021; 144: 224–235.
10. Cagol A, Fuertes NC, Stoessel M, et al. Optical coherence tomography reflects clinically relevant gray matter damage in patients with multiple sclerosis. *J Neurol* 2023; 270: 2139–2148.
11. Martinez-Lapiscina EH, Arnow S, Wilson JA, et al. Retinal thickness measured with optical coherence tomography and risk of disability worsening in multiple sclerosis: a cohort study. *Lancet Neurol* 2016; 15: 574–584.
12. Kappos L, Wolinsky JS, Giovannoni G, et al. Contribution of relapse-independent progression vs relapse-associated worsening to overall confirmed disability accumulation in typical relapsing multiple sclerosis in a pooled analysis of 2 randomized clinical trials. *JAMA Neurol* 2020; 77: 1132–1140.
13. Bsteh G, Hegen H, Altmann P, et al. Retinal layer thinning is reflecting disability progression independent of relapse activity in multiple sclerosis. *Mult Scler J Exp Transl Clin* 2020; 6: 2055217320966344.
14. Christensen R, Jolly A, Yam C, et al. Investigating the complementary value of OCT to MRI in cognitive impairment in relapsing-remitting multiple sclerosis. *Mult Scler* 2025; 31: 218–230.
15. Burguet Villena F, Cerda-Fuertes N, Hofer L, et al. Retinal neuronal loss and progression independent of relapse activity in multiple sclerosis. *J Neurol* 2025; 272: 454.
16. Bsteh G, Hegen H, Altmann P, et al. Retinal layer thinning predicts treatment failure in relapsing multiple sclerosis. *Eur J Neurol: The Official J Europ Federation Neurol Soc* 2021; 28: 2037–2045.
17. Sastre-Garriga J, Vidal-Jordana A, Toosy AT, et al. Value of optic nerve MRI in multiple sclerosis clinical management: a MAGNIMS position paper and future perspectives. *Neurology* 2024; 103: e209677.
18. Bsteh G, Hegen H, Altmann P, et al. Diagnostic performance of adding the optic nerve region assessed by optical coherence tomography to the diagnostic criteria for multiple sclerosis. *Neurology* 2023; 101: e784–ee93.
19. Tewarie P, Balk L, Costello F, et al. The OSCAR-IB consensus criteria for retinal OCT quality assessment. *PLoS One* 2012; 7: e34823.
20. Schippling S, Balk LJ, Costello F, et al. Quality control for retinal OCT in multiple sclerosis: validation of the OSCAR-IB criteria. *Mult Scler* 2015; 21: 163–170.
21. Gabilondo I, Martinez-Lapiscina EH, Fraga-Pumar E, et al. Dynamics of retinal injury after acute optic neuritis. *Ann Neurol* 2015; 77: 517–528.
22. Sanchez-Dalmau B, Martinez-Lapiscina EH, Torres-Torres R, et al. Early retinal atrophy predicts long-term visual impairment after acute optic neuritis. *Mult Scler* 2018; 24: 1196–1204.
23. Petzold A, Fraser CL, Abegg M, et al. Diagnosis and classification of optic neuritis. *Lancet Neurol* 2022; 21: 1120–1134.
24. Chen JJ, Sotirchos ES, Henderson AD, et al. OCT retinal nerve fiber layer thickness differentiates acute optic neuritis from MOG antibody-associated disease and multiple sclerosis: RNFL thickening in acute optic neuritis from MOGAD vs MS. *Mult Scler Relat Disord* 2022; 58: 103525.
25. Saidha S, Sotirchos ES, Oh J, et al. Relationships between retinal axonal and neuronal measures and global central nervous system pathology in multiple sclerosis. *JAMA Neurol* 2013; 70: 34–43.
26. Bsteh G, Hegen H, Teuchner B, et al. Peripapillary retinal nerve fibre layer as measured by optical coherence tomography is a prognostic biomarker not only for physical but also for cognitive disability progression in multiple sclerosis. *Mult Scler* 2019; 25: 196–203.
27. El Ayoubi NK, Ismail A, Sader G, et al. Retinal optical coherence tomography longitudinal measures as prognostic biomarkers in multiple sclerosis: systematic review and meta-analysis. *Neurol Neuroimmunol Neuroinflamm* 2025; 12: e200416.
28. Kramer J, Balloff C, Weise M, et al. Evolution of retinal degeneration and prediction of disease activity in relapsing and progressive multiple sclerosis. *Nat Commun* 2024; 15: 5243.
29. Lin TY, Motamedi S, Asseyer S, et al. Individual prognostication of disease activity and disability worsening in multiple sclerosis with retinal layer thickness z scores. *Neurol Neuroimmunol Neuroinflamm* 2024; 11: e200269.
30. Benkert P, Meier S, Schaedelin S, et al. Serum neurofilament light chain for individual prognostication of disease activity in people with multiple sclerosis: a retrospective modelling and validation study. *Lancet Neurol* 2022; 21: 246–257.