COMMENTARY

Practicing in a Pandemic

A Clinician's Guide to Remote Neurologic Care

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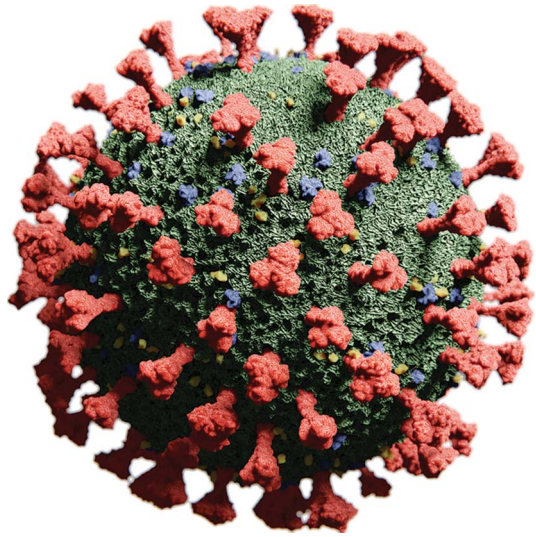
Abstract

Neurologists around the country and the world are rapidly transitioning from traditional in-person visits to remote neurologic care because of the coronavirus disease 2019 pandemic. Given calls and mandates for social distancing, most clinics have shuttered or are only conducting urgent and emergent visits. As a result, many neurologists are turning to teleneurology with real-time remote video-based visits with patients to provide ongoing care. Although telemedicine utilization and comfort has grown for many acute and ambulatory neurologic conditions in the past decade, remote visits and workflows remain foreign to many patients and neurologists. Here, we provide a practical framework for clinicians to orient themselves to the remote neurologic assessment, offering suggestions for clinician and patient preparation before the visit; recommendations to manage common challenges with remote neurologic care; modifications to the neurologic examination for remote performance, including subspecialty-specific considerations for a variety of neurologic conditions; and a discussion of the key limitations of remote visits. These recommendations are intended to serve as a guide for immediate implementation as neurologists transition to remote care. These will be relevant not only for practice today but also for the likely sustained expansion of teleneurology following the pandemic.



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The coronavirus disease 2019 (COVID-19) pandemic has rapidly changed clinical practice. In response to calls for social distancing and home sheltering, clinics have closed, and ambulatory care has gone virtual nearly overnight. The federal government recently relaxed telehealth technology regulations, allowing the use of a wider range of software platforms to extend care.[1] The Center for Medicare & Medicaid Services (CMS) simultaneously expanded telemedicine reimbursements.[2] The U.S. Department of Health and Human Services recently urged state governors to modify telemedicine regulatory barriers, including waiving licensure requirements for out-of-state clinicians.[3] Many private insurance companies followed suit, loosening previous restrictions on telehealth delivery, although questions remain surrounding coding, billing, and reimbursements for services delivered remotely.[4,5] In addition, although this new environment has fostered teleneurology expansion, the move from clinic-based neurology to telemedicine has been an uneasy transition for many clinicians, practices, and hospitals.

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As neurologists convert traditional to virtual workflows, the in-person physical examination must be replaced by a virtual version. This is particularly challenging for neurologists who rely on the in-person examination to diagnose and manage patients. In addition to acute conditions like stroke, the feasibility of remote examinations has been demonstrated across many ambulatory neurologic conditions including headache disorders, motor neuron disease, dementia, and movement disorders (table 1). In addition, neurologic societies like the American Academy of Neurology provide guidance to assist in the transition to telemedicine.[6] Despite challenges in the transition, we believe that this crisis will leave the neurologic community better positioned to embrace teleneurology, and although remote assessments are unlikely to fully replace in-person visits, they can supplement current care models and expand access to neurologic care.

Here, we aim to provide a practical guide to the remote video-based assessment of patients with neurologic disease. We focus on (1) general principles for conducting a remote ambulatory neurology visit; (2) methods to adapt the neurologic examination for remote performance, including disease-specific considerations and the use of available digital technologies to supplement the remote examination; and (3) limitations of the remote examination.

General Principles for the Remote Assessment

Hardware and Software

The ability to deliver video-based telemedicine to patients at home relies on the availability of specific hardware and software for both the patient and the clinician (figure 1). Each must have a device capable of transmitting video; this could include a smartphone, tablet, laptop, or desktop computer. If patients have multiple devices available, they should select the device with the best available camera and monitor. The benefits of portability with smartphones and tablets should be balanced against disadvantages, such as smaller screen and button sizes, which may be challenging for older patients. Beyond the device itself, teleneurology delivery requires a high-speed internet connection. Slow connection speeds degrade video quality and limit the neurologist's ability to assess the patient. Most patients with cable and fiber optic connections (with or without WiFi) have sufficient connection speeds, although those in rural areas may have reduced signal strength. Digital subscriber line and cellular (3G and 4G) connections are also likely sufficient, whereas dial-up connections are not.

Real-time video assessments are performed through several software options. Optimally, visits should be conducted using Health Insurance Portability and Accountability Act (HIPAA)-compliant software. Some electronic medical records (EMRs) have built-in telemedicine capabilities. Versions of Epic (WI), e.g., integrate video platforms to allow the patient and clinician to log into the visits using MyChart and Hyperspace, respectively. Practices without EMRs with telemedicine capabilities can use popular platforms such as Zoom Enterprise (CA), Updox (OH), and Vidyo (NJ). Although relaxed federal regulations have expanded use into HIPAA noncompliant platforms, given the potential for breach of confidentiality, we only suggest these options if no other options exist.[1] Optimal software features include multiplatform (smartphone, tablet, and computer) functionality, easy visit access (accessible by hyperlink), and simple program tools (e.g., few clicks to start a visit). In addition, programs without software download requirements increase the likelihood of a successful connection.

General Considerations and Visit Setup

Although not required, some additional resources optimize teleneurology delivery (figure 2). First, a troubleshooting team can help clinicians and patients with basic difficulties, such as connecting to the visit. Second, if feasible, a brief previsit test between the patient and office staff increases the chance of a smooth visit. Finally, clinicians should familiarize themselves with the software to manage technical difficulties during the visit itself.

Patients should be instructed on how to set up for the visit in their home (figure 1). Room selection and patient positioning are some of the most important factors. Patients should select a large, private room with good lighting that is near their internet router (if using WiFi) and a seat without windows behind it to avoid degrading the video because of backlighting. Camera positioning should allow the neurologist to assess global and spontaneous movements, which requires viewing the entire body. The patient can move their camera or chair during the examination to facilitate this assessment. Optimally, patients should conduct the visit with another person available to hold or move the camera, assist with technology, or assist with the examination.

Clinicians should similarly consider camera positioning, room selection, and webside manner, particularly if conducting the visit from home. A second monitor is useful to facilitate watching the patient while concurrently reviewing and documenting in the EMR. It is also important to be mindful of virtual empathy. Strong verbal communication is important to obtain an accurate history and examination.[7] Clinicians should speak loudly and clearly, introduce themselves with their first and last names, and ask the patient and helper how they would like to be addressed. The clinician should also orient the patient to the visit, as video-based visits are likely foreign to most, and at the end of the encounter, should ask the patient to repeat a brief summary of recommendations to ensure understanding. In addition to verbal communication, examiners should be mindful of body

Table 1 Select Studies of Remote Assessments in Neurologic Conditions

Author (year)	Condition	n	Findings
Tarolli et al.[11] (2020)	Atypical parkinsonism	45	Video visits feasible and reliable to assess and validate the diagnosis of patients with atypical parkinsonism
Friedman et al.[31] (2019)	Migraine	45	Telemedicine assessments were feasible and effective for follow-up migraine care
Selkirk et al.[32] (2017)	Motor neuron disease	68	Video-based telemedicine is effective for delivering reliable multidisciplinary care to individuals with amyotrophic lateral sclerosis
Dorsey et al.[33] (2015)	Parkinson disease	166	Video visits feasible to characterize and validate diagnosis of Parkinson disease in a national cohort
Davis et al.[34] (2014)	Multidisease	308	Follow-up telemedicine care feasible and valuable among patients in rural settings with chronic neurologic conditions
Bull et al.[28] (2014)	Huntington disease	11	Video-based visits feasible and reliable for assessing motor function in those with Huntington disease
Turner et al.[35] (2013)	Multiple sclerosis	41	Satisfaction high with telemedicine, and patients had improvements in outcomes over 6 months
Martin-Khan et al.[30] (2012)	Dementia	205	Identified high concordance between video-based vs in-person dementia diagnosis accuracy
Cialone et al.[36] (2011)	Batten disease	13	Remote administration of standardized Batten disease measure feasible and reliable by video-based visit

language and nonverbal communication. It is important to maintain open body language and good eye contact while interviewing. Clinicians should look at the camera itself while speaking to more closely approximate in-person eye contact.

Basic expectations for an in-office visit, such as professional attire for the clinician and patient, and avoiding interruptions should be upheld during the telemedicine visit. Should there be risk of interruption (e.g., because of concurrent time at home with children), clinicians should alert patients to this possibility at the start of the visit. Most states require clinicians to obtain consent from patients before conducting a telemedicine visit. This should include an overview of the limitations of and alternatives to the telemedicine encounter, including privacy risks, potential financial liability, and an inability to make some diagnostic decisions. Finally, at the start of a visit, it is imperative to confirm information from the patient in case of an emergency, including patient address and a reliable telephone number.

The Remote Neurologic Examination

Many portions of the neurologic examination rely on simple observations and can be performed by video without additional modifications beyond appropriate lighting and patient positioning. Other aspects of the examination, like fundoscopy and objective strength assessments, require advanced digital tools or the assistance of an experienced onsite examiner. Many of the remaining portions of the examination can be performed remotely, but require modifications for the virtual environment (table 2). Beyond these modifications, clinicians should consider performance and documentation of disease-specific rating scales (e.g., Movement Disorder Society–Unified Parkinson Disease Rating Scale[8,9] and Amyotrophic Lateral Sclerosis Functional Rating Scale–Revised[10]) to standardize assessments across visits, quantify disease severity, and track disease progression. Although some are not validated for remote performance, most can be modified easily for the virtual visit. Here, we describe the approach to the remote neurologic examination and provide a remote examination template (optimized for Epic EMR) for clinicians to use, which can help standardize the examination in practice (supplementary materials, links.lww.com/CPJ/A179).

General Examination

Essential components of the general examination vary based on the chief complaint. Simple inspection can be performed as it would be in the office by adjusting patient or camera position. For example, dystrophic skin changes, Raynaud phenomena, or loss of hair may suggest small fiber neuropathy or other underlying diseases. The remote examination

Figure 1 Patient and Clinician Considerations During Virtual Visit Setup

	Patient	Clinician	Both
Requirements	• Adjustable/movable camera • Ability to prop portable device • Hallway/open space nearby for walking • Majority of body visible on screen (can move camera for exam to facilitate) • Disclose limitations (e.g. hearing loss)	• HIPAA-compliant software with multi-device compatibility • Comfort with software • Camera positioned at eye level • Maintain eye contact with camera • Use clear, loud voice • Adapt based on patient limitations	• Video-ready device • High-speed internet • Private space • Avoid backlighting (close shades) • Good overhead or front lighting • Near internet router
Optimal features	• Large room • Helper present for setup and exam • Firm chair with 2 armrests • Smartphone available • Additional tools available for exam (paper and pencil, cold and sharp objects, spatula or large spoon, digital thermometer, and blood pressure cuff)	• Dual monitors to allow documentation • No software download required • Easy visit access (e.g. hyperlink) • Software with simple program tools • Direct EMR integration • Staff available for test visit	• Large monitor • High-definition camera • Limit pets • Limit background noise and distraction

EMR = electronic medical record; HIPAA = Health Insurance Portability and Accountability Act.

additionally allows assessment of the patient's home, facilitating evaluation for fall risks in those with imbalance, or the sleep environment in those with sleep disorders. Vital signs may be useful in some patients, and many have digital thermometers and portable blood pressure cuffs; assessment of orthostatic vital signs is feasible with instruction.[11] Among those without this equipment, the neurologist or onsite helpers can assess the respiratory rate, and savvy patients or family members could be instructed to take a radial pulse. The clinician can also demonstrate provocative orthopedic maneuvers (e.g., slump test and Finkelstein test) before performance by the patient to assess the musculoskeletal system.

Mental Status

Assessment of the patient's level of alertness, orientation, language, and memory can be completed as it would in the office. Formal mental status testing can also be performed remotely with a number of measures validated for remote performance.[12–14] The Montreal Cognitive Assessment (MoCA) can be modified in several ways, depending on needs and preference (mocatest.org/remote-moca-testing/). The trail making test can be performed verbally, and instructions can be given to draw a figure and clock. A blind version of the MoCA is also available and is helpful for telephone visits, when a patient has vision loss, or when there are other limitations like poor video quality.[15]

Cranial Nerves

The cranial nerve examination requires some of the most modifications for remote performance. Visual field testing and eye movements, for example, traditionally rely on confrontational maneuvers in front of the patient. However, through creative modifications and patient or family member instruction, many components of the cranial nerve examination can still be performed (table 2). In addition, a basic pupillary examination can be performed depending on the camera quality and zoom-in capabilities in the software used. Gross assessment of facial sensation can also be performed, including evaluation of temperature (using a cold utensil) or pinprick (if a toothpick or pin is available) sensation. Cranial nerves IX and X can be assessed by listening to speech, and patients can be asked to take a small sip of water during the visit to assess swallowing.[16]

Motor Examination

Patient positioning, camera quality, and room lighting are particularly important for the motor examination. Careful observation allows adequate assessment of muscle bulk and overall movement when viewing the patient from a distance; close-up assessment for fasciculations or other low-amplitude movements is possible among those with high-quality cameras. During a remote encounter, strength testing relies on inference using functional strength assessment. Patients can be asked to perform actions that use specific muscle groups (pronator drift, finger taps, rising from a chair, and heel or toe walking).

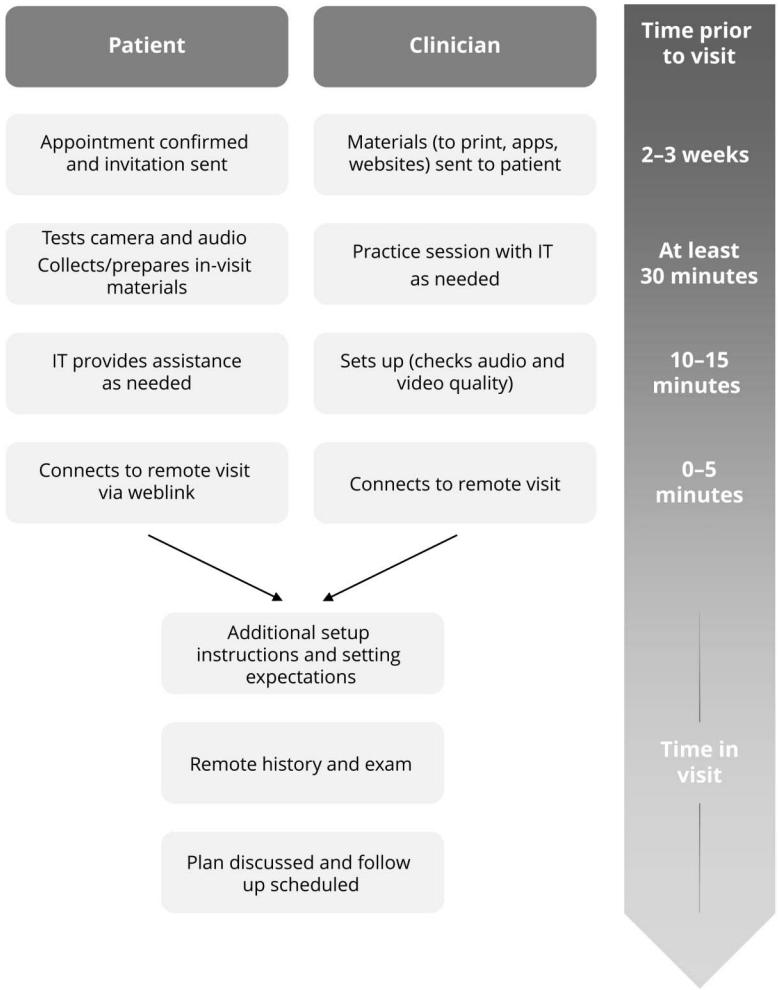
Sensory Examination

The sensory examination generally requires a reliable helper to administer the remote examination, compare right and left sides, and assess response to dual simultaneous stimulation. As above, assessment of temperature and pinprick sensation is possible with tools available in most homes. Patients can be instructed how to perform the Romberg test (with a family member nearby if concerns for safety/falls) or to touch their nose with eyes closed to assess proprioceptive function. Patients can also perform provocative sensory testing (e.g., Phalen or Tinel test) with instruction.

Coordination

Coordination testing can be performed with minimal modifications during the remote examination. Finger-to-nose testing, for example, can be performed between the patient and a helper or between the patient and a stationary object visible on the screen. Similarly, the finger chase test can be approximated by observing rapid arm movements between 2 targets. Rapid alternating movements, finger tapping, and heel-to-shin testing are performed without modification, assuming appropriate camera positioning.

Figure 2 Visit Workflow and Timeline for the Remote Neurologic Assessment



Reflexes

Reflexes are challenging without a reliable onsite helper. However, family members could be instructed in performance of the plantar response or patellar reflex using the blunt side of a heavy utensil (e.g., serving spoon and large spatula), given a general familiarity with the maneuver. Other reflex assessments are not feasible remotely.

Gait

The gait examination should be performed with the assistance of a helper with the patient, both for safety and to assist with repositioning the camera. In addition, clinicians should screen for baseline postural instability and modify the gait examination to reduce the risk of falling during the remote visit. Pointing the camera into a hallway or large room cleared of obstacles allows observation of the patient's entire body. Pull testing for postural stability should be deferred because of safety concerns.

Additional Considerations by Subspecialty

Cognitive and Geriatric Assessment

Additional special consideration should be given to patients with cognitive impairment, visual impairment, and hearing loss. When assessing elderly patients, longer visit times may be required, and technology may prove overwhelming. A plain background behind the clinician can limit visual distraction during the visit. While useful for any telemedicine encounter, the presence of a family member or knowledgeable informant is particularly important here to help with technology and corroborate the history. It is important to have the patient in full view to observe spontaneous movements and interactions with the environment and family (e.g., need for cues from a family member and difficulty focusing on the camera/screen). Likewise, it is helpful to observe for signs that family members are reluctant to discuss information in the presence of the patient (e.g., shaking their head and remaining quiet for fear of angering the patient); if identified, clinicians can suggest a private follow-up call with family members. Patients with hearing aids may experience acoustic feedback or rely on a helper to repeat information. Still, despite some limitations, home teleneurology visits offer a unique insight into a person's daily life and may facilitate assessment of home safety.

Table 2 Neurologic Examination Adaptations for the Remote Assessment

Examination portion	Maneuver	Adaptation
General	Vital signs	Use the patient's home thermometer and/or blood pressure cuff if available
		Instruct the patient or helper on assessing the respiratory rate and taking radial pulse
	Orthopedic testing	The clinician demonstrates a provocative maneuver and has the patient repeat
Mental status	Formal cognitive testing	The clinician transmits handwritten and visual test materials to the patient (email or patient portal preferred), and the patient prints materials for completion during the visit
Cranial nerves	Visual fields	The helper instructed in confrontation testing
		If using a large monitor, position the device at a fixed distance from the patient and instruct the patient to focus on the center of the screen, with the investigator performing finger flicks at the edge of the camera view
	Eye movements/VOR	Ductions/versions: the patient tracks their own finger or the finger of the helper
		Saccades: the patient looks between the camera and a fixed object in home in each direction
		The patient instructed in sustained upgaze to assess for fatigable ptosis
		For a detailed assessment, the patient moves close to the camera, so only a single eye is in view, followed by movements in all directions
		VOR: the patient fixates on the camera or the examiner's face and turn the head up/down or side to side
	Facial sensation	The patient or helper touches or places a utensil (toothpick and metal spoon) on each side of the face and compares sensation
	Facial and tongue motor function	The patient squeezes eye lids closed tightly, smiles, puffs up cheeks with air, purses lips, whistles, clenches the jaw tightly, and rapidly moves the tongue from side to side
		The patient can move closer to the camera for careful inspection for fasciculations or atrophy
	Hearing	The patient or helper performs finger rub bilaterally and compares sides
	Swallowing/pharyngeal function	The patient is asked to drink small sip of water
		The patient is asked to demonstrate strong cough
Motor	Strength	Use functional strength maneuvers to assess specific muscle groups
		Arms: raising arms (≥grade 3 strength), pronator drift, finger taps, and lifting object
		Legs: rising from a chair, squat to stand, heel and toe walking, and jumping
	Hypo- and hyperkinetic movements	Ensure that the camera allows visualization of the entire body

Continued

Table 2 Neurologic Examination Adaptations for the Remote Assessment *(continued)*

Examination portion	Maneuver	Adaptation
		The helper can move the camera/zoom in for assessment of low-amplitude movements (e.g., fasciculations)
Sensory	Pinprick	Use a toothpick, safety pin, or other sharp object
	Temperature	Use a metal utensil or key to assess cold sensation
	Proprioception	The patient instructed in the Romberg test (with the helper present) or touches the nose from the outstretched arm with eyes closed
	Dual simultaneous stimulation	The skilled helper is instructed in performance
Reflexes	Patellar reflex	Instruct the helper (or patient) in performance using a heavy, blunt utensil
	Plantar response	Instruct the helper in performance
Coordination	Finger-to-nose test	The patient moves the finger back and forth between the face and the camera or the object in view
	Finger chase	The patient rapidly moves the finger between 2 static objects in view
Gait and station	Posture	Ensure that the camera allows visualization of the entire body
	Casual/stressed gait	The patient or helper turns/moves the camera to face down a hallway or into a large room with the patient instructed in specific gait tasks

Abbreviation: VOR = vestibulo-ocular reflex.

Movement Disorder Assessment

Evaluation of patients with hypo- and hyperkinetic movement disorders largely relies on simple observation. Again, full body view during the entire examination allows the examiner to monitor for subtle movements that are only intermittently present or not visible with a narrow view. Adequate internet connection speed is particularly important for assessment of patients with Parkinson disease to ensure that observed bradykinesia is disease related rather than technology related. As in the office, assessment of tremor should include evaluation for postural, kinetic, rest, and vocal tremor. Having a pen and paper on hand allows Archimedes spiral drawing. Tech-savvy patients using a tablet with digital stylus can screen share a digital spiral.

Neuromuscular Assessment

The diagnosis of many neuromuscular disorders relies on a detailed neurologic examination and electrophysiologic studies not yet possible with remote assessments. Still, despite some limitations, teleneurology can establish gross localization for most patients. History taking and functional strength and sensory testing allow evaluation for proximal, distal, and asymmetric abnormalities. In addition, neurologists can document at least grade 3 (antigravity) or grade 4 (able to provide some resistance) strength during the functional strength assessment. Some diagnoses may be easily identifiable during the visit in those with typical history and examination features (e.g., myasthenia gravis, myotonic dystrophy, and dermatomyositis).

The remote assessment is also useful to triage patients requiring urgent in-person evaluation, such as those with bulbar or respiratory weakness. A simple swallow assessment, observing for forceful cough, or having patients count as high as they can in a single breath allows assessment of pharyngeal and respiratory muscle function. Patients can also be asked to lie down in view of the camera to assess breathing comfort in a supine position, observing for abdominal lift and chest expansion. Quantifying functional strength assessments (e.g., time required to stand from a seated position over 5 trials) could also be repeated in serial remote visits to trend strength in specific muscle groups.[17]

Novel Digital Tools

A wide range of new technologies, from wearables and biosensors to machine learning-powered augmented reality

systems, are expanding the capabilities of teleneurology today. Although the majority of these are not widely available, many patients already own commercially available technologies that can supplement the remote neurologic examination. For example, as described, patients with a digital stylus can screen share a writing sample during the visit. Smartphone applications or smart watches monitoring daily step counts, heart rate, sleep, or other disease-specific features[18] can provide objective information to neurologists about overall function at home. In addition, ambulatory monitoring tools such as home sleep apnea testing, nocturnal pulse oximetry, and snoring recordings can still be deployed to the home for objective assessments. Although many other disease-specific technologies are not yet validated in the clinical realm, we expect expanded use during the current crisis, followed by a more sustained boon when it ends, facilitating further expansion of teleneurology.

Limitations of the Remote Neurologic Examination

There are portions of the neurologic examination that cannot be performed via telemedicine, even under the best circumstances. In addition, many practices have limited the performance of tests viewed as extensions of the neurologic examination, including EMG and electroencephalography, in the setting of the COVID-19 pandemic. The absence of these data can limit the neurologist's ability to make a diagnosis or to facilitate medical decision making, particularly for patients being seen for initial assessment or for those with a substantial change compared with a prior in-person visit. Still, as described for the neuromuscular examination above, given uncertainty about the timing of return to normal clinical practice, remote assessment of new patients is likely necessary across all specialties. We suggest that clinicians inform patients about the limitations of the remote examination and the potential need for in-person follow-up at the start of each encounter. In practice settings where informed consent is required to initiate a telemedicine visit, this language can be incorporated into the consent script or documentation.

Although increased medico-legal risk may exist, the American Medical Association has lobbied for expanded liability coverage for physicians providing services via telehealth during the COVID-19 pandemic.[19] Some states have limited malpractice litigation against care delivered during the crisis.[20–22] Still, clinicians should confirm their medical liability coverage includes care provided via telemedicine. Clinicians should also document any limitations of the visit that may affect their medical decision making and share these concerns with the patient; this should include limitations in the reliability of any examination portions performed by patients or family members at home.

Beyond the limitations in examination and diagnostic capabilities, real and perceived social and societal limitations of telemedicine exist. First, the technological requirements for conducting a telemedicine visit limit access. Reassuringly, around 90% of American households have access to high-speed internet at home (73% with a broadband connection and 17% with a smartphone with cellular data without other home internet).[23] Still, this suggests at least 1 in 10 Americans lack such access with overrepresentation among older patients, those in rural locations, underrepresented minority groups, and those of low socioeconomic status.[23–26] Patients with neurologic disease may be overrepresented in this group, given the older age of many in the population.[27] In addition, the majority of patients without access to this technology are from vulnerable populations. In a time when a substantial proportion of visits are being converted to telemedicine, this has the potential to exacerbate existing disparities in care.

Despite rising use of telemedicine, patients and neurologists may worry that visits will be impersonal. Reassuringly, assessment of remote encounters across multiple neurologic conditions demonstrates that patients and neurologists establish similar comfort as compared to routine in-person visits.[11,28,29] Again, older patients with neurologic disease or those with advanced disability may feel less comfortable with the use of technology. Although previous studies have demonstrated the feasibility of remote visits among those with advanced neurodegenerative conditions, patients or families with greater baseline comfort with visits may self-select for participation in these studies, limiting generalizability.[11,30]

The rapid conversion to video-based teleneurology may be daunting for clinicians. However, neurologists should rest assured that most components of the in-person visit, including a substantial proportion of the neurologic examination, are directly translatable to the virtual environment with the modifications described here.[7] In addition, although some patients may have initial reservations about teleneurology, many view remote visits as a convenient alternative to seeing a clinician in the office. In fact, teleneurology has the potential to expand access to care for patients with impaired mobility, limited transportation options, or limited health care provider availability in their area, assuming that they have access to the appropriate technology. This can address important gaps in care by better incorporating teleneurology into postpandemic care models.

Teleneurology is well suited for follow-up of most neurologic conditions, particularly during a crisis when the alternative is often no care. Assessing treatment response, identifying treatable symptoms, and finding ways to preserve independence are based primarily on the neurologic history. In addition, quantification of portions of the examination generates objective or pseudo-objective measures that can be followed over time. Even multidisciplinary care can be delivered remotely with physical therapists,

speech pathologists, counselors, or social workers jointly attending a televisit. Remote visits can also be used to diagnose some patients with neurologic chief complaints, although we continue to consider an in-person examination preferable to a remote examination for new patients. However, given uncertainty surrounding the duration of the current crisis, the ability to triage potentially vulnerable patients for the need for in-person assessment exploits the benefits of teleneurology while mitigating risk for the patient.

Neurologists should work to incorporate remote video visits into practice today to improve their comfort with technology and the remote examination. In addition, clinicians should consider the use of novel digital tools to supplement the remote examination, including potential validation for use in clinical practice. This potentially chaotic transition to remote visits provides an opportunity to develop organized, efficient, and scalable workflows to facilitate long-term teleneurology implementation and improve traditional care models. This rapid conversion will undoubtedly set the stage for a wider adoption of teleneurology moving forward. Additional advocacy to extend the removal of barriers to telemedicine, expand physician liability protections, ensure adequate reimbursement for telehealth, and standardize the teleneurology examination and workflow can ensure that more patients with neurologic disease have ready access to care. Neurologists should act now to prepare themselves for the future of our field.

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