Virtual Medical and Impairment Assessments

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The coronavirus disease 2019 (COVID-19) pandemic has necessitated that we reappraise how we accomplish many tasks, including how we assess impairment and perform independent medical evaluations (IMEs). During a pandemic, direct face-to-face evaluations can place the examinee, office staff, and physician at risk, making it difficult to comply with state and local mandates and industry traditions. We do not know how long the pandemic will last, and we do not know how long we need to approach IMEs differently. Stakeholders need information from evaluations to make claims decisions and achieve claims closure. People's livelihoods are at stake. Therefore, it is essential that new approaches for completing IMEs be developed.

It is likely that by defining and applying innovative techniques, future assessments will be more effective and efficient. This article provides insights into virtual assessments and offers guidance.

Background

Telemedicine has come a long way since the first radiologic images were sent via telephone 5 decades ago. Telemedicine was typically more common in rural environments. The delivery of care via telemedicine is undergoing a tremendous shift as health care providers, organizations, and patients embrace virtual approaches, and this is being accelerated by the COVID-19 pandemic. It is no surprise that there is growing interest in how to perform virtual medical and impairment assessments.

Today, most Americans are familiar with computers and related technology. As of February 2019, 81% of US adults owned smartphones, 52% owned tablets, and 81% owned computers (laptops or desktops).[1] At least 9 in 10 adults access the Internet.[2] Younger adults are more likely to use the Internet, with 100% of adults between 18 and 29 years using the Internet, 97% of those between 30 and 49, 88% of those between 50 and 64, and 73% of those 65 and older.[3] Access is more readily available in urban settings than rural settings. Vast majority of working adults have access to and are familiar with the Internet, in particular, the use of video conferencing, which ranges from social platforms to robust technologies.

Exploring the potential of virtual assessments provides a unique opportunity to reexamine how we do things to provide accurate, unbiased assessments in an efficient and cost-effective manner. Best practice standards for independent medical evaluations were published in September–October 2017.[4] Unfortunately, many IMEs do not meet these standards, and often impairment assessments are erroneous.[5] So, as we advance our telemedicine practices, we can view this paradigm shift as an opportunity to improve the quality of our work.

Studies have demonstrated the effectiveness of virtual care, including for musculoskeletal care.[6-9] Experiences with virtual care are applicable to IMEs. However, virtual health care and virtual evaluations are not simply a matter of moving to a new platform. It requires a culture transformation that impacts all stakeholders.[10] It is likely that some stakeholders will find this transformation difficult. Stakeholders must reassess processes and learn new approaches. It is likely that after the pandemic, innovative virtual approaches will be integrated into in-person assessments.

Terminology

There is no common definition of telemedicine, also termed telehealth. The American Telemedicine Association states, "telemedicine now encompasses a much broader array of services and technologies—artificial intelligence, virtual reality and behavioral economics are a few examples that come to mind—that are transforming the way health and care are delivered."[11] The Health Resources and Services Administration of the US Department of Health and Human Services defines telehealth as the use of electronic information and telecommunications technologies to support and promote long-distance clinical health care, patient and professional health-related education, public health, and health administration. Technologies include videoconferencing, the Internet, store-and-forward imaging, streaming media, and terrestrial and wireless communications.[12]

The Centers for Medicare & Medicaid Services views telemedicine as "a cost-effective alternative to the more traditional face-to-face way of providing medical care (eg, face-to-face consultations or examinations between provider and patient) that states can choose to cover under Medicaid."[13] The Agency for Healthcare Research and Quality states, "telehealth, often referred to as telemedicine, is the delivery of health-related services and information via telecommunications technologies in support of patient care, administrative activities, and health education."[14]

The American Medical Association (AMA) defines telemedicine as health-related services that are synchronous and asynchronous and include a variety of tools and platforms that allow clinicians to connect

with one another, as well as with patients. See Box 1 for more information on the AMA's ongoing work in defining telehealth vs telemedicine and definition of synchronous and asynchronous in telemedicine services.

"Virtual care" is a broad term that encompasses all the ways health care providers remotely interact with their patients. Although telemedicine involves processes that may be only audio, all virtual IME incorporates video since audio alone would not be adequate, particularly for a physical examination.

BOX 1. AMA's Telehealth Initiative

Telehealth includes a variety of tools and platforms that allow clinicians to connect with one another as well as with patients virtually both in real-time and asynchronously. The use of telehealth to deliver care has been an option for many years, but its use has been limited by challenges surrounding coverage, payment, regulatory requirements, licensure, and technology. The AMA has been and continues to build the foundation for telehealth and digital medicine growth. Through advocacy efforts, the creation of the Digital Medicine Payment Advisory Group (DMPAG), and a commitment to developing practices resources, the AMA has been working to remove barriers to telehealth adoption for years and was well positioned to support physicians and practices in the quick implementation and adoption of telehealth amid the pandemic.

DMPAG, convened by the AMA, is creating a clear pathway for integration of digital medicine technologies into clinical practice by generating evidence, reviewing existing code sets, providing clinical and educational expertise, and ensuring program integrity. The AMA also leads telehealth advocacy efforts to support expansion of coverage and payment, access to telehealth for both physicians and patients, and the appropriate and ethical use of these services to provide care.

In addition, the AMA has been focusing on the creation of resources to support implementation in the clinical environment. The first Digital Health Implementation Playbook (Playbook) focused on remote patient monitoring was released in 2018. It came on the heels of the newly created remote patient monitoring (RPM) codes and CMS coverage, which became effective in the 2019 physician fee schedule. The second Playbook[15] in the series, which focused on telehealth implementation, was launched in April 2020; however, it was

already in development well ahead of the onset of COVID-19, which allowed the AMA to be a leading resource for physicians, care teams, and other industry stakeholders. Leveraging the insights and experiences from physicians, thought leaders, care team members, and patients from across the country, each Playbook offers step-by-step guidance to help with rollouts of various digital health tools, including best practices, goals to accomplish, practice stories, and additional tools and resources. In addition to the Playbooks, the AMA has led the development of The Telehealth Initiative[16] with The Physicians Foundation and various state societies that help physician practices implement telehealth services.

The AMA's definition of synchronous and asynchronous in telemedicine services are as follows:

Synchronous
- Real-time, audio-video communication that connects physicians and patients in different locations, which is often defined as telemedicine
- Real-time audio and telephone communications

Asynchronous
- Store-and-forward technologies that collect images and data to be transmitted and interpreted later
- Remote patient-monitoring tools such as blood pressure monitors, Bluetooth-enabled digital scales, and other wearable devices that can communicate biometric data for review (which may involve the use of mHealth apps)
- Online digital visits and/or brief check-in services furnished using communication technology that are used to determine whether or not an office visit is warranted (via patient portal, smartphone)

Practical Issues

For the examinee, a virtual evaluation is typically more convenient and more efficient, and it eliminates the potential risks and fears of COVID-19 exposure. Anxiety may be reduced because the examinee is typically assessed in his home rather than at a physician's office, there are no concerns regarding travel and/or being late, and there is less waiting. However, challenges with the technologies and attempts to perform an adequate physical assessment may exist.

There are no barriers related to the distance between the examinee and the physician other than jurisdictional ones. For example, an examinee may live in another state or province where the physician is not licensed. Workers' compensation cases usually require that the examination be performed by a physician licensed in that state or province. Because an IME

is considered as "any health assessment conducted by a physician, not otherwise involved in the care or treatment of the patient"[17] and because the relationship is instigated by the request of a third-party, the patient-physician relationship is not a typical or normal patient-physician relationship. The question of whether performing "an IME, in and of itself, constitutes the practice of medicine"[17] generates different answers across states and between a state and its medical board. Some states consider IMEs to be the practice of medicine and require that IME physicians be licensed in the state where the examination is performed. Because the rules for this vary from state to state, it is important for physicians and attorneys to be aware of the applicable law in the state where the IME will be performed.

Virtual evaluations make it more feasible for physicians within a state or province to provide evaluations

throughout that jurisdiction. For example, a physician could perform a virtual evaluation hundreds of miles away from his or her office. Some IME physicians fly within their state to see examinees, but this would no longer be necessary. With virtual evaluations, an examinee can be evaluated by a physician with unique qualifications for the specific case in question. This may not have been possible before. It is a very effective way to provide quality care in a cost-effective manner.

Virtual assessments have the potential to involve new physicians because the work is now more achievable and acceptable than before. It is likely that millennials who grew up using computers will embrace virtual approaches, while some baby boomers will not choose to transition to virtual work.

Physicians who plan to perform virtual evaluations must be prepared. This includes having the appropriate policies, procedures, and security in place. The physician should consider practicing an evaluation before performing his first virtual case.

It is appropriate to educate potential referral sources about the advantages and disadvantages of virtual evaluations. One significant disadvantage of an in-person evaluation during a pandemic is potential exposure to the examinee, physician, and/or physician's staff.

Reimbursement must be reasonable. Although some may view virtual evaluations as inferior to in-person evaluations, this is not necessarily the case. The physician is likely to spend more time with an examinee virtually, thus being able to obtain a more thorough history. Virtual evaluations may take the same amount of time or more; therefore, the fees should be commensurate with the time and effort involved.

Evaluation Process

It is useful to view the evaluation process from the onset (the request for an evaluation) to the end result (the preparation of the report), rather than focus solely on the interaction with the examinee. With this understanding, we can then consider virtual approaches.

An evaluation reflects data acquisition (data input), data analysis, and delivery of a report (data output), as shown in Figure 1.

FIGURE 1. Evaluation Process

There are multiple data sources for an evaluation, as illustrated in Table 1. Data input specific to a case includes the request (eg, referral letter), medical records, other documents, surveillance (less common), imaging, other diagnostic studies, examinee history, examinee forms and inventories, and the physical examination.

Each element is amenable to the virtual environment, except for some aspects of the physical examination. Although the physical examination is often important, particularly with musculoskeletal and neurological assessments, it may provide a minority of the necessary information. However, with some assessments, such data are crucial, particularly when the data are not available in other documents and/or when the reliability is questionable.

A physician uses the case data, applying evidence-based medicine and guidelines, to develop conclusions. Resources commonly used are the *AMA Guides to the Evaluation of Permanent Impairment*,[18] *AMA Guides to the Evaluation of Disease and Injury Causation*,[19] *AMA Guides to the Evaluation of Work Ability and Return to Work*,[20] *AMA Guides Newsletters*, and *AMA Guides to Navigating the Disability Benefit Systems: Essential for the Health Care Professional*.[21] Treatment and disability duration guidelines are often used, including MDGuidelines (American College of Occupational and Environmental Medicine Practice Guidelines).[22] ODG by MCG Treatment and Return to Work Guidelines,[23] UpToDate,[24] PubMed,[25] and other clinical resources are commonly referenced. Most of these resources are available virtually, either Web-based or as E-books. Soon, more AMA publications and resources will be available on Web-based platforms.

TABLE 1. Evaluation Data Sources

SOURCE	VIRTUAL POTENTIAL	VIRTUAL EXAMPLE
Case specific		
Request/Referral	√	Online forms
Medical records and documents	√	PDF documents
Imaging and diagnostic studies review	√	Virtual viewing
History	√	Web-based interview
Individual's forms and inventories	√	Online
Physical examination	√ +/-	Web-based, with limitations
References		
AMA Guides publications	√ +/-	E-books
AMA Guides Newsletter	X (planned)	
Evidence-based medicine	√	Multiple sources
Treatment and disability duration guidelines	√	MDGuidelines, ODG by MCG

The physician then analyzes these data, and a report is prepared and delivered. Many physicians currently issue reports electronically, often in Adobe portable document format (PDF).

Historically, the IME process and reports have included inconsistencies. Traditionally, IMEs are not performed using a well-defined process, and there is considerable variability in the approach and results. Clients who request evaluations may not provide adequate records or information. Physicians often receive records that are not well organized and must then laboriously sort and summarize these records. The physician interviews the examinee and performs a physical examination, often scrawling notes that are later used to dictate a report. Even when the disabilities are similar, some physicians spend only a few minutes performing their evaluations, while other physicians spend several hours performing their evaluations. Unfortunately, many reports are poorly organized, omit key information, fail to accurately address issues and, therefore, are of questionable value.

Jurisdictional and Legal Issues

The consequences of a pandemic and the performance of virtual evaluations are new issues for payers, jurisdictions, and the law. We do not know how long the pandemic will last and whether there will be subsequent waves of infection. Workers' compensation jurisdictions will likely react differently to the use of virtual IMEs and impairment evaluations in the midst of the pandemic. Some jurisdictions may not permit them and, instead, delay case progress until it is safe to perform an in-person examination. Others may embrace virtual evaluations, which could lead to serious consequences for the claimant who refuses to participate. Some may be predisposed by previous experiences with telemedicine. For example, Connecticut was one of the earliest states to encourage the use of telemedicine for evaluations (Figure 2), making that state more likely to accept virtual IMEs.[26] The longer the pandemic lasts, the more likely it is that virtual evaluations will gain widespread acceptance as a viable methodology for decision making and claim determination.

Virtual IMEs are new to all stakeholders, including the injured worker, both defense and plaintiff counsel, claims professionals (associated with insurance companies, third-party administrators), and employers. Because all stakeholders want claims to be processed and closed, virtual evaluations will allow for this process to continue in a timely fashion.

From a legal perspective, attorneys are likely to view virtual evaluations based on how they affect their cases. If an attorney perceives that the virtual-evaluation process will be favorable to his client, he will encourage it; if not favorable to his client, he will criticize it. This may be driven by past experience with a physician, perceptions of reputation, or the new process. Because the physician was not physically present, there may be evidentiary objections raised as either an admissibility or evidentiary weight argument. The validity and reliability of opinions could also be challenged based on insufficient data and questionable reliability of findings (Ranavaya M, MD, JD from ABIME. Email communication re: COVID-19 Pandemic and IMEs—Reflections. Apr 15, 2020).

Virtual Approaches

Each component of the virtual IME, including each data element, should be reassessed to determine the best practices and how virtual technologies might be successfully used. The goal is to furnish an unbiased, valid, and reliable assessment that provides meaningful information and addresses the questions asked by the referring client.

FIGURE 2. State of Connecticut WCC RME and CME Policy Regarding the Use of Telemedicine[26]

Memorandum No. 2020-09 (Dated April 1, 2020)

In response to the ongoing COVID-19 health crisis WCC has decided that RMEs and CMEs can be conducted using telemedicine at the discretion of the doctor. The following procedure will apply:

1. The decision to conduct an RME or CME by telemedicine will be made by the doctor; claimants who refuse to participate, will be subject to the same consequences as if they had failed to attend an in-person appointment.
2. For RMEs and CMEs conducted by telemedicine:
   a. Claimants shall advise the doctor at the time of the telemedicine examination if anyone else is present and must identify such person;
   b. Attorneys, paralegals and/or hearing representatives are prohibited from being present with a claimant at the time of a telemedicine examination;
   c. If claimant or anyone present with claimant intends to record the examination, or any portion of the examination, the doctor must be advised in advance and must expressly consent.
3. In addition, for a CME conducted by telemedicine, the party submitting the medical packet to WCC shall ensure that all diagnostic studies, including images (eg, CD of MRI, CT-scan) are included in the packet.

Abbreviations: CME indicates Commissioner's medical examination; COVID-19 = coronavirus disease 2019; RME = responsible managing employee; and WCC = Workers' Compensation coverage.

Examinee

The examinee must have reliable access to the Internet and a device capable of audio and video, for example, a smartphone, tablet, or computer. Often, a smartphone is used. However, in some situations, the examinee may need to borrow a smartphone, or a smartphone or tablet can be provided by an outside source. The examinee should be advised that the interview and examination must occur in a quiet, private setting, ideally, with a blank wall, particularly if motion measurements are to be taken. A support person, for example, family member, friend, or even a videographer, will likely be needed to assist with obtaining the video, particularly for physical examinations that involve gait observation, identification of tenderness, or demonstration of motion deficits.

Physician

Physicians can assist their clients by reviewing a case before a potential virtual evaluation and determining whether such an evaluation is feasible, for example, whether it is possible to obtain the information needed for a quality assessment. It is possible that other services, updated diagnostic testing, or technology specifics will be important elements of the IME in this new telemedicine setting.

The physician must have the appropriate technology and access to a sufficient and secure cloud-based communication system. Virtual records should be encrypted, and cloud-based platforms must be Health Insurance Portability and Accountability Act of 1996 (HIPAA) compliant. Numerous platforms are available, including Amazon AWS, Box, Dropbox, Google Cloud, and Microsoft Azure. Vigilance regarding best practices for communication cybersecurity and strong passwords is recommended. This security needs to also cover email systems.

Access to a reliable, high-speed Internet connection is required. Ideally, the physician will use a computer with a high-definition camera and quality microphone or headset. Use of a smartphone or other handheld device is not adequate.

The cloud-based communications system could be one that is widely used (eg, Zoom, GoToMeeting, BlueJeans, Webex, Microsoft Teams, FaceTime, or WhatsApp) or one specific for telemedicine (eg, DCCS Telemedicine, Doxy, Mend, OhMed, or VSee). Critical considerations include the physician's and examinee's platform familiarity and comfort and the strength of security features. It may be best to use a single platform and become very familiar with it. HIPAA compliance requirements and business associate agreements have been eased with the pandemic; however, the physician should reassess the need to comply with all laws, particularly those regarding privacy and security.

The physician should perform the evaluation in a quiet, private setting. Professionalism is important. Therefore, if the background does not portray a professional setting, an appropriate virtual background should be used. The quality of the virtual background is greatly improved with a green screen along with appropriate lighting. Soft lights behind the camera should illuminate the physician, and there should not be a bright light or screen behind the physician.

Steps in the Virtual Process

Information specific to the case should be obtained efficiently, accurately, and appropriately. Following are the steps to be taken in a virtual evaluation.

Referral

Often, referrals for an evaluation are initiated by a telephone call to a physician's office with a request to schedule an IME. A referral letter may be provided with the records, hopefully before the evaluation. The referral process can be integrated with the physician's calendar and database so that an appointment date is assigned immediately. Notifications can be sent virtually.

Many IMEs and impairment assessments are coordinated by companies that deliver IME services using contracted physicians. These entities often use an online referral form; however, these forms can vary from company to company. A virtual solution is to use a referral form to request information that is essential to the evaluation, including specific issues and questions. Without guidance on what needs to be addressed, the physician cannot perform an adequate evaluation. The physician needs specific information, for example, if the client requests a permanent impairment assessment, it is important to ask which *AMA Guides* edition is to be used and to address any issues surrounding assessment of maximum medical improvement.

Records and Other Documents

Traditionally, medical records and other documents have been provided in a paper format. Although many organizations that request IMEs have virtual records (ie, PDFs), physicians are often sent paper records because of the assumption that physicians prefer them.

A common complaint of physicians is that records are unorganized, incomplete, and/or late. With ready access to global services provided via the Internet, many IME companies and experienced IME providers obtain documents electronically and use offshore resources to organize and summarize the information. Typically, records are organized by date with a tabular index that has hyperlinks to specific records and a chronological summary. There are several considerations in selecting a vendor, including security, confidentiality, HIPPA compliance, business associate agreements, and skill level of the reviewer (ranging from layperson to board-certified physician).

New technologies that incorporate optical recognition and artificial intelligence are being used to organize records, remove duplicate and unnecessary documents (eg, fax cover sheets), identify specific types of records, and extract information (eg, identify an operative report and extract the date, procedure, preoperative diagnosis, postoperative diagnosis, and findings) (Mason Harrell, MD, pers. comm.). Physicians must still review

each document and edit the summaries; however, such approaches make the process more efficient. Therefore, use of paper documents will be ending soon.

Video Surveillance

Although most evaluations do not involve the review of video surveillance, the old process of sending physicians videotapes, DVDs, or flash drives is being replaced with hyperlinks to online video content. The physician should download and maintain a copy of any video material viewed in order to substantiate the review and specifics in a cross-examination setting.

Imaging and Studies

Typically, physicians are sent DVDs and/or examinees are advised to bring in their imaging studies. However, increasingly, images are available online. Access to any imaging studies must be convenient and secure, and a digital copy should be maintained.

Agreement

All stakeholders including the examinee, physician, referral source, and, if applicable, attorneys must agree to a virtual evaluation. Such agreement is not necessary if the virtual alternative is ordered by the presiding adjudicator, thus rendering it appropriate despite legal objections.

The examinee must agree to advise the physician if anyone else is present and identify such persons. Depending on the jurisdiction, attorneys, paralegals, and/or hearing representatives should not be present during the examination. As with in-person examinations, an examinee may be unable or unwilling to proceed without a caregiver or family member present.

Informed Consent

Informed consent should precede the evaluation. Informed consent should be obtained from the examinee. It can be signed virtually and should include an agreement that the session will not be recorded by either party, except for certain aspects of the physical examination. A video presentation that explains the process can be provided, followed by obtaining virtual authorization. Potentially, verbal acknowledgment of information received is digitally recorded for simplicity if the parties mutually agree.

Examinee Engagement

As noted previously, the examinee must have access to the appropriate technologies and have reliable Internet access. Often, access is via a smartphone. It is useful to use text messages and/or email messages to remind the examinee of the upcoming evaluation. Depending on the cloud platform used, a third-party, for example, a support person in the physician's office, can ensure that the examinee's equipment is working before the virtual examination takes place and assist in the completion of Web-based forms and inventories, possibly using screen sharing.

Before the examination, the examinee should verify his or her identity. This can be done by displaying a motor vehicle license or other documentation. Some conferencing platforms provide security features such as password protection, virtual waiting rooms, and the ability to "lock" the meeting to prevent others from joining later. While advance notice of the date, time, and platform is necessary, the actual communication link or invitation should be sent on the day of the examination to prevent harvesting of information by trespassers.

Examinee History

An accurate history is essential to any IME. In the past, physicians simply interviewed examinees without a well-defined structure. Today, many physicians use forms to augment the history-taking process. Still, there is considerable variability in these forms, both in scope and depth. Without a structured approach to history-taking, critically important information is often omitted through human error. This may result in erroneous conclusions. Consequently, it is essential to provide opportunities to ask open-ended questions.

Some physicians use "historians" to perform the initial interview. The goal is to obtain a history more cost-effectively. With access to English-speaking personnel in other countries, some physicians arrange for a telephonic or Web-based interview before the virtual evaluation. The effectiveness of this varies depending on the training and skills of the historian, cultural bias, and language skills.

Using artificial intelligence, it is possible to take online histories and request specific information based on existing data. The history can be completed directly by the examinee, a historian, or the physician. Thus, in the virtual environment, an online questionnaire and/or historian interview can be completed before the evaluation. The physician can then review and clarify the history. The reflective nature of this process reinforces examinee recall and communication when the history is reviewed with the examinee.

Anecdotal reports by physicians who perform virtual IMEs support the fact that histories are effectively obtained in the virtual environment and may be even more complete since there are fewer time constraints and the examinee feels more comfortable providing the history from her home than at a physician's office. Virtual histories are likely to become much more common and may precede in-person evaluations.

Inventories

Patient-reported functional outcome measures and assessment tools are often used in IMEs, with *AMA Guides,* Sixth Edition, musculoskeletal assessments, the Pain Disability Questionnaire, *Quick*DASH, and/or AAOS (American Academy of Orthopaedic Surgeons) Lower Limb Scale often administered. Some physicians use the Multidimensional Task Ability Profile and other

inventories. These tools, and many others, can be administered on the Web. Such functional inventories are likely to be routinely incorporated into most IMEs.

Physical Examination
The importance of the physical examination depends on the context of the case, the issues, and the types of problems. Specific types of examinations are discussed below.

Musculoskeletal
A physical examination may not be crucial in assessing causation of a musculoskeletal injury. However, it is very important that function and impairment be assessed based on the Fifth Edition or earlier editions of the *AMA Guides.* Since most impairments are based on diagnosis with the physical examination being a grade modifier, the *AMA Guides,* Sixth Edition, musculoskeletal assessments are more amenable to being virtual. The physician finds information in the medical records that will serve for grade modification on the basis of the physical examination and/or that will serve as the basis of impairment founded on other approaches, such as motion deficits.

A physician can observe behaviors and gait or ask the examinee to identify areas of concern or to perform certain tasks (eg, move a joint, measure circumference, or perform an activity). The range of motion of larger joints can be determined or images of motion can be measured by placing a goniometer against the screen. The physician captures images of the joint in limits of motion and includes this in the report. Measurements should be determined bilaterally. If the opposite side is uninjured and motion findings are the same, there would not be any motion loss for the injured side.

Smartphone applications (apps) to measure joint range of motion are available, which requires the examinee to install the app and make use of it as directed by the physician or staff member. Smartphone photography has been used to measure finger range of motion.[27] It is important to validate such approaches, though studies have demonstrated that teleconference and digital photography are as accurate as clinical examinations in measuring shoulder, elbow, hip, and knee motion.[28-30] Studies have demonstrated excellent inter-examiner reliability with smartphone goniometric tools.[31, 32]

Newer technologies can be used to automatically analyze movements and provide quantification of motion. However, only active, not passive, motion should be assessed, and it is more challenging to assess smaller joints, such as digits. Notably, the use of technology may lead to testimonial inquiry. A physician who uses such tools should be as prepared to describe the process as he or she is prepared to discuss diagnostic testing, its function, and challenges.

The physician may not be able to determine if the examinee demonstrates full capabilities; in other words, whether performance was self-limited. Yet, some insights can be obtained if other documentation of these findings

exists in the medical records or if contradictory movements are observed or demonstrated.

Spinal examinations are difficult to perform virtually since inclinometry cannot be achieved remotely and neurological assessment is required. A myriad of musculoskeletal findings is difficult, if not impossible, to obtain remotely, such as joint instability, left length discrepancy, lower limb alignment, swelling (unless marked), warmth (only relying on self-reports), and crepitus.

Neurological
It is particularly challenging to perform an adequate neurological examination that includes quantitative assessment of sensory loss, motor strength testing, measurement of reflexes, and other measures. However, it is possible to have someone else softly touch and assess differences and to have the examinee perform certain activities, such as walking and toe/heel walking. Some physicians use a physician extender, such as a nurse or physical therapist who is trained in performing a physical examination and reporting findings remotely to the physician.

Dermatological
Impairment assessments for skin disorders, including scars, are amenable to remote evaluation. The examinee can display skin lesions and scars using a smartphone or camera.

Internal Medicine and Other Specialties
Telemedicine has prompted the development of technologies for electronic stethoscopes (permitting remote listening to heart and lung sounds), remote electrography, transformation of ophthalmoscopes and otoscopes for remote visualization, and other developments. However, currently, these devices are better suited for remote clinical care than for independent medical evaluations, require shipping to the examinee, and require training for the user. It is difficult to virtually perform certain aspects of an internal medicine examination, such as palpation, assessment of signs of heart failure, and evaluation of orthostatic hypotension.

Mental and Behavioral Disorders
It is possible to remotely obtain a history, perform certain testing and inventories, and perform a mental status examination for psychiatry and psychology assessments. Guidelines for the practice of telepsychology, including testing and assessment, should be followed.[33] The reliability of neuropsychological and psychological test measures, including various performance, embedded, and symptom validity measures that are important for medical legal purposes and are delivered via a virtual platform and in person, is currently being researched (Konstantine Zakzanis, PhD, C Psych; pers. comm.).

Hybrid Evaluations
An alternative to a virtual physical examination is to have a limited visit where the examinee is directly examined

after a virtual history is taken. With the COVID-19 pandemic, this should involve screening the history and taking a temperature before the physical assessment. Precautions should be taken to limit exposure to the examinee, physician, and others in the office. This includes disinfecting the office before and after the visit, seeing the examinee when other examinees and/or patients are not present, and wearing a mask and gloves. The reader should reference future updates regarding COVID-19 precautions and policies on the Centers for Disease Control and Prevention website. It is also important to determine if your state and county consider the IME evaluation "essential" and therefore allow a face-to-face evaluation.

It may also be possible to have another health care provider obtain needed examination data; for example, request that a physical therapist obtain motion measurements either virtually or in person. These measurements must be reliable; in certain jurisdictions, measurements taken by another individual are not allowed, and preauthorization is needed. The physician should rely on such data only if he or she is prepared to testify that reliance on that data is reasonable and accepted in the physician's professional specialty.

Other Data Sources

It is imperative to obtain the data required for the impairment assessment. If it is impossible to obtain this on direct examination, the physician may review records dated after the examinee reached maximum medical improvement. If the needed data are available and consistent, the physician can consider using them to assess impairment.

Guidelines and Evidence-based Medicine

Essentially all of the resources applied to the specifics of a case are available in a virtual environment. There are software solutions for assessing impairment based on specific clinical data, many of which are cloud-based. It is likely that artificial intelligence tools, primarily cloud-based, will be used to apply the facts of a specific case in order to answer questions, including clinical diagnosis, causation, apportionment, impairment, work function, and clinical care.

Report Development

Rather than dictating each IME report, the physician can use technology to ensure that reports are prepared more efficiently and are of higher quality. This includes use of standard templates to ensure that the required elements of a report are included. Report preparation often involves dictation that is transcribed using software (locally or cloud-based) or resources outside of the office.

Templates and text blocks should be carefully and individually reviewed to ensure a reliable and credible output. Text expanders facilitate report development because common phrases and discussions can be included with a few keystrokes. Anecdotally, some judges have received multiple reports from the same provider over time and have noted that it appeared as if "only the names were changed . . . ." The credibility decisions are likely to be impacted by such reports.

With virtual reports, it is easy to include images of the examinee and/or to illustrate an issue, content from medical records and other documentation, and timelines. Within a virtual environment, reports may be reviewed and edited by others outside of the physician's office. In a virtual world, only electronic PDF reports are issued.

Virtual Client Meetings

It may be useful to have a virtual meeting with a client to discuss the IME report. Web-based platforms permit the physician to share desktops and view the actual report. Similarly, it is possible to share specifics in a medical record or diagnostic result with the client.

Depositions and Testimony

Depositions and testimonies are very amenable to being performed in virtual environments, with attorneys, fact-finders, court reporters, and physicians connecting via a virtual-meeting platform. A challenge in some jurisdictions is the remote swearing-in of the witness. Parties can legally stipulate (ie, come to a formal legal acknowledgment and agreement before a pending hearing or trial) around such issues. In some states, remote swearing- is allowed by law. A notary who is located near the physician's office may be needed to perform the swearing-in procedure in the event of a good faith objection.

Conclusion

Virtual evaluations will become more common, even after the COVID-19 pandemic ends. Innovative solutions necessitated by these evaluations have the potential to improve both quality and efficiency. Increasing acceptance of virtual IMEs by younger generations portends a bright future for those who adapt to the challenges this presents.

Essentially all aspects of the independent medical and impairment assessment are amenable to being performed in a virtual-environment, subject to the physician's motivation, patience, and effectiveness. The primary challenge is how to perform certain aspects of the physical examination; however, new technologies will likely eliminate many of these challenges. Until then, physicians need to address or solve problems or shortcomings. The credibility of outcome determinations may hinge on the ability to explain both what was done and why it was as efficacious as an in-person alternative or perhaps as useful as any other alternative under the circumstances, COVID-19 or otherwise. The other challenge is to obtain the acceptance of the virtual process by all stakeholders. That acceptance will come with time, experience, and effective physician performance.

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