

Introduction

Epilepsy is one of the most common chronic neurological disorders, with a prevalence of at least 7 to 9 per 1,000 people and an incidence of 67 per 100,000 people per year worldwide [1–3]. The global prevalence of epilepsy is highly variable in different regions of the world, implying that biological, environmental, and health resource-related factors contribute to this observation [4]. In addition, epilepsy is often associated with many somatic and psychiatric comorbidities, further impairing quality of life [5]. Worldwide, patients encounter disparate health systems and financial barriers in accessing face-to-face consultations. For example, in Nepal, some patients need to travel for one week to access a conventional face-to-face medical consultation, presenting a considerable economic barrier [3]. Moreover, conventional medical consultation is not only a problem for low- and middle-income countries (LMICs) but also for high-income countries (HICs) for various reasons, including unequal geographical distribution, economic restrictions, paucity of epilepsy specialists, and challenges related to neurological and cognitive deficits and stigma [3–8].

The benefits of telephonic patient review had been demonstrated in a randomized controlled trial conducted six years before the COVID-19 pandemic [9]. This study demonstrated that telephonic consultations were as effective as face-to-face consultations in providing follow-up care for persons with epilepsy (PWE) [9]. In addition, telemedicine has been utilized to provide effective care for PWE facing restrictions in driving privileges by circumventing the need for travel to the physician's location [10]. Management of epilepsy, in particular follow-up visits, can benefit immensely from telemedicine since these are more focused on seizure semiology, frequency, monitoring of side effects, adherence, and counselling rather than physical examination in most PWE [9].

During the COVID-19 pandemic, face-to-face consultations became even more constrained. Studies revealed PWE observed disruptions in the quality and availability of care as well as increased stress and social isolation, with an apparent increase in seizure frequency [7,11]. During this period, telemedicine in neurology has been increasingly utilised with broad acceptance among patients and clinicians [6,7,12–14]. Studies related to epilepsy care quality and management have shown no significant

differences between face-to-face consultations and teleconsultations [7,9,15–18]. Academic interest in telemedicine implementation has also grown, as reflected by the year-on-year increase in the number of scientific publications on this subject [19].

While 80% of all PWE live in the LMICs, the distribution of healthcare resources to these patients is unequal. As a result, a treatment gap of up to 100% is found in several regions, and gaps in access that exceed 50% are unfortunately common [4]. In a recent study undertaken in Africa, the number of neurologists was reported as remarkably low, with eight countries, having no neurologists [20]. While more will need to be done to reduce the prevailing levels of epilepsy treatment gap, improving access to qualified physicians will be an important step forward; and this is where telemedicine can deliver a significant impact [7,8] through the formulation of an epilepsy diagnosis in a remotely located patient [12], provision of follow-up care for patients on anti-seizure medications (ASMs) and ketogenic diets [21,22], remote EEG diagnostics [23], tele-neuropsychology assessment [24], and counselling patients and caregivers [25,26]. Telemedicine can also be utilized to triage patients who have breakthrough seizures at home and determine whether hospital care is immediately needed or domiciliary care would be adequate [17]. It has been shown that telemedicine can be used to provide complex care to patients with drug resistant epilepsy [27]. Through telemedicine, candidates for surgical therapeutic options or vagal nerve stimulation can also be selected and counselled [27]. A telemedicine network connecting primary centres with secondary and tertiary-care hospitals for referral and counter-referral provides a significant difference in the quality of care for PWE in remote and difficult-to-access places by improving diagnosis, treatment, and follow-up [10]. Telemedicine could also improve care for incarcerated PWE, the very elderly and support transitions when individuals relocate from one part of the country to another. Telemedicine in these specific circumstances could bridge the barriers posed by physical distance between the physician and the patient and would require prior preparation to ensure the patient has access to the technology required to engage in a tele consult, access to a reliable network connection, privacy for the consult as well as an interpreter or a trusted support during and after the consultation [28].

Management of PWE requires attention to specific details during teleconsultation regarding diagnosis, counselling, pharmacological treatment, and evaluation of comorbidities [27–29]. Current and future educational curricula should include these

details as well as an orientation script of a telemedicine interview to guide trainees on the most relevant aspects that healthcare professionals managing PWE should keep in mind [29]. Here we outline recommendations in telemedicine concerning what may be regarded as optimal practice in managing PWE.

Technical requirements

Telemedicine involves the real-time or synchronous transfer of audio-visual data between health professionals and patients through specific video conferencing hardware and software or by telephone. High-speed broadband internet access improves connectivity and the quality of audio-visual data transfer. Depending on country-specific privacy, confidentiality, and data safety regulations, telemedicine may also include other non-synchronous routes, including email or text messaging [17].

Consumer communication applications are readily accessible and convenient for consultation, although applications with high-level protection for information security and privacy are recommended [30]. Healthcare-specific videoconferencing applications are preferred and recommended as these have additional cybersecurity measures [30]. Both patients and health providers need to be alert to the risk of cyberattacks and arrange to utilize password-protected access, the use of waiting rooms to allow authentication of those joining the session, encryption or healthcare enterprise software that reduces the possibility for intrusion and breach of confidentiality during the teleconsultation process [30].

Preparing for the consultation

Telehealth consultations may not differ significantly in their content from face-to-face consultations, although for many patients, this form of consultation may be a novel experience. It is crucial to inform the patient regarding the format of the consultation in advance, what individuals should expect during the consultation, and how to access it. The patient should be guided to prepare specific information pertinent to the consultation, such as current body weight, changes in medication doses or frequency for continuing patients, new observations or suspected side effects. Healthcare providers, on the other hand, need to be sensitive to the patient's social context and pay particular attention to the setting and opening of the teleconsultation session [31]. For example, in some conservative regions in Africa and Asia, especially for women, it is preferable to

have a female specialist conducting the consultation; otherwise, the presence of a male clinician could negate the management effort.

When approaching the teleconsultation of a PWE, it is essential to determine whether it is the first clinical encounter (the first consultation) or a follow-up consultation since each presents different requirements. For the first consultation, details of past medical and treatment history should be provided by either the patient or by the referring clinician upfront to facilitate the tele-consultation. Furthermore, videos of recurrent seizures should be requested and shared by the patients if possible, prior to the teleconsultation to aid in accurate diagnosis and characterization of epilepsy. Videos can be shared in advance by suitable mode of communication, with end-to-end encryption, such as telemedicine software, email, WhatsApp and other similar applications. Arrangement for the storage of patient-related video data needs to be made before the consultation as required and in compliance with local data protection regulations [32].

Pre-consultation questionnaires which include seizure types, frequency, and current ASMs, should also be availed to improve the efficiency of the consultation. History taking is one of the most critical aspects in making a diagnosis of epilepsy, and during the first teleconsultation with a new patient, it is vital to establish a good doctor-patient relationship with the physician being conversant with the process and facilitating the comfort of the patient with the process. Establishing a good doctor-patient relationship is a challenge, especially for new teleconsultation, and some physicians may find it unsatisfactory [33]. Therefore, it is crucial to have video-based consultation, and physicians need to acquire skills of communication with body language as well as facial expression. Similarly, for follow-up consultation where the clinician already has an existing relationship with the patient, video-based consultation is of paramount importance to sustain the same connection.

In teleconsultations with adult patients, it is of particularly beneficial to have a second person who knows the patient available during the interview, as this helps clarify questions and avoid misunderstanding of treatment plans and instructions. Telemedicine virtual platforms can also facilitate the engagement of third parties whose contributions would be valuable to the consultation while living in a different region or country, for example, legal guardians to minors. Arrangements for second and third parties should be made to inform and invite them to join in the teleconsultation beforehand. Active engagement with the patient's companion and second or third parties attending the

teleconsultation is also fundamental to sustaining the physician-patient dyad [31].

Furthermore, appropriate documentation of the consultation is a requirement in most jurisdictions and is certainly necessary for clarity at follow-up visits.

Lastly, various ways to facilitate appointment mechanisms for teleconsultation should be developed, such as a) hospital or clinic-based teleconsultation registration, b) request through a physician, c) through an association of PWE, with the latter especially relevant for some countries where access to health care facilities is challenging.

The first telemedicine consultation for PWE

A checklist to guide the first consultation is provided in Table 1.

Table 1: A guide to the first teleconsultation for patients with epilepsy

PREPARATION FOR THE TELECONSULTATION	i. Inform the patient/guardian of the intended date, time, and format of the consult. Obtain confirmation of attendance from the patient at least 48 hours prior. ii. Obtain signed consent forms from the patient, specific to teleconsultation, if these are required in your jurisdiction. iii. Confirm support for the teleconsultation within the hospital set-up, such as availability of a secure virtual communication link, approved documentation for the teleconsultation and a retrievable archival system of the record, support after the consult to ensure prescriptions, EEG, and other lab requests reach the patient via email or specified portal after the teleconsultation. iv. Confirm insurance approval/financing support as required before the teleconsultation where this is
---	---

**DURING THE
CONSULTATION**

relevant.

- v. Request the patient to share a video of the seizures, if available, which may contribute to the diagnosis of epilepsy.
- i. During the teleconsultation, spend the first few minutes cross-checking that the patient can see and hear the physician appropriately. Facilitate free flow of the discussion and help the patient feel comfortable communicating virtually.
- ii. Ensure a private location is available for the patient and physician to conduct the teleconsultation.
- iii. Ensure a detailed history and all relevant information provided by the patient is reviewed and documented as would occur at a face-to-face consultation.
- iv. Requiring the presence of witnesses who can provide further information regarding the seizures of which the patient has not been aware of would be helpful. Legal guardians are required to be present during teleconsultations with minors.
- v. Where home videos of the actual seizures are available; these can be reviewed before or during the consultation to further clarify on these aspects.
- vi. If a simultaneous video system is being employed during such a videoconference and the patient is in a quiet and private space, a neurological examination can be attempted [33].
- vii. Enquire from the patient if there is any other relevant information they would like to provide
- viii. Cross-check that the patient/ guardian/companion

	has understood and is in agreement with the plan
AFTER THE TELE CONSULTATION	. i. Document the teleconsultation using the approved structure in your setting ii. Ensure that prescriptions and other orders have been prepared and delivered to the patient through pre-arranged portals or via email. iii. Arrange a re-booking for future consults with the patient and agree on the mode, in-person or another teleconsultation.

A detailed description of all seizure types would be required, including collateral history from a reliable witness if available. Both open and close-ended questions can be utilized, with the latter aimed at obtaining specific information from limited options such as the presence or absence of particular phenomena [32]. Patients with epileptic seizures are able to describe subjective sensations of seizures with greater precision than patients with psychogenic non-epileptic seizures (PNES), while patients with PNES describe the environment where the event occurred better [34].

An enquiry regarding the frequency of seizures, prior history of status epilepticus, most prolonged seizure-free interval, and date of last seizure is recommended. This could be a good time for consultation to introduce the concept of a seizure diary, which may be electronic or paper-based to document specific aspects of seizure semiology and frequency [35–38]. Seizure triggers should also be documented [39].

Current and previous medication(s) for both epilepsy and other pathologies need to be documented, as well as dose adjustments, specific side effects and potential interactions must be taken into account. There is a particular advantage here with telemedicine over face-to-face consultation—if patient is at home, they should have their medications to hand so they can read them out to the consulting clinician. There is no concern that the patient will miss bringing a list of ongoing medications, which is common with a face-to-face consultation. Evidence suggests that neurologists are generally satisfied with making dosage adjustments via telemedicine [40]. Encourage the patients to provide

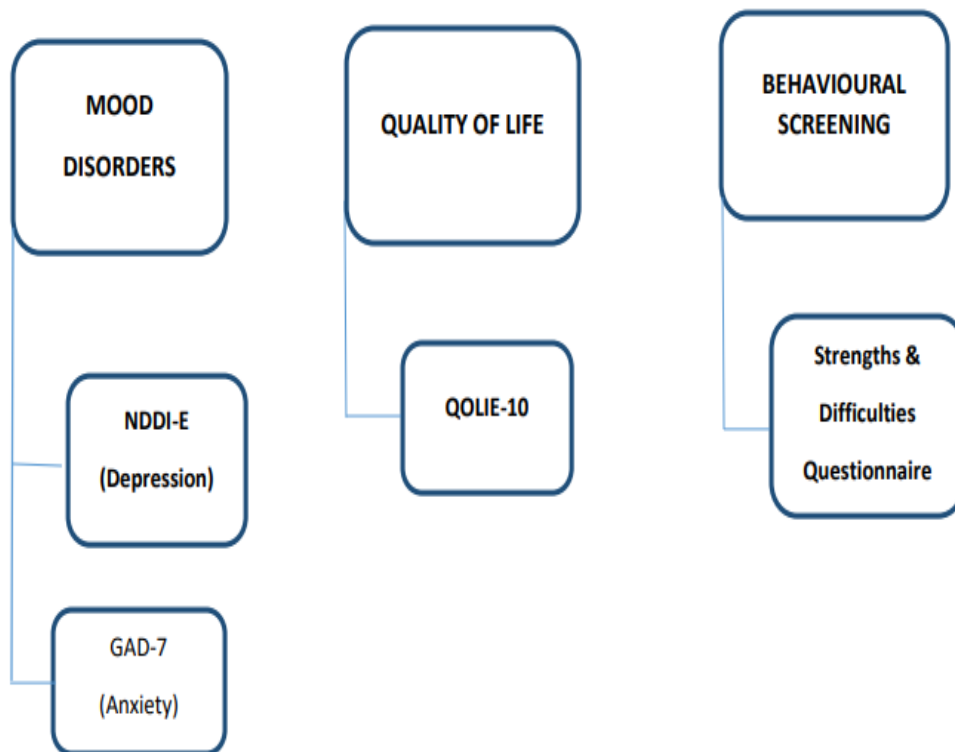
any information about complementary and alternative treatments they might be taking [41]. Information on the ASM which provided the greatest reduction of the seizures, where applicable, may help in subsequent management.

Comorbidities are frequent in PWE, especially mood disorders such as depression and anxiety, as well as other medical, neurological, psychiatric and cognitive comorbidities [19]. These can impact the patient's quality of life negatively, so early diagnosis is vital for specific multidisciplinary management. One should be mindful that certain psychosocial issues contributing to mood disorders, such as a history of abuse, may be challenging to elicit during the first telehealth consultation. An initial face-to-face consultation followed by subsequent telehealth consultations may obviate this issue and encourage patients to embrace this alternative mode of consultation, particularly once rapport is established with new patients.

In order to detect common comorbidities, self-administered validated screening tools or scales for children in the local language where available can be provided; ideally before the consultation (Figure 1) depending on the health system organization.

Figure 1: Self-administered tools to evaluate comorbidities in children

Figure 1 Self-administered tools to evaluate for comorbidities in children



Such tools include:

- 1) The NDDI-E, a six-item epilepsy-specific depression questionnaire with excellent sensitivity and specificity to detect depressive disorders, including suicidality. A score of 13 points or higher in the NDDI-E has a high sensitivity for depression, and a score of 3 or higher on item 4 of the NDDI-E is a valid risk for suicidality [42,43].
- 2) The GAD-7, a seven-item, validated tool to assess anxiety. Scores of 5, 10 and 15 represent mild, moderate, and severe anxiety. While a score of 10 has the highest accuracy for anxiety disorder [44].
- 3) The QOLIE-10, a well-known, brief tool that provides the patient's global perspective of their quality of life [45].
- 4) The Strengths & Difficulties Questionnaire (SDQ) is a short behavioural screening questionnaire for children aged 3 to 16. The questionnaire is used to assess children's

mental health and can be completed by children and young people themselves, their parents, or their teachers [46].

Potential occupational-related risk situations should be discussed during the consultation, and the legal aspects related to different activities, such as driving and sports, should be brought to the attention of the patient and family members to avoid potential accidents. It is worth highlighting special situations such as women of childbearing age, use of contraception, pregnancy, breastfeeding, and management of concurrent chronic illnesses.

Advice should be given on how to access emergency care for prolonged seizures, status epilepticus, seizures with different semiology from habitual seizures, or seizure clusters. The patient (and relative/spouse/guardian) can be guided to identify these situations and act accordingly. Lifestyle habits related to epilepsy and therapeutic adherence should be emphasized, including sleep hygiene, therapeutic adherence, avoidance of triggers, and recreational drug use.

The first consultation can be overwhelming for the PWE, particularly for those with visual and hearing impairments, intellectual disability, language barriers, the elderly, and those with reduced technology literacy. Physicians need to be aware of these possibilities and seek to overcome them for effective patient care, through adequate support and planning [17]. At the end of the teleconsultation, evaluation of the session and agreement between the patient and clinician regarding whether telemedicine is an appropriate mode for ongoing consultations should be made, and alternatives sought should that not be the case, including consideration given to utilising a hybrid model of both face-to-face visits and telemedicine.

Follow-up consultations for PWE

Once a physician has established prior contact with a PWE, they should be aware that they are dealing with a dynamic clinical presentation. Patients may present with new comorbidities, evolution of the disease, or changes in their social circumstances over time. Consequently, the clinical scenario requires re-evaluation during each follow-up session, including evaluation of seizure semiology, seizure frequency, response to treatment, efficacy, and adverse effects as well as comorbidities and social

circumstances. During subsequent teleconsultations, other aspects that may not have been raised in the first consultation, such as SUDEP and stigma, can be explored [47–49]. Many studies have shown that patients and their families want to be informed regarding SUDEP and that this does not cause emotional distress, hence this discussion with the patient has already been recommended in various clinical guidelines such as NICE (National Institute for Health Care and Excellence), AES (American Epilepsy Society) and SEN (Spanish society of Neurology) [48–52]. This is important despite neurologists finding it especially difficult to talk about it during teleconsultation [16]. Stigma in epilepsy is a factor that can lead to poor quality of life; therefore, providing the patient with social resources such as links to support groups would be a useful approach. At the end of the follow-up consultation, the patient should be encouraged to provide feedback and seek clarifications as necessary [17].

A clinical challenge in telemedicine appointments is also ensuring that negative messages are understood by the patient without the feedback automatically received during a face-to-face clinical consultation [31]. It is compounded by the fact that there is evidence that suggests neurologists find it challenging to break bad news remotely [33]. For neurologists in training, a teaching toolbox to break bad news with virtual technology, may be adapted [53]. There is no evidence on whether video appointments are superior to telephone appointments in this regard. Discussions on driving restrictions, pregnancy-related risks with ASM treatment, or other information with a medical-legal bearing are best supplemented with written information (letter or similar) after the consultation. Healthcare providers must be prepared for negative reactions or disconnection during teleconsultations and have processes for dealing with such occurrences.

Special considerations for paediatric patients with epilepsy during teleconsultations

There are unique considerations for the telemedicine management of paediatric epilepsies. These include the significant burden of developmental and epileptic encephalopathies, diverse genetic-metabolic aetiology, and difficulty with monitoring of compliance and adverse events related to ASM use [54].

Given the prevalence of developmental and epileptic encephalopathies (DEEs) in paediatric neurology that are associated with characteristic phenotypic traits and/or

stereotypes, it is of particular interest to be able to use a video system in the first consultation in order to perform a physical examination [55]. These are usually associated with specific alterations in presentation including cognition, behaviour, motor abilities, vision and hearing capabilities, gastro-intestinal tract function, sleep-wake cycle, respiratory and cardiac functions. Therefore, physicians need to pay attention to these factors during teleconsultations [56,57]. In some cases, children may require initiation of high-dose hormonal therapy, and careful monitoring of related adverse events is needed [58].

Pharmaco-resistant epilepsy is often seen in this clinical setting, so it is important to establish realistic expectations with the family regarding treatment goals and prognostication. Physicians need to explain available treatment and palliative options to support clinical decision making. Discussion around resources available for rehabilitation and special education should be part of the consultation when necessary. Due to brain maturational processes and intrinsic characteristics of different types of epilepsy, semiology may evolve over time. Pharmaco-resistant epilepsies in children are often associated with developmental delay and behavioural comorbidities. The Strength and Difficulties Questionnaire (SDQ) can be utilised to assess these aspects [46]. Adverse effects of drugs must be specifically sought as they can also affect the child's behaviour and psychomotor development.

CONCLUSION

The COVID-19 pandemic has accelerated the utilization of telemedicine in many global settings and subspecialties [33]. Utilization of teleconsultation for PWE has been found to be effective and satisfactory, with significant potential to bridge the considerable treatment gap that has been documented for these patients. Telemedicine has substantial potential for utility beyond the pandemic, despite limitations such as lack of a comprehensive physical examination as would occur during a face-to-face visit [33]. With appropriate planning and infrastructure, teleconsultations can be harnessed to meet the treatment needs of children, the elderly, incarcerated, geographically disadvantaged, and poorly resourced patients. The diagnosis of epilepsy relies to a great extent on a thorough history of the condition, which can be supplemented by video recordings to arrive at a diagnosis in the majority of cases. To aid effective implementations, we have made recommendations about how to facilitate teleconsultations for PWE. Telemedicine should become a permanent and integral part of epilepsy care worldwide with the aim of

continuing high-quality epilepsy management, leading to better seizure control, improved quality of life of PWE and their families, and reducing the current epilepsy treatment gap.

Acknowledgements: The authors would like to thank Patricia Gómez Iglesias, a member of the first ILAE telemedicine task force, who initially suggested this submission.

References:

- [1] Christensen J, Dreier JW, Sun Y, Linehan C, Tomson T, Marson A, et al. Estimates of epilepsy prevalence, psychiatric co-morbidity and cost. *Seizure*. 2022 Jun 23;S1059-1311(22)00144-3. DOI: 10.1016/j.seizure.2022.06.010.
- [2] Fiest KM, Sauro KM, Wiebe S, Patten SB, Kwon CS, Dykeman J, et al. Prevalence and incidence of epilepsy: A systematic review and meta-analysis of international studies. *Neurology*. 2017;88(3):296–303. DOI: 10.1212/WNL.0000000000003509.
- [3] GBD 2016 Epilepsy Collaborators. Global, regional, and national burden of epilepsy, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. *Lancet Neurol*. 2019;18(4):357–75. DOI: 10.1016/S1474-4422(18)30454-x.
- [4] Kwon CS, Wagner RG, Carpio A, Jetté N, Newton CR, Thurman DJ. The worldwide epilepsy treatment gap: A systematic review and recommendations for revised definitions - A report from the ILAE Epidemiology Commission. *Epilepsia*. 2022;63(3):551–64. DOI: 10.1111/epi.17112.
- [5] Rainer LJ, Granbichler CA, Kobulashvili T, Kuchukhidze G, Rauscher C, Renz N, et al. Prevalence of comorbidities, and affective disorders in epilepsy: A latent class analysis approach. *Epilepsy Res*. 2022;182:106917. doi: 10.1016/j.eplepsyres.2022.106917.
- [6] Guzik AK, Switzer JA. Teleneurology is neurology. *Neurology*. 2020;94(1):16–7. DOI: 10.1212/WNL.0000000000008693.
- [7] Patterson V. Managing Epilepsy by Telemedicine in Resource-Poor Settings. *Front Public Health*. 2019;7:321. DOI: 10.3389/fpubh.2019.00321.
- [8] Velasquez SE, Chaves-Carballo E, Nelson EL. Pediatric Teleneurology: A Model of Epilepsy Care for Rural Populations. *Pediatr Neurol*. 2016;64:32–7. DOI: 10.1016/j.pediatrneurol.2016.08.001.
- [9] Bahrani K, Singh MB, Bhatia R, Prasad K, Vibha D, Shukla G, et al. Telephonic review for outpatients with epilepsy-A prospective randomized, parallel group study. *Seizure*. 2017 ;53:55–61. DOI: 10.1016/j.seizure.2017.11.003.
- [10] Rasmussen KA, Hartshorn JC. A comparison of epilepsy patients in a traditional ambulatory clinic and a telemedicine clinic. *Epilepsia*. 2005;46(5):767–70. DOI: 10.1111/j.1528-1167.2005.44804.x.

- [11] Alkhotani A, Siddiqui MI, Almunashri F, Baothman R. The effect of COVID-19 pandemic on seizure control and self-reported stress on patient with epilepsy. *Epilepsy Behav.* 2020 Nov;112:107323. DOI: 10.1016/j.yebeh.2020.107323.
- [12] Cross JH, Kwon CS, Asadi-Pooya AA, Balagura G, Gómez-Iglesias P, Guekht A, et al. Epilepsy care during the COVID-19 pandemic. *Epilepsia.* 2021;62(10):2322–32. DOI: 10.1111/epi.17045.
- [13] Brigo F, Bonavita S, Leocani L, Tedeschi G, Lavorgna L, Digital Technologies, Web and Social Media Study Group of the Italian Society of Neurology. Telemedicine and the challenge of epilepsy management at the time of COVID-19 pandemic. *Epilepsy Behav.* 2020 ;110:107164. DOI: 10.1016/j.yebeh.2020.107164.
- [14] Rametta SC, Fridinger SE, Gonzalez AK, Xian J, Galer PD, Kaufman M, et al. Analyzing 2,589 child neurology telehealth encounters necessitated by the COVID-19 pandemic. *Neurology.* 2020;95(9):e1257–66. DOI: 10.1212/WNL.00000000000010010.
- [15] Hatcher-Martin JM, Adams JL, Anderson ER, Bove R, Burrus TM, Chehrensa M, et al. Telemedicine in neurology: Telemedicine Work Group of the American Academy of Neurology update. *Neurology.* 2020;94(1):30–8. DOI: 10.1212/WNL.00000000000008708.
- [16] Conde-Blanco E, Centeno M, Tio E, Muriana D, García-Peñas JJ, Serrano P, et al. Emergency implementation of telemedicine for epilepsy in Spain: Results of a survey during SARS-CoV-2 pandemic. *Epilepsy Behav.* 2020;111:107211. DOI: 10.1016/j.yebeh.2020.107211.
- [17] Choudhary N, Chakravarty K, Kharbanda PS, Lal V, Baishya J. Satisfaction and effectiveness of tele-medicine in follow-up of people with epilepsy in a resource-poor setting during COVID-19. *Epilepsy Behav.* 2022;128:108569. DOI: 10.1016/j.yebeh.2022.108569.
- [18] Sattar S, Kuperman R. Telehealth in pediatric epilepsy care: A rapid transition during the COVID-19 pandemic. *Epilepsy Behav.* 2020;111:107282. DOI: 10.1016/j.yebeh.2020.107282.
- [19] Garfan S, Alamoodi AH, Zaidan BB, Al-Zobbi M, Hamid RA, Alwan JK, et al. Telehealth utilization during the Covid-19 pandemic: A systematic review. *Comput Biol Med.* 2021;138:104878. DOI: 10.1016/j.compbiomed.2021.104878.
- [20] Kissani N, Liqali L, Hakimi K, Mugumbate J, Daniel GM, Ibrahim EAA, et al. Why does Africa have the lowest number of Neurologists and how to cover the Gap? *J Neurol Sci.* 2022;434:120119. DOI: 10.1016/j.jns.2021.120119.
- [21] Kikuchi K, Hamano SI, Horiguchi A, Nonoyama H, Hirata Y, Matsuura R, et al. Telemedicine in epilepsy management during the coronavirus disease 2019 pandemic. *Pediatr Int Off J Jpn Pediatr Soc.* 2022;64(1):e14972. DOI: 10.1111/ped.14972.
- [22] Armeno M, Caballero E, Verini A, Reyes G, Galarza N, Cresta A, et al. Telemedicine- versus outpatient-based initiation and management of ketogenic diet therapy in children with drug-resistant epilepsy during the COVID-19 pandemic. *Seizure.* 2022;98:37–43. DOI: 10.1016/j.seizure.2022.03.023.
- [23] Madill ES, Gururangan K, Krishnamohan P. Improved access to rapid electroencephalography at a community hospital reduces inter-hospital transfers for

- suspected non-convulsive seizures. *Epileptic Disord Int Epilepsy J Videotape*. 2022;24(3):507–16. DOI: 10.1684/epd.2021.1410.
- [24] Tailby C, Collins A, Vaughan D, Abbott D, O'Shea M, Helmstaedter C, et al. Teleneuropsychology in the time of COVID-19: The experience of The Australian Epilepsy Project. *Seizure* 2020;83:89–97. DOI: 10.1016/j.seizure.2020.10.005.
- [25] Sepat R, Sinha AP, Murry LL, Parihar J, Singh MB, Pandey S. Does an additional virtual interactive session increase the impact of digital educational material given to epilepsy patients? A randomized controlled trial. *Seizure*. 2021;92:252–6. DOI: 10.1016/j.seizure.2021.09.014.
- [26] Trembl J, Nagl M, Linde K, Kündiger C, Peterhänsel C, Kersting A. Efficacy of an Internet-based cognitive-behavioural grief therapy for people bereaved by suicide: a randomized controlled trial. *Eur J Psychotraumatology*. 2021;12(1):1926650. DOI: 10.1080/20008198.2021.1926650.
- [27] Haddad N, Grant I, Eswaran H. Telemedicine for patients with epilepsy: A pilot experience. *Epilepsy Behav*. 2015;44:1–4. DOI: 10.1016/j.yebeh.2014.11.033.
- [28] Kuroda N. What should we ask patients with epilepsy on telemedicine during the COVID-19 crisis? A checklist for clinicians. *Epilepsy Behav*. 2020 Oct;111:107184. DOI: 10.1016/j.yebeh.2020.107184.
- [29] Kissani N, Lengane Y, Patterson V, Mesraoua B, Dawn E, Ozkara C, et al. Telemedicine in epilepsy: How can we improve care, teaching, and awareness? *Epilepsy Behav*. 2020;103. DOI: 10.1016/j.yebeh.2019.106854.
- [30] Chu C, Brual J, Fang J, Fleury C, Stamenova V, Bhattacharyya O, et al. The Use of Telemedicine in Older-Adults During the COVID-19 Pandemic: a Weekly Cross-Sectional Analysis in Ontario, Canada. *Can Geriatr J CGJ*. 2022;25(4):380–9. DOI: 10.5770/cgj.25.610.
- [31] Stommel, W.J.P., Stommel, M.W.J. (2021). Participation of Companions in Video-Mediated Medical Consultations: A Microanalysis. In: Meredith, J., Giles, D., Stommel, W. (eds) *Analysing Digital Interaction*. Palgrave Studies in Discursive Psychology. Palgrave Macmillan, Cham. DOI:10.1007/978-3-030-64922-7_9
- [32] Jalali MS, Landman A, Gordon WJ. Telemedicine, privacy, and information security in the age of COVID-19. *J Am Med Inform Assoc JAMIA*. 2021;28(3):671–2. DOI: 10.1093/jamia/ocaa310
- [33] Courtney E, Blackburn D, Reuber M. Neurologists' perceptions of utilising tele-neurology to practice remotely during the COVID-19 pandemic. *Patient Educ Couns*. 2021;104(3):452–9. DOI: 10.1016/j.pec.2020.12.027.
- [34] Bodde NMG, Brooks JL, Baker GA, Boon P a. JM, Hendriksen JGM, Mulder OG, et al. Psychogenic non-epileptic seizures--definition, etiology, treatment and prognostic issues: a critical review. *Seizure*. 2009;18(8):543–53. DOI: 10.1016/j.seizure.2009.06.006.
- [35] Dash D, Sharma A, Yuvraj K, Renjith A, Mehta S, Vasantha PM, et al. Can home video facilitate diagnosis of epilepsy type in a developing country? *Epilepsy Res*. 2016;125:19–23. DOI: 10.1016/j.eplepsyres.2016.04.004.

- [36] Tatum WO, Hirsch LJ, Gelfand MA, Acton EK, LaFrance WC, Duckrow RB, et al. Video quality using outpatient smartphone videos in epilepsy: Results from the OSmartViE study. *Eur J Neurol*. 2021;28(5):1453–62. DOI: 10.1111/ene.14744
- [37] Amin U, Primiani CT, MacIver S, Rivera-Cruz A, Frontera AT, Benbadis SR. Value of smartphone videos for diagnosis of seizures: Everyone owns half an epilepsy monitoring unit. *Epilepsia*. 2021;62(9):e135–9. DOI: 10.1111/epi.17001.
- [38] Chiang S, Goldenholz DM, Moss R, Rao VR, Haneef Z, Theodore WH, et al. Prospective validation study of an epilepsy seizure risk system for outpatient evaluation. *Epilepsia*. 2020;61(1):29–38. DOI: 10.1111/epi.16397.
- [39] Koepp MJ, Caciagli L, Pressler RM, Lehnertz K, Beniczky S. Reflex seizures, traits, and epilepsies: from physiology to pathology. *Lancet Neurol*. 2016;15(1):92–105. DOI: 10.1016/S1474-4422(15)00219-7
- [40] Kristoffersen ES, Sandset EC, Winsvold BS, Faiz KW, Storstein AM. Experiences of telemedicine in neurological out-patient clinics during the COVID-19 pandemic. *Ann Clin Transl Neurol*. 2021;8(2):440–7. DOI: 10.1002/acn3.51293.
- [41] Kuan YC, Yen DJ, Yiu CH, Lin YY, Kwan SY, Chen C, et al. Treatment-seeking behavior of people with epilepsy in Taiwan: a preliminary study. *Epilepsy Behav*. 2011;22(2):308–12. DOI: 10.1016/j.yebeh.2011.06.034.
- [42] Kim DH, Kim YS, Yang TW, Kwon OY. Optimal cutoff score of the Neurological Disorders Depression Inventory for Epilepsy (NDDI-E) for detecting major depressive disorder: A meta-analysis. *Epilepsy Behav*. 2019;92:61–70. DOI: 10.1016/j.yebeh.2018.12.006.
- [43] Mula M, McGonigal A, Micoulaud-Franchi JA, May TW, Labudda K, Brandt C. Validation of rapid suicidality screening in epilepsy using the NDDIE. *Epilepsia*. 2016;57(6):949–55. DOI: 10.1111/epi.13373
- [44] Spitzer RL, Kroenke K, Williams JBW, Löwe B. A brief measure for assessing generalized anxiety disorder: the GAD-7. *Arch Intern Med*. 2006;166(10):1092–7. DOI: 10.1001/archinte.166.10.1092.
- [45] Cramer JA, Perrine K, Devinsky O, Meador K. A brief questionnaire to screen for quality of life in epilepsy: the QOLIE-10. *Epilepsia*. 1996;37(6):577–82. DOI: 10.1111/j.1528-1157.1996.tb00612.x.
- [46] Goodman A, Goodman R. Strengths and difficulties questionnaire as a dimensional measure of child mental health. *J Am Acad Child Adolesc Psychiatry*. 2009;48(4):400–3. DOI: 10.1016/j.yebeh.2019.106467.
- [47] Gutiérrez-Viedma Á, Sanz-Graciani I, Romeral-Jiménez M, Parejo-Carbonell B, Serrano-García I, Cuadrado ML, et al. Patients' knowledge on epilepsy and SUDEP improves after a semi-structured health interview. *Epilepsy Behav*. 2019;99:106467. DOI: 10.1016/j.yebeh.2019.106467.
- [48] Xu Z, Ayyappan S, Seneviratne U. Sudden unexpected death in epilepsy (SUDEP): what do patients think? *Epilepsy Behav*. 2015 Jan;42:29–34. DOI: 10.1016/j.yebeh.2014.11.007.

- [49] Shankar R, Donner EJ, McLean B, Nashef L, Tomson T. Sudden unexpected death in epilepsy (SUDEP): what every neurologist should know. *Epileptic Disord Int Epilepsy J Videotape*. 2017;19(1):1–9. DOI: 10.1684/epd.2017.0891.
- [50] Gonzalez-Viana E, Sen A, Bonnon A, Cross JH, Guideline Committee. Epilepsies in children, young people, and adults: summary of updated NICE guidance. *BMJ*. 2022;378:o1446. DOI: 10.1136/bmj.o1446.
- [51] So EL, Bainbridge J, Buchhalter JR, Donalaty J, Donner EJ, Finucane A, et al. Report of the American Epilepsy Society and the Epilepsy Foundation joint task force on sudden unexplained death in epilepsy. *Epilepsia*. 2009;50(4):917–22. DOI: 10.1111/j.1528-1167.2008.01906.x.
- [52] Sanchez-Larsen A, Fernandez-Perez I, Principe A, Ley M, Rocamora R. SUDEP in Spain: An Epilepsy Monitoring Unit based case series. *Seizure*. 2019;69:258–64. DOI: 10.1016/j.seizure.2019.05.014.
- [53] Vitto C, Del Buono B, Daniel L, Rivet E, Cholyway R, Santen SA. Teaching Toolbox: Breaking Bad News with Virtual Technology in the Time of COVID. *J Cancer Educ*. 2022;37(5):1429–32. DOI: 10.1007/s13187-021-01975-7.
- [54] Gulati S, Shruthi NM, Panda PK, Sharawat IK, Josey M, Pandey RM. Telephone-based follow-up of children with epilepsy: Comparison of accuracy between a specialty nurse and a pediatric neurology fellow. *Seizure*. 2020;83:98–103. DOI: 10.1016/j.seizure.2020.10.002.
- [55] Al Hussona M, Maher M, Chan D, Micieli JA, Jain JD, Khosravani H, et al. The Virtual Neurologic Exam: Instructional Videos and Guidance for the COVID-19 Era. *Can J Neurol Sci*. 2020;47(5):598-603. DOI: 10.1017/cjn.2020.96.
- [56] Reddy C, Madaan P, Saini L. Tele-Child-Neurology in the Era of COVID-19: A Developing Nations' Perspective. *Ann Indian Acad Neurol*. 2021;24(6):944–5. DOI: 10.4103/aian.AIAN_786_20.
- [57] Panda PK, Dawman L, Panda P, Sharawat IK. Feasibility and effectiveness of teleconsultation in children with epilepsy amidst the ongoing COVID-19 pandemic in a resource-limited country. *Seizure*. 2020;81:29–35. DOI: 10.1016/j.seizure.2020.07.013
- [58] Madaan P, Sahu JK, Wanigasinghe J, Fatema K, Linn K, Lhamu Mynak M, et al. Teleneurology based management of infantile spasms during COVID-19 pandemic: A consensus report by the South Asia Allied West syndrome research group. *Epilepsy Behav Rep*. 2021;15:100423. DOI: 10.1016/j.ebr.2020.100423.