The Canadian Journal of Neurological Sciences (2024), **51**, 126–128
doi:10.1017/cjn.2023.22

Canadian Journal of Neurological Sciences
Journal Canadien des Sciences Neurologiques

Brief Communication

A Video is Worth a Thousand Words: The Use of Home Videos in Pediatric Neurology

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ABSTRACT: The use of home video recordings (HVRs) may aid in the diagnosis of neurological disorders. However, this practice remains underutilized. Through an anonymous survey, we sought to understand the perspectives of healthcare providers regarding the sharing of HVRs alongside referrals for responsive and economical pediatric neurology care. This was timely given COVID-19 has worsened wait times for diagnosis and consequently treatment. Most providers agree that sharing of HVRs improves patient care (93.1%: 67/73) and prevents both additional investigations (67%: 49/73) and hospital admissions (68.5%: 50/73). However, a minority of providers (21.9 %: 16/73) currently share HVRs alongside their referrals.

RÉSUMÉ : Une vidéo vaut mille mots : recourir à des enregistrement vidéo à domicile en neurologie pédiatrique. Le recours à des enregistrements vidéo à domicile (EVD) peut aider au diagnostic des troubles neurologiques. Cependant, cette pratique reste sous-utilisée. Au moyen d'un sondage anonyme, nous avons cherché à comprendre le point de vue des prestataires de soins de santé en ce qui concerne le partage d'EVD et l'orientation vers des soins adaptés et économiques en neurologie pédiatrique. Un tel sondage tombe à point nommé dans la mesure où la pandémie de COVID-19 a aggravé les temps d'attente en vue d'un diagnostic et, par conséquent, les délais de traitement. La plupart des prestataires s'accordent certes pour dire que le partage des EVD améliore les soins donnés aux patients (93,1 % : 67/73) et permet d'éviter des examens supplémentaires (67 % : 49/73) et des admissions à l'hôpital (68,5 % : 50/73). Cependant, seule une minorité d'entre eux (21,9 % : 16/73) partage actuellement des EVD au moment d'orienter des patients.

Keywords: Epilepsy - pediatric; Neurology - pediatric

(Received 18 November 2022; final revisions submitted 9 January 2023; date of acceptance 27 January 2023; First Published online 27 February 2023)

Home-video recordings (HVRs) can be helpful in the diagnosis and management of pediatric neurologic disorders.[1] While video electroencephalography (vEEG) remains the gold-standard diagnostic test for epilepsy, HVRs may shorten the time to epilepsy diagnosis through efficient triaging of referrals, especially during the COVID-19 pandemic, which has worsened the wait times for EEG testing.[2] Despite the reported benefits of HVRs in the literature, their use has been limited in clinical practice. To understand how HVRs may benefit the care of children with paroxysmal events, an online survey was distributed to providers who send or receive referrals for vEEG and movement disorders at a tertiary pediatric hospital. The aim was to better understand providers' perspectives regarding the use of HVRs in neurologic diagnosis.

From August to September 2021, an anonymous, 17-item web-based RedCap, survey was distributed to providers, including family physicians, pediatricians, nurse practitioners, medical trainees, emergency physicians, neurologists, and electrophysiologists. The first and last authors co-developed an initial draft of survey questions. All authors reviewed and tested multiple iterations of the survey to check for clarity, readability, item content, effort required for completion, overall impression of the survey, and validity of the survey items. The responses were analyzed using descriptive statistics. The Hospital for Sick Children's Quality Improvement Committee approved the survey prior to its distribution.

We reviewed outpatient EEG referrals to the Hospital from July 2020 to July 2021 to identify referring providers. Surveys were sent out to 470 providers. Seventy-three providers completed the survey, and response rate was 16% (73/470). Respondents included neurologists (10%; 7/73), emergency physicians (16%; 12/73), nurse practitioners (11%; 8/73), and medical trainees in neurology (8%; 6/73) from The Hospital for Sick Children. Additionally, pediatricians (51%; 37/73) and family physicians (1%; 1/73)

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Cite this article: Kadiwal M, Donner EJ, Moharir M, Ochi A, Otsubo H, Sharma R, Go CY, Wu Y, and Abushama A. (2024) A Video is Worth a Thousand Words: The Use of Home Videos in Pediatric Neurology. *The Canadian Journal of Neurological Sciences* **51**: 126–128, https://doi.org/10.1017/cjn.2023.22

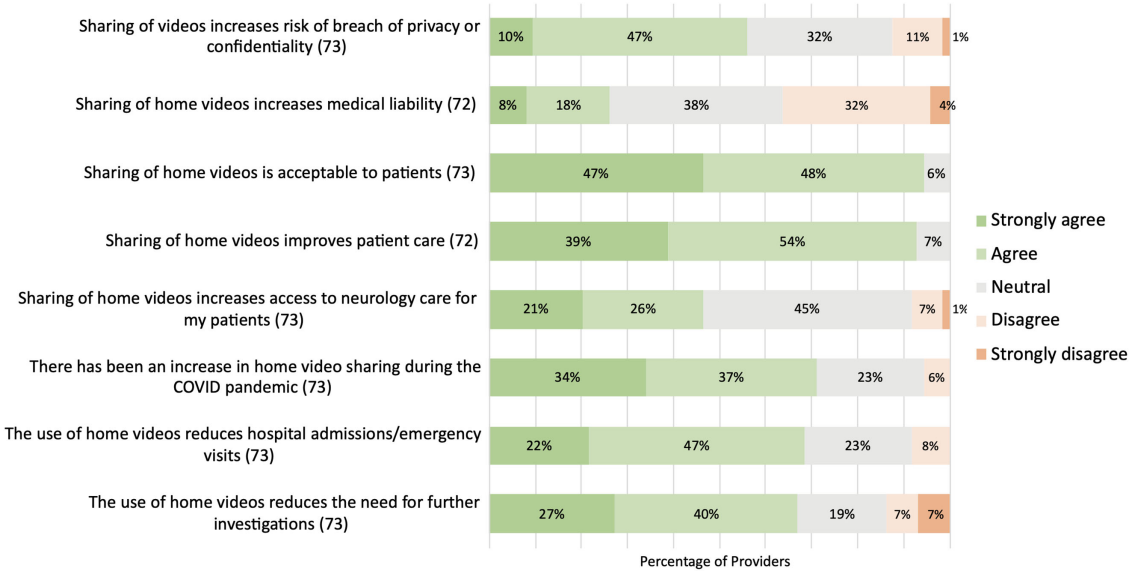

Figure 1: Providers' perspective on the use of home videos for the diagnosis of paroxysmal events in pediatric neurology.

working in the Greater Toronto Area were included. Two providers (3%; 2/73) did not fill out the question about their profession.

Most of the providers agreed or strongly agreed that sharing videos improves patient care (93%: 67/73) and prevents both additional investigations (67%; 49/73) and hospital admissions (69%: 50/73) (Figure 1). Forty-five percent (32/72) of providers use videos obtained by parents for the assessment of children with neurological complaints in their practice (Figure 2). Despite these perceived benefits, only a few providers reported that they currently share HVRs alongside referrals (22%: 16/73). When asked regarding their reasons for not sharing HVRs with referrals, providers reported that "sharing is hard" or they "typically don't have a mechanism to share." Of those providers who currently share videos (22%; $n = 16/73$), most providers only share videos some of the time with referrals for the evaluation of seizures (50%; 8/16) and movement disorders (38%; 6/16) (Figure 2).

Providers reported that they share and receive videos primarily through email for seizures (69%; 46/67) and movement disorders (64%; 36/64). While providers were open to sharing HVRs alongside referrals through an application on their phone (40%; 29/71) or a dedicated website (43%; 31/71), most preferred sharing videos through an official platform with health record access (42/71; 58%) (Figure 3).

In the United Kingdom, Professor Sameer Zuberi and his team have created a trusted platform, vCreateNeuro, to allow secured transfer of videos from families to the medical teams. This interphase enables patients to input their medical history and for clinicians to review and classify events.[3] A prospective diagnostic accuracy study (OSmartViE) conducted by Tatum, between 2015 and 2018 in the USA, concluded that outpatient smartphone video review by clinicians has predictive and additive value for diagnosing epileptic seizures. The study included a convenience sample of 44 outpatients (mean age 45) who provided a smartphone video for evaluation prior to undergoing vEEG.[4] Huang et al. (2019) investigated the value of mobile phone videos in increasing diagnostic accuracy and cost savings for infants presenting with paroxysmal events. They analyzed 12 home videos of patients as well as clinical data and asked practitioners to make their diagnoses by just the description of the events and again by watching the home videos of the episodes. They concluded that home videos are a cost-effective tool for the diagnosis of paroxysmal events in infants.[5] Our study is one of the first surveys to examine the perspectives of providers on the acceptability and usefulness of sharing HVRs alongside referrals for the diagnosis of paroxysmal events in pediatric neurology. Most providers agree that using HVRs alongside referrals is not only worthwhile and efficient but also cost-effective. This is consistent with other studies that have suggested that the use of HVRs may be of diagnostic value in the diagnosis and management of pediatric neurological disorders.[1,4,5] Furthermore, HVRs offer the opportunity to accelerate healthcare access through getting around infrastructure barriers, including heavily booked neurology practices for providers. Sharing of HVRs has the potential to aid in improving access to patients and families based in rural areas, since its benefits could be mobilized to provide essential services remotely to individuals. This can reduce costs to the patient, including transportation, accommodation, loss in wages, transit, and parking. The COVID-19 pandemic has demonstrated the importance of ensuring patients can access care, education, and support they need remotely. This study provides support to bolster efforts to envision a future where more and more of our patients will be using digital tools to enhance in-person care.

While this survey demonstrated that most providers were not significantly concerned with increased medical liability or breach of privacy or confidentiality in sharing HVRs, this could be a potential barrier to using HVR in referral triaging. Ensuring the use of a safe and secure platform for video sharing for providers can mitigate these potential barriers. Additionally, patients who already have disproportionate difficulties in accessing neurology care may not be able to participate in HVR sharing due to barriers such as stable internet connection and personal smartphone ownership. Furthermore, there may be instances when videos are not helpful. Huang et al. found that Sandifer syndrome, a type of gastroesophageal reflux with laryngospasm, may be misdiagnosed as seizures due to presence of limb posturing, abnormal eye movements, and even opisthotonos.[5] Thus, we must remain vigilant in observing and correcting for any unintentional negative consequences.

https://doi.org/10.1017/cjn.2023.22 Published online by Cambridge University Press

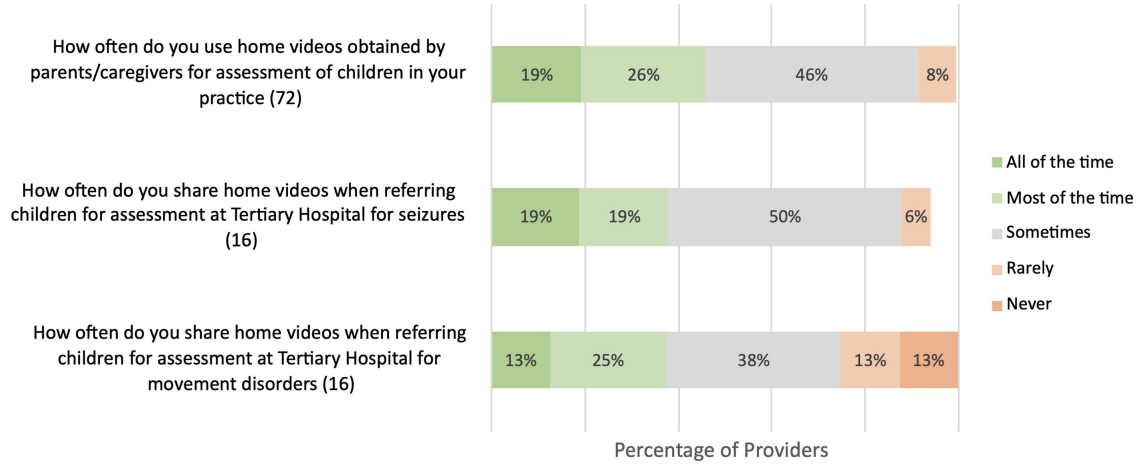

Figure 2: Use of HVRs by providers in the assessment for pediatric paroxysmal events.

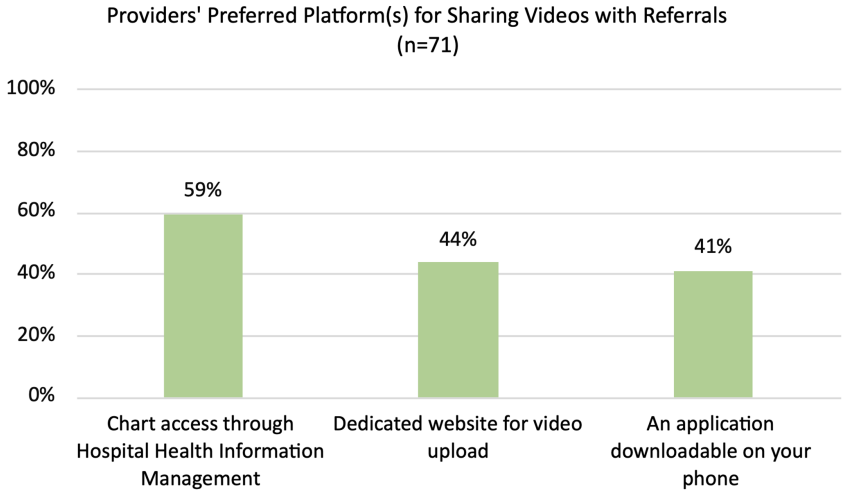

Figure 3: Providers' preferred platform(s) for sharing HVRs alongside referrals.

This project is limited by its small sample size. Furthermore, the referring providers surveyed primarily cared for an urban pediatric patient population at The Hospital for Sick Children and in the Greater Toronto Area. Hence, the results may not be generalizable.

The findings from this survey highlight that among healthcare providers there is a consensus that the use of HVRs improves patient care and prevents additional testing for the diagnosis of epilepsy and movement disorders in neurology. Further research is needed to determine if the incorporation of HVRs into the daily workflow of healthcare providers will reduce costs,[5] improve efficiency, and increase access to care. Additionally, it would be important to report instances when HVRs may not be helpful in a follow-up study to mitigate potential unintentional negative consequences.

Author Contributions. MK, with support from AA and ED, conceived of the presented idea. MK and AA developed and distributed the survey with support from ED and MM. MK analyzed the data with support from AA and ED. MK and AA wrote the manuscript with support from ED and AO. ED supervised the project. All authors provided critical feedback and helped shape the research, analysis, and manuscript.

Funding. The authors received no financial support for the research, authorship, and/or publication of this article.

Disclosures. ED has a research grant from the Ontario Brain Institute and CIHR, as well as honoraria from UCB, Eisai, Cardiol, and Tilray. ED also participates on the Neurocrine Data Safety Monitoring Committee, and she is a Board Member for Epilepsy Canada. The other authors have no competing interests to declare.

References

1. Ricci L, Boscarino M, Assenza G, et al. Clinical utility of home videos for diagnosing epileptic seizures: a systematic review and practical recommendations for optimal and safe recording. Neurol Sci. 2021;42:1301–9. DOI 10.1007/s10072-021-05040-5.
2. Assenza G, Lanzone J, Brigo F, et al. Epilepsy care in the time of COVID-19 pandemic in Italy: risk factors for seizure worsening. Front Neurol. 2020;11. DOI 10.3389/fneur.2020.00737.
3. Zuberi S. Evaluation of a new clinical service to allow video-sharing and remote care for people with epilepsy. Epilepsy Res UK. 2020, https://epilepsyresearch.org.uk/research_portfolio/evaluating-video-and-remote-care-service/
4. Tatum WO, Hirsch LJ, Gelfand MA, et al. Assessment of the predictive value of outpatient smartphone videos for diagnosis of epileptic seizures. JAMA Neurol. 2020;77:593. DOI 10.1001/jamaneurol.2019.4785.
5. Huang LL, Wang YY, Liu LY, et al. Home videos as a cost-effective tool for the diagnosis of paroxysmal events in infants: prospective study. JMIR mHealth uHealth. 2019;7:e11229.