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| Table e-1. Barriers to Teleneurology Implementation during the COVID19 Pandemic Response and Strategies Developed to Facilitate Adoption | | |
| Barrier | **Discrete Implementation Strategy (ERIC)1** | **Tailored Implementation Strategy** |
| Intervention: TN platform adaptability | | |
| Desktop access: MyChart video visits on a desktop required the patient to download additional updates, and made the log in more complicated. | *Develop and distribute educational materials; review in ongoing clinician/division meetings* | Tip sheets were created to educate clinicians and administrative staff on alternative, non-HIPAA compliant platforms that could facilitate computer access for the patient. |
| Multi-party TN: Family members or caregivers were not able to join the video visit through MyChart from a separate device. Likewise, a translator could not be added directly into the video visit through MyChart/Haiku. | *Develop and distribute educational materials; review in ongoing clinician/division meetings* | Tip sheets were created to educate clinicians and administrative staff on non-HIPAA compliant platforms that could allow caregivers/family members or translators to join the TN visit with the patient. |
| Screen sharing: Clinicians were not able to screenshare to share imaging results or neuropsychology testing documents with the patient. | *Develop and distribute educational materials; review in ongoing clinician/division meetings* | Tip sheets were created to educate clinicians and administrative staff on alternative, non-HIPAA compliant platforms that allowed clinicians to screenshare during their TN visit. |
| Outer Setting: Patient Needs and Resources | | |
| Equipment: Patients who could not afford a smart phone or tablet were not suitable candidates for a TN visit. | *Develop and distribute educational materials; review in ongoing clinician/division meetings* | Tip sheets were created to educate clinicians and administrative staff on ‘Non-MyChart’ platforms that allowed clinicians to deliver TN care to patients with non-smartphones. |
| Cognitive impairment: The MyChart e-check in not  process was difficult to navigate for some patients in this group. | *Revise professional roles* | During the pandemic, medical assistants and nurse practitioners who usually supported medical procedures were re-allocated to ‘MyChart outreach’, where they would guide patients through the MyChart login process by telephone. |
| Outer Setting: External Policy and Incentives | | |
| Inter-state practice: Prior to pandemic, clinicians were restricted to conducting TN visits with patients in states where they were licensed to practice. | *Remind clinicians* | During the pandemic, CMS waived licensing restrictions as did many individual states. Educational material was provided to clinicians and in regular division meetings regarding which patients could be seen by TN. Support was provided to obtain temporary state licenses. |
| Geographic restrictions: Pre-pandemic, Medicare patients had to be located in a rural area or in a designated medical center to receive coverage for telemedicine. | *Develop and distribute educational materials* | During the pandemic, location restrictions were waived for Medicare patients. Clinician educational resources were updated and disseminated in division meetings. |
| Inner setting: Learning Climate | | |
| Administrative staff workflows: as the TN implementation team addressed barriers to TN adoption, workflows were frequently updated, leading to additional burden on administrative staff to learn new information and follow updated workflows. | *Identify and prepare champions; distribute educational materials* | During the pandemic, as a cost-saving initiative, administrative staff hours were reduced, making additional TN scheduling responsibilities difficult to complete. We engaged early adopters to learn from their experience and seek input on new workflows. The implementation team then conducted ongoing training and distributed educational materials. |
| Technology platform malfunctions: Technical challenges (e.g., network connection or difficulties logging into MyChart) prevented the completion of TN visits. | *Develop and distribute educational materials* | During the pandemic, telephone evaluation codes (CPT 99441-3) were identified that could be used to bill for E/M services in established patients when TN technology platforms could not be used to complete the TN visit. A workflow and billing guide were developed for clinicians using input from team’s medical coding specialist, and were disseminated in faculty meetings. |
| Characteristics of Individual: Self-Efficacy | | |
| Limitations of the remote neurological exam: Many clinicians reported that the extent of the neurological examination was inherently limited over video, when compared to in-person evaluations. | *Identify early adopters* | At the start of the pandemic, we identified early adopters and collaboratively developed a ‘Tips for Best Practice Guide’ describing how to conduct a remote neurological examination.  Epic note templates were created to save clinicians’ time when documenting the neurological examination. |
| Process: Reflecting and Evaluating | | |
| Patient feedback: Prior to the pandemic, a patient experience survey tailored to telemedicine did not exist. | *Involve executive boards* | We worked with MSHS leadership and key stakeholders from the patient experience team to develop a patient experience survey for telemedicine. Using top-down approach, this survey was validated and implemented system-wide. |
| Abbreviations: ERIC, Expert Recommendations for Implementing Change; TN, teleneurology; HIPAA, Health Insurance Portability and Accountability Act; CMS, Centers for Medicare and Medicaid Services; E/M, evaluation/management; MSHS, Mount Sinai Health System. | | |

**References**

1. Powell BJ, Waltz TJ, Chinman MJ, et al. A refined compilation of implementation strategies: results from the Expert Recommendations for Implementing Change (ERIC) project. Implement Sci 2015;10:21.