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## Visits of concern in child neurology telemedicine

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**Progressing Telemedicine Using Personal Technologies, One Patient at a Time - Commentary on M. Prelack et al**

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## Progressing Telemedicine Using Personal Technologies, One Patient at A Time

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On a growing scale, individuals in most developed countries have access to affordable, always-on, miniaturized personal mobile devices, enabling them to use online services for communication, education, and more. The medicine and health services domain is not an exception in that. Especially in the context of the recent COVID pandemic, individuals have been strongly advised to leverage health teleconsultation services (via, e.g., a phone/video call) before turning for an in-person visit for non-urgent care<sup>1</sup>.

I started contributing to this area in 2002 with the pan-European MobiHealth telemedicine system targeting chronically ill patients [1]. Since then, I have researched other solutions in that space, leveraging video call options combined with highly customizable vital signs tele-monitoring via next generations of public wireless networks (3/4/5G).

Overall, telemedicine solutions aim to give patients a convenient, more active role in the healthcare process while at the same time enabling healthcare payers to manage costs more efficiently. Telemedicine solutions are engineered by integrating existing personal and medical-grade devices (e.g., tablets and blood pressure monitors) without focusing on miniaturization or optimizing sensors or power consumption. The first focus areas have been on the robust and secure telemedicine design and implementation and its integration in the clinical workflow and the reimbursement models for the service to take off. Perceived user requirements were elicited from the users – patients and clinicians - in consecutive iterative trials, and the service development continued accordingly.

There exist different solutions today, with a variety of versatile remote mobile monitoring leveraging diverse wireless sensor systems (i.e., not specific to one disease) [2], enabling patient mobility by connecting to any available public wireless network and supporting different modes of data transmission and clinician's feedback (i.e., non-real-time and real-time). There are large research efforts in modeling automatic health monitoring application behavior adaptation due to changing network characteristics [3]; towards the assurance of the quality of the data exchanged between a remote patient and distributed clinical team. An ideal telemedicine system is not “locked-in” to a specific sensors manufacturer(s) and supports the integration of any new sensor; however, due to, e.g., liability and data security, such a 'lock-in' is common nowadays.

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<sup>1</sup> <https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/telehealth-a-quarter-trillion-dollar-post-covid-19-reality>

Besides the technology-oriented research efforts, other emerging research areas exist, without which a telemedicine system's success cannot be guaranteed. Namely, a set of non-negligible human factors may influence the system use and the quality of the data being collected [4], which in turn, may affect the quality of the clinical decision-making, the patient's safety, and the quality of care. Research results indicate that systems users are content to use these, but they pose very high expectations towards them. Specifically, the solutions should empower the patients and the clinicians by being designed as easy and intuitive to use, more personalized, and context-aware for the patient's state (e.g., location) and health(care) needs. Additionally, personal wireless and mobile-based sensing solutions should assure medical-grade accuracy while being energy efficient and providing timely, evidence-based, personalized advice to patients anywhere, anytime, and anyhow.

As presented in the commented paper [5], a well-designed video-call-based telemedicine solution can be an effective platform for most child neurology visits. I envision that such a solution in the future will be even more effective in clinical decision making and enabled by personal sensing technologies (e.g., for a child functioning assessment), will assure the patients' safety and significantly improve the telemedicine-based quality of care in the long term. The research and development continue one telemedicine visit at a time.

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