Tackling the Frailty Burden in German Healthcare: Learnings from the Implementation of Digital Health Solutions in a University Hospital Setting

Fürstenau D.[1,2], Walz T.[1], Genseler G.[1], Haneke H.[3], Mörgeli R.[3], Spies C.[3], Balzer F.[2,3]

[1] Freie Universität Berlin, Garystr. 21, 14195 Berlin

[2] Einstein Center Digital Future, Wilhelmstr. 67, 10117 Berlin

[3] Charité Univeristätsmedizin Berlin, Charitéplatz 1, 10117 Berlin

Frailty is a multidimensional syndrome common in elderly people, which manifests itself through an increased vulnerability resulting from aging-associated decline in physical and psychological reserves (Xue 2011). In Germany, approximately 16.9 million patients undergo surgical procedures per year, almost half of which are performed in patients over the age of 65 who are especially prone to frailty (Statistisches Bundesamt 2018). Having the demographic change in mind, frailty should be recognized as a critical area for the individual's outcome in a perioperative setting and is important for public health (Buckinx et al. 2015, Fürstenau et al. 2019). This calls for a value-based healthcare approach, which strives to achieve best outcomes at lowest costs (Porter and Teisberg 2006).

At Charité – Universitätsmedizin Berlin, the department of anesthesiology and intensive care medicine has implemented a special track for elderly patients scheduled for elective surgery. This includes a frailty assessment procedure for patients over 65 years and is supported by a digital study database, which later became integrated into an existing patient data management system.

Based thereupon, both outcomes and costs could be determined. In a preceding study of 1,186 elderly patients, 46.9% of patients were classified as pre-frail and 11.4% as frail. It was shown that frailty status was associated with a significantly increased risk of postoperative complications (Birkelbach et al. 2019). Extending the results on outcomes, the current study integrated the gathered data for the examined patients with standard DRG data from the hospital's electronical health record system, which could serve as a blueprint for continuous analysis of costs and outcome and enabled us to in this study perform health economic analyses. For N=958 patients, we could show the frailty-associated additional costs in the inpatient environment through a cost economic statistical evaluation of the data set.

While these two analyses and the initial digital solutions combined show the value of integrating frailty assessment in line with value-based principles into care practice, the system faces barriers. The initial assessment tool was accessible only paper-based and later as a stationary desktop solution that could not be used on the bedside and was restricted to working hours. This could especially pose constraints to our target population as frailty often correlates with decreased mobility. In response, we created the concept for a tablet app for nurses to be used for full-scale assessment at bedside. Moreover, it lacked a patient self-assessment opposing our goal of putting patients center stage. We conceptualized a patient self-assessment app based on a basic validated set of questions, which could be used when the patient is entering the hospital and potentially be extended to home usage after discharge. By linking the full-scale frailty assessment with a self-assessment, we aimed at considering the patients' perspective even more and facilitate early stratification.

In the future, it will be desirable to include both outcomes and costs into one integrated solution, which falls together with a current project to scale the assessment towards other settings and to take preparatory actions for patients identified as having high postoperative risks. These next steps will also require tackling further barriers, including collaboration between ambulant and clinical stakeholders, interprofessional collaboration, and capacity constraints, which have initially led to coping strategies such as integrating the assessment-related activities into the workflow of one clinic that could mobilize the resources to carry it out.

References

Birkelbach O, Mörgeli R, Spies C, Olbert M, Weiss B, Brauner M, Neuner B, Francis RCE, Treskatsch S, Balzer F (2019) Routine frailty assessment predicts postoperative complications in elderly patients across surgical disciplines - A retrospective observational study. *BMC Anesthesiol.* 19(1).

Buckinx, F., Rolland, Y., Reginster, J.-Y., Ricour, C., Petermans, J., Bruyère, O., 2015. Burden of frailty in the elderly population: perspectives for a public health challenge. Arch Public Health 73, 19.

Fürstenau D, Spies C, Gersch M, Vogel A, Mörgeli R, Poncette AS, Müller-Werdan U, Balzer F (2019) Sharing Frailty-related information in perioperative care. *BMC Health Serv. Res.* 19(105): Article 15.

Porter ME, Teisberg EO (2006) Redefining Health Care: Creating Value-based Competition on Results. Harvard Business Review Press, Boston, MA

Statistisches Bundesamt, 2018. Fallpauschalenbezogene Krankenhausstatistik (DRG-Statistik) Operationen und Prozeduren der vollstationären Patientinnen und Patienten in Krankenhäusern. URL: https://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Gesundheit/ Krankenhaeuser /Publikationen /Downloads-Krankenhaeuser/operationen-prozeduren-5231401187014.pdf?__blob=publicationFile

Xue Q-L (2011) The Frailty Syndrome: Definition and Natural History. *Clin Geriatr Med* 27:1–15.