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Interprofessional discharge planning to reduce hospital length of stay – a quality improvement study

Submission date
21/03/2022

Recruitment status
No longer recruiting

Registration date
22/03/2022

Overall study status
Completed

Last Edited
17/12/2025

Condition category
Other

[_] Prospectively registered
[X] Protocol
[_] Statistical analysis plan
[X] Results
[_] Individual participant data

Plain English summary of protocol

Background and study aims
Health care costs in Switzerland are high and rising also due to an aging population with multiple illnesses. In-hospital treatment is a key contributor to the current cost explosion. In view of the expected demographic evolution, resource allocation becomes a national priority. There is a lack of evidence-based tools to improve the integrative inter-professional in-hospital care and the transition process in real-life of an emergency and acute care hospital setting. Also, there is no reference standard for quality benchmarking in Switzerland which is mandatory to compare the quality of different institutions.

To address these issues, we propose a pragmatic multicenter quality improvement study to explore the effect of an inter-professional discharge planning tool ("In-HospiTOOL") on length of stay and other patient outcomes. This tool combining several patient discharge measures was developed at our institution in an intensive multi-professional collaboration for the past ten years. For external multicenter validation of this tool, we will prospectively include consecutive polymorbid (with more than one illlness) medical patients upon admission to the medical ward. Because patient-level randomization is not feasible for an intervention that focuses on the process of care, we will use a quasi-experimental approach and compare outcomes before and after hospital-wide implementation of the management tool. We will use time-trend analysis to compare the length of stay before and after tool implementation. Data from other Swiss hospitals from the Swiss Federal Office of Health (Bundesamt für Gesundheit, BAG) serve as a control population. We target the inclusion of 45`000 patients over an 24-month period in at least five Swiss hospitals. The trial will inform us whether the "In-HospiTOOL" improves inter-professional team work and thereby reduces length of stay without negatively impacting subjective and objective markers of patient outcomes. The large amount of patient data collected within this trial will enable comparison of transition processes within different hospitals and establish a benchmarking for patient care quality. Our trial synergizes funds, national networks and, thus, will likely become a milestone in the current public healthcare discussions.

Who can participate?
Medical acute care units in Switzerland.

What does the study involve?
A department-wide implementation of the In-HospiTOOL.

What are the possible benefits and risks of participating?
Clinical trials that are embedded into usual care ("comprehensive effectiveness research") have the potential to yield outcomes of great relevance to the institutions where they are performed and at the same time to yield information that may be generalizable to the health care system at large.
Health care costs in Switzerland are high and rising due to the aging, polymorbid population. Scientific evidence regarding performance, safety and cost-effectiveness of specific integrative multi-professional care models tailored to the Swiss health care system is largely lacking. The "In-HospiTOOL" is an integrative multi-professional inpatient management tool that enables a better understanding of the multifaceted health care processes and will close this gap. Through a standardized but at the same time individualized approach, it will improve the inter-professional management of patients from ED admission to hospital discharge to home or a nursing care facility. This will translate into optimized transparency, resource use, patient outcome and satisfaction, functional status, and overall hospital costs. We expect that the results of the In-HospiTOOL-study will be widely, directly and rapidly applied – and indeed, will contribute to a new standard of (inter-)national health care.
In addition to the main interventional trial, gathering of data from around ~45,000 patients from 7 Swiss hospitals will help to establish a national-wide framework involving important stakeholders of the Swiss health care system. Networking is a prerequisite for improving sustainable patient-centered health care delivery with an optimal resource allocation. This will lead to a more efficient patient flow with decreased risk for hospital-associated adverse outcomes. Also, the large dataset will allow comparing different outcomes of different patient populations across different hospitals with each individual health care strategy. We will also be open to sharing our data with other national health care researchers for secondary analyses. In addition, health insurance and policy authorities will largely profit from these data to conceptualize new reimbursement strategies in the polymorbid inpatient setting.
Such embedded comparative effectiveness research relies on the engagement of care providers and health care systems as active partners in defining the objectives of the research rather than as passive consumers of its product. This pragmatic research will enforce rethinking and redefining traditional ethical and regulatory standards (including informed consent and engagement in research) in this paradigm of low risk.

Where is the study run from?
Kantonsspital Aarau, University Hospital Basel, Kantonsspital Baden, Kantonsspital Muensterlingen, Spital Interlaken, Spital Muri, Spital Zofingen (Switzerland)

When is the study starting and how long is it expected to run for?
November 2016 to March 2019

Who is funding the study?
Swiss National Science Foundation (SNSF, National Research Program, NRP 74), 407440_167376), the research council (Grant 3071410.000.086) and the "Wissenschaft & Weiterbildung" (W&W) Fonds (140.000.495) of the Kantonsspital Aarau AG, the "Hugo und Elsa Isner Foundation" of the Argovian Department of Health and Social Affairs, Funds from the "Argovia Professur" of the Medical Faculty of the University of Basel.

Who is the main contact?
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Contact information

Type(s)
Scientific

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Additional identifiers

Clinical Trials Information System (CTIS)
Nil known

ClinicalTrials.gov (NCT)
Nil known

Protocol serial number
407440_167376

Study information

Scientific Title
Integrative Hospital Treatment in Older patients to benchmark and improve Outcome and Length of stay – the In-HospiTOOL study

Acronym
In-HospiTOOL

Study objectives
There is a lack of evidence-based tools for management of polymorbid medical patients throughout the in-hospital stay with transition to post-acute care institutions. We propose a trial that will close this gap by studying the effects of the “In-HospiTOOL” on resource use including length of stay, inter-professional collaboration, and at the same time will give transparent information on outcome data and barriers to transition across several Swiss hospitals.

We hypothesize that implementing the “In-HospiTOOL” in a nationwide multicenter setting will significantly shorten length of stay without compromising patient outcomes and functional independence. Tight inter-professional collaboration enabled through an electronical communication platform and identification of the delaying factors in the patient flow will result in decreased waiting times contributing to the shortening of length of stay.

Ethics approval required
Old ethics approval format

Ethics approval(s)
As a quality improvement study, the institutional review board (IRB) of Northwestern Switzerland approved the study and waived the need for individual informed consent by formulating a declaration of no objection (approved on 21/11/2016 - EKNZ BASEC PB_2017–00449). Eligible patients will be informed by clinical staff and an information flyer about their study participation within 24 hours after hospital admission.

Study design
Interventional non randomized study

Primary study design
Interventional

Study type(s)
Other

Health condition(s) or problem(s) studied
Improving discharge planning in medical inpatients

Interventions
The In-HospiTOOL will be implemented among intervention hospitals and is a bundled patient management tool with specific items including a first medical assessment in the emergency room, a daily (re-) assessment by physicians, nurses, and social workers on medical ward, and provision of discharge relevant information in addition to typical discharge planning services provided by physicians and nurses. The tool is developed based on a sounding board consensus involving national stakeholders from the healthcare, information technology, and governmental sectors. Control hospitals were following their individual discharge planning strategies.

Before starting the intervention phase, participating hospitals will be asked to designate at least one physician, one nurse, and one social worker as local team leaders. The team leaders will be instructed in procedural details of the study and then disseminated this information among their colleagues. Training of team leaders will be accomplished through onsite visits or phone conferences at least every month. After approval and project support by hospital administrations, team leaders at each site will be asked to lead the project locally. To guarantee a standardized education of the local staff, we provided a teaching video to all study sites, where the appropriate usage of In-HospiTOOL is meticulously described (https://youtu.be /bNyRPucs-FQ, video available in German only). In February 2018, In-HospiTOOL will be implemented amongst the seven intervention hospitals. In addition, a local supervisor closely monitors tool fidelity and intervened to improve alignment with the key principles and study goals, if appropriate. From August 2017 until February 2019 local interview teams will conduct 30-day phone interviews in order to receive information on patient-reported outcomes before and during the study intervention.

Intervention Type
Other

Primary outcome(s)
Length of stay (LOS), defined as days spent in the hospital during the index hospitalization. The index hospitalization includes all readmissions into the index hospital within 18 days after discharge from the index hospital if the main reason for rehospitalization is related to the main diagnosis from the index hospitalization. According to the SwissDRG definition, every readmission into the same hospital after 18 days from discharge or any readmission into another hospital will be defined as a new index hospitalization. Thus, a single patient may have more than one index admission during the study period. LOS that crosses from one study phase to another or that goes past the study end date will be attributed to the study phase applicable during hospital admission.

Key secondary outcome(s))
1. All-cause hospital readmission within 30 days after discharge measured using patient records. Regarding hospital readmission, both planned and emergency readmissions will be included in the analysis.
2. All-cause in-hospital mortality, and facility discharge (i.e. long-term care facility, convalescent home, or rehabilitation clinic) measured using patient records. Out-of-hospital mortality data will be not available in the claims dataset.

Completion date
02/03/2019

Eligibility

Key inclusion criteria
Medical patients aged ≥18 years with at least two diagnoses in need of acute treatment

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Mixed

Lower age limit
18 years

Upper age limit
99 years

Sex
All

Total final enrolment
54695

Key exclusion criteria
1. Patients treated in an intensive care unit (ICU) only
2. Patients with outlier hospitalization stays longer than 100 days

Date of first enrolment
01/02/2017

Date of final enrolment
31/01/2019

Locations

Countries of recruitment
Switzerland

Study participating centre
Kantonsspital Aarau AG
Tellstrasse 25
Aarau
Switzerland
5001

Study participating centre
Kantonsspital Baden
Im Ergel 1
Baden
Switzerland
5404

Study participating centre
University Hospital Basel
Petersgraben 4
Basel
Switzerland
4031

Study participating centre
Kantonsspital Muensterlingen
Spitalcampus 1
Muensterlingen
Switzerland
8596

Study participating centre
Spital Interlaken
Weissenaustrasse 27
Unterseen
Switzerland
3800

Study participating centre
Spital Muri
Spitalstrasse 144
Muri
Switzerland
5630

Study participating centre
Spital Zofingen AG
Mühlethalstrasse 27
Zofingen
Switzerland
4800

Sponsor information

Organisation
Kantonsspital Aarau AG

Funder(s)

Funder type
Charity

Funder Name
Schweizerischer Nationalfonds zur Förderung der Wissenschaftlichen Forschung

Alternative Name(s)
Schweizerischer Nationalfonds, Swiss National Science Foundation, Fonds National Suisse de la Recherche Scientifique, Fondo Nazionale Svizzero per la Ricerca Scientifica, Fonds National

Suisse, Fondo Nazionale Svizzero, Schweizerische Nationalfonds, The Swiss National Science Foundation (SNSF), SNF, SNSF, FNS

Funding Body Type
Private sector organisation

Funding Body Subtype
Trusts, charities, foundations (both public and private)

Location
Switzerland

Funder Name
Forschungsrat des Kantonsspitals Aarau

Alternative Name(s)
Research Council of Aarau Cantonal Hospital, Research Council of Cantonal Hospital Aarau, Research Council of the Kantonsspital Aarau

Funding Body Type
Government organisation

Funding Body Subtype
Other non-profit organizations

Location
Switzerland

Funder Name
Wissenschaft und Weiterbildung (W&W) Fonds, Kantonsspital Aarau AG

Funder Name
Hugo und Elsa Isner Foundation of the Argovian Department of Health and Social Affairs

Funder Name
“Argovia Professur” of the Medical Faculty of the University of Basel

Results and Publications

Individual participant data (IPD) sharing plan

Available upon request.
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IPD sharing plan summary

Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article		01/09/2022	29/09/2022	Yes	No
Results article	Secondary analysis	12/12/2025	17/12/2025	Yes	No
Protocol article		23/04/2019	22/03/2022	Yes	No
Participant information sheet	in German		22/03/2022	No	Yes