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Redesigning a care pathway through digital integration

Change management and process customisation in the collaboration between an outpatient care service and a GP practice

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In view of the increasing demand for care and staff shortages in Germany, innovative digital solutions are needed to optimise collaboration. Current processes for exchanging vital data and medication schedules are time-consuming and error-prone, which impairs the safety and efficiency of care. The aim of the Docs & Care Network project was to develop standards for structured data exchange and to promote seamless digital integration that enables vital data and medication plans to be transferred promptly and securely. The change management strategy applied in the project ensures that technical, organisational and interpersonal aspects of digitalisation are addressed in a targeted manner and that employees are actively involved. The workshops held have enabled process improvements that increase both the quality of patient care and the efficiency of collaboration between nursing and GP practices.

Keywords

care pathway, digitalization, nursing

Background

In 2023, approximately 1.26 million people were employed in nursing facilities (Federal Statistical Office 2024b). Approximately 292,000 nurses subject to social insurance contributions worked in outpatient care in 2023 (Federal Employment Agency 2024). At least 280,000 additional nurses are expected to be needed by 2049 if current trends continue (Federal Statistical Office 2024a). The nursing profession suffers from a lack of social recognition, limited development opportunities, and unfavorable working conditions such as shift work and high physical demands, which reduce the attractiveness of the profession (Zandt 2022; Breinbauer 2020). Barriers to care and media disruptions between the various actors in the healthcare sector also complicate care provision, especially in the context of outpatient care.

There are currently around 5.7 million people in need of care in Germany. Due to demographic change, this number will continue to rise in the future. Around 86% of people in need of care are cared for at home. Of the people who are cared for at home, around 55% are cared for exclusively by relatives, while around 19% are supported by outpatient care services (Federal Statistical Office 2024c). Against this backdrop, the ratio between those in need of care and those working in the care sector is a critical indicator of the capacity of the care system. One approach to overcoming these challenges lies in digitalisation, which supports staff deployment and promises efficiency gains. Digital platforms make it possible to automate repetitive tasks, giving carers more time to care for patients. In the outpatient sector in particular, the use of digital technologies can improve collaboration between care services and GP practices, which optimises both patient safety and the use of resources (Auffenberg 2021). This is the starting point for the Docs & Care Network project, which aims to develop standards for the structured exchange of information on vital data and medication plans between outpatient care and GPs.

>> The project was funded by the GKV-Spitzenverband as part of the pilot programme for the integration of care facilities into the telematics infrastructure (TI) in accordance with Section 125 of the German Social Code, Book XI. The TI serves the secure and standardised networking of players in the healthcare system in Germany. It is a closed network with access exclusively for registered users (individuals or institutions). By separating it from the public Internet, it offers a high level of protection. This is made possible by a virtual private network that ensures secure data transmission (Federal Office for Information Security 2021). Data exchange in the Docs & Care Network project takes place via the communication service Kommunikation im Medizinwesen (KIM) and is intended to facilitate collaboration in order to improve the care of those in need of care. Continuous digital transmission of vital data allows doctors to regularly view their patients' values and react immediately to any abnormalities.

However, in addition to the benefits of digitalisation, there are also challenges. Outpatient care services and GP practices face technical barriers, new work processes and targeted staff training are needed (Borges do Nascimento et al. 2023). A comprehensive change management strategy is crucial in order to harmonise technological, human and organisational factors and actively involve all stakeholders in the introduction of digital innovations. Change management encompasses the development and implementation of strategies for managing change processes within organisations. It includes supporting and preparing employees for the upcoming changes, adapting existing work processes and ensuring continuous quality improvement (Schneider 2019).

In order to achieve positive results in the implementation of digital services, the involvement of professionals in decision-making is of high importance (Ross et al. 2016; Nadav et al. 2021; Papoutsi et al. 2021). For this reason, several workshops were held during the Docs & Care Network project, the content and results of which are presented below.

Initial situation in the Docs & Care Network project

The care of a person in need of care in their own home is organised on the one hand via (primary) medical care and on the other

via nursing care (Hovlin et al. 2022). Depending on the patient's care needs and corresponding care level categorisation, outpatient care performs various tasks. In addition to the nursing measures of basic and treatment care in accordance with SGB XI (social care insurance), it also takes on medically delegated, prescribed services such as the provision of medication. This activity is based on a medication plan that is regularly updated by the GP practice. This is agreed by the nursing service manager (PDL) with the GP once a month. However, the PDL often has to merge different medication plans (GP and specialist) in order to obtain a standardised overview. An automatic data transfer was not previously available. The medication plan process before digital integration is shown in Figure 1.

Typical process flows using the example of Lebensbaum GmbH before digital integration

The nursing service collects vital data for targeted monitoring of the patient's disease progression. These surveys are partly carried out on the basis of medical prescriptions and are reimbursed by the statutory health insurance fund. A medical documentation assistant app (MDA app) is used to record the data on the carer's mobile phone at home. The data is transferred to the care facility's server at the end of the care tour. Prior to the integration of the digital solution, the data relevant for transmission was printed out via the respective central office of the care facility and faxed to the practice, which in turn digitised the data in a billing file in the practice management system. The vital data process before digital integration is shown in Figure 2.

Both the medication plan and the vital data must be exchanged with the GP practice as part of the regular care process and in the event of short-term changes in the patient's medical or nursing care situation. Due to the limited availability of GPs during practice operations, the PDL required at least two contacts on average to ensure updates could be made via the practice. This led to a high time and organisational effort for the PDL, especially since fax and telephone are still the means of communication of first choice. In addition to the high organisational effort required by the nursing service to request the necessary patient data from the doctor's practice, transmission errors can occur in the forwarding of information, which in turn can lead to misunderstandings in treatment and, in the worst case, to incorrect treatment decisions on the part of the doctor (Foronda et al. 2016). Structured electronic data exchange has not yet taken place.

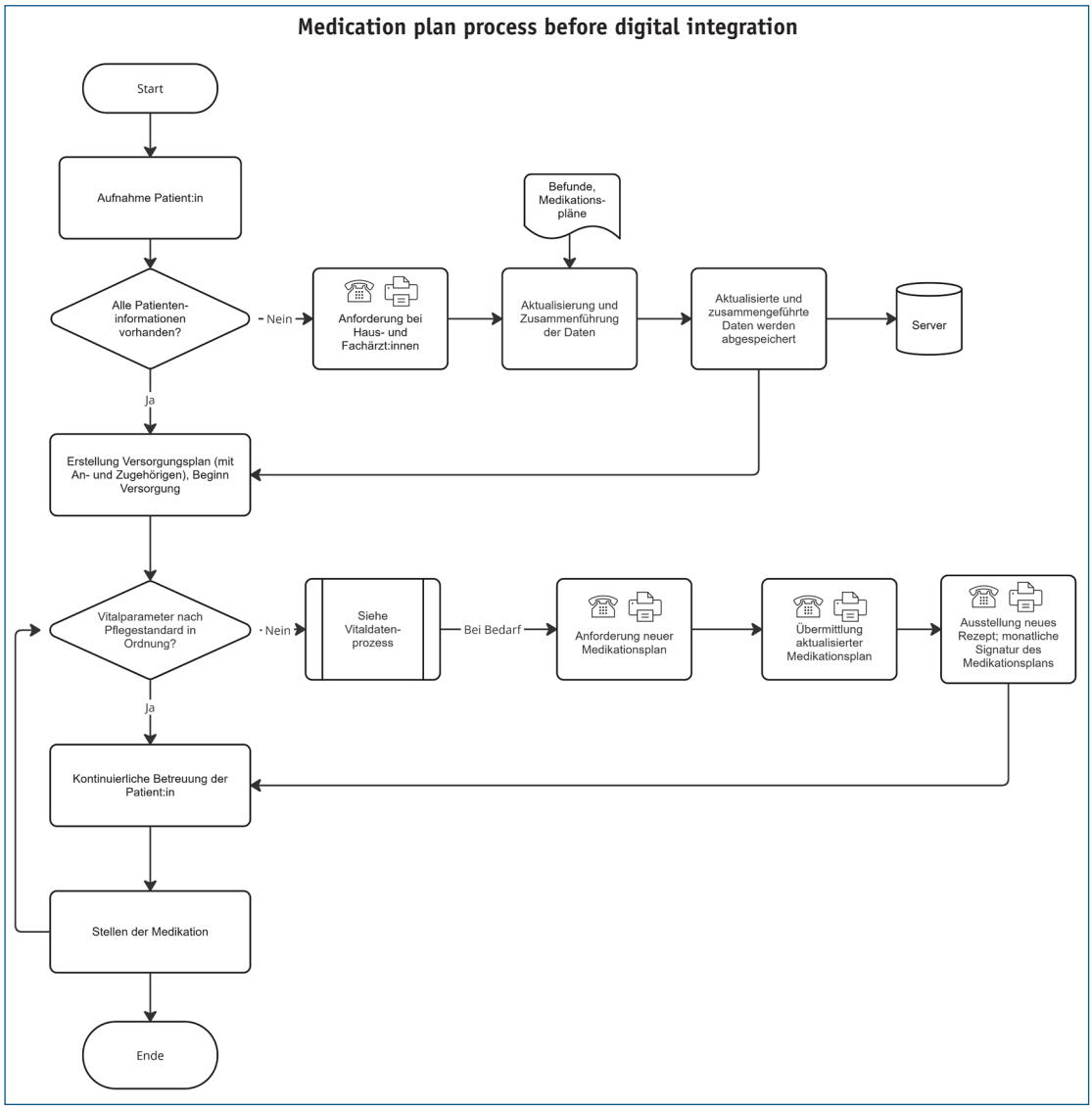


Fig. 1: Medication plan process before digital integration (source: own illustration).

Due to patients' need for care and immobility, doctors sometimes make home visits for treatments. In light of the foreseeable shortage of GPs and the simultaneously growing need for (general) medical and nursing services, the delegation of medical services to other healthcare professions, mostly to specially trained medical assistants (MFA), is becoming increasingly important (Goetz et al. 2017). Among various qualification models, further training for medical assistants VERAH (care assistant in the GP

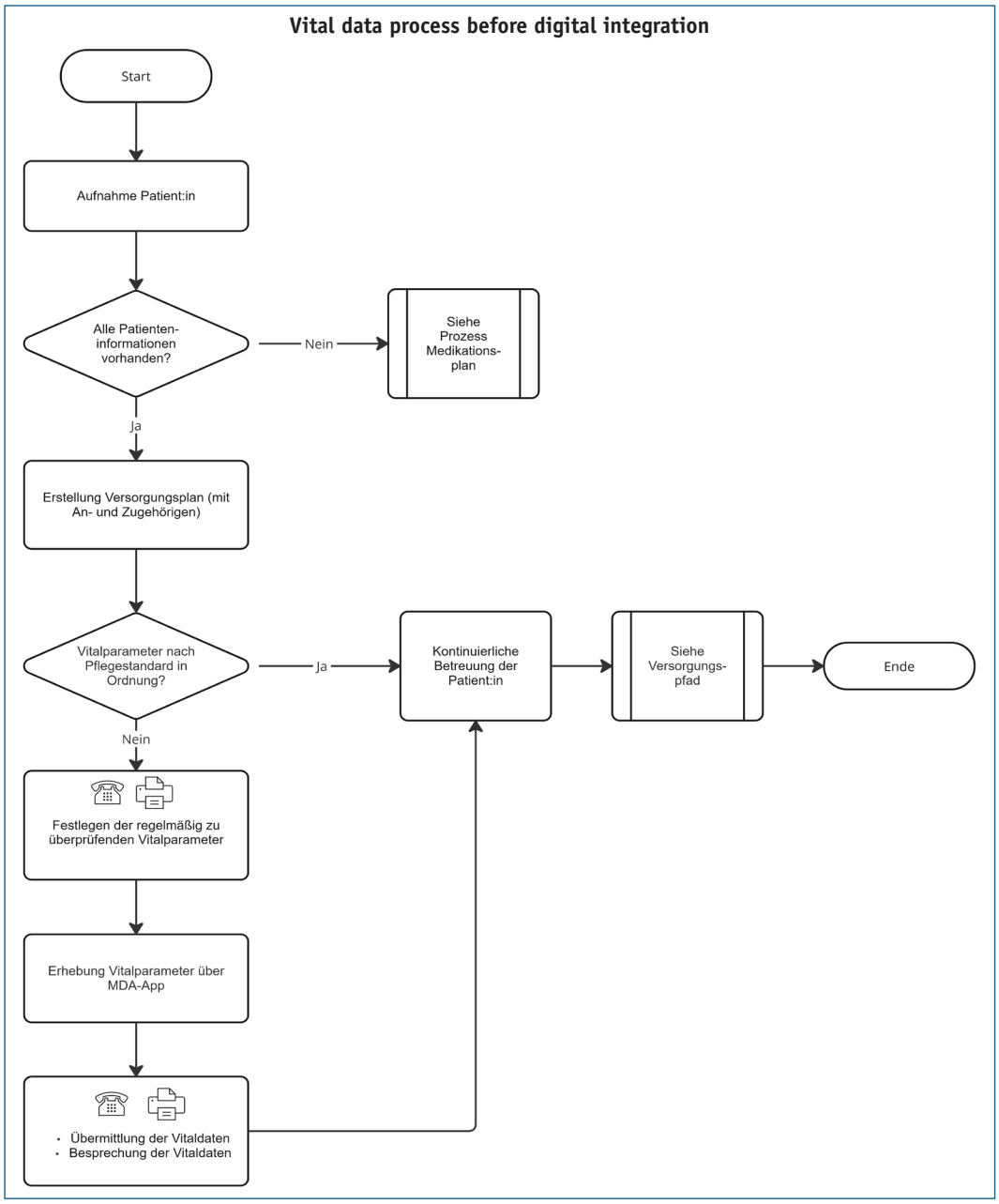


Fig. 2: Vital data process before digital integration (source: own illustration).

practice) and NäPa (non-physician practice assistant) are important due to their integration and financing in selective contractual care models and in standard care (Mergenthal and Güthlin 2021). The healthcare assistant carries out the delegated services in often time-consuming home visits, during which they take vital signs and check the medication plan, among other things. Checking the medication plans and vital signs often resulted in duplicate examinations and documentation.

Procedure in the workshops

In order to actively support the change and the process changes in practice and outpatient care, six workshops were held during the course of the project (see Table 1).

Changed processes and roles following the implementation of the digital solution

In the following, in chronological order of project implementation, the vital signs process is discussed first, followed by the medication plan process and then the development of the care pathway and the division of roles.

Vital data process

During the course of the project, the possibility was created to transfer the vital signs recorded by the nursing staff in the software directly via the TI using KIM to the practice management system of the GP practice. In accompanying workshops and retrospectives, the practice expressed the wish to display the transmitted parameters using a traffic light system so that critical values could be recognised immediately. This was implemented accordingly by the developers of the practice management system.

The digital integration changed the vital data process as follows (see Fig. 3). After the initial admission of the patient and the consolidation of all relevant findings and medication plans by the carer, care begins. The vital signs continue to be recorded via the software. After transmission to the practice management system, the values are now monitored by the GPs, which has significantly reduced the need for telephone consultations and fax transmissions. Queries can now also be made via an e-message using KIM.

Medication plan process

In a second step, it was also possible to transmit the medication plan from the GP practice to the outpatient care service. After the initial admission of the patient by the carer, the completeness of the documents is checked. If this is not the case, the information is requested digitally from the GP practice via KIM. Once the

Workshop objectives and methods			
Workshop	**Ziele**	**Methode**	**Teilnehmende**
1	Identifikation der Kommunikationswege zwischen ambulanter Pflege und hausärztlicher Praxis und auftretender Schnittstellenprobleme sowie relevanter Vitalparameter und Erhebungshäufigkeit	Gruppendiskussion (Vogl 2014)	Pflege, Medizin, IT, Projektmanagement
2	Reflexion und Diskussion der Vitaldaten und Kommunikations- und Arbeitsprozesse; Verdeutlichung Kommunikations- und Arbeitsworkflow zwischen Pflege und Praxis; Ableitung Digitalisierungspotenziale	Gruppendiskussion (Vogl 2014)	Pflege, Medizin, IT, Projektmanagement
3	Darstellung Ablaufprozesse Medikationsmanagement und Kooperationsprozesse der beiden Berufsgruppen; Entwicklung Lösungsansätze in der Kommunikation	Interviews (qualitative Inhaltsanalyse, (Mayring und Fenzl 2022); Gruppendiskussion (Vogl 2014); Walt-Disney-Methode (van Aerssen und Buchholz 2018)	Interviews: Pflege, Medizin Workshop: Pflege, Medizin, IT, Projektmanagement
4	Entwicklung Soll-Prozess im Medikationsmanagement, Retrospektive des Vitaldatenprozesses	Prozessmapping (Kostka und Kostka 2013); Sailboat Retrospektive (Gonçalves und Linders 2016)	Pflege, Medizin, Medizinische Fachangestellte
5	Zusammenführung der bisher erarbeiteten Prozesse; Entwicklung eines Versorgungspfades; Festlegung der Kommunikationsdeterminanten	Gruppendiskussion (Vogl 2014); Prozessmapping (Kostka und Kostka 2013); RACI-Matrix (Lohmann 2021)	Pflege, Medizin, IT, Projektmanagement
6	Finalisierung des Versorgungspfades sowie der Rollen und Verantwortlichkeiten entlang des Versorgungspfades; Reflexion der Projekterfahrungen	Gruppendiskussion (Vogl 2014); Prozessmapping (Kostka und Kostka 2013); RACI-Matrix (Lohmann 2021); 4L-Retrospektive (Gottesdiener 2010)	Pflege, Medizin, IT, Projektmanagement

Tab. 1: *Workshop objectives and methods (source: own illustration).*

data has been updated and collated, the current medication plan is transmitted digitally to the GP practice via the TI. The outpatient care centre then transfers the data to its software and the data is transmitted to the server. Once the care plan has been drawn up and care has started, a check of the vital signs is carried out in accordance with the care standard. If the vital signs are not in order, the vital signs process takes effect (see Fig. 3). A new medication plan is requested from the GP practice via KIM (using an e-message). The medication plan is then digitally adapted in the GP practice and transmitted to the nursing service via TI and a new prescription is issued (see Fig. 4).

Care pathway

Once the two processes have been merged, the care pathway shown in Figure 5 describes the cooperation between outpatient care and a GP or specialist practice. The care pathway is divided into several phases in which responsibilities, action steps and required documents are defined (Fig. 5).

Allocation of roles

The roles and responsibilities of the relevant actors along the care pathway were defined during the last two workshops.

The RACI matrix defines four key roles (Lohmann 2021):

1. R - Responsible: The person or organisational unit that performs the task and is responsible for its completion.
2. a - Accountable: The entity that bears ultimate responsibility for the proper performance of the task.
3. c - Consulted: Persons or bodies consulted during the fulfilment of the task.
4. I - Informed: Actors who are informed about progress, decisions and results.

The roles are described in more detail below based on the individual actors.

- Patient and relatives: They are mainly involved with regard to information flows ('I'), especially during patient admission and the monitoring of long-term and on-demand medication. They are also informed or consulted when medication is adjusted and when vital signs are recorded. In some cases, such as when taking medication, relatives can also take on an 'R' or 'A' role, depending on requirements.
- Outpatient care: In many cases, outpatient care takes on an 'R' role, particularly in the preparation of medication, its administration and the continuous monitoring of medication. They also often have the 'A' responsibility for digitally adapting medication plans and checking medication requirements. In some cases, they also act as the 'I', e.g. providing feedback on medication changes.
- GP practice: The GP practice has both an 'R' and an 'A' role in many processes, particularly when it comes to checking and updating findings and medication plans and issuing new prescriptions (e-prescription). It is also actively involved in the continuous monitoring of medication.
- Specialist practice: In most cases, the specialist practice has an advisory or supporting function ('C'), but is also directly involved in issuing new prescriptions ('R').
- Pharmacy: The pharmacy takes on the role of the person responsible ('R') for the provision of medication and is sometimes re-

sponsible for printing and filing medication plans.

Effects on the care of patients

The digitalisation of the exchange of vital data and medication plans between GP practices and outpatient care services has the potential to improve patient care. The faster and more secure transmission of vital data enables a timely response to changes in patients' health, as the traffic light system highlights critical values. Studies show that close monitoring of vital signs, for example in patients with chronic diseases, leads to better health outcomes (Omboni et al. 2020; Dinesen et al. 2016). The regular transmission of vital signs data, as implemented in this project, enables earlier intervention in the event of deteriorating values. A meta-analysis by Sakima et al. from 2024 confirms that telemedical monitoring of vital signs in patients with hypertension significantly contributes to the reduction of cardiovascular events (Sakima et al. 2024). This example illustrates that the transmission of vital signs, especially in outpatient care, can reduce the risk of serious complications. Secondly, the digital transmission of medication schedules improves drug therapy safety. One of the most common causes of adverse drug events is the incorrect or delayed adjustment of medication schedules (Bourgeois et al. 2010). The implementation of a standardised digital exchange of medication information between the various healthcare providers reduces the likelihood of transmission errors. A study by Osmani et al. (2023) shows that the electronic transmission of medication schedules leads to a significant reduction in medication errors and improved treatment adherence (Osmani et al. 2023).

The continuous monitoring of vital parameters such as blood pressure and oxygen saturation enables medication to be adjusted promptly and thus also leads to hospitalisations being avoided (Stergiopoulos et al. 2024).

Digitalisation also helps to improve communication structures between the various players in the healthcare system. This is because a lack of or delayed communication is one of the main causes of interruptions in care and avoidable hospital admissions among older patients.

This figure is available for download in a larger representation/resolution on the MVF online portal (www.m-vf.de): https://t1p.de/gg5xv

(Sheehan et al. 2021). The introduction of digital communication platforms, such as those used in the 'Docs & Care Network', accelerates the exchange of information, enabling nurses and doctors to react more quickly to changes in health status and avoid negative consequences for patients (Campanella et al. 2016).

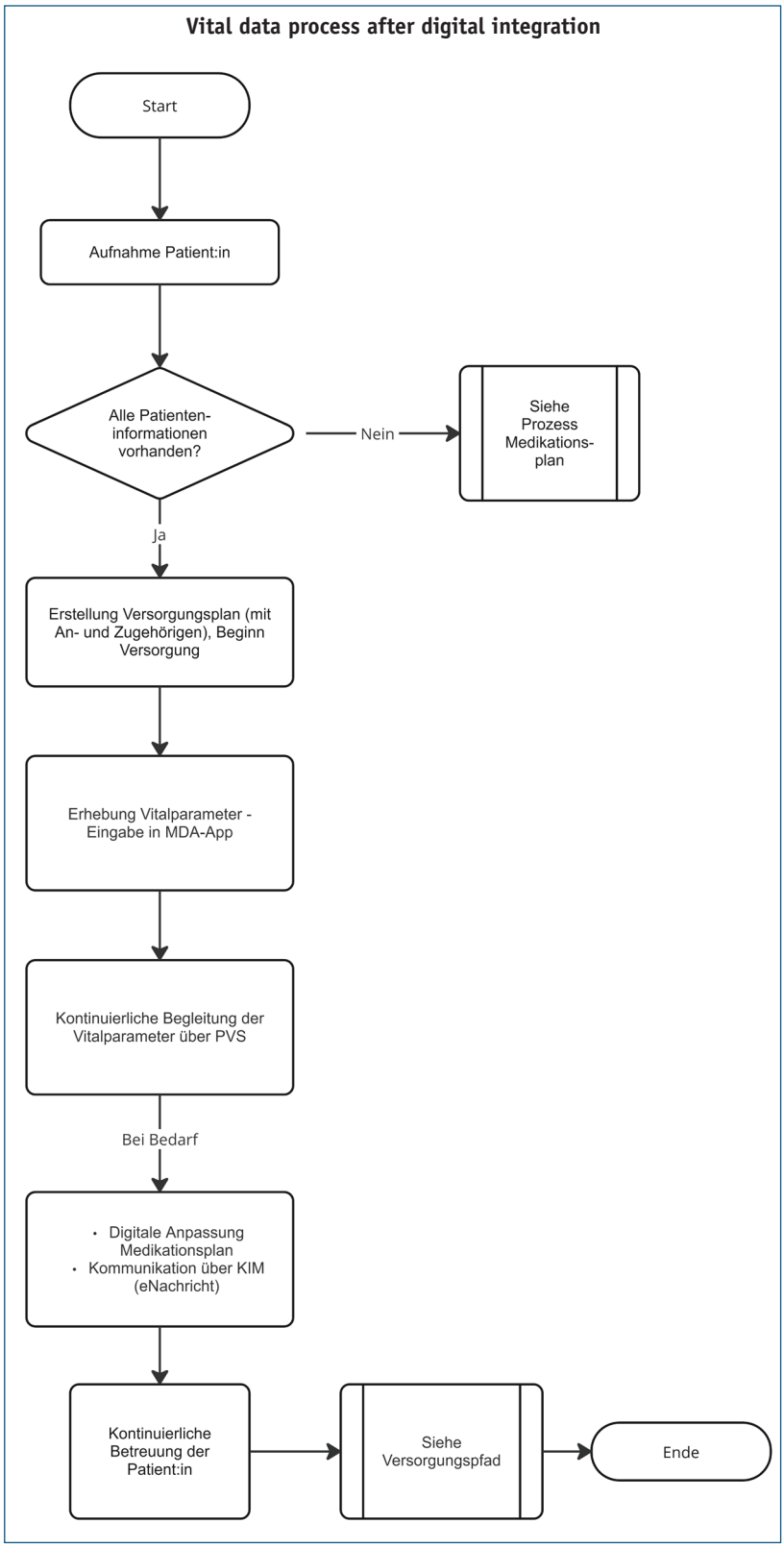


Fig. 3: Vital data process after digital integration (source: own illustration).

Conclusion

The 'Docs & Care Network' project shows how digitalising the exchange of information between outpatient care and GP care can make a significant contribution to improving patient care. In view

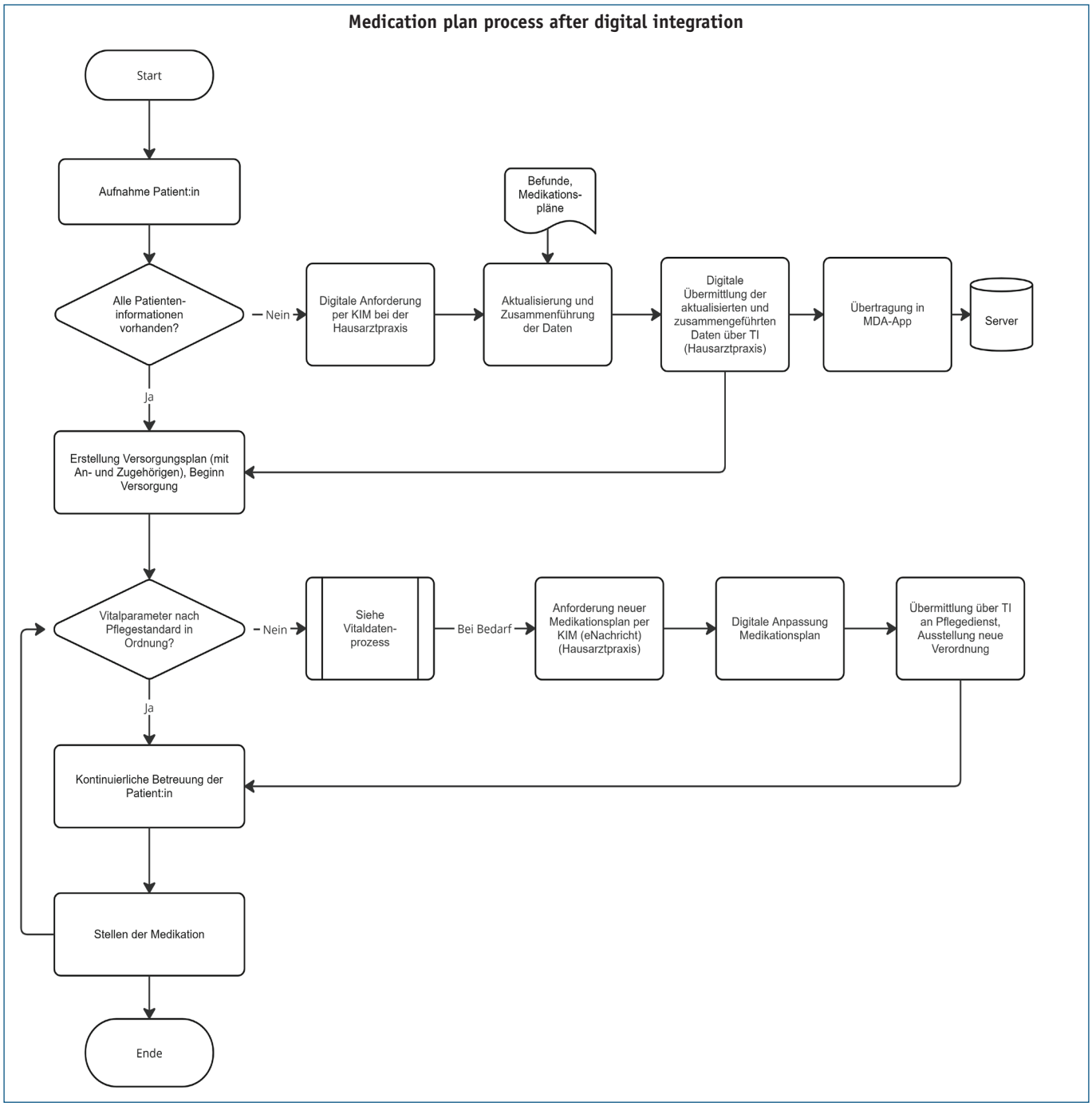


Fig. 4: Medication plan process after digital integration (source: own illustration)..

of demographic change and the growing need for care, the shortage of skilled labour is becoming an increasing challenge that can be at least partially offset by the use of digital solutions. The digitalisation of communication processes, such as the exchange of vital data and medication plans, not only reduces organisational effort, but also improves the safety of patients and nursing staff.

However, political support is a key factor in the success of such projects. Political decisions, for example to promote pilot projects such as the 'Docs & Care Network' and to integrate TI into care, create the necessary framework conditions for the digital transformation. Without targeted legal initiatives, such as those set out in Section 125 SGB XI, the widespread implementation of digital solutions in care would hardly be possible. So far, however, too little attention has been paid to sustainably securing the structures created within such projects, continuing them after the end of the project and extending them to other stakeholders.

Care services and medical practices face challenges when implementing digital systems. Technical barriers, the need for training and the adaptation of work processes are examples of hurdles that need to be addressed as part of successful change management. Political measures can also have a supportive effect here by legitimising the support of such projects through professional process

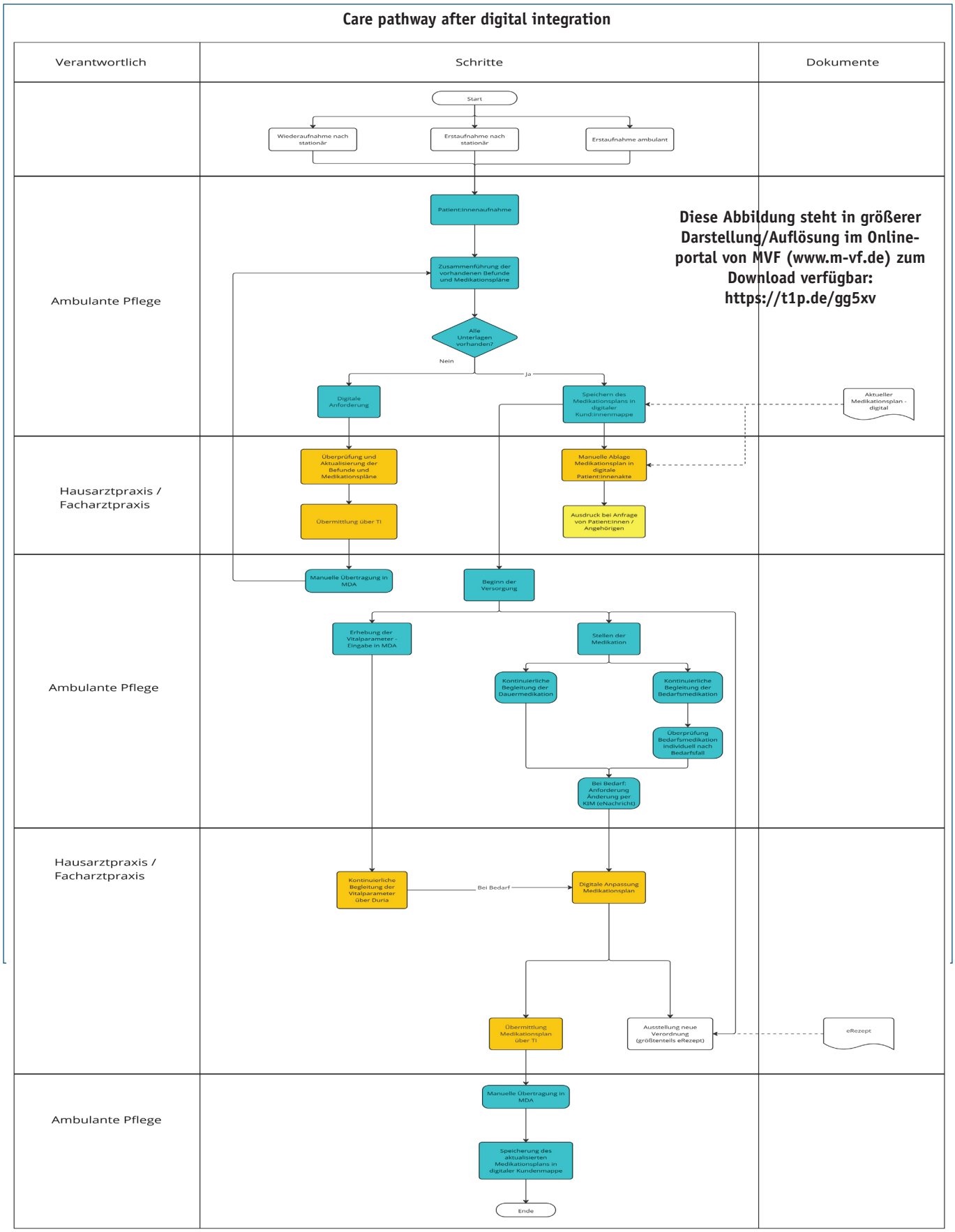


Fig. 5: Care pathway after digital integration (source: own illustration).

management.

Digital integration not only offers potential for better patient care, but can also reduce the workload of nursing staff, which can increase the attractiveness of healthcare professions, and reduce resources. A holistic strategy that integrates technological, organisational and political aspects is the only way to achieve sustainable change in the care system. <<

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Author Statement

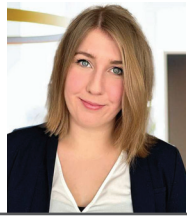
Marie Schluttig and Jana Schachtzabel are research associates, Prof. Dr. rer. pol. Clarissa Kurscheid is managing director of figus GmbH (Private Research Institute for Health and Systems Design) in Cologne. Simon Maria Kremer is an employee of Lebensbaum GmbH, and Dr. med. Thomas Assmann is a physician at the Angelus Family Practice Center in Lindlar. Marie Schluttig, Jana Schachtzabel, and Prof. Dr. rer. pol. Clarissa Kurscheid contributed pro bono to the analysis of the data and the interpretation of the results. Simon Maria Kremer and Dr. med. Thomas Assmann also contributed to the interpretation.

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