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A nurse-led care model to strengthen geriatric expertise in nursing homes: **The development and content of the INTERCARE model.**

Summary

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A nurse-led care model to strengthen geriatric expertise in nursing homes: **The development and content of the INTERCARE model.**

Summary

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About this report

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This report reflects the efforts of all members of the research group, the nursing homes we visited during the contextual analysis, and the nursing homes that participated in the INTERCARE study over a two-year period.

The development of the INTERCARE model and this report would not have been possible without the 14 Swiss nursing homes which took part in the contextual analysis, including their nurse experts, directors of nursing and physicians, who filled out questionnaire surveys, participated in the interviews and provided unpublished information about their care models. We thank them for their time and efforts, both for the interviews and for reading and giving feedback on the descriptions of their models.

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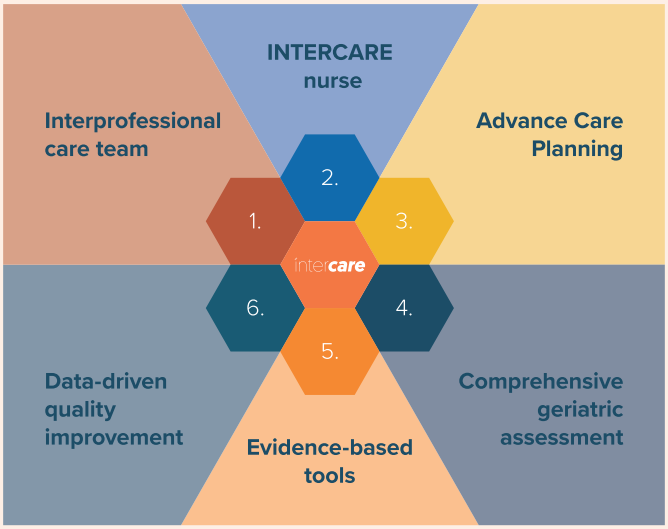
The stakeholder group was very supportive throughout the duration of the study. Their input helped build a care model that fitted the Swiss context, and allowed to tackle obstacles in implementation which contributed to a sustainable intervention. We highly appreciated their engagement and participation.

INTERCARE – «Improving INTERprofessional CARE **for better resident outcomes»**



INTERCARE is a nurse-led care model for nursing homes (NHs). It means that registered nurses in expanded roles (RNXs) with geriatric expertise enhance residents' care, empower care workers, and improve care with the overarching aim of reducing unplanned hospitalisations.

The INTERCARE study comprised two phases:

» **Phase A,**
concerned with developing a nurse-led care model adapted to the Swiss context (2017-2018).

» **Phase B,**
concerned with the evaluation of the implementation and clinical effectiveness of the model in eleven NHs in the German-speaking part of Switzerland (2018-2020).

This report focuses on the development phase of the contextually adapted nurse-led care model – Phase A. In the first part of this report, we describe the INTERCARE nurse-led care model and its six core elements. In the second part, we describe how the model was developed.

Another report evaluating the model's implementation and clinical effectiveness should be published in 2022 and will include practice and policy recommendations.

1 – Introduction

Demographical changes have led to a growing demand for professional long-term care in NHs [1]. Residents are admitted to NHs at an older age, with multimorbidities, dementia, and limitations in activities of daily living (ADL) [2]. They often require resource-intensive care, including chronic care management, palliative care, and care coordination delivered by skilled professionals. However, along with the growing demand for better tailored care, there is an increasing shortage of professionals such as registered nurses (RNs) and general practitioners (GPs) which have geriatric expertise [3]. As a result, nurse aides with condensed education and training and little geriatric knowledge provide a large proportion of care, accompanied by licensed practical nurses (LPNs)[1]. They often lack specific geriatric knowledge and are not sufficiently equipped to manage chronic diseases, for early detection of deterioration of health conditions, or timely treatment of geriatric syndromes. This leads to an increase in unplanned hospital transfers (including emergency department visits) which represents a burden for NH residents (e.g., iatrogenic complications) and subsequent high costs to the health care system. Internationally, between 19% and 67% of hospitalisations are deemed avoidable [4]. An estimation showed that in Switzerland, avoidable hospitalisations cost the health care system up to 105 million Swiss francs per annum [5].

These challenges create a need to rethink how NHs can effectively use the existing resources. RNs are key personnel in long-term care and it is important to optimally use and strengthen their competencies to guarantee geriatric expertise in NHs and improve quality of care. Indeed, internationally countries introduced and tested several nurse-led models [6-10]. In these nurse-led care models, mostly led by Advanced Practice Nurses (APNs, i.e., Master-level educated nurses [11]) with geriatric competencies take up clinical leadership roles. The APNs, as leaders of the interprofessional care teams, assure continuity and consistency of care and empower care teams for adequate provision of geriatric care meeting resident needs [6-10]. However, APNs in Switzerland, similarly to other European countries, are not readily available [12]. Additionally, nurse-led care models consist of multiple interacting elements, involving different staff – such as nurses, LPNs, physicians, or physiotherapists – each with different practice patterns (i.e., standards or methods of care) and scopes of practice (permitted procedures, actions or processes of a healthcare professional). This makes care models complex to develop, implement and sustain. Therefore, to develop a sustainable nurse-led care model adapted to the needs and resources of Switzerland, INTERCARE study using implementation science principles was designed.

[1]In Switzerland, nurse aides have a 2-3 month course or on the job training, certified nurse aides have a 2-year education. LPN here refers to the profession Fachperson Gesundheit in Switzerland. This is a 3-year education in healthcare. It is comparable to a licensed practical nurse/licensed vocational nurse in the US, the term used here, or a nursing associate in the UK. Despite the term LPN used for reference here, a Fachperson Gesundheit is not referred to as a nurse in Switzerland. Registered nurses in Switzerland have at least 3 years of education.

2 – INTERCARE study

The INTERCARE study was designed to address some of the current challenges in Swiss NHs by developing a nurse-led care model guided by the implementation science principles [13]. The key implementation science principles used for the model's development was a contextual analysis combined with stakeholders' involvement, which guided the definition of implementation strategies, and a theory-driven approach based on the Consolidated Framework for Implementation Research (CFIR) [14].

The contextual analysis was conducted to understand the various elements of nurse-led models in place in Swiss NHs, thereby focusing on what was relevant and what works in the local Swiss NHs. Furthermore, it enabled us to identify factors that may help (i.e., facilitators) or hinder (i.e. barriers) the model's implementation. The identified facilitators and barriers informed the definition of implementation strategies to enhance model up-take (e.g., providing education or NH support) [15].

2.1 – INTERCARE core elements

The INTERCARE nurse-led care model comprises **six core elements**. Each core element consists of minimal requirements, which are mandatory for NHs to implement, and peripheral requirements where NHs are free to adapt according to local needs and resources. The six core elements are:

1. Interprofessional care team:

The provision of effective geriatric care is complex. It can be only successfully provided when considering different professions' expertise, including nurses, GPs, therapeutic staff, social workers and other professionals. For INTERCARE, we identified the interprofessional care team as consisting of at least two different professionals: nurses, GPs, representatives of therapeutic professions, or social workers, working together to fulfil residents' individual needs [16].

The minimal requirement for this element is the definition of a clear structure facilitating the communication between two different professionals (e.g., meetings, visits) and its clear communication within the NH. We expected the care teams to liaise with relevant professionals to address resident problems. We also encouraged NHs to reflect on the INTERCARE nurse's role to support care teams and GPs' communication as a peripheral requirement.

2. INTERCARE nurse:

The INTERCARE nurse is the central element of INTERCARE. The INTERCARE nurse was hired by and works in the NH. An INTERCARE nurse is a RN, expected to have at least three years' experience in long-term care and to work for a minimum of 60% per 80 residents under their responsibility (i.e., 25h/week per 80 residents). The INTERCARE nurse is embedded in clinical practice, and the core activity of the INTERCARE nurse is to coach and support care teams in the decision-making process during complex resident situations and in their general care. Coaching and support from the INTERCARE nurse should empower care staff to effectively handle acute problems, monitor chronic conditions, and manage geriatric symptoms. The INTERCARE nurse supports or leads conversations with residents/relatives to fulfil individual needs and expectations. Furthermore, the INTERCARE nurse supports care teams in preparation for GP visits or during oral communication to influence interprofessional collaboration and ensure efficient communication between residents, care teams and GPs. The goal of the role is to improve residents' clinical outcomes, quality of life and reduce unplanned hospitalisations (including emergency departments transfers).

The degree to which the INTERCARE nurse is involved in quality improvement is a peripheral requirement and depends on the local structure of the NH and the capacity and experience of the INTERCARE nurse. Similarly, the degree to which the INTERCARE nurse is responsible for integrating the comprehensive geriatric assessment into practice depends on their former experience and the specific NH possibilities to offer or support further training under a GP's supervision.

3. Comprehensive geriatric assessment (CGA):

CGA is a multidimensional, interdisciplinary process to assess the resident's care and treatment needs and to establish an interprofessional care plan to promote the resident's well-being and autonomy [17]. The INTERCARE nurse should conduct a comprehensive residents' needs assessment by including physical, functional, mental, social and economic dimensions that affect residents' well-being.

As a minimal requirement, NHs should think about which validated assessment instruments are appropriate for conducting a comprehensive assessment, discuss with the GPs, and implemented these. The NHs are free to choose which assessment instruments they would like to introduce, who should use these (e.g., all RNs, only INTERCARE nurse, physiotherapists) and when to implement them.

4. Advance Care Planning (ACP):

ACP is an ongoing process of clarifying primarily the residents', but also family members' and/or legal representatives' concerns, wishes and needs concerning medical interventions to include them in the care and treatment plan [18]. ACP conversations need training and take time and resources. In the context of the project, we restricted the minimal requirements to conversations with newly admitted residents about four themes: the existence of an advanced directive, their wishes for concerning resuscitation, possible hospitalisation in the event of an emergency, be it for life-prolonging measures or symptom relief; and wishes regarding antibiotic therapy as a life-prolonging measure or as symptom relief. We expected the NHs to document either the choices made based on the ACP conversation or that the resident refused to have an ACP conversation. Additionally, we asked the NHs to put processes in place for emergency care plans ready before the weekend for residents in unstable conditions. As the peripheral requirement, the NHs were free to decide who would make the ACP conversations.

5. Evidence-based instruments:

Three instruments support the communication process and reflection about hospitalisations in care teams [8].

» **STOP&WATCH** helps nurse aids to guide their observations for early changes in residents and to communicate them effectively to the responsible LPNs/RNs[2] on the ward, enabling them to follow up on the observed change [8]. As a peripheral requirement, NHs could extend STOP&WATCH use to any NH staff, such as cleaning staff, therapists, animators or visitors.

» The **ISBAR** stands for Identification, Situation, Background, Assessment and Recommendation. ISBAR is an easy-to-remember communication instrument framing any conversation, especially critical ones, requiring clinician's immediate attention and action [8]. Within the minimal requirement, the ISBAR should be used by all RNs/LPNs when contacting a GP in situations where a resident is deteriorating.

» The last instrument mandatory to be implemented by the INTERCARE nurse is the "**reflection instrument**" to perform a root cause analysis on each unplanned transfer [8]. Root cause analysis allows an understanding of how and why a transfer occurred and a discussion about how to avoid similar transfers in the future. The INTERCARE nurse discusses the transfer with the person(s) involved. Together with NH leadership, they can discuss possible patterns and emerging reasons for unplanned transfers to plan proper interventions.

» As a peripheral requirement, a NH can implement various **care pathways** to support standardised clinical decision making [8]. In the care pathway, the different tasks or interventions by the professionals involved in the residents' care are defined and sequenced, if a specific symptom is observed, such as fever or shortness of breath. This helps the staff to decide when, in what form and by whom further assessments should be done. Each NH can decide, if, how and when they want to implement these care pathways. The research group put at the NHs disposal seven care pathways to help manage symptoms and common conditions such as: shortness of breath, fever, gastrointestinal symptoms, congestive heart failure, urinary tract infection and infection of the upper airways.

[2]In Switzerland, nurse aides have a 2-3 month course or on the job training, certified nurse aides have a 2-year education. LPN here refers to the profession Fachperson Gesundheit in Switzerland. This is a 3-year education in healthcare. It is comparable to a licensed practical nurse/licensed vocational nurse in the US, the term used here, or a nursing associate in the UK. Despite the term LPN used for reference here, a Fachperson Gesundheit is not referred to as a nurse in Switzerland. Registered nurses in Switzerland have at least 3 years of education.

The **STOP&WATCH** and **ISBAR** Instrument can be downloaded in German from our website:
https://intercare.nursing.unibas.ch/downloads/

The STOP&WATCH, ISBAR, reflection instrument and care pathways were adapted from the INTERACT Program "Interventions to Reduce Acute Care Transfers" [8]. INTERACT is a quality improvement program designed to improve the identification, evaluation, and communication about changes in resident status. INTERACT® was first designed in a project supported by the Centers for Medicare and Medicaid Services (CMS). More information can be found here:
https://pathway-interact.com

6. Data-driven quality improvement:

To monitor and improve quality, a NH needs a structured system in place to guide organisational changes to improve an identified issue in the quality of care delivery. Based on resident data (e.g., from RAI-NH, Quality indicators), the NH can decide which themes they want to work on and implement quality improvement measures according to the Plan-Do-Check-Act cycle (PDCA). During the intervention, the research group analysed transfer data and national quality indicators (e.g., physical restraint use, weight loss, pain, polypharmacy) and provided the results by means of benchmarking reports to the NHs. The goal was to regularly discuss the results and to help NHs address identified issues. As a minimal requirement, the NH decides who is responsible for interpreting the results and implementing quality improvement measures.

2.2 – Implementation strategies

Based on the contextual analysis guided by the CFIR [14], which included exploring 14 Swiss NHs working with nurse-led care models, we identified factors, i.e., barriers and facilitators, that may influence the model's implementation. We used identified factors to define a bundle of **implementation strategies** [15]. An implementation strategy is an action used to enhance the implementation of the six core elements of the model in real-life context. We determined strategies based on the Expert Recommendations for Implementing Change compilation (ERIC) [15, 19]:

Promote adaptability:
As discussed above, all core elements have both minimal and peripheral requirements. The minimal requirements of INTERCARE were essential and indispensable pieces for the INTERCARE model, and are not adaptable. The peripheral requirements can be adapted to the individual NHs so that they fit existing structures and processes. This possibility increases the model's acceptability and feasibility. One example of a peripheral requirement is the INTERCARE nurse's working hours.

Assess the readiness for change:
Based on the contextual analysis, it was clear that without the NH leadership's explicit will and readiness for a change, a nurse-led care model cannot be successfully implemented. Accordingly, the research group supported the NH leadership for the preparation and implementation of the change. In the preparation phase the NH leadership reflected upon and collegially discussed the vision they have for the model and the staff's willingness and motivation to change current practice patterns.

Obtain formal commitments:
As INTERCARE was a research study, formal commitment of the NHs for implementation of the INTERCARE model was required.

Identify barriers and facilitators:
All NHs are unique in terms of resources or leadership styles and barriers and facilitators differ across NHs. In the pre-implementation period, NHs assessed possible facilitators and barriers and worked out strategies to address them. The strategies targeted for example factors like limited support of the GPs for the INTERCARE nurse role, challenges to recruit an INTERCARE nurse or high fluctuation rates. The research group discussed with the individual NHs how to best identify factors and how to address them.

Create new clinical teams:
Each NH had a specific team in place to support the implementation of the nurse-led care model. In some NHs the INTERCARE nurse created working groups with unit champions who oversaw the implementation on the units. Any member of the care team can become a champion after receiving some training and support.

Blended-learning curriculum for the INTERCARE nurse:
The INTERCARE nurses varied in clinical experience and/or educational backgrounds due to different postgraduate training as RNs. Accordingly, to align core competencies especially for novice RNs taking on the INTERCARE nurse role, preparation was needed. A blended-learning curriculum within the INTERCARE study was developed, including modules concerning clinical leadership and communication, comprehensive geriatric assessment, advanced care planning, geriatric syndromes, chronic conditions, acute symptoms, medication management, and data-driven quality improvement. This allowed to enhance INTERCARE nurses' geriatric expertise and prepare them for their role. The curriculum **was dynamic and integrated various learning methods** like e-learning, self-evaluation, reflection, face-to-face meetings, and coaching. Moreover, the research group developed and **distributed educational material** for the implementation of the evidence-based instruments.

Continuous support of NHs:
To continuously improve quality of care, NHs need to understand results derived from their data; therefore, the research group provided **local technical assistance** in data management and discussion during meetings. Additionally, the research group offered **ongoing consultation for the NHs**. At the NH level, the research group visited the NHs every two months to discuss the implementation of the core elements, barriers and facilitators and addressed open questions with NH leadership and INTERCARE nurses. Additionally, for INTERCARE nurses' support, the project coordinator (member of the research group) provided two-weekly phone calls with each INTERCARE nurse to discuss individual challenges in the implementation process and discuss their progress in role development and to ensure effective knowledge transfer.

Based on unplanned hospitalisations and national quality indicators data, the research group audited **NHs quality and provided feedback**. The research group helped in the identification of areas for improvement and guided in the definition of possible actions to be taken. Additionally, to monitor staff perception of the work environment and of the newly introduced care model, staff surveys were conducted at baseline, six and twelve months post-implementation and the results were fed back to the NHs in the form of reports.

3 – INTERCARE model development

As an Implementation science study, the development of the INTERCARE model relied on four different studies: 1) identifying available evidence on international nurse-led care models that are effective in reducing unplanned transfers, 2) conducting a contextual analysis with case studies to gain a better understanding of models of care already in place, 3) informing the scope of practice of the INTERCARE nurse based on stakeholder input and 4) including residents' and relatives' opinions. The development of the model's core elements followed the CFIR [14].

3.1 – Strength of evidence (first study)

In a first study, we identified five international evidence-based nurse-led care models in a literature review that were effective in reducing emergency department visits and hospital transfers [6-10]. These models informed the content of the INTERCARE model's core elements. The first common element identified in all five models was the deployment of APNs. APNs belonged to the interprofessional team, worked in clinical practice, performed clinical assessments, assessed and managed episodic and chronic illnesses. The APN coached care teams, provided clinical leadership, and facilitated interprofessional collaboration.

Additionally, three of the five models identified worked with INTERACT (Interventions to Reduce Acute Care Transfers), a program focusing on the early identification, evaluation of management or residents' acute conditions to reduce hospital transfers [8]. To reduce transfers, INTERACT works with local champions and provides different instruments such as STOP&WATCH, ISBAR, reflection instruments and ACP [8].

3.2 – Contextual analysis (second study)

In the second study, we performed a context analysis with case studies of Swiss NHs. The aim of the contextual analysis was twofold. Based on the 14-NHs case studies, we understood Swiss model elements which were deemed appropriate and feasible for the Swiss context [20]. The exploration of the competencies and outcomes reached by the nurse experts leading these models was an essential part of the contextual analysis. Secondly, we identified barriers and facilitators that promoted or hindered the implementation of a nurse-led care model. Based on barriers and facilitators, we developed the implementation strategies portrayed above. **The context analysis included 14 case studies**, such as nursing homes working with a nurse-led care model, from Switzerland's three language regions. We summarised the findings in a cross-case synthesis.

Case studies (Swiss NHs)

The synthesis of all cases revealed two common elements for all Swiss nurse-led care models. The first element was RNs working as nurse experts (i.e., beyond the scope of practice of a registered nurse), internationally referred to as RNXs (i.e., registered nurses in expanded roles) [21]. The second common element was the use of data to drive quality improvement.

Based on the case studies we understood that a combination of elements drove the NHs in developing and implementing their nurse-led care models, depending on their needs and vision. These included residents' needs, available resources, workforce issues or NH restructuring processes. Nurse experts and NH management had to work closely together to develop the nurse expert role(s) and regularly exchange information and ideas to build a shared vision and mission for the care provided, which also contributed to facilitating the introduction of the models in the different NHs. Therefore, the case-study models were continuously adapted based on internal changes, care needs and expectations.

Swiss nurse expert roles

The nurse experts have education in specialized areas such as a Certificate of Advanced Studies in Dementia or a Diploma of Advanced Studies in Palliative Care; and two nurse experts are APNs with a Master's degree in Nursing. The NHs adapted the nurse expert roles to fit their skills and strengths and respond to the needs of the NHs.

We described the content of **nurse expert** roles according to Hamric's framework of Advanced Practice Nursing [22]. Hamric's model includes seven competency areas including: **clinical practice, coaching, clinical and professional leadership, interprofessional collaboration, ethical decision-making, and research skills** [22]. Research skills was the least developed area of expertise of the nurse

experts. In the area of research skills, the nurse experts usually focused on using evidence-based information to inform nursing procedures or update policies. Most nurse experts focused exclusively on this expert role, and few combined it with a management position, e.g., ward manager. Some worked in one NH, others across several sites belonging to the same NH group (each of the 14 NHs which participated in the case studies are described in detailed in Appendix 1 available on our website: *https://intercare.nursing.unibas.ch/publikationen/* The models are described in German or French).

Competencies of the nurse experts:

» **Clinical practice** is an essential part of all nurse expert roles. It gives them credibility as they are able to help care staff identify and resolve issues, and gain acceptance as experts as they provide coaching and execute clinical leadership. The degree of involvement in clinical practice differs: while some of them restrict their activities to providing support and guidance in complex situations, others assess newly admitted residents, develop care goals together with residents and family members, or support them during acute events. Their clinical practice enables them to identify gaps in knowledge of care teams and seize opportunities to coach staff and strengthen their geriatric expertise.

» Nurse experts identify needs for innovation, practice development and evidence-based practice. They all have **clinical leadership** roles, evaluate and improve resident safety, quality of care, quality of life, and person-centred care.

» All nurse experts stress the importance of **interprofessional collaboration**, not only with GPs but also with all other health care professionals involved in the care and treatment of residents. They support care teams in their communication with GPs and, depending on the GP model and have the possibility of collaborating closely with the GPs (e.g., daily exchange about current problems).

» In the area of **ethical decision-making**, nurse experts help to identify ethical dilemmas and tackle them effectively. They play an essential role in ACP with residents and family members, clarifying wishes and expectations for treatment and care. At least one nurse expert in each NH is trained in having open discussions and end-of-life conversations with residents and family members.

Data-driven quality improvement

All NHs in the case studies used **data-driven quality improvement**. They used resident data (e.g., quality indicators provided by the resident assessment instruments), to monitor and improve quality. They used data to decide on action plans and to raise awareness among staff for specific themes. Additionally, all of them used staff, residents' or family members' surveys, to assess their opinions and identify areas in need of improvement.

Considerations before implementation

We were able to identify several **factors that could potentially hinder or facilitate the implementation of a nurse-led care model** based on the case studies (all factors are described in Appendix 2 "Summary of potential factors influencing the implementation of a model in NH" available in English and German language on our website: *https://intercare.nursing.unibas.ch/publikationen/*). The factors were structured according to CFIR [14]. We present here two of the five dimensions of CFIR as examples.

Intervention characteristics

The nurse-led care model itself needed to address a local issue or concern and be tailored to the specific setting's circumstances. No model fits every context and every NH, which have different resources and needs.

Nurse experts need to have clear competencies, and their role must be differentiated from the RNs role. If a nurse expert is perceived as a resource person who can provide support in daily practice, it increases the care team's preference to collaborate with them. For the model to work in practice, the nurse expert needs professional experience, geriatric expertise, and advanced interpersonal and leadership competencies.

Inner setting

An organisational culture supporting the implementation is characterised by (1) transparent communication among staff and leadership, (2) mutual respect between professions, (3) a shared vision about the nurse expert's role, and (4) continuous support for the staff and nurse experts.

A NH should carefully prepare the implementation of the new care model. This should include clarifying the nurse expert's aims and competencies and a plan for integrating the role in daily working processes (e.g., when will nurse

experts visit units or contact GP). From the start, key stakeholders such as GPs and ward managers need to be integrated in the role's development and implementation.

3.3 – Stakeholder involvement (third study)

In the third study, stakeholders rated relevant competencies and outcomes for the RNXs relevant to the Swiss context [21]. Based on the literature review (first study) and the case studies (second study), we extracted possible competencies and outcomes for the RNXs and developed a rating questionnaire [21]. The stakeholder group was comprised of health care providers, NH leaders, insurance company representatives, as well as representatives from policy and professional groups. The relevant competencies of the RNXs were clinical leadership and coaching, supporting and empowering care teams and improving quality of care with evidence-based practice. Stakeholders also stressed the threat of deskilling RNs with the introduction of the new role. This required to carefully define the scope of practice of the INTERCARE nurses and the differences and complementary roles regarding RNs and that each NH should tailor the position to its context.

3.4 – Residents' and family members' involvement (fourth study)

In the last study, we conducted **focus group interviews with residents and family members** to explore their experiences and needs in acute situations [23]. The focus groups took place in three NHs working with nurse experts (two in the German part and one in the French speaking part of Switzerland). Since the results were only available after the implementation start, they did not directly influence the INTERCARE model development.

The main finding considerably changed our perspective on acute situations. The research group understood acute situations as a medical condition needing attention. The residents and family members, on the other hand, understood the acute situations as any situation which did not meet residents' or family members' basic needs and when quality of life was not maintained. Accordingly, fostering relationships between staff and residents and conversations about needs and wishes (e.g., with ACP or a collaborative care plan), should be a vital part of the role of the INTERCARE nurse. Additionally, residents and family members in all NHs talked about similar daily experiences of limited resources, minimal availability of RNs with geriatric expertise, and limited access to GPs who are usually not available on site. Detailed results are described in a publication [23]

4 – Synthesis

INTERCARE – a possible answer to current challenges in nursing homes

The INTERCARE model offers a potential solution to bring geriatric expertise into NHs, improve the quality of care, and reduce unplanned transfers. It is evidence-based and builds upon existing Swiss nurse-led models offering a feasible and scalable solution for any NH. As are the NH case studies, the INTERCARE model is based on RNXs working as INTERCARE nurses and hired by the NHs. The goal is to provide in-house geriatric expertise and to empower care workers in the NH. The INTERCARE nurses' duties include visiting wards regularly to remain close to the care teams and show involvement in clinical care and to provide coaching and formal training. The INTERCARE nurse has the expertise to address gaps in practice development and implement projects as needed, to fulfil the vision and goals of the NH.

Nurse-led care models driven by APNs would be a great asset for Swiss NHs. However, this is currently not a viable option, given the number of APNs available for working in long-term care. Moreover, Switzerland has limited experience with APNs, as the first APN program started in 2000 [24]. In 2015, only 328 APNs had graduated, and most of them work in acute care settings [24].

Another essential element of the INTERCARE model is interprofessional collaboration. Residents' care goals can only be reached with an interprofessional team. The INTERCARE nurses support the building of trustful relationships with GPs. All NHs in the case studies stressed the importance of communicating with residents and families about their needs and wishes and focusing on person-centred care. All of these NHs worked with ACP to some degree, such as documenting residents wishes at admission or towards the end of life. Therefore, ACP is another crucial element of the INTERCARE model. However, integrating ACP in routine care remains challenging for NHs, especially if they have no NH-based GP [25, 26]. Accordingly, INTERCARE starts with ACP by defining minimal requirements as the conversations about resuscitation status and wishes concerning hospitalisations. After the implementation of the INTERCARE model in eleven NHs in the German speaking part of Switzerland (Phase B of the INTERCARE study) the research group will evaluate the feasibility and adoption of ACP to give guidance in implementing ACP based on the experiences of phase B.

Evidence-based instruments

The core element of evidence-based instruments includes the **STOP&WATCH**, **ISBAR** and the **reflection instrument**. This model element is the only one solely based on the literature and not adapted according to the case studies. Literature pin points that to reduce unplanned transfers, early recognition of resident conditions changes, their communication to the LPNs/RNs and GPs, and reflection upon internal factors contributing to unplanned hospitalisations with care teams and with GPs is required. Therefore, we used the INTERACT program's evidence-based instruments, which effectively reduced unplanned hospitalisations [8]. We included STOP&WATCH to support early recognition of changes in residents' condition, ISBAR for structured communication with GPs, and the reflection instrument to enable reflection on unplanned hospitalisations.

Data-driven quality improvement

The core element of data-driven quality improvement was a hallmark of all the NHs described in the case studies. Working with data to decide where to invest quality improvement initiatives and direct the INTERCARE nurse's focus is essential. The data is a basis for discussion about strategic decisions to improve care quality and further develop action plans. For the INTERCARE study, it was important to assess and measure transfer rates and quality indicators.

INTERCARE nurse

The clinical leadership position of the INTERCARE nurse can provide a career ladder and an exciting expansion of the traditional RNs' scope of practice. Accordingly, nurse-led care models offer the opportunity to increase the attractiveness of the NH setting for nurses. They can expand their role and scope of practice while remaining in a clinical role and not having to change to a management position.

To prepare the INTERCARE nurses for their role, we developed a program that served as a basis for the development of a Certificate of Advanced Studies (More information

about the program: *https://nursing.unibas.ch/de/weiterbildung/cas-intercare/*). We strongly emphasize that the INTERCARE nurse role does not replace APNs, but rather be complementary. This is a pragmatic solution that allows for the rapid training of nurse experts on the job and provides NHs with short-term skills. APNs are a medium- to long-term perspective, and are an extension or complement to this initial investment. Both the INTERCARE nurse and the APN can work side by side, each within their specific scope of practice to care for residents, family members and care teams in NHs.

From a research project to the real-world use

Implementation science principles guided the development of the INTERCARE model. Key principles included the contextual analysis, the involvement of stakeholders and definition of implementation strategies. Implementation science principles added to the model's feasibility and increases its chances of successful implementation in the real-world setting. While the literature review helped us identify effective nurse-led care models which reduced unplanned hospitalisations, the case studies enabled understanding of the model elements feasible in the Swiss context and circumstances under which such models work. The stakeholders' involvement helped to identify acceptable competencies and expected outcomes of RNXs part of such models [21].

Additionally, based on context analysis we identified real barriers and facilitators and defined implementation strategies to facilitate model implementation. In the evaluation of phase B we will examine which implementation strategies are fundamental for implementation success (part of the next national report).

This report can serve as a blueprint for NHs interested in implementing the nurse-led care model, reflecting on key ingredients, barriers and facilitators which need to be considered for the model to work, and the implementation strategies required. The NHs can tailor the INTERCARE core elements to their local context considering their own needs and resources. The descriptions of the NHs which participated in the case studies (Appendix 1) can serve as examples and inspiration.

The introduction of a nurse-led care model is an organizational change with repercussions on all levels and shifts in responsibilities. Readiness for change is crucial for the implementation to work. NH leadership needs a clear vision of the change they want to bring about. The INTERCARE nurse needs the corresponding preparation with geriatric in-depth knowledge and expertise and advanced interpersonal and leadership skills to take up their role. The INTERCARE has the potential to support NHs in addressing the increasing challenges they face and improve the quality of care and residents' quality of life. Financial incentives can support and facilitate the overall development of nurse expert roles in NHs to address current issues, and be prepared for new challenges.

A further national report will be published in 2022 after we evaluate the implementation of the INTERCARE model in 11 German-speaking NHs. We are currently performing the analyses to be able to provide information about the INTERCARE model implementation process and its clinical effectiveness.

Acronyms and abbreviations

ADL	*Activities of daily living*
ACP	*Advance Care Planning*
APNs	*Advanced Practice Nurses*
CAS	*Certificate of Advanced Studies*
CFIR	*Consolidated Framework for Implementation Research*
CGA	*Comprehensive geriatric assessment*
ERIC	*Expert Recommendations for Implementing Change compilation*
GP	*General practitioner*
INTERACT	*Interventions to Reduce Acute Care Transfers*
INTERCARE	*improving INTERprofessional CARE for better resident outcomes*
ISBAR	*Identification, Situation, Background, Assessment, Recommendation*
LPN	*Licensed practical nurse*
NH	*Nursing home*
PDCA	*Plan-Do-Check-Act*
RAND	*Research and Development*
RN	*Registered nurse*
RNXs	*Registered nurses in expanded roles*

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