

CHAPTER - 5

PATIENT GENERATED CARE AND INTERDISCIPLINARY COLLABORATION

***Mr. Guntu Durga Prasad^{1*}, Prof. Devi Nanjappan²,
Mrs. Snehalatha Reddy³, Mrs.Nirmala Reddy⁴***

^{*1} Assistant professor, Department of Medical Surgical Nursing,
Smt.Nagarathnamma College of Nursing,
Rajeev Gandhi University of Health Sciences Bangalore, Karnataka, India,
Phone Number: 7386415473, Email durgaprasadmsn99@gmail.com

² Principal, Department of Medical Surgical Nursing,
Smt.Nagarathnamma College of Nursing,
Rajeev Gandhi University of Health Sciences Bangalore, Karnataka, India,
Phone Number: 9291235070, Email: principalanr@acharya.ac.in

³ Professor, Department of Medical Surgical Nursing,
Smt.Nagarathnamma College of Nursing,
Rajeev Gandhi University of Health Sciences Bangalore, Karnataka,
India, Phone Number: 7483263022, Email: Sneha.reddy1976@gmail.com

⁴ Assistant Professor, Department of Medical Surgical Nursing,
Smt.Nagarathnamma College of Nursing,
Rajeev Gandhi University of Health Sciences, Bangalore, Karnataka,
India, Phone Number: 7204646708, Email: nirmala@acharya.ac.in

Abstract

Interdisciplinary communication and collaboration are crucial in the care of people with multiple long-term conditions (MLTCs) yet are often experienced as insufficient. Through the lens of complexity science, this study aims to explain how healthcare professionals (HCPs) adapt to emerging situations in the care of patients with MLTC by examining interdisciplinary communication and collaboration in the outpatient hospital setting. We used the constant comparative method to analyze

transcribed data from seven focus groups with twenty-one HCPs to generate a constructivist grounded theory of 'interdisciplinary communication and collaboration in the outpatient setting of the hospital for patients with multiple long-term conditions'. Our theory elucidates the various pathways of communication and collaboration. Why, when, and how team members choose to collaborate influences if and to what degree tailored care is achieved. There is great variability and unpredictability to this process due to internalized rules, such as beliefs on the appropriateness to deviate from guidelines, and the presence of an interprofessional identity. We identified organizational structures that influence the dynamics of the care team such as the availability of time and financial compensation for collaboration. As we strive for tailored care for patients with MLTC, our theory provides promising avenues for future endeavors.

Key words: Tailored care, interdisciplinary collaboration, interdisciplinary communication, Grounded theory, complexity science. Team work, Group participation, Integrated work, disciplinary work .

5.1 Introduction

An increasing number of people live with multiple long-term conditions (MLTCs), defined as two or more chronic conditions. Similar to most other European countries, it is estimated that 32% of the Dutch population lives with MLTCs. Prevalence increases with age, reaching 87% of people aged 75 years and older. Due to an aging population, the prevalence of multiple long-term conditions will continue to rise. It is widely recognized that patients living with MLTCs require tailored and integrated care, which extends beyond their concurrent diseases . Tailored care considers not only the biomedical domain but consists of an integrated biopsychosocial approach taking physical and cognitive functioning, psychosocial context, as well as personal goals, priorities, and preferences into account. However, because care systems and guidelines are mostly focused on distinct diseases, patients currently receive care from multiple healthcare professionals (HCPs) based on disease-specific

guidelines. This fragmentation of care often leads to polypharmacy and higher care utilization. In addition, living with MLTCs is associated with lower life expectancy, poorer quality of life, and adverse psychosocial and functional outcomes [1,10]. Numerous studies and guidelines describe, in broad terms, what tailored and integrated care for patients with MLTCs should entail, highlighting the integral role of interdisciplinary communication and collaboration. Interdisciplinary care has already become common practice for various single diseases (e.g., breast cancer) where it has resulted in improved quality of care and patient satisfaction. However, the current literature and guidelines provide limited insight into the processes of interdisciplinary communication and collaboration for patients with MLTCs, nor do they offer guidance on how to optimize it to meet this prerequisite for delivering high-quality, interdisciplinary, patient-centered care. To understand how interdisciplinary healthcare teams interact and collaborate, scholars have introduced complexity science, particularly complex adaptive systems (CASs), as a framework [17–21]. A CAS is “a collection of individual agents with freedom to act in ways that are not always totally predictable, and whose actions are interconnected so that one agent’s actions changes the context for other agents” [18]. As an open system, membership is subject to change and agents can be members of several systems at the same time [17–21].

5.2 Research Methodology

In the research study the researcher has used secondary data. The data has been collected from research papers, published materials, online websites, and survey reports published by various research organisations.

Design and Data Collection This descriptive qualitative study was based on constructivist grounded theory, a method used to explain the complexity of human interactions and social processes. The theories are generated from the context in which they will later be applied. In contrast to traditional grounded theory, constructivist grounded theory considers the researcher’s (theoretical) perspective as an integral role in the research process. Through grounded theory, it is possible to move beyond the mere descriptive level of qualitative data by theorizing about actions

and processes in a specific context, which aligns with the process-focused aim of our study. Data were collected using focus groups with physician specialists, physician assistants, and nurse practitioners involved in the care of patients with MLTC in the outpatient hospital setting. Focus groups help identify individual and shared ideas . To ensure the expressed ideas were firmly rooted in daily clinical practice, we organized each focus group around a recent, local case study of a patient with MLTC and invited all HCPs of the care team of that patient to participate in the focus group. The focus group setting provided the opportunity for participants to interact and speak with candor about the process of their interprofessional communication and collaboration. Participants were recruited through members of a national working group mandated by the National Society of Internists (NIV) to develop a guideline for coordinated care for patients with MLTC. Recruitment ran from October 2021 until June 2022. Working group members asked colleagues in their respective hospitals to provide case studies involving a patient with at least three chronic diseases and three HCPs in their outpatient care team. A minimum of three chronic diseases and three HCPs were chosen to ensure a sufficient level of complexity in communication and collaboration. For each case study, a treating HCP provided pseudonymized data on age, gender, number and type of chronic diseases and HCPs involved, number of hospitalizations, emergency room visits, and outpatient clinic visits in the previous year. Through purposive sampling, we selected patient case studies that involved a range of medical specialties from both secondary and tertiary referral centers. Through theoretical sampling after three focus groups, we also invited the primary care physician and/or nursing home elderly care physician. Focus groups were organized when at least three HCPs agreed to participate. When a participant could not attend the focus group after agreeing to participate, a separate interview was scheduled if possible. Demographic characteristics were collected for each participant (i.e., profession, gender, and age).

Data collection ceased when no further insights emerged from the data [28]. Focus groups were held from November 2021 to July 2022 with EG, UdR, and JdG, and lasted 1.5 h. Focus groups were held online

(Microsoft Teams or ZOOM) due to COVID-19 regulations. Attendees were instructed to find a comfortable, quiet room prior to logging on to prevent any distractions. All focus groups were led by an interviewer (EG) and supported by a note taker (UdR), both with a background in care for patients with MLTC. A senior researcher experienced in qualitative research and interdisciplinary organization of care (JdG) was present to observe, summarize, and ask follow-up questions. We started each focus group with an introduction of the case study by one of the participants. To help build rapport, we gave each attendee the opportunity to introduce themselves and how they were involved in the case study. Then we explored interdisciplinary communication J. Pers. Med. 2024, 14, 533 4 of 14 and collaboration in relation to the case study using a discussion guide .

5.3 Role of NIV

Participants were recruited through members of a national working group mandated by the National Society of Internists (NIV) to develop a guideline for coordinated care for patients with MLTC. Recruitment ran from October 2021 until June 2022. Working group members asked colleagues in their respective hospitals to provide case studies involving a patient with at least three chronic diseases and three HCPs in their outpatient care team. A minimum of three chronic diseases and three HCPs were chosen to ensure a sufficient level of complexity in communication and collaboration. For each case study, a treating HCP provided pseudonymized data on age, gender, number and type of chronic diseases and HCPs involved, number of hospitalizations, emergency room visits, and outpatient clinic visits in the previous year. Through purposive sampling, we selected patient case studies that involved a range of medical specialties from both secondary and tertiary referral centers. Through theoretical sampling after three focus groups, we also invited the primary care physician and/or nursing home elderly care physician. Focus groups were organized when at least three HCPs agreed to participate. When a participant could not attend the focus group after agreeing to participate, a separate interview was scheduled if possible. Demographic characteristics were collected for each participant .Focus groups were

held from November 2021 to July 2022 with EG, UdR, and JdG, and lasted 1.5 h. Focus groups were held online (Microsoft Teams or ZOOM) due to COVID-19 regulations. Attendees were instructed to find a comfortable, quiet room prior to logging on to prevent any distractions. All focus groups were led by an interviewer (EG) and supported by a note taker (UdR), both with a background in care for patients with MLTC. A senior researcher experienced in qualitative research and interdisciplinary organization of care (JdG) was present to observe, summarize, and ask follow-up questions. We started each focus group with an introduction of the case study by one of the participants. To help build rapport, we gave each attendee the opportunity to introduce themselves and how they were involved in the case study. Then we explored interdisciplinary communication and collaboration in relation to the case study using a discussion guide. All focus groups were audio-taped for transcription.

5.4 DATA ANALYSIS

We analyzed the data throughout the data collection process according to the constant comparative method. Following each focus group, all researchers present engaged in a brief discussion to establish findings that were similar across previous groups and findings that deserved consideration in upcoming sessions. All focus groups were transcribed verbatim by a team of research assistants. Transcriptions were checked by a researcher (EG) and subsequently approved by the participants of the respective focus group.

Data coding started after the first focus group was completed and was performed by two researchers (EG and UR). Open and axial coding were completed independently while making use of memos to conceptualize how codes relate. Discussion followed (EG and UR) to agree upon the core and sub-core categories. Both researchers analyzed the data once more using selective coding, focusing on the core and sub-core categories. This was not a linear process but involved constant comparison between data and the categories, actively looking for similarities and differences in the data. Next, two researchers (EG and UR) convened for multiple, extensive sessions to take the analysis to a higher level of abstraction by

investigating potential theoretical relationships between categories and concepts in the data. This collaboration led to the development of the final theory, as described below in ‘results’. This study was approved by the Medical Research Ethics Committee of the University Medical Center Groningen (nWMO 202100785). Written informed consent was obtained from all participants. Pseudonymized data were analyzed, and data are presented in this paper anonymously.

Our theory reveals the process of interdisciplinary communication and collaboration but does not predict how it will occur in a certain situation. The theory consists of three core components ‘the pathways of interdisciplinary communication and collaboration’, ‘internalized rules of HCPs’, and ‘organizational structures of influence’. The ‘pathways of interdisciplinary communication and collaboration’ are separated into five parts: ‘reason’, ‘timing’, ‘mode’, ‘outcome’, and ‘goal’. Interaction between these parts is highly dynamic and influenced by ‘internalized rules of HCPs’ and ‘organizational structures’.

5.5 Reasons for interdisciplinary communication and collaboration

The participants described situations in which they sought collaboration with their colleagues, which fall into four categories: ‘biomedical complexity’; ‘division of roles and tasks care team’; ‘goals, values and capabilities of the patient’; ‘signal patient or caregiver’. Commonly, participants sought collaboration for multiple reasons at once.

The first category, ‘biomedical complexity’, encompasses situations where HCPs are faced with a problem that falls outside of their own medical expertise, or where their own treatment or diagnostic decisions impact those of others. One participant explained that interdisciplinary communication allows them to *“call upon others to evaluate the situation too, because I can’t possibly know everything”*.

The second category, ‘the division of roles and tasks care team’, entails situations in which there is an unclear division of tasks and roles among HCPs. This often results in multiple HCPs attending to the same patient issue. Conversely, lack of communication may lead to issues not

being attended to at all because HCPs assume that this falls under someone else's responsibilities.

The third category, 'goals, values, and capabilities of the patient', refers to when HCPs aim to incorporate the individual patient's goals, values, and capabilities into the treatment plan. This category also includes discussions on advance care planning and whether the treatment plan is proportionate to its goal, considering the context of the patient. Participants expressed that to do the above well and consistently across disciplines, interdisciplinary communication and collaboration are essential. However, as one participant described, HCPs often make assumptions rather than communicate.

The fourth category, 'signal patient or caregiver', refers to instances where the patient or caregiver gives a direct or indirect signal that they experience fragmented care. A direct signal can be a patient who expresses that they received contradicting advice. An indirect signal may be fraught patient-doctor communication. One participant reflected on how she successfully organized a multidisciplinary team meeting for a patient who repeatedly reached out to her .

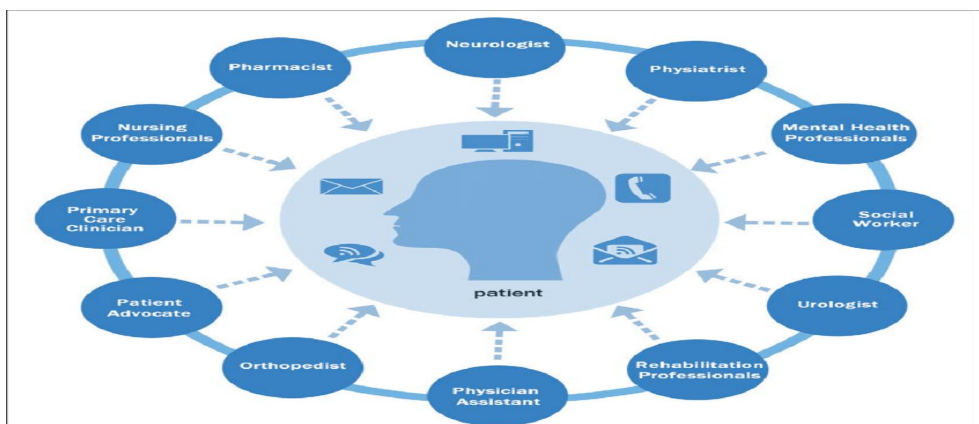


Figure 1: Roles in in interdisciplinary collaboration

Effective integration of PGHD into electronic health records (EHRs) can improve interdisciplinary collaboration among healthcare providers.

EHRs enable real-time sharing of patient information across different healthcare settings, facilitating better clinical decision-making and fostering a more integrated approach to patient care. However, challenges exist in integrating PGHD into clinical workflows, including issues related to data quality, interoperability, and the potential for increased clinician workload. Addressing these challenges requires developing standardized protocols and leveraging technological solutions to ensure seamless integration and effective use of PGHD in patient care.

Overall, the incorporation of PGHD into healthcare systems holds significant potential to enhance patient-centered care and improve outcomes through strengthened interdisciplinary collaboration.

5.5.1 Timing of interdisciplinary communication and collaboration

Interdisciplinary communication and collaboration are most often employed for problem-solving, with varying degrees of urgency depending on the timing of interdisciplinary communication and collaboration. As HCPs wait longer to communicate or collaborate, problems become bigger or more acute. Participants expressed that collaboration early in the care process allows HCPs to prevent negative outcomes of care. At the same time, participants expressed that the timing is often random and reactive. Mode of interdisciplinary communication and collaboration

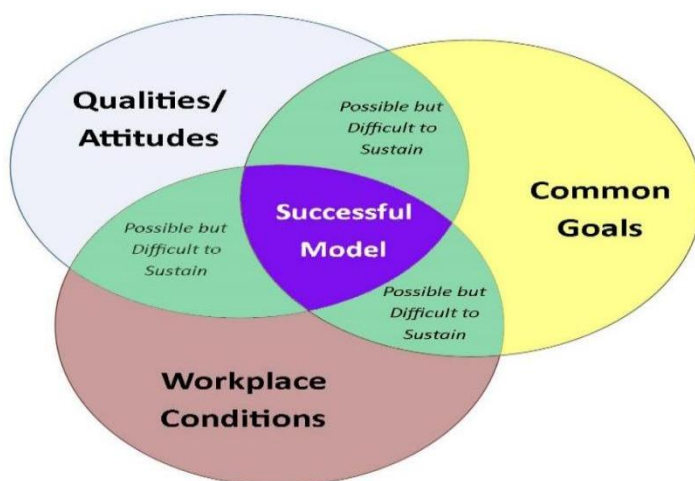


Figure 2 : Successful model in interdisciplinary collaboration

Effective interdisciplinary communication and collaboration are vital throughout the entire patient care process to ensure optimal outcomes. Engaging in collaborative efforts at the beginning, middle, and end of a treatment plan allows healthcare professionals to deliver timely and coordinated care, ultimately enhancing patient outcomes.

Structured interdisciplinary bedside rounds (SIBR) exemplify this approach by facilitating regular, scheduled interactions among healthcare team members. These rounds create a shared mental model, ensuring consistent and efficient communication, which is essential for effective collaboration.

To foster successful interdisciplinary collaboration, it's crucial to establish a culture of mutual respect and value for each professional's unique contributions. This foundation enhances teamwork and improves patient care. In summary, timely and continuous interdisciplinary communication—initiated at the onset of care and maintained throughout the patient's treatment journey—is key to delivering comprehensive and effective healthcare.

The participants described nine modes of communication and collaboration. There are four modes of indirect contact. First, 'letters' are written to update other HCPs, primarily those who work outside of the hospital. They simultaneously serve as comprehensive reports. Second, 'e-mails' are regularly exchanged when HCPs have a simple question. The advantages are their non-intrusive nature and minimal time investment. Disadvantages are that it is hard to keep track of unanswered e-mails and that not everyone replies promptly. Third, the 'electronic health record' is used to inform others by deliberately writing a more extensive report. Often-heard disadvantages were that these extensive reports can easily be overlooked, are difficult to find, and are limited to HCPs within the hospital. Fourth, HCPs make a 'referral' to colleagues when in need of their expertise or when they themselves experience too little time to take care of a problem outside of their usual tasks. Participants expressed that referrals are often utilized out of convenience because they require minimum effort. Participants conveyed that this behavior of is not desirable but happens frequently.

There are five modes of direct contact. First, participants expressed that they often consult a colleague haphazardly when they run into them, a mode we coined “coffee-machine consultation”. While this is experienced as convenient, the conclusions of these consultations are often not documented. Second, a ‘multidisciplinary team meeting’ is organized when it is deemed beneficial for more providers to speak to each other at the same time. A multidisciplinary team meeting for a patient with MLTC, with all involved HCPs, is not embedded in standard clinical practice. It can be organized ad hoc but this occurs rarely, because HCPs consider this time-consuming and logistically challenging. Third, a ‘video conference’ is sometimes organized instead of a multidisciplinary team meeting. This is considered especially convenient when HCPs from other organizations are invited to join. Fourth, ‘multidisciplinary consultations’ are standardized consultations where two professionals see patients together. For example, participants described oncologists and geriatricians holding clinic hours together. Fifth, ‘phone calls’ are made for relatively simple questions. Listed advantages are the minimal time investment and the possibility of an immediate answer. A disadvantage is that it is difficult to gauge when it is a convenient time to call.

5.5.2 Outcome of interdisciplinary communication and collaboration

Depending on the reason for -and chosen mode of- interdisciplinary communication and collaboration, participants described six outcomes that can be positively affected. However, when a reason for interdisciplinary communication and collaboration is present, but HCPs fail to act or choose an inappropriate mode, this can result in a lack of a positive impact or even a negative impact on these outcomes.

First, interdisciplinary communication and collaboration can provide clarity by making the ‘division of roles and tasks of the care team’ explicit. Participants described the importance of making deliberate choices concerning who should deliver which care and where it should take place:

Participants described finding it helpful to appoint someone within the care team as the coordinator of care. This coordinator is responsible for aligning care plans, communicating across all disciplines, and can serve as the point of contact for the patient. Second, proper

interdisciplinary communication and collaboration can improve ‘patient and caregiver satisfaction’ and ‘HCP satisfaction’. Participants expressed that patients and caregivers value it greatly when their HCPs are aware of each other’s treatment trajectories. An often-heard complaint is that HCPs give contradictory advice. Communicating as a team can be beneficial. Participants explained that proper interdisciplinary communication and collaboration can also lead to HCP satisfaction because the lack thereof is often experienced as frustrating.

Third, participants discussed that interdisciplinary communication and collaboration can aid in ‘incorporating patient goals, values, and capabilities’. Reflecting on the case studies, participants often expressed that, in hindsight, they would have liked to be aware of information concerning patient goals, values and capabilities that other health professionals had but they did not ask for:

In this situation, neglecting to involve the answers to these questions in the patients’ care plan led to multiple, highly acute readmissions and unsafe circumstances at home without the needed support.

In addition, participants described ‘less avoidable care’ as a positive outcome. Participants were adamant that proper interdisciplinary communication and collaboration would lead to less avoidable and unnecessary care. Examples given were stopping medication or treatments earlier, avoiding protocolized care that does more harm than good and reducing the number of referrals. Participants also described how aligning care plans can prevent negative effects of drug and treatment interactions, such as emergency room visits or hospitalizations. Reflecting on the case studies, all participants described the provision of care that was considered unnecessary and avoidable due to a lack of interdisciplinary collaboration. For example, one surgeon described planning a surgery for a patient without being aware of comorbid dementia, for which the patient was receiving care in the same hospital.

5.5.3 Goal of interdisciplinary communication and collaboration

Participants described five internalized rules that influence whether they follow up on a reason that calls for interdisciplinary communication

and collaboration, which mode they employ, and, consequently, which outcomes they are likely to bring about. First, participants expressed varying degrees of ‘interprofessional identity’: some find it more important than others to collaborate and engage in collaboration more often. Some HCPs described that they are attached to delivering disease-specific care, that they will not entrust to others.

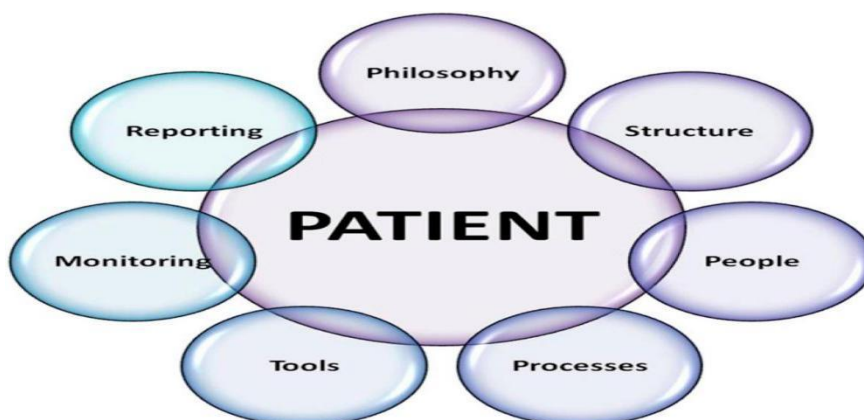


Figure 3 : patient centered approach roles involvement

Second, participants described that to reach outcomes such as “incorporating patient goals, values, and capabilities”, and “less avoidable care”, it is required to assess the patient in a holistic manner. Whether participants believed they had the ‘appropriate skills and time required to perform a holistic assessment’ varied. Some believe these skills are exclusive to a small number of specialists. Third, participants described that HCPs have varying levels of ‘willingness to claim a care coordinator role’. The likelihood of experiencing a sense of duty to claim a care coordinator role increases when HCPs have treated the patient for a long time and know them well.

5.5.4 Organizational structures of influence

The way HCPs respond to emerging problems and choose to collaborate is influenced by several factors that relate to the broader

healthcare system. Three factors were reiterated in all focus groups. First is the ‘financial compensation’, or lack thereof, for the different modes of communication and collaboration. For example, an HCP receives financial compensation for evaluating a patient that is formally referred to them, while engaging in an ad hoc multidisciplinary team meeting about the appropriate course of action is not compensated. A second factor is the extent to which HCPs have ‘flexibility in managing their daily schedules and time allocation’. For many, time is experienced as a scarce resource in their daily schedule and patient consultations are often limited to ten minutes. This limits HCPs greatly to what degree they can go beyond the minimal required effort in patient care. Finally, the ‘electronic health record’ is perceived as a barrier to interdisciplinary communication and collaboration because of the poor integration of patient information from other systems and the (un)findability of data. At the same time, HCPs see great potential in electronic health systems supporting them in collaborating across disciplines and hope that technological innovation will realize this.



Figure 4. Organizational structural influence

Discussion

Our study illustrates that HCPs in the outpatient setting of the hospital behave as a CAS in the care for patients with MLTC. To achieve tailored care, they often need to adapt to emerging situations through interdisciplinary communication and collaboration. We offer a theory of this adaptation process that covers the reasons that can catalyze an

adaptive response (i.e., problems within the zone of complexity), its different approaches and outcomes. The adaptive response is shown to be non-linear and unpredictable, and its outcome variable. Moreover, there are numerous internalized rules at play that influence HCP behavior. Finally, we identify limitations to the self-organizing abilities of the system due to the environment in which it operates. Our study adds to the current body of literature that explores interdisciplinary healthcare teams as a CAS and is the first to apply this to care teams of patients with MLTC in the hospital.

Compared to other interdisciplinary teams that have been studied as CAS in the literature, there are a few elements that are distinct to the interdisciplinary team for patients with MLTC. Until now, CAS research primarily focused on interdisciplinary teams in nursing homes or primary care, which exhibit high levels of stability as they work on common ground towards objectives that are often shared. Contrarily, for patients with MLTC, HCPs join and leave care teams continuously depending on patients' comorbidities and developments in health status. HCPs can therefore be members of a multitude of differently composed interdisciplinary teams. Moreover, HCPs often work towards their own condition-specific goals, which are not shared across all members. Membership fluidity can be problematic to collaboration because it is known to reduce the feeling of belonging to a team, and can diminish trust in other team members to effectively complete the task

Another element distinct to care teams for patients with MLTC is that there is no set moment for collaboration. Thus, this is heavily dependent on opportunities created by members of the care team and the way in which they do so. Our theory describes nine modes of communication that members employ to create such opportunities. Due to the non-linear nature of the system, it is impossible to assert that mode X leads to outcome Y. However, it needs to be underlined that not all forms of communication lead to true collaboration when they are used as an exclusive approach. For example, merely referring patients from one HCP to the next, does not sustain collaborative teamwork and is unlikely to contribute towards tailored care. Research by Dukewits and Gowan,

described the presence of a collaborative culture, fostered by activities such as conducting effective team meetings and reflecting on team performance, to be essential to successful collaborative teams . As shown in other clinical settings, just because people are members of the same team, does not mean that they behave as such Our study shows that the fluidity of the care team, in combination with the lack of a set moment for collaboration (i.e., regular team meetings) is likely to diminish team identity and collaborative behavior.

To enhance credibility and conformability, two independent researchers with experience in care for patients with MLTC performed the analysis. In case of no consensus, a third researcher with extensive experience in research on patients with MLTC (JdG) was consulted To ensure dependability, several experts working in the multimorbidity field performed skeptical peer review (JdG, AvH, and BvM) .Finally, to strengthen credibility, we performed member checking by presenting the results to the mandated national working group including a representative of the Dutch Patient Federation . All data were analyzed in Atlas.ti version.We report our findings in accordance with the Standards for Reporting Qualitative Research We identified six internalized rules that influence if, and to what degree, an HCP engages in interdisciplinary collaboration. Some of these internalized rules seem more pivotal to obtaining the goal of tailored care, such as ‘interprofessional identity’. The literature on interprofessional identity describes how a diminished team identity and team performance, as seen in highly fluid interdisciplinary teams, can be overcome when individuals identify themselves with a larger group of various professions . A strong interprofessional identity has a positive effect on interprofessional collaboration . A survey among HCPs in the Netherlands showed that, overall, the interprofessional identity of the different specialties is strong but the individual differences within groups are significant . These individual differences contribute to the variability of the degree of collaboration that we describe in our theory.

‘Beliefs on the appropriateness to deviate from guidelines or standard practice’ is another key internalized rule in realizing tailored care. The

literature shows that following disease-specific guidelines may be inappropriate, as these guidelines frequently do not apply to patients with MLTC, may be mutually incompatible, and may result in an increased treatment burden . However, we found that not all HCPs are comfortable to deviate from guidelines or standard practice. This is in line with a study by Brown et al., which identified medicolegal vulnerability as a barrier for primary care physicians to deliver personalized care to older patients with MLTC. This calls for a discussion and improved comprehension of the intricate challenges in providing care for patients with MLTC within the medicolegal domain.

Our theory also uncovers starting points to improve interdisciplinary communication and collaboration for patients with MLTC. The outcomes and goals we present in our theory show that HCPs believe that interdisciplinary communication and collaboration can lead to improved care for patients with MLTC, as described in guidelines and consensus documents. At the same time, a key conclusion from our study is that whether the CAS adapts to emerging situations in such a way that the outcomes and goals are achieved, is highly unpredictable and dependent on members of the CAS, and their interrelationships and connections. Given that care teams for patients with MLTC behave as a CAS, it is important to accept that adaptive responses will never be linear and predictable. However, provided that tailored care is greatly beneficial to the patient, we should strive to consistently achieve this for patients with MLTC and thus reduce the variability in patient healthcare experiences.

Solutions in healthcare tend to be top-down and linear: implementing care pathways, defining roles and responsibilities, standardizing consultations, etc. Although these solutions have their own merits, we should also explore innovative solutions that foster collaborative care because interdisciplinary teams in the care for patients with MLTC behave as a CAS. When we recognize that the connectivity between members of a CAS is more important than the members themselves, it becomes clear that future efforts should focus on lifting barriers that halt this connectivity and on promoting behaviors that facilitate it. The internalized rules and structures of influence identified in our theory,

provide anchor points for innovative endeavors. For example, medical curricula should cultivate a stronger interprofessional identity and focus on enabling HCPs to recognize which problems lie in the zone of complexity that ask for a different response than merely following guidelines and protocols. Secondly, providing time and financial compensation for efforts that promote tailored care will create the freedom for a CAS to self-organize and adapt to problems in an effective manner. Third, efforts to enhance information mobility and technological innovations for electronic health records could play an important role in facilitating tailored care. Another direction of interest is to take a closer look at patterns that emerge in a CAS. While CASs are intrinsically unpredictable, it is possible to draw conclusions from overall patterns that emerge. For example, in the case studies discussed, one patient had 64 phone calls or visits to the outpatient clinic in the past year. While it is impossible to predict the timing or reason of the next consultation, it is evident that unless the system adapts, this patient will appear very regularly. Activating HCPs to look for these patterns could trigger adaptive responses where necessary. Providing evidence through future research endeavors to support that strengthening interdisciplinary communication and collaboration will reduce care utilization, alleviate treatment burden, and improve patient care experiences, would help in creating consensus amongst HCPs regarding the approach to care and expected outcomes.

An important limitation of our study is that although we aimed to apply purposive and theoretical sampling, we were limited to participants that volunteered to partake. The primary care physicians of the patients discussed in the focus groups, for example, were invited after three focus groups but were unable to join. Therefore, our performed sampling methods closely resembled convenience sampling, potentially leading to selection bias. It did however provide valuable insight because the difficulties we experienced in organizing a focus group study with all HCPs involved in the care for patients with MLTC are likely to resemble the difficulty of organizing an ad hoc multidisciplinary team meeting. We experienced the enthusiasm of most HCPs to engage in the group

discussion concerning this topic, but also the restraints of time and lack of flexibility in their schedule. Furthermore, our findings should be interpreted in the context from which our grounded theory emerged: secondary and tertiary hospitals in The Netherlands. The unique characteristics of our healthcare system, working environment, and culture may limit the broader generalizability to other healthcare systems or cultural contexts. At the same time, most Western healthcare systems face similar challenges concerning the fragmentation of care, so valuable insights can still be drawn from our findings while taking context into consideration.

Conclusion

Interdisciplinary care teams in the outpatient setting of the hospital operate as a CAS in the care for patients with MLTC. Our theory elucidates the different pathways of communication and collaboration that exist in the care of patients with MLTC. Why, when, and how team members choose to communicate and collaborate influences if and to what degree tailored care is achieved. Currently, there is great variability and unpredictability in this process due to internalized rules and organizational structures. As we strive for tailored care for patients with MLTC, our theory provides promising avenues for future endeavors to optimize interdisciplinary communication and collaboration that take the principles of a CAS, such as non-linearity and self-organization.

References

1. Petri, L. (2010). Concept analysis of interdisciplinary collaboration. *Nursing Forum*, 45(2), 73–82. <https://doi.org/10.1111/j.1744-6198.2010.00167.x> [Wiley Online Library](#)
2. Witt Sherman, D., Flowers, M., Rodriguez Alfano, A., Alfonso, F., De Los Santos, M., Evans, H., Gonzalez, A., Hannan, J., Harris, N., Munecas, T., Rodriguez, A., Simon, S., & Walsh, S. (2020). An integrative review of interprofessional collaboration in health care: Building the case for university support and resources and faculty engagement. *Healthcare*, 8(4), 418. <https://doi.org/10.3390/healthcare8040418> [MDPI](#)

3. Sangaleti, C., Schveitzer, M. C., Peduzzi, M., Zoboli, E. L. C. P., & Soares, C. B. (2017). Experiences and shared meaning of teamwork and interprofessional collaboration among health care professionals in primary health care settings: A systematic review. *JBIR Database of Systematic Reviews and Implementation Reports*, 15(11), 2723–2788. <https://doi.org/10.11124/JBIRIR-2016-003016> PubMed
4. Reeves, S., Pelone, F., Harrison, R., Goldman, J., & Zwarenstein, M. (2017). Interprofessional collaboration to improve professional practice and healthcare outcomes. *Cochrane Database of Systematic Reviews*, 6, CD000072. <https://doi.org/10.1002/14651858.CD000072.pub3> PubMed
5. Coulter, A., & Ellins, J. (2007). Effectiveness of strategies for informing, educating, and involving patients. *BMJ*, 335(7609), 24–27. <https://doi.org/10.1136/bmj.39246.581169.80>
6. Carman, K. L., Dardess, P., Maurer, M., Sofaer, S., Adams, K., Bechtel, C., & Sweeney, J. (2013). Patient and family engagement: A framework for understanding the elements and developing interventions and policies. *Health Affairs*, 32(2), 223–231. <https://doi.org/10.1377/hlthaff.2012.1133>
7. Abbasgholizadeh-Rahimi, S. , Granikov, V. , & Pluye, P. (2020). Current works and future directions on application of machine learning in primary care. In Proceedings of the 11th Augmented Human International Conference (pp. 1–2). [Google Scholar]
8. American Psychological Association. (2020). *Publication manual of the American Psychological Association* (7th ed.). Washington, DC: Author.
9. Cochran School of Nursing. (n.d.). *APA style guide for nursing assignments*. Retrieved March 28, 2025, from <https://cochranschoolofnursing.us/wp-content/uploads/2021/06/APA-Style-Guide-for-Nursing-Assignments-Copy.pdf> Cochran School of Nursing -+1Cochran School of Nursing -+1
10. Walsh University. (n.d.). How do I cite a medical or patient record in APA? Retrieved March 28, 2025, from

<https://libanswers.walsh.edu/faq/273731> Walsh University
LibAnswers

11. Purdue Online Writing Lab. (n.d.). *APA formatting and style guide (7th edition)*. Retrieved March 28, 2025, from https://owl.purdue.edu/owl/research_and_citation/apa_style/apa_formatting_and_style_guide/index.html Purdue OWL Benjamin, R. (2019). Race after technology: Abolitionist tools for the new Jim code. *Social Forces*, 98(4), 1–3. [Google Scholar]
12. Brennan, P. F. , & Bakken, S. (2015). Nursing needs big data and big data needs nursing. *Journal of Nursing Scholarship*, 47(5), 477–484. 10.1111/jnu.12159.
13. Cato, K. D., McGrow, K., & Rossetti, S. C. (2020). Transforming clinical data into wisdom: Artificial intelligence implications for nurse leaders. *Nursing Management*, 51(11), 24–30. <https://doi.org/10.1097/nnn.0000000000000855>
14. Clancy, T. R. (2020). Artificial intelligence and nursing: The future is now. *Journal of Nursing Administration*, 50(3), 125–127. <https://doi.org/10.1097/nnn.0000000000000855>
15. Colduvell-Gaines, K. (2019). Nurses rank most honest profession 17 years in a row. *Nurse.org*. Retrieved from <https://nurse.org/articles/nursing-ranked-most-honest-profession>
16. Nagree, Y., Cameron, P., Gosbell, A., & Mountain, D. (2012). Telephone triage is not the answer to ED overcrowding. *Emergency Medicine Australasia*, 24, 123–126. <https://doi.org/10.1111/j.1742-6723.2012.01547.x>
17. McCullough, P. A., Eidt, J., Rangaswami, J., et al. (2020). Urgent need for individual mobile phone and institutional reporting of at-home, hospitalized, and intensive care unit cases of SARS-CoV-2 (COVID-19) infection. *Reviews in Cardiovascular Medicine*, 21(1), 1–7. <https://doi.org/10.31083/j.rcm.2020.01.42>
18. Grange, E. S., Neil, E. J., Stoffel, M., et al. (2020). Responding to COVID-19: The UW medicine information technology services experience. *Applied Clinical Informatics*, 11(2), 265–275. <https://doi.org/10.1055/s-0040-1709715>