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# Contents of Informational and Management Continuity of Care

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**Abstract**

*Continuity of patient care (COC) is considered an essential feature of good quality care, but the ambiguity of the concept has given rise to methodological challenges in scientific studies. This study has a strong link to the functional definitions of electronic health records (EHR). In order to evaluate how COC is achieved, through a discharge summary, for example, the contents of COC should be defined. Conceptual consensus on COC as a multidimensional concept has increased. This study was conducted to provide an overview of the dimensions and descriptions of informational and management continuity of care. A scoping review was conducted. We found that informational continuity of care refers to data tool, data content, data structures or information quality related processes. Management continuity of care refers to information flow, co-operation, co-ordination, multiprofessionality or management processes. We identified the need to define next the contents of relational and cross-border continuities.*

***Keywords:***

Continuity of Patient Care, Electronic Health Records, Patient Discharge Summaries (MeSH)

## Introduction

Continuity of patient care (COC) is considered an essential feature of good quality care, but the ambiguity of the concept has given rise to methodological challenges in scientific studies. COC is more often default than defined. [1] This study has a strong link to the functional definitions of electronic health records (EHR). Unless COC is clearly defined, it can not be measured [1; 2], achieved [3], or continuity-promoting methods [4] such as shared and synchronized EHRs can not be developed [5].

Continuity of care is a global priority for reorienting health services to the needs of people [5]. Through COC, the reduction in the risk of re-hospitalization is significant both for individual patients and in terms of the effectiveness of the service system [6; 7]. COC is associated with information flow, collaboration [2], patient safety issues [8], improved care results [9] and reduced costs [10].

Surprisingly, COC is a broad concept that has been loosely defined and used without a stable or clear aim [2]. This, in turn, leads to challenges when it comes to identification of effective methods for improving COC [4]. Originally identified in Canada [1], the classification into relational (also called inter-personal), informational and management continuity of care has been quoted a great deal [e.g. 2; 5; 11; 12; 13; 14; 15]. Conceptual consensus on COC as a multidimensional concept has increased, but only single standardized measures exist [13]. Different measures are needed to measure different dimensions of COC [2]. The vagueness of the methods of measuring COC makes it difficult to compare studies [9].

Electronic nursing discharge summary (ENDS) is a data tool that is supposed to comprise shared use of information to help maintain patient continuity and safety, collaboration between professionals, and thus provide good care results [15]. In order to evaluate how COC is achieved when using ENDS, the concept of COC needs to be defined. It is obvious that there is a need to determine explicitly what informational and management continuity of care mean. The purpose of this paper is to provide an overview of the dimensions and descriptions of informational and management continuity of care based on previous studies. The research questions are: (1) What are the dimensions and the descriptions of informational continuity and (2) What are the dimensions and descriptions of management continuity. The aim is to present the contents of informational and management continuity of care.

## Methods

A scoping review, which is a systematic approach for synthesizing research evidence, was conducted in 2016 (Figure 1). Searches were updated in 2017–2018. The scoping review was used to investigate the scope, nature and gaps in the COC research and literature and to identify and present relationships between concepts [16].

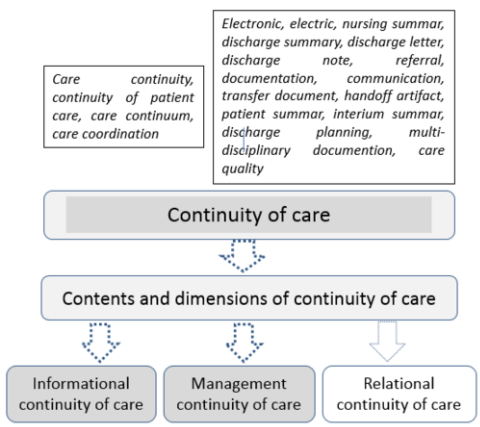


*Figure 1. Search Areas and Search Terms for Databases and Search Services*

*Table 1. The Dimensions and Descriptions of Informational Continuity of Care*

| Data tool | Data content | Data structures | Information quality |
|---|---|---|---|
| Paper[18, 19] | Administrative data[32] | Standards-compliant interoperability[30, 31, 32] | Spelling and grammar[18] |
| Telephone[18] | Demographic data[32] | Structural change of information[15, 30, 31, 34, 36, 37] | Sufficiency of information[18] |
| Mail and e-mail[6, 20] | Clinical data[32] | Need for structuring[20, 36] | Correctness of information[30] |
| Fax[6, 20] | Medication data[13, 20, 24, 26] | The benefits of structuring[20, 37] | Patient-oriented approach[18, 33] |
| Dictation[20] | Basic patient knowledge[19, 20] | Challenging structuring[15] | |
| Video[21] | Identification of provider[19, 20] | Lack of structuring[36] | |
| Electronic summary[20, 22] | Incomplete recording of investigation results[6, 20] | | |
| Automatic summary[23, 24] | Need for care[33] | | |
| The patient carries a summary[20] | Goals for care[33] | | |
| Telecommunications[25] | Nursing interventions[33] | | |
| E-message system[26] | Care outcomes[33] | | |
| Regional eHealth network[27, 28] | Multiprofessional information content[15] | | |
| Regional information system[20, 29] | Patient summary[34, 35] | | |
| National patient records archive[30, 31] | | | |

Systematic searches were made in relevant databases (PubMed, Cochrane, Science Direct and CINAHL Complete) and search services (Google and Google Scholar) without search restrictions and with 2018 as start time limit. The data search was supplemented by a manual search to ensure comprehensive retrieval of information. The search terms were used alone and in combination (Figure 1). The abstracts of retrieved references were studied. The scoping review was not limited to particular countries, but only included literature published in Finnish or English.

When it was found that conceptual clarity of COC had been sought in multidimensional models, in particular the continuity of care trilogy [1; 5; 11; 13], searches were targeted at literature on the informational and management dimensions of COC. The aim was to refine the contents of COC and continue with the definition of the concepts. The literature was tabulated by author, publication year, country, purpose, material acquisition method, target group, time and key results. Detailed tables are available online at http://epublications.uef.fi/pub/urn_isbn_978-952-61-2707-1/ [15].

Inclusion criteria were articles about dimensions and descriptions of informational and management continuity of care during the patient transfer process. Peer-reviewed studies as well as expert articles and reports were included to ensure a meaningful and comprehensive review of the literature. The exclusion criteria were unpublished manuscripts (abstracts) and articles on the relational continuity of care, because this study focuses on the professional perspective.

The material was analyzed thematically [17]. After compilation and encoding, the material was compared and the dimensions of informational and management COC (e.g. data tool) and their descriptions (e.g., paper or emails) were searched and synthesized.

## Results

### What are dimensions and descriptions of informational continuity of care?

Table 1 shows the *dimensions and descriptions of informational continuity* of care based on the choices made by the researcher in the literature. The dimensions are data tool, data content, data structures and data quality.

There are many types of data tools. Information is forwarded on paper [e.g. 18; 19], by phone [e.g. 18], mail, e-mail or fax [6; 20]. Information is generated by dictation [20] and using video [21]. Electronic summaries are used for information sharing between organizations [20; 22] and the automatic composition of the data stored in EHR is sought [23; 24]. Summaries can be conveyed by the patient [20] or e.g. by means of telecommunication [25]. The common infrastructure between hospital and primary health care is sought from the e-message system [26], regional eHealth network [27; 28], regional information system [20; 29] and national patient records archive [30; 31].

Data content of the discharge summaries consisted of administrative, demographic and clinical data [32] and was found to be inadequate in medication [13; 20; 24; 26], basic patient knowledge, identification of the provider [19; 20] and investigation results [6; 20]. Information was insufficient regarding care needs, goals, nursing interventions and outcomes [33]. The discharge summaries written by doctors and nurses were professional-specific and partly overlapping [15]. One solution could be a patient summary [34; 35]

Structuring of information requires standards-compliant interoperability [32] and was studied from the perspective of its need [20; 36], benefits [20; 37], challenges [15] and deficiencies [33].

Description of the quality of the information refers to spelling and grammar, sufficiency [16], correctness of information [28] and patient-oriented approach [16; 30].

### What are the dimensions and descriptions of management continuity of care?

Table 2 presents the *dimensions and descriptions of management continuity* of care based on the choices made by the researcher in literature. The dimensions are information flow, co-operation, co-ordination, multiprofessionality and management.

*Table 2. The Dimensions and Descriptions of Management Continuity of Care*

| Information flow | Co-operation | Co-ordination | Multiprofessionality | Management |
|---|---|---|---|---|
| Health IT[14] | Partnership[13] | Coordinator role[13, 14] | Multiprofessional documenting[38] | Resourcing and organization[39] |
| Timeliness[8, 20, 22] | Networks[14] | Care plan[11, 13, 38] | Multiprofessional discharge planning[41] | Encouragement and support[37] |
| Information gap[13] | Inadequate cooperation[30] | Follow-up care plan[6, 20, 33] | Multiprofessional cooperation[42] | Politics and decision-making[43] |
| Reliability [10, 28, 30, 38] | Work practices[27] | Care, service and patient management plan[11] | Multiprofessional information exchange[42] | Knowledge management[44] |
| | Confidence[39] | Advance care plan[40] | Role clarity[13] | Financial aspects[14] |
| | Communication[12] | Discharge summary[14, 38] | Confidence in team[13] | |
| | Understanding other's work[38, 39] | Nursing discharge summary[14, 15, 29] | | |
| | | Multiprofessional summary[24, 36] | | |

The information flow was studied in terms of health IT [14] timeliness [8; 20; 22], information gap [13] and reliability. Reliability was analyzed with regard to access to patient information [38], the confidentiality and security of electronic data [10], sensitive data [28] and privacy risks [30].

Co-operation was looked at in terms of partnership [13], networks [14], inadequate cooperation [30], work practices [27], confidence [13; 39], communication [12] and understanding other's work [38; 39].

Co-ordination descriptions are coordinator role [13; 14] and different care plans, such as care plan [11; 13; 38], follow-up care plan [6; 20; 33], care, service and patient management plan [11] and advance care plan [40]. Different summaries include discharge summary [14; 38], nursing discharge summary [14; 15; 29] and multiprofessional summary [24; 36].

Multiprofessionality was described in the field of documenting [38], but also in terms of multiprofessional discharge planning [41], cooperation, information exchange [42], role clarity and confidence in team [13].

Management in relation to continuity of care was studied resourcing and organizing [39], encouragement and support [37], policy and decision-making [43], knowledge management [44] and financial aspects [14].

## Discussion

The purpose of this study was to provide an overview of the dimensions and descriptions of informational and management continuity of care. This study was carried out because we think that the previously published and much cited continuity typology, i.e. information, management and relational continuity [1; 11; 13; 14], do not give a sufficient picture of the dimensions and descriptions of informational and management continuity. The pressure on data interoperability [30; 31; 32] and care integration has increased [3] since the publication of the continuity typology. This study thus supplements the continuity trilogy [1; 11; 13; 14] in terms of the contents of informational and management continuity of care.

*Informational continuity* (Table 1) has previously been defined as follows: "*The use of information on past events and personal circumstances to make current care appropriate for each individual"* [11]. In nursing literature, information transfer has been the most prominent of the content areas of COC [1]. Technology and different data tools play an important role in enabling informational continuity, and data tools provide access to information. Electronic information exchange between organizations is hampered by lack of interoperability and the fact that patient information systems do not "talk to each other" [42]. Traditional data tools are still in use. Exchange of information from hospital to home care takes place using paper [18] or fax [6; 20; 26], which are not secure data tools. In addition, many referrals from primary health care to specialized healthcare are still paper-based [19].

Informational continuity has been considered to comprise how well patients' health information follows them over time between different places of care and service providers [5; 11]. For years, a common infrastructure for facilitating information exchange between the hospital and the community has been sought from the regional information system [20; 29], eHealth network [27; 28], electronic message system [26], and the national patient records archive [30; 31]. If professionals have to use a number of separate data tools that are not part of the professional workflow they may not be used [27].

The data content of medical case summaries has seen a lot of development. Still, their contents are inadequate [6; 20]. However, there exist standards as to which data should be included in discharge summaries [32]. For the time being, discharge summaries are professional group-based and partly overlapping [35]. The solution could be a patient summary [31; 32] generated automatically from EHR [23; 24]. Getting an automatic summary of the data recorded in the IT system requires standards-compliant interoperability [30; 31; 32].

Descriptions of data structures are seen especially in articles from the 2010s. They have been studied e.g. in patient transfer and discharge situations [37] and nurses' handoffs [35].

Informational continuity is largely a combination of shared, synchronized care records and their accuracy [11]. From the point of view of the quality of the information, especially important are language, sufficiency [18] and correctness [30] of information, as well as the patient-oriented approach [18, 33].

*Management continuity* (Table 2) has previously been defined as follows: "*A consistent and coherent approach to the management of a health condition that is responsive to a patient's changing needs"* [11]. We found that management continuity of care is related to organization structures and care planning. It is emphasized when the patient moves across organizational boundaries and focuses, for example, on patient management plans [38; 40] and summaries [15; 29]. In Scandinavia and the USA, researchers studied information flow from hospital to home care and found that accurate and in-time information was difficult to achieve [8].

Partnership [13] and networks [14] are an important part of co-operation. From the technology point of view, work practices

involve the need to learn how to work with new data tools [27]. Unless technology supports work processes, commitment to the new data tools (e.g. discharge checklists) can be challenging and the desired benefits will be missed.

Co-ordination requires a coordinator [13; 14] and includes different care plans [6; 11; 13; 20; 33; 38; 40], summaries [14; 15; 24; 29; 36; 38] and workflows. For example, ENDS has promoted information flow, cooperation and getting a complete picture of the client [15]. In Finland, the Patient Data Repository is in use [31]. Today, many patients in need of social and health services can have a number of services, care, rehabilitation or other plans (Table 2).

Multiprofessionality in documenting has long been discussed [36]. Despite this, it still does not work very well [15; 33]. One solution could be role clarity and confidence in team [13].

We found a few references on management support [34] from the point of COC [14; 37; 39; 43; 44].

**Strengths and limitations**

Scoping review is best suited for examining complex and heterogeneous topics like continuity of care [16]. The reliability of this review was increased by the use of pre-defined inclusion and exclusion criteria and the utilization of methodical literature [16; 17].

An information technician checked the searches made [17]. Data retrieval was continued until references repeatedly recalled the same articles. The analysis proved to be the greatest challenge [see 17] and the reliability of the review may be slightly weakened by the fact that one researcher (AK) made the selection of articles.

**Recommendations for the future work**

Our findings are a starting point to expand on and provide further insight into the construct. We identified the need to define the contents of relational continuity, i.e., the relationship between the professional and patient and cross-border continuity, i.e., situations where the patient's care responsibilities change.

## Conclusions

We found that informational continuity of care refers to data tool, data content, data structures or information quality related processes. Management continuity of care refers to information flow, co-operation, co-ordination, multiprofessionality or management processes. Continuity of care is a concept that underlies many applications in eHealth and is thus one of the core constructs of biomedical and health informatics. Further work is still needed but the foundations are laid with this study.

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