

Breathe

Improving continuity of care of patients with respiratory disease at hospital discharge

Continuity of care refers to the delivery of coherent, logical and timely care to an individual. It is threatened during the transition of care at hospital discharge, which can contribute to worse patient outcomes. In a traditional acute care model, the roles of hospital and community healthcare providers do not overlap and this can be a barrier to continuity of care at hospital discharge. Furthermore, the transition from inpatient to outpatient care is associated with a transition from acute to chronic disease management and, in a busy hospital, attention to this can be crowded out by the pressures of providing acute care. This model is suboptimal for the large proportion of patients admitted to hospital with acute-on-chronic respiratory disease.

In a chronic care model, the healthcare system is designed to give adequate priority to care of chronic disease. Integrated care for the patient with respiratory disease fits the chronic care model and responds to the fragmentation of care in a traditional acute care model: providers integrate their respiratory services to provide continuous, holistic care tailored to individuals. This promotes greater continuity of care for individuals, and can improve patient outcomes both at hospital discharge and more widely.

Cite as: Dummer J, Stokes T. Improving continuity of care of patients with respiratory disease at hospital discharge. *Breathe* 2020; 16: 200161.

Educational aims

- To understand the concept of continuity of care and its effect at the transition between inpatient and outpatient care.
- To understand the difference between the acute and chronic models of healthcare.
- To understand the effect of integration of care on continuity of care for patients with respiratory disease and their health outcomes.

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The transition of care at hospital discharge is a time when continuity of care is threatened and this can contribute to adverse events. Increased integration of care by health providers at this time permits greater continuity of care and better outcomes. <https://bit.ly/3iElq0l>



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What is continuity of care?

Continuity of care in chronic disease management refers to the delivery of coherent, logical and timely care to an individual. It may relate to a discrete episode of care, such as a hospital admission, or ongoing continuing care such as occurs for patients seen in primary care and under hospital outpatient follow-up [1]. The term is distinct from other concepts, such as integration and coordination of care, which refer to the structure and function of relationships between healthcare providers at an organisational level and their administration: an individual patient experiences integration and coordination as continuity of care [1–3].

Three types of continuity of care have been described. Informational continuity is the use and transfer of information from one healthcare provider and/or healthcare event to another such that current care is appropriate for the individual. Management continuity is a consistent, coherent and responsive approach to the care of an individual by (sometimes multiple) healthcare providers. Relational continuity is an ongoing therapeutic relationship between an individual patient and one or more healthcare providers [1]. At the transition from inpatient to outpatient care, all three are relevant.

What does routine transition of care at hospital discharge look like?

While transitional care, *i.e.* the care that is delivered when moving from one healthcare setting to another, has received plenty of attention from researchers, the elements of effective transitional care remain uncertain. NAYLOR *et al.* [4] recently attempted to define the critical components of effective transitional care: patient engagement, caregiver engagement, complexity and medication management, patient education, caregiver education, patients' and caregivers' well-being, care continuity, and accountability. The transition from inpatient to outpatient care is recognised to be a time when continuity of care can be threatened and poor communication between hospital-based and primary care physicians can contribute to adverse events [5].

The most common form of communication at transition from inpatient to outpatient care is the discharge summary, in which the diagnosis, hospital management and post-discharge follow-up plans are documented. It is well recognised that deficiencies exist in the communication of information *via* the discharge summary and up to 20% of patients experience an adverse event in the 3 weeks following hospital discharge [6]. Problems include delay in its availability and lack of important information or errors regarding diagnostic testing, treatment,

provision of care equipment, referrals, discussions with the patient and family, and follow-up planning [5, 6]. Deficiencies in the discharge summary are also associated with harm to the patient and increased risk of rehospitalisation [6, 7]. Aside from these issues, the discharge summary is primarily a means of communicating information and thus provides some informational continuity of care; however, it provides limited management and relational continuity of care and does little to address many of the components of effective transitional care described by NAYLOR *et al.* [4].

In addition to the discharge summary, there are several other common elements of care that may play a role in facilitating the transition of care at hospital discharge. 1) The use of health information technology and an electronic patient record that is universally accessible to all healthcare providers can improve communication, reduce delays and reduce redundancy in diagnostic testing and history-taking. Conversely, health information systems restricted to primary or secondary care providers may reduce the sharing of information and create a barrier to the transition of care at hospital discharge [8]. 2) Formal medication reconciliation occurs in some healthcare settings and can reduce medication errors and adverse drug events at and following hospital discharge [9, 10]. The 20% of patients who suffer an adverse event after hospital discharge most commonly suffer an adverse drug event, and ~50% of all hospital medication errors occur at a transition of care [8, 11]. 3) A multidisciplinary approach to discharge planning facilitates appropriate assessment and provision of a patient's medical and social supports in the community: a functional multidisciplinary team that communicates well can result in reduced length of hospital stay and lower readmission rates [11, 12].

Continuity of care at the time of hospital discharge represents a persisting challenge. It is well recognised that the priorities of acute care frequently crowd out the less pressing need to bring chronic illness under good control and this has been described as “the tyranny of the urgent” [13]. The transition from inpatient to outpatient care is associated with a transition from acute to chronic disease management and, in a busy hospital, attention to this can be crowded out by the pressures of providing acute care [14].

Is there a problem with transition of care for patients with respiratory disease at hospital discharge?

Both quantitative and qualitative research has suggested that there are deficiencies in the transition of care for patients with respiratory disease at hospital discharge. Much of this work has related to the commonest cause for

respiratory admissions: acute exacerbation of COPD. Internationally, readmission rates are high for patients admitted with acute exacerbations of COPD. In the USA the 30-day readmission rate is high and static at 20%; while, in the UK it has been reported at 24% with approximately half of readmissions attributable to non-respiratory causes [15–18]. As might be expected, errors in the discharge summary are seen in respiratory cases just like cases of any other disease [19, 20]. At hospital discharge, patients with COPD are typically uncertain about their illness, care provision and prognosis, and they want better communication about their post-discharge care [21]. Further to these problems, patients with COPD commonly have multimorbidity (the presence of two or more chronic conditions) [15, 22, 23]. Patients with COPD and comorbidities describe the lack of a comprehensive and integrated approach to their illnesses at discharge [24]. Healthcare providers describe health system weaknesses that might account for the typical patient experience: a lack of communication (particularly between primary and secondary care providers), limited resources, and poor patient engagement with current care pathways [25].

Can improving continuity of care at hospital discharge improve patient outcomes?

Improving continuity of care at hospital discharge is often associated with an improvement in patient outcomes. In a systematic review of studies of interventions to improve patient handover at hospital discharge, HESSELINK *et al.* [26] found that 69% of the 36 studies reviewed showed a statistically significant effect in favour of the intervention. The large majority of the studies described multicomponent interventions and a wide range of outcome measures were used, so it was difficult to conclude which of the delivered interventions were effective. Broadly, there was some evidence of effect for interventions aimed at providing structured, reconciled discharge information, direct and prompt communication between healthcare providers, and coordinated follow-up care. The improved health outcomes included reduced hospitalisation, improved measures of continuity of care, and improved patient quality of life and satisfaction [26].

Specific improvements to the patient discharge summary that have been shown to improve health outcomes include: a structured format; checklists; electronic tools to aid completion and electronic discharge notifications; medication reconciliation; shared involvement in follow-up by hospital and community care providers; and guidelines to outline the key characteristics of a discharge summary [26, 27]. In recent years, national standards have

been introduced in some countries with the aim of improving and standardising the content of discharge summaries [28–30]. Such standards can improve the quality of communication at discharge, but audits have shown variable adherence to recommendations [31, 32].

Greater use of electronic health records (EHRs) has the potential to improve the transition of care at hospital discharge. Computer-enabled discharge summaries improve timeliness and patient/physician satisfaction, although reductions in hospital readmissions and deaths remain unproven [33, 34]. The benefits of EHRs may be limited, however, if data cannot be shared between primary and secondary healthcare providers, and it is frequently the case that the EHR systems of the two are incompatible. A potential solution is the use of health information exchanges, which allow the sharing of data even if EHR systems are incompatible. Adoption of health information exchanges has been shown to reduce duplication of tests and imaging and decrease readmissions [35].

As noted earlier, post-discharge adverse drug events are common and are therefore a target for improvement at transition of care. A recent meta-analysis showed that pharmacist-led inpatient medication reconciliation reduced post-discharge healthcare use: statistically significant reductions of 67%, 28%, and 19% were seen in hospitalisations secondary to adverse drug events, emergency department visits, and hospital readmissions, respectively [9]. While some uncertainty remains about which specific components of medication reconciliation are effective, the evidence supports a role for pharmacist-led interventions [9, 10, 36].

Communication and integration of the multidisciplinary team across primary and secondary care leads to improved outcomes at hospital discharge. Care coordination teams and specified discharge planners within those teams improve patient satisfaction and quality of life, while improved communication across teams can reduce readmission rates [12]. A recent meta-analysis showed that individualised discharge planning for medical patients, compared with routine discharge care, resulted in a 13% reduction in readmission rates [37].

Can improving continuity of care at hospital discharge improve outcomes for patients with respiratory disease?

Interventions to improve care at hospital discharge

The literature regarding interventions to improve the continuity of care for patients with respiratory

disease is dominated by studies of COPD, and the evidence for improved outcomes in this group is mixed. ABOUMATAR *et al.* [38] recently undertook a randomised controlled trial of a 3-month hospital-initiated intervention for patients recruited at hospitalisation due to COPD that comprised three components: 1) individualised self-management support (*e.g.* support to take medications correctly, recognise exacerbation symptoms and enact an action plan), 2) facilitated access to treatment services in the community and 3) transitional support aiming to ensure patients and their caregivers understood the post-discharge plan. 240 patients were divided evenly between intervention and usual care groups. In the 6 months after discharge, patients in the intervention group had a significantly increased mean number of acute COPD-related events compared with those in the usual care group (1.40 (95% CI 1.01–1.79) *versus* 0.72 (95% CI 0.45–0.97), $p=0.004$). The reasons for this unexpected finding were unclear, but the authors noted that the increase in acute COPD-related events was in the patients with a higher level of knowledge, skill and confidence in managing their disease at baseline and they postulated that these patients became more vigilant for symptoms of exacerbation and quicker to act upon them. An inability to gain access to their regular physicians within 24 h (as per their action plan) may have then led them to seek care more frequently from acute services [38].

Two randomised controlled trials of similar interventions, but with more promising results, were published in 2018 [39, 40]. The COPD Patient Management European Trial (COMET) investigated the effect of an intervention including self-management support, medical management, home telemonitoring and care coordination compared with usual care in 319 patients with severe COPD recruited as outpatients [39]. The primary outcome of all-cause hospitalisation days per year was not different between the intervention (mean \pm SD 17.4 \pm 35.4 days per year) and control groups (22.6 \pm 41.8 days per year), mean difference -5.3 (95% CI -13.7 to -3.1 , $p=0.16$). There were, however, significant reductions in the secondary outcomes of acute care hospitalisation days (mean difference -8.3 (95% CI -16.4 to 0.1 , $p=0.047$) and mortality (1.95% *versus* 14.2%, $p<0.001$) in the intervention group [39].

The Program of Integrated Care for Patients with Chronic Obstructive Pulmonary Disease and Multiple Comorbidities (PIC COPD⁺) trial investigated an intervention including health education, self-management support and home telemonitoring compared with usual care in 470 patients with COPD and at least two prognostically important associated comorbidities [40]. Participants were recruited both from hospital admissions and respiratory clinics. The primary outcome of emergency department visits at 1 year after randomisation was not different between the groups (RR 0.76 (95% CI 0.47–1.23,

$p=0.76$) but a significant reduction in mortality was again seen in the intervention group (8.9% *versus* 15.1%, HR 0.56 (95% CI 0.32–0.95, $p=0.03$)) [40].

A 2017 meta-analysis of earlier studies, by YANG *et al.* [41], showed that, based on evidence of moderate or above moderate quality, health education (RR 0.40 (95% CI 0.27–0.59)), telemonitoring (RR 0.78 (95% CI 0.58–0.88)) and comprehensive nursing interventions (mostly including self-management advice, health education and an exacerbation action plan in patients recruited as outpatients) (RR 0.70 (95% CI 0.63–0.78)) all reduced all-cause readmissions at 6–12 months when compared with usual care, while home visits did not (RR 0.92 (95% CI 0.82–1.04)). The meta-analysis did not show evidence for efficacy of any of the above interventions in improving quality of life or reducing mortality [41].

A discharge bundle is a simple intervention comprising components usually known to improve patient outcomes that can be applied before hospital discharge for acute COPD. A checklist of tasks might include, for example, checking inhaler technique, checking smoking status and offering help to quit, assessing suitability for and offering pulmonary rehabilitation. Discharge bundles are attractive in their simplicity and their aim of consistently delivering evidence-based care to patients as they transition from the hospital to the community setting. While the evidence for individual components of COPD discharge bundles is often well established, the implementation of a discharge bundle is associated only with modest improvement in outcomes. A systematic review of their effectiveness, compared with usual care, showed a reduction in hospital readmissions (RR 0.80 (95% CI 0.65–0.99)), while there was insufficient evidence to show any change in quality of life or mortality [42]. Consistent and ongoing adoption of a discharge bundle in a clinical setting can also be challenging and may limit its impact [43, 44].

To summarise, the effect of interventions to improve health outcomes on transition from the inpatient to outpatient setting in patients with COPD remains uncertain. Interventions comprising multiple and differing components and studies using a variety of outcomes do not lend themselves to easy comparison or synthesis. Furthermore, an emphasis on reduction of readmissions as a primary outcome may give an incomplete picture of the value of an intervention. There is little or no correlation between readmission rate and mortality, for example, and the reduction in mortality (as a secondary outcome) seen in the COMET and PIC COPD⁺ trials warrants further study [45, 46].

Relational continuity of care

Relational continuity of care is generally measured through recording longitudinal continuity of care: how often the patient sees the same healthcare

provider over time is seen as a proxy for the patient–healthcare professional relationship and there exist a range of measures to do this using administrative clinic data (*e.g.* Usual Provider Continuity (UPC) Index) [47]. Studies of longitudinal continuity of care using such measures have been more consistently encouraging in their findings. In a study that specifically addressed continuity of care following an initial COPD admission, SWANSON *et al.* [48] found that increased continuity of care after discharge was associated with reduced readmissions in the Norwegian and German health systems. Increases in three indices of continuity of care were associated with significant reductions in rates of 1-year readmission [48]. A number of other recent studies have shown a more general association between increased continuity of care and improved outcomes in patients with respiratory disease. These studies have examined the relationship between various indices of continuity of care and use of hospital care or all-cause mortality, and their results are consistent with the wider literature regarding chronic disease [49]. SVEREUS *et al.* [50] divided 20187 patients with COPD into quintiles according to an index of clinic-level continuity of care and compared those in the highest and lowest quintiles. The probability of any hospitalisation was increased in the lowest, compared with the highest, quintile (odds ratio 2.17 (95% CI 1.95–2.43)). KAO and WU [51] divided 3395 older adults with asthma into groups with high, moderate and low levels of continuity of care. The group of patients with low continuity of care had an increased risk of asthma-related emergency department visits compared with the high continuity of care group (adjusted HR 2.11 (95% CI 1.37–3.25)). Finally, CHO *et al.* [52] divided 3090 patients with COPD into those with high and low levels of continuity of care: the latter had a 22% increased risk of all-cause mortality (HR 1.22 (95% CI 1.09–1.36)).

Similarly, studies have shown an association between outpatient follow-up visits after hospital discharge for acute COPD (either with a respiratory physician or general practitioner) and a reduced risk of hospital readmission. A follow-up visit within 30 days of discharge has been associated with a significantly reduced risk of readmission at 30 days (HR 0.91 (95% CI 0.87–0.96)) and 90 days (RR 0.79 (95% CI 0.73–0.86)) [53, 54].

The chronic care model and integrated care: can we do better at transition from hospital care?

When considering a patient’s transition from hospital to the community after acute respiratory illness, it is important to place the acute episode of illness in the context of their ongoing chronic illness and comorbidities. It is important to demonstrate

whether an intervention comprising a number of components does or does not improve an outcome in a clinical trial, but to improve clinical care for an individual, an intervention such as self-management support is effectively an ongoing commitment that must be met by an appropriately designed healthcare service. From the patient’s perspective, we must place continuity of care at the discrete episode of transition of care into the broader context of ongoing continuity of care in the community.

BODENHEIMER *et al.* [13] described the chronic care model as a guide to overcome the “tyranny of the urgent”. Central to the model, patients are considered their own principal caregiver and the health system is designed around them to provide self-management support from a prepared, proactive healthcare team. Pivotal to effecting change, healthcare providers must have a structure, goals and values that prioritise chronic care. On this foundation, it is then possible to design a healthcare delivery system within which acute and chronic work streams are separated so that the former does not overwhelm the latter. Around the patient, hospital and community health and social care providers develop strong linkages and share information *via* coordinated clinical information systems to support the patient [13].

Integrated care for the patient with respiratory disease fits the chronic care model and can usefully be described as: “an organisational process of coordination that seeks to achieve seamless and continuous care, tailored to the patient’s needs, and based on a holistic view of the patient” [55]. Integrated care is a response to the fragmentation of healthcare provided to a patient by different providers at different times and places whose roles do not necessarily overlap in a traditional acute care model. Instead, the different providers integrate their services such that they are coordinated to achieve the objectives described above, the degree and nature of the integration varying according to the needs of the target patient population [56].

Within a health system providing integrated care, a hospital admission for an acute exacerbation of chronic respiratory disease not only precipitates acute management but is also a sentinel event that prompts a holistic review of a patient’s ongoing care. What does this care look like in practice?

In a recent study of integrated transitional care at hospital discharge for acute COPD, LIU *et al.* [57] developed a comprehensive intervention based on four domains: 1) home environment (*e.g.* income and sanitation), 2) psychosocial (*e.g.* spirituality and relationship with care-givers), 3) physiological (*e.g.* vision, oral health, respiratory function and urinary function) and 4) health-related behaviours (*e.g.* sleep, rehabilitation and medication use). The researchers worked with 13 local community health agencies to provide solutions to problems identified within each domain. In this study, there were significant improvements in patients’ quality

Self-evaluation questions

- 1 Types of continuity of care include:
 - a) Informational
 - b) Management
 - c) Relational
 - d) All of the above
- 2 Approximately 20% of patients suffer an adverse event after hospital discharge. The most common of these relates to which of the following factors?
 - a) Falls risk
 - b) Medication error
 - c) Hospital-acquired infection
 - d) Follow-up planning error
- 3 Which of the following are not key components of the chronic care model?
 - a) Segmentation, diagnostic accuracy, therapeutic reliability and disposition
 - b) Self-management support
 - c) Clinical information systems
 - d) Healthcare structure, goals and values that prioritise chronic care
- 4 The following effects of integrated care have been established except for:
 - a) Increased patient satisfaction
 - b) Perceived improvement in quality of care
 - c) Improved access to services
 - d) Reduced cost

of life in the intervention group compared with usual care group and there is also evidence that patients with respiratory disease experience greater integration of healthcare services as increased

continuity of care [57, 58]. Furthermore, integrated care for patients with COPD has been shown to reduce hospital admissions and hospital days per person [59]. These findings are consistent with the broader evidence for integrated care, which shows increased patient satisfaction, perceived quality of care and access to services, although evidence for other outcomes (including cost) has not been established [60].

Conclusions

The transition of care at hospital discharge remains a time when suboptimal continuity of care can contribute to adverse outcomes for patients with respiratory disease. Continuity of care at hospital discharge can be understood at the level of the patient encounter, where increased relational, informational and management continuity of care may result in improved patient outcomes. It can also be understood at the health system level, where reorientation from an acute to a chronic care model and increased integration of care reduces fragmentation of services and permits greater continuity of care for individual patients. While the evidence is not uniformly in favour of integrated respiratory care interventions at hospital discharge, which include multiple and varying components from one study to another, it is important to understand that there is often good evidence for the individual components themselves. We should therefore persist with our efforts to provide models of care that encourage comprehensive, holistic care and continuity of care both at hospital discharge and more widely.

Key points

- Continuity of care refers to the delivery of coherent, logical and timely care to an individual either during a discrete episode of care, such as a hospital admission, or during ongoing care such as occurs for patients seen in primary care and under hospital outpatient follow-up.
- The transition of care at hospital discharge is a time when continuity of care is threatened and this can contribute to adverse events.
- Increased integration of care reduces fragmentation of services offered by healthcare providers to patients with respiratory disease at hospital discharge, permits greater continuity of care for individuals, and can improve patient outcomes.

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Conflict of interest

None declared.

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Suggested answers

1. d.
2. b.
3. a, these are key components of the acute care model.
4. d.

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