

3Ci model of care

For health professionals caring for patients living with chronic heart failure and chronic obstructive pulmonary disease in NSW

MARCH 2023



AGENCY FOR
**CLINICAL
INNOVATION**

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The information is not a substitute for healthcare providers' professional judgement.

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Preferred citation: NSW Agency for Clinical Innovation. *3Ci model of care: For health professionals caring for patients living with chronic heart failure and chronic obstructive pulmonary disease in NSW*. Sydney: ACI; 2023.

SHPN (ACI) 210076

ISBN 978-1-76081-595-0

Version: V1; ACI_7027 [03/23]

Published: March 2023

Review date: March 2028

Cover image credit: [shutterstock.com](https://www.shutterstock.com)

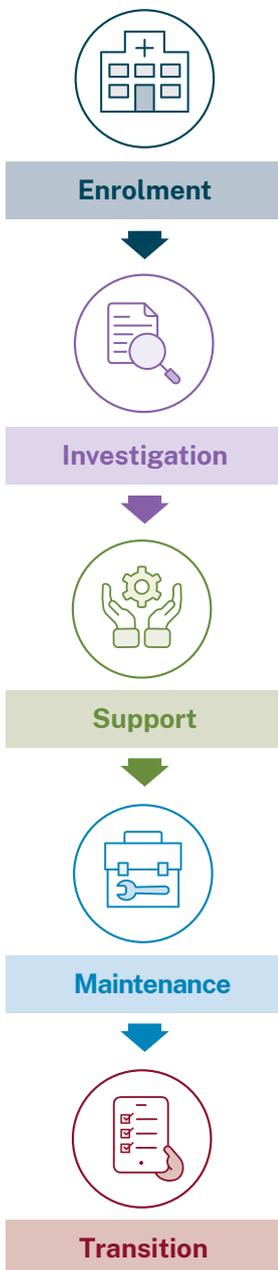
TRIM: ACI/D21/1262

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3Ci model of care – at a glance

The prevalence of chronic heart failure (CHF) and chronic obstructive pulmonary disease (COPD) is high in NSW. These conditions are a leading cause of potentially preventable hospitalisation. The 3Ci model of care aims to improve patient outcomes and reduce unnecessary hospitalisations.

Patient journey



The role of the 3Ci clinician

The 3Ci model of care principles, **C**are, **C**ollaboration, **C**linical intervention and **i**mproved health literacy, are applied across the patient journey through partnership between 3Ci expert clinicians, patients and their carers.



Local implementation of the 3Ci model of care should be tailored, considering locally established CHF and COPD care.

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Summary

Chronic heart failure and chronic obstructive pulmonary disease

Chronic heart failure (CHF) is a chronic, progressive condition with exacerbating features caused by structural or functional abnormalities of the heart. Chronic obstructive pulmonary disease (COPD) is a chronic, progressive condition with exacerbating features that limits airflow in the lungs. Both conditions often have a high incidence of multimorbidity. Consequently, CHF and COPD can be complex, disabling and negatively impact on quality of life.^{1,2} The prevalence of both conditions remains high in NSW, with CHF and COPD being two of the leading causes of potentially preventable hospitalisations.³

A value-based approach that improves health outcomes

The patient journey for CHF and COPD can be complex and fragmented. For a person living with CHF and/or COPD, their healthcare picture is like a puzzle, broken up into many pieces.

The 3Ci model of care (3Ci) uses a value-based approach to bring these pieces together in a structured and cohesive way to improve patient outcomes and the experience of receiving care. It provides support to improve and maintain the health literacy of patients to enable a strong partnership with their healthcare team.

In line with the focus of value-based healthcare, the result will be an improvement in:

- health outcomes that matter to patients with CHF and COPD
- the experience of receiving care
- the experience of providing care
- the effectiveness and efficiency of care.⁴

Developing the 3Ci model

The 3Ci model of care builds upon the CHF and COPD clinical initiatives of the NSW Health Leading Better Value Care (LBVC) program.⁵ With 3Ci, care is organised to meet the clinical priorities for CHF ([Appendix 1](#)) and COPD ([Appendix 2](#)). It spans the healthcare journey in a way that integrates elements of the LBVC organisational models for CHF ([Appendix 3](#)) and COPD ([Appendix 4](#)). It also supports the management of exacerbations and disease progression in the long term by addressing key gaps in these existing models. The components to address these gaps include:

- holistic assessment
- action planning and support for improving the social determinants of health
- leveraging virtual care where appropriate to safely connect health professionals with patients to deliver care when and where it is needed.

The 3Ci model brings together what has been learnt through the implementation of the LBVC initiatives to date, and brings these together to support more coordinated, person-centred care. Local health districts (LHDs), specialty health networks (SHNs), primary health networks (PHNs) and general practice can work in partnership with the 3Ci clinician(s) to support them to implement and achieve the aims of the LBVC program.

A principles-based model of care

The 3Ci is a principles-based organisational model of care. It is evidence-based, clinically led, patient-centred and value-driven. It aims to reduce the length and severity of exacerbations of both conditions, with a focus on care in the community where appropriate. This will translate into improved care and outcomes across the patient journey and may reduce potentially preventable hospitalisations in both patient cohorts.

3Ci is named after four key principles:

- **Care** – guideline-based care delivered in the context of patient needs and multimorbidity
- **Collaboration** – creating partnerships between patients living with CHF and COPD and their healthcare and supporting teams
- **Clinical intervention** – delivering or organising a rapid clinical intervention to de-escalate an exacerbation of CHF and COPD
- **Improving health literacy** – education and support to help patients living with CHF and COPD understand their disease and how to access the right care by the right people at the right time.

The 3Ci principles are applied across the care continuum by clinicians through the care delivery framework.

The 3Ci clinician(s)

3Ci offers a way for one or more dedicated LHD or SHN clinicians to facilitate guideline-based care for patients living with CHF or COPD. The 3Ci clinician(s) provides consultation, liaison and advice for all patients living with CHF and COPD. Patients who are assessed as having risk factors that are likely to lead to poor outcomes will be formally enrolled in 3Ci. For these patients, the 3Ci clinician(s) will support them to improve outcomes across their healthcare journey.

The 3Ci care continuum

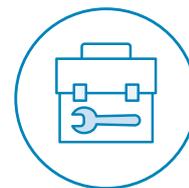
The 3Ci care continuum consists of five connected phases that span the entire healthcare journey of a patient living with CHF or COPD. This is representative of CHF and COPD as chronic progressive conditions with exacerbating features (with a high incidence of multimorbidity that impacts on complexity and outcomes). Patients may already be enrolled in, or may be referred to and from, other statewide programs, such as the Integrated Care Planned Care for Better Health and Collaborative Commissioning initiatives, based on the patient needs and local implementation. These complementary interventions provide care that is streamlined to support optimal patient outcomes.

The 3Ci care delivery framework

The 3Ci care delivery framework outlines the components of care that improve outcomes for patients living with CHF or COPD.

Each LHD and SHN across NSW is a unique healthcare environment with their own enablers and challenges to providing care for people with CHF and COPD. The 3Ci care delivery framework is designed for LHDs and SHNs to be able to adapt during implementation to suit their local context.

The **five phases** of the 3Ci continuum include:



The framework includes 12 care delivery components:

1. consultation, liaison and advice
2. acute inpatient in-reach during admission to hospital
3. virtual care
4. home visiting
5. partnerships with local GPs and general practice teams
6. CHF and COPD specialist input in care
7. multidisciplinary care
8. partnerships with heart failure rehabilitation and pulmonary rehabilitation services
9. action-planning and patient-centred care that can be adjusted in real time
10. care coordination and navigation
11. improving health literacy
12. routine data reporting and review.

Aligning value-based healthcare and 3Ci

The 3Ci model of care supports the management of people living with CHF and COPD across the continuum of care in acute and community settings.

It aligns with, and complements, several programs in NSW Health. At LHDs and SHNs, these partnerships will vary. All programs form part of the NSW Health approach to value-based healthcare.

Value Based Health Care (VBHC) program and 3Ci alignment

State program	Leading Better Value Care (LBVC)	Integrated Care	Collaborative Commissioning
Focus area	Identifying and scaling evidence-based initiatives statewide for specific conditions	Leading partnerships to deliver seamless care	Whole-of-system approach to incentivise local autonomy and accountability for delivering patient-centred, outcome focused care in the community
Target group(s)	13 groups including CHF and COPD	People with chronic disease	Variable depending on initiative
Timeframe	Variable depending on stage of initiatives	12-week care coordination	Variable depending on stage of initiatives
How 3Ci will align	CHF and COPD are two of the Tranche 1 LBVC initiatives. Early work for CHF and COPD as part of LBVC focused on care in the acute setting. 3Ci builds on this by broadening the scope to include care in the community.	Patients may already be enrolled in, or may be referred to and from, Integrated Care depending on the acuity of their condition and local service arrangements. As such, 3Ci will require strong partnerships with the Integrated Care team.	There are a number of projects in Collaborative Commissioning aimed at supporting people with CHF and COPD. 3Ci will partner with these programs to learn from their experience, facilitate alignment, and optimise patient experience and outcomes.

Introduction

Background

NSW Health, LHDs, SHNs, PHNs, general practitioners, Aboriginal Controlled Community Health Services (ACCHSs), and primary and community care organisations are committed to working in partnership in a system-wide approach to improve the health outcomes and experiences of care for people living with chronic heart failure (CHF) and chronic obstructive pulmonary disease (COPD).

The NSW Ministry of Health (the Ministry) and the Agency for Clinical Innovation (ACI) have identified an opportunity to build on the existing management approaches in acute and community settings. This collaborative work focuses on a statewide model of care called 3Ci that supports a more coordinated approach for people living with CHF or COPD, to keep them well in the community and out of hospital.

NSW Health is using a VBHC approach to develop and implement a number of statewide initiatives, including those addressing the needs of patients living with CHF and COPD. These programs focus on implementing different aspects of value-based healthcare including Leading Better Value Care, Integrated Care, Collaborative Commissioning and Commissioning for Better Value.

The 3Ci model sits within the LBVC program and provides a tailored approach to care based on strong partnerships between the patient, their carer and general practice teams. It facilitates a flexible and collaborative approach. It does this by recognising that patients may already be enrolled in, or may be referred to and from, other statewide programs, such as Integrated Care Planned Care for Better Health initiatives, depending on the acuity of their condition and local service arrangements. As such, 3Ci will require strong partnerships with these teams.

The 3Ci model of care builds on the key features outlined in the LBVC organisational models for CHF ([Appendix 3](#)) and COPD ([Appendix 4](#)).⁵ It aims to continue the approach of reducing unwarranted clinical variation by extending it from the inpatient setting to span the entire healthcare journey.

The whole model, or parts thereof, can be implemented depending on:

- existing local services to manage people living with CHF and COPD
- networking arrangements and identified gaps in service delivery.

Further to this, 3Ci addresses gaps to support improved patient outcomes across the healthcare journey, within an adaptable framework for delivering care. These include:

- holistic assessment to fully identify the potentially preventable causes of readmission
- support for improving the social determinants of health as key causes of preventable hospitalisations
- action-planning to enhance self-management
- patient and clinician partnerships that will support the completion of heart failure and pulmonary rehabilitation programs as key programs to enable improved outcomes
- improving health literacy as an essential overarching adjunct to improving outcomes
- incorporation of routine data reporting and review to embed quality improvement cycles.

The 3Ci model of care is informed by a comprehensive evidence report⁶ and the case for change report (unpublished). It has been developed in consultation with clinical experts and experienced service managers from the ACI cardiac and respiratory networks. Expert GPs have also been key members of this group.

The case for the 3Ci model of care

CHF and COPD were introduced as two of the eight initiatives for tranche one of the NSW LBVC program in 2016. Work initially focused on the acute inpatient setting to reduce potentially preventable hospitalisations and length of stay for these two conditions. The most recent Bureau of Health Information (BHI) report for readmissions for CHF and COPD demonstrates that both conditions have a high burden of disease across NSW. They remain two of the leading causes of readmission to hospital.³

One of the intended outcomes of the LBVC programs for CHF and COPD was to reduce unplanned admissions to hospital by reducing unwarranted clinical variation. Since the LBVC implementation in 2017-18, all cause re-admission rates at 28 days have remained stable for CHF and COPD from 2017-18 to 2019-20. For CHF this is an average of 16.6% and for COPD, 17.7%. The rate decreased for CHF to 14.8% and COPD to 16.7% in 2020-21 (noting this period was impacted by the COVID-19 pandemic).

In the cohort of patients who had CHF as a principal or additional diagnosis, and prior to COVID-19, 28-day all causes re-admission rates were 16.6% while for patients with COPD as a principal or additional diagnosis, re-admission rates were 18%. Service utilisation metrics for CHF and COPD do not show a clear improvement since the start of the LBVC interventions.

In 2019, formative evaluation of the COPD and CHF initiatives identified that although most LHDs and SHNs had achieved some degree of clinical practice change, there was significant variability in the type and level of change. Gaps in delivering care that aligns with the evidence-based guidelines were still evident. The 3Ci model of care facilitates the delivery of care that is based on the Australian guidelines for

the management of CHF⁷ and COPD⁸. It does this via a care delivery framework across the entire healthcare journey by coordinating care across settings. This ensures the delivery of the right care at the right time, in the right place by the right clinician or support team.

Data from the BHI adult admitted patient survey show lower scores for people living with CHF or COPD compared to other patients in NSW. The lower scores were across several domains including:

- health professionals “always” explain things in a way they could understand
- being involved as much as they wanted to be in decisions about their treatment and care
- decisions about their discharge from hospital.

Some of these measures have a significant association with re-admission within 90 days of discharge and highlight the importance of health literacy to support patient’s care which is one of the key principles in the 3Ci model of care.

Clinicians often face challenges in providing care for people living with CHF and COPD as they are admitted to different wards and are managed by a range of multidisciplinary teams. Some common themes were identified by clinicians including:

- limited access or referral to community-based services
- the patient's ability to self-manage their condition
- the patient's ability to adhere to treatment regimes
- the patient's ability to engage with health and social care providers
- the clinician's inability to provide guideline concordant care, including medication management, monitoring and action plans.

The 3Ci clinician(s) provides care navigation to help patients navigate the healthcare system, access timely healthcare and helps build health literacy to support self-management.

CHF and COPD are chronic conditions that require ongoing, long-term management led by primary care providers in the community. Therefore, the scope of the initiative needs to expand beyond acute inpatient management to encompass the whole care continuum in line with the VBHC principles and the objectives of the Future Health Strategy.

There are several established models for CHF and COPD management nationally and internationally that demonstrate positive clinical impact and improved cost effectiveness.⁹⁻¹⁵ The care delivery framework components and the continuum of care in these models align to peer reviewed publications and were supported by the consensus of clinical experts⁶ and provide the foundation for the 3Ci model of care. However, the case for change clearly identifies that in NSW, there is still an opportunity to improve the care provided for people living with CHF and COPD.

Patient cohort

The 3Ci model of care is designed for adult patients over the age of 18 years living with CHF or COPD. It will support all patients with CHF and COPD by offering consultation, liaison and advice when the need arises.

Patients who are assessed as having risk factors that are likely to lead to poor outcomes will be formally enrolled into 3Ci so they are supported across their entire health journey. This risk can be complex to assess, and tools to support the identification of patients who will most benefit from being formally enrolled in 3Ci will be further described in the 3Ci toolkit. These patients will be captured via inpatient in-reach, through referral from aligned services like

Integrated Care Planned Care for Better Health initiatives and through general practice teams as deemed appropriate in the local context.

Locally based support services will enhance the experience of patients who are vulnerable or have specific needs. Some of these groups may include:

- Aboriginal patients
- patients who are significantly socially disadvantaged, e.g, people with no fixed address or who have low or no income
- older patients who reside in residential aged care facilities
- patients with physical and intellectual disabilities
- patients who are affected by mental illness
- patients who are refugees or who are seeking asylum
- patients who are currently or have recently been incarcerated.

The 3Ci clinician(s) will partner with locally-based services that will assist these patients and those who support them to maintain their active participation in 3Ci.

The 3Ci principles

3Ci is a principles-based model of care. The principles are the foundation for delivering guideline-based care. There are four 3Ci principles that should be present across the entire patient journey.



Care

- Champion guideline-based clinical care across the entire patient journey by following evidence-based clinical guidelines for CHF and COPD.
- Use the Australian Guidelines for Chronic Heart Failure⁷ outlining the clinical care for patients with CHF and align to the NSW Chronic Heart Failure Clinical Priorities ([Appendix 1](#)).
- Use the Australian Guidelines for COPD (COPD-X)⁸ which outline the clinical care for patients with COPD, and align to the NSW Health Chronic Obstructive Pulmonary Disease Clinical Priorities ([Appendix 2](#)).
- Deliver patient-centred care across multiple clinical teams, with an established flow of information.



Collaboration

- Provide patient-centred multidisciplinary care.
- Identify multimorbidity and incorporate this into shared care planning.
- Explore and strengthen existing partnerships and establish new partnerships as required for effective care coordination and navigation.
- Establish strong partnerships between patients and their support people, 3Ci clinicians, and patients' general practice teams.
- Embed guidelines into clinical practice.



Clinical intervention

- Deliver or facilitate immediate access to clinical interventions that reduce the length and severity of an exacerbation or prevent admission to hospital.
- Involve patients, the people who support them and members of patients' general practice team in shared clinical decision-making.
- Align clinical interventions to guidelines and to action plans.



Improving health literacy

- Proactively support patients and the people who support them to understand their healthcare needs across their entire healthcare journey.
- Empower and enable patients and the people who support them to undertake their own care coordination and navigation within their own capability.
- Partner with patients and the people who support them to support knowledge-building around their disease and strategies to self-manage it in the long term.
- Support the uptake of guideline-based care.

Based on the principles, there are three elements which describe how care should be delivered:

1. the 3Ci clinician(s)
2. the 3Ci care continuum
3. the 3Ci care delivery framework.

1. The 3Ci clinician(s)

The 3Ci clinician(s) is a dedicated role that facilitates the delivery of guideline-based care and is central to the model.

For all patients with CHF and COPD, the 3Ci clinician(s) provides consultation, liaison and advice as needed.

For patients formally enrolled in 3Ci, the 3Ci clinician(s) is responsible for partnering with the patient and the people who support them to improve outcomes across their entire healthcare journey. These interactions may be more significant (or involve direct patient care) when patients are in the earlier phases of the 3Ci care continuum. The role will evolve to a facilitatory or advisory role in later stages of the 3Ci care continuum. By this stage patients, the people who support them, and their general practice teams should be working together to maintain and optimise the patient's condition. At every stage of the care continuum, the 3Ci clinician(s) must ensure that the care they organise and deliver meets the principles of 3Ci.

Current evidence suggests this dedicated role would be best filled by a registered nurse with clinical expertise in CHF and/or COPD⁶. As a clinician that operates within the Registered Nurse Standards for Practice,¹⁶ the 3Ci clinician(s):

- can deliver or access clinical interventions for patients in the community within their scope of practice
- have specialised knowledge of guidelines for CHF⁷ and/or COPD⁸ that supports the delivery of guideline-based care
- can understand the impact and significance of a patient's multimorbidity, and assist other clinicians involved in a patient's 3Ci journey to tailor care appropriately
- can provide care coordination and navigation that supports the care required for a patient's other pre-existing conditions
- receives mandatory training in detecting and monitoring clinical deterioration to ensure safe and appropriate decisions are made when a patient is unwell at home and their symptoms require immediate action¹⁷
- can develop strong local partnerships with general practices that support 3Ci patients throughout the care continuum.

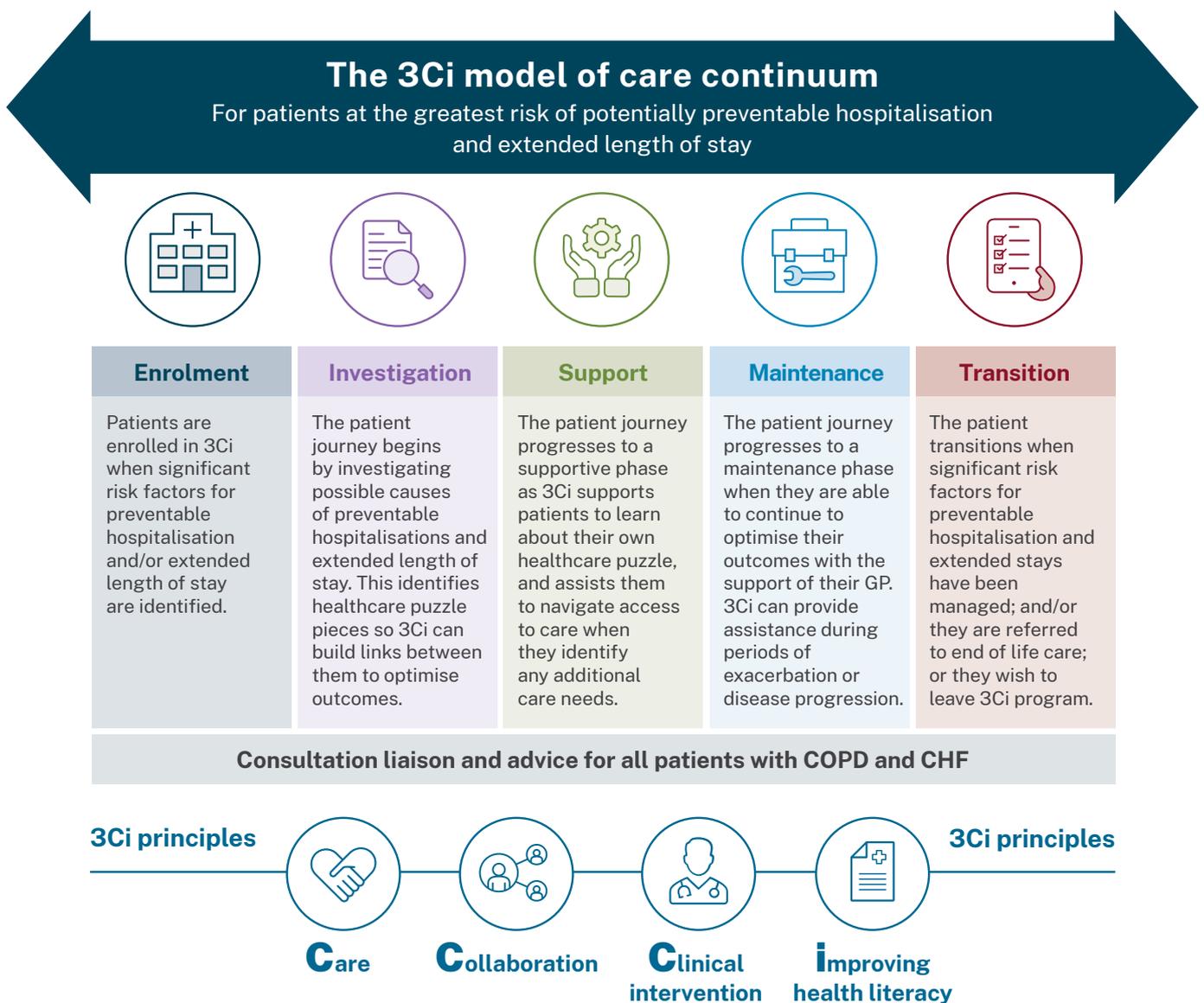
There may be local context that makes it difficult to implement a nurse-led 3Ci model. LHDs and SHNs should consider how they will bridge any gaps that will affect the delivery of guideline-based care when 3Ci is not delivered by experienced registered nurses.

2. The 3Ci care continuum

The 3Ci care continuum spans the entire healthcare journey of a patient who is formally enrolled in 3Ci. The continuum has five phases that interact across a multi-directional trajectory. This is representative of CHF and COPD as chronic progressive conditions with exacerbating features (with a high incidence of multimorbidity that impacts on complexity and outcomes).

The key activities within the five phases in Figure 1 are detailed in the 3Ci care delivery framework on the next page.

Figure 1: The 3Ci care continuum



3. The 3Ci care delivery framework

The 3Ci care delivery framework outlines the essential components of care that improve outcomes for patients with CHF or COPD. It is designed to meet the clinical priorities for CHF ([Appendix 1](#)) and COPD ([Appendix 2](#)) across the healthcare journey and integrate the elements of the organisational models for CHF ([Appendix 3](#)) and COPD ([Appendix 4](#)). This integration is demonstrated in [Appendix 5](#) of this document. The components of the care delivery framework are outlined below. More detailed resources will be available in the 3Ci toolkit to support clinicians to deliver guideline-based care within each of the care delivery components.

Consultation, liaison and advice

3Ci clinicians can harness their clinical expertise to support all patients with CHF or COPD. They advise clinical teams who are actively providing care to optimise a patient’s outcomes when the need arises. They interact with other aligned programs like integrated care to provide unique disease-specific support for patients with CHF and COPD at risk of poor outcomes. Through consulting, liaising and advising the clinical teams, the 3Ci clinician(s) can identify patients with CHF or COPD who may benefit from being formally enrolled in 3Ci.

Operationalisation across the patient healthcare journey

	All patients with CHF or COPD	Enrolment	Investigation	Support	Maintenance	Transition
When	At any point when disease-specific advice is required to support care for patients with CHF and COPD.					
Goal	<ul style="list-style-type: none"> To facilitate access to specialist expertise that supports guideline-based care. To enhance patient-centred support for shared care planning and decision-making. To facilitate access to clinical interventions that prevent hospital admissions. 					

* This care delivery component is most closely aligned to components of the heart failure nurse-coordinated care model contained within the organisational models for CHF ([Appendix 3](#)), and the RCCP model contained within the organisational models for COPD ([Appendix 4](#)).

Acute inpatient in-reach during admission to hospital

3Ci clinicians are located within LHDs and SHNs, enabling them to work with inpatient clinical teams via acute inpatient in-reach. This facilitates reorientation towards guideline-based care in the acute inpatient space. It also allows for strategies to prevent readmission to hospital to commence.

Operationalisation across the 3Ci care continuum

	Enrolment	Investigation	Support	Maintenance	Transition
When	When deemed to have risk factors that are likely to lead to poor outcomes.	If admitted to hospital for inpatient care.	If admitted to hospital for inpatient care.	If admitted to hospital for inpatient care.	If a patient is admitted in the last days of life.
Goal	To identify and enrol patients who will benefit from 3Ci and investigate preventable causes of poor outcomes.	To deliver guideline-based care, and identify risk factors that are likely to lead to poor outcomes.	To deliver guideline-based care, and update care plan as necessary.	To deliver guideline-based care, and update care plan as necessary.	To support patients at the end of life.

* This care delivery component is most closely aligned to components of the heart failure nurse-coordinated care model contained within the organisational models for CHF ([Appendix 3](#)), and the nurse-led model of care contained within the organisational models for COPD ([Appendix 4](#)).

Home visiting

The 3Ci clinician(s) will ideally visit the home of patients enrolled in 3Ci within seven days of enrolment (if this is achievable within the local context). Home visiting allows the 3Ci clinician(s) to establish a rapport with newly enrolled patients and the people who support them. This can support assessment in the home environment of preventable causes of poor outcomes such as:

- adherence to exercise programs and medications
- the appropriate condition and use of equipment (e.g. scales, spacer devices and home oxygen)
- the social determinants of health.

This assessment can inform patient-centred care planning that harnesses the patient’s strengths and enablers to support the successful long-term management of their condition.

Following the initial home visit, further visits can support successful health outcomes for patients formally enrolled in 3Ci. The need, timing and frequency of these visits should be determined by the 3Ci clinician(s) based on the needs, preferences and circumstances of the patient, and what is appropriate to the local context.

Operationalisation across the 3Ci care continuum

	Enrolment	Investigation	Support	Maintenance	Transition
When		Within seven days of enrolment, and as needed.	Undertaken according to patient-centred requirements.	Event driven, and for annual review.	If a patient requires support in the last days of life.
Goal		To develop relationships, undertake comprehensive assessment in the home environment, and identify preventable causes of poor outcomes.	To support treatment regimes, and the development of health literacy.	To deliver a clinical intervention to prevent hospital admission, or to detect and manage progression of disease.	To support patients at the end of life in collaboration with palliative care services.

* This care delivery component is most closely aligned to components of the heart failure nurse-coordinated care model contained within the organisational models for CHF ([Appendix 3](#)), and the RCCP model contained within the organisational models for COPD ([Appendix 4](#)).

Virtual care

Virtual care is any interaction between patients receiving healthcare and their care team occurring remotely, using any forms of communication or information technologies with the aim of facilitating or maximising the quality and effectiveness of clinical care. For patients with CHF and COPD, virtual care is useful when the clinician and patient have an established relationship to contribute to the continuity of care. Where clinically appropriate, incorporating virtual care may have a range of benefits and can complement 3Ci care delivery throughout the care continuum.

Virtual care interventions are best used within 3Ci according to these principles:

- initial risk screening must be undertaken to ensure clinical safety
- the patient’s ability to effectively operate and interact with virtual care must be considered
- the patient and the clinician must have access to digital technology to facilitate the use of virtual care

- support for the patient and the clinician to use the technology effectively must be available
- if utilising videoconferencing platforms, the patient must have a stable internet connection
- when undertaking care via videoconferencing, only endorsed and supported NSW Health platforms should be used
- decisions about the extent to which virtual care is used should be made according to the local context of each LHD and SHN.

There are many emerging technologies in the field of virtual care.^{18,19} Clinicians should remain up-to-date with these developments and consider the adoption of new technologies and opportunities to enhance the care of patients with CHF or COPD. For example, this could include wearable devices that may assist in remote monitoring.

For more information, see the [ACI](#) and [NSW Health](#) virtual care websites and the [NSW Virtual Care Strategy 2021-2026](#).

Operationalisation across the 3Ci care continuum

	Enrolment	Investigation	Support	Maintenance	Transition
When	If required to support disease-specific acute care delivery.	When required as an adjunct to face-to-face assessment and care planning.	When it is an adjunct to reduce care fragmentation and to support care navigation.	Event driven when virtual care can provide access to a clinical intervention.	If appropriate at the end of life.
Goal	To access specialist expertise that supports guideline-based care.	To link clinicians and support teams when virtual care complements face-to-face interactions.	To enhance patient-centred support for shared care planning with general practice teams and other key stakeholders.	To prevent a hospital admission.	To provide support to patients or to access specialist expertise at the end of life.

* This care delivery component most closely aligns to the virtual care models described in the organisational models for CHF ([Appendix 3](#)) and the organisational models for COPD ([Appendix 4](#)).

Partnerships with local GPs and general practice teams

Strong long-term partnerships with local GPs and general practice teams are key to improving outcomes for patients living with CHF and COPD. They are also fundamental to assist patients and the people who support them to improve their health literacy.

General practice teams depend on the business model of individual general practices. They can encompass GPs, general practice nurses, pharmacists, allied health clinicians and administrative staff.

The involvement of general practice teams in a patient’s healthcare journey will depend on the extent of services available within a patient’s local general practice.

Significant disconnects in the collaborative clinical partnerships between LHD and SHN-based teams and general practice teams can fragment the healthcare journey for patients with CHF or COPD.²⁰ Acute care clinicians, specialists and general practice teams, along with Integrated Care teams and the 3Ci clinician(s), should seek opportunities to work collaboratively to reduce duplication of effort in managing the care of patients living with CHF or COPD. The inclusion of 3Ci within locally-based

HealthPathways will promote collaboration between general practice teams and 3Ci clinicians.

Other key steps towards collaborative partnerships between general practice teams and 3Ci clinicians are:

- fostering a local culture of strong working relationships
- facilitating communication to bridge technical gaps in collaborative care between general practice teams and 3Ci clinicians
- shared care planning and shared decision-making
- using the role and function of PHNs to strengthen partnerships between LHDs, SHNs and their local general practice teams.

The development of patient-centred CHF action plans²¹ or COPD action plans²² provides a good opportunity for general practice teams to begin working collaboratively with the 3Ci clinician(s).²³ It is essential that this partnership is established early to create a strong foundation. As this foundation strengthens and the patient’s health literacy improves, general practice teams will take a stronger role in supporting the patient’s care coordination and navigation, with the 3Ci clinician(s) providing advice and support when needed.

Operationalisation across the 3Ci care continuum

	Enrolment	Investigation	Support	Maintenance	Transition
When	As soon as possible following enrolment if not already engaged.	Within seven days of discharge from hospital, or at least one care episode during this phase.	As patient-centred needs for shared care planning and decision-making require.	Event driven.	When a patient has reached the end of life.
Goal	To establish the flow of information and address preventable causes of poor outcomes.	To facilitate partnership with 3Ci clinicians, evaluate treatment, and commence shared action planning.	To enhance ongoing partnerships that facilitate rapid clinical interventions and support the development of action planning and health literacy.	To support general practice teams with guideline-based care across the 3Ci continuum in the event of clinical deterioration.	To facilitate the flow of information and end of life care as required.

* This care delivery component is most closely aligned to components of the heart failure nurse-coordinated care model contained within the organisational models for CHF ([Appendix 3](#)), and the RCCP model contained within the organisational models for COPD ([Appendix 4](#)).

CHF and COPD specialist input in care

Care and consultation by physicians who specialise in CHF or COPD is critical to improved health outcomes.^{7,8} 3Ci clinicians should facilitate access to specialist CHF or COPD care for all patients formally enrolled in 3Ci to ensure that care is optimised and reflected in action plans.

If this expertise is not available in the geographical context, access to this care may be established by:

- developing strong partnerships with 3Ci clinicians from other LHDs or SHNs who have this expertise available within their LHD or SHN and are willing to assist
- exploring partnerships with physicians who operate in private practice to improve access for patients who can afford this
- using virtual care to attend appointments remotely to overcome geographical barriers.

3Ci clinicians also need to incorporate the importance of specialist care into health literacy. They can partner with patients and the people who support them to improve their understanding of the importance of attending appointments and assist them to overcome any practical or perceptual barriers.

Operationalisation across the 3Ci care continuum

	Enrolment	Investigation	Support	Maintenance	Transition
When	As soon as possible following enrolment, if not already engaged.	At least one care episode during this phase.	When specialist expertise is required.	Event driven, and for annual review.	If a patient requires specialist care at the end of life.
Goal	To ensure the delivery of guideline-based care.	To provide comprehensive follow-up and action planning.	To optimise function and support adherence to guideline-based care.	To continue to adjust treatment regimens and action plans to optimise function across the disease trajectory.	To support symptom management in collaboration with palliative care teams.

* This care delivery component is most closely aligned to components of the heart failure nurse-coordinated care model contained within the organisational models for CHF ([Appendix 3](#)), and the RCCP model contained within the organisational models for COPD ([Appendix 4](#)).

Multidisciplinary care

Multidisciplinary care for CHF and COPD refers to care delivered by various professionals based on a patient’s clinical and social needs. Accessing timely and appropriate multidisciplinary care is an essential driver of improved outcomes for patients.^{7,8} It also assists with the management of multimorbidity that can result in poor outcomes.

Multidisciplinary care for patients with CHF and COPD primarily includes:

- physiotherapists with experience in the symptom management of patients with CHF or COPD
- pharmacists that can support the medication management of patients with CHF or COPD
- social workers who can partner with the patient (and the people who support them) to support social determinants of health outcomes
- dietitians with experience in dietary considerations for patients with CHF or COPD
- non-government organisations that provide support services and education for patients with CHF or COPD (and the people who support them).

There may be other professionals who also need to be incorporated into a patient’s care. Some of these may include mental health services, palliative care services, occupational therapy, aged care assessment teams and services, and teams who provide support to patients who are vulnerable and have specific needs.

If access to established multidisciplinary care cannot be supported or no such teams exist, LHDs and SHNs should consider how they will make this essential component of care available to patients formally enrolled in 3Ci.

Before engaging new multidisciplinary care providers for a patient, the 3Ci clinician(s) should collaborate with the general practice team to understand how multidisciplinary care has already featured in the patient’s journey.

Operationalisation across the 3Ci care continuum

	Enrolment	Investigation	Support	Maintenance	Transition
When	When initial supports are identified that will mitigate poor outcomes.	As new supports to optimise function are identified.	When planned interventions or supports are organised or identified.	During pre-planned interventions or supports, plus during interventions or supports newly accessed by the patient and their general practice team.	If a patient requires multidisciplinary care at the end of life.
Goal	To optimise outcomes.	To commence patient-centred care navigation to initiate or re-engage appropriate clinical interventions and social supports.	To support recognition of the importance of attending planned appointments for organised interventions and supports.	To continue to adjust care in real time to optimise function across the disease trajectory.	To collaboratively support symptom management and social needs at the end of life.

* This care delivery component most closely aligns to components of the nurse-led models of care described in the organisational models for CHF ([Appendix 3](#)) and organisational models for COPD ([Appendix 4](#)).

Partnerships with heart failure rehabilitation and pulmonary rehabilitation services

Heart failure rehabilitation and pulmonary rehabilitation have a significant role to play in the treatment of CHF and COPD.^{24, 25}

The interdisciplinary nature of these rehabilitation services and the collaborative aspects of 3Ci provide opportunities for integration across the healthcare journey. The 3Ci clinician(s) can also support the uptake of rehabilitation by addressing any challenges to attendance and completion.

3Ci clinicians should:

- facilitate timely referrals to rehabilitation earlier in the healthcare journey and in line with current guidelines for CHF²² and COPD⁸
- work collaboratively with local rehabilitation services so that patients are referred to the most appropriate type of rehabilitation
- use strong local partnerships with general practice teams and other professionals to advocate for the benefits of heart failure and pulmonary rehabilitation for patients with CHF or COPD.

Operationalisation across the 3Ci care continuum

	Enrolment	Investigation	Support	Maintenance	Transition
When	As soon as possible following enrolment if not already engaged.	During initial home visit, or subsequent episodes of care if required.	When rehabilitation services identify a role for the 3Ci clinician(s) to collaborate.	Event driven re-referral to rehabilitation.	Unless the patient is at the end of life, consider offering a referral to rehabilitation.
Goal	Early identification and referral to support guideline-based care and exacerbation recovery.	To facilitate the acceptance of a new referral and build health literacy around the role of rehabilitation.	To support completion of rehabilitation programs and call to action if the person is exacerbating.	To optimise function across the disease trajectory.	To continue to offer referral to rehabilitation to patients when they are reluctant to engage with the 3Ci clinician(s).

* Access to this care delivery component is established in similar ways by all of the organisational models outlined in the organisational models for CHF ([Appendix 3](#)) and the organisational models for COPD ([Appendix 4](#)).

Action-planning and patient-centred care that can be adjusted in real time

Patients formally enrolled in 3Ci (and the people who support them) must be able to contact 3Ci clinicians when they are unwell. Each LHD and SHN will need to ensure that 3Ci has operational hours to support this. Action planning should consider how patients will access clinical interventions outside of 3Ci operational hours. This allows for real time adjustments to be made to their treatment plan to alleviate symptoms or prevent deterioration that would otherwise result in admission to hospital.

These adjustments should be undertaken in a patient-centred way:

- in consultation with the general practice team or specialist physicians
- based on clinical assessment
- in alignment with the patient’s action plan.

Operationalisation across the 3Ci care continuum

	Enrolment	Investigation	Support	Maintenance	Transition
When	Commences on enrolment.	Event driven.	Event driven in collaboration with the patient’s general practice team.	Event driven by general practice teams when they require the support of the 3Ci clinician(s).	When a patient requires adjustment to care at the end of life.
Goal	To optimise outcomes and ensure delivery of guideline-based care.	To ensure timely delivery of clinical interventions to address potential causes of poor outcomes.	To ensure timely delivery of clinical interventions to address potential causes of poor outcomes.	To ensure timely delivery of clinical interventions to address potential causes of poor outcomes.	To support symptom management and social needs at the end of life.

* This care delivery component most strongly aligns to components of the heart failure nurse-coordinated model described in the organisational models for CHF ([Appendix 3](#)) document and the RCCP model described in the organisational models for COPD ([Appendix 4](#)).

Care coordination and navigation

The 3Ci clinician(s) can coordinate and navigate care to positively impact health outcomes.⁶

Care coordination will:

- link clinical and support teams
- establish a clear flow of information.

Care navigation will:

- assist patients and the people who support them to negotiate an increasingly complex healthcare system (particularly in the context of multimorbidity)
- enable access to the most appropriate care in a timely way
- build the capability of the 3Ci clinician(s) to understand what clinical and support services are available, and how they work together
- build the health literacy of patients and the people who support them to navigate and access these services.

A strong partnership with general practice teams will assist patients and the people who support them to coordinate and navigate their own care as their health literacy improves and they become more accomplished at self-management. This can be supported by 3Ci clinicians regularly sharing information with general practice teams about what local services are available and how these can be accessed.

Operationalisation across the 3Ci care continuum

	Enrolment	Investigation	Support	Maintenance	Transition
When	Commences on enrolment.	As new multidisciplinary supports to optimise function are identified.	When planned interventions or supports are organised or identified.	Event driven.	When a patient requires multidisciplinary care at the end of life.
Goal	To establish the flow of information and address preventable causes of poor outcomes.	To ensure timely and appropriate access to multidisciplinary care.	To optimise function through timely and appropriate access to multidisciplinary care.	To facilitate access to newly identified multidisciplinary care if a patient, the people supporting them and their general practice team require support with care navigation.	To coordinate and navigate care that supports symptom management and social needs at the end of life.

* This care delivery component closely aligns to components of any of the organisational models outlined in the organisational model for CHF ([Appendix 3](#)) and organisational model for COPD ([Appendix 4](#)).

Improving health literacy

Health literacy that supports self-management of diseases like CHF and COPD requires two important skills:

1. A basic understanding of the disease and its associated treatments.
2. An understanding of how to navigate the healthcare system in a timely and appropriate way (particularly in the context of multimorbidity).²⁶

3Ci clinicians need to tailor education on disease and system navigation to meet the capacity of patients and their support people to understand, receive and act on the information. The patient’s general practice team is integral in this process, and practical support for improving health literacy should be shared between them and the 3Ci clinician(s). This will underpin ongoing gains in self-management.

Operationalisation across the 3Ci care continuum

	Enrolment	Investigation	Support	Maintenance	Transition
When	Commences on enrolment.	At initial home visit, and then extends during subsequent interactions with the 3Ci clinician(s).	In collaboration with the patient’s general practice team during shared care planning and decision-making.	Opportunistically when interactions with the patient and/or their general practice team and the 3Ci clinician(s) occur.	If support is needed for the patient and the people supporting them at the end of life.
Goal	To prevent readmission to hospital prior to the first home visit.	To build the foundations of disease knowledge and care navigation capability.	To develop disease knowledge and care navigation capability.	To consolidate disease knowledge and navigation capability.	To support the patient and the people supporting them to understand the end of life process.

* This care delivery component closely aligns to the components of any of the nurse-led models outlined in the organisational model for CHF ([Appendix 3](#)) and organisational model for COPD ([Appendix 4](#)).

Routine data reporting and review

LHDs, SHNs and statewide system supports should give 3Ci clinicians timely access to relevant data.

Data should be meaningful to:

- patients with CHF or COPD (patient-reported measures)
- the clinicians delivering their care
- the system that supports this care delivery.²⁰

Local resources, skills and expertise must be available to 3Ci clinicians to ensure that data is useful for quality improvement activities and evaluation. The collection and analysis of relevant data needs to be well designed and embedded into regular reviews of 3Ci.⁶

Operationalisation across the 3Ci care continuum

	Enrolment	Investigation	Support	Maintenance	Transition
When	Commences on enrolment.	On initial assessment.	Clinical outcomes data at patient-centred set intervals, and system performance indicators as pre-determined within the local context.	Clinical outcomes data at patient-centred set intervals, and system performance indicators as pre-determined within the local context.	Following exit from 3Ci.
Goal	To capture initial data around demographics, risk factors, and system performance indicators prior to enrolment.	To capture initial clinical data and patient-reported measures to establish baseline data.	To assess and action ongoing clinical outcomes data and patient-reported measures, and to capture initial performance indicators that will demonstrate the success of 3Ci.	To assess and action ongoing clinical outcomes data and patient-reported measures. To review system performance indicators to support service review and identify quality improvement opportunities.	To capture final clinical and performance indicators to demonstrate the impact of 3Ci on the person’s healthcare, and the effectiveness and efficiency of that care.

* Though not specifically described in any of the models outlined in the organisational models for CHF ([Appendix 3](#)) or organisational models for COPD ([Appendix 4](#)), all the outlined models should be routinely reporting and reviewing relevant data that may be useful to 3Ci.

Key organisational elements of the 3Ci model of care

Key organisational elements of the 3Ci model of care

There are three key organisational elements that support the success of the 3Ci model of care.

1. Primary care

Primary care plays a vital role in supporting patients living with CHF and COPD across the care continuum through care delivered by general practice teams outside of the LHD and SHN environments. Primary care should work closely with 3Ci clinicians and specialists to support and deliver patient-centred care.

2. Local health districts and specialty health networks

LHDs and SHNs are responsible for the provision and management of public hospitals and health services to defined geographical areas of NSW. They ensure that the 3Ci model of care is operationalised with the appropriate governance structures, resourcing supports and access to data.

3. Statewide system supports

As leads for the CHF and COPD LBVC clinical initiatives, the ACI cardiac and respiratory networks partnered to develop the 3Ci model of care. They will continue to support implementation as a central point of access to expertise for advice on clinical and system challenges. They may also continue to extend innovation when future opportunities arise.

The NSW Ministry of Health provides leadership at the program level across NSW. The Ministry supports other programs at the system level that apply similar principles to 3Ci across chronic disease (including CHF and COPD) to deliver similar outcomes, including Integrated Care Planned Care for Better Health initiatives²⁷ and collaborative commissioning.²⁸

One of the key principles of the 3Ci model is collaboration between health and other providers to achieve the best outcomes for patients. The 3Ci clinician(s) will build strong partnerships between programs (recognising that patients may already be enrolled in other programs). They will do this to facilitate two-way referral into and out of the model and streamline care between health providers, such as Integrated Care Planned Care for Better Health initiatives. This will enable the provision of patient-centred, seamless, effective and efficient care.

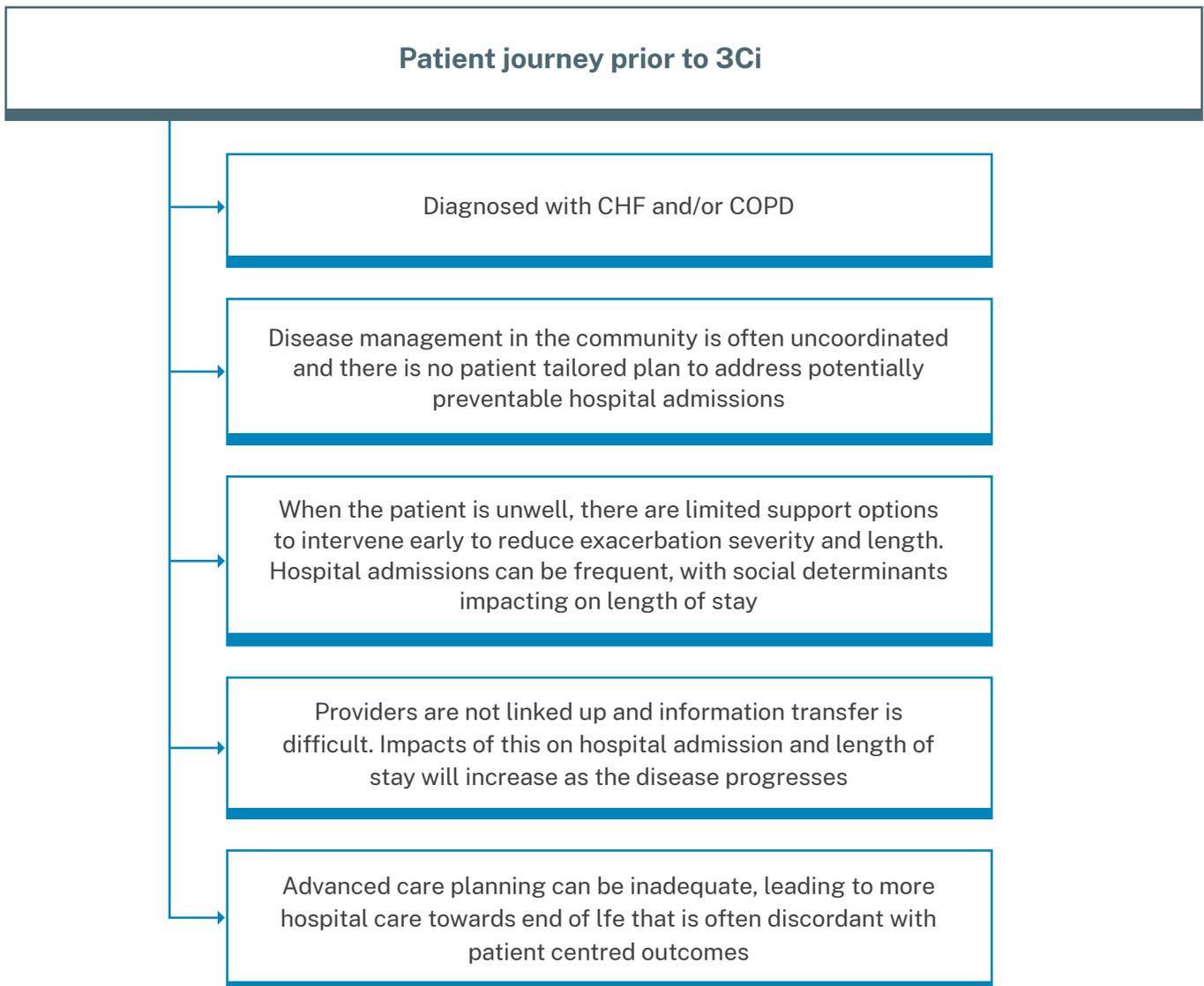
At the LHD and SHN level, patients may already be participating in a Collaborative Commissioning program. Therefore, the 3Ci clinician(s) will work in partnership with local teams to learn from their experience, facilitate alignment, reduce duplication and optimise patient experience and outcomes. These partnerships will vary across the LHDs and SHNs.

The impact of implementing the 3Ci model of care on the patient journey

The primary objective of implementing the 3Ci model of care is to establish world-class CHF and COPD care in NSW that will positively impact the healthcare journey of patients living with these conditions.

Prior to establishing care that aligns to the 3Ci model of care, the healthcare journey of patients with CHF and COPD is demonstrated in Figure 2.

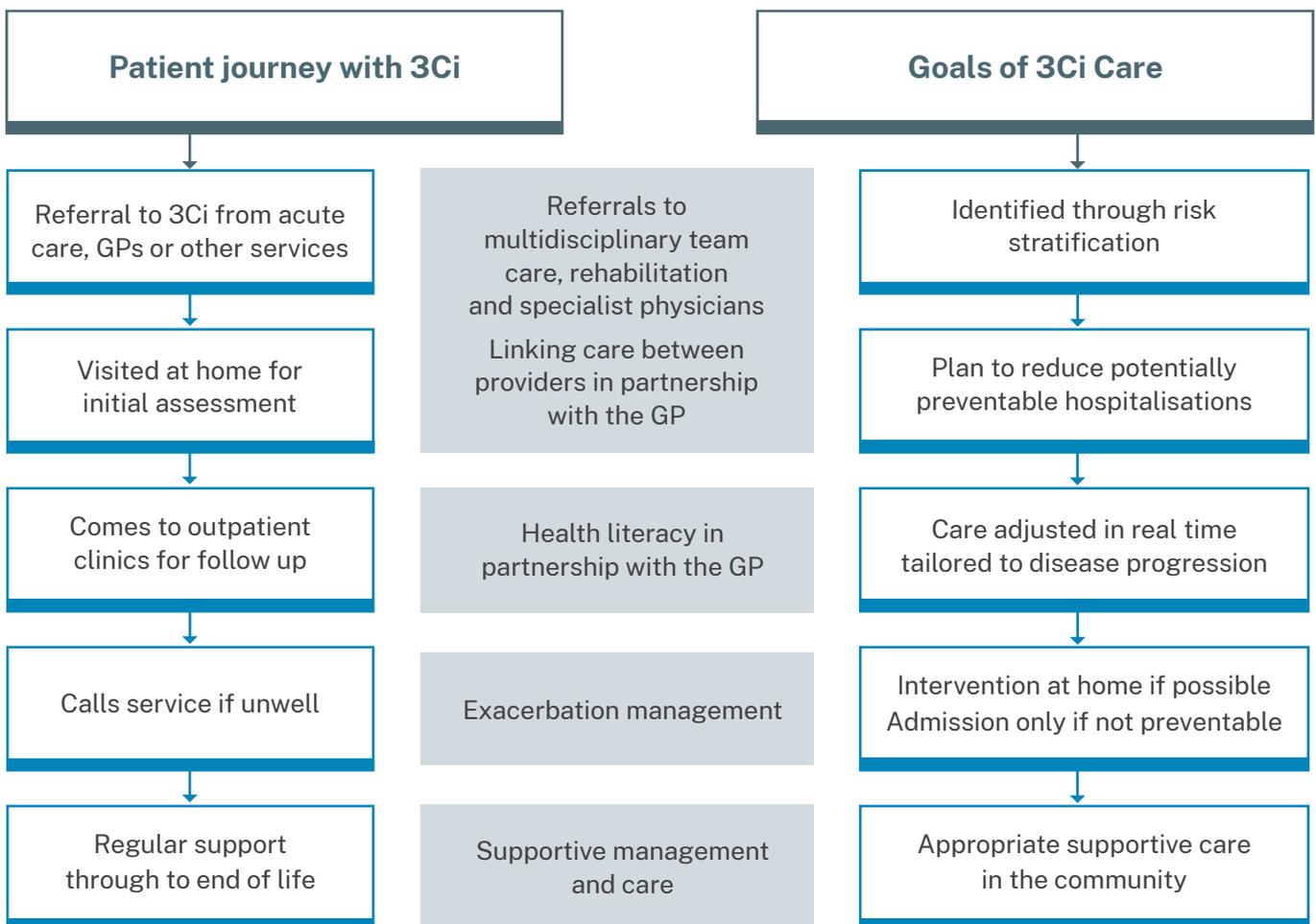
Figure 2: Patient journey prior to 3Ci



Once implementation of the 3Ci model of care is locally established, the same patient could be formally enrolled in 3Ci. Their predicted healthcare journey is demonstrated in Figure 3.

There will be many complex factors driving the successful implementation of 3Ci. The local implementation approach should be tailored and take into consideration established CHF and COPD care. This will ensure that local sites are able to facilitate the care delivery components across the entire healthcare journey. A 3Ci toolkit will be available to support clinicians and service managers to implement 3Ci locally.

Figure 3: Patient journey with 3Ci



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Appendices

Appendix 1

Clinical priorities for chronic heart failure

NSW Health

Leading Better Value Care

Chronic heart failure Clinical priorities

Chronic heart failure (CHF) is a complex clinical syndrome secondary to an abnormality of cardiac structure or function which impairs the ability of the heart to pump blood to meet the needs of the body's organs. It is a severe, disabling condition which negatively impacts quality of life. A recent analysis of care provided across NSW hospitals highlighted four key areas for improvement.

Aims of the initiative

- Reduce readmissions and have care provided outside of hospital
- Increase their patients' confidence to manage their condition
- Provide options after hospital discharge and at end of life.

69 hospitals admit more than **50 patients** each year

NSW Health Statistics 2016-2017



16,757 separations



121,206 bed days



7.2 days average length of stay

1



DIAGNOSTICS

Timely access to cardiology review, echocardiogram, chest X-ray and pathology is crucial for accurate and prompt diagnosis.

2



EXACERBATION MANAGEMENT

Prescription of evidence-based medicines and targeted oxygen therapy aim to improve severity of symptoms and patient outcomes.

3



OPTIMISING HEALTH THROUGH ONGOING CARE

a. Referral to multidisciplinary heart failure disease management programs decreases rates of rehospitalisation and mortality and improves self-management.

b. Standardised communication processes support the CHF patient's transfer of care to the community for ongoing multidisciplinary team management.

4

LAST YEAR OF LIFE

Palliative management alleviates end-stage symptoms, improves quality of life and decreases rehospitalisation.



NSW Health Leading Better Value Care

As part of the Leading Better Value Care (LBVC) CHF initiative, four key areas of care have been identified as a priority for both local and statewide improvement. These were identified following the review of current guidelines and evidence, the audit of more than 1000 CHF cases across NSW and the economic analysis of the potential impact of change.



Diagnostics

Patients will receive a timely cardiology review and access to appropriate investigations including transthoracic echocardiogram, chest X-ray and pathology.

- Cardiology review for high-risk patients or patients with new presentation of heart failure.
- Accurate diagnosis of type and severity of heart failure is crucial to identify and treat reversible causes and determine appropriate management strategy in accordance with guideline standard care.



Exacerbation management

Patients will receive evidence-based pharmacological treatment, fluid management and targeted oxygen therapy to improve severity of symptoms and facilitate better patient outcomes.

- Use of beta-blockers and angiotensin converting enzyme inhibitors (ACEI) or an angiotensin receptor blocker in patients with left ventricular systolic dysfunction.
- Oxygen therapy titrated to maintain oxygen saturation >94% and use of non-invasive ventilation (NIV) in hypoxemic and tachypnoeic patients where appropriate.
- Use of loop diuretics in patients with acute heart failure associated with pulmonary congestion.



Optimising health through ongoing care

- Patients will receive timely referral to a multidisciplinary heart failure disease management program to improve self-management and decrease rates of rehospitalisation and mortality.
 - Use of telemonitoring or telephone support where face-to-face access is limited or not available.
 - Patients receive education that is timely, patient-centred, appropriate to their level of health literacy and culturally appropriate to improve self-management.
 - Regular exercise, such as that offered by a cardiac rehabilitation program, is recommended to improve physical functioning, improve quality of life and to decrease hospitalisation.

- Standardised communication processes and tools will support the CHF patient's transfer of care to the community for ongoing management by a general practitioner and integrated care team.

- While the LBVC initiative for CHF focuses predominantly on the acute inpatient care of the patient, it is acknowledged that seamless care transition beyond the hospital is a key priority area for improving outcomes for patients.



Last year of life

Patients with advanced heart failure are identified and receive appropriate palliative referral and management to alleviate end-stage symptoms, improve quality of life and decrease rehospitalisation.

- Close to 40% of patients diagnosed with heart failure will die within 12 months of their first hospitalisation with heart failure.
- Palliative care involvement should be sought early in the heart failure trajectory to reduce the suffering and distress associated with these symptoms.

Evidence

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Appendix 2

Clinical priorities for chronic obstructive pulmonary disease

NSW Health

Leading Better Value Care

Chronic obstructive pulmonary disease Clinical priorities

Chronic obstructive pulmonary disease (COPD) is a serious, progressive and disabling condition that limits airflow in the lungs. A recent analysis of care provided across NSW hospitals highlighted four key areas for improvement.

Aims of the initiative

- Reduce unwarranted clinical variation
- Increase education, resources and support for COPD patients to self-manage their disease
- Develop optimal care after discharge and at end of life.

75 hospitals
across NSW admit
patients with COPD

NSW Health Statistics 2016–2017



44,582
separations



407,539 bed days



9.14 days
average length of stay

1



DIAGNOSTICS

Spirometry confirms an exacerbation of COPD and its severity.

2



EXACERBATION MANAGEMENT

Controlled delivery of oxygen and appropriate use of non-invasive ventilation (NIV) improves patient outcomes and reduces length of stay.

3



OPTIMISING HEALTH THROUGH ONGOING CARE

- a. Pulmonary rehabilitation and chronic disease management programs prevent readmissions by improving self-management.
- b. Standardised communication processes will support the COPD patient's transfer of care to the community for ongoing multidisciplinary team management.

4

LAST YEAR OF LIFE

Palliative management of end-stage symptoms prevents unnecessary admissions and improves patient reported outcomes.



NSW Health **Leading Better Value Care**

As part of the Leading Better Value Care (LBVC) COPD initiative, four key areas of care have been identified as a priority for both local and statewide improvement. These were identified following the review of current guidelines and evidence, the audit of more than 1000 COPD cases across NSW and the economic analysis of the potential impact of change.



Diagnostics

Patients will receive a spirometry to confirm an exacerbation of COPD and to assess its severity.

- Spirometry is the most objective measurement of airflow limitation that enables clinicians to diagnose COPD and monitor the progression of the disease.
- Diagnosis of COPD based on a physical assessment by a clinician has been shown to have poor sensitivity, with misdiagnosis rates as high as 84%.

- b. Standardised communication processes and tools will support the COPD patient's transfer of care to the community for ongoing management by a general practitioner and integrated care team.
 - While the LBVC initiative for COPD focuses predominantly on the acute inpatient care of the patient, it is acknowledged that seamless care transition beyond the hospital is a key priority area for improving outcomes for patients.



Exacerbation management

Patients will receive controlled delivery of oxygen and criteria-led non-invasive ventilation (NIV) to reduce length of stay and facilitate better patient outcomes.

- Oxygen therapy titrated to maintain oxygen saturations of 88-92% in patients at risk of hypercapnea.
- Criteria led use of NIV to alleviate dyspnoea associated with acidosis, hypoxemia and hypercapnea.



Last year of life

Patients with advanced COPD are identified and receive appropriate palliative referral and management to alleviate end-stage symptoms, improve quality of life and decrease rehospitalisation.

- Close to 50% of patients diagnosed with end stage COPD will die within 12 months of demonstrating a reduction in lung function of FEV1<30%.
- Palliative care involvement should be sought early in end-stage COPD to reduce the suffering and distress associated with end-stage symptoms.



Optimising health through ongoing care

- a. Patients will receive timely referral to a pulmonary rehabilitation or chronic disease management program to improve self-management and decrease rates of rehospitalisation and mortality.
 - Regular exercise, such as that offered by a pulmonary rehabilitation program, is recommended to improve physical function, improve quality of life and decrease hospitalisation.
 - Patient-centred care coordination and education through chronic disease management programs for patients with comorbidities or low health literacy improves self-management, reduces readmissions and length of stay.

Evidence

- Lung Foundation Australia and Thoracic Society of Australia and New Zealand. *The COPD-X Plan: Australian and New Zealand guidelines for the management of Chronic Obstructive Pulmonary Disease 2018 V 2.53* [Internet]. Milton: Lung Foundation Australia and Thoracic Society of Australia and New Zealand; 2018 [cited August 2018]. Available from: https://copdx.org.au/wp-content/uploads/2018/06/COPDX-V2-53-March-2018_2.pdf
- The Agency for Clinical Innovation (ACI) *Clinical, Monitoring, Economics and Evaluation*. Economic appraisal for COPD. Sydney: ACI; 2018.
- Thoracic Society of Australia and New Zealand. *Oxygen guidelines for acute oxygen use in adults* [Internet]. Sydney: Thoracic Society of Australia and New Zealand; 2015 [cited August 2018]. Available from: https://www.thoracic.org.au/journal-publishing/command/download_file/id/34/filename/TSANZ-AcuteOxygen-Guidelines-2016-web.pdf
- NSW Health. *Care coordination: planning from admission to transfer of care in NSW public hospitals* [Internet]. Sydney: NSW Health; 2016 [cited August 2018]. Available from: https://www1.health.nsw.gov.au/pds/ActivePDS/Documents/PD2011_015.pdf



ACI_0102 (11/18; ACI/D19/3866)

Appendix 3

Organisational models for chronic heart failure

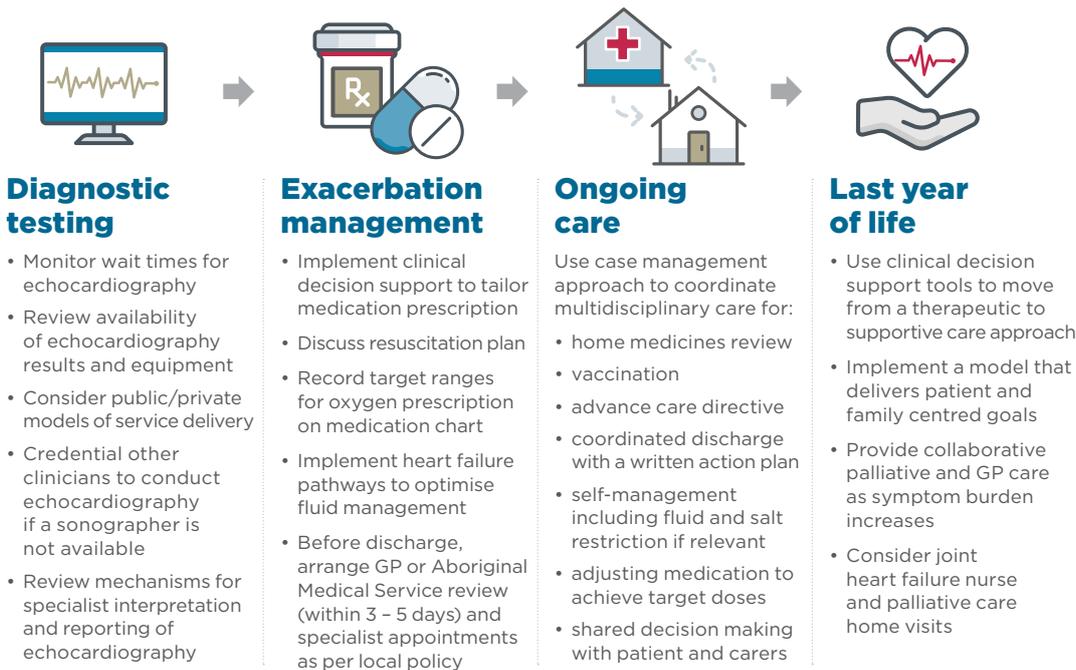


Leading Better Value Care

Chronic heart failure Organisational models

This document provides decision-makers with options to improve care in different service delivery settings. Building on *Chronic heart failure: Clinical priorities* (2017) which described *what* to improve, the focus here is on *how* to improve care. Together these documents are informed by: research evidence about best clinical care and the effectiveness of different delivery models; empirical evidence about current service delivery levels; experiential evidence from clinicians and patients.

IMPROVING KEY PRIORITY AREAS



IMPROVING THE OVERALL PATIENT JOURNEY

- Do not delay treatment if awaiting echocardiography
- Include integrated rehabilitation with exercise to facilitate early return to normal activity
- Incorporate the general practitioner (GP) as an integral part of the patient's care journey
- Consider early referral to palliative care
- Consider use of brain natriuretic peptide (BNP) or NT proBNP when echocardiography is not available
- Discuss deactivation of implantable cardiac defibrillator with the patient, family and cardiologist prior to implantation, and during the patient journey
- Improve access to results of all investigations in eMR
- Support quality improvement by establishing routine audit and feedback processes
- Measure and act upon patient reported experience and outcome measures (PROMIS-29 and Kansas City Cardiomyopathy Questionnaire (KCCQ)).





NSW Health **Leading Better Value Care**

● Potential location(s) for implementation

OPTIONS FOR ORGANISATIONAL CONFIGURATIONS

A coordinated multidisciplinary team-based approach delivers core components of care. The options below outline different organisational models which sites can use to tailor their clinical services to align with local requirements.

Option 1: Heart failure nurse-coordinated care model

This model is centred around a heart failure nurse who streamlines care and strengthens transition of care from hospital to community. This model is suitable for adoption in metropolitan and regional facilities.

	Emergency department	Early admission	Late admission	Transition to discharge	Community
Case finding	●	●	●	●	●
Refer to heart failure nurse		●	●	●	●
Coordinate tailored care	●	●	●	●	●
Refer to multidisciplinary team (MDT)		●	●	●	●
Discuss advance care directive		●	●	●	●
Discuss resuscitation plan		●	●	●	●
Psychological support and counselling	●	●	●	●	●
Enrol in heart failure program				●	●
Follow-up with specialists					●
Patient reported outcome and experience measures				●	●
Communication with GP				●	●
Refer to palliative care service	●	●	●	●	●

Option 2: Nurse-led models including clinics and home visits

These models focus on partnering with primary and tertiary services. They provide support for self-management (such as medication, daily weight, fluid management), early post-discharge care (within 1 - 2 weeks) and ongoing management in the community. The evidence shows that using these approaches reduces hospital readmission and improves quality of life. These models are suitable for adoption in all facilities across NSW.

	Clinic visit	Admit to ward	Community
Promote awareness of clinic, location, referral criteria, hours and objectives to GPs and health providers	●	●	●
Enrol in heart failure program	●	●	●
Medication review	●	●	●
Support for self-management	●	●	●
Patient reported outcome and experience measures			●
Communication with GP	●		●
Refer to palliative care service	●	●	●

Option 3: Virtual health model

Models of care that use virtual wards, hospital in the home (HITH) and remote telemonitoring can be combined with other models of care. They are suitable for adoption in all facilities. A large number of sites currently use virtual models to deliver care for people with CHF.

	Emergency department	Early admission	Late admission	Transition to discharge	Community
Telehealth	●	●	●	●	●
Remote monitoring (education for patients on what to expect, how to use the system and contact staff)				●	●
Telephone support				●	●
Support for self-management		●	●	●	●
Patient reported outcome and experience measures				●	●
Communication with GP				●	●
Refer to palliative care service	●	●	●	●	●



ACL_0241_ (09/20; ACI/D20/2704)

Appendix 4

Organisational models for chronic obstructive pulmonary disease

NSW Health

Leading Better Value Care

Chronic obstructive pulmonary disease Organisational models

This document provides decision-makers with options to improve care in different service delivery settings. Building on *Chronic obstructive pulmonary disease: Clinical priorities* (2017) which described *what* to improve, the focus here is on *how* to improve care. Together these documents are informed by: research evidence about best clinical care and the effectiveness of different delivery models; empirical evidence about current service delivery levels; experiential evidence from clinicians and patients.

IMPROVING KEY PRIORITY AREAS



Diagnostic testing

- Establish local policies and procedures for spirometry including:
 - Training and capability building
 - Correct operator technique
 - Incorporation into patient flow processes
 - Establish a 'spirometry champion'
 - Bluetooth and Cerner interface capability in new purchases
 - Automated integration of results into the eMR



Exacerbation management

- Perform arterial blood gases to assess acute respiratory failure
- Educate staff about local policies and procedures to ensure appropriate non-invasive ventilation (NIV) and oxygen (O₂)
- Use NIV and O₂ prescription modules in eMR
- Establish an 'O₂ champion'
- Build medication device technique checks into patient flow processes



Ongoing care

- Hold regular multidisciplinary meetings to review and refer high risk patients to chronic disease management services supporting discharge
- Ensure patient flow processes include assessment and referral to pulmonary rehabilitation
- Build discharge communication with GP into patient flow processes



Last year of life

- Establish breathlessness clinics
- Prevent presentations to emergency departments (EDs) and unnecessary admissions through the use of rapid review clinics
- Enhance quality of life through early referral to palliative care and extended symptom management
- Establish joint respiratory/palliative care treatment models to optimise management

IMPROVING THE OVERALL PATIENT JOURNEY

- Consider the continuum of care for patients with COPD and plan for other determinants of health that impact on patient outcomes
- Support health literacy and provide education to patients, enabling self-management
- Coordinate care, reducing fragmentation of services (particularly for patients with comorbid conditions)
- Incorporate the general practitioner (GP) as an integral part of the patient's care journey
- Establish data collection and monitoring through audit and feedback processes
- Measure and act upon patient reported experience and outcome measures (PROMIS-29 and COPD Assessment Test (CAT))



NSW Health **Leading Better Value Care**

● Potential location(s) for implementation

OPTIONS FOR ORGANISATIONAL CONFIGURATIONS

A coordinated multidisciplinary team-based approach delivers core components of care. The options below outline different organisational models which sites can use to tailor their clinical services to fit with local requirements. Larger hospitals may have both models in use, smaller hospitals require ED protocols that ensure evidence based diagnostic testing, and appropriate transfers for more severe cases.

Option 1: Respiratory coordinated care program

Hospital-based community programs that span hospital and community care. A specialised hospital-based community program, it also assists people with end-stage lung disease to stay in their homes. Its goal is to coordinate care, reduce unplanned admissions and strengthen transition of care from hospital to community. This model is suitable for adoption in metropolitan and regional facilities.

	Emergency department	Early admission	Late admission	Transition to discharge	Community
Referral to respiratory coordinated care program (RCCP)		●	●	●	●
Case finding	●		●	●	
Refer to multidisciplinary team		●	●	●	●
Ensure correct inpatient management	●	●	●	●	
Immunise				●	●
Home medicine review				●	●
Discuss advance care plan	●	●	●	●	●
Discuss resuscitation plan	●	●	●	●	●
Communication with GP	●	●	●	●	●

Option 2: Nurse-led models of care

Nurse-led models of care, or nurse navigators, provide services for patients with complex health conditions who require coordinated, comprehensive care. The nurses are highly experienced. Nurse navigators work across system boundaries in close partnership with patients, multiple health specialists and health service stakeholders. Patients with very low health literacy, comorbid conditions and multiple returns to acute care benefit most from these services, which focus on hospital avoidance. This model is suitable for adoption in all facilities across NSW.

	Emergency department	Admit to ward	Community
Promote awareness of service, location, referral criteria, hours and objectives to GPs and acute care staff	●	●	●
Enrol in nurse navigation program	●	●	
Medication review		●	●
Communication with GP		●	●
Support for self-management			●
Communication with GP	●	●	●

Option 3: Virtual health model

Models of care that use virtual wards, hospital in the home (HITH) and remote telemonitoring. Can be combined with either of the above models of care. This model is suitable for adoption in all facilities across NSW.

	Emergency department	Early admission	Late admission	Transition to discharge	Community
Telehealth	●	●	●	●	●
Remote monitoring				●	●
Telephone support	●	●	●	●	●
Support for self-management	●	●	●	●	●



ACL_0242 (07/19; ACI/D19/3878)

Appendix 5

Concordance between 3Ci and the CHF and COPD key priority improvement areas

Table 1: 3Ci principles (Care, Collaboration, Clinical intervention, improving health literacy) are applied across each care delivery framework component by the 3Ci clinician

3Ci care delivery component	Components of the NSW CHF clinical priorities and organisational models that 3Ci will deliver	Components of the NSW COPD clinical priorities and organisational models that 3Ci will deliver
Consultation, liaison and advice	<p>Diagnostics</p> <ul style="list-style-type: none"> cardiology review echocardiogram chest X-ray pathology <p>Ongoing management</p> <ul style="list-style-type: none"> referral to chronic disease management programs ongoing multidisciplinary team management <p>End of life</p> <ul style="list-style-type: none"> palliative management 	<p>Diagnostics</p> <ul style="list-style-type: none"> spirometry <p>Exacerbation management</p> <ul style="list-style-type: none"> controlled delivery of oxygen appropriate use of non-invasive ventilation (NIV) <p>Ongoing management</p> <ul style="list-style-type: none"> referral to chronic disease management programs communication to support transfer of clinical information ongoing multidisciplinary team management <p>End of life</p> <ul style="list-style-type: none"> palliative management
Acute inpatient in-reach during admission to hospital	<p>Diagnostics</p> <ul style="list-style-type: none"> cardiology review echocardiogram chest X-ray pathology <p>Exacerbation management</p> <ul style="list-style-type: none"> targeted oxygen therapy <p>Ongoing management</p> <ul style="list-style-type: none"> ongoing multidisciplinary team management <p>End of life</p> <ul style="list-style-type: none"> palliative management 	<p>Diagnostics</p> <ul style="list-style-type: none"> spirometry <p>Exacerbation management</p> <ul style="list-style-type: none"> controlled delivery of oxygen appropriate use of non-invasive ventilation (NIV) <p>Ongoing management</p> <ul style="list-style-type: none"> communication to support transfer of clinical information ongoing multidisciplinary team management <p>End of life</p> <ul style="list-style-type: none"> palliative management

3Ci care delivery component	Components of the NSW CHF clinical priorities and organisational models that 3Ci will deliver	Components of the NSW COPD clinical priorities and organisational models that 3Ci will deliver
Home visiting	<p>Diagnostics</p> <ul style="list-style-type: none"> heart failure management assessment <p>Ongoing management</p> <ul style="list-style-type: none"> communication to support transfer of clinical information ongoing multidisciplinary team management <p>End of life</p> <ul style="list-style-type: none"> palliative management 	<p>Diagnostics</p> <ul style="list-style-type: none"> spirometry <p>Exacerbation management</p> <ul style="list-style-type: none"> controlled delivery of oxygen appropriate use of non-invasive ventilation (NIV) <p>Ongoing management</p> <ul style="list-style-type: none"> communication to support transfer of clinical information ongoing multidisciplinary team management <p>End of life</p> <ul style="list-style-type: none"> palliative management
Virtual care	<p>Diagnostics</p> <ul style="list-style-type: none"> cardiology review <p>Ongoing management</p> <ul style="list-style-type: none"> communication to support transfer of clinical information ongoing multidisciplinary team management <p>End of life</p> <ul style="list-style-type: none"> palliative management 	<p>Ongoing management</p> <ul style="list-style-type: none"> communication to support transfer of clinical information ongoing multidisciplinary team management <p>End of life</p> <ul style="list-style-type: none"> palliative management

3Ci care delivery component	Components of the NSW CHF clinical priorities and organisational models that 3Ci will deliver	Components of the NSW COPD clinical priorities and organisational models that 3Ci will deliver
Partnerships with local GPs and general practice teams	Diagnostics <ul style="list-style-type: none"> • cardiology review • echocardiogram • chest X-ray • pathology Exacerbation management <ul style="list-style-type: none"> • prescription of evidence-based medicines Ongoing management <ul style="list-style-type: none"> • communication to support transfer of clinical information • ongoing multidisciplinary team management End of life <ul style="list-style-type: none"> • palliative management 	Diagnostics <ul style="list-style-type: none"> • spirometry Ongoing management <ul style="list-style-type: none"> • communication to support transfer of clinical information • ongoing multidisciplinary team management End of life <ul style="list-style-type: none"> • palliative management
CHF and COPD specialist input in care	Diagnostics <ul style="list-style-type: none"> • cardiology review • echocardiogram • chest X-ray • pathology Exacerbation management <ul style="list-style-type: none"> • prescription of evidence-based medicines • pathology End of life <ul style="list-style-type: none"> • palliative management 	Diagnostics <ul style="list-style-type: none"> • spirometry Exacerbation management <ul style="list-style-type: none"> • controlled delivery of oxygen • appropriate use of non-invasive ventilation (NIV) End of life <ul style="list-style-type: none"> • palliative management
Multidisciplinary care	Exacerbation management <ul style="list-style-type: none"> • targeted oxygen therapy • prescription of evidence-based medicines Ongoing management <ul style="list-style-type: none"> • ongoing multidisciplinary team management End of life <ul style="list-style-type: none"> • palliative management 	Exacerbation management <ul style="list-style-type: none"> • controlled delivery of oxygen • appropriate use of non-invasive ventilation (NIV) Ongoing management <ul style="list-style-type: none"> • ongoing multidisciplinary team management End of life <ul style="list-style-type: none"> • palliative management

3Ci care delivery component	Components of the NSW CHF clinical priorities and organisational models that 3Ci will deliver	Components of the NSW COPD clinical priorities and organisational models that 3Ci will deliver
Partnerships with heart failure rehabilitation and pulmonary rehabilitation services	<p>Exacerbation management</p> <ul style="list-style-type: none"> targeted oxygen therapy <p>Ongoing management</p> <ul style="list-style-type: none"> ongoing multidisciplinary team management 	<p>Diagnostics</p> <ul style="list-style-type: none"> spirometry <p>Exacerbation management</p> <ul style="list-style-type: none"> controlled delivery of oxygen <p>Ongoing management</p> <ul style="list-style-type: none"> pulmonary rehabilitation ongoing multidisciplinary team management
Action planning and patient-centred care that can be adjusted in real time	<p>Diagnostics</p> <ul style="list-style-type: none"> cardiology review echocardiogram chest X-ray pathology <p>Exacerbation management</p> <ul style="list-style-type: none"> prescription of evidence-based medicines <p>Ongoing care</p> <ul style="list-style-type: none"> communication to support transfer of clinical information ongoing multidisciplinary team management <p>End of life</p> <ul style="list-style-type: none"> palliative management 	<p>Diagnostics</p> <ul style="list-style-type: none"> spirometry <p>Exacerbation management</p> <ul style="list-style-type: none"> controlled delivery of oxygen appropriate use of non-invasive ventilation (NIV) <p>Ongoing care</p> <ul style="list-style-type: none"> pulmonary rehabilitation communication to support transfer of clinical information ongoing multidisciplinary team management <p>End of life</p> <p>palliative management</p>
Improving health literacy	Patient-centred education that is timely, culturally appropriate and aligns with their health literacy level to improve self-management	Patient-centred education for patients with high comorbidities or low health literacy improves self-management, reduces readmission and length of stay
Routine data reporting and review	Support quality improvement by establishing routine audit and feedback processes	Establish data collection and monitoring through audit and feedback processes

Glossary

ACI Cardiac Network	A network of clinicians working towards improving patient outcomes and access to cardiac services across NSW. ²⁹
ACI Respiratory Network	A network of clinicians working towards improving patient outcomes and access to respiratory services across NSW. ³⁰
Action plan	An individually tailored plan which assists people living with CHF or COPD in recognising when their symptoms change and outlines what action they should take. ^{21,22}
Call to action	What action to take and when to take it.
Exemplar site	Sites providing a service that aligns with the 3Ci model of care principles with available data to demonstrate their success.
General practice teams	General practice teams are dependent on the business model of individual general practices. They can encompass GPs, general practice nurses, pharmacists, allied health clinicians, and administrative staff.
Guideline-based care	Clinical care according to Australian evidence-based guidelines for CHF ⁷ and COPD ⁸ .
Health literacy	How people access, understand, appraise and apply health information in order to make decisions about their health. Health literacy includes both disease knowledge and systems navigation. ²⁶
HealthPathways	Web-based portal for primary care that offers referral advice, resources and pathways for clinical management. ³¹
Heart failure rehabilitation	Any rehabilitation program that includes heart failure specific exercise therapy, education and/or psychological support for people with limited exercise tolerance attributable to CHF.
Integrated care	NSW Health Statewide initiatives focused on coordinating care between health providers to provide seamless, effective and efficient care. ²⁷
Length of stay	Duration of a single hospital admission episode.
Multidisciplinary care	Care delivered by various professionals based on a patient's clinical and social needs.
Patient-reported measures (PRMs)	Measures that capture information via surveys that ask patients about their healthcare experiences and the outcomes of their care. ³²
Patient-centred care	Holistic care that considers the social, psychological, societal and cultural factors affecting a person and their healthcare journey. ³³
Planned episode of care	An episode of care arranged in advance.
Potentially preventable hospitalisations	Unplanned hospital admissions that could potentially have been prevented with effective, timely outpatient care before admission. ²⁰

Pulmonary rehabilitation	Any in-patient, out-patient, community-based or home-based rehabilitation program of at least four weeks' duration that includes exercise therapy with or without any form of education and psychological support delivered to patients with exercise limitation attributable to COPD. ²⁵
Quality of life	An individual's perceived physical and mental health over time. ³⁴
Readmission	Readmission to the same hospital, or a different hospital, within 30 days following discharge from hospital for an acute care admission. ³
Rehabilitation	Pulmonary or heart failure rehabilitation programs.
Social determinants of health	Social factors that affect health outcomes. ³⁵
Unwarranted clinical variation	Variation that can only be explained by differences in health system performance. ³⁶
Value-based healthcare	Care in NSW that improves health outcomes that matter to patients, experiences of receiving care, experiences of providing care, effectiveness and efficiency of care. ³⁷

Acknowledgements

The 3Ci Model of Care Taskforce

The ACI 3Ci model of care team would like to thank and acknowledge the work of the 3Ci Model of Care Taskforce, and in particular extend their thanks to the Co-Chairs of the taskforce (Professor Andrew Sindone and Mr John Harrington). The contributions and expert guidance of the taskforce have been fundamental to the development of 3Ci. The members of the 3Ci Model of Care Taskforce are:

Professor Andrew Sindone	3Ci Taskforce Cardiac Co-Chair Director Heart Failure Unit and Department of Cardiac Rehabilitation (Cardiologist), Sydney and Northern Sydney LHD
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Marcelle Appay	Cardiology Pharmacist – Hunter New England LHD

The 3Ci model of care deliberative workshop participants

The ACI 3Ci model of care team would like to thank and acknowledge the experts who participated in the 3Ci model of care deliberative workshop. The workshop was held over half a day on 15 January 2021. The deliberations and expert consensus reached by the participants were integral to further defining the care delivery components of 3Ci. The expert participants in the 3Ci model of care deliberative workshop included all members of the 3Ci Model of Care taskforce and these additional attendees:

Professor Peter Wark	Staff Specialist (Respiratory Physician) – Hunter New England LHD The Centre for Healthy Lungs - Hunter Medical Research Institute
Dr Gayathri Kumarasinghe	Consultant Cardiologist – South Western Sydney LHD Conjoint Senior Lecturer, Faculty of Medicine, University of NSW Conjoint Clinical Faculty, Victor Chang Cardiac Research Institute
Dr Upal Liyanage	Geriatrician – Nepean Blue Mountains Local Health District
Dr Tracy Smith	Staff Specialist (Respiratory Physician) – Western Sydney LHD
Dr Dan Ewald	General Practitioner and Public Health Physician – Lennox Head Medical Centre, Bullinah Aboriginal Health Service Adjunct A/Professor Sydney University Medical School, Northern Rivers University Centre for Rural Health.
Jane Cotter	Nurse Practitioner (Chronic Care) – Southern NSW LHD
Maria Sheehan	Nurse Practitioner (Heart Failure) – St Vincent’s Health Australia
Anne-Maree Cheffins	Nurse Practitioner (Chronic Disease and Rural Emergency) - Northern NSW LHD-MPS Network
Professor Christine Jenkins	Head, Respiratory Group, The George Institute Professor of Respiratory Medicine, University of NSW Sydney Clinical Professor, Department of Thoracic Medicine, Concord Hospital
Professor Jenny Alison	Professor of Respiratory Physiotherapy – Sydney LHD and University of Sydney
Dr Sally Wootton	Clinical Specialist Physiotherapist - Chronic Disease Community Rehabilitation Service (CDCRS) - Pulmonary & Heart Failure Rehab Macquarie Hospital

Expert peer reviewers

The ACI 3Ci model of care team would like to thank and acknowledge the experts who provided peer review of the 3Ci model of care. Their time, talents and expertise have been instrumental in refining the 3Ci model of care. The expert peer reviewers for the 3Ci model of care were:

Annabel Hickey	Statewide coordinator heart failure services – QLD
Professor Anne Holland	Professor of Physiotherapy, Monash University and Alfred Health – VIC
Dr Gary Deed	General Practitioner, Chair, Diabetes Specific Interest Network RACGP, Adjunct Senior Research Fellow Monash University – QLD
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Dr Kerry Hancock	General Practitioner, BMBS (Flin) RACGP (Hon), Chandlers Hill Surgery – SA
Ros Rolleston	Primary care nurse educator and facilitator, Sessional Academic, University of Wollongong – NSW
Professor Trish Davidson	Dean, John Hopkins School of Nursing – USA Vice-Chancellor, University of Wollongong (from May 2021) – NSW

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The ACI's clinical networks, institutes and taskforces are chaired by senior clinicians and consumers who have a keen interest and track record in innovative clinical care.

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