

TITLE

The Chronic Care Model and chronic condition self-management: an introduction for audiologists

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ABBREVIATIONS

ACE = Active Communication Education

CCM = Chronic Care Model

CDSMP = Chronic Disease Self-Management Program

HHC = hearing health care

HL = hearing loss

HRQoL = health-related quality of life

ABSTRACT

Hearing health care is biomedically focused, device-centered, and clinician-led. There is emerging evidence that these characteristics – all of which are hallmarks of a health care system designed to address acute, rather than chronic, conditions – may contribute to low rates of help-seeking and hearing rehabilitation uptake among adults with hearing loss. In this review, we introduce audiologists to the Chronic Care Model, an organizational framework that describes best-practice clinical care for chronic conditions, and suggest that it may be a viable model for hearing health care to adopt. We further introduce the concept of chronic condition self-management, a key component of chronic care that refers to the knowledge and skills patients use to manage the effects of a chronic condition on all aspects of daily life. Drawing on the chronic condition evidence base, we demonstrate a link between the provision of effective self-management support and improved clinical outcomes and discuss validated methods with which clinicians can support the acquisition and application of self-management skills in their patients. We examine the extent to which elements of chronic condition self-management have been integrated into clinical practice in audiology and suggest directions for further research in this area.

LEARNING OBJECTIVES

As a result of this activity, the participant will be able to: (1) compare and contrast the characteristics of the current hearing health care system with the Chronic Care Model; (2) define the complementary concepts of self-management and self-management support; and (3) describe ways in which self-management support could be integrated into clinical practice in audiology.

KEYWORDS

aural rehabilitation, Chronic Care Model, chronic condition, hearing loss, self-management

CEU QUESTIONS AND ANSWERS

1. Current clinical practice in hearing health care can be broadly characterized as:
 - (a) delivered only by audiologists
 - (b) expensive but patient-centered
 - (c) focused primarily on patients' psychosocial concerns
 - (d) biomedically focused, device-centered, and clinician-led**
 - (e) based on the Chronic Care Model
2. The Chronic Care Model was developed because:
 - (a) a large number of military personnel returned home from World War II with noise-induced hearing loss
 - (b) the health care system was originally designed to address acute conditions and was therefore inadequate to manage chronic conditions**
 - (c) doctors could not find cures for common diseases
 - (d) patients belonging to a diabetes advocacy group lobbied the government for better care, which triggered a change in health policy
 - (e) it was mandated by the Health Insurance Portability and Accountability Act
3. The term "self-management" refers to:
 - (a) the knowledge and skills that are used by a patient to manage the effects of a chronic condition on all aspects of everyday life**
 - (b) only the set of skills that are needed to carry out a specific treatment or rehabilitation strategy
 - (c) a model of care in which patients lead their own group aural rehabilitation programs
 - (d) a hearing health care provider who owns his or her own clinic
 - (e) an integral component of care for acute health conditions
4. According to Lawn and Schoo, the three components of effective self-management support are:
 - (a) collaborative goal-setting, educational handouts, and adherence to treatment
 - (b) collaborative goal-setting, skill development, and regular check-ups
 - (c) ongoing individualized assessment, collaborative goal-setting, and skill development**
 - (d) ongoing individualized assessment, measurement of treatment outcomes, and inclusion of a family member when setting goals
 - (e) skill development, joining a support group, and eating a healthy diet

5. Why might hearing health care professionals want to consider adopting a model of service delivery that is designed for chronic conditions?
- (a) permanent hearing loss is a chronic condition
 - (b) recent research suggests that characteristics of the current hearing health care system, such as its biomedical focus and emphasis on technology, may be contributing to low rates of help-seeking and hearing aid uptake
 - (c) the Chronic Care Model supports interventions to address the psychosocial difficulties that arise from living with a chronic condition, which are often overlooked in current clinical practice in audiology
 - (d) empowering a patient to self-manage a chronic condition more effectively has been shown to improve health outcomes and quality of life
 - (e) **all of the above**

The Chronic Care Model and chronic condition self-management: an introduction for audiologists

INTRODUCTION

Only a minority of adults with hearing loss (HL) seek help for their hearing problems and take up hearing rehabilitation.¹⁻³ The majority of the research into hearing help-seeking, hearing aid and aural rehabilitation uptake, and hearing aid retention and use has focused on the individual patient characteristics, attitudes, and beliefs that are associated with these behaviors.⁴⁻⁸ However, there is emerging evidence that the characteristics of the hearing health care (HHC) system itself – which has a biomedical focus, emphasizes technological interventions, and typically aligns with a clinician-led style of patient care – also contribute to low rates of hearing help-seeking and rehabilitation uptake and use.⁹⁻¹² In this review, we examine this evidence and use it as a rationale for exploring the feasibility of an alternative model of service delivery in order to improve HHC utilization and patient outcomes. The review is structured around the following questions: What are the characteristics of the existing HHC service delivery model? What are the implications of viewing HL within the context of a service delivery model designed to serve patients with chronic conditions? What are the key components of such a model? What is the evidence for chronic condition self-management and its effect on patient outcomes? To what extent have these principles already made inroads into HHC, and how can we build on that foundation in future research?

HOW IS ADULT HEARING REHABILITATION CURRENTLY DELIVERED?

HL is the most prevalent sensory impairment¹³ and the third leading cause of years lost to disability worldwide.^{14,15} Disabling HL, defined by the World Health Organization as a four-frequency (0.5, 1, 2, and 4 kHz) pure-tone average that exceeds 40 dB HL in the better ear, is estimated to affect 538 million people globally over the age of 15 years.¹⁶ HL has a wide range of significant consequences beyond a reduction in peripheral auditory sensitivity. Among older adults, HL is associated with such psychosocial effects as depression,¹⁷⁻²⁰ isolation and social withdrawal;^{18,20,21} somatization,²² and cognitive impairment.^{17,23-25} Studies of older adults have further demonstrated that individuals with bilateral HL have poorer physical health-related quality of life (HRQoL) than do those with normal hearing, and that self-reported physical HRQoL declines as the degree of HL increases.^{26,27} Among adults of working age, HL is additionally associated with poorer levels of educational attainment, diminished vocational prospects, and reduced earning power over the lifespan.^{26,28-30}

The standards of care endorsed by leading professional bodies acknowledge the wide-ranging effects of HL and thus recommend a comprehensive and multidimensional care process with consideration given to the patient's physiological, communicative, behavioral, and psychosocial needs.³¹⁻³³ In practice, however, disproportionate attention is paid to the biomedical nature of the HL at nearly every stage of the clinical pathway, beginning with the initial clinical encounter. Grenness et al. examined patient-audiologist interaction patterns by recording and analyzing 63 initial consultations.³⁴ Communication dynamics were analyzed with the Roter Interaction Analysis System, a quantitative method grounded in the idea that patient-clinician dialogue shapes the therapeutic relationship and provides insight into the nature of that relationship, particularly with respect to issues of power, control, and informational exchange.³⁵ Grenness et al. reported that the case histories obtained by the

audiologists in that study tended to be weighted toward the identification of underlying biomedical issues, such as past episodes of otalgia or otitis media.³⁴ Proportionally fewer questions pertaining to the patient's psychosocial or functional difficulties were posed, which may communicate to the patient at the outset that the problems arising from HL should be defined primarily in biomedical terms.

The application of a biomedical framework to the clinical decision-making process is reaffirmed throughout subsequent clinical activities.^{9,36,37} Not only is a large proportion of the initial assessment devoted to quantifying the degree, type, and symmetry of a patient's HL, but two recent studies have demonstrated that the results of the assessment also tend to be communicated to the patient in predominantly biomedical terms.^{36,37} In those studies, clinicians typically explained the diagnosis of HL to their patients by describing the audiogram, rather than by discussing its functional and psychosocial implications. A recent study conducted by Ekberg et al. suggested that the clinician's view of HL as a primarily biomedical concern is at odds with the way patients perceive their own hearing difficulties.⁹ In that study, the corpus of 63 patient-audiologist interactions from Grenness et al.³⁴ were analyzed with conversational analysis, a technique in which both verbal and non-verbal communication is examined with the aim of understanding social interaction. Ekberg et al. reported that patients routinely raise psychosocial concerns of their own volition within a typical clinical encounter, and will persist in doing so even in the face of efforts by the audiologist to redirect the conversation toward a discussion of hearing aids.⁹ Indeed, the psychosocial and functional issues arising from HL have been shown in many studies to be among the major drivers of help-seeking.^{4,7,38-41} Further, Ekberg et al. found that when psychosocial concerns were left unaddressed by the audiologist, the patient often declined hearing aids.⁹ Even if the patient did agree to take up amplification, which was often the case

for the patients in that study whose hearing aids were subsidized by a government program, patients who did not have their psychosocial concerns addressed by the audiologist expressed less commitment to hearing aid use, leading the authors to speculate that clinician behavior could have consequences for longer-term hearing aid use and retention.

A robust body of research has established that at least for patients with mild to moderately severe HL, hearing aids are a cost-effective intervention^{42,43} that reduce activity limitations and participation restrictions and improve HRQoL.⁴⁴⁻⁴⁶ However, hearing aids alone do not adequately address the full range of difficulties that can arise from a HL, particularly those of a psychosocial nature. Aural rehabilitation, counseling, and communication programs are all examples of non-technological interventions in HHC whose positive outcomes are supported by evidence,⁴⁷⁻⁵⁰ but they are not routinely offered by audiologists.⁵¹ Conversational analysis of patient-clinician communication patterns has demonstrated that audiologists tend to base their rehabilitative recommendations almost exclusively in terms of the technological benefits of hearing aids, irrespective of the patient's interest in, or receptivity to, that option.⁹ Studies that have investigated the patient's perception of HHC services confirm these findings.

Despite the fact that there is greater acceptance of an intervention when the patient is offered the opportunity to choose from a range of options,^{52,53} hearing aids are often the sole intervention offered by audiologists, with individual patient preferences rarely explored.^{10,12}

The focus on technology means that counseling in an audiologic rehabilitation context becomes more informational than empathic, with an emphasis on teaching the patient how to manage the practical aspects of using hearing aids rather than ensuring the patient acquires the skills necessary to manage the HL and its functional and psychosocial effects more broadly.^{9,10} The consequences of informationally focused counseling were explored by Kelly et al., who convened a series of eight patient focus groups to determine what kind of support

patients thought was necessary to become a successful hearing aid user and the extent to which they believed they had received such support from the HHC professionals they encountered.¹² The 31 older adults with HL who participated in the focus groups, approximately half of whom were experienced hearing aid users, perceived deficiencies in their care both pre- and post-fitting. In particular, they highlighted a need for professional support in managing the psychosocial issues associated with HL, such as coming to terms with and accepting the loss, and navigating the functional aspects of living with a HL, such as acclimatizing to the presence of new sounds and employing communication strategies in challenging listening environments.

Many aspects of the clinician-patient relationship described above – most notably the clinician’s agenda taking precedence over the patient’s individual goals and the lack of shared decision-making when choosing a rehabilitation strategy – suggest that clinical practice in audiology is clinician-led rather than patient-centered. Patient-centered care refers to the idea that it is the patient, not the health condition, who is being treated.⁵⁴ Patient-centered care is conceptualized as an equal partnership between the patient and clinician in which health care is provided in a “holistic, individualized, respectful, and empowering” manner.⁵⁵ It is diametrically opposed to a paternalistic, clinician-led style of practice, in which the patient is largely a passive recipient of treatment. Surveys conducted in Australia,⁵⁶ Portugal,⁵⁷ India,⁵⁷ Iran,⁵⁷ and Malaysia⁵⁸ have revealed that while audiologists express an overall preference for, and theoretical understanding of, patient-centered care, they do not necessarily practice in accordance with this belief. For example, participants in Kelly et al.’s patient focus groups frequently described clinical encounters in which the audiologist implicitly assumed that they would take up hearing aids, rather than explicitly soliciting their views.¹² The power imbalance in the clinician-patient relationship may have meant that

patients thus felt pressured to accept the audiologist's recommendation, regardless of their actual willingness to take up and use hearing aids. Even clinical practice that appears patient-centered may, in fact, not be. Pryce et al. observed six clinician-patient dyads and analyzed their interactions using a constant comparison method of grounded theory, an inductive process in which concepts and theory are informed by the data collected. They found that the majority of clinicians explicitly invited patient participation in the decision-making process.¹⁰ However, the audiologists provided no pertinent information upon which the patient was expected to base intervention decisions beyond the audiologist's own views, thus biasing the decision in favor of the audiologist's recommendation. Further, the patient's willingness to pursue hearing rehabilitation was often interpreted by the audiologist as a preference specifically for hearing aids.

What are the consequences of clinician-led practice in audiology? Poost-Foroosh et al. convened a series of patient and clinician focus groups in which participants were invited to identify aspects of clinical practice they believed would influence hearing aid uptake.¹¹ Twelve patients and seven audiologists took part in an initial brainstorming session in which a list of potential factors was generated; a group of 11 patients and 10 audiologists, some of whom had participated in the brainstorming session, sorted and rated the list of factors according to theme and perceived importance. Following initial analysis of the data by the experimenters, four patients and three audiologists, all of whom had participated in at least one of the previous sessions, assisted with interpreting and naming the themes that had been developed in the second session. Patients and clinicians both reported that the likelihood of hearing aid uptake would increase if the clinician valued what was important to the patient, tailored rehabilitation recommendations to the needs of the individual patient, and worked to build rapport with the patient, all of which are characteristics of patient-centered care. While

the relationship between patient-centered care and patient outcomes in an audiology context is not yet fully understood, studies conducted in other areas of health care have demonstrated that patient-centered care improves adherence to the recommended treatment or rehabilitation strategy,^{59,60} patient satisfaction with the clinical encounter,⁶⁰⁻⁶² health outcomes,^{63,64} and quality of life.⁶⁵

The three themes of current clinical practice in audiology – the application of a biomedical framework to the assessment and management of HL, the lack of rehabilitative choices offered to the patient, and the provision of clinician-led rather than patient-centered care – are all hallmarks of a health care system designed to address acute health conditions on an episodic basis.⁶⁶ Indeed, participants in an international study of patients' views of hearing help-seeking and rehabilitation characterized their interactions with the HHC system as “isolated events rather than chronologically ordered steps... relating to a common goal,”⁴⁰ despite the frequent conceptualization of hearing rehabilitation in the audiology literature as a “journey.” In the next section, we distinguish between acute and chronic conditions and introduce a clinical service delivery model that is specifically designed to address the latter.

WHAT IS THE CHRONIC CARE MODEL?

The Chronic Care Model (CCM) was developed in response to the paradigm of service delivery that dominated much of twentieth-century health care, which, with its focus on acute and urgent illness, was ill-equipped to deal with the needs of individuals with chronic conditions.⁶⁶ Chronic conditions are those that are experienced on a long-term or permanent basis⁶⁷ and whose effects are merely controllable, rather than curable.^{68,69} The need for ongoing treatment and management is another key aspect of living with a chronic condition,

which may take the form of medical intervention, rehabilitation services, assistive devices, personal assistance, or a combination of these.⁶⁹⁻⁷¹ While chronic conditions have traditionally been thought of as referring only to physically disabling or life-threatening illnesses, such as arthritis, asthma, and diabetes, the definition also encompasses conditions that have a “psychological or cognitive basis”⁷⁰ as well as those, like HL, that produce impairments in sensory and communicative function.⁷² Within a traditional model of health care, complications and declines associated with a chronic condition may not be reliably detected; patients are encouraged to be passive recipients of treatment, rather than active participants; and the psychosocial effects of the chronic condition are rarely taken into account. As a result, an acute-focused strategy can result in suboptimal health outcomes for many individuals with chronic conditions.^{67,73}

In contrast, the CCM (Figure 1) emphasizes a collaborative relationship between clinicians and patients in which health care and self-care are viewed as complementary, rather than competing.⁶⁷ Wagner et al. characterized this relationship as “productive interactions [between the] informed, activated patient [and the] prepared, proactive practice team.”⁷⁴ Six elements are included in the model: the community, the health system, delivery system design, decision support, clinical information systems, and self-management support. The inclusion of the health system in the model highlights the fact that quality care for individuals with chronic conditions requires organizational support, rather than just interventions on an individual clinician or patient level.^{73,75} The four components of the health system – delivery system design, decision support, clinical information systems, and self-management support – refer to the clinical infrastructure required to deliver effective chronic condition care. The community component complements the health system by supporting or expanding upon the delivery of chronic care through community programs and advocacy groups. The CCM is not

specific to a particular chronic condition; instead, it emphasizes commonalities of experience across a wide range of conditions and individuals and is in line with the assertion that “whether manifestations are primarily physical or psychosocial, essentially all chronic conditions present a common set of challenges to the sufferers and their families.”⁶⁶

In a review of the CCM’s effectiveness in clinical practice, Bodenheimer found that while no individual element is essential to the model, self-management support was arguably the most critical.⁷⁶ Of the studies included in that review, all but one demonstrated improvement in patient outcomes when self-management support was a component of chronic condition care, regardless of the presence or absence of the other elements of the model. An important distinction must be drawn between the terms *self-management* and *self-management support*. Self-management refers to the roles and responsibilities of the patient in managing his or her chronic condition, whereas self-management support refers to the roles and responsibilities of the clinician in ensuring that these skills are acquired and applied.^{66,67} In the next two sections, we explore the concepts of self-management and self-management support in more depth.

WHAT IS CHRONIC CONDITION SELF-MANAGEMENT?

Self-management refers, broadly, to everything a patient knows and does to manage the effects of a chronic condition on his or her overall quality of life.^{77,78} Despite the seeming simplicity of this statement, self-management is a complex, multidimensional concept and there is no consensus on its precise definition or conceptual boundaries. One of the most comprehensive definitions, and thus a useful starting point, is that of Barlow et al., who define self-management as

“the individual’s ability to manage the symptoms, treatment, physical and psychosocial consequences, and lifestyle changes inherent in living with a chronic condition... to monitor one’s condition; and to effect the cognitive, behavioural, and emotional responses necessary to maintain a satisfactory quality of life. Thus, a dynamic and continuous process of self-regulation is established”⁷⁹

The reference to self-regulation highlights the definition’s grounding in Bandura’s social cognitive theory.^{80,81} Social cognitive theory describes the triadic interaction between personal (i.e. cognitive, affective, and biological), behavioral, and environmental factors that gives rise to the acquisition and maintenance of behavioral patterns. The theory states that each factor continuously and dynamically affects the other factors in the triad, a relationship referred to as reciprocal determinism.⁸² Within the theory, individuals are therefore viewed as proactive, rather than reactive, and capable of self-reflection and self-regulation. Social cognitive theory has been widely adopted in health care because it provides three possible avenues – personal, behavioral, and environmental – via which an intervention strategy can be delivered, with the expectation that the benefits of the intervention will then flow to the other domains.⁸³ Barlow et al.’s definition makes explicit the idea that self-management does not refer solely to the skills necessary to manage a condition-specific intervention,⁷⁹ such as the ability to inject oneself with insulin or to use and manage a hearing aid. Rather, self-management encompasses the broader range of knowledge, skills, and behaviors necessary to manage the effects of the chronic condition on all aspects of one’s life.^{68,84} In other words, self-management skills are necessarily multidimensional – encompassing physical, social, psychological, cognitive, behavioral, and emotional domains – since the effects of a chronic condition also extend to these areas. Finally, Barlow et al.’s definition describes self-management as a process.⁷⁹ Since chronic conditions are long-term or even lifelong experiences, so too are the strategies and actions necessary for its successful management.⁸⁵

A further addition to the concept of self-management is the idea that all chronic conditions are self-managed with a common or “generic” set of skills, regardless of the underlying physiological impairments caused by different conditions. This theory was first proposed by Clark et al., who reviewed the self-management literature for five chronic conditions: heart disease, asthma, chronic obstructive pulmonary disease, arthritis, and diabetes.⁷⁷ The review identified a set of self-management tasks that all five conditions had in common, including ongoing use and management of the prescribed intervention, maintaining physical and emotional health, monitoring for and responding to changes in condition severity, information- and support-seeking, and interacting with health care providers. Clark et al. noted that while the specific task may vary (e.g. using an inhaler for asthma but insulin injections for diabetes), the “essential nature” of the task (i.e. managing the medical aspects of the condition) remains the same.⁷⁷ At the time of the review, very few studies had examined self-management within a mixed population, but since then, the concept of a generic set of self-management skills that is applicable to all chronic conditions has gained considerable traction,⁸⁶⁻⁸⁹ and is now a key concept that underpins the CCM framework.

Drawing on all of these sources, we suggest that any useful and comprehensive definition of chronic condition self-management must first acknowledge the patient’s capacity for self-determination, namely the ability to exercise a measure of control over his or her health. This ability extends beyond the skills needed to manage or adhere to a specific health intervention and reaches into the domains of physical, psychosocial, communicative, and behavioral functioning, regardless of the specific nature of the chronic condition. Self-management should be considered a dynamic process, one that is exercised over the long-term or lifelong course of the chronic condition.

WHAT IS THE ROLE OF THE CLINICIAN IN SELF-MANAGEMENT SUPPORT?

Traditionally, clinical support has been primarily informational in nature, with a focus on educating patients about their health condition and teaching them the skills they need to manage a condition-specific treatment or intervention.⁷⁸ However, just as self-management is not simply managing and adhering to a particular treatment or rehabilitation strategy, self-management support is not restricted to the provision of information about the patient's condition or impairment. In an outline of the components necessary for successful self-management, Lorig and Holman state that the "formulation of a patient-clinician partnership"⁹⁰ is a key aspect of self-management, echoing the "productive interactions" between patients and clinicians that underlie the CCM.⁶⁶ Battersby et al. further emphasize the critical role of social and professional support in successful self-management, stating that "optimal self-management... involves working collaboratively with health professionals... and is the product of a partnership between the patient, the family, and health care providers."⁹¹

According to Lawn and Schoo, effective self-management support has three main components.⁸⁵ The first of these, ongoing individualized assessment, involves evaluating the patient's level of self-management skill as a basis for selecting individually appropriate self-management goals and interventions. Lawn and Schoo highlight the importance of conducting such assessments on a regular basis, not just at the time of diagnosis and the initiation of treatment, since patient needs and capabilities can fluctuate over time. The second component is collaborative goal-setting. Clinicians should not dictate patient activities; rather, clinicians and patients should work in partnership to develop individualized and realistic self-management goals. The third component is skill development, in which

clinicians provide the support that will assist patients in achieving their stated self-management goals. Skill development spans a wide range of topics and includes teaching patients how to “solve problems, make decisions, set goals, access available resources, cope with the emotional challenges of the chronic condition, and monitor and evaluate their own progress.”⁸⁵ Ultimately, self-management support necessitates the “fundamental transformation of the patient-clinician relationship into a collaborative partnership.”⁹² The conceptualization of self-management support as a collaborative partnership underscores the fact that the goal of self-management support is not to ensure that all patients achieve a uniform standard of self-management that has been chosen by the clinician, but to assist the patient in reaching his or her own self-defined goals and to move along a continuum toward optimal health and wellbeing.^{93,94}

Self-management support may be provided opportunistically, by integrating it into routine clinical care through the use of empathic communication, tailored information, and motivational interviewing techniques,^{85,91} or in a more structured format. In the next section we examine two evidence-based structured self-management support programs: one that focuses on assessment and goal-setting, and one that focuses on education and skill acquisition.

HOW CAN SELF-MANAGEMENT SUPPORT BE IMPLEMENTED IN CLINICAL PRACTICE?

Flinders Chronic Condition Management Program™

The Flinders Chronic Condition Management Program™ is a self-management program that sits, both conceptually and practically, within the framework of the CCM and prioritizes collaboration between clinicians and patients in the management of chronic conditions.⁹⁵ The program grew out of a coordinated care trial in which it was observed that service coordinators naturally provided coordinated care on the basis of patients' self-management skills, rather than the severity of their health condition.⁹⁶ Assessment of the patient's self-management is undertaken with two complementary tools, the Partners in Health scale⁹⁷⁻⁹⁹ and the Cue and Response interview.⁹⁷ As shown in Table 1, the Partners in Health scale contains 12 statements, each of which probes a different facet of self-management. Patients complete the scale independently, rating each item on a scale from 0 (*very little/never/not very well*) to 8 (*a lot/always/very well*). The Partners in Health scale aims to obtain the patient's view of his or her self-management skills without influence from the clinician. The Cue and Response interview, which focuses on the same 12 items as the Partners in Health scale, is completed collaboratively by the clinician and the patient (Table 1). During the interview, the clinician uses open-ended cue questions to elicit further information about each item. Based on the patient's responses to the cue questions, the clinician provides a rating from 0 to 8; the ratings of the patient and clinician are subsequently compared. At this point, the patient has the opportunity to revise his or her rating if the discussion has triggered a shift in perception. For example, the patient may realize, based on the clinician's feedback, that he or she manages more successfully than originally believed; conversely, the clinician's input may bring to light a previously unrecognized area of difficulty.

The Problems and Goals assessment and the Care Plan are used for goal-setting and management planning.¹⁰⁰ The Problem and Goals assessment distills the results of the Partners in Health scale and the Cue and Response interview into a single problem for the

patient to address. Patients are asked to identify what they see as their biggest problem, its impact on their life, and how the problem makes them feel. Problem severity is rated on a 0-8 scale; higher numbers indicate greater severity. Patients are next asked to nominate a medium- to long-term self-management goal that is specific, measurable, action-based, and realistic, which can be achieved over the subsequent 6-9 months. Progress toward goal achievement is rated on a 0-8 scale, with 0 representing no success and 8 representing complete success. The Care Plan begins with the patient's chosen problem and goal and lists a number of short-term goals and interventions that will ultimately lead to the achievement of the primary, longer-term goal.

Together, the Flinders Chronic Condition Management Program™ tools yield an assessment of a client's self-management skill and aid the clinician in the development of individualized, realistic, and achievable goals for enhancing self-management skills and effecting behavioral change. Figure 2 provides an example of how the tools could be used in the context of adult hearing rehabilitation. A key strength of the program is that its use is not restricted to a particular chronic condition. Efficacy of the program has been demonstrated for a diverse range of health conditions, including Type 1 diabetes,¹⁰¹ cardiovascular and respiratory diseases,^{102,103} mental illness,^{104,105} and arthritis.¹⁰⁶ A further strength is the program's inclusion of an assessment component. Although a wide range of interventions to improve self-management exist, there are few tools available with which the clinician can assess the patient's level of self-management skill. Additionally, the majority of the currently available self-management assessment tools – such as the Multiple Sclerosis Self-Management Scale¹⁰⁷ and the Mental Health Self-Management Questionnaire¹⁰⁸ – are condition-specific and are thus restricted in their use to the designated patient subgroup. One potential drawback is that use of the full suite of Flinders Chronic Condition Management Program™ tools is time-

intensive. Assessment of a patient with the Partners in Health scale and the Cue and Response interview can take up to half an hour, which could present a challenge to the time constraints imposed by routine clinical practice.⁸⁵ Given its stated focus on assessment and goal-setting, the Flinders Chronic Condition Management Program™ provides clinicians with the tools needed to support these processes, but not with the educational materials or interventions for improving self-management.¹⁰⁹ Indeed, the training materials for the Flinders Chronic Condition Management Program™ explicitly identify situations where clients should be referred to a lay-led course¹¹⁰ like the Chronic Disease Self-Management Program (CDSMP),¹¹¹ which is discussed in the next section.

Chronic Disease Self-Management Program

Unlike the Flinders Chronic Condition Management Program™, which focuses on individual self-management assessment and goal-setting, the CDSMP was initially designed as a group education program.⁹⁰ In its current form, the CDSMP is a lay-led, community-based self-management support program that aims to effect health behavior change.¹¹¹ The theoretical foundation of the CDSMP is Bandura's social cognitive theory, and is based on the idea that successful behavior change requires both a belief in one's own ability to perform the behavior (self-efficacy) and an expectation that enacting the behavior will assist in achieving the desired goal (outcome expectancy).^{81,83,112} The CDSMP program targets self-efficacy for self-management behaviors, rather than the behaviors themselves.⁹⁰ The content and format of the CDSMP was informed by Clark et al.'s identification of the generic self-management tasks that are believed to be common to all chronic conditions.⁷⁷ During the development of the CDSMP, these tasks were reviewed with a series of patient groups in which adults with a range of chronic conditions were asked to describe their condition and their beliefs about its

cause, reflect on the effects of their chronic condition on their lives and their feelings about them, and explain the problem-solving strategies they used to cope with these effects.¹¹³

The CDSMP is run as a weekly workshop of 12-16 patients that meets for six consecutive weeks for 2.5 hours per session and is facilitated by two trained leaders.¹¹⁴ The topics covered in the weekly sessions include goal-setting, problem-solving, physical and emotional management techniques, medication use and adherence, communication skills, decision-making, and information-seeking. The content of each session is tailored to the individual group in that participants create weekly action plans, discuss experiences, and assist each other in troubleshooting the problems they encounter in performing self-management activities. Two key characteristics make the CDSMP unique among self-management interventions. First, in line with the idea that managing any chronic condition requires a common set of skills, groups are composed of participants with a range of different conditions. Second, at least one of the two group facilitators must be a layperson who also has a chronic condition. Use of peers as group facilitators is consistent with the role of modeling, or “vicarious experience,” as an agent for improving self-efficacy within Bandura’s social cognitive theory.⁸³ In other words, when we observe another person succeeding at a task, particularly a person with whom we perceive we share common traits, our own self-efficacy for performing that task is thought to increase. Indeed, evidence has suggested that the peer-led nature of the CDSMP is the fundamental mechanism by which it serves to improve patients’ self-efficacy for self-management, since the group facilitators not only impart knowledge and skills, but serve as positive role models.¹¹¹ The use of peer facilitators is also thought to be less confronting than receiving formal, one-on-one instruction from a health professional.¹¹⁵ On the other hand, it has been suggested that the

structured group format of the CDSMP may make addressing individual needs a challenge and may invite negative social comparisons among group members.⁸⁵

WHAT IS THE EVIDENCE THAT IMPROVING SELF-MANAGEMENT LEADS TO IMPROVED PATIENT OUTCOMES?

Self-management support is a useful component of clinical practice to the extent that it is significantly associated with improved patient outcomes. In this section, we consider the evidence for the CDSMP and the Flinders Chronic Condition Management ProgramTM in the context of Lawn and Schoo's statement that effective self-management support has three components: (1) ongoing individualized assessment; (2) collaborative goal-setting; and (3) skill development.⁸⁵ Although it is considered best practice in chronic condition management to provide self-management support that includes all three components,^{66,92} the vast majority of self-management research has examined the outcomes achieved with the CDSMP, which focuses solely on the third component. Two of the most recent systematic reviews of this research, conducted by Franek and Foster et al., found small, though statistically significant, improvements in self-reported pain and fatigue, participation in exercise, and self-efficacy for self-management activities as a result of participation in the CDSMP.^{115,116} Small but significant effects on HRQoL and self-reported general health were reported by Franek,¹¹⁶ but not by Foster et al.¹¹⁵

Franek hypothesized that the small effect sizes frequently seen in systematic reviews of the CDSMP evidence could arise, at least in part, from the variable baseline levels of participants' self-management skills, since they are not formally assessed prior to commencement of the program.¹¹⁶ A systematic review conducted by Newman et al. suggests

that this could be a particularly important factor in studies that use psychological outcome measures, such as health distress, depression, and anxiety, to evaluate the CDSMP.¹¹⁷ Those patients who show little to no improvement on these measures may not have had clinically significant psychological symptoms upon commencement of the program. As a result, Franek and Newman et al. suggested that two major priorities of future self-management research should be to develop ways of better identifying who could benefit most from self-management support and to determine how self-management interventions should be best tailored to the individual patient.^{116,117} Studies that have used the Flinders Chronic Condition Management Program™ in conjunction with the CDSMP – thus adding the ongoing individualized assessment and collaborative goal-setting components to the skill development component of self-management support – suggest that this is a promising approach. In one study, Harvey et al. studied a group of 175 patients with a variety of chronic conditions, such as diabetes, arthritis, and chronic respiratory and cardiovascular disease, many of whom had multiple comorbidities.⁸⁸ Self-management was assessed with the Partners in Health scale and Cue and Response interview at baseline and at 6, 12, and 18 months. At the time of the initial self-management assessment, patients underwent an individual determination of their self-management goals and subsequent self-management interventions were tailored accordingly. The data were analyzed using random coefficient regression analysis, revealing significant and sustained improvements on 11 of the 12 items of the Partners in Health scale ($p < 0.0001$). Item 3, which probes adherence to treatment, was the only item that did not show significant improvement over time; scores on this item were already high at baseline for the majority of participants. Although only p values were reported for the health indicator data, they indicated significant improvements in self-reported general health, pain levels, level of frustration with their condition, fear about the future, and anxiety at the end of the 18-month study period ($ps < 0.05$).

A similar study, a randomized controlled trial undertaken with 77 Vietnam veterans with mental health conditions and a history of alcohol abuse, employed a similar protocol, using the Flinders Chronic Condition Management Program™ tools to assess self-management, collaboratively set goals, and provide tailored self-management support.¹⁰⁵ Self-management, as measured by the Partners in Health scale, was significantly improved by a mean of 12.1 points from baseline to 9 months ($p < 0.0001$) and 13.4 points from baseline to 18 months ($p < 0.0001$). Participants in the intervention group demonstrated significantly greater improvements on the primary outcome measure, a self-report questionnaire about risky alcohol use, relative to the control group ($p = 0.039$). Fifty-one percent of participants reported that they considered the problems identified at the initial assessment on the Problems and Goals assessment to be solved at 9 months, and 65% deemed their goals to be achieved at 9 months post-intervention. Both studies highlight the value of assessing a patient's self-management on a continuous basis and providing self-management interventions that are individually tailored to their needs and preferences.^{88,105} The efficacy of such an approach to self-management support is further supported by a recent systematic review that aimed to identify the specific attributes of successful self-management interventions. The review concluded that despite varying levels of effectiveness of different self-management interventions for different chronic conditions and different patient groups, the most successful interventions are: (1) multifaceted, including education about the condition and its treatment, strategies for managing psychosocial wellbeing, and social support; (2) tailored to the individual patient's needs, preferences, capabilities, beliefs, and health status; and (3) offered in the context of a collaborative patient-clinician relationship which is, in turn, embedded in an organizational culture that actively promotes and supports patient self-management.¹¹⁸

TO WHAT EXTENT HAS SELF-MANAGEMENT SUPPORT BEEN ADOPTED IN HHC?

Elements of self-management support have long been components of aural rehabilitation and communication programs. Such programs vary in content, but typically include information about HL and hearing aid use, communication strategies, speechreading tactics, relaxation and mindfulness techniques, and/or psychosocial support. A facilitated group setting has traditionally been considered the most cost-effective method of delivering aural rehabilitation, with the added benefit of enabling peer support and the exchange of ideas between group participants.^{49,119} For example, the Active Communication Education (ACE) program is a five-week facilitated group program in which participants learn problem-solving skills for use in challenging communicative situations.⁴⁸ Advances in technology have informed the delivery modes of more recently developed aural rehabilitation programs. An example is C2Hear, a library of interactive videos that address practical aspects of hearing aid management, adapting to amplification, and communication strategies.¹²⁰ Similarly, Thorén et al. have reported on an online rehabilitation program that incorporates ACE; self-paced learning; sessions with professionals to learn more about HL, hearing aids, and communication strategies; and chat rooms in which participants can communicate with peers.⁵⁰ A randomized controlled trial on 74 adult hearing aid users showed that participation in the online program resulted in significant improvements in self-reported communication skills relative to a control group that received only the self-paced learning component of the program.¹²¹ Notably, both the intervention and control groups reported significantly reduced hearing handicap relative to their pre-trial scores, suggesting that even participating in short or limited rehabilitation interventions can yield some benefit.

In keeping with the evidence base supporting the use of specific self-management interventions for other chronic conditions, aural rehabilitation programs have been shown in individual studies to improve psychosocial wellbeing,^{50,122} reduce activity limitations and participation restrictions,^{48,49} foster greater knowledge of HL and hearing aids,¹¹⁹ and improve quality of life.⁴⁷ However, systematic reviews of aural rehabilitation outcomes consistently conclude that the evidence base is weak.^{119,123,124} Two systematic reviews evaluated counseling-based programs offered in a facilitated group format. Both reviews concluded that while aural rehabilitation programs resulted in a reliable, statistically significant, short-term reduction in perceived degree of hearing handicap, the effect size was small.^{119,123} The results of a more recent systematic review, which restricted the focus to randomized controlled trials that employed HRQoL as an outcome measure, were inconclusive, with the authors stating that there was insufficient evidence at present to make a definitive statement regarding the effect of aural rehabilitation programs on HRQoL for adults with HL.¹²⁴ The authors of all three systematic reviews have suggested that the small effect sizes typically seen in aural rehabilitation research may be due to several factors. First, there is considerable heterogeneity in the goals, duration, and content of the aural rehabilitation programs that are evaluated from one study to the next. Second, the majority of aural rehabilitation programs have standard curricula and are offered over a fixed time period, thus operating on the implicit assumption that all patients stand to benefit from the intervention. However, large improvements may be evident only among patients who start off with significant deficiencies in the areas targeted by the program, whereas patients who begin an aural rehabilitation program with relatively good skills may show small to negligible gains upon completion of the program simply because they have less room to improve.^{123,125} Third, the outcome measures that are typically employed in hearing rehabilitation research,

particularly those that assess HRQoL, are thought to lack sufficient sensitivity to demonstrate larger effect sizes.^{119,123,124}

Only one series of studies is known to have evaluated the real-world availability of self-management interventions in HHC from the theoretical perspective of the CCM.⁶⁶ Barker et al. conducted a Delphi review to determine the extent to which HHC professionals were in agreement regarding self-management support strategies and the identification of patients who were successful self-managers.¹²⁶ A Delphi review is an anonymous, iterative process for seeking expert consensus on a topic or issue of interest. Participants in a Delphi review provide input to the topic, generally via questionnaire, in successive rounds. Responses from each round are fed back to the group so that individual participants can reassess their input in light of the emerging convergence of opinion on the topic.¹²⁷ While there was a general consensus in Barker et al.'s study that HHC professionals should play an integral role in providing self-management support,¹²⁶ a related study identified that self-management support is not a widespread feature of routine clinical practice. A content analysis of British policy documents outlining standards of care for HL and for a group of designated chronic conditions was undertaken, with the aim of determining how well they conformed to the CCM.¹²⁸ While neither standard fully exemplified the CCM, the audiologic policies mapped especially poorly onto the model's framework, with particular deficiencies observed in the self-management support component. Reflecting on the outcome of the Delphi review, Barker et al. speculated that a possible contributor to the gap between belief and practice could be traced to the fact that the clinical behaviors that were identified as necessary to provide effective self-management support were broad and vaguely defined, such as "be professional" and "promote self-advocacy."¹²⁶ They suggested that defining these attributes

in more concrete, behavioral terms could facilitate uptake and enactment of these behaviors in routine clinical practice.

CONCLUSIONS AND FUTURE RESEARCH DIRECTIONS

HHC is biomedically focused, device-centered, and clinician-led. Adoption of a model of service delivery that is designed for chronic conditions, such as the CCM, could be a feasible way of moving toward a more biopsychosocial, patient-centered style of clinical practice and an improvement in patient outcomes.^{66,75} Self-management support is a critical component of the CCM that places the patient at the center of care and transforms the clinician-patient relationship into an active, equal partnership.^{85,90,92} Elements of self-management support have made inroads into HHC, primarily via aural rehabilitation and communication programs, yet there are still significant gaps in our knowledge, evidence base, and clinical practice.

Future research into chronic condition self-management in the context of HHC should ideally address the three key components of effective self-management support defined by Lawn and Schoo: (1) ongoing individualized assessment; (2) collaborative goal-setting; and (3) skill development.⁸⁵ Clinical tools should be modeled on the complementary strengths of the Flinders Chronic Condition Management ProgramTM and the CDSMP. First, a method for assessing self-management in adults with HL should be developed. The results of administering such an assessment would enable clinicians to identify the patient's areas of strength and weakness such that subsequent interventions could be tailored to individual needs, preferences, and capabilities. The availability of a self-management assessment tool for HL could further enable research into the factors that influence a patient's ability to

successfully self-manage a HL and the relationship between self-management and hearing rehabilitation outcomes. Second, interventions to improve the self-management skills of adults with HL should be developed and evaluated. Existing aural rehabilitation programs tend to focus on improving communicative function and/or increasing hearing aid use, which are important goals, but there is a paucity of interventions that provide psychosocial support and enable the development of skills to manage the social and emotional effects of HL on everyday life. Ultimately, research into chronic condition self-management in the context of HHC should aim to support clinicians in providing patient-centered care and to empower patients in becoming active participants in the self-management of their own hearing, health, and wellbeing.

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FIGURES

Figure 1. The Chronic Care Model.

Figure 2. A case study illustrating how the Flinders Chronic Condition Management Program™ tools could be used in the context of adult hearing rehabilitation.

TABLES

Table 1. The Partners in Health scale items and the Cue and Response interview cue questions from the Flinders Chronic Condition Management Program™.

Partners in Health scale item	Cue and Response interview cue questions
1. Overall, what I know about my health condition is	1. What do you know about your condition (e.g. causes, effects, symptoms)? What could happen to you with this condition? What does your family/carer understand about your condition?
2. Overall, what I know about the treatment (including medications) of my health condition is	2. What can you tell me about your treatment? What may happen if the treatment is stopped? What other treatment options, including alternative therapies, do you know about? What does your family/carer understand about your treatment?
3. I take medications or carry out the treatments asked by my doctor or health worker	3. What stops you from taking medication as prescribed (e.g. lack of understanding, frequency, side effects, costs, other barriers)? What stops you from carrying out your other treatments (e.g. not knowing what to do and why, time, energy, other barriers)?
4. I share in decisions made about my health condition with my doctor or health worker	4. How involved do you feel in making decisions about your health with your doctor/care coordinator? Does your doctor/health worker listen to you? Is there anyone else who makes your health decisions for you?
5. I am able to deal with health professionals to get the services I need that fit with my culture, values, and beliefs	5. How do you get the services you need to manage your health? How do these services fit in with your culture, values, and beliefs? How confident are you dealing with health professionals to get these services? Is there anything that stops you from using these services?
6. I attend appointments as asked by my doctor or health worker	6. What prevents you from attending your appointments (e.g. transport problems, cost, physical disability)?

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| 7. I keep track of my symptoms and early warning signs (e.g. blood sugar levels, peak flow, weight, shortness of breath, pain, sleep problems, mood) | 7. What are the early warning signs or symptoms that you need to check and write down for your condition? What is it important to check for early warning signs or symptoms? How often do you check and/or write down these signs and symptoms? What stops you from doing this? |
| 8. I take action when my early warning signs and symptoms get worse | 8. What do you do to manage your early warning signs and symptoms? What stops you from taking the recommended action? Do you have a written action plan? How is your family/carer involved? |
| 9. I manage the effect of my health condition on my daily activities and physical activities (e.g. walking, hobbies, and household tasks) | 9. What activities have become more difficult to do (e.g. showering, walking, household jobs, etc.)? What things can you no longer do? How much does your health condition interfere with you going out of your home? How do you manage these aspects? |
| 10. I manage the effect of my health condition on how I feel (e.g. my emotions and my spiritual wellbeing) | 10. Do you ever feel as though the effort of daily activities is too much for you (e.g. feeling tired, can't be bothered, etc.)? Does your condition ever get you down? How do you feel about your life at the moment? How does your illness affect your spiritual wellbeing? |
| 11. I manage the effect of my health condition on my social life (e.g. my ability to participate, how I mix with other people, and my personal relationships) | 11. Tell me about the people who support you. How does your condition affect the way you mix or socialize with other people? What aspects of your social life would you like to change? How does your condition impact on you ability to maintain work/hobbies? |
| 12. Overall, I manage to live a healthy lifestyle (e.g. no smoking, healthy food, moderate alcohol, regular physical activity, sleep well, manage stress and worry) | 12. What do you do to help stay as healthy as possible? What things do you do that could make your health worse (e.g. smoking, alcohol, diet, inactivity, stress, drugs, gambling)? What aspects of your lifestyle would you like to change? |
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