

# Models of care for pain management: a rapid review

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An **Evidence Check** review brokered by the Sax Institute  
for the NSW Agency for Clinical Innovation

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## Contents

<b>EXECUTIVE SUMMARY .....</b>	<b>5</b>
Limitations of this Review .....	9
<b>Background and introduction .....</b>	<b>11</b>
<b>Description of the method used for the Review.....</b>	<b>14</b>
<b>Analysis of literature organised around questions aligned to the ‘Changing Models of Care’ Framework .....</b>	<b>17</b>
What are the issues associated with the current model of care? .....	17
What are the values and principles involved in care delivery? .....	22
What are the current structures and roles in pain management? .....	25
What are the care delivery processes and referral patterns and criteria for getting into and out of the service? .....	29
What are the patient outcomes? .....	34
What does the community think of the current model of care? .....	41
What is the staffing profile and skills mix? What factors affect this? .....	42
What is the cost of service delivery and what evidence is there that the model of care is cost effective? .....	44
<b>Recommendations for a model of care for pain management in NSW Health .....</b>	<b>47</b>
<b>References .....</b>	<b>49</b>
<b>Appendices</b>	
Appendix 1: Review Proposal .....	67
Appendix 2 : Sample record of process of initial review of papers – pre feedback on interim report .....	71
Appendix 3: Pain Services and Clinics in NSW .....	74
Appendix 4: Sample of literature reviewed related to care processes .....	75



## EXECUTIVE SUMMARY

The prevention and management of pain is a key aspect of health care. There is increasing recognition that pain, particularly persistent pain, is a multidimensional phenomenon which requires a comprehensive, integrated and multifaceted model of care. This Report describes contemporary thinking about pain and its management in order to identify those factors that must be considered in developing an effective model of care for people who experience pain in NSW.

The literature revealed a heightened awareness of the epidemiology and impact of pain (National Pain Strategy (NPS) 2010; Institute Of Medicine (IOM) 2011). The unique challenges of working in the field of pain management, including the need to work with clients who can have very complex needs, have been identified. Legislation, regulation and health and social policy also impact on how pain is managed. For example, factors related to opioid and other substance use, social benefits, medical and pharmaceutical benefit arrangements, mental health care, aged care, cancer care, indigenous health, rehabilitation and occupational medicine, and palliative care have been noted to influence and impact pain management field (IOM 2011, NPS 2010).

In this Report the aspects that constitute a model of care are described and the findings of the literature review are discussed in relation to each of these. A recommended model of care for NSW is proposed based on this. Although there does not appear to be a body of evidence that examines the implementation of models of care in their entirety, there is a range of research and other literature which provides cues as to the attributes of a model of care for more effective management of pain. Moreover there is consensus that failure to intervene appropriately for those who experience pain has a number of undesirable risks for the individual, families and communities and places increased demand on acute and community services. In particular, there is a strong body of evidence that indicates that early, targeted pain management plays a significant role in the prevention of long term pain conditions.

The questions examined in this literature review were drawn from the *Changing Models of Care Framework* (Queensland Health 2000). The questions and a summary of the analysis of the literature related to each of them are:

### 1. What are the issues associated with the current model of care?

The major problems with the current approaches to pain management are long standing and well documented. They include:

- An overreliance on the biomedical view of pain and a concomitant lack of services within the biopsychosocial approach to responding to chronic pain
- Limited timely access to existing services for a range of reasons
- A need to develop capacity to respond to increasing demand for pain management particularly chronic pain as people survive conditions which are associated with or lead to persistent pain

- A need to better target services to clients experiencing pain who have differing needs.

## **2. What are the values and principles involved in care delivery?**

The values and principles which guide care delivery are a commitment to the most effective, evidence-based approaches using a population approach to pain management. Achieving this requires clear appreciation of the structures and roles of each part of the health sector and clearly delineated care delivery processes across primary and acute health care sectors in NSW.

## **3. What are the current structures and roles in pain management? What are the care delivery processes and referral patterns and criteria for getting into and out of the service?**

The current care delivery processes for the management of pain suggest a need to:

- 1) Better define the type of services for specific populations who experience pain
- 2) Promote pain management as a specialty area of practice that works collaboratively with other specialities to optimise patient experience and outcomes
- 3) Continue to ensure care processes are founded on research related to the biopsychosocial view of pain.

The services and programs provided at hospitals in NSW appear to vary based on the local context and history of the service. It is important that patients are clear about the types of services available to them in each Local Health District and that there is reasonable access to pain management services for the population of NSW.

There is evidence of a need to:

- Optimise quality and consistency in care of the person with pain in all settings irrespective of the nature of pain through greater use of standardised care guidelines, protocols and pathways
- Ensure there are valid and comprehensive screening and assessment processes to ensure the right level of care is available to patients
- Provide a range of interventions for both acute and chronic pain - including behavioural programs for people with persistent pain
- Better define the criteria for attendance at specialist pain services and improve the discharge process from specialist services to community and primary care services;
- Optimise case management for those with chronic and complex pain who need high levels of support
- Further explore the use of technology to facilitate care processes
- Better classify and code pain related presentations and use of services.

## **4. What are the patient outcomes? Is the model of care delivery safe? Does it provide equity of access? Is it based on the most appropriate available evidence?**

Patient outcomes measured are varied but generally researchers seek to determine the impact of care on factors such as pain intensity and duration, quality of life and functional outcomes. Dependent on the intent of the pain management strategy and the research questions, other aspects that have been examined include participation in work/school; length of stay in hospital, medication usage and use of health care services.

Synthesis of the available literature indicates that positive outcomes for patients are maximised when there is:

- Prompt, appropriate and targeted care processes for the management of acute and chronic pain
- Screening and appropriate referral for those at risk of needing secondary and tertiary intervention
- Use of multimodal therapies including cognitive based programs that build self-management capacity among those who experience chronic pain
- High intensity rather than low intensity care processes for those experiencing high levels of distress related to chronic pain.

#### **5. What does the community think of the current model of care?**

The current models of care, particularly for those who experience chronic pain, do not meet community expectations of timely access to services where staff are responsive to their needs in supportive ways. There is a need to change community as well as individual expectations of pain management processes and outcomes. The extent to which individuals are assisted to understand the nature of their pain impacts on individual experience and satisfaction and shapes community expectations. Skilled and knowledgeable staff are critical to this process.

#### **6. What is the staffing profile and skills mix? What factors affect this?**

The staffing profile varies dependent on the nature of the service provided. Tertiary chronic pain services are usually staffed with medical staff, clinical psychologists, physiotherapists, and nursing staff who have specialist expertise in pain management. Occupational therapists, pharmacists and psychiatrists may also form part of the core staff establishment in a pain service. Irrespective of the staff profile of a pain service, close working relationships with other services that enable the effective management of pain as well as services that may require specialist pain input (e.g. services for oncology, surgery, older person care, chronic diseases and addiction) are essential. There is also a need to ensure that there are administrative personnel who support effective clinical service delivery in order to utilise the expertise of clinical staff well.

#### **7. What is the cost of service delivery and what evidence is there that the model of care is cost effective?**

There is evidence that the ineffective management of pain is costly to the community. Efforts to better manage pain have been shown to have some impact on the cost of delivery across the health care system. However, conclusions about cost effectiveness depend on where in the care continuum cost savings are measured and how. Some

of the literature shows that delivering a formalised pain service can be expensive but the quality of pain management is improved. Others question the degree of improvement related to the additional cost. There is limited literature that quantifies the cost of pain services and their cost effectiveness related to outcomes such as medication use and use of hospital services. The general consensus is that as community and outpatient care is less expensive than inpatient care in Acute Hospitals, avoidance of admission and use of acute hospital care resources (e.g. Emergency Departments (EDs)) is cost effective to the Acute Hospital Care sector. There are also challenges in identifying the costs and benefits associated with the management of pain due to limitations in patient classification and coding processes.

As a whole, the literature related to the management of pain reflects the need for more effective management of pain, particularly for those who experience chronic pain. This necessitates a model of care which is inclusive of, yet far broader than, the traditional, biomedical approach which focuses on 'curing' pain. The acknowledgement that chronic pain is very different to acute pain in terms of its aetiology and complexity has resulted in renewed emphasis on pain as a multidimensional experience that needs to be viewed and managed through a biopsychosocial lens. There are examples of comprehensive approaches to pain management in Australia and internationally. The implementation of these models of care frequently involves the establishment of pain clinics within integrated pain services. Many of these pain services have described their model of care in detail on their websites and at conference presentations. There is increasing consistency in the attributes of these models of care. The emergent models:

- Recognise the interaction of biological, psychological and social factors in the experience of and response to pain and aim to provide a suite of interventions and therapies to address these
- Align to the principles of health promotion and prevention, early assessment and intervention
- Are directed toward developing greater self-management of chronic pain;
- necessitate a strong community and primary care sector
- Are multidisciplinary and operate across the interfaces of among population health; primary care and community health; and acute health sectors
- Provide specialised pain services for those who have need for these in inpatient, outpatient and outreach services
- Are increasingly oriented toward seeking to determine outcomes for both patients and the health system as a whole
- Are informed by the best available evidence, including expert opinion.

The model of care adopted in NSW should:

- Include strategies to enable the prevention of pain as well as the management of pain
- Be directed toward optimising the health and wellbeing of individuals experiencing pain
- Promote active engagement and self-management by the patient
- Be multidisciplinary, comprehensive, integrated and system wide



- Be underpinned by educated staff and informed clients, strong governance of the implementation of guidelines and protocols, and a culture of research generation and translation of that research into practice
- Be appropriately resourced and sustainable
- Have strong links to other parts of the health system
- Be evaluated as a model of care in its entirety, not only of the elements within a model of care.

The available evidence supports a conclusion that NSW Health should adopt a model of care that is consistent with a 'stepped care' approach which:

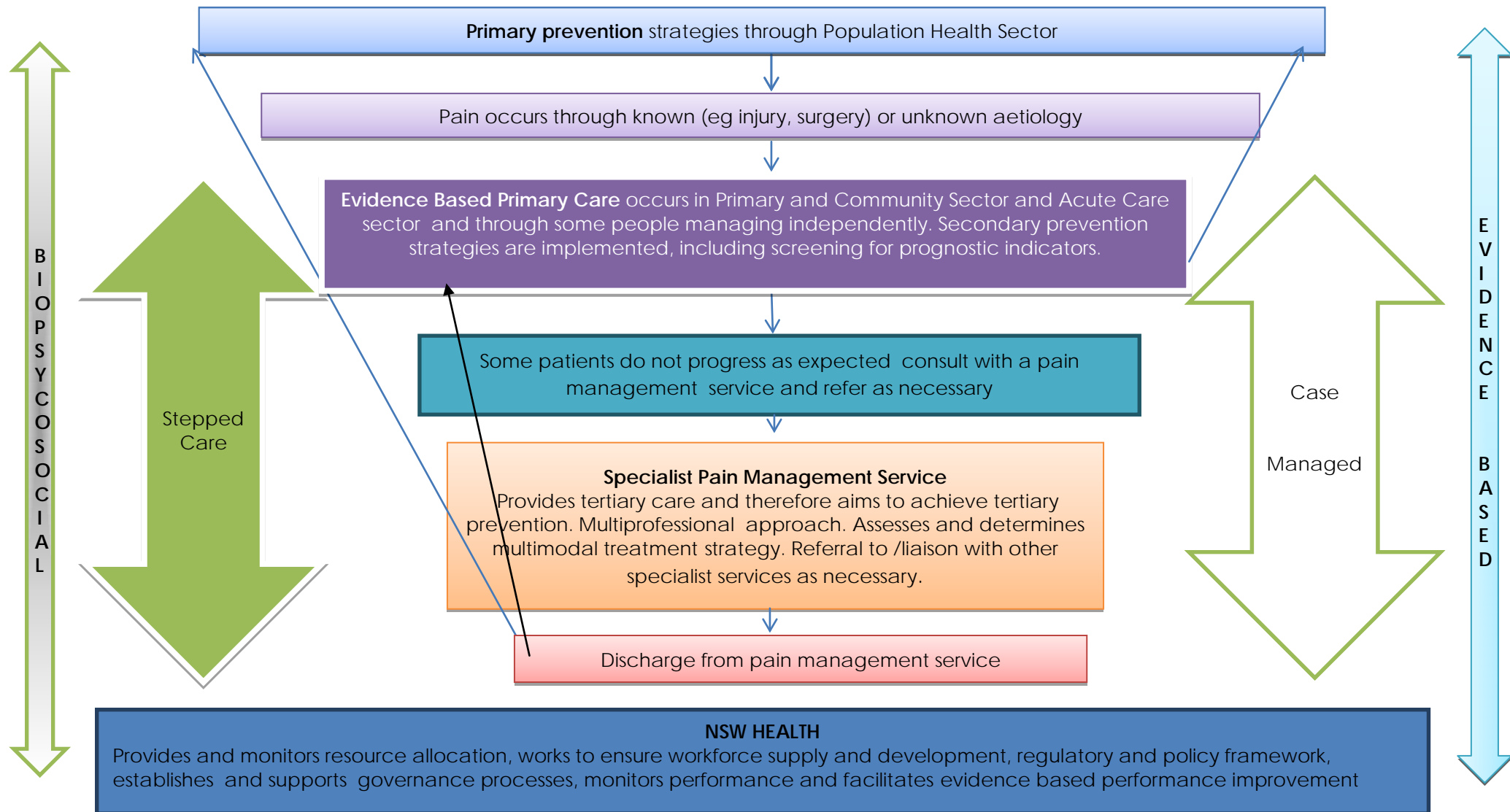
- Facilitates the identification and management of those at risk of chronic pain through evidence-based screening and triaging
- Distinguishes among and responds to the patient's need for generalist or specialist pain management within the hospital and community i.e. 'the right treatment is provided to the right patient'; and thus
- Is consistent with a chronic care model which acknowledges that while the majority of patients who experience chronic pain will be managed in the primary care sector, there are those who will require a different level of intervention through inpatient, outpatient or outreach activities within the public hospital system.

A representation of a model of care based on the literature is presented overleaf.

### *Limitations of this Review*

It is recognised that there are a number of significant limitations to this Review, particularly in relation to the initial review proposal as provided in Appendix 1. Following a meeting with the Agency for Clinical Innovation to discuss an interim report and the definition of 'Model of Care', the key questions addressed in the report were altered. The scope of this Review and literature analysed reflects the volume that was able to be reviewed in the short time frame and inevitably results in omission of some studies. Those studies that were reviewed consistently identified a variety of limitations in research design that prohibits generalisation of the findings. There were examples of systematic reviews of the literature that resulted in contradictory conclusions with other systematic reviews. There is resounding consensus about the need for more research in order to draw more meaningful conclusions. The majority of literature examined related to chronic pain and within that low back and adult populations. Other populations where pain management is a major focus of care (arthritis, migraine, general musculoskeletal conditions, spinal cord injury and cancer pain) were not examined in detail. In the main, outcomes investigated relate to particular care processes and therapies and again, these have not been not examined in detail. Detailed information about study populations, inclusion and exclusion criteria, cause of presentation related to trauma and its severity, descriptions of screening tools, and the time at which they were used in the care trajectory were not collated.

## A suggested Model of Care for Pain in NSW



## Background and introduction

There are few human experiences that are as compelling as pain, yet it remains poorly managed by professionals in a range of health care settings. While there is a large body of research into the mechanisms of pain, pain management and improved techniques for pain control, many people continue to suffer with unrelieved pain. The high prevalence of pain, and its impact, makes pain a public health issue (Fox, Parminder & Jadad 1999, Blyth 2004, NPS 2010). Indeed, it seems incongruous that while scientific research has uncovered many of the biochemical, neurobiological and psychosocial processes of pain, along with the development of sophisticated treatments for its control, many people, even in countries such as Australia, continue to live with chronic, unrelieved pain. There is no cure for chronic pain, so options at present are directed towards minimising its impact. Nationally and internationally, the problem of unrelieved pain is set to increase as the population ages with the magnitude of the problem amongst those with cognitive impairment and communication difficulties escalating.

The high prevalence of pain and its impact is of national and international concern. Peak bodies, including the International Association for the Study of Pain (IASP), the British Geriatrics and Pain Societies, and the IOM in the United States, The Royal College of Physicians, Chronic Pain Australia, and Australia's National Pain Strategy (NPS) (representing 150 healthcare professionals, consumers, and not-for-profit bodies including the Australian and New Zealand College of Anaesthetists, the Australian Pain Society and the Faculty of Pain Medicine) have all called for urgent health reform to improve pain management. The NPS document (see accompanying document) provides a comprehensive appraisal of the current situation for the management of pain in Australia. The document presents a credible and convincing argument to justify an integrated approach to pain management for all types of pain through Pain Management Networks. The Agency for Clinical Innovation (ACI) established the Pain Management Network in NSW in February 2010. It has been tasked with developing an integrated model of care for chronic pain management including community, primary, secondary and tertiary treatment services.

The results of the present Review will be used to inform the ACI and its partners in developing a Model of Care and a State-wide Plan for the improved delivery and funding of chronic pain services to consumers within the next financial year. Clinicians from within the Network will use this information to achieve a consensus view on a Model of Care to be implemented once funding has been released. A key argument in the National Pain Strategy is to not 'reinvent the wheel', but to use a best practice, evidence-based approach to develop and implement effective and efficient pain management strategies at all levels of health care. Therefore, this rapid review of published literature relating to the implementation and evaluation of models of care for pain management for effectiveness in improving outcomes in hospital inpatient, hospital ED services and hospital based outpatient pain services has been undertaken.

The impact of both acute and chronic pain on the Australian population has been well documented (Access Economics 2007, NPS 2010). The Institute of Medicine (IOM 2011) describes the definition and broad reaching impact of pain:

*'Acute pain, by definition, is of sudden onset and expected to last a short time. It usually can be linked clearly to a specific event, injury, or illness. (...) People can handle many types of acute pain on their own with over-the-counter medications or a short course of stronger analgesics and rest, and the acute pain...usually subsides when the underlying cause resolves. (...) Acute pain also can be a recurrent problem, with episodes being interspersed with pain-free periods...*

*Chronic pain, by contrast, lasts more than several months (variously defined as 3 to 6 months, but certainly longer than 'normal healing') and can be frustratingly difficult to treat. Although improvement may be possible, for many patients cure may be unlikely. Chronic pain can become so debilitating that it affects every aspect of a person's life - the ability to work, go to school, perform common tasks, maintain friendships and family relationships - essentially, to participate in the fundamental tasks and pleasures of daily living' (p 1:14).*

There is increasing recognition that 'acute and chronic pain may represent a continuum rather than distinct entities. Increased understanding of the mechanisms of acute pain has led to improvements in clinical management and in the future it may be possible to more directly target the pathophysiological processes associated with specific pain syndromes' (Macintyre et al. 2010, p 1).

Pain Australia 2011 summarises the work undertaken by Access Economics 2007 thus,

- Chronic, or severe persistent pain, is one of the top three most expensive health care conditions in Australia, costing \$34 billion per annum
- That equates to 36 million lost workdays and affects one in five working-age Australians. It includes health system costs of \$7 billion, and \$11.7 billion in lost productivity costs
- Epidemiological research shows that one in every five people in Australia suffers chronic pain and a third of these have severe pain associated with severe disability. One in 25 of all patients seen in primary care is in this latter category
- The prevalence of chronic pain is projected to increase as Australia's population ages, from around 3.2 million Australians in 2007 to 5 million by 2050
- Effective pain management has a great deal to offer in reducing the burden of chronic disease. This includes the treatment of acute pain in its early stages to limit the otherwise likely progression to chronic pain and disability, which then contributes markedly to healthcare and social welfare costP
- There is growing emphasis on developing multidisciplinary management strategies for chronic illnesses such as persistent non-cancer and cancer pain, and for the management of acute pain (e.g. post-operative pain).

The NPS recommends early intervention for acute pain and urgent changes to clinical practice in pain assessment and management to mitigate progression to chronic pain. Indeed, there is global recognition that 'there are potentially vast gains to be made through prevention, community awareness, early intervention, and better access to pain management services' (NPS 2010, p2). The model of care for pain management in NSW needs to acknowledge that pain management and access to services, especially for those at risk of or who have developed chronic pain, is a fundamental component of health service delivery. Development of such a model of care

necessitates a State-wide model of care that is a framework for implementing an agreed approach to the management of pain, delineates the roles and functions of each of the sectors in NSW Health, defines the key aspects of care processes for pain management and facilitates care transition between the services provided in Primary and Community and Acute Hospital sectors.

## Description of the method used for the Review

The initial scope of the Review is outlined in Appendix 1. The Review was intended to examine the effectiveness of models of care for pain management in hospital inpatient, hospital emergency department services and hospital based outpatient pain services and address two questions:

1. *Which models of care for pain management have been implemented and evaluated for effectiveness in improving outcomes in any of the following settings: hospital inpatient, hospital emergency department services and hospital based outpatient pain services?*
2. *Of those models of care which have evidence of positive outcomes at individual and hospital level? Which have no evidence of positive outcomes?*

The parameters for the Review were to:

- Provide a comprehensive coverage of research in the peer review literature including academic databases
- Provide a comprehensive review of the grey literature including government reports, agency reports
- Identify areas where there is strong evidence in relation to the review question; where there is equivocal or conflicting evidence; and where there are gaps in the evidence
- Focus on literature published since 1990
- Only include studies that provide some description of the model of care.

'Grey' literature was provided by the ACI. Key terms searched in the literature were model of care, pain, persistent pain, recurrent pain, chronic pain, outcome and process. The databases searched were: Medline, Embase, PsycINFO, PsycEXTRA, Cochrane Library, Informit Health, AMED, Scopus, Web of Science, CINAHL and Mosby's. The abstracts for each of these articles were reviewed for their congruence with the intent of the Review. A limited number of articles were not available in English and were excluded from the Review. Articles associated with abstracts of interest were located and reviewed for inclusion or exclusion using the protocol presented in Appendix 2. Many articles were useful in providing the context for the Review. These included papers which described philosophical and theoretical propositions; those which report the consensus views of experts; and those which report on epidemiological data for the purpose of baseline, co-morbidity and risk identification. Other papers located reported on proposed clinical trials; quality assurance initiatives; protocol and guideline development; the implementation of new routines and procedures; assessment of clinical interventions related to 'usual' care; and comparison between the outcomes of a particular professional group within a model of care that would be usual practice (e.g. comparing physiotherapist and chiropractor outcomes).

The most significant challenge in undertaking the Review was the definition of a model of care. This is not surprising as there is no consistent definition of the term 'model of care' (Queensland Health 2000, Davidson 2006). Nevertheless Davidson et al. (2006, p 49) describe a model of care as:

'an overarching design for the provision of a particular type of health care service that is shaped by a theoretical basis, EBP and defined standards. It consists of defined core elements and principles and has a framework that provides the structure for the implementation and subsequent evaluation of care. Having a clearly defined and articulated model of care will help to ensure that all health professionals are all actually 'viewing the same picture', working toward a common set of goals and, most importantly, are able to evaluate performance on an agreed basis'.

Feedback on an Interim Report and subsequent discussion with members of the ACI resulted in agreement to structure this Final Report using the *Changing Models of Care Framework* (Queensland Health 2000). The Framework presents a methodology for those who wish to redesign the way health care services are delivered. It provides a set of useful questions to guide the collection of information to argue the need for change as well as questions which identify those factors which need to be considered in implementing a changed model of care. Therefore, the next section of this Report is organised around a series of key questions aligned to those in the *Changing Models of Care Framework*.

Other challenges were identified during the initial phase of the Review. For example, at times it was difficult to distinguish between a study which reports on interventions intended to develop the case for a particular model of care and a study which reports on the outcomes of interventions delivered and evaluated as part of an established model of care.

Although the literature which discusses the management of pain provides descriptions of effective treatment options, there is comparatively little published evidence-based research which both describes models of care for pain management and evaluates the outcomes associated with aspects of a model of care other than treatment options. Possible reasons for this include:

- The development and sustainability of a range of models of care has been challenging because the organisation of care delivery is determined by a variety of factors such as economic issues, leadership beliefs, and the ability to recruit and retain staff (Jennings 2008)
- The dominant discourse in academic journals related to pain management has not historically been focused on service delivery models
- Rich descriptions of the operationalisation of the model of care is constrained by word limit in publications
- There has been a lack of recognition of the importance of auditing of pain service activities and outcomes (McIntyre 2008)
- As is the case in all longitudinal studies there are methodological challenges such as participant attrition and low response rates (Asenlof et al. 2009).

Other challenges in obtaining literature related to models of care for pain management and outcomes where model of care is the variable of interest related to range of outcomes measures used in pain management and methodological issues such as study design, intervention/program investigated and exclusion of populations of interest e.g. people with depression and or compensable situations, children and adolescents. Blyth et al. 2003 have identified that those who have litigation and compensation cases have a higher level of pain related disability and this is suggested as one reason this population would be excluded from studies. The range of outcomes identified in the literature reviewed as well as the use of ill- defined and interchangeable terminology used (e.g. pain clinic, pain program, pain service, usual care, multidisciplinary, interdisciplinary and multimodal) added to the challenges in identifying existing models of care and care processes and outcomes associated with them.

Nevertheless the literature highlights key factors which shape a model of care for pain management such as the need to:

- Consider the implications of new ways of thinking about the management of pain for treatment options and care pathways
- Ensure treatment options are targeted and accessible
- Capture a variety of outcomes required to persuade numerous stakeholders of the efficacy of these interventions
- Develop mechanisms to both generate and translate research to practice
- ensure appropriate staffing and other resource issues within a model of care.



## Analysis of literature organised around questions aligned to the 'Changing Models of Care Framework'

The approach used in the *Changing Models of Care Framework* begins with an exploration of the problems to be addressed through a changed model of care. It then proposes a series of questions which can be used to support the case for change. The questions most pertinent to the scope of this Review are:

- What are the issues associated with the current model of care?
- What are the values and principles involved in care delivery?
- What are the current structures and roles in pain management?
- What are the care delivery processes and referral patterns and criteria for getting into and out of the service?
- What are the patient outcomes? Is the model of care delivery safe? Does it provide equity of access? Is it based on the most appropriate available evidence?
- What does the community think of the current model of care?
- What is the staffing profile and skills mix? What factors affect this?
- What is the cost of service delivery and what evidence is there that the model of care is cost effective?

### *What are the issues associated with the current model of care?*

Almost 20 years ago, the Task Force on Pain Management (1993, p 30) observed:

'Pain management is a societal problem because of concerns about the use of drugs, the belief that patients are not good judges of the severity of their pain, and an alarming level about ignorance of pain and its treatment among physicians, nurses and other health providers. The result is that patients suffer pain unnecessarily, even up to the point of their death. Pain management is also a clinical-practice problem. Courses in pain and symptom management are not readily available to medical and nursing students. And in clinical practice, good pain assessment is not easy to accomplish because pain is so subjective. Additional problems in pain management relate to the manner in which healthcare is provided today: an acute disease-oriented model of hospital care, frequent transfers, fragmented care, inadequate reimbursement, market forces that drive up costs and maldistribution of clinical services. In improving their ability to manage pain, professionals must understand the difference between pain and suffering, acute and chronic pain and the sensory and emotional aspects of pain'.

The literature highlights the complex nature of developing a model of care that addresses these issues across populations and contexts. Almost every person will experience pain at some stage. This pain may occur in single and multiple sites and be acute, chronic, acute on chronic, and recurrent episodic pain. Pain may be the primary condition that causes the person to seek health care or may be a consequence of other conditions. Pain is managed in community and primary health care settings as well as in acute hospital inpatient units, EDs and outpatient clinics. The experience and expression of pain varies with cause, duration and patient characteristics such as age, gender, physiological and psychological attributes and

social environment (Clinch and Eccleston 2009, Cogan 2010, Coyle et al. 2010, Donovan 2002).

Despite the challenges, the necessity to implement a new model of care is paramount as the existing models, dominated by limited views of pain as acute disease which is resolvable, are being replaced by understandings that pain and disability is a 'complex and dynamic interaction among physiologic, psychologic and social factors, which perpetuates and may worsen the clinical presentation' (Gatchel 2009, p 2).

Pain has historically been viewed as physiologically driven however the contemporary literature consistently identifies the limitations of the traditional view of pain as acute, of short duration and curable. Key documents such as the National Pain Strategy 2010, publications related to jurisdictional pain strategies, the Access Economics 2007 *Report into the economic impact of persistent pain in Australia*; the Australian and New Zealand College of Anaesthetists (ANZCA) and Faculty of Pain Medicine (FOPM) 2010 publication *Acute Pain Management: Scientific Evidence* and the Institute of Medicine's (IOM 2011) *Relieving Pain in America: A Blueprint for Transforming Prevention, Care, Education, and Research* all cite the need for a heightened awareness of the epidemiology and impact of persistent pain as well as the need to implement models of care that are directed towards helping people live with pain as best possible through models of care that include the development of self-management strategies and focus on 'carative' rather than 'curative' processes (Gatchel 2009).

The implications of pain for individuals as well as the implications of less than optimal pain management for communities, public health and social systems has been consistently identified (Access Economics 2007, Becker 1997, NPS 2010). The NPS 2010, p12 identifies the need to better manage the 'window of opportunity' between acute and chronic pain. As well as describing the need to better manage chronic pain, the literature has also revealed that there is a need to better manage acute pain experiences (Bedard et al. 2006, Berger et al. 2010, Carfango and Schecter 2002, Fry et al. 2010). The development of chronic pain among those who survive major trauma and diseases such as cancer, and the potential for them to be at risk of inadequate pain management post discharge from the health services focussed on their primary disease has been highlighted (IOM 2011). It is important to note that approaches to the management of cancer pain and palliation for cancer and other conditions has been reported extensively in specialist literature related to these fields. While this review has not examined the literature related to cancer pain, it is imperative to be conscious of the potential for people who have experienced cancer to develop residual pain and the need for this to be managed effectively (British Pain Society 2010, NPS 2010). Similarly those who survive events such as burns, amputation and spinal cord injury and other disabling conditions are likely to have ongoing pain management needs (Browne et al. 2011, Dauber et al. 2002, Ehde et al. 2003, Hanley et al. 2007, Nicholson Perry et al. 2010).

There are a range of barriers to effective pain management. Patient related issues which discourage people from seeking pain management services include well-documented sociocultural and economic barriers to access to health care in general

coupled with individual and community beliefs about people who experience pain. Brennan et al. 2007 describe the extent to which fatalistic views of pain being part of the human condition pervade belief systems about pain. Perceptions of those with pain may result in people struggling to achieve credibility regarding their pain (Monsivais 2011). There is evidence that there are many people who experience chronic pain and do not use health services extensively. However, those people who experience higher levels of pain and pain related disability have poorer health status and a greater use of health services (Becker et al. 1997, Blyth et al. 2004, Elliott et al. 2004, von Korff et al. 1991). People with chronic, persistent and severe pain enact a range of help seeking behaviours, some of which place increased demand on the acute care sector. Blyth et al. 2004 conducted a study in NSW of people who experience chronic pain and their use of health services. These authors found that there was a strong association between pain-related disability and greater use of services. Compared to chronic pain respondents with no or limited pain-related disability, those with most pain-related disability reported more primary care visits in the last 2 weeks and last 12 months, were more likely to have pain associated hospital admissions and ED presentations.

Unfortunately, the experiences of people with chronic pain who seek assistance is not overwhelmingly positive (Upshur et al. 2010). When people with chronic pain present to ED, they are considered a low priority (Wilsley et al. 2011). People who experience chronic pain are often stigmatised as malingerers who are seeking to 'play the system' or gain some benefit associated with illness (Dersch et al. 2005, Worzer et al. 2009). This continues despite the fact that the losses experienced by people who live with chronic pain are multiple, can be profound and may contribute to the development of further pain states (Worzer et al. 2009). In addition to the need to better manage pain (in particular chronic pain) for all people, there is a need to acknowledge the impact of both acute and chronic pain on populations who may experience disadvantage and vulnerability, such as Aboriginal and Torres Strait Islander people, neonates, children, older people and those with cognitive and communication impairment. The literature reveals that poor management of pain in neonates and infants has been identified as an area to be addressed for both the immediate needs of the child (Stevens et al. 2007) and to prevent potential longer term pain hypersensitivity (Howard 2003, p 2004). Howard 2003 has noted that a large number of children experience chronic pain and are not adequately treated. He identifies chronic abdominal pain, headache, musculoskeletal and neuropathic pain as prevalent in children as well as the pain associated with underlying diseases such as cancer, juvenile rheumatoid arthritis and sickle cell disease. More recently, Palermo et al. 2010 cite numerous studies to conclude that chronic pain affects 15-30% of children and adolescents.

A considerable number of older people experience chronic pain (Dewar 2006). Pain management in older people is a significant care issue with studies reporting between 25% and 85% of people in residential aged care facilities experience pain and at least 50% of older people living in the community experience persistent pain (Helme and Gibson 2001). In an Australian research study to examine the prevalence of persistent pain in the community, Blyth et al. 2001 analysed 17,543 completed interviews and identified chronic pain prevalence peaked at 27.0% in the 65-69 year age group for males and for females, prevalence peaked at 31.0% in the oldest age group (80-84

years). Despite this, pain assessment and management in the elderly, particularly those with cognitive impairment, continues to be inadequate (Wilson et al. 2006).

There are also high levels of chronic pain reported among Indigenous communities, children and the elderly. For example Vindigni et al. 2004 assessed 189 Indigenous members of the Kempsey community and found that 57% of participants suffered from two to four musculoskeletal conditions and classed their endured level of pain as 'high'. A majority of participants had suffered from their principal condition for seven weeks or more, indicating high levels of chronicity in the community. Fenwick 2006 has commented specifically on the limited resources informing non-Indigenous nurses about the concepts of pain, pain assessment, and pain relief amongst Indigenous people (Fenwick 2006).

From the perspective of those who have expertise in pain management, a range of issues which inhibit provision of adequate pain care due to cultural (including financial) aspects of health care, organisational, professional, regulatory factors have been identified. Crowley-Matoka et al. 2009 conducted a review of literature and identified three key features of biomedical culture with critical implications for pain management 1) mind-body dualism; 2) a focus on disease versus illness; and 3) a bias toward cure versus care. These authors highlight the potentially insidious impact of the biomedical model on patient care:

‘Patients presenting with “classic” physical manifestations of disease are characterised as “great cases”, while those whose illnesses have strong psychosocial influences are thought of as “frustrating”’ (p 1315).

Organisational factors include fragmented care delivery and inappropriate policy as well as challenges in providing pain management to particular populations such as those in locations distant to general health services and pain specific services. For example those who are in institutions such as prisons and long term care facilities are at risk of not having their pain recognised or managed effectively yet are known to have a higher rate of co-morbid conditions that are associated with pain (Baidawi et al. 2011, Baldridge and Andrasik 2010). Chen et al. 2004 have described the factors that impact rural residents' access to effective pain management as including distance, shortage of health care professionals and complementary therapists, health care professionals in these areas knowledge deficits, and elements of the rural culture.

The ways in which treatment services are provided and services are funded has been identified as a factor in the literature. The financial drivers for approaches to care of people with pain have been identified and some concern has been expressed about the extent to which there is mal-alignment of these to 'best practice' approaches to pain management (Gatchel and Okifuji 2006, NPS 2010). The potential for third parties such as insurance companies to limit access to appropriate services has been discussed, particularly with regards to the United States (Gatchel and Okifuji 2006). The potential for the availability of compensation and litigation to be seen as a contributor to poor health outcomes has been identified in some literature. However Spearing and Connelly 2010 have cautioned against drawing conclusions about any correlation between the availability of compensation and poor health outcomes in order to direct policy and treatment options. In a review of 11 systematic reviews which examined the

relationship between compensation and health outcomes, Spearing and Connelly found only one that met their criteria for a high quality review and this single review identified no correlation between the availability of compensation and health outcomes. Chen et al. 2004 have commented on the impact of funding arrangements as inhibiting the development of models of care which are effective in the absence of a medical practitioner. The National Chronic Disease Strategy 2009, p 38 acknowledges 'funding for self-management approaches are set against an acute care system that... tends to receive budgetary priority', while Kane 2009 has challenged the fee for service model stating:

'Fee-for-service payment is the anathema of effective chronic disease care. Any system that emphasizes production units, especially those based on personal contact, discourages precisely the kinds of activities that lie at the heart of proactive primary care. Fee-for-service payment has encouraged one of the most wasteful components of primary care: the return appointment' (p 2342).

Waiting times for chronic pain services are of concern. In a submission to the Productivity Commission about Disability Care and Support, the ACI identified issues related to the limited access for public patients across all of NSW to tertiary hospital pain management clinics and the lack of recurrent funding for pain management services in NSW as problematic. Moreover, wherever specialist pain services are available, there are significant waitlists. Hogg and Gibson 2010 report the average wait time for a public multidisciplinary clinic in Australia is six months. Waiting for access to services is associated with deterioration in health-related quality of life and psychological wellbeing, with an increase in depression scores (Badke and Boissonnault 2006, Hinkley and Jaremko 1994, Lynch et al. 2007).

A recurring theme in the discussion about pain management is recognition of the need to apply the principles of chronic disease management to those who experience chronic pain. According to the National Chronic Disease Strategy (NHPAC 2006, pp 9-10) the principles of chronic disease management are to:

- Adopt a population health approach and reduce inequalities
- prioritise health promotion and illness prevention
- Achieve person-centred care and optimise self- management
- Provide the most effective care
- Facilitate coordinated and integrated multidisciplinary care across services, settings and sectors
- Achieve significant and sustainable change
- monitor progress.

Any model of care for pain management in NSW should align to these principles, particularly the imperative to prevent the development of chronic pain and its sequelae.

In summary, the major problems with the current approaches to pain management are long standing and well documented. They include:

- An overreliance on the biomedical view of pain and a concomitant lack of services within the biopsychosocial approach to responding to chronic pain

- Limited timely access to existing services for a range of reasons
- A need to develop capacity to respond to increasing demand for pain management, particularly chronic pain as people survive conditions which are associated with or lead to persistent pain
- A need to better target services to clients experiencing pain who have differing needs.

### *What are the values and principles involved in care delivery?*

The interrelated values and principles guiding care delivery for people in pain are:

1. Prompt and effective treatment for people in pain
2. Evidence-based practice to guide primary, secondary and tertiary intervention
3. A biopsychosocial approach to the management of pain
4. Stepped care as a mechanism to optimise outcomes within finite resources.

One of the guiding principles of all health care professionals is that pain should be responded to promptly and minimised as effectively as possible (Brennan et al. 2007, Schatman 2011). This is accompanied by a commitment to preventing impairment, disability and chronic pain (Schultz 2009). The literature highlights the evolution of thinking about pain as a subjective, multidimensional and potentially chronic and complex condition. Similarly, the increasing recognition that pain is for many people a disease in itself, not a symptom of other illness is apparent (Covington 2007, NPS 2010, IOM 2011), as is the consensus that there are at least three major categories of pain: acute pain, chronic or persistent pain and cancer pain.

Those who work in the field of pain management have a strong commitment to evidence-based practice and clinical research. It is this body of knowledge which informs their practice and has necessitated changes in the models of care for people with pain. Approaches that view the mind and body as separate have been consistently critiqued (Yunus 2004) and there is a research into neural pathways and neuroplasticity being undertaken in order to better understand the relationships among central sensitisation and pain hypersensitivity (Jensen 2010, Woolf 2011). The field of psycho-neuro-immunology continues to develop and will shape how pain is conceived and managed (Kiecolt-Glaser and Glaser 1995, Woolf 2010). Several authors assert there is increasingly strong evidence related to the efficacy of psychological interventions in the management of chronic pain (Hoffman et al. 2007, Jamison et al. 2010).

Research will continue to guide primary, secondary and tertiary interventions for the management of pain. In particular, as a result of a commitment to prevent the development and minimise the impact of chronic pain, predictors of the development of chronic pain post surgical procedures have been proposed but not consistently demonstrated. For example, Mongardon et al. 2011 conducted a 12 month follow-up study on 65 patients post thoracotomy and found that prevalence of chronic pain was 48%; among them eight patients had neuropathic pain (12% of the whole group). In the year following surgery, 14 patients had consulted a health professional about their pain and of 31 patients who experienced chronic pain, 27 reported it affected their daily life. The researchers cite previous studies which concluded that effective



polymodal analgesia and applying good surgical practice would reduce the occurrence of chronic pain although their study did not find conclusive evidence of that. Rather, their study did identify a correlation between younger age, number of chest drains and physical status as seeming to contribute to the development of chronic pain. The literature related to factors that may predict the development of chronic pain syndromes after trauma or surgery has been reviewed by researchers and a need for more robust evidence has been identified. For example, Beerthizen et al. 2009 examined literature and identified 31 articles for inclusion in a systematic review they conducted to determine the evidence for an association between psychological factors and the development of Complex Regional Pain Syndrome (CRPS) in adults. The authors concluded there was no evidence of a relationship between the development of CRPS and a range of psychological indicators but in doing so commented on the poor quality of the methodology and limited number of participants involved in the studies they included.

Other reviews have drawn similar conclusions about the methods used in studies and identified that correlation between psychological factors and the development of chronic pain is not unambiguous (Pincus et al. 2002, Schiphorst-Preuper 2008). Nevertheless, there is a strong body of literature that consistently identifies that there may be a range of psychosocial factors at play in the development of and response to pain (Chou and Shekelle 2010, Eccleston 2001, Foster and Delitto 2011, Hill and Fritz 2011, Kent and Keating 2008, Nicholas et al. 2011, Roth et al. 2007). The methodological rigour of studies which purport psychological aspects have limited influence on pain outcomes is questionable (Nicholas et al. 2011) and the interdependence of psychosocial factors makes determining independent and interrelated indicators challenging (Pincus et al. 2002, Raymond et al. 2011). A review of the literature undertaken by Cats-Baril and Frymoyer in 1991 identified over 100 variables associated with the development of disability in people experiencing lower back pain. Since that time studies have explored a range of psychosocial factors thought to be related to pain and pain related disability in a range of settings. However, Blyth et al. 2007, p 8 have observed:

'There has been a tendency to refer to psychosocial factors without articulating what they are, and rarely have studies of psychosocial factors included specific consideration of the level at which social factors are operating. Despite considerable data showing that "psychosocial factors" are associated with pain and may predict its onset, there is little consistency on the precise factor(s) which may be imparting risk, and often little clarity about what we are measuring. Consequently, interventions have targeted psychosocial factors in an unsystematic manner, often without regard for the appropriate level at which the intervention should occur. Perhaps significantly, few "psychosocial" interventions seem to have addressed the "social" (or environmental) domains...'

Attempts to address this have commenced. Hill and Fritz 2011 have categorised psychosocial indicators as: 1) prognostic factors; 2) treatment effect modifiers or moderators; and 3) treatment mediators. Nicholas et al. 2011 have reviewed the literature related to the early identification and management of psychological factors in patients with back pain. Twenty-eight reviews which examined the use of 'yellow flags' in musculoskeletal pain were identified for inclusion in their review process. From this, they drew the inference that: 'Taken as a whole, the evidence shows a clear

relationship between psychological yellow flags and future clinical and occupational outcomes' (p 741).

While research into which psychosocial factors impact particular phases of pain management, there is strong agreement about the need to recognise the interaction of biological, psychological, sociological factors on the manifestation and experience of pain. The potential for social factors to compound psychological factors has been identified (Gatchel et al. 1995, Hansenbring et al. 2001, Nicholas et al. 2011, Theodore et al. 2008). Since the early 1990s, there has been significant research undertaken in order to gain insight into factors that may predict responses to the experience of pain and provide at least theoretical insights into strategies to assist people. For example, Dysvik et al. 2005 examined how coping, as measured by the Ways of Coping Checklist was related to medical variables, depression and self-esteem. In a sample of 88 people who were recruited for a multidisciplinary pain management program, they found there were indications that people used difference coping strategies in response to pain and therefore would require different strategies to build coping mechanisms. In a study of 168 patients attending a multidisciplinary work rehabilitation program, Carosella et al. 1994 examined a set of psychological, pain, perceived work environment and patient expectation measures in order to conclude that patients who displayed a pattern of low expectations of return to work and heightened perceived disability pain and a somatic focus experience compliance problems with work rehabilitation programs and are likely to not complete the program. Haldorsen et al. 1998 have reported on a study of 142 patients with low back pain who were on sick leave for at least eight weeks and provided with multi modal cognitive behaviour treatment program compared with those who received ordinary physical therapy. At a 12 month follow-up there was no significant difference in the return to work rate of either group, however the factors that influenced non return to work were predictable before treatment when both medical and psychological data were combined. Hinrichs-Rocker et al. 2009 conducted a systematic review of literature to identify 50 publications in which psychosocial predictors correlated to Chronic Post-Surgical Pain (CPSP). Depression, psychological vulnerability, stress and late return to work showed likely connection to the development of CPSP. Foster et al. 2008 studied the illness perceptions of patients with lower back pain over a period of six months and found people who had expectations of long term problems and held weak beliefs in the management and control of their back problem were more likely to have poor clinical outcomes six months after their initial visit to their doctor. Suissa 2003 found a range of socio-demographic factors and accident conditions associated with a longer recovery from whiplash. These include older age, female gender, having dependents and not being employed full time. Other authors who have investigated Whiplash Associated Disorder (WAD) have concluded post injury psychological factors such as passive coping style, depressed mood, and fear of movement were prognostic for slower or less complete recovery. There is also preliminary evidence that the prevailing compensation system is prognostic for recovery in WAD (Carroll et al. 2008), although the criteria for 'recovery' vary and there is evidence that many people resume a level of functioning despite persistent pain (Blyth et al. 2001, Nicholas et al. 2011).

Given the increased recognition of the prevalence of pain in the community, there is a strong body of literature that identifies the need to promote self- management among those with chronic pain (Ersek et al. 2008, Smith and Elliot 2005). Self- management is



directed toward increasing the patient's role in their health care and supporting them to assume more responsibility for their own care (Kane 2009) and 'involves the skills and resources that a person needs to negotiate the health system and maximise their quality of life across the continuum of prevention and care' (National Health Priority Action Council (NHPAC) 2006, p 37).

Stepped care provides a framework to enhance self- management among people with chronic illnesses and optimise the use of limited resources to gain the greatest effect on a population basis. It 'stresses the importance of equitable access to health care; the triage of treatment based on patient needs; and the effective use of resources to prevent the occurrence of pain for people' who use the health care system (Rosenberger et al. 2011, p 40). A 'stepped care' approach to the management of chronic illness has been shown to be effective in a number of studies related to the management of chronic illness, including back pain (Von Korff and Tiemens 2000, Von Korff and Moore 2001). Stepped care is based on three assumptions: 1) different people require different levels of care; 2) finding the right level of care often depends on monitoring outcomes; and 3) moving from lower to higher levels of care based on patient outcomes often increases effectiveness and lowers costs overall. The significance of psychosocial factors on people's capacity to enact self-management has been identified in the literature related to diabetes, epilepsy and asthma (Glasgow et al. 2001, Gallant 2003) and serves to reinforce the need for pain management to be inclusive of these domains.

In summary, there have been numerous studies that have identified a relationship between psychosocial factors and the development of chronic pain. Despite the challenges in determining the interrelationship among the factors that influence the development of chronic pain, there is agreement that the approach to pain management should acknowledge pain as a biopsychosocial response and there is a need to mitigate the development or exacerbation of pain wherever possible. The values and principles which guide care delivery are a commitment to the most effective, evidence-based approaches to pain management using a population based approach to align resources to need in ways which maximise outcomes. Such an approach requires a greater understanding of the interaction of the biological, psychological and social aspects of pain in order to further develop the evidence base for the targeted management of pain. Considerable effort has been invested in research activity but there is much more to be done. Nevertheless, the principles of minimising the experience and impact of pain and best utilisation of resources to enable optimal outcomes are fundamental to a model of care for pain management in NSW. This requires appreciation of the structures and roles of each part of the health sector and clearly delineated care delivery processes.

### *What are the current structures and roles in pain management?*

There is growing consensus that the most effective strategy to prevent the development of pain disorders is to provide appropriate secondary and tertiary prevention of chronic pain (Brison et al. 2005, Gatchel 2009, Rueben 2007, Scholz and Yaksch 2011). The table below (adapted from the commentary in Gatchel 2009)

presents the levels of 'care' and their associated functions in the prevention and management of pain.

**Table 1: Levels of care and associated functions in the prevention and management of pain**

	Prevention	Treatment
Primary	Interventions to prevent pain occurring	Mainly passive modalities directed toward pain relief to promote early healing of tissues
Secondary	Interventions intended to avoid chronic disability/pain	Therapy driven programs intended to promote rehabilitation within a limited time frame
Tertiary	Interventions to minimise the impact of chronic conditions	Individualised and intensive treatment for the small fraction of patients whose biomechanical dysfunction, physical deconditioning and psychosocial stressors have led to chronic, entrenched disability (Gatchel 2009)

The current structures and roles in pain management reflect the responsibilities within the Population Health, Primary and Community Health and Acute Care Hospital sectors in NSW. Population health strategies focus on the health of population and have an emphasis on promotion, protection and prevention; Primary and Community health is a mixture of first contact generalist and specialised services that provide episodic and ongoing care; and the Acute Care Hospital sector focuses on providing episodic /short term care for individuals requiring specialised services. Access to Acute Care Hospital services, with the exception of EDs, is usually by referral (NSW Health Integrated and Primary and Community Health Policy 2007-2012, p 1). It is important to note that primary, secondary and tertiary treatment and associated secondary and tertiary prevention of pain occurs in both the Primary and Community and Acute Care Hospital sectors in NSW.

Examples of how each of these sectors contributes to pain management can be found in the literature. Population Health strategies intended to prevent the occurrence of pain are broad ranging and include immunisation programs for diseases which are known to lead to pain, particularly chronic pain (e.g. polio); health promotion activities designed to reduce the co-morbidities associated with the development of chronic pain (e.g. obesity, depression and smoking); and injury prevention programs such as safe driving campaigns and workplace injury prevention programs. Population health strategies can also assist communities to have more realistic expectations of treatments and interventions for pain. For example, Buchbinder and Jolley 2005 reported on a study undertaken three years after the cessation of a media campaign in Victoria which provided simple evidence-based advice about back pain, that there were significant improvements in both community and physicians' beliefs about back pain as well as a decline in number of workers' compensation back claims. A similar study was conducted by Gross et al. 2010 in Alberta, Canada. The authors' conclusions were that the Canadian campaign

appears to have had a small impact on public beliefs specifically related to campaign messaging to stay active, and that media campaigns have potential to prevent the over-medicalisation of lower back pain although no statistically significant or clinically meaningful impact was observed on health service utilisation or work disability outcomes. According to the Working Group which developed the European Guidelines for the Prevention of Chronic Back Pain (Burton et al. 2004), a broad categorisation of primary prevention strategies would be:

'information/advice, activity/exercise, ergonomics, organisational change, furniture, clothing, and orthoses. Clearly, some interventions involve an active element, and some will concern avoidance, whilst others may involve less direct approaches, such as addressing inappropriate beliefs (Ihlebaek & Eriksen 2003), or interfacing with social reorganisation (Scheel et al. 2002).

Specific interventions may not be universally applicable; rather they will be variously suited to the general population, workers, and school age' (p 7).

There are a range of providers in the primary and community health sector from whom people seek pain management. According to NSW Health:

'It is common for a person with chronic pain to consult their GP about their pain, but patients also seek advice from medical specialists (e.g. orthopaedic surgeons, rheumatologists, anaesthetists), and allied health professionals and alternative practitioners including physiotherapists, pharmacists, chiropractors, masseurs, acupuncturists, and naturopaths'.

Examples of the effective management of pain in the community and primary health care sector have been well described and are beyond the scope of this Review. Guidelines to enable the translation of evidence to practice have been developed (Clark and Upshur 2007). Issues associated with the assessment of pain and use of evidence-based interventions in primary and community care have been identified in the literature (Dobscha et al. 2008, 2009) and the need to provide continuing professional development to primary care providers (Crawford et al. 2007) has been highlighted. The model of care in community and primary health tends to be unidisciplinary or involve multiple practitioners in ways that may not be well coordinated. The need for specialist pain services to be available to those who experience unrelieved, severe and persistent pain in the community has been consistently identified (NPS 2010, IOM 2011).

Within the Acute Hospital Care sector, pain management is often espoused as a cornerstone of quality care. Despite this, there continues to be evidence that people continue to experience both acute and chronic pain while inpatients (Closs et al. 1998, Crawford et al. 2011, Dahl 2003, Falanga et al. 2006). Acute Pain Services have been introduced in major hospitals in NSW. The literature related to Acute Pain Services around the world indicates they are primarily focused on postoperative pain management (Barak et al. 2006, Bardiau et al. 1999, Chaudhari and Feaver 2011, Wangswadinat et al. 2008) and staff education (Barton et al. 2004, Chaudhari and Feaver 2011). The mainstay of acute pain experiences are pharmacological and non-pharmacological treatments such as balanced activity and rest, surgery or other procedures (Carfango and Schechter 2002, Howard 2003, Miaskowski et al. 1999).

Changed care processes in the Acute Hospital Care sector such as ambulatory surgery necessitate closer interaction between the acute service and community and primary care in regards to pain management and monitoring (Chaudhari and Feaver 2011).

The Acute Hospital Care sector also provides tertiary level services for people with pain as their principle health concern. There are 28 Pain Clinics and Pain Management Services listed on the NSW Health website (see Appendix 3). The overwhelming majority of these are in large metropolitan areas. The literature which describes pain clinics indicates they are committed to a biopsychosocial view of pain, tend to focus on complex, chronic pain and are staffed by multidisciplinary teams.

There are differences in nomenclature and structures of pain treatment facilities (Nicholas 2004). The IASP Task Force on Guidelines for Desirable Characteristics for Pain Treatment Facilities 2011 differentiates among pain facilities thus.

- Multidisciplinary pain centres differ from multidisciplinary pain clinics because they include research and teaching as well as patient care related to acute and chronic pain. Multidisciplinary pain centres are closely affiliated to academic and research institutions. Health care services in a multidisciplinary pain clinic are integrated and based upon multidisciplinary assessment and management of the patient. Inpatient and outpatient programs are offered in such a facility
- Multidisciplinary pain clinics specialise in the diagnosis and management of patients with chronic pain. They do not include research and teaching activities in their regular programs
- Pain clinics may specialise in specific diagnoses or in pains related to a specific region of the body. Classification as a Pain Clinic necessitates there being appropriate consultative and therapeutic services and ensuring chronic pain patients are suitably assessed and managed. The absence of interdisciplinary assessment and management distinguishes this type of facility from a multidisciplinary pain centre or clinic
- Modality-oriented clinics are facilities which offer a specific type of treatment and do not provide comprehensive assessment or management. Examples include nerve block clinics; transcutaneous nerve stimulation clinics; acupuncture clinics; biofeedback clinics; etc. Modality-oriented clinics may have one or more health care providers with different professional training; because of their limited treatment options and the lack of an integrated, comprehensive approach, they do not qualify for the term multidisciplinary.

The Australian Pain Society describes two tiers of pain facility. Tier 1 facilities are multidisciplinary pain clinics. These specialise in the diagnosis and management of a wide variety of patients with painful conditions. They also conduct research, are active in educational programs and are strongly affiliated to a major educational or research institution in the health sciences. Tier 2 Facilities are pain management services.

The services provided at given clinics in NSW appears to vary based on the local context and history of the service. A search for 'pain clinics' in NSW and Australia on the internet resulted in a wide variety of community based practitioners purporting to

provide/be pain services – the criteria for using the title pain service is unclear but it seems important that patients are clear about the types of services available to them in each Local Health District and that there is reasonable access to at pain management services for the population of NSW.

### *What are the care delivery processes and referral patterns and criteria for getting into and out of the service?*

Care delivery processes are dependent on the nature of pain. Patients who experience acute pain are seen in primary care settings, EDs and as inpatients. The need for greater collaboration among care providers within the hospital is a recurring theme in numerous reports related to the quality of care in hospitals. Concerns have been expressed about the quality of pain management for people who are inpatients as well as their ongoing pain management post discharge from the acute care service.

The potential for the development of chronic pain after particular surgical procedures has been identified. There is evidence that secondary prevention (i.e. interventions with person experiencing acute pain in order to prevent chronic pain) may be effective in preventing chronic pain and disability. Acute Pain Services may be important in this. However their role has tended to focus on the management of immediate pain, particularly post operative pain (McQuillan et al. 2005, Scott et al. 2008). Scott et al. 2008 argue there is potential for appropriately resourced Acute Pain services to make a greater contribution to areas such as:

- Acute pain in non-surgical settings (e.g. following acute trauma and some medical illnesses)
- Acute-on-chronic pain (and possibly assist in the prevention of chronic pain)
- Acute cancer pain (and sometimes acute palliative care)
- Acute postoperative and other medical problems (perioperative medicine).

If there is a correlation between poor pain management in hospitals and the development of chronic pain in some people, clearly a comprehensive model of care for pain management in NSW needs to ensure effective management of acute pain and early identification of those at risk of the development of chronic pain. Similarly, there is a need for prevention of development of the undesirable consequences of chronic pain whether their point of initial presentation is in the acute hospital sector or the community (Hansen 2005).

The longer people have to wait for access to services to address their ongoing pain needs is a factor that has been demonstrated to impact their pain outcomes. In a systematic review of the literature which links waiting times and outcomes, Lynch et al. 2007 identified that waiting times for treatment effect outcomes and the longer the period of waiting, the greater the deterioration in health and quality of life for people experiencing pain. This again highlights the need for models of care that facilitate prompt treatment for those who experience pain. In some cases, prompt treatment necessitates specialist input from experts in pain management in order to prevent undesirable outcomes (Hansen 2005). For example, Cicero et al. 2009 examined the co-morbidity and use of medical services of pain patients receiving opioid

medications and found a disproportionate number of claims and analgesic use among those who had chronic opioid use. They identified a number of factors other than pain intensity and duration as contributing to this, not least the fact that specialists in pain management were not consulted about appropriate and quality use of opioids or alternative treatment options. It is beyond the scope of this Review to explore the discussion about the use of opioids in pain management in detail. However, in addition to specialists in pain management not being consulted about the commencement and management of opioids, one of the primary reasons patients may access specialist pain services is to have their use of opioid medication authorised by a specialist pain physician. While some clinicians may view this as an opportunity to engage with people who experience chronic pain using a range of therapies, this may be a point of tension in care processes as some patients may have little interest in changing their treatment regime (Nicholas 2004) and clinicians may have mixed opinions about the opioid use in the management of pain. For example, Brennan et al. 2007 discuss the impact of what they term 'opiophobia' and 'opioignorance' on patients and their carers, health professionals and legislators as an example of how effective treatment of pain through the use of opioid medications can be inhibited. While agreeing with the need to ensure pain management is effective and acknowledging the intent of the paper by Brennan et al. is to promote the effective management of pain, White and Kehlet 2007 express concerns about any implication that there should be more liberal use of opioid medications and highlight the need for balanced, evidence-based discussion in both the academic and broader community about the management of pain and the merits and consequences of a range of treatment options (including but not limited to opioids).

Care processes that seek to prevent or better manage the progression from an initial injury to more chronic experiences of pain in particular lower back pain and WAD are prominent in the literature. The majority of patients with chronic pain may have very different care trajectories to those with acute pain. The Pfizer Health Report 2011 states:

'The vast majority (91%) of people who have chronic pain consult their doctor about their condition. Forty-five per cent (45%) also visit a physiotherapist; 29% speak with a pharmacist and 22% consult a pain specialist. A proportion (23%), also seek out help from 'other' (undefined) sources'.

The changed view of pain, and associated disability as a biopsychosocial phenomenon which for many people is also a chronic condition necessitates a model of care that is consistent with a focus on management rather than cure. This has resulted in the development of services that offer Pain Management Programs (PMPs) (British Pain Society 2007) as a core component of the care process. It is beyond the scope of this Review to describe PMPs in detail.

As has been discussed previously, the ability to develop tools and indicators that guide interventions is an important part of the referral process. Red flags are used to identify serious pathology, orange flags indicate psychiatric symptoms, yellow flags psychological factors such as beliefs and judgements, emotional responses and pain behaviour; blue flags explore the perceived relationship between work and health and black flags seek to identify system and contextual variables that may present obstacles to overcoming pain and disability (Gatchel 2009, Nicholas et al. 2011). The



use of indicators, in particular psychosocial indicators, in pain management has been identified as an area for further refinement. Nicholas et al. 2011 have noted suggestions that the range of applicability for 'yellow flags' should be confined primarily to psychological risk factors to differentiate them from other risk factors, such as social and environmental variables. Further, these authors note:

'...questions remain about which factors are the most important, both individually and in combination, and how they affect outcomes. Published early interventions have reported mixed results, but, overall, the evidence suggests that targeting yellow flags, particularly when they are at high levels, does seem to lead to more consistently positive results than either ignoring them or providing omnibus interventions to people regardless of psychological risk factors' (p 737).

The ability to develop predictive indicators is particularly important in order to determine the appropriate intervention for people through identifying those most at risk of chronic and disabling pain; identification and stratification of potential needs; and intervening as appropriate in those cases rather than offering an intervention to everyone experiencing acute or chronic pain. As predictive and prognostic research continues, it is important to remain abreast of it as increasingly strong evidence may emerge that there are care processes which can reduce the experience and consequences of pain for individuals and communities as well as reduce attrition from programs. There needs to be a model of care that can support delivery of these strategies and facilitate access to pain management approaches that are congruent with both immediate need and the potential for long-term consequences in those who experience pain.

As pain is a multifaceted experience that has multiple co-morbidities, it is important that there is interdisciplinary engagement in care processes, particularly for those who have complex needs related to their chronic pain. This has the potential to ensure optimal use of health care resources as well as maximise access to appropriate interventions for clients. In a study of 938 patients across the United States who experienced high levels of pain and depression, Bao et al. 2003 identified that people with high levels of pain and depression were less likely to use specialist mental health services than general medical services. The organisation of the complex and interdependent entities within the health care system and the need to integrate at various levels is well recognised as an area in need of improvement (Carlson et al. 2011, Gallagher et al. 1990, Kodner and Spreeuwenberg 2002). Care coordination is a key element in achieving integrated care for clients and reducing health service use including unplanned admission to hospital or presentation to ED (NSW Health 2011) The care/case manager approach has been demonstrated to have utility in improved patient outcomes in a range of chronic conditions (Deitrich et al. 2004). According to NSW Health 2011:

'Case management has been shown to be an effective tool for coordinating and integrating the multiple health and social care needs of people with complex chronic conditions and/or intensive needs. Care planning is needed to identify and organise appropriate ongoing care for the individual... Case management is a collaborative process of assessment, planning, facilitation and advocacy for options and services to meet an individual's health and social care needs.

The literature indicates that integrated case management leads to improved outcomes for people with chronic and complex conditions. It is particularly effective in people whose health and social care needs cannot be met with less intensive interventions. Case management uses innovation and flexibility to address individual care needs and facilitate collaboration between providers...'.

A case management approach for people in NSW who experience high levels of chronic and complex pain will necessitate strategies intended to build secondary level support for people experiencing pain, including access to general practitioners, allied health and other community based services (Bishop and Wing 2006, Matthias et al. 2010).

All processes, including referrals to and discharge from a chronic pain service should be systematic and evidence-based. Nicholas 2004 discusses the potential for pain services to add to the waiting times for patients through not having effective mechanisms to manage repeat consultations that do not necessitate the provision of services by a specialist team and poorly defined discharge processes.

A stepped model of care enables the most effective use of health resources through care processes which are targeted to populations. There is evidence that improved outcomes through systematic changes in the delivery of care enable more effective outcomes for patients and the community (Gilbody et al. 2003, Katon et al. 1999, Von Korff and Tiemens 2000). Aspects that are essential to effective stepped care are collaborative management; shared problem definition; goal setting and care plan; self-management training and support and active follow-up; and monitoring and treatment modification as necessary (Von Korff and Tiemens 2000).

The potential for telephone and other communication technology to assist in meeting developing self-management capacity among people who experience pain has been identified in a number of studies. For example, Ahles et al. 2001 introduced a telephone liaison nurse for people experiencing chronic pain, most commonly lower back or neck and head pain in Dartmouth. The nurse provided telephone follow-up with patients identified as having psychosocial elements in their pain while those without this received usual care. The authors concluded patients in the intervention group scored significantly better on the pain, physical, emotional, social and functional measures than those who received usual care, although the authors acknowledged that post treatment outcomes were tempered by baseline imbalances across groups.

The potential for information technology to maximise delivery of pain management strategies is being explored (Wing-Venuti et al. 2010). Maccea et al. 2010 conducted a systematic review and meta-analysis to quantify the efficacy of web-based cognitive behavioural interventions for the treatment of patients with chronic pain. They included 11 studies and demonstrated a small effect of web-based interventions, when using pain scale as the main outcome. They concluded that despite the minor effects and high dropout rates, the decreased costs and minor risk of adverse effects support additional studies in chronic pain patients using web-based interventions. They note it is particularly important to confirm the effects and determine the best responders to this intervention. Rosser and Eccleston 2011 caution against the overzealous adoption of technology by people experiencing chronic pain. They



reviewed pain apps available on smartphones and found limited involvement of health care practitioners in the development of these and support of patients. Rosser and Eccleston highlight the potential for poor quality resources stating: 'Pain apps appear to be able to promise pain relief without any concern for the effectiveness of the product, or for possible adverse effects of product use. In a population often desperate for a solution to distressing and debilitating pain conditions, there is considerable risk of individuals being misled' (p 208). Eccleston 2011 provides a useful commentary on the need to further explore the potential for internet-based delivery of cognitive behavioural therapy for pain management. In this he highlights the need to address the limitations of current evidence of the effectiveness of face to face cognitive behavioural interventions such as 'the proliferation of interventions of questionable quality, or poor reporting of quality....the lack of consensus or guidance over what is considered an effective intervention...the important contextual features of the treatment environment' (p 1701).

Eccleston 2011, p 1701 concludes that e-health offers great potential but:

*'If e-health is to deliver on its much lauded promise of delivering behaviour change interventions to the masses, it will need to move from its pragmatic beginnings and build theoretical informed foundations within behaviour therapy. Further, it is time to call for a new generation of therapists who are interested in developing technology assistive therapy'.*

The literature related to chronic disease management emphasises the need for integration of the physical and behavioural approaches to therapy (Cummings et al. 2005). While the extent to which these approaches are integrated in the various programs described in the literature was difficult to discern and not examined as part of this Review, there must be capacity in NSW Health to implement both physical and psychosocial components of pain therapy and management.

In summary, there is evidence of a need to:

- Optimise quality and consistency in care of the person with pain in all settings irrespective of the nature of pain (Bedard et al. 2006, Benjamin 2008, Clark and Upshur 2007, Dahl et al. 2003)
- Better implement the use of standardised care guidelines, protocols and pathways (Berger et al. 2010, Crawford et al. 2011, Falanga et al. 2006, Gordon 1996, Rothe et al. 2005, Titler et al. 2009)
- Ensure the validity and comprehensiveness of screening and assessment tools and processes (Hayes et al., 2002, Hasewaga et al. 2001, Idvall and Berg 2008, Leskin et al. 1999, Molea and Augustyniak 2005, Nicholas 2004, Nicholas et al. 2011)
- Provide a range of interventions for both acute and chronic pain, including behavioural programs for people with persistent pain (Sowden et al. 2004)
- Better define the criteria for attendance at specialist pain services and improve the discharge process from specialist services to community and primary care services
- Further explore the use of communication technology in pain management.

## *What are the patient outcomes?*

The patient outcomes that researchers examine are broad and include pain intensity and duration, quality of life, and functional outcomes. Dependent on the intent of the pain management strategy and the research questions, other aspects that have been examined include participation in work/school; length of stay in hospital; medication usage; and use of health care services. There is an emphasis on functional outcome measures rather than relying solely on symptom reporting in both acute and chronic pain experiences (Macintyre et al. 2010, Nicholas 2004, Motor Accidents Authority 2010). The range of outcome measures used in the pain management field have been reviewed by the IOM and others. There is consensus that there are limitations to single measures of outcomes such as pain intensity given the multifaceted nature of pain. Also recognised is:

'The lack of a single, universally accepted metric confounds clinicians' efforts to assess an individual patient's progression and response to treatment and researchers' efforts to evaluate treatment modalities through clinical, cost-effectiveness, comparative effectiveness, or even health services research' (IOM 2011, pp 3-23).

Therefore, there is a need for a range of tools that examine the outcomes of pain management from patient and system perspective. A number of approaches to determining pain outcomes are emerging as having utility in informing the growing body of knowledge about pain care. Dworkin et al. 2008 report on a consensus meeting: *Initiative on Methods, Measurement, and Pain Assessment in Clinical Trials (IMMPACT)*; to make recommendations about how to interpret reports of outcomes in the management of chronic pain. The meeting proposed provisional benchmarks and four core chronic pain outcome domains. Although there may be a need for data collection tools to be refined and agreed outcome measures to be determined, this has not inhibited systematic evaluation of patient outcomes. The literature revealed there is a strong emphasis on seeking the evidence of improved patient outcomes for given therapeutic interventions. The effectiveness of specific treatments, programs and interventions including the effectiveness of complementary and alternative therapies on pain has been examined (Badke and Boissonnault 2006, Barak et al. 2006, Barrows and Jacobs 2002, Berman 2001, Burke et al. 1994, Closs et al. 1998, Fritz et al. 2011, George et al. 2008, Gepstein et al. 2007, Lawrence et al. 2008, Marcus et al. 2003, Nguyen 2004, Patel et al. 2007, Piotrowski et al. 2003, Richardson et al. 2006, Snell and Hicks 2006, West et al. 2011).

Several papers located during this review examined clinical and other outcomes such as patient satisfaction or return to employment in order to collect evidence about the status quo and argue the case for improved pain management (Mularski et al. 2006, Sherwood et al. 2003, Stevenson et al. 2006, Todd et al. 2007, Wallace et al. 2009, Watson et al. 2004, Watson and Main 2004) and associated changes in models of care (Strachan and Gill 1999).

The predominant cause of persistent pain reported in the literature related to pain management is associated with musculoskeletal and connective tissue problems (Bove et al. 2008, Dziedzic et al. 2009), thus the literature related to this has been dominant in this Review. Other conditions which have been explored and found to

have positive patient outcomes for treatments that included psychosocial strategies include:

- Arthritis (Dixon et al. 2007)
- Chronic knee pain (Hurley et al. 2010)
- Headache (Gunreben-Stempfle et al. 2009, Haas et al. 2010, Rothner et al. 2011)
- Chronic abdominal pain (McGarrrity et al. 2000, Rothley 2004)
- Chronic craniomandibular pain (Aggarwal et al. 2010, Mohler and Tarrant 1991)
- Burns (Edgar et al. 2011)
- Cancer (Tatrow and Montgomery 2006)
- Spinal Cord Injury (Nicholson Perry et al. 2010)
- Chronic post partum pelvic pain (Jarrell et al. 2005).

Patient outcomes demonstrate improvement across a range of factors associated with psychological interventions such as cognitive behavioural therapy (CBT) in varied conditions and age groups, particularly when compared with no treatment/waiting list groups (Flor 1992, Hechler et al. 2010, Morley et al. 1999, Palermo et al. 2010). Logan and Simons 2010 implemented and evaluated an 8-hour outpatient clinic CBT program delivered by psychologist to 40 adolescents aged 12-17 and their parents and found improved outcomes related to depression, pain, and school attendance. Consistent with the discourse about pain as multidimensional, considerable literature has been dedicated to describing interventions that are inclusive of the psychological, social and environmental dimensions of pain. Some studies have focused on particular conditions and sought to determine the merits of psychosocial programs. The methodological challenges inherent in seeking to determine the outcomes of particular programs using published literature are exemplified in a study reported by Altmaier et al. 1992. These authors concluded that psychological treatment does not add significantly to improved outcomes for patients who receive usual treatment. However, it is important to note that the authors conceded their usual treatment included aspects of psychological intervention such as education and support and that they excluded people who were likely to experience chronic pain from their study. Nicholas et al. 2011 (p 743) comment:

'The term "usual care" is potentially misleading, as its meaning varies in different countries. In the Netherlands, for example, usual care can include attention to psychological risk factors and encouragement to resume activities by a general practitioner. In the United Kingdom it is more general and symptom -relief focused'.

Attempts have been made to determine the merits of inpatient and outpatient pain service attendance. Morley et al. 2008 examined the outcomes for patients who attended a well established four week long in-patient programme over a period of 10 years. Data were collected pre-treatment, one month post-treatment and nine months post-treatment. The unit in which the program occurs was staffed by a consultant anaesthetist, two clinical psychologists, a physiotherapist, an occupational therapist, a senior nurse, and a secretary/administrator. The program incorporated operant and cognitive behavioural principles in all aspects. No other active treatments (such as nerve blocks or acupuncture) were offered once patients were accepted for the program. Treatment was carried out in hospital premises with hostel-

type accommodation for in-patients who lived independently outside program hours and returned home at weekends. The in-patient programme was carried out over four weeks, four-and-a-half days per week. Morley et al. 2008 quote the description of the program by Williams et al. 1999.

'The program consisted of the following components, all supported by written materials: education concerning pain, disuse, drugs, and sleep; exercise routines for fitness, flexibility and muscle minimum strength, increasing gradually on a quota system; goal setting across all activities with quota increases and activity-rest scheduling (pacing); psychology sessions to improve problem solving, change maladaptive behaviours and to maintain those changes, with cognitive techniques to identify unrealistic and unhelpful thoughts and beliefs, and to challenge and change them; drug reduction applied to all pain-related drugs which had neither achieved analgesia nor improved function, with the usual aim of abstinence by discharge; applied relaxation; relapse prevention and planning for crises; and sleep hygiene. Spouses and family members (where available) were involved in a small number of sessions'.

There have also been analyses which suggest more intensive programs, although initially more expensive, appear to be more effective. Guzman et al. 2002 excluded studies where patients who had only physical or only educational interventions to examine 10 trials (12 randomised comparisons). The studies randomised a total of 1964 patients with chronic low back pain. Guzman et al. concluded there was strong evidence that intensive multidisciplinary bio-psycho-social rehabilitation with a functional restoration approach improved function when compared with inpatient or outpatient non-multidisciplinary treatments. There was moderate evidence that intensive multidisciplinary biopsychosocial rehabilitation with a functional restoration approach improved pain when compared with outpatient non-multidisciplinary rehabilitation or usual care. There was contradictory evidence regarding vocational outcomes of intensive multidisciplinary biopsychosocial intervention. Less intensive outpatient psycho-physical treatments did not improve pain, function or vocational outcomes when compared with non-multidisciplinary outpatient therapy or usual care. Other studies have demonstrated the relationship among intensive treatment and effect in those with high level needs. Gunreben-Sempfle et al. 2009 examined the outcomes of a 96-hour intensive headache treatment program compared to a 20-hour program. Their results showed that the 'intensive multidisciplinary treatment program produced a significant improvement in both migraine and tension type headache- days per month, frequency of migraine attacks and depressive symptoms (p 998). Williams et al. 1996, 1999 conducted previous studies of the program Morley et al. evaluated in 2008. Williams et al. 1999 undertook a randomised control trial with patients who had intractable pain who were randomised between inpatient, outpatient and waiting list control groups. Inpatients undertook a program for four weeks, four-and-a-half days a week while outpatients attended over eight weeks in sessions lasting three-and-a-half hours. The researchers concluded that both inpatients and outpatients improved over a one-month period and that at one-year those who were inpatients 'showed greater likelihood than outpatients of maintaining these treatment gains' (p 57). These studies highlight the potential for better discrimination among target groups for intensive interventions in order to address the question 'Which care for which patient?' and optimise resource distribution for maximal benefit.

Numerous other papers seek to determine the outcomes of programs designed to provide education, psychological intervention and self-management support (Moseley 2002). For example, a brief intervention for primary care back pain patients designed to provide accurate information about back pain and develop attitudes favourable towards self care was examined by Moore et al. 2000. Patients (n =226) were randomly assigned to a Self Care intervention or to Usual Care, and were assessed at baseline, 3-, 6-, and 12-months. The intervention involved a two-session Self care group and an individual meeting and telephone conversation with a psychologist experienced in chronic pain management. The authors report that:

'Research found that a brief psychologist-led cognitive-behavioral intervention designed to enhance back pain self care can be modestly effective in reducing worries about back pain, pain intensity, interference with activities, fear avoidance and dysfunction, while favorably altering attitudes toward back pain self care' (p 149).

Frost et al. 2000 conducted a prospective study of 129 patients about the outcomes of a modified multidisciplinary outpatient functional restoration programme. They concluded:

'Reports of improvement in pain-related disability 12 months after treatment were small to moderate. Patients had a 1 in 2 chance of reducing disability by 4% on the Oswestry Disability Index but some patients reported increased disability following the programme' (p 285).

The authors describe the program as multidisciplinary, including a physiotherapist, a part-time clinical psychologist and a physician, and focused on improved function and increased self-management by the patient. They also highlight that the program differs from other pain management programs in that only a small amount of treatment is carried out by a psychologist with the physiotherapist providing most of the cognitive based therapy within the program.

As is the case with biophysical therapies for pain management, there are studies which have compared particular strategies within the general sphere of psychosocial therapies. For example, in a study of people who had the presence of chronic pain, which had persisted for at least three months at the moderate-to-severe level (i.e. at least 4 of 10 on an 11-point Numerical Rating Scale (NRS) pain score), Wong et al. 2011 report on a randomised comparative trial of two programs – one using mindfulness-based stress reduction (n=39) and the other a multidisciplinary program (n=44). Patients in both the groups were comparable with regard to demographic characteristics, pain intensity, mood symptoms, and health-related quality-of-life measures before intervention. In both the groups, patients who completed the trial demonstrated statistically significant improvements in pain intensity and pain-related distress. They concluded both programs reduced pain intensity and pain-related distress although no statistically significant differences were observed between the two groups and the improvements were small.

Although general education and information programs have been found to have limited outcomes (Burton et al. 2004), the distinction among education and psychological approaches is not well defined nor described in the majority of studies.

Terms such as Cognitive Patient Education (Werner et al. 2010) do not facilitate the distinction.

The review of the literature related to psychological interventions in this rapid review indicates while programs may vary in terms of duration, structure and setting, there is a similar set of content delivered in these. In the main, the literature includes discussion and evaluation of models of care which include a range of multidisciplinary programs and their outcomes but does not appear to have compared outcomes across programs or identify the evidence base for the structure and content for particular programs. This has led to the conclusion that:

'There is insufficient evidence to recommend any one (psychological) therapeutic approach or modality over another. It is reasonable to consider the possibility that patients with different characteristics might derive benefits from treatments with different foci and targets' (Turk et al. 2011, p 16 cited in IOM, 2011, pp 3-17).

Psychosocial factors not only influence the development of chronic pain, they also influence patient engagement with programs. Burns et al. 2005 have linked patient outcomes and patient pre-treatment readiness to engage in self-management strategies. Again this highlights the need for a suite of programs aligned to particular clients and groups of clients. There is interest in comparing the outcomes of group and individual approaches to psychosocial interventions. Turner-Stokes et al. 2003 examined the outcomes of a randomised comparative trial with 113 adult patients with chronic pain (mean 8.8 years duration) who participated in a cognitive behavioural therapy program delivered in group-based multidisciplinary program or in an individual therapy program and identified no significant difference between the outcomes for two groups occurred. The authors note that decisions about group versus individual sessions are also related to space, scheduling and staffing.

Despite the range of variables within the literature and methodological limitations of studies, it must be emphasised that Gatchel and Okifuji 2006 concluded from a review of a decade of literature related to the management of chronic pain there is ample evidence that comprehensive pain programs are the 'most efficacious and cost-effective treatment for persons with chronic pain, relative to a host of widely used conventional medical treatment' (p 779). Therefore a model of care for pain management should be inclusive of pain clinics which provide a range of programs which are targeted to client need.

There also seems to be an emergent theme in studies that suggests the outcomes of those patients who engage in educative, psychological and behavioural interventions and experience positive outcomes and those who do not become more congruent over time. This suggests there is a window of opportunity in which to maximise outcomes from such interventions. It is also important to note that the groups examined in studies which draw this conclusion may not have included patients who experience the greatest level of pain related distress and disability.

Within the pain management literature, particularly that related to persistent pain, there is increasing recognition that patients have the capacity to engage in self care techniques as part of the care process. The belief that the patient should be 'encouraged to assume shared ownership of the health problem' (Texidor 1991, p 39)



underpins many of the programs developed (Nordin et al. 2002). Lorig and colleagues identified five core self-management skills: problem-solving; decision-making; resource utilisation; formation of a patient-provider partnership; and adoption of actions to manage the health condition. These skills are taught in a variety of settings (inpatient, outpatient, community) and delivered to groups or individuals although tailoring the intervention to the individual person in treatment also is a distinguishing characteristic of self-management (Lorig and Holman 2003).

Preliminary support for self-management approaches to chronic pain comes from reports of improvements in pain among individuals with arthritis (Lorig and Holman 1993), back pain (Von Korff et al. 1998), and diverse chronic pain conditions (LeFort et al. 1998), after participating in pain self-management training programs. Furthermore, individuals who participate in such programs show increases in active pain coping and in self-efficacy for managing pain, and decreases in negative cognitive responses to pain (LeFort et al. 1998, Lorig et al. 1998, Moore et al. 2000), suggesting that the effects of self-management programs on pain outcomes may be mediated by these cognitive and behavioural changes. Blyth et al. 2005 conducted a study of 474 adults aged 18 years or over with chronic pain and examined the effect of active self-management strategies compared with passive strategies. Using passive strategies increased the likelihood of having high levels of pain-related disability and more pain-related health care visits while using active strategies substantially reduced the likelihood of having high levels of pain-related disability. Appendix 4 presents further examples of the range of literature which seeks to relate care processes and patient outcomes.

Among the challenges noted in seeking to determine outcomes of a model of care for pain management is the mechanism for consistent categorising and coding of client presentations. For example, Pines et al. 2011 have identified the need for more effective understanding of frequent use of ED by patients by creating more meaningful categories based on actual usage, patterns over time, types of ED services used, and whether more than one ED is used. Despite the ED being a less than optimal setting for patients seeking management of persistent pain, patients continue to present there for treatment and support. People with chronic pain are a relatively small group of vulnerable patients accounting for a disproportionately high number of ED visits (Althaus et al. 2011). There have been some initiatives implemented to provide improved care for people with persistent pain who present frequently to the ED. Woodhouse et al. 2010 report on a study in which an ED-based behavioural health consultation was provided to those who presented to ED for problems related to chronic pain. They compared high-utilisers (>4 emergency department visits in 6 months) to low utilisers in total ED visits 6 months before and after the intervention. The low utilisers mean ED visits remained stable before and after the intervention while the high utilisers showed a decrease in ED utilisation. This differential response between groups was statistically significant. The authors concluded there was evidence that the introduction of behavioural health consultations may be effective for reducing high utilisation of ED services by some chronic pain patients, particularly those who consume the most services. Althaus et al. 2011 performed a systematic review of the type and effectiveness of interventions to reduce the number of ED visits by frequent users. They reviewed 11 studies (three randomised controlled trials, two controlled and six non-controlled before-and-after studies). Case management was the most studied

intervention (n=7). Only one of the three randomised controlled trials showed a significant reduction in ED use compared with usual care. Six of the 8 before-and-after studies reported a significant reduction in ED use, and one study showed a significant increase. ED cost reductions were demonstrated in three studies Althaus et al. concluded: 'Interventions targeting frequent users may reduce ED use. Case-management, the most frequently described intervention, reduced ED costs and seemed to improve social and clinical outcomes. It appears to be beneficial to patients and justifiable for hospitals' frequent users and standardised outcome measures' (p 41).

Determining outcomes of models of care and care delivery processes is challenging. As Gatchel and Okifuji 2006 comment:

'What complicates the already complex picture of pain management is the fact that therapy outcomes for chronic pain require multidimensional assessment because (a) chronic pain affects multiple domains of life; (b) different parties involved in the care of persons with chronic pain are interested in different outcomes; and (c) those outcomes are not necessarily correlated with one another' (p 781).

However, synthesis of the available literature indicates that positive outcomes for patients are maximised when there are care processes which provide:

- Prompt and appropriate intervention for acute pain
- Multimodal therapies that build self-management capacity
- Screening and appropriate referral for those at risk of needing tertiary intervention for pain and processes for discharging people from programs
- A high intensity care process for chronic pain which is multidisciplinary and multimodal
- Case management and coordination.

In summary

- There are a range of patient outcomes examined in the literature. While this provides insight into the variables that can be affected by pain, the extent to which patient outcomes are collected and examined systematically impacts the capacity to make generalised conclusions about the outcomes of specific programs and care processes
- The use of evidence-based guidelines results in improved patient outcomes
- The nature and intensity of an intervention are variables that will impact outcomes. There is some evidence to suggest that high intensity programs have greater effect than lower intensity programs for those with 'high-level' need. The delivery of intense, high cost programs to people who do not have 'high-level' need is likely to lead to inappropriate use of resources and 'over-servicing' of those for whom less intensive programs would be of equal benefit
- The nature of integrated therapeutic processes (e.g. physical and behavioural) will influence patient experience, engagement and outcomes
- There is need for more systematic coding of pain in order to determine patient and system outcomes related to care processes and program.



### *What does the community think of the current model of care?*

People with long-term chronic conditions experience the receipt of health care across a range of settings. They expect consistent, evidence-based treatment to be available at multiple points of service delivery and to be provided with a timely response that prevents deterioration of their condition. Unfortunately people with pain, particularly chronic pain, face a number of barriers in attaining this standard of care (IASP 2011, Lynch et al. 2008).

Community perceptions of an approach to care can be inferred from studies which examine patient expectations, satisfaction and experience. The 2011 Pfizer Health Report states 56% of people with chronic pain feel their pain is slightly understood and 36% believe it is not at all understood. People with chronic pain report being stigmatised and 41% are to some extent dissatisfied with the way their pain is managed with only 16% being satisfied with their pain management. Petrie et al. 2005 conducted a study of 77 patients attending their first session of a pain clinic. These patients sought an explanation of their pain and relief from its occurring. The most disappointing outcome was being told nothing could be done. The majority of patients expected further medical investigations and changes to the prescribed medication. Petrie et al. concluded improved understanding of patient expectations by pain clinic clinicians may lead to greater patient satisfaction and reduced treatment dropout. Other authors have identified a need for sensitive and constructive communication with patients in order to manage disappointment and any perceptions of banishment (Nicholas 2004, Verbeek et al. 2004).

The extent to which client expectation and preference influences outcomes has been identified as warranting further investigation. More comprehensive screening of patient readiness to engage has also been identified as necessary in order to improve patient outcomes. White and Kehlet 2007 highlight the extent to which well intentioned discussions about the need to minimise pain may result in unrealistic expectations that people experience no pain, and result in demands for pain management interventions that may have negative short and long term outcomes. Some studies have identified the extent to which patient expectations impact their engagement with evidence-based treatments. McGuirk and Bogduk 2007 conducted a study of 164 consecutive patients who were employees in two public hospitals in NSW and attending a back pain clinic in the hospital. The researchers assigned patients to an evidence-based treatment group and a usual care group. Usual care consisted of certification for modified duties or time off work, variously coupled with non-opioid analgesics and physiotherapy. The evidence-based care group had consistently better outcomes against measures of return to work, lost time, recovery, recurrence and chronic pain. In this study, three types of patients were identified: those who accepted evidence-based care readily (32%); those who brought to the consultation beliefs about how their back pain should be managed (24%); and workers with job dissatisfaction and psychosocial difficulties in the workplace (44%) (McGuirk and Bogduk, 2007, p 39)). This type of study highlights the need for practitioners to actively engage patients in evidence-based care. It also reinforces the need for early identification of patients who may be predisposed to non-engagement with evidence-based practice based on their individual circumstances.

The reported experience of people with pain suggests there is a need to improve access and referral processes to specialist pain services. In a national telephone survey of 500 adults in the United States who had attend ED with persistent or chronic pain, Todd et al. 2010 found this group had 4.2 ED visits within the past two years. A significant minority (11%) reported that the ED staff appeared to perceive them as 'drug seekers'. The authors concluded there is need for more information for people attending EDs and improved mechanisms for referral to speciality pain clinics. NSW data for those presenting to ED with persistent pain as their primary reason for attendance was not provided as part of this Review.

Logistic challenges have been identified in attending outpatient clinics for pain and other conditions. These include demographic and social factors, capacity to attend due to illness, scheduling difficulties, poor quality communication and clinician and referral factors (Lacy et al. 2004, Logan and Simons 2010, Mitchell and Selmes 2007, Neal et al. 2005).

### *What is the staffing profile and skills mix? What factors affect this?*

The staffing profile varies dependent on the nature of the service provided. Tertiary chronic pain services are usually staffed with medical staff, clinical psychologists, physiotherapists, and nursing staff who have specialist expertise in pain management. Occupational therapists, pharmacists and psychiatrists may also form part of the core staff establishment in a pain service. Irrespective of the staff profile of a pain service, close working relationships with other services that enable the effective management of pain as well as services that may require specialist pain input (e.g. services for oncology, surgery, older person care, chronic diseases and addiction) are essential. There is also need to ensure that there are administrative personnel who support effective clinical service delivery in order to ensure clinical staff are well utilised.

Staffing profiles are dependent upon professional and regulatory factors such as scopes of practice, educational preparation, rights to practice and funding models as well as workforce supply. Clinical policy and procedure related to matters such as who can order diagnostics medication and who is responsible for the overall plan of care, influence staffing profiles as do arrangements for independent; supervised/delegated practice; and expanded and extended scopes of practice (Brown and Folen 2005, Byfield 2001, Cartmill et al. 2011, Ryan and Thwaites 2009). Some approaches to pain management programs have used 'expert patients' as part of the staff profile. Whether these are paid or voluntary is not consistently identified. Foster et al. 2007 examined 17 studies of lay-led self-management programs for people with chronic conditions and concluded there were no significant or sustainable benefits to these as a whole.

There is anecdotal and experiential evidence that changing models of care are resulting in greater interprofessional collaboration and involvement of professionals in care in ways that have traditionally been the domain of a single profession. For example, Murray 2011 describes the introduction of nurse-led triage clinics, and Sorenson and Frich 2008 discuss home visits by nurses after discharge from a chronic pain clinic. Carfango and Schechter 2002 describe the role of a pharmacist in an acute pain management service as including review of a patient's drug therapy and optimising drug selections well as the management of medication with regards to

preparation, stability and storage and policy and procedure development. Valgus et al. 2010 report on a pharmacist-led, interdisciplinary outpatients clinic for patients with pain and other symptoms related to cancer. The team worked collaboratively to ensure optimal medication regimes. Patients reported a reduction in pain symptoms following attendance at this clinic. Bero et al. 2000 conducted a review of the literature in order to determine the impact of expanding outpatient pharmacists' roles on health services utilisation, the costs of health services, and patient outcomes. They found the limited number of studies analysed support the expanded roles of pharmacists in patient counselling and physician education and reduced hospital admissions and health service utilisation without impacting adversely on patient outcomes. They concluded that doubts about the generalisability of the studies, the poorly defined nature of the interventions tested, and the lack of studies including cost assessments and patient outcome data make it difficult to determine the efficacy of pharmacy led care processes.

Courtenay and Carey 2008 conducted a review of the literature on nurse-led care in both acute and chronic pain settings. They located 21 studies and identified that the activities in which nurses are engaged in caring for people with both acute and chronic pain include assessment, monitoring, evaluation of pain, interdisciplinary collaboration and medicines management. Nurses are also involved in the education of patients and staff as well as administration functions. Education programmes delivered by specialist nurses can improve the assessment and documentation of acute and chronic pain. Educational interventions and the use of protocols by specialist nurses can improve patients understanding of their condition and improve pain control. The authors provided examples of where acute pain teams, led by nurses, can reduce pain intensity and are cost effective as well as where researchers have examined nurse-led cognitive behavioural programs and other psycho-education programs to conclude there is evidence nurse-led chronic pain programs can achieve improved patient outcomes. Courtenay and Carey 2008 (p 2010) caution that although:

'The findings of the review are generally positive, there are methodological weaknesses (in particular the wide range of tools used to assess and explore acute and chronic pain) and under researched issues (e.g. research examining nurse-led activities outside the hospital setting and the prescription of medicines by nurses) that point to the need for further rigorous evaluation'.

There are also examples of working across both acute and chronic pain services within professions as demarcations between acute and chronic pain service provision are replaced with more integrated service delivery congruent with integrated models of care. For example, Williamson-Swift 2007 examined the experiences of 101 pain specialist nurses in the United Kingdom via survey and found that 48 percent of the nurses worked equally in acute and chronic pain; 27 percent worked most or all of the time in chronic pain; and 25 percent worked most or all of the time in acute pain. Nurses who responded to the survey, which was designed to explore their educational preparation and development for the role of Pain Nurse Specialist, indicated nurses were concerned about their access to education that focused on the knowledge and skills required for their roles. Ryan et al. 2007 explored the implementation of a nurse consultant position in a rheumatology clinic by exploring the perceptions of peers about the role, and conducting a retrospective audit of 60 patient records to determine if implementation of the role had any impact on use of health services. The

results of the audit demonstrated a reduction in the number of hospital specialties attended by patients and the number of hospital appointments patients were attending. The study did not examine if patients were using other services in lieu of the hospital nor if patients' experience of pain was altered.

The literature seems to use the terms 'interdisciplinary', 'interprofessional' and 'multidisciplinary', 'multiprofessional' interchangeably when describing pain management programs and their associated staffing. However, the modus operandi and activities of the multidisciplinary team are frequently not well elaborated. Further, there is a questioning of the financial viability of some models of multidisciplinary pain management (Kent 2008). Consideration of a staffing profile for pain services raises questions not easily addressed through a review of literature. For example, does a multidisciplinary pain assessment entail the patient having separate consultations with each professional? Or does it involve the patient being assessed by a group of clinicians as a team at the same time? Or does it describe the process by which one professional uses a standardised approach to patient assessment which provides information to each of the disciplines in the multidisciplinary team in order to develop a multidisciplinary treatment plan? Are there generic competencies required by all professional staff in a pain service? Do all the aspects of clinical service delivery have to be provided by a professional workforce or could vocationally qualified personnel contribute? If a member of the multidisciplinary team assumes activities that may have traditionally been undertaken by another professional group (e.g. psychosocial assessment, ordering of diagnostic investigations or pharmacotherapeutics) what education is required? Are there implications to legislation, policy or procedure? What situations require discipline specific expertise?

What is clear in the literature with regard to staff is that there is need:

- To change the culture of health care and the broader community with regard to perceptions of those who experience pain (Clark and Cox 2002, Robinson et al. 2011)
- For more robust education of all health professionals about pain and the role a pain service can play in that (Atkinson et al. 1999, Barton et al. 2004, Green and Tait 2002, Gregory and Haigh 2008)
- To supply and maintain an appropriately educated workforce with specialist knowledge in the field of pain management (Arora et al. 2011)
- To ensure staff skills are matched to patient need.

### *What is the cost of service delivery and what evidence is there that the model of care is cost effective?*

As has been observed by Dickinson et al. 2010:

'Providers and patients often search for a satisfactory combination of treatments to ease suffering and increase functional status, while minimizing costs to the individual and the healthcare system' (p 38).

Stephens and Gross 2007 examined the influence of stepped continuum of care model on the rehabilitation of compensation claimants with soft tissue injury. These authors provide a rich description of the model of care implemented by the Workers

Compensation Board of Alberta in a staged way since 1995. The model of care involved three main components 1) staged application of different types of rehabilitation services depending on the progress of recovery; 2) case management protocols and checkpoints integrated into case planning; and 3) contracted services with four types of rehabilitation service providers (physical therapy, chiropractors, multidisciplinary assessment centres, and multidisciplinary rehabilitation providers). Within the model, primary physical therapy or chiropractic may be used but only for the first six to eight weeks following a claim and only in cases where spontaneous recovery is not occurring or expected. Claimants still off work for six to eight weeks are referred for multidisciplinary assessment for the purpose of identifying return-to-work barriers and determining most appropriate treatment. Further time-limited care by the primary care provider could be recommended or referral for multidisciplinary rehabilitation made if important psychosocial or other barriers were identified. Multidisciplinary rehabilitation was in the form of functional restoration and delivered in a team setting.

Treatment teams consisted of occupational, physical and exercise therapists, psychologists, as well as physicians with special interest in occupational medicine. Programs were goal-oriented with a component of cognitive-behavioural therapy and work simulation. Stephens and Gross 2007 estimated overall cost savings during the full implementation period were approximately \$21.5 million (Canadian) and attributed this to reduced disability compensation payments as well as reduced healthcare utilisation. Further, they concluded that duration of work disability decreased after implementation in the intervention group, while little change was seen in a comparison group and implementation of a continuum of care appears to have resulted in more rapid and sustained recovery in patients filing soft tissue injury claims while maintaining client satisfaction.

Dobscha et al. 2008 describe the process for implementing a model of care for pain management in a primary care setting. The staff development undertaken prior to the implementation of a model of care is described in their study of the implementation of a care pathway for veterans experiencing more than 12 weeks of pain. This model of care, entitled *Assistance with Pain*, is designed to educate and engage patients and clinicians, and to facilitate care in the primary care setting, involves screening, education and goal setting at initial consultation with a clinician in a primary setting, attendance by the patient at four, ninety-minute group sessions which focus on brief activating interventions and aim to reduce fear-avoidance beliefs, to identify individualised functional goals, and to increase physical activity using cognitive/behavioural and educational approaches. Consistent with principles of primary and collaborative care, there is communication from the pain care manager to other members of the primary care team regarding the patient's goals, and interventions based on treatment guidelines are implemented. The patient is monitored for improvements in pain, depression, alcohol and goal attainment every two months via telephone consultation with his/her care manager. The need for referral to specialist pain, mental health and other services is identified via this consultation based on criteria such as lack of improvement in pain function or severity or depression severity despite treatment, diagnostic uncertainty, or complexity. The outcome evaluation of this model of care has been described by Dickinson et al. 2010. In a randomised study of the implementation of the '*Assistance with Pain*' program (Dickinson et al. 2010) reported an increase in pain-disability free days but concluded

the cost of delivery of the program was more expensive than anticipated for the outcome and relatively expensive when compared to other programs in primary care. These authors note 'further research is necessary to identify if the intervention is more cost effective for some patient subgroups and to learn whether pain improvements and higher costs persist after the intervention has ended (p38).' They also acknowledge that there may be cost and other variables associated with the population of interest (Veterans' Affairs clients) that impact the study results.

Brandow et al. 2011 explored the impact of a pain service for children with Sickle Cell Disease. They undertook a retrospective study and identified that interdisciplinary pain clinic services results in increase in non-pharmacological techniques for pain management, decreased analgesic use and reduced hospitalisation for pain-related reasons.

There are relatively few studies which seek to determine the cost effectiveness of models of service delivery. The point at which cost is determined may lead to conclusions that are not accurate when the patient pain trajectory is viewed in entirety. Luck et al. 2007 have identified a need to use standardised methodologies in order to create a business case for a particular model of care and highlight the necessity to establish appropriate time horizons, scope of services, target populations and existing arrangements. In their paper reporting on the study which compared the outcomes of inpatients and outpatients who participated in a pain management program, Williams et al. 1999 identify factors to consider when seeking to determine the cost effectiveness of a model of care for pain management. These include cost of inpatient versus outpatient treatment, savings in drugs, medical resources and disability payments and minimising health services. Lin et al. 2011 conducted a review of 26 studies which examined cost effectiveness of protocols for LBP and found evidence supporting the cost effectiveness of the guideline-endorsed treatments of interdisciplinary rehabilitation, exercise, acupuncture, spinal manipulation and cognitive-behavioural therapy for sub-acute or chronic LBP and concluded there is little or inconsistent evidence for other treatments.



## Recommendations for a model of care for pain management in NSW Health

Pain is increasingly viewed as a chronic disease. The objectives of an effective chronic care strategy are to:

- Prevent/delay the onset of chronic disease for individuals and population groups
- Reduce progression and complications of chronic disease
- Maximise wellbeing and quality of life
- Reduce avoidable admissions and health care procedures
- Implement best practice in prevention, detection and management
- Enhance the capacity of the health workforce to meet population demand for chronic disease prevention and care into the future (NPHAC 2006, p 8).

The two questions asked in this Review were:

- *Which models of care for pain management have been implemented and evaluated for effectiveness in improving outcomes in any of the following settings: hospital inpatient, hospital emergency department services and hospital based outpatient pain services?*
- *Of those models of care which have evidence of positive outcomes at individual and hospital level? Which have no evidence of positive outcomes?*

This Review has demonstrated there is strong conceptual commitment to the biopsychosocial model of pain, and treatment strategies are being implemented to address these. There is much research activity about the effectiveness of some care processes and treatments within the biopsychosocial approach related to individual patient outcomes although it is difficult for those unfamiliar with the pain management field to gain a definitive sense of the strength of the evidence resulting from this work.

There is an emerging body of evidence about the factors that may predispose people to particular responses to pain and the need to screen for those factors in order to optimise early intervention and prevention of further chronic pain. There is less evidence available related to the effect of these interventions on hospital admissions; length of stay; and presentations, however the evidence that is available demonstrates that for particular populations there are strategies which are potentially effective in reducing each of these.

Other factors which are important in effective care processes are the translation of research to practice. Clinical guidelines are important in achieving improved clinical outcomes and optimising use of resources, including appropriate access to specialist services.

It has been observed that 'Many of the barriers to good pain management are not primarily scientific or medical, but organizational' (Clinch and Eccleston 2009). This Review has identified factors to be considered in developing a system-wide model of care for pain management in NSW Health that will enhance the implementation of scientific knowledge across all sectors of care in NSW Health.





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## Appendix 1: Review Proposal

### FINAL PROPOSAL

The Agency for Clinical Innovation (ACI) wishes to commission a review of models of care for integrated chronic pain management services including the key aspects which have been found to result in improved processes and functional outcomes.

#### Purpose and audience

Expert consensus and a growing body of research indicate that best practice chronic pain management requires coordinated interdisciplinary assessment and management. The ACI established the Pain Management Network in February 2010. It has been tasked with developing an integrated model of care for chronic pain management including community, primary, secondary and tertiary treatment services.

The results of this review will be used to inform the ACI and its partners in developing a Model of Care and a Statewide Plan for the improved delivery and funding of chronic pain services to consumers within the next financial year. Clinicians from within the network will use this information to achieve a consensus view on a Model of Care to be implemented once funding has been released.

#### Review question one:

Which models of care for pain management have been implemented and evaluated for effectiveness in improving outcomes in any of the following settings: hospital inpatient, hospital emergency department services and hospital based outpatient pain services?

#### Scope of question one:

- The target population for these models of care would be those with chronic (persistent) pain or recurrent episodic pain (e.g. migraine); or populations where pain management is a major focus of the model of care (for example, people with arthritis or musculoskeletal conditions more generally)
- Improvements in outcomes would include reduction in readmissions to one or more hospitals or ED departments; reduction of length of hospital stay; reduced inappropriate use of opioid medications
- Only studies that evaluate the effect of implementing models of care are of interest. These include single group before-and-after studies and comparison studies (ie comparing an intervention and control groups)
- Where the cause of presentation with pain is trauma-related, this includes the full range of injuries irrespective of the level of severity of that injury

- While the primary focus is on effectiveness in relation to hospital services, it is expected that the models of care may include components outside of these (for example primary care)
- There is particular interest in identifying those models of care that also include secondary prevention strategies to prevent progression from acute to chronic pain (that is, early screening, identification and triaging of those at risk of progression from acute to chronic disabling pain)
- There is particular interest in identifying those models of care that include compensable injury populations
- There is particular interest in identifying those models of care that also include strategies to improve routine system-level identification of pain patients (for example, by changes to coding of hospital admissions)
- Only include studies that provide some description of the model of care

#### Review question two:

Of those models of care identified in Question 1, which have evidence of positive outcomes at the individual and hospital level? Which have no evidence of positive outcomes?

#### Scope of question two:

- Hospital-level outcomes include: improved access to services for groups with poor access prior to implementation of the model of care (e.g. geographically isolated; distinct cultural and language groups; Medicare funded; paediatric patients); reduction in waiting list times for access to hospital-based inpatient and outpatient pain services; cost savings; reduction in number of hospital admissions
- Individual-level outcomes include: pain-related disability; functional status; health-related quality of life; social participation (including work); mood and unwanted side-effects of medication.

#### Scope of the review

The review should:

- Provide a comprehensive coverage of research in the peer review literature including academic databases (e.g. Cochrane, Medline, Psycinfo)
- Provide a comprehensive review of the grey literature including government reports, agency reports. The ACI will provide relevant reports (for example, National Pain Management Strategy, Victorian and Queensland Statewide plans)



- Identify areas where there is strong evidence in relation to the review question; where there is equivocal or conflicting evidence; and where there are gaps in the evidence
- Focus on literature published since 1990.

#### Format of the Review

The review will consist of:

- **Executive summary:** This will be one to two pages and summarise the key findings from the review. It should be suitable to be read by research literate individuals.
- **Main review:** This will be around 10-20 pages (excluding references) and will provide:
  - Background and introduction
  - Description of the method used for searching and selecting research papers
  - Analysis of research evidence in terms of specified review question/s
  - Analysis of applicability of findings to NSW context:
  - Description of the studies including:
    - Brief description of study population (for example, age range; subgroups eg subacute/chronic/recurrent pain; cause of pain – particularly motor vehicle-related trauma)
    - Brief description of how people with pain were identified for inclusion in the study (specifically comment on whether hospital coding systems were used to identify the study population)
    - Primary and secondary outcome measures
    - Brief description of the components of the model of care
    - Brief description of implementation process if available
    - Commentary on whether or not the implementation process was described and/or evaluated
    - A description of any barriers or enablers to implementation that were identified
    - A description of factors which were associated with either a positive impact or a negative impact/lack of impact on outcomes.
    - A description of any access factors that were identified that affected either implementation or outcomes (for example, out of pocket costs, language and cultural barriers, geographical barriers, waiting times)
  - For those models of care that include secondary prevention strategies to prevent progression from acute to chronic pain the following additional information is required:
    - Brief summary of key components of the assessment and triaging process:
      - Which screening tools were used?
      - How early in the acute/subacute pain process did assessment and triaging occur?

- How were patients triaged (setting, assessor, actions following assessment and triaging)?
- **Recommendation based on review questions 1 and 2 of:**
  - Expert opinion of best models of care
  - Expert opinion of best bets for improving routine identification/coding of inpatients, and emergency department episodes of care for pain.
- **Tabulation of the relevant papers indicating:**
  - The methods, findings and critical commentary for each study
  - Description of the intervention and any co-interventions,
  - Study methods including
    - sample size
    - setting
    - level of evidence (strong, weak, equivocal)
    - Summary of evidence
- **List of critical terms and measures**
- **Reference list**
  - Limited to papers and other publications referred to in the review

## Appendix 2 : Sample record of process of initial review of papers – pre feedback on interim report

### 1. Citation

Arora, S. et al. 2011 Partnering urban academic medical centers and rural primary care clinicians to provide complex chronic disease care. *Health Affairs* 30 (6) 1176-1184.

### 2. Does the paper identify outcomes?

- ☐ Yes - proceed to 3
- X No – describes
  - ☐ consensus view
  - ☐ guideline development
  - ☐ professional perspectives
  - ☐ education and training needs analysis
  - X education and training program and learning and other outcomes
  - ☐ quality audits (e.g. non compliance with policy re medication administration and pain assessment protocols in an APS)
  - ☐ other: Comment discusses partnership between education providers and care providers and use of technology as enhancing education and community care. Identifies how telehealth and case learning can be integrated to promote learning and provision of care to communities.

*If 'No' – consider using as background*

Ask 'what is the literature that is not included saying about what needs to be addressed in developing a model of care ?'

### 3. Does the paper identify outcomes that have been evaluated through research?

- ☐ Yes - interrogate further
- ☐ No - include as background

### 4. For papers that report outcomes, are the outcomes clearly related to

- ☐ a model of care (e.g. compares and contrasts inpatient and outpatient services, redesign of clinical services, use of technology to change way service is delivered, professional role expansion, interprofessional and multidisciplinary practice; definitive outcomes of effectiveness of screening; relationship of pain services and other services )
- ☐ a treatment intervention – e.g. a modality (outcomes of PCA versus other forms of analgesia); surgery versus conservative treatment; complementary and alternative medicine, hypnosis, CBT- exclude unless discusses a model of care – consider the question 'What is this saying about what needs to be addressed in developing a model of care ?'
- ☐ comparison of professional groups in administering a treatment intervention (e.g. physiotherapists versus chiropractors in manipulation and exercise , psychiatrists versus psychologists re CBT) – exclude

**5. Of those studies which describe outcomes of a model of care Is the model clearly described?**

- ☐ Yes – if 'Yes' proceed to 6.
- ☐ No

**6. What is the model?****7. What setting does the model occur in –**

- ☐ Primary healthcare community/general practice? – if 'yes' use as background or discard
- ☐ Acute hospitals - if 'Yes'
- ☐ Inpatient
- ☐ Outpatient
- ☐ ED

**8. For those models of care delivered in acute hospital settings - what was the focus of the approach?**

Condition	Adult	Paediatric	Acute	Chronic	Comment e.g. culturally diverse, veterans, MVA/WAD
<input type="checkbox"/> Musculoskeletal					
<input type="checkbox"/> Headache					
<input type="checkbox"/> Arthritis					
<input type="checkbox"/> Post surgical					
<input type="checkbox"/> Trauma/burns					
<input type="checkbox"/> Prevention of acute – chronic pain					
<input type="checkbox"/> Compensable injury					
<input type="checkbox"/> Cancer					
<input type="checkbox"/> End stage chronic disease-					
Other					

**9. What are the outcomes:***A. Systems indicators*

- ☐ Reduction in admission to hospital
- ☐ Reduction in use of other specialist services
- ☐ Reduced hospital stay
- ☐ Reduced inappropriate use of opiod medication
- ☐ Improved access
- ☐ Reduced waiting times
- ☐ Cost savings

Other

*B. Patient indicators*

- ☐ Quality of life

- ☐ Physical/functional(eg exercise tolerance, flexibility)
- ☐ Pain (intensity, duration,)
- ☐ Pain related disability
- ☐ Work/school participation
- ☐ Mood/disposition
- ☐ Other: (e.g. medication use/effects/carers etc)

**10: Method**

Comment

## Appendix 3: Pain Services and Clinics in NSW

Source: NSW Health

[http://www.health.nsw.gov.au/PublicHealth/Pharmaceutical/chronic\\_pain/services.asp](http://www.health.nsw.gov.au/PublicHealth/Pharmaceutical/chronic_pain/services.asp)

Darlinghurst Arthritis & Pain Research Clinic  
Camperdown Pain Management Centre  
Pain Management Centre, Royal Prince Alfred Hospital  
Pain Management Department, The Prince of Wales Hospital  
Pain Management Service, Sydney Children's Hospital,  
Calvary Health Care Sydney  
St George Pain Management Unit, St George Hospital  
The Pain Medicine Research Centre, Liverpool Hospital  
Multidisciplinary Pain Clinic, Concord Hospital  
Sydney Pain Management Centre, Parramatta  
Pain & Palliative Care Unit, The Children's Hospital at Westmead, Westmead  
Westmead Chronic Pain Service, Westmead Hospital, Westmead  
Total Pain Management, Blacktown  
Nepean Pain Management, Kingswood  
Pain Management Unit, Nepean Hospital  
Pain Management and Research Centre, Royal North Shore Hospital  
Delmar Private Hospital, Dee Why  
Multidisciplinary Pain Program, Mt Wilga Private Hospital, Hornsby  
Interdisciplinary Pain Service, Gosford Hospital  
Rehabilitation Therapies Unit, North Gosford Private Hospital  
Toronto Rehabilitation Unit, Toronto Private Hospital  
Hunter Integrated Pain Service, Royal Newcastle Centre  
Department of Pain Management and Clinical Research, Royal Newcastle Centre  
Hunter Pain Clinic, Broadmeadow  
Innervate Pain Management, Broadmeadow  
NCAHS Multidisciplinary Pain Clinic, North Coast Area Health Service  
Illawarra Pain Management Service, Port Kembla Hospital  
Pain Clinic, Wodonga Regional Health Service

## Appendix 4: Sample of literature reviewed related to care processes

Reference details	Methods	Findings	Critical commentary	Intervention	Summary of evidence
Ahles, T. A., J. Seville et al. 2001. 'Panel-based pain management in primary care: A pilot study.' <i>Journal of Pain and Symptom Management</i> 22(1): 584-590.	Patients from 4 primary care centres with severe pain were randomised. The control group received mailed information and weekly telephone support from nurse educator. At six months questionnaires were mailed to both groups which included the <i>Medical Outcomes Study-36 Item-Short Form (MOSSF-36)</i> , <i>Functional Interference Estimate (FIE)</i> , <i>Patient Knowledge Questionnaire</i> and <i>process questions</i> related to satisfaction with treatment.	The intervention evaluated in this study provides rapid assessment and feedback to physicians regarding the effectiveness of pain interventions, educates patients regarding pain and basic self-management techniques, and addresses psychosocial problems when relevant. Data from the SF-36 and the FIE provided preliminary evidence supporting the efficacy of the approach. Patients in the intervention group scored significantly better on the Pain, Physical, Emotional, and Social subscales of the SF-36 and on the total score of the FIE.	Not fully randomised groups as was a feasibility study about potential utility of study approach.	The nurse-educator 1) conducted an assessment of pain and psychosocial problems; 2) established patient preferences for types of pain management strategies; 3) reviewed pain self-management strategies and provided, via mail, supplemental written and audio-taped materials describing basic pain management strategies (e.g. overview of pain management, relaxation, activity pacing, sleep, and pain); and 4) provided a problem-solving approach for psychosocial issues based on a problem-solving manual developed for treatment of patients in primary care. Nurses also communicated with specialists re patients' issues and treatment.	Nurse phone support has positive outcomes on patient indicators compared to mail out information alone.
Altmaier, E. M., T. R. Lehmann et al. 1992. 'The effectiveness of psychological interventions for the rehabilitation of low back pain: A randomized controlled trial evaluation.' <i>Pain</i> 49(3): 329-335.	Patients consecutively admitted over an 18-month period to the Low Back Rehabilitation Program at the Dept. of Orthopaedic Surgery, University of Iowa Hospitals and Clinics had to meet the following criteria: disabled and not working due to pain for at least 3, but no more than 30, months; not candidates for lumbar surgery; 18-63 years of age; not currently involved in personal injury litigation etc.	Looked at pain intensity, pain interference and return to employment as well as range of measures throughout program that measured physical exercise and self efficacy etc. Identified that both programs effective against indicators at various phases and 12-month follow-up.	Compared a program that included psychosocial support and education about pain and its management with one that included this and had added psychological components. The original program was effective and not a purely biomedical approach. This limits ability to discriminate among program outcomes as does the exclusion of people who may be experiencing high level of chronic pain.	Program with additional psychological components.	Cites other studies Turner and Clancy 1988 and a meta-analysis by Malone and Strube 1988 to conclude that there are patterns of uniformity in treatments that are psychologically oriented – the model of care should be inclusive of psychological treatments but effectiveness of particular ones in comparison to others should be further investigated.
Anooshian, J., J. Streltzer et al. 1999. 'Effectiveness of a psychiatric pain clinic.'	Medical charts were reviewed for 101 consecutive outpatients seen between January 1, 1993 and July 1, 1996 at a	The patients had significantly fewer medical visits and diagnostic tests 6 months after attending the pain clinic, compared with 6 months before	Inclusion criteria were suspicion of psychological issues and/or need for assistance with	Interventions frequently included detoxification and reduction and substitution of medication, and	Suggests potential benefit of psychological intervention with referral to others as



Reference details	Methods	Findings	Critical commentary	Intervention	Summary of evidence
Psychosomatics 40(3): 226-232.	unidisciplinary, psychiatric pain clinic, which exists within a hospital-based, university-run, outpatient service with primary and specialty care clinics. Mean duration of pain was 7 years. Multiple sites of pain were present in 69% of patients. Eighty-eight percent fulfilled DSM-IV criteria for pain disorder.	(P_0.0001). Also decreased use of narcotics and benzodiazepines. There was a difference between patient self-report re pain perceptions and physician reports of patients' pain status after the clinic. Forty-five (44.6%) patients reported that their pain had decreased after pain clinic intervention; 38 (37.6%) described their pain as the same; 9 (8.9%) stated it was worse; and 8 (7.9%) had no report. Physicians documented improvement in 56 (55.4%) patients; no change in 34 (33.7%) patients; worsening in 1 (1.0%) patient; and no report for 9 (8.9%) patients.	medication management.	always included psychotherapeutic approaches, particularly support and suggestions.	secondary.
Bardiau, F. M., M. M. Braeckman et al. (1999). 'Effectiveness of an acute pain service inception in a general hospital.' Journal of Clinical Anesthesia 11(7): 583-589.	1304 patients in the pre-APS inception phase and 671 patients after its implementation who have undergone various types of surgery (orthopaedics, gynecology, urology, neurosurgery, stomatology, ear, nose, and throat, ophthalmic, abdominal, vascular-thoracic, plastic, and maxillofacial). Patients were included in the study if they were more than 15 years old; were able to read and understand French; had normal mental health; and were hospitalised for elective surgery. Inclusion was prospective and consecutive.	Postoperative pain was assessed using a visual analogue scale (VAS) every 4 hours for 72 hours in the two phases. Analgesic consumption was registered at the same time. Time-related VAS scores were summarised using several pain indicators. There was an overall improvement in the pain scores after APS inception. The differences were most pronounced, around 50%, in patients undergoing vascular, maxillofacial, gynecologic, and urologic surgeries, and stomatology. Regular administration of paracetamol and nonsteroidal antiinflammatory drugs decreased morphine consumption in the second phase.	Highlights the importance of defining the term multi-disciplinary - when the intervention is unidimensional (e.g. assessment and response to pain as a physiological issue: is the intervention multidisciplinary or is it simply delivered by a team of consisting of different professions?). Only assessed at rest pain however acknowledged this and that effective measurement of pain on movement is essential for post surgical care. Patients were familiarised with use of pain assessment tools prior to surgery.	Evaluates the implementation of a nurse-based, anaesthetist supervised APS in surgical units.	When there is an APS there is improved monitoring of people's pain. Visual Analogue Scale and analgesic consumption are valid outcome measures for an APS.
Chenot, JF., C. Leonhardt et al. 2008. 'The impact of specialist care for low back pain on health service utilization in primary care patients: A prospective cohort study.' European Journal of Pain 12(3): 275-283.	This is a longitudinal prospective cohort study. General practitioners recruited consecutive adult patients presenting with LBP. Data on physical function, on depression, and on utilisation of health services were collected at the first consultation and at follow-up telephone interviews for a period of 12 months.	Logistic regression models were calculated to investigate predictors for specialist consultations and use of specific health care services. Large proportions (57%) of the 1342 patients were seeking additional specialist care. Although patients receiving specialist care had more often chronic LBP and a positive depression score, the association was weak. A total of 623 (46%) patients received some form of imaging; 654 (49%) physiotherapy; and 417 (31%) massage. Consulting	Not known who initiated the consult with the specialist-patient or GP as in German system no referral to specialist is needed.	No intervention but important as it indicates the impact of an open access to specialist without pain management expertise on the health system.	Consulting a specialist was the strongest predictor for the use of any further kind of health care services, while disease-related factors were comparatively less important predictors and socio-demographic factors of negligible importance. Highlights need to better

Reference details	Methods	Findings	Critical commentary	Intervention	Summary of evidence
		a specialist remained the strongest predictor for imaging and therapeutic interventions while disease-related and socio-demographic factors were less important; high utilisation of specialist care we observed is highly suggestive of inappropriate referrals or inappropriate self-referrals in a health care system with unrestricted access to specialist care. On the other hand, the high use of specialty care is contrasted by a significant proportion of patients with suspicion of red flags (43/108) or low functional capacity (240/533) which did not seek specialty care. This indicates a potential underutilisation of health services and a lack of sensitivity and specificity of red flags as for triage.			manage patients' expectations of what pain management strategies are appropriate and need for strong primary care screening and management prior to referral to specialist. Identifies there is a lack of incentives for GPs to be gatekeepers.
Cicero, T. J., G. Wong et al. 2009. 'Co-morbidity and utilization of medical services by pain patients receiving opioid medications: Data from an insurance claims database.' Pain 144(1-2): 20-27	Used a large medical insurance claims database to identify three groups: chronic opioid use (>180 therapeutic days, N = 3726); acute opioid use (<10 therapeutic days, N = 37,108); and a non-opioid group (N = 337,366) who filed at least one insurance claim but none for opioids. Looked at large data base to determine correlations between gender, age, incidence of acute and chronic pain, use of medical services, mental and physical health and specialty of service provider.	Although only 0.65% of the total insured population, those patients prescribed chronic opioids were much heavier consumers of all medical services than either the acute opioid or non-opioid groups. Collectively, these patients filed over 5% of all medical insurance claims; received 45% of all opioids prescribed in the state; had many more non-pain related physical disorders; more psychiatric co-morbidity; saw significantly more doctors; had more office and E.R. visits; and days in the hospital. Comprehensive pain management approaches may be relatively rare in actual practice: first, only a third of those receiving chronic opioid prescriptions were seen by a pain management specialist; second, a very high percentage (>80%) of the chronic pain patients had musculoskeletal and chronic pain patients, in all respects, utilised more health services than either the acute opioid use group or the non-opioid insured group. In a broad sense, the three groups filed over 12 million medical claims during the year, but the chronic opioid group, representing only 0.65% of the total population, was responsible for over 5%. There was also a very large gender difference in all three		No intervention but is important because it looks at impact of a particular cohort and system and highlights need to have a model of care that is inclusive of and effective for them.	Highlights impact of chronic pain on system as a whole but within that group, impact of people who at chronic opioid users on the system. Notes that most patients do not see a pain specialist but are managed by internists.

Reference details	Methods	Findings	Critical commentary	Intervention	Summary of evidence
		groups with females filing significantly more insurance claims than males. A significant number of patients had joint pain, but less than 4% were referred to the logical specialist, a rheumatologist; and, third, although 35% of those in chronic pain had a formal psychiatric diagnosis, less than 10% received psychiatric care.			
Dahl, J.C. and Nilsson, A. 2001. Evaluation of a randomized preventive behavioural medicine work site intervention for public health workers at risk for developing chronic pain. <i>European Journal of Pain</i> , 5 (4) 421-432.	29 randomly selected participants (nurses with pain symptoms at the work site) were placed in 2 groups – one participated in an active program based on principles of cognitive behaviour therapy with an emphasis on the reduction of fear/avoidance of work tasks and the other, a passive program based on conventional symptom reduction. There was a 4-week baseline, a 4-week intervention and follow-ups including booster sessions at 4 and 8 weeks, 6 and 12 months and a follow-up with no booster at 24 months. The 29 participants were randomly distributed by means of a computerised randomisation table into the two intervention groups: active and passive. Exclusion criteria for participation in the present study were as follows: currently on sick leave; participating in other treatment programs; and/or showing other signs of progressive illness. Inclusion criteria consisted of experiencing recurring pain at a minimum of once a week and willingness to participate.	The main results of the present study showed that participants who received the cognitive behavioural treatment (active) used significantly less analgesic medications at the 1-year follow-up; regarded themselves as significantly less sick at the 1- and 2-year follow-ups; and displayed significantly less kinesophobia as measured by the FABQ, part 2, behavioural test, at all follow-ups, as compared with those who received the passive treatment. Results at 4 and 8 weeks and at 6-, 12- and 24-month follow-ups showed improvements for those individuals receiving the active treatment with regard to the reduction of use of pain-killers; perception of one's self as being sick; and the fear-avoidance response to work-related activities.	Dependent variables dysfunction due to pain; degree of fear/avoidance of work-related activities; and degree of work and life satisfaction.	The two treatment conditions, provided by a registered nurse and a physical therapist, took place 30-min. a week each once a week, on an individual basis for 4 weeks at the work site during work time.	Work based behavioural programs are effective compared to more passive programs for those experiencing back pain in the workplace.
Dept of Health WA, 2009 Spinal pain model of care, <a href="http://www.healthnetworks.health.wa.gov.au/models/care/docs/Spinal_Pain_Model_of_Care.pdf">http://www.healthnetworks.health.wa.gov.au/models/care/docs/Spinal_Pain_Model_of_Care.pdf</a> .	Page 32 describes community physiotherapy and occupational therapy pilot programs based on a patient education model called 'Back to Activity' - evaluation is occurring. Sir Charles Gairdner and Royal Perth Hospitals have a physiotherapy triage program. Of 268 patients assessed by the physiotherapist, only 19% needed surgical referral. The pain		Identified impact of spinal pain as being substantial medication costs, multiple visits to GPs and ED, numerous admissions to secondary and tertiary hospitals and multiple requests for imaging and other diagnostic interventions. Acute episodes		

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	management team at Freemantle Hospital and health service introduced patient triage questionnaires and self training educative pain sessions (STEPS) - an 8-hr interprofessional group training session which has helped to eliminate the 2-year waiting list for people with persistent pain at Freemantle Hospital.		provided with appropriate therapy minimise progression to chronic. Recommends a networked approach to ensure an appropriate model of care. Describes a range of treatment studies. Describes the current state of play in WA for treatment. Identifies gaps in current services and shortage of health workforce, and fragmentation and lack of integrated care pathways. Recommend a future spinal pain model of care. Makes recommendations about early triage, access to physiotherapists, primary care chiropractors and core triage by multi-disciplinary teams including an assistant workforce.		
Dewar, P. Alternate models of care in tertiary outpatient clinics – powerpoint presentation about WA model of care available at <a href="http://www.changechampions.com.au/resource/Peter_Dewar__Reduced_wait_times.pdf">http://www.changechampions.com.au/resource/Peter_Dewar__Reduced_wait_times.pdf</a>		Physio spinal triage outcomes, 698 patients assessed in 2008, 60% increase in through put. 26% require neurosurgery review, 38% conversion to surgery vs 5-10% at normal clinic. Patients wait 4 months rather than 2-3 years for outpatient appointment. Orthopaedic physio/ OT triage clinic, 209 patients over 8 weeks 38% for surgical review 34% discharged directly or referred to other health care providers 28% for physio/ OT. Multidisciplinary teams wait time reduced from 44 months to 3 months, through put increased by 8.	State's current model = specialist as gatekeeper. Alternate model = specialist as option. Team is physio, nurse, OT, multidisciplinary team, medical doctor. Extended scope of practice for allied health, for nursing, nurse practitioners and CNS.		
Wand, B. et al. 2004. Early intervention for the management of acute low back pain: A single blind randomized control trial of biopsychosocial education, annual therapy and	A single blind, randomised control trial comparing two models of care for patients with simple, acute low back pain. 804 referred patients, 102 subjects were randomly assigned to an assess/ advise/ treat group or an assess/ advise/ wait group.	Outcomes of reported pain, functional disability, mood, general health and quality of life were assessed at baseline, 6 weeks, 3 months and 6 months. At 6 weeks, the intervention group demonstrated greater improvements in disability, mood, general health and quality of life. Disability and pain were not significantly different at long term		Biopsychosocial education, manual therapy and exercise.	The timing of intervention effects the progression of psychosocial features.

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exercise. <i>Spine</i> 29 (21) 2350- 2356.		follow-up, however mood, general health and quality of life remained significantly better in the assess/ advise/ treat group.			
Dysvik, E. et al. 2010. The effectiveness of a multidisciplinary pain management programme managing chronic pain on pain perceptions, health related quality of life and stages of change: A non randomized controlled study. <i>The International Journal of Nursing Studies</i> 47,(7)826- 835.	Pre-test/ post-test quasi experimental wait list controls and baseline and post test measures. Conducted in a rehabilitation unit. 113 adults (18-67 years) with pain lasting more than 6 months and motivation completed the 8 week multidisciplinary pain management programme based on cognitive behavioural therapy and physical activity. Exclusion criteria were ongoing litigation, major mental disorders, major medical conditions requiring treatment.	Significant improvements in HRQL pain intensity and interference. 81% of participants reported experiencing an important and positive change in areas such as positive thinking, relaxation and breathing.		A one-day introduction, 5 hrs a week over 8 weeks meeting with a nurse and a physiotherapist and a volunteer patient who has gone through the program and been trained to provide some counselling. A psychologist and a physician also took part in the training. Data were collected before starting and after completion of the 8 weeks.	
Moitra, E., Sperry, J., Mongold, D., Kyle, B., Selby, J. 2011. Group medical care program for primary care patients with chronic pain <i>Professional psychology: research in practice</i> vol 42 iss 2 pp 153-159.	113 patients were identified and referred to pain day, 44% attended the appointment. A range of baseline measures were taken.		ABSTRACT ONLY READ	The pain day program is a single session for chronic pain patients in the primary care setting. Each patient received an individual medical appointment focussed solely on pain evaluation and management and then joined a group of pain patients for a 75- minute pain psycho-educational and behavioural session with behavioural health specialists.	
Moore, J. et al. 2000. A randomized trial of a cognitive behavioural program for enhancing bback pain self care in a primary care setting. <i>Pain</i> 88 (2):145-153.	Patients enrolled in a large health maintenance organisation were invited to participate in an education program to improve back pain self care skills 6-8 weeks after a primary care back pain visit. Patients (n=226) were randomly assigned to self care intervention or usual care and were assessed at baseline, 3, 6 and 12 months.	Self care orientation scale was more favourable in the self care group than the usual care group. Reached statistical significance at 3 and 6 months, but was no longer significant at 12 months due to improvement in the control group between 6 and 12 months. Self care groups showed highly significant reductions in worry about back pain at all follow-up periods. There is a greater reduction in pain intensity for self care but was only significant at 6 months. Self care group demonstrated lower fear avoidance scores at all follow-up periods. At 3 months, the self care group reported significantly	Similar findings to a previous study which involved lay volunteers rather than professional leaders, however in this study treatment effects were generally more significant at 3 month follow-up rather than 6 months as was the case with the volunteer leaders.	Involved a 2-session self care group, each of 2 hours with 12-16 participants in each group. There was a 45-minute individual consultation to develop personal care plan and an individual meeting and telephone conversation with a psychologist experienced in chronic pain management. Books and videos supporting active management of back pain were provided. The control group received	The self care group demonstrated significantly less interference with activities at both 3- and 6-month follow-ups, but no longer a difference between groups at 12 months.

Reference details	Methods	Findings	Critical commentary	Intervention	Summary of evidence
		less disability on the Roland disability questionnaire. This effect was no longer significant at 6 or 12 months and the self care group did not show more favourable mental health outcomes than usual care group.		usual care, supplemented by a book on back pain care.	
Brandow, A. et al. 2011. The impact of a multidisciplinary pain management model on sickle cell disease pain hospitalizations. <i>Pediatric Blood &amp; Cancer</i> 56 (5):789-93.	A retrospective cohort study of children with SCD evaluated and treated in our institution's multidisciplinary pain clinic between 1999 and 2008 was conducted. Descriptive statistics evaluated patient characteristics and Wilcoxon-Signed Rank evaluated change in median number of pain hospitalisations 1 year before and after referral.	Median age of 19 children identified was 15 years (IQR 11-17); significantly more were female (78.9% vs. 21.1%; $P = 0.012$ ). At time of referral, all patients reported taking opioids; 68.4% were taking hydroxyurea; half of those not on hydroxyurea started it ( $n = 3$ ); none were chronically transfused; and one initiated transfusions upon referral. Majority (89.5%) learned non-pharmacologic pain management techniques. $= 0.022$ .	A multidisciplinary pain management model appears to have decreased SCD pain hospitalisations. Results of this retrospective study will need to be tested in a prospective randomised trial.	Referrals to the pain clinic occur when children require chronic opioids and/or have frequent pain hospitalisations.	Median number of pain hospitalisations between the year before and after referral significantly decreased [5(IQR 3-6) to 1(IQR 0-4); $P = 0.006$ ]. To further delineate the pain clinic's effect, analysis was repeated after removing children initiating hydroxyurea/transfusions upon referral. The significant decrease in hospitalisations persisted [5(IQR 3-6) to 1(IQR 0-4); $P =$
Brooks, E. and J. Younce. 2007. A case management model for the ambulatory care patient experiencing chronic pain. <i>AAACN Viewpoint</i> 29 (1):3-5.	This article describes the development and implementation of a Case Managed Opioid Program managed by an ambulatory care section nurse at the James A. Haley Veterans' Hospital, Tampa, FL. The authors discuss the program from a historical perspective and the positive outcomes that were achieved.	Better pain control. <ul style="list-style-type: none"> <li>enhanced customer satisfaction, due to decreased wait times to obtain medications</li> <li>decreased walk-ins and unscheduled visits to the provider</li> <li>increased cost effectiveness</li> <li>increased nurse participation in the veteran's pain management and increased role satisfaction for the nurse</li> <li>enhanced quality of life for the veteran with the ability to engage in a more normal lifestyle.</li> </ul>	Describes a model of care and lists outcomes but does not present evidence of these in terms of description of tools and statistics.	The nurse case managed pain clinic program operates as follows: each primary care team has a <i>pain resource nurse</i> , who is assigned his or her own panel of patients who have been referred to the clinic by the provider. In the absence of the pain resource nurse, staff nurse colleagues, trained and oriented to the Opioid Program, manage the panel. Once the patient has been accepted into the program, the nurse conducts an initial baseline in-depth patient self-screening evaluation; provides the patient with extensive pain education describing the pain program; and obtains the patient's consent to enrol in the chronic pain program. On a monthly basis, each veteran submits a self screening	

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				pain evaluation.	
Dickinson, K.C. et al. 2010. VA healthcare costs of a collaborative intervention for chronic pain in primary care. <i>Medical Care</i> 48 (1):38-44.	Data on VA treatment costs incurred by participants were obtained from the VA's Decision Support System for all utilisation except certain intervention activities which were tracked in a separate database. Outcome data were from a cluster-randomised trial of a collaborative intervention for chronic pain among 401 primary care patients at a VA medical centre. The main outcome measure was pain disability-free days (PDFDs), calculated from Roland-Morris Disability Questionnaire scores.	Participants in the intervention group experienced an average of 16 additional PDFDs over the 12-month follow-up window as compared with usual care participants. This came at an adjusted incremental cost of \$364 per PDFD for a typical participant. Important predictors of costs were baseline medical co-morbidities, depression severity, and prior year's treatment costs.	Although identified as more expensive than usual care, the point at which costs are measured in the continuum of care will impact interpretation. Further research is necessary to identify if the intervention is more cost-effective for some patient subgroups and to learn whether pain improvements and higher costs persist after the intervention has ended.	Intervention group participants received assessments and care management; stepped-care components were offered to patients requiring more specialised care.	This collaborative intervention resulted in more pain disability-free days and was more expensive than usual care. Collaborative care models show promise for improving treatment of patients with chronic pain.
Dixon, K. E., F. J. Keefe et al. 2007. 'Psychological interventions for arthritis pain management in adults: A meta-analysis.' <i>Health Psychology</i> 26(3): 241-250.	Meta analysis of randomised controlled trials testing the efficacy of psychosocial interventions in arthritis pain management were reviewed. <b>Data Extraction:</b> Twenty-seven randomised controlled trials were analysed. Pain intensity was the primary outcome. Secondary outcomes included psychological, physical, and biological functioning.	An overall effect size of 0.177 (95% CI _ 0.256–0.094) indicated that patients receiving psychosocial interventions reported significantly lower pain than patients in control conditions (combined $p$ _ .01). Meta-analyses also supported the efficacy of psychosocial interventions for the secondary outcomes.	Lacks description of the programs and how they were delivered in relation to a model of care.	Psychosocial interventions may have significant effects on pain and other outcomes in arthritis patients.	Provides further evidence about need for model of care to be inclusive of psychological interventions.
Dobscha, Steven K., Kathryn Corson, Ruth Q. Leibowitz, Mark D. Sullivan and Martha S. Gerrity 2008. Rationale, design, and baseline findings from a randomized trial of collaborative care for chronic musculoskeletal pain in primary care. <i>Pain Medicine</i> 9 (8):1050-64.	Cluster randomised clinical trial. PARTICIPANTS AND SETTING: Forty-two clinicians and 401 patients from five Veterans Affairs primary care clinics. INTERVENTION: The intervention was based on the chronic care model, and included patient and provider activation and education, patient assessment, outcomes monitoring, and feedback to providers over 12 months. OUTCOME MEASURES: Main outcomes are Roland-Morris Disability Questionnaire (RMDQ) score, depression severity (Patient Health Questionnaire-9), and pain severity (Chronic Pain Grade Severity subscale) at 6 and 12 months.	Fifteen percent of primary care patients mailed a study advertisement letter requested screening for the study. The mean age of enrolled patients was 62. Back and neck or joint pain diagnoses were present in 67% and 65% of patients, respectively. Mean pain duration was 15 years, and mean RMDQ score (range 0-24) was 14.7 (standard deviation = 4.4). Sixty-five percent of patients were receiving disability. Eighteen percent of patients met criteria for major depression, 17% for posttraumatic stress disorder, and 9% for alcohol misuse. Thirty-nine percent of patients felt strongly that experiencing pain was a sign of damage, and 60% reported strong avoidance of painful activities.		The intervention team consisted of a full-time psychologist care manager and a part-time physician internist. Approaches included goal setting emphasising function, patient activation and educating about fear avoidance, and care management.	These baseline data support the rationale to develop a multifaceted approach to treat chronic pain in primary care that includes detection and treatment of psychiatric co-morbidity.
Edwards, H., M. Courtney, K. Finlayson, P. Shuter, and	Randomised controlled trial. Recruited a sample of 67 participants with venous leg	Participants who received care under the Leg Club model demonstrated significantly improved	Also did a cost analysis and reported this in another study	The evaluation of the Leg Club model of care shows potential to	It is hardly surprising that a multifaceted care approach



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E. Lindsay 2009. A randomized controlled trial of a community nursing intervention: Improved quality of life and healing for clients with chronic leg ulcers. <i>Journal of Clinical Nursing</i> 18 (11):1541-1549.	ulcers referred for care to a community nursing organisation in Queensland, Australia after obtaining informed consent. Participants were randomised to either the Lindsay Leg Club<sup></sup> model of care (n = 34), emphasising socialisation and peer support; or the traditional community nursing model (n = 33) consisting of individual home visits by a registered nurse. Participants in both groups were treated by a core team of nurses using identical research protocols based on short-stretch compression bandage treatment. Data were collected at baseline, 12 and 24 weeks from commencement.	outcomes in quality of life (p = 0014); morale (p < 0001); self-esteem (p = 0006); healing (p = 0004); pain (p = 0003); and functional ability (p = 0044).	demonstrating Leg Club was more cost effective than traditional home nursing service.	improve the health and well-being of clients who have chronic leg ulcers.	(nutrition, social interaction, mental stimulus as well as wound care and education about wound management) provides more positive outcomes than being at home and awaiting attendance by nurse. Has potential to demonstrate how pain management could be integrated with other services being offered in this way as well as be a service that is a 'club'.
Foster, GI, et al. (2007). Self-management education programmes by lay leaders for people with chronic conditions. <i>Cochrane Database of Systematic Reviews</i> (4).	Review of Randomised controlled trials (RCTs) Two authors independently assessed trial quality and extracted data. Results of RCTs were pooled using a random-effects model with standardised mean differences (SMDs) or weighted mean differences (WMDs) for continuous outcomes. Included seventeen trials involving 7442 participants. The interventions shared similar structures and components but studies showed heterogeneity in conditions studied, outcomes collected and effects. There were no studies of children and adolescents, only one study provided data on outcomes beyond six months.	Primary outcomes Health status: There was a small, statistically-significant reduction in: pain (11 studies SMD -0.10 (95% confidence interval (CI) -0.17 to -0.04)); disability (8 studies, SMD -0.15 (95% CI -0.25 to -0.05); and fatigue (7 studies, SMD -0.16 (95% CI -0.23 to -0.09); and small, statistically-significant improvement in depression (6 studies, SMD -0.16 95% CI -0.24 to -0.07). There was a small (but not statistically, or clinically-significant) improvement in psychological well-being (5 studies; SMD -0.12 (95% CI -0.33 to 0.09)); but no difference between groups for health-related quality of life (3 studies; WMD -0.03 (95% CI -0.09 to 0.02). Six studies showed a statistically-significant improvement in self-rated general health (WMD -0.20 (95% CI -0.31 to -0.10). Health behaviours: 7 studies showed a small, statistically-significant increase in self-reported aerobic exercise (SMD -0.20 (95% CI -0.27 to -0.12) and a moderate increase in cognitive symptom management (4 studies, WMD -0.55 (95% CI -0.85 to -0.26)). Healthcare use: There were no statistically-significant differences between groups in physician or general practitioner attendance (9 studies; SMD -0.03 (95% CI -0.09 to 0.04)). There were also no	Only two studies reported clinical outcomes.	Randomised controlled trials (RCTs) comparing structured lay-led self-management education programs for chronic conditions against no intervention or clinician-led programs.	Lay-led self-management education programs may lead to small, short-term improvements in participants' self-efficacy; self-rated health; cognitive symptom management; and frequency of aerobic exercise. There is currently no evidence to suggest that such programs improve psychological health; symptoms or health-related quality of life; or that they significantly alter healthcare use.

Reference details	Methods	Findings	Critical commentary	Intervention	Summary of evidence
		statistically-significant differences between groups for days/nights spent in hospital (6 studies; WMD - 0.32 (95% CI -0.71 to 0.07)). Self-efficacy: (confidence to manage condition) showed a small statistically-significant improvement (10 studies): SMD -0.30, 95% CI -0.41 to -0.19. No adverse events were reported in any of the studies.			
Gordon, L. et al. 2006. A cost-effectiveness analysis of two community models of care for patients with venous leg ulcers. <i>Journal of wound care</i> 15 (8):348-353.	Participants were randomised to the Leg Club (n=28) or home visits (n=28). Data were obtained on resources/related costs incurred by the service provider, clients and carers, and the community.	From the collective perspective (service provider, clients and carers, and the community), at six months the incremental cost per healed ulcer was dollars AU515 (Euros 318) and the incremental cost per reduced pain score was dollars AU322 (Euros 199). For the service provider, Leg Club intervention resulted in cost savings and better health effects when compared with home nursing.		Same intervention as described in Edwards et al. i.e. a 'Leg Club'.	On both clinical and economic grounds, the Leg Club model appears to be more cost-effective than traditional home nursing for the treatment of chronic venous leg ulcers. However, clients and the local community contribute substantial financial and in-kind support to the operation of both services.
Henry, D. et al. 2011. Recurrent abdominal pain in adolescents: Initial evaluation of an interdisciplinary pain rehabilitation program. <i>Journal of Pain Conference: 30th Annual Scientific Meeting of the American Pain Society</i> Austin, TX United States. Conference Start: 20110519 Conference End: 20110521. Conference Publication: (var.pagings). 12 (4 SUPPL. 1):P72.*	Twenty-two adolescents (mean age = 15.54 years) with recurrent abdominal pain and associated disability were treated in a three-week, combined inpatient/day hospital pain rehabilitation program. Mixed model regression analyses revealed significant improvements made during and after the program.	At admission, surveyed patients rated their pain a '7.25' on a '0'- '10' scale. They averaged 4.0 missed school-days in a week, and their parents reported an average of 2.40 missed work-days in a week. At both 2- and 3-year follow-up points, surveyed patients rated their pain a '3.0'. Patients surveyed 2 years following the program averaged 0.13 missed school-days/week, and their parents reported no missed work-days.	NB full paper not accessed – useful as it demonstrates range of indicators for consideration in children's response to pain management.	The purpose of this research is to describe the effectiveness of interdisciplinary pain rehabilitation for adolescents with recurrent abdominal pain.	Those surveyed 3 years after program reported no missed school-days/week, and their parents reported no missed work-days. These results suggest that interdisciplinary pain rehabilitation is a promising approach to the management of recurrent abdominal pain and associated disability. Enduring improvements on real-world indices of pain and functioning were found two and three years following program completion.
Hurley, M. et al. 2010. Improvements in physical	418 people from 54 primary care surgeries were (cluster) randomised to receive 1) usual	At baseline physical function in both groups were similar. Immediately after the intervention,	NB abstract only accessed.	We devised a rehabilitation programme that integrates exercise	Demonstrates outcomes of an integrated approach in

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function were sustained for 2 1/2 years following escape-knee pain: An integrated rehabilitation programme for chronic knee pain. <i>Rheumatology</i> Conference: Rheumatology 2010 - British Society for Rheumatology, BSR and British Health Professionals in Rheumatology, BHPR Annual Meeting 2010 Birmingham United Kingdom. Conference Start: 20100420 Conference End: 20100423. Conference Publication: (var.pagings). 49:i16-i17.	care, or ESCAPE-knee pain delivered to 2) individual; or 3) groups of 8 participants. As there were no differences in the baseline or post-rehabilitation data between participants who received the program individually or in groups, these data were combined. Subjective physical function was measured by the Western Ontario and McMasters University Osteoarthritis Index function sub-scale (WOMAC-func) at baseline, immediately post-rehabilitation, 6-months, 18-months and 30-months after completing the ESCAPE-knee pain programme. Multilevel Modelling was performed to adjust for clustering, baseline WOMAC-func and missing data.	participants who undertook ESCAPE-knee pain reported better physical function than participants who remained on usual primary care. In the following 30 months, physical function of participants who remained on usual care remained unchanged. Physical function of participants who undertook the ESCAPE-knee pain programme improved at each assessment compared with baseline value, i.e. mean WOMAC-func decreased, (post-rehabilitation WOMAC-func -5.49 (95% CI -7.78, -3.19; P<0.0001); 6-month WOMAC-func -4.44 (-6.54, -2.33; P<0.0001); 18-month WOMAC-func -3.10 (-5.44, -0.76; P<0.0095) 30-month WOMAC-func -2.78 (-5.32, -0.23; P<0.0323)), but declined over time becoming more similar to the usual care values. Conclusions: ESCAPE-knee pain is an exercise-based rehabilitation program for chronic knee pain that has sustained improvement in physical function for up to 2 1/2 years after completing the program. Models of care should be developed that will sustain for longer the large initial improvement in physical functioning.		and self-management (Enabling Self-management and Coping with Arthritic knee Pain through Exercise, ESCAPE-knee pain), that produced short-medium term (6-months) improvements in physical functioning. To measure long-term effects of the program, we continued to follow participants for 30 months after completing the program.	this group of patients.
Khan, F. et al. 2007. Multidisciplinary rehabilitation for adults with multiple sclerosis <i>Cochrane Database of Systematic Reviews</i> .	To assess the effectiveness of organised multidisciplinary rehabilitation in adults with multiple sclerosis. Searched the Cochrane Multiple Sclerosis Group's Trials Register (25 February 2011), PeDRO (1990 - 2011), the Cochrane Rehabilitation and Related Therapies Field Trials Register, the National Health Service National Research Register (NRR) and relevant journals were hand searched. No language restrictions were applied.	<ul style="list-style-type: none"> <li>excluded 49 studies based on Not an RCT or CCT (n=29)</li> <li>variable was not multi-disciplinary rehabilitation (n=10)</li> <li>not MS patients or details of MS subgroup not provided (n=2)</li> <li>abstract only and details insufficient or results not available from authors (n=6) and</li> <li>fatal flaws, including excessive attrition (n=1), different cointerventions (n=1).</li> </ul>	Provides exclusion criteria which reflect the challenges in conducting research in the field of pain management.	Ten trials (9 RCTs and 1 CCT) (954 participants and 73 caregivers) met the inclusion criteria. Eight RCTs scored well; while one RCT and one CCT scored poorly on the methodological quality assessment.	Concluded there is strong evidence that inpatient or outpatient rehabilitation can lead to improvement in activity (disability) and in overall ability to participate in society, even though there is no reduction in actual impairment. Multidisciplinary rehabilitation programs do not change the level of impairment, but can improve the experience of people with MS in terms of activity and participation.
Kozłowska, K. 2008. A		An advantage of this integrated, family-based	This model of care is illustrated		

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conceptual model and practice framework for managing chronic pain in children and adolescents. <i>Harvard Review of Psychiatry</i> 16(2):136-50.		assessment and treatment approach is the overarching emphasis on identifying the contribution of each system to the child's subjective experience of pain, thereby avoiding the deleterious polarisation of the pain as either physical or psychogenic in origin.	with reference to the management of two cases of children with chronic pain and significant functional impairment. A brief overview of the care utilisation of 62 children referred to the Chronic Pain Clinic is also provided, with the clinical characteristics of 40 children with somatoform pain disorder (SPD) being described in more detail. Of 28 children with SPD treated with our systems intervention, 82% reported significant reductions in pain intensity, 71% returned to school full-time, and 29% part-time.		
Matas-Guiu, J. et al. 2009. A cost consequence evaluation of two models of care of outpatients with chronic neuropathic pain in neurology settings in Spain: General clinics versus specialized pain clinics. <i>Value in Health Conference: ISPOR 12th Annual European Congress Paris France. Conference Start: 20091024 Conference End: 20091027. Conference Publication: (var.pagings). 12 (7):A379.</i>	A 6-month retrospective observational non-interventional study was designed. Adults, both genders patients with chronic NeP were included in the analysis. Patients were allocated to two types of health care models according to usual administrative procedures in each participant centre without investigator participation, consecutively and independently of the diagnosis and clinical status of patients. Sociodemographics and clinical characteristics of subjects along with pain-related health care and non health care resources utilisation were recorded. Work-days missed as a consequence of pain were also collected. Costs were calculated in Euros year 2008 from the societal perspective, while severity and interference of pain (BPI scale, range 0-10) were used for effectiveness. Patient's satisfaction with health care was also assessed.	A total of 234 patients (56.8% women, 59.3 +/- 14.7 years) were included (53.0% in SPCs). Yearly indirect cost was a1299 +/- 2804 in SPC compared to a1483 +/- 3452 in GC (p = 0.660), while annual direct costs were, respectively, a2911 +/- 3335 and a3563 +/- 4,797 (p = 0.239), with total costs of a4210 +/- 4654 and a5060 +/- 6250, respectively (p = 0.249). Mean pain severity at the time of evaluation was 3.8 +/- 2.3 in subjects at SPC versus 5.2 +/- 2.0 in GC (p < 0.0001), while the average interference of pain on daily activities were, respectively, 3.3 +/- 2.0 and 4.7 +/- 2.5 (p < 0.0001). Patients managed at SPC were statistically more satisfied in all domains of health care satisfaction assessment.	NB Abstract only accessed.		In Neurology settings in Spain, the outpatient clinical management of chronic NeP in Specialized Pain Clinics was a dominant alternative compared with General Clinics health care, since it was shown better patients health care outcomes and satisfaction while maintaining a similar level of costs to the Society.
Eccleston, C. et al. 2002. Systematic review of	A search of four computerised abstracting services recovered 123 papers from which 28	The odds-ratio for a 50% reduction in pain was 9.62 and the number needed to treat was 2.32, indicating	The majority of these papers reported brief behavioural and	p164 states There is insufficient evidence to judge the effectiveness	

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randomized controlled trials of psychological therapy for chronic pain in children and adolescents, with a subset meta-analysis of pain relief. <i>Pain</i> 99 (2002) 157–165.	potential trials were identified. Eighteen met the criteria for inclusion in the review.	that the psychological treatments examined are effective in reducing the pain of headache.	cognitive behavioural interventions for children with headache and many were conducted in community (i.e. school) settings.	of psychological therapies in improving mood, function, or disability associated with chronic pain in children and adolescents. Well-designed and comprehensively reported RCTs of psychological therapy for non-headache chronic pain in children and adolescents are urgently needed. There is strong evidence that psychological treatments, principally relaxation and cognitive behavioural therapy, are highly effective in reducing the severity and frequency of chronic pain in children and adolescents. There is a strong case for these treatments to be offered to patients with headache as a matter of routine care (McGrath 1999).	
Morley, S. et al., 2008. Estimating the clinical effectiveness of cognitive behavioural therapy in the clinic: Evaluation of a CBT informed pain management programme. <i>Pain</i> 137(3):670-680.	Over a 10-year period 1013 pain patients were accepted into a 4-week in-patient pain management program. Data from more than 800 patients was available at pre-treatment and at one month post-treatment and for around 600 patients at pre-treatment and at 9 months follow-up. Measures reported in this analysis were pain experience and interference, psychological distress (depression and anxiety), self-efficacy, catastrophising, and walking.	Outcomes measured include pain intensity, distress and interference, depression, five minute walk, anxiety coping strategies, self efficacy.		The 4-week in-patient program incorporated operant and cognitive behavioural principles in all aspects. Was interdisciplinary and is described in detail in text.	Evidence of statistical improvement at post-treatment and follow-up between 1 in 3 and 1 in 7 (depending on the outcome measure) achieved clinically significant gains. There was also evidence that a small percentage of patients (1-2%) reliably deteriorated during the period of treatment.
Mo- Yee Lau, P. et al. 2008. Early physiotherapy intervention in an Accident and Emergency Department reduces pain and improves satisfaction for patients with acute low back pain: A randomized trial	Randomised trial with concealed allocation, assessor blinding, and intention-to-treat analysis. <b>Participants:</b> 110 patients attending the Accident and Emergency Department of a local acute hospital. Pain was measured using the Numeric Pain Rating Scale and satisfaction was measured using the Numeric Global Rating of Change	Participants in the experimental group had 1.6 out of 10 points (97.5% CI 0.8 to 2.3) less pain than the control group on discharge from the Accident and Emergency Department and still had 0.9 points (97.5% CI 0.1 to 1.6) less pain on admission to the Physiotherapy Outpatient Department. Participants in the experimental group were 2.1 out of 20 points (97.5% CI 1.2 to 2.9) more satisfied		The experimental group received early physiotherapy intervention which consisted of education, reassurance, pain management, mobility training, interferential therapy, walking training, and walking aids as indicated. The control group	Early physiotherapy intervention was effective in reducing pain and increasing satisfaction for patients with acute low back pain in an Accident and Emergency Department but the effect tailed off.

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<i>Australian Journal of Physiotherapy</i> 54(4):243-249.	Scale at baseline, discharge from the Accident and Emergency Department, admission to the Physiotherapy Outpatient Department, 1 month, 3 months, and 6 months. Acute low back pain was screened by an experienced physiotherapist as pain onset in the lower back with or without referred leg pain within the preceding 24 hours before admission to Accident and Emergency Department. Patients were included if they were of age 18 years or above. They were excluded if they presented with red flags such as fracture, tumour, infection, or cauda equina syndrome. In addition, patients with a previous episode of acute low back pain within 6 months, osteoporosis, inflammatory arthritis, pregnancy, previous hip or back surgery, or systemic steroid therapy for longer than 12 weeks were excluded.	than the control group on discharge from the Accident and Emergency Department.		received only walking training and walking aids as indicated. All participants received conventional medical intervention and outpatient physiotherapy intervention.	
Palermmo, T. et al. 2010. Randomized controlled trials of psychological therapies for management of chronic pain in children and adolescents: An updated meta- analytic review: <i>Pain</i> 148 (3)387-397.	This study evaluates a more accessible treatment approach for chronic pediatric pain using an Internet-delivered family CBT intervention. Participants included 48 children, aged 11-17 years, with chronic headache, abdominal, or musculoskeletal pain and associated functional disability, and their parents. Children were randomly assigned to a wait-list control group or an Internet treatment group. Primary treatment outcomes were pain intensity ratings (0-10 NRS) and activity limitations on the Child Activity Limitations Interview, both completed via an online daily diary.	Findings demonstrated significantly greater reduction in activity limitations and pain intensity at post-treatment for the Internet treatment group and these effects were maintained at the three-month follow-up. Rate of clinically significant improvement in pain was also greater for the Internet treatment group than for the wait-list control group. There were no significant group differences in parental protectiveness or child depressive symptoms post-treatment. Internet treatment was rated as acceptable by all children and parents. Group differences in children's emotional functioning, specifically in their depressive symptoms, from pre- to post-treatment were not found. Overall, depressive symptoms were in the subclinical range both before and after treatment. However, at the three-month follow-up depressive		In addition to their medical care, the Internet treatment group completed 8 weeks of online modules including relaxation training, cognitive strategies, parent operant techniques, communication strategies, and sleep and activity interventions. Youth randomised to the wait-list control group continued with the current medical care only.	Findings support the efficacy and acceptability of Internet delivery of family CBT for reducing pain and improving function among children and adolescents with chronic pain.

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		symptoms were significantly decreased in the Internet treatment group. It is unclear whether a lengthier period of time was necessary for changes to occur in children's emotional functioning or whether measurement issues contributed to this finding.			
Rothner, A .D. et al. 2011: Chronic daily headache in adolescents: Initial evaluation of an interdisciplinary pain rehabilitation program. 53 <sup>rd</sup> Scientific Meeting of the American Headache Society	24 adolescents (mean age = 14.87 years) with chronic daily headache and associated disability were treated in a three-week, combined inpatient and day hospital pain rehabilitation program.	Mixed model regression analyses revealed significant improvements made during and after the program. At admission, surveyed patients rated their pain a '7.29' on a '0'-'10' scale. They averaged 2.14 missed school-days in a week, and their parents reported an average of 1.17 missed work-days in a week. At 2- and 3-year follow-up points, surveyed patients rated their pain a '4.5' and '2.25', respectively. Patients surveyed 2 years following the program averaged 0.71 missed school-days/week, and their parents reported an average of 0.14 missed work-days/week. Those surveyed 3 years after the program averaged 0.14 missed school-days/week, and their parents reported no missed work-days/week.	NB abstract only accessed.	Interdisciplinary pain clinic not described in abstract.	Conclusions: These results suggest that interdisciplinary pain rehabilitation is a promising approach to the management of chronic daily headache and associated disability. Enduring improvements on real-world indices of pain and functioning were found two and three years following program completion. Ongoing research will examine program effectiveness on a broader range of self-report, parent report, and objective measures.
Taylor, S. et al. 2002. Patient satisfaction with a new physiotherapy telephone service for back pain patient. <i>Physiotherapy</i> 88 (1) 645-657	The purpose of this study was to investigate patient satisfaction with physiotherapy telephone advice in addition to standard management for back pain. A randomised controlled trial was conducted in two urban general practices (population 10,500 and 11,500) over five months. Patients with back pain who were referred by their general practitioner to physiotherapy were randomised into a control group who received usual care or an experimental group who received physiotherapy telephone advice before their usual care. Satisfaction levels were measured at the point of discharge from physiotherapy using the	The experimental group expressed more satisfaction than the control group with the physiotherapy service received ( $p < 0.05$ ). Physiotherapy telephone advice reduced reported symptoms associated with back pain and was easily remembered by the recipients.	Telephone advice was given while waiting for a physiotherapist appointment. Both groups received physiotherapy appointment. It is unclear how many times a patient received telephone advice – assume once only?	The subjects were contacted within 24 hours of receiving the referral (excluding weekends) in order to provide them with advice.	



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	Patient Satisfaction with Healthcare Provider Scale.				
Yip, Y.B. et al. 2007. Impact of an arthritis self-management programme with an added exercise component for osteoarthritic knee sufferers on improving pain, functional outcomes, and use of health care services: An experimental study. <i>Patient Education and Counseling</i> 65 (1) 113-121.	To assess the effect of an adopted Arthritis Self-management Programme (ASMP) with an added exercise component among osteoarthritic knee sufferers in Hong Kong. An experimental study with 88 participants assigned to an intervention group and 94 participants to a control group. One hundred and forty-nine participants (81.9%) completed the 1-week and 120 participants (65.6%) the 16-week post-intervention assessments. Participants in the intervention group received a 6-week ASMP with an added exercise component.	At 16 weeks, there were significant mean changes between groups in four outcome measures: reduction in arthritis pain ( $p = 0.0001$ ) and fatigue ( $p = 0.008$ ); and increased duration of weekly light exercise practice ( $p = 0.0001$ ) and knee flexion ( $p = 0.004$ ). The ability to perform daily activities and the number of unplanned arthritis-related medical consultations show statistically significant improvements between three time-points within the intervention group only ( $p = 0.0001$ and $p = 0.005$ , respectively), but not between-groups ( $p = 0.14$ and $p = 0.86$ , respectively). Both groups apparently had no changes in muscle strength.		The topics covered were 1) an overview of self-management principles; 2) medical aspects and pain management; 3) joint protection; 4) physical activity and exercise; 5) available treatments; 6) managing stress; 7) nutrition; and 8) communication skills and the availability of community resources. Based on the results of our pilot study [19] where many participants expressed their desire to learn more about exercise or motion to reduce their knee pain, three types of exercises were taught and promoted in the program. The participants were asked to set their goal on exercise practice and received positive feedback by a nurse every week. The three types of exercises were stretching; walking; and Tai Chi types of movement. A lay-person tutor who suffered from knee osteoarthritis and who had 3 years experience in teaching Tai Chi coached the third aspect of the exercise.	Intervention had a positive effect in reducing pain, fatigue, knee range of motion, the practice of exercise routines, the number of medical consultations and in improving functional status and over a 16-week period.