Proceedings from the

Chronic Pain Initiatives Meeting

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September 17, 2003

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Participants:

Alberta Community Development
Alberta Health and Wellness
Alberta Heritage Foundation for Medical Research
Calgary Chronic Pain Centre
Capital Health
Lifemark Health Institute Inc.
University of Alberta
University of Calgary

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Proceedings from the Chronic Pain Initiatives Meeting
September 17, 2003

On September 17, 2003, Alberta Health and Wellness hosted a productive and informative day-long conference on chronic pain in Alberta. Participants shared information and research on recent chronic pain initiatives, and discussed the opportunities and challenges this area of health research faces.

Included in this conference proceedings document are research reports provided in advance to all attendees and a series of PowerPoint presentations made by the Alberta Heritage Foundation for Medical Research, Alberta Health and Wellness, the University of Calgary, Calgary Chronic Pain Centre, and Lifemark Health Institute Inc. The document concludes with a summary of group discussion, and "next steps" to be taken.

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PROCEEDINGS FROM THE CHRONIC PAIN INITIATIVES MEETING
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AGENDA

Chronic Pain Initiatives Meeting
September 17, 2003
Winter Lake Room, Sheraton Grande Hotel
10235 – 101 Street, Edmonton

Chair: Joan Welch, Alberta Health and Wellness

Facilitators: Bruce Milne, Alberta Health and Wellness
Andrew Curran, Alberta Community Development
Scott Finnerty, Alberta Community Development

Purpose of Meeting:

- **To share information and research on recent chronic pain initiatives –** state of the art; prevalence and incidence; multidisciplinary approaches.
- **To provide an opportunity for participants to discuss and identify opportunities and challenges –** starting a dialogue; learning from each other; creating networks; imagining next steps together.

Time	Agenda Item
0900 – 0915	**Welcome** • **Chair – Statement of Objectives** • **Welcome by Alberta Health and Wellness**
0915 – 0945	**Prevalence and Incidence of Chronic Pain** • **Presentation from AHFMR** (*Don Juzwishin and Christa Harstall***)** • **Presentation from AHW** (*Dr. Don Schopflocher)*
0945 – 1030	**Current and Best Practices on Treatment of Chronic Pain** • **Presentation by** *Dr. Barry Finegan and Dr. Saifudin Rashiq (U of A)* • **Presentation by** *Dr. Geoffrey Hawboldt (U of C)*
1030 – 1045	**Coffee Break**
1045 - 1200	**Small Group Discussion** *Key Question: What is the preferred approach/appropriate response to the management of Chronic Pain?*
1200 – 1300	**Lunch Break**

1300-1400	**Multidisciplinary Experience – Regional Learnings on Two Programs** • **Calgary Chronic Pain Centre - Calgary Health Region** *(Dr. Tony Taylor, Dr. Pam Barton and Dr. Paul Taenzer)* • **LifeMark Health Institute Inc. – Capital Health** (*Jennifer Rees, Dr. Ian Forster and David VanDriesum)*
1400 - 1430	**Small Group Reports**
1430 - 1545	**Small Group Discussion** *Key Question: Based on your experience and what you have heard today in the presentations and the group discussions, what should the next steps be?*
1545 - 1630	**Full Group Session/Report** *How do we advance the management of chronic pain?*
1630	**Wrap Up**

*An afternoon coffee break will be determined by each individual group, based on the timing of their discussions between 1430 – 1545.

*Each group will have a facilitator to record discussion, and a group spokesperson designated by the group.

*A record of the discussions will be available to the participants.

REPORTS

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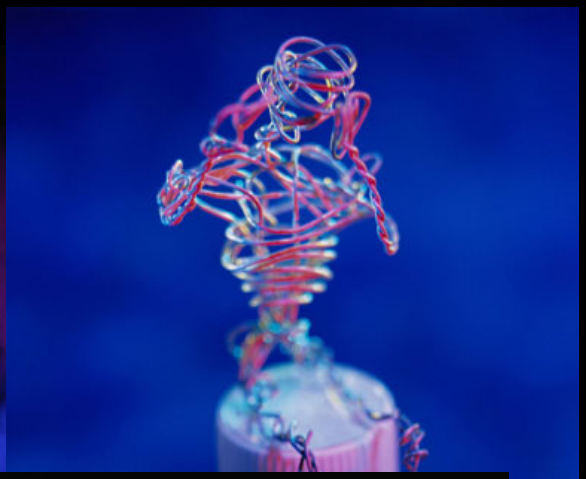
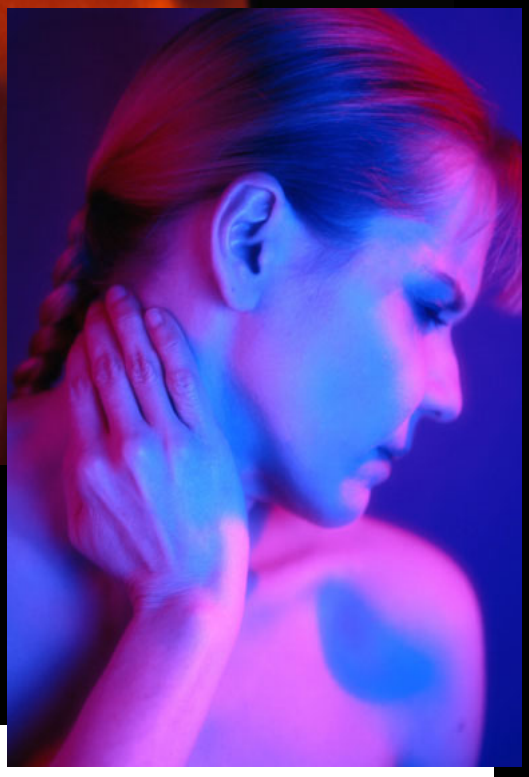


Chronic Pain in Alberta: A portrait from the 1996 National Population Health Survey and the 2001 Canadian Community Health Survey

REPORT



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Health Surveillance

May 2003

Chronic Pain in Alberta: A Portrait from the 1996 National Population Health Survey and the 2001 Canadian Community Health Survey

Health Surveillance
Alberta Health and Wellness

Chronic Pain in Alberta: A portrait from the 1996 National Population Health Survey and the 2001 Canadian Community Health Survey

Health Surveillance
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May, 2003

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ISBN (0-7785-2404-3)

Executive Summary

The 1996 National Population Health Survey (NPHS) asks respondents about pain intensity and interference with activity due to pain. The answers provide an estimate of the prevalence of chronic pain among Albertans. While 11.2 per cent report some chronic pain, about 2.3 per cent characterize their chronic pain as severe.

The proportion of individuals suffering chronic pain increases with age and decreases as income increases, but does not differ by place of residence. As self-reported pain levels increase, health status decreases and self-reported use of public health care services increases.

Measures of actual health care utilization were derived from linked administrative records. These confirm that as reported pain levels increase, use of public health care services increases. These data also show that this relationship existed for at least four years prior to time of the survey, and for at least one year after the survey was conducted.

Finally, the number of individuals suffering chronic pain is projected to increase dramatically in Alberta over the coming decades due to the aging of the population, even if the prevalence of chronic pain does not change.

Acknowledgments

Donald Schopflocher prepared this report for the project team listed below:

Henry Borowski	Senior Policy Advisor, Strategy Development, Alberta Health and Wellness
Christa Harstall	Technology Assessment, Alberta Heritage Foundation for Medical Research
Don Juzwishin	Director, Health Technology Assessment, Alberta Heritage Foundation for Medical Research
Maria Ospina	Technology Assessment, Alberta Heritage Foundation for Medical Research
Dr. Saifee Rashiq	Director, Division of Pain Medicine, Department of Anaesthesiology and Pain Medicine, University of Alberta.
Dr. Donald Schopflocher	Biostatistician, Health Surveillance, Alberta Health and Wellness
Dr. Paul Taenzer	Clinical Service Manager, Calgary Chronic Pain Centre, Calgary Health Region

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Introduction

Chronic and severe chronic pain

Chronic pain is defined by the International Association for the Study of Pain (1986) as an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage that persists beyond the expected time frame for healing, or that occurs in disease processes in which healing may never occur. A recent systematic review (Ospina & Harstall, 2003) concludes that standardized definitions and criteria to define "chronic" or "severe" pain are not available and diverse pain qualifiers have been proposed. It is clear, however, that in severely affected individuals, chronic pain is associated with considerable suffering, disability, and high levels of utilization of health care services over long time spans. The prevalence of chronic pain in Alberta is not known, but the review (Ospina & Harstall 2003) of prevalence studies carried out in other jurisdictions suggest a prevalence of severe chronic pain in the range of 8 per cent (in children) to 15 per cent (in a clinical elderly population).

Prevalence

Unfortunately, administrative data sources are unable to provide sound estimates of the prevalence of chronic pain because the International Classification of Diseases 9th Revision (ICD-9-CM) diagnostic system is not organized by symptoms such as pain. Furthermore, chronic pain can be a symptom of a large number of specific diseases (such as arthritis, diabetes, heart disease and endometriosis and hundreds more). As a result, the prevalence of chronic pain is typically estimated from health surveys. Millar (1996) presents a portrait of chronic pain in Canada based upon responses to the 1994 National Population Health Survey. The current report updates this information for Albertans from the 1996 National Population Health Survey. It also presents information about health utilization from administrative records linked to responses from the National Population Health Survey.

Data Sources

National Population Health Survey

The National Population Health Survey (NPHS) is a major longitudinal health survey conducted by Statistics Canada with the support of Health Canada and the provincial health ministries. In 1996, Alberta Health and Wellness commissioned survey responses from an additional cross-sectional sample of individuals in order to examine health status across the province's 17 health regions.

The NPHS is comprehensive in scope, and includes questions relevant to an examination of the prevalence of chronic pain and the characteristics of chronic pain sufferers.

The Health Utility Index

Specifically, the NPHS includes a set of survey questions utilized to derive the Health Utility Index (HUI). The HUI is a single value from 0 to 1 for each individual surveyed representing the degree of health functioning that the individual enjoys. (See Wolfson (1993) for a discussion of the HUI including references that describe its development.)

Two questions measure pain states and are included in the calculation of the HUI. In addition, a wide variety of questions about health status and health care utilization are also asked on the NPHS. This provides the opportunity to explore the impact of chronic pain on sufferers.

Record linkage

Comparing survey results with administrative records can help to characterize how individuals who suffer from chronic pain use public health care services. An important feature of the NPHS survey was that individuals were asked to allow provincial ministries to link their survey responses to administrative records, and were invited to provide their health care identification numbers to allow this linkage to occur.

For those individuals who consented, the Physician Services and the Hospital Morbidity files of the Alberta Health Care Insurance Plan were linked to the NPHS survey responses.

The current report presents findings from the NPHS and the linked Alberta Health and Wellness administrative records to characterize the population suffering chronic pain in Alberta.

The National Population Health Survey Pain Questions

Prelude (presented at the beginning of the HUI questions):
The next set of questions asks about your day-to-day health. The questions are not about illnesses like colds that affect people for short periods of time. They are concerned with a person's usual abilities.

Are you *usually* free of pain and discomfort?

1. Yes (skip to next section)
2. No

How would you describe the *usual* intensity of your pain or discomfort?

1. Mild
2. Moderate
3. Severe

How many activities does your pain or discomfort prevent?

1. None
2. A few
3. Some
4. Most.

These questions are re-coded into the following indices for the calculation of the HUI.

HSC6DPAD (Derived activities prevented-due to pain/discomfort)

Value	Label
1	NO PAIN/DISCOMFORT
2	DOESN'T PREV ACTIVITIES
3	PREVENTS FEW ACTIVITIES
4	PREVENTS SOME ACTIVITIES
5	PREVENTS MOST ACTIVITIES

HSC6DSEV (Derived severity of pain)

Value	Label
1	NO PAIN/DISCOMFORT
2	MILD PAIN/DISCOMFORT
3	MOD PAIN/DISCOMFORT
4	SEVERE PAIN/DISCOMFORT

Subjects

The population under study was Albertans aged 12 and over (or aged four to 11 as reported by a parent or proxy). The total sample size was 15,535. Analyses employed a relative weight derived from the sampling procedure.

Linkage between NPHS responses and Alberta Health and Wellness administrative databases was successful for 6,012 individuals. This relatively low rate is sufficient to cast doubt on the generalizablility of the results[1]. However, the uniqueness of the data and the strength of the findings dictated that the results be presented here.

1 No child less than age 12 was asked for linkage information. Among those aged 12 or over, those less than 40 were less likely and those over 60 more likely to supply linkage information. In addition, those resident in Edmonton or Calgary were more likely to supply linkage information. The groups did not differ according to levels of reported pain, although individuals who supplied linkage information reported more disability days and medical consultations.

Results

Prevalence by Pain Classification

Using the NPHS weights derived from the 1996 Census Populations, the number of individuals over age four in Alberta suffering from various pain complaints in 1996 can be estimated.

Table 1 Estimated population by pain categories

	Severity				
	No Pain	Mild	Moderate	Severe	
Activity					Total
No Pain	2,284,477				2,287,447 88.8%
Doesn't Prevent Activities		40,248	27,648	**2,941**	70,836 2.8%
Prevents Few Activities		33,756	**47,181**	**3,460**	84,396 3.3%
Prevents Some Activities		**16,337**	**52,511**	**9,508**	78,356 3.0%
Prevents Most Activities		**4,498**	**26,952**	**22,151**	53,600 2.1%
Total	2,287,447 88.8%	94,838 3.7%	15,4291 6.0%	38,059 1.5%	2,571,666 100%

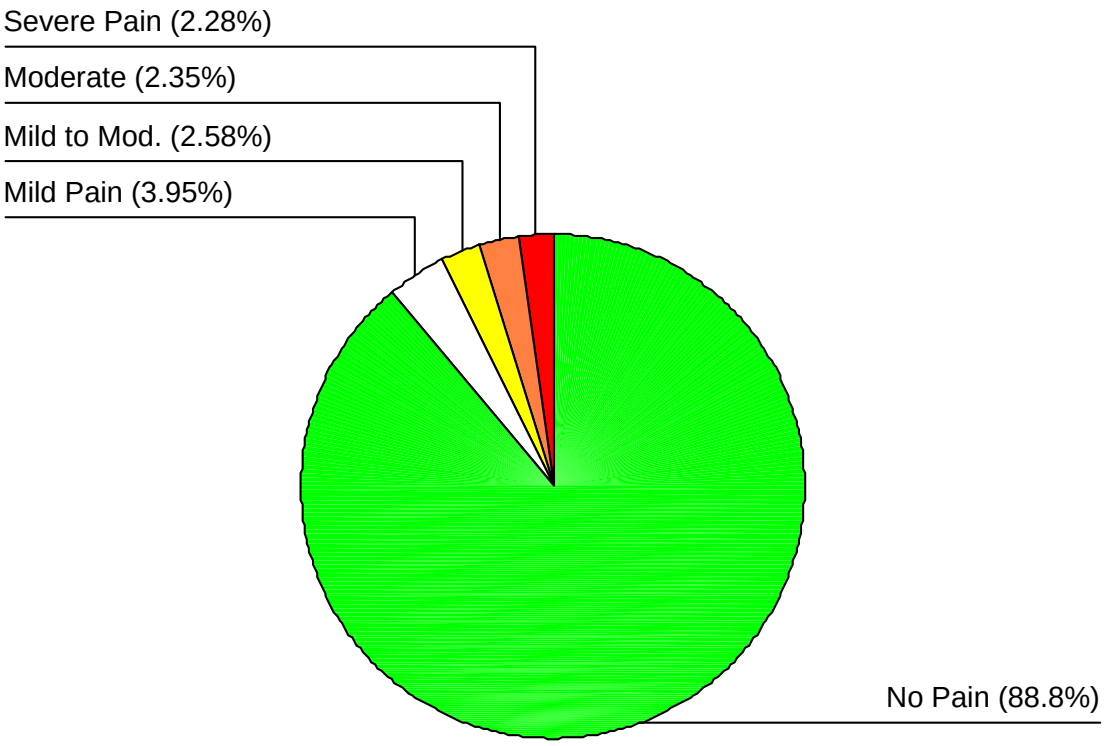
Red indicates severe chronic pain, orange indicates moderate chronic pain, and yellow indicates mild to moderate chronic pain.

Table 1 presents this data as a cross tabulation between the pain severity and the activity limitation by pain questions. The numbers in the cross tabulation table are an estimate of the number of Albertans in each pain category.

As is evident from the table, there is a strong positive association between the two pain questions. This is reflected in the table by the fact that the vast majority of individuals have similar elevations on the two dimensions. As a result, entries in table 1 are presented against four background colours to distinguish four levels of chronic pain: mild, mild to moderate, moderate, and severe. The severe chronic pain category is indicated in red and includes individuals with severe pain and limitations in some or most activities as well as individuals with moderate pain intensity and limitations in most activities. Further analysis was conducted according to this derived pain classification.

Figure 1 shows the population proportions according to the four derived levels of chronic pain.

Figure 1 Proportion of Albertans age four and over by chronic pain category, 1996



Based on the 1996 Alberta population of 2,571,666, the number of Albertans with severe chronic pain is 58,611. Thus, the estimated prevalence of severe chronic pain in the Alberta population based on the NPHS is 2.3 per cent. The estimated total prevalence of chronic pain, including those who are mildly or moderately affected along with severely affected individuals, is 11.2 per cent.

Age-sex prevalence

Age prevalences were calculated for each sex separately for the derived pain classification using the NPHS weighted data. The data were smoothed prior to further analysis[2].

[2] Smoothing across age within category was accomplished by a localized regression procedure (loess). After smoothing, the estimates were standardized to total 1.0.

Figures 2 and 3 present the age-specific prevalences as stacked area charts. It is clear that the prevalence of pain increases markedly with age, and that females are more likely to suffer chronic pain than are males at every age.

Figure 2 Pain categories by age for males

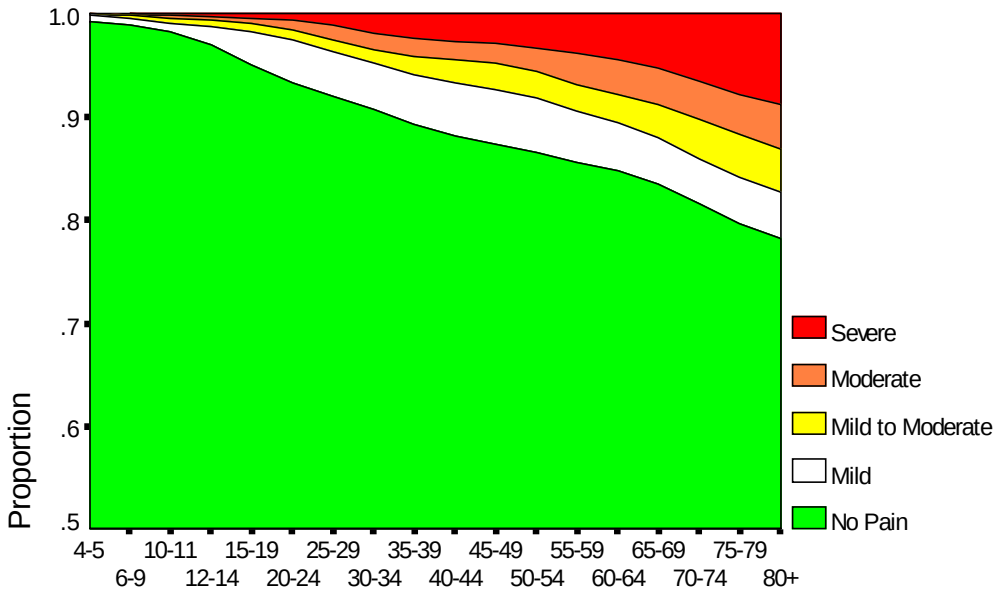
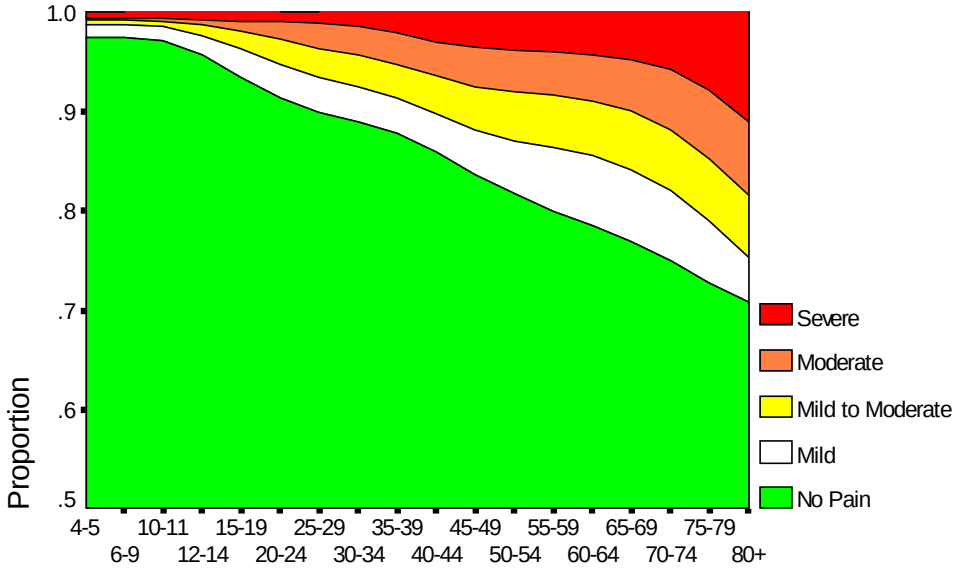


Figure 3 Pain categories by age for females

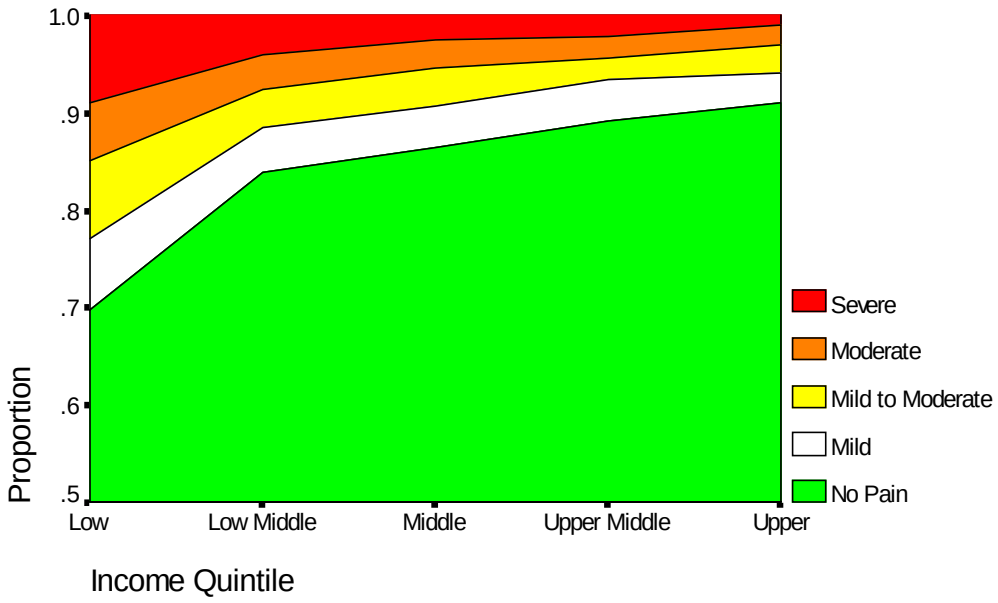


Prevalence by urban-rural residence and by income level

Prevalences were calculated for place of residence. There were no differences between urban and rural residents.

Prevalences were also calculated for each of the five self-reported family income quintiles using the NPHS weighted data. Figure 4 presents the income-specific prevalences as stacked area charts. It is clear from this figure that the prevalence of chronic pain decreases markedly as income increases.

Figure 4 Pain classification by income quintile



Health status by pain classification

In this section a number of health status variables are presented according to the pain classification presented in the previous section. All variables were measured by the NPHS. The fundamental finding is that all of these variables show a gradation with levels of chronic pain.

Table 2 Percentage of each pain group in each self-reported health group

	Pain Classification				
Self Reported Health	No Pain	Mild	Mild to Moderate	Moderate	Severe
Excellent	32.9	13.3	4.7	4.0	3.0
Very Good	38.9	31.2	23.8	11.8	10.1
Good	23.5	37.5	37.9	32.0	19.9
Fair	3.9	16.2	25.6	39.3	31.9
Poor	0.7	1.8	8.0	12.9	35.2

The Distress scale is the sum of six items from the Composite International Diagnostic Interview (CIDI Scores range from 0 to 24 with higher scores indicating more distress.

Table 3 Distress scale score by pain group

	Pain Classification				
	No Pain	Mild	Mild to Moderate	Moderate	Severe
Distress Scale	2.26	3.46	3.74	4.53	6.45

The probability of being diagnosed as a case of clinical Depression in an examination by a psychiatrist is also derived from items from the CIDI.

Table 4 Probability of suffering clinical depression by pain group

	Pain Classification				
	No Pain	Mild	Mild to Moderate	Moderate	Severe
Probability of Depression	.04	.11	.14	.16	.25

Table 5 Percentage of each pain group reporting chronic diseases

	Pain Classification				
Number of Chronic Diseases	No Pain	Mild	Mild to Moderate	Moderate	Severe
0	48.1	21.3	10.2	8.3	4.2
1	27.7	27.1	23.4	20.7	17.7
2	13.3	25.2	26.5	20.6	22.2
3	6.2	11.7	14.5	15.4	17.1
4 or more	4.7	14.7	25.4	35.0	38.8

Table 6 Proportion reporting general activity limitations by pain group

	Pain Classification				
	No Pain	Mild	Mild to Moderate	Moderate	Severe
Activity Limitations	.10	.27	.53	.64	.85

Table 7 Proportion rated Inactive (sedentary) by pain group

	Pain Classification				
	No Pain	Mild	Mild to Moderate	Moderate	Severe
Proportion Inactive	.04	.11	.14	.16	.25

Table 8 Average disability days in the past two weeks by pain group

	Pain Classification				
	No Pain	Mild	Mild to Moderate	Moderate	Severe
Disability Days	.63	1.15	2.35	3.19	6.19

Health utilization by pain classification

In this section a number of health utilization variables measured by the NPHS are presented according to the pain classification previously presented. As was the case with Health Status variables, the fundamental finding is that all of these variables also show a gradation with levels of chronic pain.

Table 9 Proportion overnight (or longer) hospitalization in the past 12 months

	Pain Classification				
	No Pain	Mild	Mild to Moderate	Moderate	Severe
Proportion Hospitalized	.06	.08	.14	.16	.24

Table 10 Average consultations with a medical professional in past 12 months

	Pain Classification				
	No Pain	Mild	Mild to Moderate	Moderate	Severe
Consultations	3.43	5.79	8.90	9.93	13.42

Table 11 Proportion reporting an unmet health need

	Pain Classification				
	No Pain	Mild	Mild to Moderate	Moderate	Severe
Prop. Unmet Needs	.06	.14	.19	.25	.29

Table 12 Proportion consulting an alternative care provider

	Pain Classification				
	No Pain	Mild	Mild to Moderate	Moderate	Severe
Alternate care	.07	.11	.13	.17	.15

Table 13 Proportion attending a self-help group

	Pain Classification				
	No Pain	Mild	Mild to Moderate	Moderate	Severe
Self Help Group	.03	.04	.04	.08	.07

Table 14 Proportion reporting the use of pain relievers

	Pain Classification				
	No Pain	Mild	Mild to Moderate	Moderate	Severe
Pain Relievers	.67	.81	.86	.87	.88

Table 15 Proportion reporting use of narcotic medication

	Pain Classification				
	No Pain	Mild	Mild to Moderate	Moderate	Severe
Narcotics	.05	.10	.16	.18	.31

Table 16 Average number of medications reported

	Pain Classification				
	No Pain	Mild	Mild to Moderate	Moderate	Severe
Number of Medications	.79	1.23	1.80	2.03	2.85

Relationship to chronic diseases

The derived chronic pain classification was employed to examine the associations between chronic disease and chronic pain. There are a number of complications to this analysis:

1. The NPHS asked questions about only a selection of chronic diseases. Some of these are not generally associated with pain.
2. The NPHS allowed the individual to register all chronic diseases from which they suffered. This complicates analysis because a decision needs to be taken as to whether to ignore or attempt to model the effects of co-morbidity.

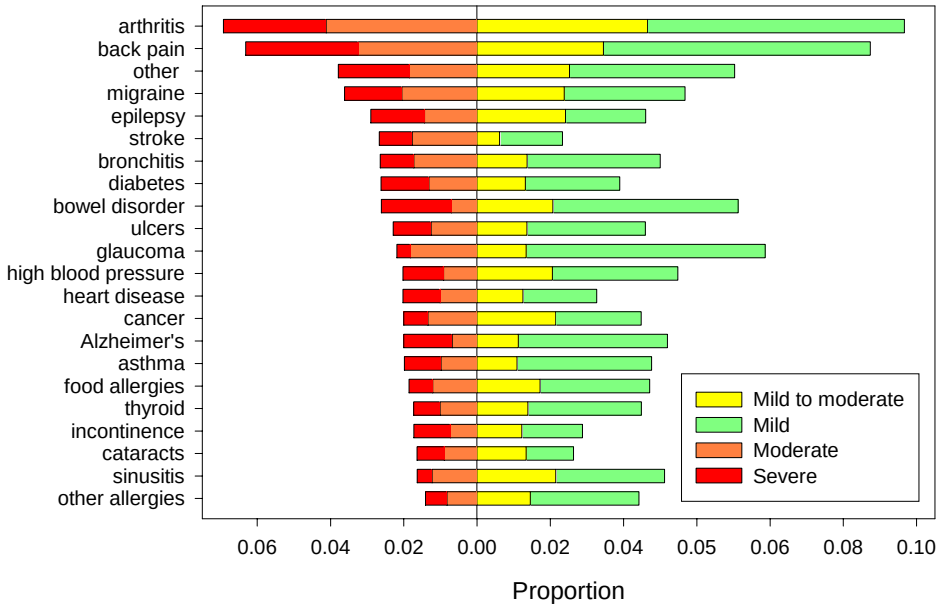
The current analysis attempted to control for (or model) the effects of co-morbidity, so that the resulting estimates of pain prevalence within the chronic diseases should be thought to refer to *individuals suffering from that single chronic disease alone.* The presence of two or more chronic diseases would increase the proportion of individuals suffering pain in every category.

The base analysis was a multinomial logistic regression in which each of the pain categories within the combined pain scale were predicted by the presence or absence of each of the 22 chronic disease categories queried by the NPHS. No interaction terms were entered[3].

The probabilities of belonging to each pain category in the presence of each single chronic disease were calculated. These were arrayed in a histogram in figure 5 below. Left of the centre line is a stacked histogram showing the proportion of the individuals self-identifying as suffering from a particular chronic disease who also report suffering severe or moderate pain on the derived scale. To the right are the proportions suffering mild or mild to moderate pain.

Chronic pain of a moderate to severe severity is most likely to be reported in arthritis, back pain, and migraine headache. Rates are approximately equal to each other for other chronic diseases.

Figure 5 Chronic pain in chronic diseases



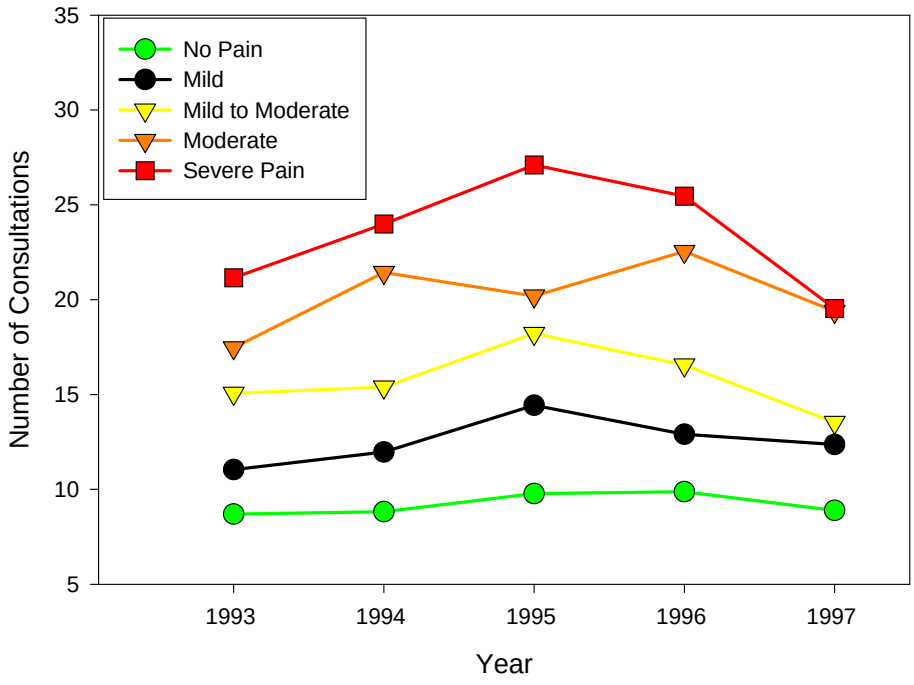
[3] It remains possible that suffering both disease A and disease B leads to a more considerable elevation of pain prevalence than implied by a non-interactive additive model in which the pain severities would be thought to sum.

Administrative records by pain classification

In this section, results are presented for the linkage between the NPHS and administrative records. Despite the fact that the number of individuals that could be linked for this analysis is only 39 per cent of the respondents, the picture presented by this data is consistent and compelling.

Figure 6 shows the average number of medical consultations from administrative records for each year from 1992 to 1997. It is interesting to note that these numbers appear to be substantially larger than those reported in the survey.

Figure 6 Consultations with health professionals by pain classification



Figures 7 and 8 show the number of hospitalizations and the total number of hospital days according to administrative records.

Figure 7 Number of hospitalizations by pain classification

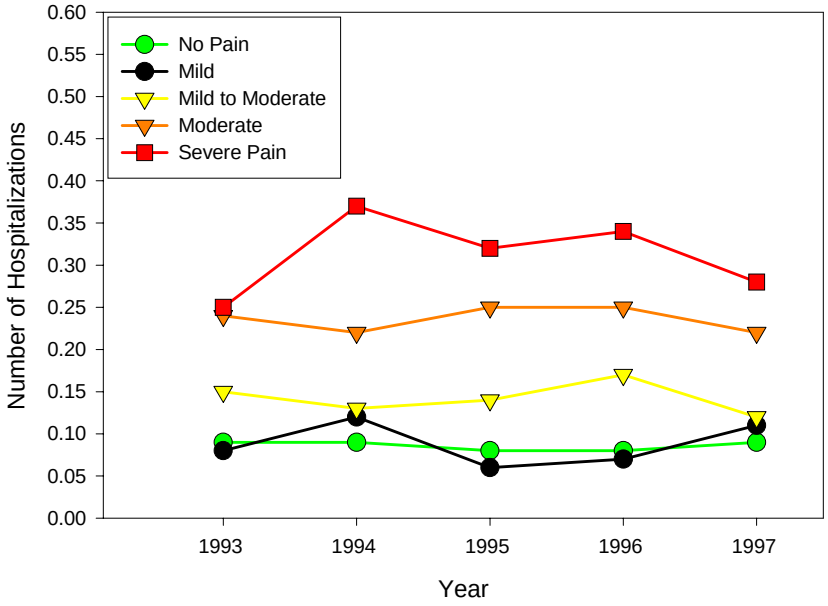
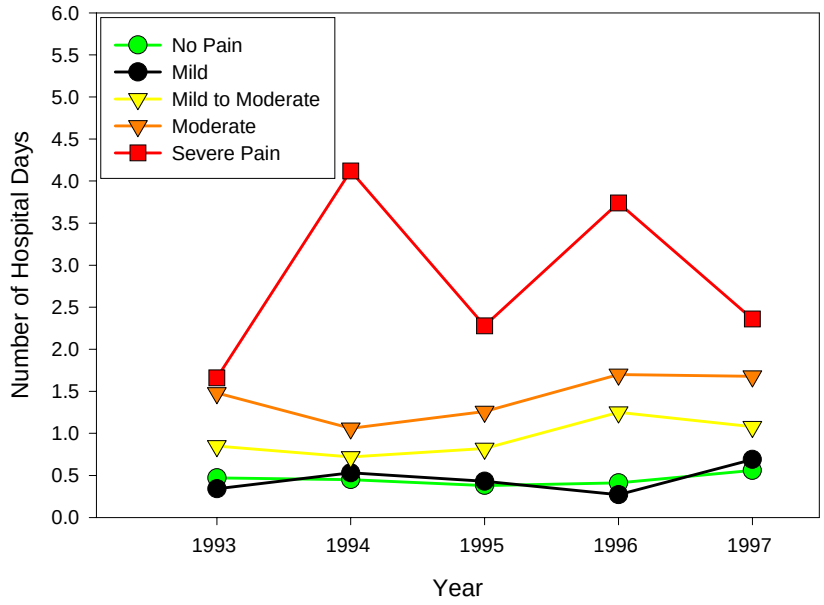


Figure 8 Number of hospital days by pain classification



In all cases, the gradation in health utilization is as expected: individuals with severe pain requiring greater levels of utilization than those with moderate levels of pain. In turn those with moderate pain utilized greater levels of health care services than did individuals with mild to moderate pain, and so on. As well, while 1996 (the year of the survey) generally had the highest levels of utilization, the levels in the three previous years and in the following year were only very slightly lower.

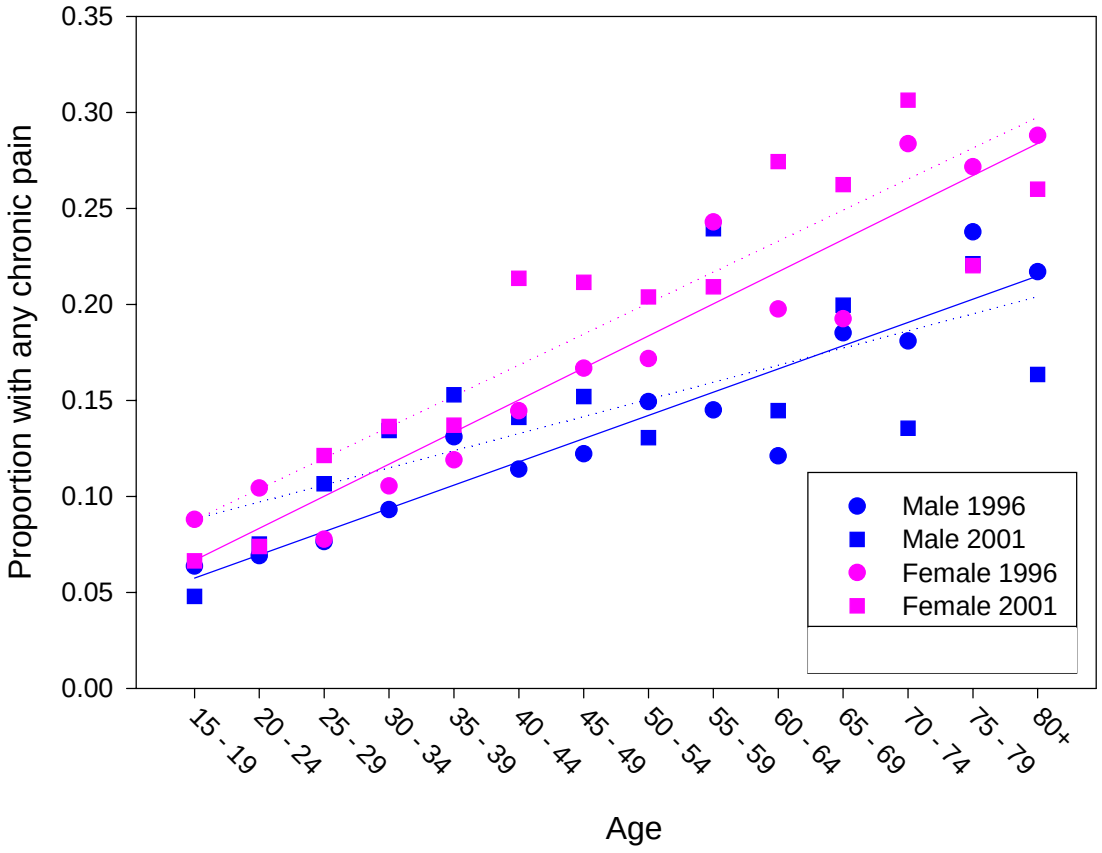
Stability of prevalence estimates for chronic pain

Data from the Canadian Community Health Survey (CCHS) recently became available from Statistics Canada. The CCHS is a major cross-sectional health survey first conducted by Statistics Canada in 2001. Over 130,000 Canadians were sampled with the intention of providing health indicators at a regional level for over 135 health regions across Canada. It is anticipated that the CCHS will be conducted with a similar sample size every two years. It replaces the NPHS for cross sectional purposes.

Although the CCHS contains fewer questions than the NPHS, the Health Utility Index was included for 2001. The chronic pain classification employed in the analysis of the NPHS data was calculated for the 13,725 subjects (aged 15 and over) to whom the CCHS was administered.

Age-sex specific prevalences for individuals over age 15 for both the 1996 NPHS and 2001 CCHS samples are shown figure 9. The figure also shows trend lines for each year and each sex.

Figure 9 Age-sex prevalence of chronic pain, NPHS 1996 and CCHS 2001

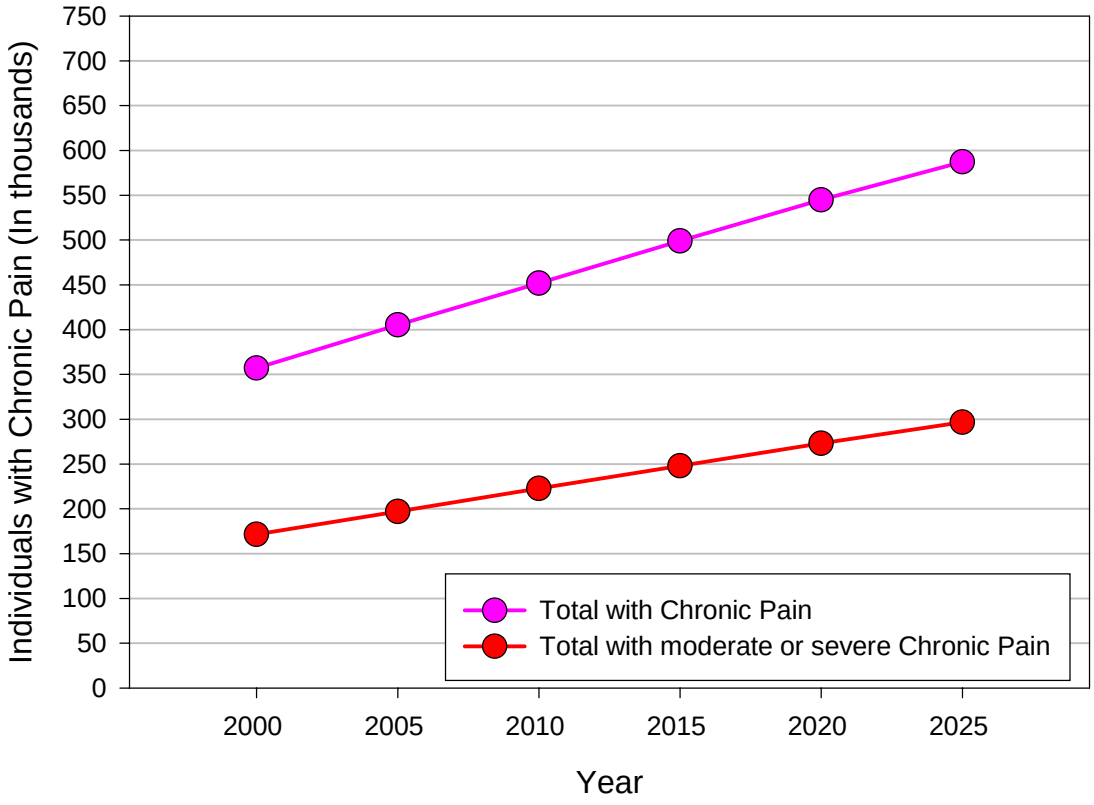


The data from the two surveys reveal a similar picture: female rates are higher and rise more rapidly with age. There is a slight but statistically significant increase in baseline chronic pain rates from 1996 to 2001, particularly for females. (This can be seen in the increased level of the 2001 trend lines). This apparent increase is also present for females, but not males, in the severe pain categories.

Prevalence projections for chronic pain

The age-sex prevalence rates calculated from the 2001 CCHS were applied to population projections previously prepared by Health Surveillance (Alberta Health and Wellness, 2000). The number of individuals 15 years of age and over projected to have chronic pain and moderate or severe chronic pain is shown in figure 10.

Figure 10 Expected change in number of individuals suffering chronic pain



It is apparent that there will be a large increase in the number of individuals suffering chronic pain in Alberta even in the absence of a change in the prevalence rates for chronic pain. In fact this increase will be about 70 per cent in the next 25 years. Part of the increase is due to a population increase in Alberta, but the primary impact will come from the aging of the population.

Conclusion

These data derived from the Alberta sample of the National Population Health Survey (NPHS) provide estimates of the prevalence and severity of chronic pain in Alberta. Two NPHS questions target pain intensity and interference with activity due to pain. The questions are very strongly correlated and allow the creation of a valid composite pain measure.

Rate of chronic pain

The estimated prevalence of severe chronic pain in the Alberta population based on this composite pain measure is 2.3 per cent. The estimate of the total prevalence of chronic pain, including those who are mildly or moderately effected along with severely effected individuals, is 11.2 per cent. Millar (1996) using data from the 1994 NPHS found a Canada-wide of 17 per cent prevalence for individuals aged 15 and over. The comparable figure for Alberta for the 1996 NPHS is 13.2 per cent for individuals aged 15 and over. The difference is very likely due to the fact that Alberta has a young population relative to the rest of Canada.

Chronic pain, age and income

In fact, the proportion of individuals in the pain categories of this measure increases in prevalence with age. This relationship is found in both males and females. The proportion of individuals in the pain categories of this measure also decreases as income increases.

Chronic pain and health status

A large number of health status and health utilization measures from the NPHS confirm that there is a gradient according to pain such that health status decreases and health utilization increases as pain levels increase.

Chronic pain and chronic diseases

Respondents to the NPHS also reported the presence of a number of chronic illnesses. Using regression analysis, the association of chronic pain with these illnesses was estimated. The results of these analyses indicate the highest proportion of severe and moderate chronic pain is associated with arthritis, back pain, and migraine headache.

Chronic Pain and utilization of health services

Utilization measures derived from record linkage confirm the gradient in health utilization measures, and show that the gradient exists for at least four years prior to the survey, and at least one year after the survey.

Changes in prevalence and number of chronic pain sufferers

The prevalence of chronic pain appears to have increased slightly from 1996 to 2001 as measured by the CCHS, particularly for females. The shape of the relationships with age remained the same.

Finally, the number of individuals suffering chronic pain will increase dramatically in Alberta over the coming decades due to the aging of the population, even if the prevalence of chronic pain does not change.

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Multidisciplinary Pain Programs for Chronic Pain: Evidence from Systematic Reviews

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Multidisciplinary Pain Programs for Chronic Pain: Evidence from Systematic Reviews

Executive Summary

Background

The health-related quality of life of chronic pain (CP) sufferers is among the lowest observed for any medical condition. Approximately 45% of Americans require treatment each year for pain at a cost of $85 to $90 billion. CP is a multifactorial condition and several interventions, both invasive and non-invasive, have been developed to manage it. These interventions may be used in isolation or as components of a multidisciplinary pain program (MPP). The rationale for the MPP approach is to provide simultaneous assessment and management of somatic, behavioural, and psychosocial components of CP. MPPs may include pharmacological intervention, physical therapy, psychological (cognitive-behavioural) treatment, family counselling, patient education, vocational counseling, or even surgery. Most programs involve medication management.

At the Calgary Chronic Pain Centre in Alberta, an interdisciplinary approach is used for the assessment and treatment of people who experience CP due to musculoskeletal pain, pelvic pain (in women), or daily headaches. This pilot program is currently funded by the Ministry of Health and the Calgary Health Region, and is supported by the Alberta Medical Association.

Given the cost and consequences of CP, the therapeutic and financial effectiveness of MPPs are important issues.

Objectives

Two main questions were addressed in this report:

1) What is the strength of the evidence on the efficacy/effectiveness of MPPs for patients with CP?
2) What is the evidence on the efficiency of MPPs for treating CP patients?

Methods

This report is a tertiary qualitative systematic review (SR). The current published scientific evidence on the efficacy/effectiveness and economic consequences of MPPs for patients with CP (not related to cancer) was obtained by analyzing and synthesizing findings from SRs. Information from Canadian clinical practice guidelines(CPGs) was also provided.

Results

All of the reviewed CPGs recommended the use of an interdisciplinary/multidisciplinary team approach for CP patients that included a physician, psychologist, and physical/occupational therapist, but the evidence for this was weak. Five SRs met the inclusion criteria. Four assessed the effectiveness of MPPs for a variety of musculoskeletal problems in adult populations, while one SR examined the effectiveness of a MPP for chronic pelvic pain. Four of the included SRs were Cochrane reviews and they provided the best available evidence on the effectiveness of MPPs for CP (see Table 1).

Table 1: Summary of best available evidence for MPPs

Condition	Level of Evidence	Conclusion
Chronic low back pain	Strong	Effective
Chronic pelvic pain	Moderate	Likely to be effective
Fibromyalgia and widespread pain	Limited	Inconclusive
Neck and shoulder pain	Limited	Inconclusive

Caution should be exercised when generalizing these results because the programs were not standardized, and it is not known whether the observed outcomes were attributable to a particular treatment modality or to the interactions among the multiple treatments. Uncertainty remains as to the effect of other factors such as the duration and intensity of therapy required for certain conditions, the type of healthcare professionals that should be involved, and the level of involvement of the patients and their families.

The one SR that provided evidence on the economic effectiveness of MPPs for patients with CP concluded that the available research had serious methodological flaws and was deficient in the basic principles of economic evaluation.

Conclusions

It remains unclear which treatment or set of treatments is responsible for the observed improvements in CP patients or which kind of patients do best under a particular form of individualized treatment plan. A standardized operational definition for a MPP is essential for future program comparisons or evaluations. Regional Health Authorities providing MPPs for the management of CP must establish appropriate data collection systems and conduct extensive evaluations to assess not only the clinical effectiveness of intervention strategies but also their efficiency. Maintaining and monitoring outcome data systems should be a top priority for any MPP in Alberta.

Reference:

Ospina M, Harstall C. Multidisciplinary Pain Programs for Chronic Pain: Evidence from Systematic Reviews. Alberta Heritage Foundation for Medical Research HTA, editor. Edmonton, Alberta, Canada: 2002. Report: HTA 30.

The full text is available at http://www.ahfmr.ab.ca/programs.html

Alberta Heritage Foundation
for Medical Research

Multidisciplinary Pain Programs for Chronic Pain: Evidence from Systematic Reviews

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January 2003

HTA 30: Series A Health Technology Assessment

This Health Technology Report has been prepared on the basis of available information of which the Foundation is aware from public literature and expert opinion and attempts to be current to the date of publication. It has been externally reviewed. Additional information and comments relative to the report are welcome and should be sent to:

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Print: ISBN 1-896956-72-6
On-line: ISBN 1-896956-74-2

Print: ISSN 1704-1090
On-line: ISSN 1704-1104

Alberta's health technology assessment program has been established under the Health Research Collaboration Agreement between the Alberta Heritage Foundation for Medical Research and the Alberta Health Ministry.

ACKNOWLEDGMENTS

The Alberta Heritage Foundation for Medical Research is most grateful to the following persons for provision of information and comments on the draft report. The views expressed in the final report are those of the Foundation.

- Dr. Dennis Turk, Department of Anesthesiology, University of Washington, Seattle, Washington.
- Dr. Mauritis W. van Tulder, Institute for Work and Health, Toronto, Ontario.

In preparing this report, the Foundation was assisted by an information sharing group on chronic pain that provided advice and comments on the report. Participants in this group were:

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SUMMARY

- The approach taken to evaluate the current published scientific evidence on the efficacy, effectiveness and economic consequences of multidisciplinary pain programs (MPPs) for patients with chronic pain (CP) not related to cancer, was to analyze and synthesize the findings from systematic reviews (SRs) including meta-analyses. Given the cost and consequences of CP, whether MPPs are therapeutically and financially effective are important issues of consideration.
- MPPs in this report are defined as being a comprehensive approach that involves coordinated interventions among a variety of disciplines working together in the same facility in an integrated way with joint goals and with ongoing communication. The patient is considered to be an active participant who assumes significant responsibility within the rehabilitation process with the staff playing a teaching and consulting role.
- The rationale for MPPs as a therapeutic approach is to provide simultaneous assessment and management of somatic, behavioural and psychosocial components of CP. MPPs aim to improve quality of life outcomes, to increase patient independence and to restore physical, psychological, social, and occupational functioning.
- Treatment strategies available at MPPs usually vary from centre to centre in terms of the setting (inpatient versus outpatient), number of hours and days involved, and type, intensity, and nature of treatment modalities offered. Patients seen at MPPs are often not representative of all those with CP and alternatively, not all CP patients should attend MPPs. As tertiary centres, MPPs are generally selected for patients with complex and long-standing pain problems.
- From the twelve SRs on the effectiveness of MPPs, five met the inclusion criteria. Four of these SRs focused on MPPs as the primary intervention of interest, whereas one SR considered MPPs among several other interventions.
- The results from a recent good quality SR tend to support the effectiveness of intensive MPPs for chronic low back pain patients in terms of their effects on functional improvement and pain reduction. The results from one clinical trial included in one of the SRs support the use of MPPs in patients with chronic pelvic pain in terms of daily activity level and self-rating scales.
- The other SRs found limited evidence and therefore the findings were considered to be inconclusive regarding the effectiveness of MPPs in managing CP in other conditions such as fibromyalgia and widespread musculoskeletal pain, and shoulder and neck pain.

- From the five SRs on the efficiency of MPPs, only one met the inclusion criteria. The authors of this good quality SR concluded that it was not possible to answer the question on whether MPPs are cost effective or not. They noted a lack of economic evaluations within the published research on multidisciplinary management of CP.
- A standardized operational definition for a MPP is essential to ensure that future program comparisons or evaluations are possible to answer the challenging questions such as which treatment/management strategies are effective, for which patient group and at what costs.
- There is a need for research on the various aspects of the multidisciplinary approach. Regional Health Authorities providing MPPs for the management of CP not related to cancer need to conduct appropriate evaluations. Because the programs vary so much in the specific techniques used to manage pain, little is known about which treatment or set of treatments is responsible for the observed improvements or which kind of patients do best under a particular form of individualized treatment plan. Maintaining and monitoring outcome data systems should be a top priority for any MPP.

CONTENTS

Tables:

INTRODUCTION

During the last decade published research has indicated that chronic pain (CP) is multifactorial and several interventions both invasive and non-invasive have been developed. Such procedures may take the form of either single interventions or may act as components of multidisciplinary pain programs (MPPs). MPPs have been established to address the specific and complex needs faced by individuals with CP.

The efficacy and effectiveness of MPPs have been questioned and their cost-effectiveness and other economic outcomes are contested in the current health care environment [1, 2].

Chronic pain has been considered among the most disabling and costly afflictions and one of the most common reasons for seeking medical attention [3]. In the American population, people with chronic pain, many of whom have had multiple failed interventions, make 70 million visits to physicians and 425 million visits to alternative health care providers each year [4-6]. CP has a devastating effect on the lives of sufferers and families [7] and creates a high amount of distress and disability [8].

SCOPE OF THE REPORT

This is the second report of a series of documents being prepared by the Health Technology Assessment (HTA) Unit of the Alberta Heritage Foundation for Medical Research (AHFMR) in response to requests from the Calgary Health Region and Alberta Health and Wellness (AHW) for evidence on the efficacy, effectiveness and economic outcomes of MPPs for CP not associated with cancer. A previous HTA report prepared by the HTA Unit at AHFMR entitled *Prevalence of chronic pain: an overview* [9] presented the challenges of answering the question on the estimated prevalence of CP in the general population. Estimates varied from 10.1% to 55.2% in the heterogeneous studies reviewed and severe CP prevalence ranged from 8% in children to 11% in adult populations.

In order to establish provincial needs for a MPP, it was necessary to provide estimates of the prevalence of CP in Alberta. It was decided to use a convergence approach where published research on CP prevalence was analyzed (*Prevalence of chronic pain: an overview*, HTA Report [9]) and AHW's administrative data linked to the National Population Health Survey were analysed to estimate local prevalence in Alberta (*Chronic Pain in Alberta: A portrait from the 1996 National Population Health Survey and the 2001 Canadian Community Health Survey*, Health Surveillance, AHW; in press).

Using the 1996 National Population Health survey data, this report provides an estimate of the prevalence of CP among Albertans. It was estimated that 11.2% of

Albertans suffer some level of CP and about 2.3% suffer from severe CP. As the proportion of individuals suffering from CP increases with age, it is projected that CP will represent an important health problem as the population in Alberta ages over the coming decades.

Two main questions will be addressed: 1) What is the strength of the evidence on the efficacy/effectiveness of MPPs in patients with CP? and 2) What is the evidence on the efficiency of providing MPPs for treating CP patients?

In order to evaluate the current published scientific evidence on the efficacy, effectiveness and economic consequences of MPPs for patients with CP, the approach taken was to analyze and synthesis the findings from systematic reviews (SRs) including meta-analyses. Information from Canadian clinical guidelines is also provided. The search strategy and methodological approaches used for this report are outlined in detail in Appendices A and B. Results from primary studies conducted after the completion of the most updated SRs are not included. This limitation becomes important if new research results from good quality studies should alter the overall findings.

BACKGROUND

The International Association for the Study of Pain (IASP) defines pain [10] as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage". As a multidimensional and complex phenomenon made up by sensation, emotion, experience and behaviour, pain is considered the "5th vital sign" when evaluating patients [11]. Three general types of pain have been described: acute, episodic and chronic pain [12].

CP is defined here as pain not associated with cancer that exists beyond an expected time frame for healing (usually taken to be three [13] or six months [14]) and associated with protracted illness or as a symptom of a recurring condition [7, 15, 16].

The Canadian Pain Mechanisms, Diagnosis and Management Consortium considers CP to have severe consequences on the physical, psychological, social, and economic dimensions of the lives of sufferers and families [17]. The health-related quality of life of CP sufferers has been documented as being among the lowest observed for any medical condition [18]. Many individuals have associated sleep and appetite disturbances and become less physically active. These factors lead to an overall deterioration of physical functioning [19].

The indirect costs for the family of patients with CP are often underestimated [20] and as medical costs escalate and disability increases, patients and their families feel progressively more distressed [21]. CP is a costly condition for society due to health care expenditures and indirect costs associated with disability compensations and loss of

productivity resulting from absenteeism [21]. Approximately 45% of Americans require treatment each year for pain at a cost of $85 to $90 billion [22]. When combined with the expense of financial compensation and loss of an estimated 700 million work days each year to pain related disabilities [22], means that the estimated annual cost of CP in America is over $100 billion [23]. Given the cost and consequences of CP, whether MPPs are therapeutically and financially effective are important issues for consideration [24]. Despite the growing interest in MPPs for CP patients and health care providers, scepticism among third-party payers regarding the efficacy and cost-effectiveness of MPPs persists [21].

Patients with CP present a clinical challenge in view of the physical, cognitive, emotional, behavioural and social factors that often interfere with pain management. The traditional biomedical model, based on a cause-and-effect approach used in treating acute pain, falls short when applied to CP. When CP is treated as only a symptom of a body disease, the role of these very complex factors and effects are ignored, and result in poor treatment outcomes [25, 26].

From a biopsychosocial perspective, CP is the result of complex interactions among biological changes, psychological status, and the social and cultural contexts that shape the diversity of its clinical presentation (severity, duration, and outcomes), as well as the patient's perceptions and response to illness [11, 26, 27]. The biopsychosocial model for CP has allowed the development and establishment of a multi-dimensional therapeutic approach that recognises the complexity of the factors contributing to the individual expression of CP. The rationale for such a therapeutic approach is to provide simultaneous assessment and management of somatic, behavioural and psychosocial components of CP [28].

MULTIDISCIPLINARY PAIN PROGRAMS

The pioneer of pain programs was John J. Bonica. In the 1950s he developed an interdisciplinary approach designed to integrate the efforts of several health-care providers to restore function, alleviate pain wherever possible and improve pain management skills. Although Bonica's original model has changed due to improvements in pain treatment techniques and changes in reimbursement, the basic principle remains the same [29].

There are many terms used to signify MPPs. For example terms such as "multimodal treatments", "multidisciplinary facilities (multidisciplinary pain centre, and multidisciplinary pain clinic)", "multidisciplinary approach", "multicomponent treatments", "interdisciplinary team", "multidisciplinary team", "chronic pain rehabilitation", "functional rehabilitation", "multidisciplinary care" have been used interchangeably in the literature to describe MPPs. It is important therefore, to clarify some of the terms used:

- *Multimodal therapy* can be defined as the concomitant use of diverse, separate therapeutic interventions under the direction of a single practitioner [30].
- *Multidisciplinary* treatment entails more than one health care discipline provider who may not always be "under the same roof" treating the pain condition [30, 31]. Each treatment stands alone without requirement for input from the other, that is, there is no distinct need for one discipline to synchronize therapy with the work of other health professionals [32].
- *Interdisciplinary* treatment is a comprehensive approach that involves coordinated interventions among a variety of disciplines working together in the same facility in an integrated way with joint goals and with ongoing communication [1, 5]. Interdisciplinary pain treatment considers the patient as an active participant who assumes significant responsibility within the rehabilitation process with the staff playing a teaching and consulting role [29, 33].

The term "multidisciplinary" is commonly used in the research literature to define a comprehensive model of treatment that is most consistent with the definition of an "interdisciplinary" approach. The term MPP used in this report refers to an interdisciplinary formulation of treatments for the management of CP.

Characteristics of MPPs

The IASP [34] defines four types of pain centres according to the level of comprehensiveness of the treatment and the range of problems treated. The four types, modality-oriented clinics, pain clinics, multidisciplinary pain clinics, and multidisciplinary pain centres, are outlined in Table 1. This report focuses on the latter two types of MPPs (interdisciplinary in nature) for CP patients.

Table 1: IASP Classification of pain centres (adapted from [5, 14, 34, 35])

1. Modality-oriented clinics • Facilities with one or two medical specialities. • Provide treatments limited to a specific intervention. • Have no emphasis on integrated, comprehensive, interdisciplinary approach. • Do not provide comprehensive assessment or management of CP.	**2. Pain clinics** • Specialised in a particular diagnosis or pain associated with a specific area of the body. • Single physician, absence of interdisciplinary assessment and management. • Focused on diagnosis and management of patients with CP.
3. Multidisciplinary pain <u>clinics</u> • Staffed by a diverse group of health care professionals comprised of physicians, psychologists, nurses, physical therapists, occupational therapists, case managers, and other specialists working as a team.	**4. Multidisciplinary pain <u>centres</u>** • Interdisciplinary in nature. At least three medical specialties, physicians from two specialties and clinical psychologist. • Multiple therapeutic modalities available offered by a wide variety of health care

• Specialised in the diagnosis and management of CP patients. • May have diagnostic and treatment facilities, which are outpatient, inpatient or both. • Do not include research, training activities in the regular programs and is not affiliated with a major education or research institution.	professionals (same as #3). • Affiliated with major health science institutions and/or universities. • Facilities for inpatient and outpatient services. • Includes research, teaching and patient care related to acute and CP. • The largest and most complex of the pain treatment facilities.

The nature of treatment goals in MPPs is rehabilitative rather than curative. Emphasis is on specific, definable, operable and realistic [5] outcomes rather than total pain relief. Instead of focusing primarily on pain, MPPs aim to improve quality of life outcomes, to increase patient independence and to restore physical, psychological, social, and occupational functioning [5]. Specific goals of MPPs for CP patients are:

- Reduce overdependence on drugs and other treatment modalities [1, 16, 36].
- Symptomatic improvement [35].
- Improve physical functioning levels appropriate to age and condition [16].
- Reduce subjective pain intensity [37].
- Help regain independence [16].
- Master coping techniques [1] and self-management skills [37, 38].
- Restore the ability to function productively and satisfyingly [39].
- Decrease inappropriate use of the health care system [40].

Treatment strategies available at MPPs vary from centre to centre in terms of the setting (inpatient versus outpatient), number of hours and days involved, and type, intensity, and nature of treatment modalities offered. Each perspective of an interdisciplinary formulation has a unique logic that defines specific methods for designing treatment plans for a patient with CP therefore, these plans are usually formulated on an individual basis for assessment, treatment, and follow-up.

MPPs may offer pharmacological interventions, physical therapy, psychological (cognitive-behavioural) treatment, family counselling, patient education or vocational counselling and, in some instances, surgery or a variety of other non-pharmacological modalities. Most programs involve medication management to simplify medication schedules and reduce the use of opioids [1, 14, 41]. Core staff may vary from centre to centre depending upon the available resources and goals of the facility. Table 2 presents the roles of those health care providers who are usually involved in these types of programs.

Table 2: Roles of staff members at MPPs (adapted from [5, 19])

Staff Member	Functions
Medical director/physician	• Responsible for all medical issues associated with pain complaint, including diagnoses and management of physiologic, anatomic and pathologic processes. • Comprehensive assessment of patient, focusing on careful neurological and musculoskeletal examination, review of past interventions, and consideration of potential medical, block and implantation interventions. • May be a psychiatrist, anaesthesiologist, neurologist or other trained medical professional.
Nurse/case coordinator	• Role in gathering patient histories, evaluating lifestyle issues that may impact patients and their response to treatment, and monitoring medications. • Co-ordination of care (case management), education, and medical therapy.
Psychologist	• Facilitates treatment planning through comprehensive assessments of the patient's psychosocial functioning, including personality, psychopathology, social support, level of motivation, and coping resources. • Development of psychological interventions, including education on the use of self-management techniques and cognitive-behavioural therapy.
Physical therapist	• Comprehensive assessment, that includes evaluation of strength, flexibility, and physical endurance, reflexes, sensation, neurologic indices, range of motion, and gait and postural abnormalities. • Evaluation of the work site and home. • Provides education on active physical coping skills and management of physical rehabilitation.
Occupational therapist	• Provides pre- and post- treatment evaluations targeting the patient's daily activities. Including work and recreational activities, with regard to body mechanics and energy conservation. • Oversees the progressive increase of functional activity to return the patient to the maximum normal level of activity possible. • Works as a liaison between employers and injured workers to accommodate the employee with needed job modifications.
Medical disability case manager	• Monitors patient's progress, adherence, performance and post-treatment development. • Advocates for vocational and social reactivation throughout the program. • Provides occupational planning, sequencing, and identifies socio-economic issues.
Pharmacist	• Comprehensive review of past and current pharmacological interventions including the use of herbal and homeopathic substances. • Provides education on appropriate use of pharmacological interventions.

MPPs have come under criticism. It has been stated that they tend to be time consuming for the providers and the patients [32, 33, 37]. Debates continue on whether they should be offered on an outpatient or inpatient basis. These factors influence resource requirements [36]. Since MPPs involve health-care providers from several disciplines, it has been argued that a potential shortcoming of this approach is that access to such a range of health-care providers is usually limited and that the patient's care is rarely coordinated, even when the program considers itself to be interdisciplinary-grounded[19].

Characteristics of patients at MPPs

Patients with CP have different characteristics based on referral patterns or self-selective factors. For example, the features and characteristics of CP patients may be heterogeneous. Patients seen at MPPs are often not representative of all those with CP and alternatively, not all CP patients should attend MPPs [24, 35].

As tertiary centres, MPPs are generally selected for patients with complex and long-standing pain problems. Compared with community samples of individuals with CP, MPPs patients have previously failed less intensive interventions, have higher rates of opioid useage and analgesic intake, and a higher prevalence of surgery. Likewise, they have greater functional impairment, experience higher levels of emotional problems, more constant pain and more negative attitudes about the future, and have been seen by a wide range of physicians resulting in a greater level of health-care utilization [1, 18, 24, 35].

In view of this, it seems reasonable to assume that CP patients who attend MPPs have the most recalcitrant problems. It is important to take these patient characteristics into consideration when evaluating the efficacy of MPPs as appropriate patient selection ensures that the intervention is used only for those who are most likely to benefit.

MPPs in Alberta

A MPP was set up on a demonstration/pilot basis in Calgary. The Calgary Chronic Pain Centre (CCPC) uses an interdisciplinary approach for the assessment and treatment of people who experience CP in one of three areas: musculoskeletal pain, pelvic pain in women and daily headaches. The pilot program (Tripartite Project) is currently funded by Alberta Health and Wellness, the Calgary Health Region, and is supported by the Alberta Medical Association. Rationale, goals and key components of the program are consistent with those reported in the literature on MPPs.

Health professionals work as a team in one location. The assessment and treatment team includes: specialist physicians, family physicians, psychologists, physiotherapists, occupational therapists, nurses, pharmacists and kinesiologists. Among the main characteristics of care provision at the CCPC are a thorough on-site assessment, development of an individual care plan, and the discussion of the care plan in

conference with the patient, family members, family physician and the CCPC team. The patient actively participates in the process.

The Calgary program is but one example of the services available in Alberta for CP management. In addition, other facilities in Alberta provide care to this patient group, each operating with different staffing, funding, and access arrangements. These include the LifeMark Health Institute, The University of Alberta's Multidisciplinary Pain Centre and the facilities of the Workmen's Compensation Board, Columbia Health and Orion Health, amongst others.

The Canadian Pain Mechanisms, Diagnosis and Management Consortium [17] notes that few cities in Canada have pain clinics that provide MPPs by an integrated team of specialists. New clinics are being developed. Only recently has the monitoring of pain practices been included in accreditation standards. The revised standards from the Canadian Council on Health Facilities Accreditation now contain components requiring documentation of pain assessment and management, including patients' responses to treatment for pain. The Canadian accreditation standards give clear direction to Canadian hospitals that ongoing assessment of the effectiveness of pain management is expected [17].

CANADIAN CLINICAL PRACTICE GUIDELINES

Five Canadian clinical practice guidelines (CPGs) on the management of CP were developed by the Colleges of Physicians and Surgeons of Alberta [42], Manitoba [43], New Brunswick [44], Ontario [45] and the Canadian Pain Mechanisms, Diagnoses and Management Consortium [17]. The Colleges of Physicians and Surgeons consider the most appropriate therapeutic paradigm for most CP patients should follow a rehabilitative model rather than an acute medical model. They also agree that the goals of any intervention should be functional restoration (including physical, psychological and social function), symptomatic relief and comfort improvement. Several relevant outcomes in these guidelines include: pain reduction, limiting adverse effects, and reduction of pain therapy as well as quality of life improvement, optimal utilization and cost of services.

The Canadian Pain Mechanisms, Diagnosis and Management Consortium [17] also recognises that traditional approaches to the management of CP have been generally unidimensional and that the multidimensional nature of CP demands a broadly based approach.

All of the reviewed CPGs recommend the use of an interdisciplinary/multidisciplinary team approach that includes physicians, psychologists, and physical/occupational therapists.

The Canadian guidelines do not seem to have been independently developed as they appear to be based on a core statement that was progressively adopted by the different Colleges of Physicians and Surgeons in each of the provinces (Alberta, British Columbia, Manitoba, New Brunswick, and Ontario). Recommendations are based on a mixture of consensual and evidence-based statements. The paucity of documentation on how the CPGs were developed does not allow for an evaluation on whether there was a biased selection of evidence, a skewed interpretation of that evidence or an idiosyncratic set of values that may have affected the processes [46].

The guidelines from the College of Physicians and Surgeons of Ontario [45] provided information on the limitations of the guidelines and the levels of evidence on which the recommendations were based. The evidence-based recommendations for the effectiveness of "multimodal" interventions for very specific pain syndromes are described in Table 3.

Table 3: Evidence-based recommendations for multimodal interventions in CP (adapted from College of Physicians and Surgeons of Ontario [45])

Condition	Conclusions	Level of Evidence
Chronic Low back Pain	Effective Recommended	Level III (well-designed trials without randomisation, single group pre-post, cohort, time series, or matched case-controlled studies).
Neck with/without limb pain	Recommended on the basis of efficacy with other CP syndromes	No systematic reviews
Generalized soft tissue pain	No information.	No systematic reviews.
Pain with psychological factors	Effective Recommended	Level V (opinions of respected authorities, based on clinical evidence, descriptive studies, or reports of expert committees).

Although the CPGs recommend MPPs for CP patients, the evidence for its support is weak. It is not clear from the guidelines when and how MPPs should be provided. Differences in patient selection, types of interventions included in the programs and the degree of treatment intensity needed to produce a certain level of improvement, are factors that are not clearly described in the CPGs.

EVIDENCE OF EFFECTIVENESS FROM SYSTEMATIC REVIEWS

From the thirteen systematic reviews identified, five [2, 47-50] met the inclusion criteria. Four out of five were Cochrane Reviews [2, 48-50] (see Appendices E and F for description and summary of results of SRs). Eight SRs were excluded [51-58] (see Appendix D for reasons of exclusion).

Four SRs [47-49, 57] focused on MPPs as the primary intervention of interest, whereas one Cochrane SR [50] considered MPPs among several other interventions.

Flor et al. [47] conducted a meta-analysis of 65 controlled and non-controlled studies published from 1960 to 1990 to determine the relative effectiveness of multidisciplinary treatments for patients with **chronic low back or heterogeneous pain**. Patients included in the studies (3,089 patients) were those with the greatest amount of psychosocial dysfunction associated with CP.

Multidisciplinary treatment was defined by Flor et al. as an interdisciplinary approach in a multidisciplinary pain clinic (private, university-based practices) provided either on an outpatient or inpatient basis. The interventions consisted mainly of a combination of psychological, medical and physical or occupational therapies. The average duration of the treatments was 7 weeks (range 1 to 31 weeks) and the average number of hours spent in treatment was 96 hours (range from 4 to 264 hours). The comparison groups were: 1) no treatment, 2) being on a waiting list, 3) medical treatment, 4) placebo treatment, 5) second treatment, and 6) other (not specified). The outcome measures included somatic, psychophysiological, behavioural (i.e. return to work, use of the health care system, medication intake, observable pain behaviours, activity levels), and verbal-subjective measures (interference, mood and others). Assessments were grouped and analysed based on the time since the completion of treatment. Group one studies were those whose patients were followed up for up to 6 months after completion of treatment (short-term outcomes) and group 2 studies had follow up periods longer than 6 months (long-term outcomes). The quality of primary studies was assessed using the Glass et al. criteria for internal validity of the study.

The review found that multidisciplinary treatments are superior to no treatment, being on a waiting list and single discipline treatments (such as medical treatment or physical therapy) in terms of pain reduction, activity level and mood improvement, health care utilization, medication intake and return to work. Treatment effects achieved with MPPs appeared to be maintained over time (up to 7 years). The review concluded that although the studies that were assessed supported the effectiveness of multidisciplinary treatments, the studies were of marginal methodological quality. The authors suggested that future research needed to focus on improving the quality in the study's design.

Based on ten randomized controlled trials (RCTs) published between 1966 and 1998 (1,964 patients), **Guzman et al.'s** review [49] assessed the effect of multidisciplinary biopsychosocial rehabilitation in patients with **chronic disabling low back pain**. To be considered a multidisciplinary biopsychosocial program, a minimum of a physical and one other dimension (psychological, social/occupational) needed to be provided. The intervention was provided either on an inpatient or outpatient basis. The content of the programs in the individual studies was variable. There were two main program

categories based on duration of treatment: daily intensive programs (more than 100 hours of therapy) and once or twice a week programs (less than 30 hours of therapy). Control subjects received non-multidisciplinary inpatient or outpatient rehabilitation, usual care, or no treatment (waiting list). The outcome measures considered were pain severity, global improvement, functional status, quality of life, and employment status (time to return to work, proportion of patients working at follow up, or return to normal activities). Short and long-term outcomes were not reported separately, as was the case with the Flor et al. review [47].

Two independent reviewers using the van Tulder criteria [59] assessed the methodological quality of the individual studies. Two clinical reviewers also judged the clinical relevance of the individual studies using a modified version of the Shekelle et al. criteria [60]. Due to the heterogeneity of the target populations, interventions and outcome measures among the individual studies, no attempt was made to combine the results. The findings were summarized by strength of evidence and the nature of the intervention and control treatments. Evidence was considered to be strong when multiple high quality RCTs produced generally consistent findings. Evidence was considered to be moderate when multiple low quality RCTs or one high quality and one or more low quality RCTs produced generally consistent findings. Evidence was considered to be limited when findings were based on one RCT, or if the findings from the RCTs were inconsistent.

The review concluded that there was strong evidence to support the use of intensive multidisciplinary programs (> 100 hours) to improve function in CP patients when compared to CP patients receiving inpatient or outpatient non-multidisciplinary treatments. There was moderate evidence to support this intensive approach in reduction of pain when compared with CP patients who received outpatient non-multidisciplinary rehabilitation or usual care. Less intensive multidisciplinary outpatient programs (< 30 hours) did not improve pain, function or vocational outcomes in patients with chronic disabling low back pain when compared with those receiving non-multidisciplinary outpatient therapy or usual care. The results for vocational outcomes were contradictory. Some trials reported improvements in work readiness, while others showed no significant reduction in sickness leaves. Few trials reported effects on quality of life measures or global assessments. The authors noted that it is unclear whether the observed improvements are due to the intensity of the interventions under study or to the use of a functional restoration approach. Due to the variation in the description of multidisciplinary approaches in the primary studies, the authors suggest that it may be inappropriate to refer patients for multidisciplinary rehabilitation without knowing the actual content of the specific programs.

Karjalainen and colleagues reviewed [48] four RCTs and three clinical controlled trials (CCTs) published from 1966 to 1998 to assess the effectiveness of multidisciplinary

biopsychosocial rehabilitation for **fibromyalgia and widespread musculoskeletal pain** (1,050 patients). To be considered as multidisciplinary, the rehabilitation program had to consist of a physician consultation plus a psychological, social or vocational intervention, or a combination of these. The intervention could be provided either in an inpatient or outpatient setting. The included studies were very heterogeneous with regards to populations, content of interventions and follow-up periods. Comparison groups consisted of those on the waiting list, provision of education, conventional treatment and aerobic exercise. Pain intensity, global status, disorder specific functional status, generic functional status or quality of life, ability to work (e.g. return to work, sickness absence), health care consumption and costs, and satisfaction with treatment were considered as appropriate outcome measures. Results were not reported separately for short or long-term outcomes or analysed separately on treatment intensity.

Two independent reviewers using the van Tulder's criteria [59] assessed the methodological quality of the individual studies. Two experts in the field of rehabilitation also assessed the clinical relevance of the individual studies by evaluating whether the patients, health care setting and interventions were sufficiently described in order to apply the results to current practice. No attempts were made to perform a meta-analysis or to combine the results due to the heterogeneity in the target populations, interventions and outcome measures among the studies. Alternatively, findings were summarized according to the strength of the evidence, and the nature of the intervention and control treatments.

This review concluded that the level of scientific evidence regarding multidisciplinary programs for fibromyalgia and widespread musculoskeletal pain is limited and that there is no quantifiable benefit for this approach in treating these conditions.

Another **Karjalainen et al. review** [2] assessed the effectiveness of multidisciplinary biopsychosocial rehabilitation for **neck and shoulder pain** (177 patients) based on one RCT and one controlled clinical trial (CCT) that were published between 1966 and 1998. The intervention under review was described as consisting of a physician consultation plus a psychological, social or vocational intervention, or a combination of these provided in either an inpatient or outpatient setting. Duration of the intervention ranged from 5 to 8 weeks. Comparison groups received traditional care or multidisciplinary rehabilitation with a clinical psychologist acting as a supervisor. The outcome measures considered were pain intensity, global status, disorder specific functional status, generic functional status or quality of life, ability to work (e.g. return to work, sickness absence), health care consumption and costs, and satisfaction with treatment.

Two independent reviewers assessed the methodological quality of the individual studies using the van Tulder criteria [59]. Two experts in the field of rehabilitation

assessed the clinical relevance of the individual studies by evaluating whether the patients, health care setting and interventions were described in sufficient detail to apply the results to current practice. No attempt to perform a meta-analysis was made due to the heterogeneity in the target populations, interventions and outcome measures among the individual studies. Alternatively, findings were summarized by the strength of the evidence and nature of the intervention and control treatments.

On the basis of two available trials, both rated as low regarding their methodological quality, the review found that multidisciplinary programs for neck and shoulder pain did not differ from traditional care in any of the assessed outcomes at 12 and 24 months follow up. The review concluded that it could not be shown that MPPs are better than usual care. The level of scientific evidence regarding MPPs for neck and shoulder patients is limited.

Finally, **Stones et al.** [50] SR was conducted to identify and review several interventions for treating **chronic pelvic pain** in women. Several treatments (lifestyle, psychological, physical, medical, surgical and other therapies) were assessed. MPP (6 months of duration) was compared to standard care. Pain, quality of life, resource utilization and adverse outcomes were the measures reported.

Two independent reviewers assessed the methodological quality of individual studies using a standard checklist developed by the Cochrane Menstrual Disorders and Subfertility Group based on the guidelines of the Cochrane Handbook.

Only one high quality RCT (106 patients) compared standard care versus a multidisciplinary approach that included physiotherapy, psychology, attention to dietary and environmental factors was included. Patients were followed over a 1 year period. A multidisciplinary approach led to a positive outcome based on a self-rating scale and daily activity (Odds Ratio: 4.15, 95% confidence interval 1.91 to 8.99) but not on pain scores. The authors concluded that there is evidence from a single RCT to support MPPs for chronic pelvic pain in women.

Methodological issues in systematic reviews on efficacy and effectiveness of MPPs

Four SRs [2, 47-49] assessed the effectiveness of MPPs for a variety of musculoskeletal problems in adult populations and one SR [50] assessed the effectiveness of a MPP, along with other interventions, for chronic pelvic pain. Explicit inclusion and exclusion criteria regarding the participants, interventions, comparison groups and outcome measures were reported in all SRs. These studies' characteristics were not comparable. Whereas Guzman et al. [49], Stones et al. [50] and the two reviews by Karjalainen et al. [2, 48] considered only RCTs and CCTs, Flor et al. [47] included controlled and non-controlled studies. Estimating treatment effects in the absence of a control group and pooling together controlled and non-controlled studies implies a high risk for bias.

The reviews focused on selected clinical outcomes, ignoring data on physical measurements and psychological scales. There was not a consistent assessment of the short-versus long-term effects and the treatment intensity of MPPs.

The search strategy was fully described in the reviews by Guzman et al. [49], Karjalainen et al. [2, 48], and Stones et al. [50] and included manual searches for relevant journals and sometimes expert consultation. This approach ensured that publication bias was minimized in these reviews, although funnel plot graphs or formal tests were not performed to assess this assumption. On the other hand, the search strategy by Flor et al. [47] was not fully described, precluding the reproducibility of the review process.

At least two independent reviewers in the Guzman et al. [49], Stones et al. [50], and Karjalainen et al. [2, 48] reviews selected the studies and extracted data using standardized forms. It was not clear in the Flor et al. [47] review whether one or more reviewers independently selected the studies, however two independent raters coded the variables of interest using standardized data collection forms.

The quality of the included studies was also independently assessed by reviewers in the Guzman et al. [49] and Karjalainen et al. [2, 48] reviews using a set of criteria (van Tulder 1997, 1999) that have been shown to be comprehensive enough to judge the methodological quality of the included trials. Stones et al. [50] used a standard checklist developed by the Cochrane Menstrual Disorders and Subfertility Group and Flor et al. [47] assessed the internal validity of the studies based on the Glass et al. 1981 criteria. It was not clear however if this quality assessment [47] was independently conducted. It is interesting to note that the Guzman et al. [49] and Karjalainen et al. [2, 48] reviews added an assessment of the clinical relevance of individual studies. This added component to the assessment helps to identify if the results may be applicable to current clinical practice.

Discrepancies between the reviewers regarding selection, data extraction and quality of the studies were resolved through consensus in the Guzman et al. [49] and Karjalainen et al. [2, 48] reviews. Stones et al. [50] resolved the disagreements through consultation with a third reviewer. No attempts to calculate formal agreement measures were made in any of these four reviews. Flor et al. [47] calculated a kappa agreement measure to inform inter-rater reliability in data extraction.

As stated above, Flor et al. [47] pooled controlled and non-controlled studies into a meta-analysis, whereas Guzman et al. [49] and Karjalainen et al. [2, 48] avoided combining heterogeneous studies to provide single estimates of treatment effects. This conservative approach may be more appropriate to avoid bias in the assessment and summarization of the results.

In summary, the Cochrane SRs [2, 48-50] included in this report are of higher methodological quality than the earlier SR [47]. The Cochrane reviews were more

standardized in their reporting of the methods and presentation of the results. This may be related to the fact that they were conducted more recently and that the methodology of SRs may have improved over time.

EVIDENCE OF EFFICIENCY FROM SYSTEMATIC REVIEWS

From the six reviews on the efficiency of MPPs, only one [61] met the inclusion criteria (see Appendices E and F for description and summary of results) and the remaining five were excluded [21, 24, 62-64] (see Appendix D for reasons of exclusion).

Thomsen and colleagues [61] evaluated the available evidence on the economic effectiveness of MPPs in the management of CP. Their analysis was based on 14 reports of nine studies (1,032 patients) published between 1966 and 1999. Restriction to RCTs was not done. Cost-analyses, cost description studies, and cost outcome descriptions were included. MPPs were defined according to the IASP guidelines and at least the services of three different medical specialists or health care providers were required to meet the definition of a MPP. CP was defined as pain lasting 6 months or more. Outcome measures were categorized into therapeutic measures, quality of life measures, and changes in resource use or benefits.

The senior author using a methodological checklist based on O´Brien et al. [65], Drummond et al. [66], and Goosens et al. [67] assessed the methodological quality of the individual studies. No attempts were made to perform a meta-analysis or to combine the results.

Out of the four RCTs included in this SR, two RCTs were full economic evaluations, studies that considered both economic and health consequences for more than one intervention (cost-effectiveness analysis and cost-utility analysis in fibromyalgia; and cost-effectiveness analysis in chronic low back pain). The intent of these two RCTs was to determine the importance of adding a cognitive component to an education/operant strategy. A generic multidimensional quality of life instrument, a modification of the McMaster Utility Measurement Questionnaire, was used.

In the RCT of MPPs for CP in patients with fibromyalgia it was found that the inclusion of the cognitive component increased health care costs but gave no additional improvement in quality of life compared with the educational component alone. In the RCT of MPPs for chronic low back pain it was determined that adding the cognitive component to an operant treatment did not result in significant cost differences nor showed an improvement in quality of life when compared to operant treatment alone. It should be noted that these two RCTs did not allow for long term evaluations as the waiting list controls were taken into active treatment after only 10 weeks.

Thomsen and colleagues observed that sensitivity analyses were performed by the authors of the two RCTs using a number of alternative calculations. The results from

the RCTs were insensitive to particular assumptions and hence their results may be considered with greater confidence. Discounting of costs, however, was not done in the RCTs. Thomsen et al. [61] noted that this was a weakness in particular when dealing with costs and consequences that have different timing. It is necessary to discount the figures and to convert future costs and benefits into comparable present values. Without discounting the benefits of MPPs, this approach to managing chronic pain may appear to be more costly.

The remaining two RCTs for the management of chronic low back pain were incomplete cost-effectiveness analysis as the unit cost of resources were not identified and thus the resource use was not costed in monetary terms. The authors of these two RCTs compared a full functional restoration program with no treatment and two shorter programs (active physical training plus back school and active physical training plus psychological pain management). Specific instruments that focused on aspects of health status relevant to patients with non malignant CP were used in the RCTs.

At four months and at one year, the full functional program was superior to no treatment or treatment in less intensive programs from the patients' point of view as well as from an economic perspective. Thomsen and colleagues noted that authors of the RCTs did not discount their figures nor conduct a sensitivity analysis to determine the robustness of their conclusions.

Three of the other five studies included in this SR used control groups and were a cost outcome description (fibromyalgia), a cost description (chronic pain), and a cost analysis (chronic back pain). Since these studies were partial analyses their results will not be presented.

Thomsen and colleagues point out that there is a lack of economic evaluations within the research of multidiscipline pain treatment. They conclude that not only is there an apparent lack of knowledge of the principles of economic evaluations; there are serious methodological problems in study designs and choice of outcome measures. Outcomes were mostly measured in terms of different aspects of pain and physical function. As CP is a complex biopsychological condition, health related quality of life measures are more valid indicators of whether a management strategy is effective or not. Overall they conclude that it was not possible to draw any conclusions on the clinical or economic effectiveness of MPPs for conditions with non malignant CP.

Methodological issues in systematic reviews on economic outcomes of MPPs

Thomsen et al. [61] used explicit inclusion and exclusion criteria regarding the participants, characteristics of the interventions, and outcome measures. The review was not limited only to the inclusion of RCTs due to the sparse number of studies found. The outcome measures were defined broadly (therapeutic measures, quality of

life measures, and changes in resource use or benefit). This breadth of the inclusion criteria suggests that it is unlikely that relevant studies were disregarded. The search strategy was fully described in such a way that the strategy could be replicated. One senior reviewer assessed the methodological quality of the individual studies using a methodological checklist based on the criteria proposed by several authors in the fields of epidemiological and economic evaluations. It is unknown however if the checklist used allows for reliable comparisons in the quality ratings when it is applied by more than one reviewer.

No attempt to conduct a meta-analysis of individual economic evaluations was made, avoiding the inappropriate combination of studies that were heterogeneous in both study design and economic analyses. Based on the results reported in the Thompsen et al. review [61] it is not possible to make generalizations regarding effectiveness of MPPs compared to other alternatives.

SUMMARY OF RESULTS FROM REVIEWS

It should be highlighted that the SR [47] based on studies published between 1966 to 1990 recommended the use of MPPs for CP patients whereas the more recent Cochrane reviews (studies published between 1966 to 1998) were cautious in supporting the effectiveness of MPPs for several CP conditions (low back pain, fibromyalgia and widespread pain, shoulder and neck pain, and chronic pelvic pain) (see Table 4 for summary of conclusions).

Table 4: Summary of conclusions for efficacy and effectiveness of MPPs

Condition	Conclusions	Level of Evidence
Chronic Low back Pain [49]	Effective	Strong. Multiple high quality RCT producing generally consistent findings.
Chronic pelvic pain [50]	Likely to be effective	Moderate. One high quality RCT.
Fibromyalgia and widespread pain [48]	Inconclusive	Limited. Low quality and non-powered RCTs. Findings among RCT were inconsistent.
Neck and shoulder pain [2]	Inconclusive	Limited. Low quality and non-powered RCTs. Findings among RCT were inconsistent.

The conclusions from the four Cochrane reviews provide the best available evidence on the effectiveness of MPPs for CP. Guzman et al. [49] reported that when compared to non multidiscipline rehabilitation or usual care there was strong evidence to support intensive MPPs (>100 hours) resulting in improved functional status, moderate evidence that intensive MPPs reduced pain, and limited evidence to support the use of less intensive MPPs (<30 hours) in patients with disabling low back pain. The Karjalainen et al. reviews [2, 48] concluded that the evidence was limited for the

effectiveness of MPPs in patients with fibromyalgia and widespread musculoskeletal pain, and shoulder and neck pain when compared to usual care. Stones et al. [50] concluded that there was some evidence (from a single high quality RCT) to support MPPs (treatment intensity 6 months) for patients with chronic pelvic pain when compared to standard care resulting in positive outcomes in self-rating scales and daily activity level but not in pain scores.

Caution should be exercised when generalizing the results as the programs are not standardized, treatment plans are usually individualized and there are no data demonstrating the necessary and sufficient components of MPPs. The various components of the MPPs for CP were not well enough described to allow for the assessment of each component. Thus, it is not known whether the observed outcomes may be attributable to a particular treatment modality or to the interactions among the multiple treatments. Also unknown is the effect of other factors such as the duration and intensity of therapy required for certain conditions, the type of health care professionals that should be involved, and the level of involvement of the patients and their families. To address the question of effectiveness for MPPs all of these variables when available should have been extracted from the studies and analysed.

The authors of the SRs usually grouped the studies either according to short and long term outcomes or treatment intensities. Evaluations of the effect of MPPs depend upon the assessment criteria used and the nature and selection of the patients who are treated. Amongst the most common outcome measures used to evaluate treatment effects were pain reduction, medication intake, health care use, increased activity including return to work, and psychological and social outcomes. The effectiveness of MPPs needs to be evaluated on each of these measures.

Differences in CP treatment options and in socio-economic settings of the various studies must also be considered as suggested by Guzman et al. [49] "The final judgement will depend on societal resources, available alternatives, and the value attached to the observed decreases in human suffering from CP".

The SR by Thomsen et al. [61] provides the only evidence on the economic effectiveness of MPPs for patients with CP. Based on the results of this SR, no conclusions can be drawn on the economic impact of MPPs. Their review of the available evidence was unable to determine whether MPP was cost effective or not. The lack of standardized methods to report results in economic evaluations has hampered the use of data on costs and financial benefits in evidence-based reviews of economic effectiveness. Data were notably sparse and studies were generally of poor methodological quality. Another limitation of the current research is that it has not compared the economic advantages or disadvantages of MPPs to other alternatives such as surgery, nerve block and spinal cord stimulators taking into account the related costs of potentially adverse events and iatrogenic problems (personal communication D. Turk).

The choice to conduct a systematic review of systematic reviews for this report means that a number of important variables of interest were left unexplored. Furthermore, another shortcoming of this approach is that studies published beyond 1998 were not included in the analyses of the findings summarized in this report.

CONCLUSIONS

Although the results from an earlier published SR support the effectiveness of MPPs, it was rated as a poor quality SR. The results from a recent good quality SR tend to support the effectiveness of intensive MPPs for chronic low back pain patients in terms of their effects on functional improvement and pain reduction. The Canadian clinical guidelines are consistent with the conclusions from this review. The results from one clinical trial support the use of MPPs in patients with chronic pelvic pain in terms of daily activity level and self-rating scales. The other SRs found limited evidence and therefore the findings were considered to be inconclusive regarding the effectiveness of MPPs in managing other conditions such as fibromyalgia and widespread musculoskeletal pain, and shoulder and neck pain.

The Calgary Chronic Pain Centre provides multidisciplinary treatment for musculoskeletal, pelvic CP as well as daily headaches. The current evidence published in good quality SRs support the effectiveness of MPPs for the management of patients with chronic low back pain and is likely to support MPPs for patients with chronic pelvic pain. It is unknown whether the conclusions drawn for some CP groups apply to others or whether treatment effects for certain conditions will be as effective for treating patients with other conditions associated with CP.

Although the descriptions of MPPs provided in the SRs were heterogeneous, it can be assumed that they have similarities with the program provided at the Calgary Chronic Pain Centre. Although some of the SRs often did not refer to the intervention as MPP, it was the content of the intervention (physician consult, physical, psychological and social/occupational dimensions) rather than the name given to the intervention that was important for inclusion in this report. Furthermore, patient involvement was not explicitly identified in the SRs.

There is still a need for research on the various aspects of the multidisciplinary approach. Regional Health Authorities providing MPPs for the management of CP not related to cancer need to set up appropriate data collection systems and conduct appropriate evaluations. Because the programs vary in the specific techniques used to manage pain, little is known about which treatment or set of treatments is responsible for the observed improvements or which kind of patients do best under a particular form of individualized treatment plan. A standardized operational definition for a MPP is essential to ensure that future program comparisons or evaluations are possible to

answer the challenging questions such as which treatment/management strategies are effective, for which patient group and at what costs.

At present, it is not possible to make any valid recommendations regarding the optimal content and duration of MPPs due to the heterogeneity of the MPPs presented in the literature that was reviewed. Based on current clinical practice and on published trials it is possible to make recommendations about content in general but what is unclear is what specific components are the most effective (personal communication M. van Tulder).

As health resources are to be used to increase or maintain health status, there is a need to assess not only the clinical effectiveness of intervention strategies but also their efficiencies. Based on the results of only one good quality SR it was concluded by the authors of that review that it was not possible to answer the question on whether MPPs are cost effective or not. They noted a lack of economic evaluations within the published research on multidisciplinary management of CP.

Economic consequences of MPPs should be assessed from an individual, family and societal perspective. Quality of life measures are important for clinical consequences and economic outcomes incorporating health status valuations are useful utility measures.

Maintaining and monitoring outcome data systems should be a top priority of any MPP. More research is needed, especially good quality RCTs with an economic evaluation component, to assist future decision-making and program planning.

APPENDICES

APPENDIX A: SEARCH STRATEGY

The following databases and information sources were searched to identify the literature and related materials for both Sections 1 and 2:

Database/Date Searched	Terms Used
PubMed <1991- January 19, 2003>	((chronic disease AND pain) OR (chronic pain)) AND (multidisciplin* OR multimodal* OR multidisciplinary OR multi-disciplinary OR multimodal OR multi-modal OR interdisciplinary OR inter-disciplinary) AND (((systematic OR systematically OR systematical) AND (review OR reviews OR reviewed OR reviewing)) OR systematic[sb] OR metanalysis OR meta-analysis OR metaanalysis OR ((critical OR critically) AND ((appraisal OR appraised OR appraise OR appraises)))
CINAHL (Ovid) <1991-December 2002> **EMBASE (Ovid)** <1991-January 2003> **MEDLINE (Ovid)** <1991-January 2003> **PsycInfo (Ovid)** <1991-January 2003> **EBM Reviews (Ovid)** **Cochrane Database of Systematic Reviews** <4th Quarter 2002> **ACP Journal Club** <1991 to September/October 2002> **Database of Abstracts of Reviews of Effectiveness** <4th Quarter 2002> **Cochrane Central Register of Controlled Trials** <4th Quarter 2002>	1 chronic pain.mp 2 multidisciplinary.mp. 3 multi-disciplinary.mp. 4 multimodal.mp. 5 multi-modal.mp. 6 interdisciplinary.mp. 7 inter-disciplinary.mp. 8 1 and (2 or 3 or 4 or 5 or 6 or 7) 9 (systematic$ and review$).mp. 10 (critical$ and apprais$).mp. 11 (metaanaylysis or metanalysis or meta -analysis).mp. 12 8 and (9 or 10 or 11)
BioethicsLine (Ovid) <1991-December 2000>	exp* **pain** AND exp* **chronic disease**
HealthSTAR (Ovid) <1991- January 2000>	exp* **pain** AND exp ***chronic disease**

Database Searched	Dates/Terms Used
CRD databases <Up to January 2003> **Database of Abstracts of Reviews of Effectiveness (DARE)** **NHS Economic Evaluations Database (NHSEED)** **Health Technology Assessment Database (HTA)**	Pain AND (multidiscipline OR interdisciplin OR multimodal)
Cochrane Database of Systematic Reviews (Update software) <2002 Issue 1>	(chronic next pain) AND (multidisciplinary OR lti-disciplinary OR interdisciplinary OR inter-disciplinary)
Websites	
<Up to January 19 2003> **CMA Practice Guidelines-CPG Infobase** **National Guideline Clearinghouse** **ECRI website** **Statistics Canada** **Health Canada** **36 INAHTA members websites**	chronic pain OR (chronic AND pain) AND multidisciplinary
NEOS library catalogue	Keyword search: Chronic AND pain AND (program? OR systematic)
Internet websites of note:	Canadian Consortium on Pain Mechanisms Diagnosis and Management www.curepain.ca Chronic Pain Association of Canada www.ecn.ab.ca/cpac The Canadian Pain Society www.canadianpainsociety.ca North American Chronic Pain Association of Canada www.chronicpaincanada.org American Chronic Pain Association www.theacpa.org American Pain Society (annual meeting abstracts at Medscape.com)

- General exclusion of literature on pain associated with cancer.
- It was decided that specific medical condition terms (such as, rheumatoid arthritis, fibromyalgia) are not used in the search because there are numerous conditions related to pain. Searching for all those terms would take an extended period of time and generate large search results with less precision, which is not desirable for the time constraints.

Manual searches of reference lists of relevant studies were done to retrieve further studies. Other studies were identified by external experts. No language restrictions were applied; however, specific databases for literature in other languages (e.g. LILACS) were not searched.

APPENDIX B: METHODOLOGY

The decision to exclude SRs published before 1991 was based on the interest of the Information Sharing Group on CP to retrieve only fairly recent SRs in this field. SRs were defined as a type of scientific study that used a replicable, systematic and transparent approach to search the literature, assessed the methodological quality and validity of primary studies, extracted, analysed and synthesized relevant data [68]. The SR could be qualitative or quantitative.

Criteria for selection of SRs on effectiveness:

Inclusion criteria:

SRs could include controlled and non controlled studies and focus on the efficacy and effectiveness of MPPs (as defined by the authors of the SRs) for CP patients (as a whole group or according to specific diagnostic categories). A quality assessment tool(s) was used to assess the methodological quality of the selected studies.

Exclusion criteria:

Narrative reviews or non-SRs and primary studies on MPPs were excluded. SRs assessing individual interventions were excluded. SRs on combined therapy that was not defined as MPP (using similar terms) were not considered.

Data extraction and quality assessment of SR:

One of the authors (MO) selected the relevant articles to be included in the report and data were extracted using standard forms. Two reviewers (MO, CH) independently assessed the methodological quality of the SRs using a checklist adapted from several sets of criteria [69-74]. This checklist was specifically developed for the purposes of this report. Briefly, the checklist includes aspects that assess appropriateness of the research question and methods, the search strategy, inclusion and exclusion criteria, the methodological quality assessment of the primary studies, the combination of the results from primary studies, and the interpretation of findings. To ensure that the checklist developed was reliable, a simple agreement measure was estimated (86%) based on the independent ratings from both researchers. Discrepancies in quality appraisal were then solved by discussions (see Appendix C for a summary of the critical appraisal of SRs). No attempts to contact the authors for clarification were made.

Criteria for selection of SRs on efficiency:

Inclusion criteria:

SRs as defined could include controlled and non controlled studies. They should focus on economic evaluations of MPPs (cost-benefit, cost-effective and cost-utility analyses) for CP patients (as a whole group or according to specific diagnostic categories) and use

of an appropriate quality assessment tool(s) to assess the methodological quality of the selected studies.

Exclusion criteria:

The same as defined for SRs on effectiveness. SRs on financial compensation and disability claims were excluded.

Data extraction and quality assessment of SR:

One of the authors (MO) selected relevant articles to be included in the report and data were extracted using standard forms. Considering that the methodology of summarizing the findings of economic evaluations is not as well established as that applied to systematic reviews on clinical effectiveness, a formal critical appraisal of the SRs on economic studies was not conducted. Nonetheless, criteria suggested by Jefferson et al. [75] were applied by one of the reviewers (MO). Briefly, this set of criteria refers to the comprehensiveness of the search strategy, if the inclusion criteria used to select individual studies were appropriate, if the assessment of the studies was reproducible, if the design/or methods and/or topic of included studies were broadly comparable, if the overall results are reproducible and if the results would help to guide resource allocation.

Results and data report:

A qualitative analysis of the results is presented in the text of this report. Appendices E and F summarize the characteristics and main findings reported in each of the SRs.

APPENDIX C: CRITICAL APPRAISAL OF SYSTEMATIC REVIEWS ON THE EFFICACY AND EFFECTIVENESS OF MPPS FOR CP (adapted from [69-74])

STUDIES / CRITERIA		Guzman et al. 2002 [49]	Karjalainen et al. 2002 [2]	Karjalainen et al. 2002 [48]	Stones et al. 2002 [50]	Flor et al. 1992 [47]
Study question formulated		●	●	●	●	●
Explicit inclusion/exclusion criteria	Participants	●	●	●	●	●
	Interventions	●	●	●	●	●
	Comparators	●	●	●	●	◐
	Outcome measures	●	●		●	●
	Study design (RCT and/or CCT only)	●	●	●	●	◐
Search strategy	Electronic databases described	●	●	●	●	●
	Other sources described	●	●	●	●	●
Data extraction	Standard data extraction method	●	●	●	●	○
	Independent extraction by at least two reviewers	●	●	●	●	●
	Measure of inter-rater agreement	○	○	○	○	●
Quality assessment	Criteria used to assess the validity of included studies	●	●	●	●	●
	Inter-observer agreement for quality assessment reported	○	○	○	○	○

APPENDIX C: CRITICAL APPRAISAL OF SYSTEMATIC REVIEWS ON THE EFFICACY AND EFFECTIVENESS OF MPPS FOR CP (adapted from [69-74]) (cont'd)

STUDIES / CRITERIA		Guzman et al. 2002 [49]	Karjalainen et al. 2002 [2]	Karjalainen et al. 2002 [48]	Stones et al. 2002 [50]	Flor et al. 1992 [47]
Data synthesis	Qualitative review	●	●	●	N/A	N/A
	Meta-analysis	N/A	N/A	N/A	●	●
	Overall pooling	N/A	N/A	N/A	●	●
	Precision of the results reported	N/A	N/A	N/A	●	●
	Tests of homogeneity	N/A	N/A	N/A	●	○
	Test for publication bias	○	○	○	○	●
Conclusions	Conclusions supported by results	●	●	●	●	●
	Methodological limitations discussed	●	●	●	●	●
	Conflict reported (if any)	●	●	●	●	○
	Source of funding stated	●	●	●	●	○

Reported: ●

Partially reported: ◐

Not reported: ○

Not applicable: N/A

APPENDIX D: EXCLUDED SYSTEMATIC REVIEWS

Table 5: Excluded systematic reviews on efficacy and effectiveness of MPPs for CP

Authors	Title	Comments (reasons for exclusion)
Aker PD, Gross AR, Goldsmith CH, Peloso P (1996) [56]	Conservative management of mechanical neck pain: systematic overview and meta-analysis. *BMJ* 1996;313:1291-1296 (23 November)	Did not assess explicitly multidisciplinary programs. Individual interventions were assessed.
Cutler RB, Fishbain DA, Rosomoff HL, Abdel-Moty E, Khalil TM, Rosomoff RS (1994) [57]	Does nonsurgical pain center treatment of chronic pain return patients to work? A review and meta-analysis of the literature *Spine* 19(6): 643-652.	The study did not fully meet the definition of a SR. An evaluation of the methodological quality or validity of individual studies was not conducted.
Guzman J, Esmail R, Karjalainen K, Malmivaara A, Irvin E, Bombardier C (2001) [51]	Multidisciplinary rehabilitation for chronic low back pain: systematic review. *BMJ* 2001; 322(7301): 1511-6.	Duplicate publication.
Morley S, Eccleston C, Williams A (1999) [53]	Systematic review and meta-analysis of randomized controlled trials of cognitive behaviour therapy and behaviour therapy for chronic pain in adults, excluding headache. *Pain* 1999; 80 1-13.	Focused on cognitive behaviour therapy and behaviour therapy.
Oliver K, Cronan TA, Walen HR (2001) [52]	A review of multidisciplinary interventions for fibromyalgia patients: where do we go from here? *J Musculoskeletal Pain* 2001; 9(4): 63-80	The study did not fully meet the definition of a SR. An evaluation of the methodological quality or validity of individual studies was not conducted.
Rossy LA, Buckelew S, Dorr N, Hagglund KJ, Thayer JF, McIntosh MJ, Hewett JE, Johnson JC (1999) [54]	A meta-analysis of fibromyalgia treatment interventions. *Ann Behav Med* 1999; 21: 180-191.	Focused on "nonpharmacological treatments" that combined "physically-based and psychologically-based treatments" with no further definition. Combined interventions are not equivalent to the multidisciplinary definition provided in this report.
Sim J, Adams N (2002) [58]	Systematic review of randomized controlled trials of nonpharmacological interventions for fibromyalgia. *Clin J Pain* 2002;18(5):324-36.	Multidisciplinary treatments were not considered but combinations of therapies (such as integrated group therapy, education plus physical therapy and relaxation) that do not fit the definition of multidisciplinary treatments considered in the report

Table 5: Excluded systematic reviews on efficacy and effectiveness of MPPs for CP (cont'd)

Authors	Title	Comments (reasons for exclusion)
van Tulder MW, Koes BW, Bouter LM (1997) [55]	Conservative treatment of acute and chronic non-specific low back pain. A systematic review of randomized controlled trials of the most common interventions. *Spine* 1997; 22 (18) 2128-2156.	Individual interventions were assessed.

Table 6: Excluded systematic reviews on economic evaluation of MPPs for CP

Authors	Title	Comments (reasons for exclusion)
Okifuji A, Turk DC, Kalauokalani D (1999) [21]	*Clinical outcome and economic evaluation of multidisciplinary pain centers.* Handbook of pain syndromes: Biopsychosocial perspectives.1999. Block, Andrew R.; Kremer, Edwin F; et al. (eds). Lawrence Erlbaum Associates, Inc., Publishers, Mahwah, NJ.	Narrative review
Rohling ML, Binder LM. (1995) [63]	Money matters: a meta-analytic review of the association between financial compensation and the experience and treatment of chronic pain. *Health Psychology* 1995; 14(6): 537-547.	The review was focused on disability compensation.
Turk DC, Okifuji A. (1998) [24]	Efficacy of multidisciplinary pain centres: an antidote to anecdotes. *Bailliere's Clin Anaesth* 1998; 12:103-119.	Narrative review
Turk DC, Okifuji A (1998) [62]	Treatment of chronic pain patients: clinical outcomes, cost-effectiveness, and cost-benefits of multidisciplinary pain centers. *Critical Review in Physical & Rehabilitation Medicine* 1998; 10(2):181-208	Narrative review
Turk DC (2002) [64]	Clinical effectiveness and cost-effectiveness of treatments for patients with chronic pain. *Clin J Pain* 2002;18(6):355-365.	Narrative review

APPENDIX E: SUMMARY OF SYSTEMATIC REVIEWS

Table 7: Summary of systematic reviews on efficacy and effectiveness of MPPs for CP

Review	Type of analysis	Condition under study	Characteristics of the intervention	Follow-up periods considered
Flor et al. [47]	Meta-analysis 65 controlled and non controlled trials	Chronic low back pain or heterogeneous pain (3089 patients)	7 weeks of duration (range 1 to 31 weeks) 96 hours of treatment (range 4 to 264 hours)	Up to 6 months (short-term) Longer than 6 months (long-term)
Guzman et al. [49] (Cochrane review)	Qualitative review 10 RCTs	Chronic disabling low back pain (1964 patients)	More than 100 hours of therapy Less than 30 hours of therapy	Information not available from the article
Karjalainen et al. [48] (Cochrane review)	Qualitative review 4 RCTs, 3CCTs	Fibromyalgia and widespread musculoskeletal pain (1050 patients)	Information not available from the article	Information not available from the article
Karjalainen et al. [2] (Cochrane review)	Qualitative review 1 RCT, 1 CCT	Neck and shoulder pain (177 patients)	5 to 8 weeks of treatment	Up to 12 months More than 24 months
Stones et al. [50] (Cochrane review)	Meta-analysis 1 RCT	Chronic pelvic pain (106 patients)	6 months of treatment	1 year

Table 8: Summary of systematic reviews on economic evaluations of MPPs for CP

Review	Type of analysis	Condition under study	Characteristics of the intervention	Follow-up periods considered
Thomsen et al. [61]	Qualitative review	Chronic pain (1032 patients)	2 to 10 weeks of duration	6 months to up to 5 years

APPENDIX F: CHARACTERISTICS OF INCLUDED SYSTEMATIC REVIEWS

Table 9: Characteristics of included systematic reviews on efficacy and effectiveness of MPPs for CP

Study	Characteristics of the study
Flor et al. 1992 [47]	**Question / objectives:** • To determine the relative effectiveness of multidisciplinary treatment for patients with chronic low back or heterogeneous pain.
	Inclusion / Exclusion criteria: Type of studies: • Controlled and non-controlled studies • Predictive studies with a single post-treatment assessment, or single case presentations were excluded. • Language restrictions not reported. Type of participants and condition under study: • Patients with chronic low back or heterogeneous pain. No other restrictions were applied in advance. Type and definition of intervention and comparison groups: • Interdisciplinary approach in a multidisciplinary pain clinic. No further description in advance. • Comparison groups considered: no treatment, waiting list, medical treatment, placebo treatment, second treatment, other (no specified). • Studies were excluded if single or combined interventions other than multidisciplinary interventions were assessed. Type of outcome measures considered: • Somatic. • Behavioural (return to work, use of health care system, medication intake, observable pain behaviour, activity levels). • Pain. • Verbal-subjective (interference, mood, other). • Short-term and long-term effects. • Psychophysiological.
	Search strategy: Electronic databases: • Studies published from 1960 to 1990. • MEDLARS (years not reported). • PsychInfo (years not reported). • Search terms not reported. Other searches: • Hand searching of relevant journals • Trace of publications in reference list of relevant articles

Table 9: Characteristics of included systematic reviews on efficacy and effectiveness of MPPs for CP (cont'd)

Study	Characteristics of the study
Flor et al. 1992 [47] (cont'd)	**Methods of the review:** Selection of studies and data extraction: • Two independent raters coded the variables of interest. • Use of standardized data collection forms unclear. • Inter-rater reliability was computed for a random sample (kappa: 0.88%). • Disagreements in data extraction were resolved by discussion. Criteria to assess the validity of primary studies: • Use of four criteria to assess the internal validity of the study (based on Glass et al. 1981). • It is not clear if quality assessment was made by one or more independent reviewers. Analysis of data: • Meta-analysis of 65 studies (3089 patients). • Statistical measures: overall within- and between group effect sizes. • Heterogeneity between study results was not formally assessed.
	Results and additional comments: • Multidisciplinary treatments for chronic low back pain are superior to no treatment, waiting list and single discipline treatments in terms of pain reduction, activity level, mood improvement, reduction on health care utilization, and increased return to work. Effects appear to be stable over time (follow-up intervals averaging 95 weeks post-treatment). • Methodological quality of studies included in the meta-analysis was poor. Therefore, results must be interpreted cautiously. • Meta-analysis combined controlled and non-controlled studies.
Guzman et al. 2002 [49] Cochrane Review	**Question / objectives:** • To assess the effect of multidisciplinary biopsychosocial rehabilitation (MBPSR) on clinically relevant outcomes in subjects with chronic disabling low back pain.
	Inclusion / Exclusion criteria: Type of studies: • RCT. • No language restrictions. Type of participants and condition under study: • Adults (over 18 years) • Severe low disability secondary to low back pain for more than 3 months. • Studies on specific low back pain (due to infection, cancer, vertebral fracture or ankylosing spondylitis) were excluded.

Table 9: Characteristics of included systematic reviews on efficacy and effectiveness of MPPs for CP (cont'd)

Study	Characteristics of the study
Guzman et al. 2002 [49] (cont'd)	Type and definition of intervention and comparison groups: • MBPSR compared to a non-multidisciplinary control intervention. • To be considered MBPSR a minimum of a physical and one of the other dimensions (psychological or social/occupational) had to be present. • Back school intervention was excluded, unless it was part of a comprehensive program that fulfilled the MBPSR criteria. Type of outcome measures considered: • Pain severity • Functional status • Employment status • Global improvement • Quality of life
	Search strategy: Electronic databases: • Medline (1966 to June 1998) • CINAHL (1982 to June 1998) • The Cochrane Library (Issue 2, 1998) • EMBASE (1980 to June 1998) • Health STAR (1975 to June 1998) • Search terms reported. Other searches: • Citation tracking. • Consultation with experts. • Hand searching of journals.
	Methods of the review: Selection of studies and data extraction: • Two reviewers independently selected the trials. • Data extracted by two reviewers using a standard pre-tested data extraction form. • Discrepancies between reviewers were solved by consensus. Criteria to assess the validity of primary studies: • Quality assessment by two independent reviewers. Discrepancies resolved by consensus or by a third reviewer. • A scheme recommended by the Back Review Group of the Cochrane Collaboration (Van Tulder criteria [59]) was used to assess the methodological quality of the studies. • Two clinical reviewers assessed the clinical relevance using the Shekelle et al. criteria [60]. Analysis of data • Qualitative analysis. • Results reported according to strength of evidence (strong, moderate, limited).

Table 9: Characteristics of included systematic reviews on efficacy and effectiveness of MPPs for CP (cont'd)

Study	Characteristics of the study
Guzman et al. 2002 [49] (cont'd)	**Results and conclusions:** • Ten RCT (12 randomised comparisons) were included (1964 patients). • There is strong evidence that intensive MBPSR (more than 100 hours of therapy) with a functional restoration approach improves function when compared with inpatient or outpatient non-multidisciplinary treatments. • There is moderate evidence that intensive MBPSR with a functional restoration approach reduces pain when compared with outpatient non-multidisciplinary rehabilitation or usual care. • For less intensive outpatient MBPSR (once or twice a week programs with less than 30 hours of therapy) beneficial effects on pain, function or vocational outcomes could not be demonstrated when compared with non-multidisciplinary outpatient therapy or usual care. • Results on quality of life and vocational outcomes are ambiguous. • It is unclear whether the shown improvements are due to the intensity of the tested interventions or to their functional restoration approach. • Given the variability across multidisciplinary treatments, it may be inappropriate to refer patients for multidisciplinary rehabilitation without knowing the actual content of the MBPSR program.
Karjalainen et al. 2002 [48] Cochrane Review	**Question / objectives:** • To determine the effectiveness of multidisciplinary rehabilitation for fibromyalgia and widespread musculoskeletal pain in working age adults.
	Inclusion / Exclusion criteria: <u>Type of studies:</u> • Randomised controlled trials (RCT) and clinical controlled trials (CCT). • Studies published in languages other than English were included. <u>Type of participants and condition under study:</u> • "Working age adults" (18 to 65 years). • Fibromyalgia and widespread musculoskeletal pain. • Acute trauma, osteoporosis, postoperative pain, neoplasms, inflammatory or neurologic disease were excluded. <u>Type and definition of intervention and comparison groups:</u> • Inpatient or outpatient multidisciplinary rehabilitation program compared to several interventions (waiting list controls, education, aerobic exercise and conventional treatment). • Definition of the intervention: Physician's consultation plus a psychological, social or vocational intervention, or a combination of these. • Predominantly medical rehabilitation (i.e. medical treatment and physiotherapy) was excluded.

Table 9: Characteristics of included systematic reviews on efficacy and effectiveness of MPPs for CP (cont'd)

Study	Characteristics of the study
Karjalainen et al. 2002 [48] (cont'd)	Type of outcome measures considered: • Pain intensity. • Global status. • Disorder specific functional status. • Generic functional status or quality of life. • Ability to work. • Health care consumption and costs. • Satisfaction with treatment.
	Search strategy: Electronic databases: • Medline (1966 to 1998). • PsycLIT (1967 to 1998). • EMBASE (1988 to April 1998). • Cochrane Controlled Trials Register (CCTR). • Cochrane Musculoskeletal Group trials register • Medic database (from Finland, 1978 to 1998). • Science Citation Index search. • Search terms reported. Other searches: • Experts in rehabilitation area were contacted.
	Methods of the review: Selection of studies and data extraction: • Four reviewers independently selected the trials. • Data independently extracted by two reviewers using a standardized form. • Disagreements in selection and data extraction were discussed in consensus meetings. Criteria to assess the validity of primary studies: • Quality assessment by two independent reviewers. Disagreements resolved by consensus method. • Criteria list of Van Tulder [59] to assess methodological quality of studies. • Two experts in the field of rehabilitation assessed the clinical relevance of included studies. Analysis of data: • Qualitative analysis. • Results reported according to strength of evidence (strong, moderate, limited).

Table 9: Characteristics of included systematic reviews on efficacy and effectiveness of MPPs for CP (cont'd)

Study	Characteristics of the study
Karjalainen et al. 2002 [48] (cont'd)	**Results and conclusions:** • Included seven studies (1050 patients). Four RCT on fibromyalgia; three RCT on widespread musculoskeletal pain. Wide variation in the precision by which patients, setting, interventions and follow-up were described. • Poor overall methodological quality of the studies. • Limited evidence available suggests that there is no quantifiable benefit of multidisciplinary rehabilitation for fibromyalgia. Behavioural treatment and stress management may be important components of these programs, as well as education combined with physical training in long-term follow up. • Based on low quality and inconsistent evidence on widespread musculoskeletal pain, multidisciplinary rehabilitation was graded as ineffective. • The level of research-based scientific evidence regarding effectiveness of multidisciplinary rehabilitation for fibromyalgia and widespread musculoskeletal pain is limited. • Evidence for clinical recommendations was insufficient.
Karjalainen et al. 2002 [2] Cochrane Review	**Question / objectives:** • To determine the effectiveness of MBPSR for neck and shoulder pain among working age adults.
	Inclusion / Exclusion criteria: <u>Type of studies:</u> • Randomised controlled trials (RCT) and clinical controlled trials (CCT). • Studies published in languages other than English were included. <u>Type of participants and condition under study:</u> • "Working age adults" (18 to 65 years). • Neck and shoulder pain. • Acute trauma, neoplasms, inflammatory or neurologic disease and postoperative pain and osteoporosis were excluded. <u>Type and definition of intervention and comparison groups:</u> • Inpatient or outpatient multidisciplinary rehabilitation program compared to traditional care, and against a group receiving multidisciplinary rehabilitation but with a clinical psychologist as supervisor. • Intervention had to include physician's consultation plus a psychological, social or vocational intervention, or a combination of these. • Predominantly medical rehabilitation (i.e. medical treatment and physiotherapy) was excluded. <u>Type of outcome measures considered:</u>

	• Pain intensity. • Global status. • Disorder specific functional status. • Generic functional status or quality of life.	• Ability to work. • Health care consumption and costs. • Satisfaction with treatment.

Table 9: Characteristics of included systematic reviews on efficacy and effectiveness of MPPs for CP (cont'd)

Study	Characteristics of the study
Karjalainen et al. 2002 [2] (cont'd)	**Search strategy:** Electronic databases: • Medline (1966 to 1998). • PsycLIT (1967 to 1998). • EMBASE (1988 to April 1998). • Cochrane Library. • Medic database (from Finland, 1978 to 1998) • Science Citation Index searches. • Search terms reported. Other searches: • Reference checking. • Experts' consultation in the rehabilitation field.
	Methods of the review: Selection of studies and data extraction: • Four reviewers independently selected the trials. • Data extracted by two blinded reviewers using a standard pre-tested data extraction form. • Discrepancies between reviewers were solved in consensus meetings. Criteria to assess the validity of primary studies: • Quality assessment by two independent reviewers. Discrepancies resolved by consensus. • Criteria list of Van Tulder [59] to assess methodological quality of studies. • Two experts in the field of rehabilitation assessed the clinical relevance of included studies. Analysis of data: • Qualitative analysis. • Results reported according to strength of evidence (strong, moderate, limited)
	Results and conclusions: • Included two studies (177 patients). • Poor overall methodological quality of the studies. • The level of research-based scientific evidence regarding effectiveness of multidisciplinary rehabilitation for neck and shoulder pain was graded as limited. • There is insufficient evidence for clinical recommendations to be made about the magnitude and duration of the effectiveness of multidisciplinary rehabilitation compared to control interventions.

Table 9: Characteristics of included systematic reviews on efficacy and effectiveness of MPPs for CP (cont'd)

Study	Characteristics of the study
Stones et al. 2002 [50] Cochrane Review	**Question / objectives:** • To identify and review treatments for chronic pelvic pain in women in the reproductive age group.
	Inclusion / Exclusion criteria: <u>Type of studies:</u> • RCT. • No language restrictions. <u>Type of participants and condition under study:</u> • Women in the reproductive age group (not further defined). • Chronic pelvic pain (patients diagnosed with pelvic congestion syndrome or adhesions). • CP caused by endometriosis, primary dysmenorrhoea, pain due to active chronic pelvic inflammatory disease, or irritable bowel syndrome was excluded. <u>Type and definition of intervention and comparison groups:</u> • Interventions of interest may be lifestyle, psychological, medical, surgical and other treatments. • Multidisciplinary treatment was compared against referral to standard clinic (no further description). <u>Type of outcome measures considered:</u> • Pain scores in rating scales. • Quality of life. • Resource utilization by patients, family, practitioners and hospitals. • Other measures: mood, sexual function, time off work. • Adverse outcomes.
	Search strategy: <u>Electronic databases:</u> • Medline (1966 to 1998). • Embase (1987 to present) • Cochrane Library (Database CENTRAL/CCTR) • Search terms reported. <u>Other searches:</u> • Hand searches in relevant journals, conference proceedings.

Table 9: Characteristics of included systematic reviews on efficacy and effectiveness of MPPs for CP (cont'd)

Study	Characteristics of the study
Stones et al. 2002 [50] (cont'd)	**Methods of the review:** Selection of studies and data extraction: • Two reviewers independently selected the trials. • A third reviewer acted as arbiter to solve disagreements in study selection. • Data independently extracted by two reviewers using forms designed according to Cochrane guidelines. Criteria to assess the validity of primary studies: • Quality assessment by two independent reviewers. Discrepancies resolved by consultation with a third reviewer. • Standard checklist developed by the Cochrane Menstrual Disorders and Subfertility Group to assess methodological quality of studies. Analysis of data: • Meta-analysis (Odds ratio under a fixed model effect). • Test for heterogeneity (Chi-square test).
	Results and conclusions: • A single high quality RCT of multidisciplinary approach (physiotherapy, psychology, and attention to dietary and environmental factors) versus a conventional approach for women with chronic pelvic pain was identified (N = 106). • The use of a multidisciplinary approach led to a positive outcome in a self-rating scale and daily activity but not in pain scores. • Currently available information about treatment of women with chronic pelvic pain provides some support for the use of a multidisciplinary approach to assessment and treatment. Nonetheless, conclusions are based on a single RCT.
Thomsen et al. 2001 [61]	**Question / objectives:** • To evaluate available evidence on the economic effectiveness of multidisciplinary pain treatment in CP patients.
	Inclusion / Exclusion criteria: Type of studies: • Reports concerning economic evaluations of MPP for non-cancer CP. Restrictions to RCT were not made. Cost analyses, cost description studies, cost outcome descriptions were included. • No language restrictions. Type of participants and condition under study: • CP should be defined as pain lasting for 6 months or more. • Studies on acute and sub acute pain as well as trials on cancer patients were excluded.

Table 9: Characteristics of included systematic reviews on efficacy and effectiveness of MPPs for CP (cont'd)

Study	Characteristics of the study
Thomsen et al. 2001 [61] (cont'd)	Type and definition of intervention and comparison groups: • MPPs were defined according to the IASP guidelines: MPP requires at least three different medical specialists or health care providers. Type of outcome measures considered: • Therapeutic measures. • Quality of life measures. • Changes in resource use or benefits.
	Search strategy: Electronic databases: • Medline (1966 to 1999). • EMBASE (1988 to 1999). • Search terms reported. Other searches: • Reference list of reports identified.
	Methods of the review: Selection of studies and data extraction: • It was not clear if one or more reviewers selected the studies. • Use of a standardised form: not reported. Criteria to assess the validity of primary studies: • Quality assessment by the senior author. • A methodological checklist based on O'Brien et al. [65], Drummond et al. [66 76] and Goossens et al. [67] was used to categorize and select reports. Analysis of data • Qualitative analysis.
	Results and conclusions: • Fourteen reports of nine studies evaluating the economic consequences of MPP in CP patients were identified (1032 patients). • Four studies were RCT. Two RCT were full economic evaluations (cost-effectiveness analysis and cost-utility analysis in fibromyalgia and cost-effectiveness analysis in chronic low back pain). Two RCT were intended to be cost-effectiveness analyses (in chronic low back pain). • Five studies were a mix of non-controlled and controlled studies: one cost-analysis (in chronic back pain), two cost-outcome descriptions (in CP and fibromyalgia, respectively), one cost description (in chronic low back pain) and one study on the quality of resources (in CP, not otherwise defined). • Poor overall methodological quality of the studies in terms of cost measurements. • Standard methods of costing and outcome measurement were not appropriately used. • Due to methodological problem in study designs and outcome measures used in individual studies, it was not possible to draw conclusions on clinical or economical effectiveness.

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Prevalence of Chronic Pain: An Overview

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Prevalence of chronic pain: an overview

Executive Summary

Background

Pain is a subjective experience that interferes with emotional, social, and physical functioning. It is a multidimensional construct where the relationship between disease (as a biological phenomenon) and illness (as a subjective experience of discomfort and dysfunction) is hard to disentangle.

Chronic pain (CP) has a devastating effect on the lives of sufferers and families, and creates a large amount of distress and disability. Many patients undergo a progressive physical deterioration caused by concomitant sleep and appetite disturbances, decreased physical activity, and excessive use of medication. Apart from anxiety, many patients develop reactive depression, hypochondriasis, somatic preoccupations, and a tendency to deny life problems unrelated to their physical condition. The social effects of CP are equally devastating. Many patients become estranged from their families and friends; decrease their social interactions; and are unable to work. Consequently, CP sufferers are five times more likely than non-sufferers to utilize healthcare services.

Understanding the factors contributing to the variation in prevalence estimates of CP may provide a more complete understanding of the scope and distribution of the public health problem related to CP.

Objectives

The aim of this report was to analyze and critically appraise the published evidence on the prevalence of CP (not related to cancer) in the general population and primary care setting. A secondary objective was to summarize information on the characteristics of pain (i.e., level of severity and functional limitations) and the use of health services in the population of CP sufferers.

Methods

A quasi qualitative/quantitative systematic review of research studies was undertaken. Data on a set of pre-determined variables were extracted from each study. Studies were divided according to the criteria that were used to define CP (International Association for the Study of Pain (IASP), American College of Rheumatology (ACR), etc.). Important variables such as the methodological scores assigned to the studies, which might explain the differences in the prevalence

estimates, were considered in the analyses. Weighted mean estimates (based on sample size of the studies) adjusted by these variables were reported for each subgroup of studies.

Results

Two systematic reviews of the prevalence of pain disorders were identified but they did not adequately address the study objectives. A total of 13 studies were analyzed. Most of the studies reported prevalence estimates for adolescent and adults populations (range 15 to 86 years). Two studies provided prevalence data for elderly populations (over 65 years) exclusively, while one study addressed the prevalence of CP in children aged 0 to 18 years. In general, the quality of the studies was acceptable. The CP prevalence estimates reported varied widely from 10.1% to 55.2%.

The studies were very heterogeneous regarding the definition of CP. Even when similar criteria were used to define CP, phrasing and ordering of the questions used to assess pain parameters were quite different. The main methodological problems of the studies were related to: failure to provide validity and reliability information on the data collection instruments, a lack of confidence intervals for the prevalence values, and low response rates.

Calculation of severe CP prevalence was possible in five studies that utilized both the IASP definition and proxy definitions of severity (intensity, level of functional limitations and disability). Severe CP prevalence figures showed little variation, ranging from 8% in children to 11% in adults. These estimates were similar to those reported in three studies using the ACR criteria (11.8%, range 10% to 13%).

Conclusions

Given that associated costs for severe CP must be considerable for the health system, the individual and society, the appropriate and effective management of CP is essential. Wide variations in the estimated prevalence rates precluded a generalization of the review findings to a regional context. Therefore, the most important recommendation, with respect to future research, is to conduct prospective epidemiological studies to estimate the CP prevalence in Alberta (using a clear case definition, and well validated and reliable data collection tools).

Reference:

Ospina M, Harstall C. Prevalence of chronic pain: an overview. Alberta Heritage Foundation for Medical Research HTA, editor. Edmonton, Alberta, Canada: 2002. Report: HTA 29.

The full text is available at http://www.ahfmr.ab.ca/programs.html

Alberta Heritage Foundation
for Medical Research

Prevalence of chronic pain: an overview

Maria Ospina, Christa Harstall

December 2002

HTA 29 Health Technology Assessment

This Health Technology Report has been prepared on the basis of available information of which the Foundation is aware from public literature and expert opinion and attempts to be current to the date of publication. It has been externally reviewed. Additional information and comments relative to the report are welcome and should be sent to:

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Tel: 780-423-5727, Fax: 780-429-3509

Print: ISBN 1-896956-62-9
On-line: ISBN 1-896956-64-5

Print: ISSN 1704-1090
On-line: ISSN 1704-1104

Alberta's health technology assessment program has been established under the Health Research Collaboration Agreement between the Alberta Heritage Foundation for Medical Research and the Alberta Health Ministry.

ACKNOWLEDGMENTS

The Alberta Heritage Foundation for Medical Research is most grateful to the following persons for provision of information and comments on the draft report. The views expressed in the final report are those of the Foundation.

- Dr. Elena Catala, Hospital Universitario de la Santa Creu i Sant Pau; Barcelona, Spain.
- Dr. Alejandro Jadad, Centre for Global eHealth Innovation, University Health Network, University of Toronto; Toronto, Ontario.
- Dr. Thomas J Murray, Department of Medicine, Dalhousie University; Halifax, Nova Scotia.
- Dr. Ralph Nickel, Klinik fuer Psychosomatische Medizin und Psychotherapie; Mainz, Germany.
- Ms. Jacqueline Roberts, Faculty of Health Sciences. School of Nursing, McMaster University; Hamilton, Ontario.
- Mr. Barry Ulmer, Executive Director, The Chronic Pain Association of Canada; Edmonton, Alberta.
- Dr. Peter Verhaak, Netherlands Institute of Primary Health Care; Utrecht, The Netherlands.

In preparing this report, the Foundation was assisted by an information sharing group on chronic pain that provided advice and comments on the report. Participants in this group were:

- Mr. Henry Borowski, Strategy Development, Alberta Health and Wellness; Edmonton, Alberta.
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Bibliographic and administrative support

- Ms. Leigh-Ann Topfer, Canadian Coordinating Office for Health Technology Assessment; Edmonton, Alberta.

SUMMARY

- Chronic pain (CP) is an unpleasant sensory and emotional experience associated with actual or potential tissue damage that persists beyond the expected time frame for healing or that occurs in disease processes in which healing may never occur [1]. Standardized definitions and criteria to define "chronic" or "severe" pain are not available and diverse pain qualifiers have been proposed.
- Two systematic reviews about the prevalence of CP were identified but they did not provide a definite and reliable answer to the research question.
- Thirteen primary studies were systematically reviewed. CP prevalence estimates varied widely in studies that used the International Association for the Study of Pain definition of CP (weighted mean: 35.5%, range: 10.5% to 55.2%). In studies that used the criteria of the American College of Rheumatology (ACR) to determine the prevalence of chronic widespread pain, variation was narrower (weighted mean: 11.8%, range: 10.1% to 13%). Lack of consensus about basic definitions and inconsistencies in measurement among the published studies on CP prevalence may explain these variations. It was not possible to quantitatively compare the findings.
- Based on proxy definitions of severity (intensity, level of functional limitations, and disability) provided by several studies, calculation of the prevalence of severe CP was done. Figures showed little variation in the study populations, ranging from 8% (in children) to approximately 11% (in adults). These estimates are similar to those reported in studies (10% - 13%) using the ACR criteria to define chronic pain.
- Prospective epidemiological studies are needed to estimate the CP prevalence in Alberta (using a very clear case-definition and well-validated and reliable data collection tools). Some important questions should be addressed in these studies: numbers and characteristics of people with CP in Alberta (as well as site of pain, level of intensity, frequency, and quality of life) and the proportion of people in each category of pain based on level of severity).
- Estimation of the size and characteristics of the population affected by CP provides a basis for designing and providing therapeutic efforts toward those most likely to need and benefit from them.

CONTENTS

Tables:

SCOPE OF THE REPORT

This is the first report of a series of documents being prepared by the Health Technology Assessment (HTA) Unit of the Alberta Heritage Foundation for Medical Research in response to requests from Calgary Health Region and Alberta Health and Wellness (AHW) for updated evidence on the efficacy and effectiveness of multidisciplinary pain programs for chronic pain not related to cancer. In order to establish provincial needs for a multidisciplinary pain program, it was necessary first to provide policy makers with evidence based estimates of the prevalence of chronic pain (CP). Therefore, it was decided to use a convergence approach where research on CP prevalence was analyzed and AHW administrative data were used to estimate local prevalence in Alberta (*Chronic Pain in Alberta: A portrait from the 1996 National Population Health Survey and the 2001 Canadian Community Health Survey*, Health Surveillance - AHW; in press).

The aim of this report was to present and critically appraise the published evidence on the prevalence of chronic non-malignant pain in the general population and the primary care setting. A secondary objective was to summarize all the available information in the primary studies about characteristics of pain (i.e., level of severity and functional limitations) and the use of health services in the population of CP sufferers.

The research question about the prevalence of CP in the general population and primary care setting originated from discussions about how many people would potentially benefit from therapies for CP. This information will be useful for program planning purposes. Issues related to the efficacy, effectiveness and economic evaluation of multidisciplinary pain programs for CP will be the subject of another HTA report.

Prevalence data are not only important in clinical practice but are also a prerequisite for the efficient planning of health services, for assessing health care priorities, and for monitoring trends of disease prevalence. It is expected that the findings provided by this report will be valuable for the organization and prioritization of health services at the provincial level. This report consists of two main sections. The first section summarizes and analyses previous systematic reviews on the prevalence of CP while the second section presents the findings from the systematic review conducted on a selection of published primary studies on the prevalence of CP in the general population and the primary care setting. The search strategy and methodological approaches used for this report are outlined in Appendices A to C, inclusively.

BACKGROUND

Pain is defined as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage" [1]. Such vagueness in the definition reflects the subjective nature of pain as well as the variety of ways in which to understand and categorize this complex human experience. Pain is a subjective experience that interferes with emotional, social, as well as physical functioning [1]. It is a multidimensional construct where the relationship between disease (as a biological phenomenon) and illness (as a subjective experience of discomfort and dysfunction) is hard to disentangle.

A problem arises when deciding what CP is. Standardized definitions and criteria to define "chronic" or "severe" pain are not available and diverse options (according to the quality and/or quantity of pain) have been proposed. Following are some of these descriptive definitions and criteria:

- Health and Welfare Canada [2] considers CP as pain that "persists (beyond) the normal time of healing, is associated with protracted illness or is a severe symptom of a recurring condition", and is of 3 months duration or more.
- The Clinical Standards Advisory Group of the National Health System in the United Kingdom [3] defines CP as pain "persisting beyond the expected time frame for healing or that occurs in disease processes in which healing may never occur".
- The International Association for the Study of Pain (IASP) provides one of the most referenced definitions of CP that takes into account factors related to duration and 'appropriateness'. According to the IASP subcommittee on taxonomy, three categories of pain may be defined: less than 1 month, from 1 to 6 months, and over 6 months [1]. CP is defined by the IASP as pain that has persisted beyond the normal tissue healing time (usually taken to be 3 months). The IASP considers a further characteristic related to the 'appropriateness' of the disorder. While acute pain would be usually adaptive (for example, after an injury the organism rests and protects the injured body part during the healing process), in CP there is no obvious biological value for the pain.
- The 1990 classification of fibromyalgia by the American College of Rheumatology (ACR) [4] includes another set of criteria to define CP. Chronic widespread pain (CWP) is defined when all of the following are present for at least 3 months: pain in the left side of the body, pain in the right side of the body, pain above the waist, and pain below the waist. In addition, axial skeletal pain (cervical spine or anterior chest or thoracic spine or low back) must be present.
- The Practice Guidelines of the American Society of Anesthesiologists for Chronic Pain Management consider CP as "persistent or episodic pain of a duration or

intensity that adversely affects the function or well being of the patient, attributable to any non malignant etiology" [5]. These practice guidelines agree with the IASP definition of CP based upon a 3-month duration [6]. Nonetheless, some researchers and clinicians consider that the use of 3 or 6 months criteria as a cut-off point to differentiate chronic from acute pain is arbitrary [7] and that there is no consensus regarding duration [8].

CP has a devastating effect on the lives of sufferers and families [3] and creates a high amount of distress and disability [9]. Patients with CP report severe impairments on multiple quality-of-life measures that consider physical, social and psychological well-being domains [8]. Many patients undergo a progressive physical deterioration caused by sleep and appetite disturbances, decrease in physical activity, and high risk of excessive medication. Apart from anxiety, many patients develop reactive depression, hypochondriasis, somatic preoccupations, and a tendency to deny life problems unrelated to their physical problem [7, 8]. Furthermore, the social effects of CP are equally devastating; many patients become estranged from their families and friends; they decrease their social interactions and are unable to work, leading to loss of their jobs in many cases [7, 10, 11].

Compared to patients with no CP complaints, CP sufferers are five times more likely to utilize health care services [11]. From Canada Health and Welfare's perspective, persons who experience CP become dependent and hence recipients of some type of public or private income-support program, or both [2].

PREVALENCE OF CP

CP is an issue of major importance (although at very different levels) to the health professionals, the health care system, the patient, and society. Valid estimates of CP prevalence (the proportion of a defined population that has CP at some specified time) are obtained by dividing the number of people who currently have the condition by the number of people in the study population [12].

The efforts to determine the prevalence of CP in the general population, however, have been faced with challenges such as prevalence variations according to the population sampled, the method used to collect data, and the criteria to define CP. Consequently, prevalence estimates of CP differ greatly from one study to another. Understanding factors that underline variation in prevalence estimates of CP may help to provide a more complete depiction of the scope and distribution of the public health problem related to CP.

Furthermore, the identification of some methodological factors that may account for differences among studies may guide the interpretation of these studies and be useful to inform future research in this area.

Published systematic reviews

Two systematic reviews of the prevalence of pain disorders were identified [10,13] (see Table 2 in Appendix D).

Verhaak et al. [10] conducted a systematic review of studies on the epidemiology of CP among adults. The first aim of the review was to determine which methods were used in the primary studies to determine the prevalence of CP.

Studies that exclusively focused on the pediatric and elderly populations were excluded, as well as those epidemiological studies that addressed acute pain or pain secondary to a defined disease.

Fifteen descriptive studies that assessed the prevalence of CP were identified. Thirteen of these studies were general population surveys and the remaining two were primary health care surveys. Data collection methods used in the individual studies included telephone survey (three studies); postal questionnaire (six studies); interview (three studies); and expert assessments (three studies). Data on research methods, definition of CP, prevalence, demographic, and co morbidity characteristics were summarized for each study.

The authors reported results such as "women were over-represented in two studies", "CP generally increased with age (peak prevalence between 45 and 65 years)", "prevalence of CP was higher in lower income groups", and "the most prevalent pain was musculoskeletal pain". Publication restrictions may be the reason numeric data was not included to support these conclusions. Therefore, the magnitude and significance of the association among these variables are uncertain.

The authors found a wide variability in the estimates of CP prevalence. A 'median point prevalence' of 15% (range: 2% to 40%) was calculated. When the complexity of the definition of CP was considered ('multidimensional' vs. 'simple', according to the authors and not clearly defined), the reported median point prevalence values were 13.5% (based on six studies) and 16% (number of studies not stated), respectively. The authors concluded that although the studies used a wide range of CP definitions and yielded widely varying CP estimates, neither the method of data collection nor the definition of CP seemed to affect the prevalence reported.

The use of a 'median point prevalence' as a pooled measure estimated from the individual studies however is inappropriate. The set of data used to calculate this measure originates from heterogeneous studies with different populations, data collection methods, and definitions of CP. A combined single estimate therefore is not an accurate reflection of prevalence.

The authors used both electronic and manual search strategies that were appropriate to identify the potential studies to be included in the review. Although the grey

(unpublished) literature was not searched, the authors considered that, given the scarcity of prevalence studies on CP in the general population, it is unlikely that other prevalence studies were not identified by their search strategy. Therefore a publication bias would not seem to be a concern.

Although a set of inclusion and exclusion criteria were established in advance, the criteria were not applied consistently to all studies. For example, a study that provided the incidence instead of the prevalence of CP was included. This added further heterogeneity to the review and a likely selection bias cannot be disregarded. Several individual aspects regarding the quality of the studies were reported, but a systematic assessment of the primary studies' methodological quality was not undertaken using an assessment tool. Therefore, the reproducibility of the process to appraise the quality of primary studies is uncertain.

Nickel and Raspe [13] conducted a qualitative systematic review on the epidemiology and use of services in treating CP. Studies on populations receiving treatment for CP were reported separately. Seventeen epidemiological studies were included in the report. Information regarding data collection methods, prevalence estimates, duration of pain, and demographic variables were extracted from individual studies. Data collection methods of the individual studies included: telephone survey (six studies), postal questionnaire (eight studies), and interview (three studies). The review concludes that epidemiology studies are limited by theoretic, methodological, and economic factors and that quantitative comparisons were precluded due to differences in populations, methods of data collection, definition of CP, and reporting of the results. The authors considered that CP was often not clearly defined and the definition was highly variable among the studies. Nonetheless, they reported that the frequency of CP increased with age, with a peak between 45 and 65 years of age. Likewise, higher rates of CP among women were found and an association between social status and frequency of specific types of pain was noted.

Although the search methods used by the authors to identify the studies were not reported in the publication, contact with the first author indicated that a systematic search strategy was used. Searches, however, were conducted using one database only and keywords were not explicitly reported. It is likely, therefore, that the search for evidence may not have been comprehensive enough.

A set of inclusion and exclusion criteria was defined. However, it was not clear why the review included some studies that were not focused specifically on CP [14-17] and excluded others that actually were [18]. Therefore, it appears that the inclusion and exclusion criteria were not applied consistently and that a selection bias is likely.

The criteria to assess the quality of the included studies were not reported and, in fact, a formal assessment of the quality of primary studies was not undertaken.

Given the heterogeneity of the studies, the review did not try to combine their results in a quantitative way but reported appropriately the results in a narrative way. Nonetheless, conclusions about the association between gender, social status, and age should be reported as observed trends, given the lack of a quantitative analysis to support this finding.

In general, the findings reported in both systematic reviews pointed out that there is a wide variation in CP prevalence estimates among primary studies that may be explained by several factors related to the design and the methodology of the individual studies. Nonetheless, the authors of the present report do not agree with the conclusions of the Verhaak systematic review [10] that methods of data collection or CP definition do not seem to affect prevalence rates. Lack of appropriate quantitative and qualitative analyses about the impact that these and other variables may have on the CP prevalence estimates in the review, preclude drawing such conclusions in a reliably way.

ANALYSIS OF PRIMARY STUDIES

The search strategy identified 32 potentially eligible publications. Based on the inclusion and exclusion criteria, 19 of these were excluded. The reasons for the exclusions are reported in Table 3 (see Appendix E). A total of 13 studies [18-30] were included in this review. Table 1 provides a comparative description of the characteristics of the studies. Table 4 in Appendix F provides further details of the individual studies.

The studies included were published between the years 1991 to 2002. Three studies were conducted in the United Kingdom [18, 20, 21] two in Australia [22, 23] and one each in Canada [19], France [30], Israel [24], Netherlands [25], Scotland [26], Spain [27], and Sweden [28]. A multinational study conducted by the World Health Organisation [29] with collaborative centres in Chile, Germany, Brazil, Turkey, France, Netherlands, England, India, the United States of America, Italy, China, Greece, Japan and Nigeria, was also included.

Eleven of the included studies [18-25, 27, 28, 30] surveyed the general population and two studies [26, 29] surveyed the population from primary care settings.

Most of the studies [18-22, 24, 26-29] (10 out of 12) reported prevalence estimates for adolescent and adults populations (lower age limit defined: 15 years, upper age limit defined: 86 years). There were two studies [23, 30] that provided prevalence data for elderly populations (65 to 85 years and over), exclusively. One further study addressed the prevalence of CP in children aged 0 to 18 years [25].

All the studies used a cross-sectional design to collect the data and the response rates ranged from 100% [30] to 54.6% [29]. The sample sizes varied from 410 [19] to 17,496 [22] participants of both genders. The number of male participants in those studies that

reported raw data by gender ranged from 158 [19] to 2,653 [25]. The number of female participants in the studies ranged from 252 [19] to 2,770 [25].

There were five studies [18, 20, 25, 26, 28] that used postal questionnaires (one of them [25] also used a self-completed questionnaire in a subgroup of participants). Four studies [19, 21, 22, 27] conducted phone interviews; and four studies used face-to-face interviews [23, 24, 29, 30] to collect data.

Pain was the main outcome measure in nine studies [18-21, 24-28]. CP data, however, were collected in four studies [22, 23, 29, 30] as part of a broader community survey that assessed several aspects of the general health state of the population.

Table 1: Comparative description of the characteristics of the studies

Authors/Country/ Study and publication year	Total Prevalence Estimate	Definition of CP (Duration)	Sample Size (N)	Setting	Method of Data Collection	Type of Outcome	Valid and Reliable Instrument	Response Rate	Quality Score
Andersson et al. [28] Sweden **1993**	49.8% (95%CI: 47.4-52.2%) (801/1609)	Dysfunctional Chronic Pain > **6 months.**	1,609	General population	Postal questionnaire	Primary	Yes	89%	86/90
	55.2% (95%CI:52.8-57.6) (885/1609)	Pain with duration **> 3 months** **IASP criteria.**							
Blyth et al. [22] Australia **2001**	18.5% (95%CI: 17.8 to 19.3%)	Pain experienced on most days for **3 months**. **IASP criteria.**	17,496	General population	Computer-assisted phone interview	Secondary	N/A	70.8%	80/90
Bowsher et al. [21] United Kingdom **1991**	11.5% (119/1037)	Pain with duration **> 3 months** **IASP criteria.**	1,037	General population	Phone interview	Primary	N/A	N/A	70/90
Catala et al. [27] Spain **2002**	23.4% (1170/5000)	Pain for more than **3 months.** **IASP criteria.**	5,000	General population	Phone interview	Primary	Unclear	54.6%	76/90
Elliot et al. [26] Scotland **1999**	50.4% (1817/3605) range: 39.4 to 61.2%	Pain or discomfort that persisted continuously or intermittently for longer than **3 months**. **IASP criteria.**	3,605	Primary care	Postal questionnaire	Primary	Yes	82.3%	76/90
Perquin et al. [25] Netherlands **2000**	25% (1358/5423)	Recurrent or continuous pain for more than **3 months**. **IASP criteria.**	5,423	General population	Postal questionnaire and self-completed questionnaire.	Primary	Unclear	82%	82/90
MacFarlane et al. [20] United Kingdom **1997**	13% (252/1953)	Pain for more than **3 months** **ACR criteria**.	1,953	General population	Postal questionnaire	Primary	N/A	75%	66/90

Table 1: Comparative description of the characteristics of the studies (cont'd)

Authors/Country/ Study and publication year	Total Prevalence Estimate	Definition of CP (Duration)	Sample Size (N)	Setting	Method of Data Collection	Type of Outcome	Valid and Reliable Instrument	Response Rate	Quality Score
Croft et al. [18] United Kingdom **1993**	13% (164/1340)	CWP that started more than **3 months** ago. **ACR criteria.**	1,340	General population	Postal questionnaire	Primary	N/A	66%	72/90
	35%	Chronic pain that started more than **3 months** ago.							
Buskila et al. [24] Israel **2000**	10.1% (532/2210)	Current widespread or regional pain for at least **3 months.** **ACR criteria.**	2,210	General population	Face-to-face interview	Primary	N/A	95.2%	84/90
Birse and Lander [19] Canada **1998**	44.4% (CI%: 41.8 – 45.4%) (182/410)	Continuous or intermittent pain for at least **6 months.**	410	General population	Phone interview	Primary	Unclear	69%	76/90
Brochet et al. [30] France **2002**	32.9% (244/741)	Persistent pain: daily pain for more than **6 months**	741	General population	Face-to-face interview	Secondary	Incomplete data	100%	77/90
Gureje et al. [29] World Health Organization **1998**	21.5% (1169/5438)	Current and persistent pain that was present most of the time for a period of **6 months** or more during the prior year.	5,438	Primary care	Face-to-face interview	Secondary	Yes	62%	58/90
Helme and Gibson [23] Australia **1997**	50.2% (497/990)	Pain for more than **3 months.**	990	General population	Face-to-face interview	Secondary	N/A	70%	63/90

The duration of CP was considered in several ways. Four studies [19, 28-30] considered 6 months as a criterion to define CP. Among these, one study [28] also considered a 3-month criterion within the definition. The remaining nine studies [18, 20-27] used 3 months to define the duration of CP.

When the use of formal criteria to define CP was considered, there were three studies [18, 20, 24] that explicitly reported that the ACR definition of chronic widespread pain was used. Seven studies [21-23, 25-28] used the IASP definition of CP (or a close approximation) and three studies [19, 29, 30] used other or non specified set of criteria.

From a qualitative point of view, the studies were very heterogeneous regarding the definitions for CP. Pain parameters such as location, intensity, frequency, and disability were not investigated by all the studies. Even when the same definition (e.g. IASP, ACR) was used as a basis, phrasing and ordering of questions to assess pain parameters were quite different.

Furthermore, other important outcomes related to health perceptions, seeking of medical care, the use of analgesics, or health service resources were not consistently investigated. Six studies [19, 21, 23, 25, 28, 29] provided information about the location of pain among CP sufferers. Four studies [19, 21, 23, 25] reported the frequency or the time spent in pain among those with CP. Severity was defined in many ways including intensity, disability and/or interference with daily activities. Nine studies [19, 21, 22, 24-26, 28-30] provided information about how severity was defined for the purposes of their study. Data on perceived causes of pain or associated disorders were presented in four studies [18, 21, 24, 26]. Finally, three studies [19, 22, 29] provided information of perceived health status and four studies [20, 21, 24, 26] outlined the use of health services or analgesics.

Methodological quality of the primary studies

Ten studies [18, 19, 21, 22, 24-28, 30] reached a quality score of 70 out of 90 or above and three studies [20, 23, 29] were rated below 70. Although total scores ranged from 86 [28] to 58 [29], it can be said that, in general, the quality of the studies was acceptable (mean value of the quality score 70.3; SD 8.2, median value 76). Table 5 in Appendix G provides the results from the critical appraisal and methodological quality scores of the individual studies.

The studies were heterogeneous in terms of the individual items rated to determine the methodological quality. All the studies used a cross-sectional design appropriate for the research question. As a whole, the methods to select the samples (randomization, size and sampling frame) appeared to be appropriate and the study population was usually described. The definition of CP was reported in most of the studies, although they used different criteria.

The main methodological problems were related to the failure to provide validity and reliability data on the data collection instruments, the lack of estimates calculated

around the prevalence values (i.e. 95% confidence intervals) and the low response rates in some studies.

Only three studies [26, 28, 29] provided information on the validity and reliability of the measurement instruments. One study [27] used a questionnaire validated in a pilot study of 800 participants from the general population (personal communication with the first author). However, validity and reliability data were not reported in the article or elsewhere. Two studies [19, 25] stated that the instruments for data collection were developed specifically for the study but no further information about the validity and reliability of the data collection tools were provided. One study [30] reported that trained interviewers applied the instrument to collect the data. None of the other remaining studies provided any information.

Although all studies reported point prevalence estimates (total and subgroups) or raw data to calculate them, only four studies [19, 22, 24, 28] reported confidence intervals (95% CI) around the prevalence estimates. Two studies [22, 26] reported range values around the prevalence estimates. Confidence intervals were not provided in the remaining studies.

All the studies except one [21] reported the response rate or provided enough data to calculate it. Studies with the lowest response rates (less than 70%) [18, 19, 27, 29] did not analyze the impact of a non-response bias on the findings, thereby affecting the level of certain that can be placed in the reported findings.

Studies that used the IASP definition of CP

Prevalence estimates of CP

The search strategy identified seven studies that provided a definition of CP equivalent to the IASP definition for CP [21-23, 25-28]. Two of them were conducted only in children [25] and elderly [23] populations and they will be described separately elsewhere. Five studies [21, 22, 26-28] that used the IASP definition of CP were considered. The studies were analyzed according to relevant variables that may explain the wide differences in the prevalence estimates (see Table 6 for sample sizes and prevalence data for weighted mean calculations in Appendix H).

Based on the information provided by four [21, 26-28] out of the five studies (one study [22] was excluded from calculations because it did not report the numerator used to calculate the prevalence estimates), the weighted mean prevalence of CP was 35.5%. Prevalence estimates ranged from 55.2% [28] to 11.5% [21]. The weighted mean prevalence of CP among male and female populations among the studies was 31.0% (range: 54.9% to 9.1%) and 39.6% (range: 55.5% to 13.4%), respectively.

When publication year was used to group the studies, there was not a clear trend towards lower or higher prevalence estimates according to this variable. Two studies published before 1993 reported figures of 11.5% [21] and 55.2% [28], respectively.

Alternatively, three studies published from 1999 to date reported figures of 18.5% [22], 23.4% [27] and 50.4% [26]. It is unknown the effect that publication year might have on the prevalence estimates.

The type of setting where the studies were conducted (general population, primary care) did not appear to explain the differences in the prevalence estimates. The only study included in this analysis that reported a prevalence estimate [26] in a primary care setting, reached a similar figure (50.4%) than that provided by the study that estimated the highest prevalence in the general population (55.2%) [28]. As would be expected, the population where the cases come from is a main source of variation. The sampling frame, sample selection referral patterns, and other characteristics of the settings where the studies were conducted may contribute to differences in prevalence estimates. Nonetheless, conclusions can not be drawn about a consistent relationship between the type of setting and the prevalence estimates reported in the studies.

In the same way, when studies were analyzed according to arbitrarily cut-off points chosen for sample size (<1,000, 1,000 to 2,000, and >2,000 participants) and response rate (above 70% and below 70%), prevalence estimates did not show a clear trend.

When CP was considered as a primary or secondary outcome, only one study [22] assessed CP as a secondary outcome (prevalence estimate: 18.5%). The remaining four studies [18, 21, 26, 27] assessed CP as a primary outcome and the differences among them continued to be large even when the aforementioned study was excluded. Nonetheless, the fact that there were more studies focussed on CP as a primary outcome highlights the increasing interest in determining the frequency and pattern of CP.

Studies that used phone surveys had lower prevalence rates (11.5% [21], 23.4% [22] and 18.5% [27]) than those that used postal questionnaires as the method for data collection (50.4% [26] and 55.2% [28]). This finding suggests that the method of data collection may be an important variable associated to the differences found in prevalence estimates. Nonetheless, there is not enough information to explain the direction and magnitude of the effect that this variable has on the CP prevalence estimates.

All five studies had a quality score above 70 points; however, due to the lack of data on the validity and reliability of the quality scoring system (personal communication with authors) used in this report, it can not be concluded that these figures are valid. It would perhaps be more reasonable to consider the impact that the individual items within the methodological quality assessment tool may have on the prevalence estimates.

Data on pain parameters and resource utilization

Four of the studies provided information on the characteristics of CP in terms of location [21, 28], frequency [21], severity [21, 22, 26, 28], perceived cause of pain [21, 21, 26], perceived health status [22], level of expressed needs [26], and use of analgesics [21].

Andersson et al. [28] reported that low back was the most frequent location of CP among sufferers (males: 23.8% and females: 22.8%) followed by shoulder, upper arm (males: 17.7%, females: 22.3%), neck, back or head (males: 14.5%, females: 19.1%), and knee (males: 14.2%, females: 12.7%). In this study, 90% of CP was from musculoskeletal origin. Bowsher et al. [21] reported that the distribution of location among CP sufferers was 43% for back, 25.3% for lower limbs, 16% for upper limbs, and 29% for non-specified locations. Although the information provided by both studies is not comparable in terms of the body area involved, it seems to be that musculoskeletal problems were common among both populations of CP sufferers.

This finding is supported by the data provided in the Elliot et al. [26] study, where the more common self-reported cause of pain among those with CP were back problems (16%) and arthritis (15.8%). Alternatively, Bowsher et al. [21] reported a higher estimate of pain associated with arthritis/rheumatism (44%) among CP sufferers that may be due to differences in the categorization of the perceived causes associated with CP. This study also provided information about the time spent in pain. The mean number of days (out of last 28) in pain among CP sufferers was 18.8 days and the percentage of CP patients in pain for more than half of the last month was 60%.

Elliot et al. [26] reported the level of severity among those with CP in terms of intensity and disability: grade I (low disability, low intensity) 48.7%; grade II (low disability, high intensity) 24.4%; grade III (high disability, moderately limiting) 11.1%; and grade IV (high disability, severely limiting) 15.8%.

Andersson et al. [28] also graded the intensity of CP on a scale ranging from 1 (weak) to 5 (intense). Thirty-three percent of the CP sufferers had grade 3 intensity, followed by 22.6% with grade 2 intensity and 19.8% with the most intense grade of CP. Twelve point nine percent and 11.6% of the pain sufferers had grades 4 and 1 of intensity, respectively. Prevalence of definite pain problems (dysfunctional CP) was 12.8% of the total population.

Blyth et al. [22] reported that 11% of males and 13.5% of females in the survey reported some degree of interference with daily activities. Among those with CP, 64.9% had some degree of interference with daily activities caused by pain and 35.1% (1260/3598) had no interference. On the other hand, Bowsher et al. [21] found that 55.2% of CP sufferers had some level of social disability and, among them, 55% were unable to work or lead a normal life due to their CP problems.

Finally, Elliot et al. [26] reported the level of expressed needs of patients with CP in terms of treatment and use of analgesics (using a scale ranging from 0 - low to 4 - high). The highest level of expressed needs was reported by 28% of CP sufferers, followed by 24.7% classified in level 2. Alternatively, Bowsher et al. [21] reported that 70% of CP sufferers were taking analgesics but they continued to have pain. Although these

results are dissimilar regarding the use of analgesics, they do suggest that patients with CP are likely to make extensive use of health services.

Prevalence of severe, limiting or disabling CP

Five primary studies [21, 22, 25, 26, 28] provided data on the number of CP sufferers with severe, limiting or disabling CP. All the studies used the IASP criteria to define CP. The information was collected in very different ways, and definitions of severity were not directly comparable among the studies. For example, severity was measured in one study [28] according to a rating scale graded from 1 (weak) to 5 (intense) while in other study [26] it was rated from Grade 0 (pain free) to Grade IV (high disability, severely limiting CP). Severity of CP can be defined in several different ways in terms of disability, interference, and/or intensity. Nonetheless, it may be assumed that a common factor underlies these definitions: the need to identify and characterize a special group that may demand a greater amount of services within the health care system.

Based on raw data provided by these studies, prevalence was re-calculated for severe, limiting or disabling CP reported by the general population and those from a primary care setting. The prevalence of severe (intense) CP in the general population in the Anderson study [28] was 10.7%. The percentage of participants with Grade III (highly disabling, moderately limiting CP) and Grade IV (highly disabling, severely limiting CP) CP was also 10.7% in the Elliot study [26]. When social disability (inability to work or lead a normal life due to CP) was considered in the Bowsher study [21], the percentage of severe CP was 11%. Thirteen point three per cent of participants in the Blyth study [22] had CP that caused interference with activities.

Prevalence of "very frequent and more intense pain" in children from the general population in the Perquin study [25] was 8%. Therefore, when these figures are considered altogether, it can be said that severe CP (however it is defined) in the general population may vary from 8% among children to approximately 11% among adults.

Studies that used the ACR definition of chronic widespread pain

Three studies reported the prevalence of CWP in the general population [18, 20, 24]. The weighted mean prevalence of CWP was 11.8% (range: 10.1 to 13%). All the studies provided estimates of prevalence by gender (the proportion of males and females that have CWP in the general population). The weighted mean prevalence of CWP among male and female populations was 7.2% (range: 3% to 10.5%) and 14.7% (range: 14.7% to 14.9%), respectively (see Table 6 for sample sizes and prevalence data for weighted mean calculations in Appendix H).

It cannot be reliably concluded that the variation of prevalence estimates among studies on CWP is low. There were only three studies identified and the chance of variation in prevalence estimates may be lower when the number of studies is low.

As prevalence estimates of CWP were similar in the three studies, an analysis considering methodological variables was not conducted. Briefly, studies that reported CWP prevalence estimates of 13% [18, 20] used the same method of data collection (postal questionnaire) and one study [24] that reported a CWP prevalence estimate of 10.1% used face-to-face interviews. Two studies [18, 24] had quality scores above 70 points.

Data on pain parameters and resource utilization

The studies provided information on the characteristics of CWP in terms of disability [24], associated disorders [18, 24], and the use of health services or analgesics among CWP sufferers [20]. Buskila et al. [24] reported that 32% of CWP sufferers had one to seven lost workdays in the last 6 months and 9% had quit work due to pain-related problems. CWP was associated with hypertension in 33% of the cases, followed by dyslipidemia (15%), and ischemic heart disease (15%). Croft et al. [18] reported that CWP patients tended to have symptoms such as tiredness upon waking (42.1%), depression (31.1%), and difficulties in coping with problems (27.4%).

Mac Farlane et al. [20] found that 72% of CWP sufferers had consulted a general practitioner due to pain. Buskila et al. [24] found that 43% of the CWP sufferers had four to six medical consultations in the last 6 months, followed by 35% and 21% that had one to three and more than seven medical appointments, respectively. Eighty percent of them were referred to a specialist. This study also provided information on the use of drugs and other interventions over the last 6 months to relieve pain symptoms. Ninety-five percent of the CWP sufferers used drugs to treat their pain problems. The most common treatments were analgesics (90%) and non-steroidal anti-inflammatory drugs (75%). Physiotherapy (30%), steroid injections (26%) and oral steroids (2%) were used to a lesser degree.

Studies that used other/not clearly defined criteria

Three studies [19, 29, 30] used other or no clearly defined criteria. These studies were not comparable in many ways. One of these studies [30] was exclusively conducted in elderly participants. Therefore, results from this study are described elsewhere.

Birse and Lander [19], a Canadian study, was conducted in the general population and provided a prevalence estimate of 44.4% (males: 33.5%, females: 66.5%) using a definition of "*continuous or intermittent pain for at least 6 months*". The authors recognized that the prevalence rate may have been inflated or deflated by several factors, such as poor recall and lack of probability sampling of individuals within households.

Gureje et al. [29] conducted a multi-centre WHO study in primary care settings. The prevalence of CP 21.5% (males: 16.2%, females: 24.8%) was a secondary outcome defined as "*current and persistent pain that was present most of the time for a period of 6 months or more during the prior year*".

Data on pain parameters

The Canadian study by Birse and Lander [19] provided information about pain parameters and perceived health status among those with CP. Pain experience was characterized in terms of mean pain intensity using an 11-point scale (7.9, SD: 2.0), mean years since pain onset (10.2 years, SD: 10.8) and frequency of pain (infrequently 7.7%; one to two times per month 15.9%; three to ten times per month 18.7%; more than 10 times per month 57.7%). Compared to peers, 42% of CP sufferers considered that their health status was similar and 26.9% considered it as worse when compared to peers without pain. It was surprising that 24.2% considered that their own health status was better when compared to peers without pain.

The multi-centre WHO study [29] identified the three most commonly reported anatomical pain sites among those with persistent pain: back pain (47.8%), headache (45.2%), and joint pain (41.7%). The majority (68%) of primary care patients with persistent pain in this study reported pain in at least two anatomical sites. On the other hand, unfavorable health perceptions were reported by 33.4% of those with persistent pain in this study. Thirty-one point four percent of those with persistent pain were rated as having moderate to severe interference with their work and 41.2% had more than three days of limited activity due to pain in the prior month.

Studies in children and elderly populations

One study [25] assessed the prevalence of CP in children. By using the IASP definition, the study reported prevalence estimates of CP for children from 0 to 18 years of age. The distribution of CP by gender was 19.5% for males and 30.4% for females. The study did not provide additional information on pain characteristics and use of health care resources.

There were two studies [23, 30] that provided data on the prevalence of CP in elderly populations. One study [23] used the IASP definition and calculated a total prevalence of 50.2%. Prevalence estimates by gender were not reported.

The other study [30] calculated a total prevalence of 32.9% for the elderly in the general population. The distribution of CP by gender was 23.7% for males and 40.1% for females. This study was part of a larger cohort study and the response rate was absolute (100%).

Pain parameters

Helme and Gibson [23] provided information about characteristics of pain. The study reported the percentage of pain sites in the past 12 months. Joints, back, and lower limbs were the more common pain sites. Data on resource utilization was not provided in the studies.

DISCUSSION

Verhaak et al. [10] included 15 descriptive studies, Nickel and Raspe [13] included 17 descriptive studies and this systematic review considered 13 studies. Several reasons can be put forward to explain the differences in the number and type of studies included in each of the systematic reviews. Restrictions by date of publication as part of the search strategies and the use of different selection criteria account for the main variations (see Table 7 in Appendix I). Only two studies [21, 28] were similarly included in all three systematic reviews. The same five studies that were included in Verhaak et al. [10] and Nickel and Raspe [13] were identified by our search strategy, but were not included as they did not meet our inclusion criteria. For similar reasons those studies included either solely in Verhaak et al. [10] or Nickel and Raspe [13] were excluded from this review.

The systematic review of CP prevalence studies presented in this report satisfied the Oxman and Guyatt criteria for critical appraisal of systematic reviews [31, 32] and, therefore, has some advantages over the previous published systematic reviews in this field. The search strategy was sensitive and specific to identify all the relevant prevalence studies on CP in the general population and primary care setting published from 1991 to date. Inclusion and exclusion criteria were defined in advance and bias in the selection of studies was avoided by the use of two independent reviewers that selected and appraised the quality of the individual studies. The reasons for excluding studies were reported in every case. Furthermore, a full description of the process used to assess the quality of the individual studies was provided and therefore could be replicated. Although the assessment tool has yet to be validated, it was used consistently by both researchers.

The studies were analyzed according to relevant variables and combined when appropriate in a single estimate (weighted mean prevalence). The conclusions of this report are similar to previous published systematic reviews on CP. Studies were heterogeneous in many ways and several factors need to be considered to explain the variability in prevalence estimates reported by the primary studies. Demographic factors of the populations under study and variations of associated disorders, the use of different criteria to define CP, and methods of data collection are sources for variations in the prevalence estimates.

Although almost all the studies discussed here were conducted in a more or less Anglo-Saxon environment (north-west Europe, North America and Australia), it is still possible that important social and cultural differences in the acceptance of pain reporting behaviour may be an important variable to consider. Nonetheless, caution should be taken when drawing conclusions about the role of these factors in determining responses to CP, given that results are based on samples drawn from limited settings within each geographic location.

The nature of the questions asked in the studies about the temporal nature of pain may be one of the main sources of variability in the prevalence estimates. CP may be defined in terms of interval of occurrence and frequency, and the questions used in the studies to explore these domains were not comparable (see Table 4 in Appendix F for further details on questions used in the individual studies).

Furthermore, the effect that ordering of specific questions might have on the estimates of CP prevalence is unknown. For example, if the first question refers to the identification of "any" pain before asking the location of the pain, it may result in different CP prevalence estimates than when asking first about pain in each anatomical location and then asking specific details concerning that pain [23]. Primary studies used several different CP case definitions. For example, some studies included measures of severity, others included measures of disability, and some included both severity and disability measures while others had no restricted case definitions. It should be noted that researchers may not be able to distinguish between extent of the complaints and the degree of disability (personal communication Dr. Nickel).

Not all of the studies used questions to adequately describe such pain characteristics as the site of pain, its continuous or intermittent nature, its quality and severity at different times, and the level of disability as a result of the pain. All of these aspects (window of pain, the time in pain within this window, the criteria for defining CP, and the effect that ordering has) related to the questionnaires might help to explain the variation in prevalence figures [33].

The method of data collection may be an important variable associated to differences in prevalence estimates. Studies that used phone surveys had lower prevalence rates than those that used postal questionnaires as the method for data collection. Nonetheless, there is not enough information to explain the direction and magnitude of the effect that this variable has on the CP prevalence estimates.

The noted differences in prevalence estimates when the studies were divided according to the ACR and IASP definitions may be attributable to the differences in the level of comprehensiveness of these classification systems. Nonetheless, it should be kept in mind that the ACR definition may also be considered as a subset of the IASP definition. Therefore, each patient with pain that has persisted beyond normal tissue healing time is an IASP-defined pain patient. Only if such pain involves four different parts of the

body, the patient is considered an ACR-defined pain patient (personal communication Dr. Verhaak).

It is noteworthy that little variation was observed among the three studies that used the ACR criteria (weighed mean: 11.83%, range: 10.1 to 13%). Studies that used the IASP definition showed a broader range of variation among their prevalence estimates (weighed mean: 35.5%, range: 10.5 to 55.2%). Variations in the application of criteria may explain some of the discrepancies observed in the primary studies. The questionnaires used in the primary studies using the ACR criteria were more comprehensive and similar. Nonetheless, caution should be taken to interpret the least variation in prevalence estimates among studies that used the ACR criteria. It is also likely that just by chance, the lower number of studies is associated with a lower variation in prevalence estimates.

It is interesting to note that studies using the IASP definition and providing information about CP severity using proxy definitions such as intensity, level of functional limitations and disability had similar prevalence estimates as those studies using the ACR criteria (10% to 13% to define chronic pain). Prevalence estimates from studies of severe CP using the IASP criteria were calculated and ranged from 8% in children to around 11% in adults.

The information about the prevalence of CP in the general population and primary care settings should be put into a Canadian perspective. Two studies that assessed the prevalence of CP in Canadian populations were identified [19, 34]. The Millar article [34] that reported the prevalence of CP based on the results of the 1994-1995 National Population Health Survey was excluded from this review because the duration of CP was not clearly defined. This study considered pain as a secondary outcome and reported that 17% of the Canadian population aged 15 years and over experienced some CP or discomfort. This figure is quite different from the 44% estimated in the Birse and Lander's study [19] that was conducted using a random sample extracted from the general population in Alberta. Differences in CP prevalence estimates in these studies may be explained by the same reasons previously presented.

It is worthwhile to note that the primary focus of this review was on the prevalence of CP in the general population and primary care setting. Consequently, the search strategy was not designed to retrieve specific information about the characteristics of CP in terms of severity and other parameters such as use of health care resources. The information reported here with regard to these parameters should be taken with caution and generalizations should be avoided. Nonetheless the data reported in the primary studies support the findings of a high prevalence of CP among females (usually from musculoskeletal origin) and a significant increase in the use of health care resources within CP sufferers.

CONCLUSIONS

This report has identified and critically appraised the published evidence on the prevalence of CP in the general population and primary care setting. Published systematic reviews on this topic have no definitive answer. The CP prevalence estimates reported in the 13 studies included in the systematic review vary widely from 10.1% to 55.2%. Lack of consensus about basic definitions and inconsistencies in measurement among the published studies on CP prevalence make it difficult to quantitatively compare the findings.

Nonetheless, it is important to point out that based on proxy definitions of severity (intensity, level of functional limitations and disability) provided by five (using the IASP definition) out of the 13 studies included in the review, calculation of severe CP prevalence was possible. Severe CP prevalence figures showed little variation in the study populations, ranging from 8% in children to 11% in adults. These estimates are similar to those reported in the three studies using the ACR criteria, weighted mean 11.8% with a range of 10% to 13%. Given that associated costs for severe CP must be considerable for the health system, the individual and the society, the management of CP problems needs to be recognized and addressed.

Several studies showed high CP prevalence rates. In the particular case of Canada and Alberta settings, CP prevalence estimates were calculated in studies that used broad and non-formal definitions of CP. Wide variations observed in the estimated prevalence rates preclude a generalization of the findings into a regional context.

Therefore, the single most important recommendation in the context of a research agenda is to conduct concurrent, prospective epidemiological studies to estimate the CP prevalence in Alberta (using a clear case-definition, and well-validated and reliable data collection tools). Some important questions should be addressed: numbers and characteristics of people with CP in Alberta and the proportion of people with disabling, limiting or intense CP. Quality of life is a further issue that should be assessed in this CP population. Estimation of the size and characteristics of the population affected by CP may provide a basis for designing and providing therapeutic efforts toward those most likely to need and benefit from them.

More stringent, systematic and uniform methodological approaches to study the prevalence of CP are needed. The results from this report provide a clear description of the impact that various aspects related to the methodology of the studies may have on prevalence estimates. Differences in demographic characteristics of participants, the use of formal criteria to define CP, the type of questions used for case definition, the methods of data collection and the consideration of CP measures as primary or secondary outcomes should be taken into account.

APPENDICES

APPENDIX A: METHODOLOGY

Analysis of systematic reviews:

In order to identify all the systematic reviews that assess the prevalence of CP in the general population and/or primary care settings, a systematic search of the published literature from 1991 to 2002 was performed (see Appendix B). The objective at this stage of the report was to identify valid and reliable information about the prevalence of CP and to assess the quality of the published systematic reviews. The reports had to be described as systematic reviews, or they had to include a pooled analysis (either qualitative or quantitative) of the results from several independent primary studies. The quality of the systematic reviews was assessed using the Oxman and Guyatt criteria for critical appraisal of systematic reviews [31, 32] (see Appendix C, Table 1). Briefly, this set of criteria assesses the question and methods, the search strategy to locate the relevant studies, the description of the inclusion and exclusion criteria to select the studies, the methodological quality assessment of the primary studies, and the combination of the results from primary studies [31].

Analysis of primary studies

Inclusion and exclusion criteria

Types of studies

Studies of any design were included if they met the following criteria:

- Estimate (or provide enough data to calculate) the prevalence of CP.
- When longitudinal studies were available, the first period where CP was measured (by any data collection method) was considered.

Studies focused on acute pain, pain by diagnostic categories or by body area involved, or pain secondary to a defined disease, were excluded.

Types of participants

Male and female subjects. Any age.

Type of setting

General population and primary care settings. Studies of special groups in the community (industrial workers, etc) or hospital settings were excluded.

Type of outcome measures

Point prevalence of CP. Other prevalence estimates were reported, if available. Duration of CP should be clearly defined in the studies. Studies that described CP just in a vague way (i.e., "persistent", "long lasting", "recurrent", "continuous") were excluded.

Methods of the review

One researcher selected the articles that met the inclusion criteria. This could potentially lead to selection bias. Information on the following variables was extracted from each study in a standardized form: publication year, country and date of conduction, setting, study design and sampling frame, sample size and characteristics, methods of data collection, definition of CP, instrument to measure CP, response rates, and prevalence estimates. When prevalence was calculated using more than one case definition, the definition with the most inclusive criteria were considered. For example, if a same study reported CP estimates for 6-month and for 3 month of duration, the later estimate was considered. Data on characteristics of pain and use of services were also abstracted.

One reviewer assessed the methodological quality of all the included studies according to the 1998 criteria proposed by Loney et al. [35] (Table 2 in Appendix C). Briefly, this set of criteria relates to the validity of the study methods (design, sampling frame, sample size, outcome measures, measurement, and response rate), the interpretation of the results and applicability of the findings. Each article was also rated according to the 1999 scoring system proposed by Loney et al. [36] to assess the methodological quality of prevalence studies. This scoring system includes nine items that are rated in a 10 point-scale according to the presence or absence of the aforementioned issues. Scores range from 0 to 90 points. A total methodological score of 70 points was considered a priori as acceptable (see Appendix C, Table 3).

A second researcher independently appraised a random sample of included studies by using the same set of criteria and scoring system. The sample was obtained with a random numbers table. The level of agreement between both reviewers was established by a simple agreement measure.

When both reviewers critically appraised the included studies, the level of agreement was 100% when the total quality methodological score was classified according to a cut-off of 70 out of 90 points. When the individual items of the scoring system were considered, the level of agreement was 71%.

Studies were divided according to the criteria that were used to define CP (IASP, ACR, other/not specified). When prevalence estimates were not reported in the article, these were calculated from the available raw data. Where possible and plausible, a quantitative integration of the results was considered. This approach used data from all relevant studies to calculate prevalence estimates. Studies with CP prevalence estimates that were likely to differ systematically were excluded (Appendix E). Potential biases and their impact on prevalence rates were also explored.

Apart from the criteria for case definition, important variables that may individually explain the differences in the prevalence estimates were considered in the analyses. These included:

- Publication year (before 1993, 1994 to 1998, 1998 to date),
- Type of setting (general population, primary care),
- Sample size (<1000, 1000 to 2000, and >2000 participants),
- Response rate (above 70% and below 70%) [36],
- Type of outcome measure (pain collected as a primary or a secondary outcome in the study),
- Methods for data collection (postal, face to face interview, telephone),
- CP definition (duration) (> 3 months, > 6 months), and
- Methodological score (above 70 points and below 70 points).

The possibilities to calculate a pooled prevalence estimate using meta-analytical techniques were explored. Weighted mean estimates (based on sample size of the studies) adjusted by these variables are reported for each subgroup of studies, if appropriate. Other relevant information related to characteristics of chronic pain (i.e., nature, frequency, location, severity) and use of health services are extracted and presented (Appendix G).

APPENDIX B: SEARCH STRATEGY

The following databases and information sources were searched to identify the literature and related materials:

Database Searched	Dates/Terms Used
AMED (Ovid)	1991- April, 2002 (chronic pain.mp. OR (chronic.mp AND pain.mp.) OR (chronic widespread pain.mp) OR (chronic wide-spread pain.mp) OR (chronic wide spread pain.mp)) AND prevalence.mp.
PubMed	1991- December, 2002 Chronic pain AND **prevalence**
MEDLINE (Ovid)	1991-March 2002 pain.sh,hw,ti. AND chronic.sh,hw,ti. AND prevalence.sh,hw,ti.
EMBASE (Ovid)	1991- March 2002 pain.sh,hw,ti. AND chronic.sh,hw,ti. AND prevalence.sh,hw,ti.
CINAHL (Ovid)	1991-Feb 2002 (chronic pain.mp. OR (chronic.mp AND pain.mp.) OR (chronic widespread pain.mp) OR (chronic wide-spread pain.mp) OR (chronic wide spread pain.mp)) AND prevalence.mp.
BioethicsLine (Ovid)	1991-December 2000 Exp **pain** AND exp **chronic disease**
PsycInfo (Ovid)	1991- February 2002 pain.sh,hw,ti. AND chronic.sh,hw,ti. AND prevalence.sh,hw,ti. 13 citations
Database of Abstracts of Reviews of Effectiveness (DARE) **NHS Economic Evaluations Database (NHSEED)** **Health Technology Assessment Database (HTA)**	Up to December 1, 2001 Chronic AND pain AND prevalence
Cochrane Database of Systematic Reviews (Update software)	2001 Issue 4 (chronic next pain) and prevalence
HealthSTAR (Ovid)	1991- January 2000 **exp** pain **AND exp** chronic disease and prevalence

Websites:	
CMA Practice Guidelines-CPG Infobase **National Guideline Clearinghouse** **ECRI website** **Statistics Canada** **Health Canada** **36 INAHTA members websites**	December 2001 (chronic pain OR (chronic AND pain)) and prevalence
NEOS library catalogue	Keyword search: Chronic AND pain AND prevalence
Internet websites of note:	Canadian Consortium on Pain Mechanisms Diagnosis and Management www.curepain.ca Chronic Pain Association of Canada ecn.ab.ca/cpac The Canadian Pain Society www.canadianpainsociety.ca North American Chronic Pain Association of Canada www.chronicpaincanada.org American Chronic Pain Association www.theacpa.org Amercian Pain Society (annual meeting abstracts at Medscape.com)

It was decided that specific medical condition terms (such as, rheumatoid arthritis, fibromyalgia) are not used in the search because there are numerous conditions related to pain. Searching for all those terms would take an extended period of time and generate large search results with less precision, which is not desirable for the time constraints.

Manual searches of reference list of relevant articles identified by the electronic searches were done to retrieve further studies. Publications in any language were considered. Canadian studies published before 1991 were considered and included in the report, if appropriate.

APPENDIX C: QUALITY ASSESSMENT TOOLS

Oxman and Guyatt criteria for critical appraisal of systematic reviews [31, 32, 37]

- Were the search methods used to find evidence (original research on the primary questions) stated?
- Was the search for evidence reasonably comprehensive?
- Were the criteria used for deciding which studies to include in the overview reported?
- Was bias in the selection of studies avoided?
- Were the criteria used for assessing the validity of the included studies reported?
- Was the validity of all the studies referred to the text assessed using appropriate criteria (either in selecting studies for inclusion or in analysing the studies that are cited)?
- Were the methods used to combine the findings of the relevant studies (to reach a conclusion) reported?
- Were the findings from the relevant studies combined appropriately, relative to the primary question that the overview addresses?
- Were the conclusions drawn by the author(s) supported by the data and/or analysis reported in the overview?

Guidelines for critical appraisal of studies of prevalence or incidence of a health problem [35]

A. ARE THE STUDY METHODS VALID?

1. Are the study design and sampling method appropriate for the research question?
2. Is the sampling frame appropriate?
3. Is the sample size adequate?
4. Are objective, suitable and standard criteria used for measurement of the health outcome?
5. Is the health outcome measured in an unbiased fashion?
6. Is the response rate adequate? Are the refusers described?

B. WHAT IS THE INTERPRETATION OF THE RESULTS?

7. Are the estimates of prevalence or incidence given with confidence intervals and in detail by subgroup, if appropriate?

C. WHAT IS THE APPLICABILITY OF THE RESULTS?

8. Are the study subjects and the setting described in detail and similar to those of interest to you?

Methodological scoring system to rate studies reviewed [36]

Item	Score
1. Random sample	10 points
2. Unbiased sampling frame (i.e. census data)	10 points
3. Adequate sample size (>300 subjects)	10 points
4. Measures valid and reliable	10 points
5. Adequate response rate (70%)	10 points
6. Point prevalence estimates provided	10 points
7. Confidence intervals provided	10 points
8. Definition and duration of CP	10 points
9. Study subjects described	10 points
Maximum score	**90 points**

APPENDIX D: SYSTEMATIC REVIEWS ON THE PREVALENCE OF CP

Table 2: Systematic review on the prevalence of CP

Study: Verhaak et al. [10] – Qualitative review		
Objectives	- To determine the methods used to calculate prevalence of chronic benign pain. - To determine the prevalence of benign pain among adults.	
Search Strategy	- Search on electronic databases (Medline and Embase) (1990-1996); manual search in reference lists of reviews and editorials on pain research. Language restrictions: not available.	
Study selection / inclusion and exclusion criteria	Inclusion criteria: - Studies focused on CP (as defined in the studies). - Epidemiological studies on pain. - Studies should include subjects with ages between 18 and 75 years. - Studies should report prevalence estimates of CP in the general population or in primary health care setting.	Exclusion criteria: - Studies exclusively dealing with pediatric and elderly populations - Studies exclusively focused on acute pain or pain secondary to a defined disease.
Data extraction	- Author and year of publication. - Methods of data collection. - Definition of CP in the studies. - Prevalence of CP (in %). - Non-response rate (in %). - Demographic and co-morbidity characteristics of the samples in the individual studies. - It is unclear how the data extraction process was performed.	
Quality of studies assessment	- Formal criteria to assess the quality of the primary studies were not available.	
Results/ Data integration	- 15 descriptive studies: USA (4), UK (3), Denmark (2), Sweden (2), Canada (1), Finland (1), Germany (1), New Zealand (1). Data collected from 1980 to 1990. 13 population surveys; 2 in general practice. 3 studies restricted to pain in specific body sites; 12 on pain in general. Range of number of subjects in the studies: 308 to >10,000 subjects. Non-response rate varied from 10% to 30%. - Methods to collect data: telephone survey (3); postal questionnaire (6); interview (3); expert assessments (3). - Median point prevalence of CP: 15% (2% to 40%). According to the complexity of the definition of CP (“multidimensional” or “simple”) the median prevalence is 13.5% (6 studies) and 16% (number of studies unknown), respectively.	

Table 2: Systematic review on the prevalence of CP (cont'd)

Study: Verhaak et al. [10] – Qualitative review (cont'd)		
Conclusions	- There have been no epidemiological studies on the prevalence of chronic benign pain in the general population. - There are few epidemiological studies of CP in this population. - The use of different definitions for CP and the variation on the assessment methods did not seem to affect the prevalence reported. - There were no clear-cut differences between prevalence based on each of the methods used. - There was consensus about the characteristics of CP sufferers: they are often middle-aged women from lower socioeconomic strata.	
Reviewers assessment	- The objective of the review is related to a highly significant topic (prevalence of chronic benign pain) that seems to be underreported in the available literature on pain. - The search strategy was sufficiently broad to identify the most relevant studies.. - Although there was not a priori formulation of study design that would be considered, the inclusion and exclusion criteria were clearly stated and are coherent with the main issues of the review question. - The methodological quality of the studies was not assessed in a systematic way using defined criteria. - The use of a "median point prevalence" as a pooled estimate from individual studies is inappropriate. - The reproducibility of the review process is uncertain.	
Study: Nickel and Raspe [13] – Qualitative review		
Objectives	- To provide an overview of the frequency and distribution of CP in the general population and among those receiving treatment.	
Search Strategy	- Search on Medline (1980-2000); manual search of the references listed in the literature (personal communication with the first author). Language restrictions: not available.	
Study selection / inclusion and exclusion criteria	Inclusion criteria: - Studies focused on epidemiology of CP and demographic parameters in general populations. - Studies on populations with CP that received treatment (personal communication with the first author).	Exclusion criteria: - Epidemiological studies that investigate pain in distinct locations (personal communication with the first author). - Studies that investigate pain in specific age groups.
Data extraction	- Author and year of publication. - Sample size of the individual studies. - Methods of data collection. - Prevalence of CP (in %). - Definition of CP in the studies (by duration). - Demographic characteristics of the samples in the individual studies (gender, age).	

Table 2: Systematic review on the prevalence of CP (cont'd)

Study: Nickel and Raspe [13] – Qualitative review (cont'd)	
Quality of studies assessment	- Formal criteria to assess the quality of the primary studies were not available.
Results/ Data integration	- 17 descriptive studies. - Methods to collect data: phone survey (6 studies); postal questionnaire (8 studies); interview (3 studies). - Narrative analysis was presented.
Conclusions	- Epidemiology studies on CP are limited by theoretic, methodological and economic reasons. - There are variations in populations, methods of data collection, definition of CP and reporting that preclude a quantitative integration of the results. - Frequency of CP is increased with age (peak: 45 to 65 years of age).
Reviewers assessment	- Search methods were not reported in the publication, but the review used a formal search strategy to identify the studies. - A set of inclusion and exclusion criteria was defined; nonetheless it appears that they were not applied in the same way and a selection bias is likely. - The methodological quality of the studies was not assessed in a systematic way using defined criteria.

APPENDIX E: EXCLUDED STUDIES

Table 3: Excluded studies

Study (by publication year)	Reasons for Exclusion
Smith et al., 2001 [38]	This was a duplicate report of Elliot et al. study [26]. The article examined CP from a clinician's perspective and reported the prevalence and distribution of the most severe or troubling CP in the community. The article did not provide new relevant information apart from that published in the original paper.
Perquin et al., 2000 [39]	This was a duplicate publication of the data presented in Perquin et al. [25]. Although the report was excluded, it allowed completing some data that were not provided in the first report.
Anderson et al. 1999 [40]	Focused on musculoskeletal CP.
Bassols et al., 1999 [14]	This study assessed the prevalence of pain in a Spanish region, but the definition of pain did not consider the duration. It was not possible to make distinctions between acute and CP from the figures provided.
Cassidy et al. 1998 [41] White et al. 1998 [42]	These were two Canadian studies about the prevalence of low back pain and fibromyalgia, respectively. The definition of CP was limited to specific types of pain. They may be analyzed in futures updates of this report.
Becker et al., 1997 [43]	This study was not a prevalence study. It assessed a sample of 150 CNMP patients consecutively referred to a Danish multidisciplinary pain centre that was not representative of the CNMP patients in Denmark.
Brattberg et al., 1996 [44]	This study of the prevalence of pain in Swedish elderly from the general population. It did not report prevalence data considering the duration of pain. Therefore, there were not distinctions made between acute and CP from the figures provided.
Millar, 1996 [34]	The duration of CP was not clearly stated.
Sjøgren et al., 1996 [45]	The study examined how physicians in Denmark managed cancer pain and did not provide prevalence data.
Mobily et al., 1994 [46]	This is a very interesting analysis from the Iowa 65+ Rural Health Study that assessed the health status of the elderly population in USA. Information on the number of subjects that experienced some type of pain in the year prior to the time for data collection was provided. A definition for CP in this population. Was not stated
Lipton et al. 1993 [47]	The study focused exclusively on the prevalence of orofacial pain and CP was not clearly defined.
Magni et al., 1993 [48]	This was a follow-up study of the participants in HANES I (the Hispanic Health and Nutrition Examination Survey). It was excluded as the original study was related with specific types of pain (musculoskeletal pain).
Magni et al. 1992 [49]	This study addressed exclusively the prevalence of abdominal CP data from the HANES study in the USA.
Potter & Jones, 1992 [50]	This was a follow-up study about the natural history of CP in an apparently non-random sample of forty-five patients. The aims of the study were to describe the progress of pain after a 6-months period and to identify factors associated with chronicity. The study did not focus on the prevalence of CP in the general population or primary care settings.
Sorensen et al., 1992 [51]	The duration of CP was not clearly stated. This study used indirect data collection methods. It was based on information provided by general practitioners about the number of strong analgesics prescribed for each patient. The expected prevalence rate for CNMP pain in a primary care setting was then indirectly calculated. This study is in many ways quite different from the others in respect to the approach to collect the information.

Table 3: Excluded studies (cont'd)

Study (by publication year)	Reasons for Exclusion
James et al., 1991 [17]	This report provides data from an epidemiological study that assessed the prevalence of psychiatric disorders in a random sample of the general population at New Zealand. The study assessed the lifetime prevalence of pain (as a secondary outcome) using 11 questions on pain from the Diagnostic Interview Schedule and did not considered the duration of pain. It was not possible to extract precise information about point prevalence.
Kohlman, 1991 [52]	This was a German-published report of a population-based pain survey. The duration of pain was not explicitly stated and data for CP could not be extracted from the available information.
Mäkelä & Heliövaara, 1991 [53]	The study addressed exclusively the prevalence of primary fibromyalgia (defined by operational criteria) in the Finnish population.

APPENDIX F: CHARACTERISTICS OF THE INCLUDED STUDIES

Table 4: Characteristics of the included studies

Study Country/Date of conduction and Setting	Sample Size and Sample characteristics	Study Design	Sampling Frame	Method of Data Collection	Definition of CP and other measures	Response Rate	Prevalence Estimates Pain parameters and use of health services among CP sufferers
Andersson et al., 1993 [28] Sweden (1988) General population	N = 1,609 1806 eligible participants Adults 25 to 74 years **Mean age:** Not available **Distribution by gender**: ♂ = 49.7% (799/1609) ♀ = 50.3% (810/1,609)	Cross-sectional survey	Random sample from a population register	Postal questionnaire	Pain as primary outcome (persistent or regularly recurrent pain) **CP definition:** ① Pain with duration > 3 months IASP definition ② Dysfunctional CP (DCP): Pain with duration > 6 months, pain intensity grades 4 or 5 (any localisation), impairment in 2 aspects o ADL and/or sick leave due to pain at least once during the past 3 months. **Validity and reliability data of the instrument to measure CP:** Apparently validated questionnaire. Validity and reliability data were provided. **Question:** "Do you feel pain lasting for more than three months?" Survey of pain symptoms (duration, location, intensity, and functional capacity), medical care sought, therapy, and lifestyle. **Questions cueing:** 1. Initial question about pain experiences. 2. Pain localisation by a drawing (11 areas of localisation) 3. Intensity for each location (graded from 1 to 5 – weak to intense) Activities of daily living: questions about the ability to perform seven different activities: no difficulty, some and greater difficulty.	89.9% (1609/1806)	**Total prevalence:** **> 3 months (IASP criteria):** 55.2% (95%CI:52.8-57.6) (874/1609) **By gender:** ♂ = 54.9% (439/799) ♀ = 55.5% (449/810) **DCP > 6 months** 49.8% (95%CI: 47.4-52.2%) (801/1609) **By gender:** Not available **Severe CP (grade 5 - intense):** 10.7% (173/1609) 90% CP from musculoskeletal origin **Prevalence of CP by localisation and gender:** Low back: ♂ =23.8%, ♀ = 22.8% Shoulder, upper arm: ♂ = 17.7%, ♀ = 22.3% Neck, back or head: ♂ = 14.5%, ♀ = 19.1% Knee: ♂ = 14.2%, ♀ = 12.7% **Intensity of CP:** 1 (weak) = 11.6% 2 = 22.6% 3 = 33.1% 4 = 12.9% 5 (intense) = 19.8%

Table 4: Characteristics of the included studies (cont'd)

Study Country/Date of conduction and Setting	Sample Size and Sample characteristics	Study Design	Sampling Frame	Method of Data Collection	Definition of CP and other measures	Response Rate	Prevalence Estimates Pain parameters and use of health services among CP sufferers
Birse and Lander, 1998 [19,54] Canada (1991 to 1992) General population	N = 410 592 eligible individuals Adults 18 years and over **Mean age:** 40.8 years (SD: 16.3) **Distribution by gender:** ♂ = 38.8% (158/410) ♀ = 61.2% (252/410)	Cross-sectional survey	Random sample of households with telephones obtained from a databank of random digit numbers. Randomisation within the households by birthday date.	Phone interview	CP as a primary outcome. **CP definition:** Continuous or intermittent pain for at least 6 months. Reference to a specific set of criteria was not provided. **Validity and reliability data of the instrument to measure CP:** Instrument for data collection was developed for the study and was no validated. **Question:** "Do you have or have you had since the past six months any pain or discomfort?"	69% (410/592)	**Total prevalence:** 44.4% (CI%: 41.8 – 45.4%) (182/410) **By gender:** ♂ = 33.5% (61/158) ♀ = 66.5% (121/252)
					Questions cueing: 1. Respondents were asked to report occurrence of any pain in the previous six months and to identify each site where it had occurred. 2. To identify each site where it had occurred. 3. Onset and frequency of pain at each site. 4. Pain intensity assessed on an 11-point scale (0 to 10 – none to worst possible pain).		**Perceived health status of CP sufferers compared to peers:** Much better = 5.0% Better = 24.2% Same = 42.9% Worse = 26.9% Much worse = 1.0% **Mean pain intensity (SD):** 7.9 (2.0) **Mean years since pain onset (SD):** 10.2 (10.8) **Frequency of CP (%)** Infrequently: 7.7% 1-2 times per month: 15.9% 3-10 times per month: 18.7% > 10 times per month: 57.7%

Table 4: Characteristics of the included studies (cont'd)

Study Country/Date of conduction and Setting	Sample Size and Sample characteristics	Study Design	Sampling Frame	Method of Data Collection	Definition of CP and other measures	Response Rate	Prevalence Estimates Pain parameters and use of health services among CP sufferers
Brochet et al., 1998 [30] France (1990) General population	N = 741 1,726 eligible participants from a larger cohort study **Mean age:** 74.2 years **Distribution by gender:** ♂ = 39.8% (295/741) ♀ = 60.2% (446/741)	Cross-sectional survey within a cohort study	Stratified random samples from electoral registers of 37 parishes.	Face-to-face interview	Persistent pain as secondary outcome within a large cohort study of elderly people (PAQUID study) **CP definition:** Daily pain for more than 6 months. Reference to a specific set of criteria was not provided. **Validity and reliability data of the instrument to measure CP:** Interviews conducted by psychologists specifically trained and experienced in interviewing elderly subjects. No further information was provided. **Question:** During the previous year, did you feel pain anywhere? Daily for more than 6 months? Was severity of the last 'usual' episode mild, moderate, severe or very severe?	100% (741/741)	**Total prevalence:** 32.9% (244/741) **By gender:** ♂ = 23.7% (70/295) ♀ = 40.1% (179/446)
					Questions cueing: 1. Frequency of pain 2. Location of pain. 3. Temporal pattern of each pain. 4. Severity of pain.		11% of males and 13.5% of females in the survey reported interference with daily activities. Among those with CP, 64.9% (2338/3598) had some degree of interference with daily activities caused by pain and 35.1% (1260/3598) had no interference.

Table 4: Characteristics of the included studies (cont'd)

Study Country/Date of conduction and Setting	Sample Size and Sample characteristics	Study Design	Sampling Frame	Method of Data Collection	Definition of CP and other measures	Response Rate	Prevalence Estimates Pain parameters and use of health services among CP sufferers
Blyth et al., 2001 [22] Australia (1997) General population	N = 17,496 24712 eligible participants (calculated from the response rate provided) Adults 16 years and over **Mean age:** ♂ = 42.8 years range: 42.3 to 43.3 years ♀ = 44.1 years range: 43.6 to 44.6 years **Distribution by gender:** ♂ = 49.3% (7484/17496) ♀ = 50.7% (10012/17496)	Cross-sectional population survey	Simple random sampling of household phone numbers within strata and simple random sampling of a resident within each household	Computer-assisted phone interview	Pain measured as a secondary outcome through one question within the 1997 New South Wales Survey **CP definition:** Pain experienced everyday for three months in the six months prior to interview. IASP definition **Validity and reliability data of the instrument to measure CP:** Not available **Question:** Thinking back over the last 6 months, have you had an episode of pain that has lasted more than 3 months?	70.8% (17496/24712)	Raw data for percentages are not presented here due to inconsistencies in the reported figures. **Total prevalence:** 18.5% (95%CI: 17.8 to 19.3%) ***By gender:*** ♂ = *17.2%* (95%CI: 16.2 to 18.2%) ♀ = 19.9% (95%CI: 18.9 to 20.9%) **CP that cause interference with daily activities:** 13.3% (2338/17496)
					Questions cueing: 5. Pain experienced 6. Interference with daily activities on a five-point adjective scale (none to extreme). 7. Self-rated health		11% of males and 13.5% of females in the survey reported interference with daily activities. Among those with CP, 64.9% (2338/3598) had some degree of interference with daily activities caused by pain and 35.1% (1260/3598) had no interference.

Table 4: Characteristics of the included studies (cont'd)

Study Country/Date of conduction and Setting	Sample Size and Sample characteristics	Study Design	Sampling Frame	Method of Data Collection	Definition of CP and other measures	Response Rate	Prevalence Estimates Pain parameters and use of health services among CP sufferers
Bowsher et al., 1991 [21] Great Britain (1990) General population	N = 1037 responders from a household population of 2942 people. 15 years and over **Mean age:** 44 years **Distribution by gender:** ♂ = 47.5% (493/1037) ♀ = 52.4% (544/1037)	Cross-sectional survey	Random sample of households from phone lists. Respondents stratified by age and social strata.	Phone interview	CP as the primary outcome. **CP definition:** Pain defined as pain which lasted on or off for more than the last 3 months. IASP definition **Validity and reliability data of the instrument to measure CP:** Not available. **Question:** Not available.	Not available	**Total prevalence:** 11.5% (119/1037) **Recalculated including all household members:** 7% (208/2942) **By gender:** ♂ = 9.1% (45/493) ♀ = 13.4% (73/544) **Social disability caused by CP:** 11% (115/1037)
					Questions cueing: 1. Presence of pain 2. Responded were asked what they believed to be the cause of pain. 3. Location of pain. 4. Total time spent in pain. 5. Social disability.		**Cause of pain among CP sufferers:** Arthritis/rheumatism: 44% "Illness": 8.1% **Location of pain:** Back: 43% Other/not specified: 29% Lower limb: 25.3% Upper limb: 16% 70% of CP sufferers were taking analgesics but they continued to have pain. **Total time spent in pain:** Mean number of days (out of last 28) in pain: 18.8 Percentage of patients in pain for more than half the last month: 60% **Social disability:** 55.2% of positive responders. Unable to work or lead a normal life because of pain: 55%

Table 4: Characteristics of the included studies (cont'd)

Study Country/Date of conduction and Setting	Sample Size and Sample characteristics	Study Design	Sampling Frame	Method of Data Collection	Definition of CP and other measures	Response Rate	Prevalence Estimates Pain parameters and use of health services among CP sufferers
Buskila et al., 2000 [24] Israel (1997) General population	N = 2,210 2322 eligible participants Adults 18 to 86 years **Mean age:** 43 years, SD = 17 **Distribution by gender:** ♂ = 40% (884/2210) ♀ = 60% (1326/2210)	Cross-sectional population survey	Stratified random sample from health service register	Face-to-face interview	CP as primary outcome Participants divided according to pain categories (Wolfe et al, 1995): Group 1: No pain Group 2: Current pain as well as pain that had been present for less than 3 months (transient pain) Group 3: Current (non-widespread) pain as well as pain that had been present for at least 3 months (chronic regional pain) Group 4: Current pain as well as pain that had been present for at least 3 months that was considered widespread according to the ACR definition. Group 5: Cancer-related pain. **Validity and reliability data of the instrument to measure CP:** Not available **Question:** Not available.	95.2% (2210 / 2322)	**For Chronic Widespread Pain (CWP):** Total prevalence: 10.1% (224/2210) 95%CI: 8.7 to 11.1% By gender ♂ = 3% (29/884) ♀ = 14.9% (195/1326) **For chronic regional pain (CRP):** Total prevalence:: 13.9% (308 / 2210) 95%CI: 12.4 to 15.2% By gender: ♂ = 13% (114/884) ♀ = 14.6% (194/1326) **For both (CWP and CRP):** Total prevalence: 24.0% (532/2210) By gender: ♂ = 26.9% (143/532) ♀ = 73.1% (389/532) ♂ = 16.2% (143/884) ♀ = 29.2% (388/1326)

Table 4: Characteristics of the included studies (cont'd)

Study Country/Date of conduction and Setting	Sample Size and Sample characteristics	Study Design	Sampling Frame	Method of Data Collection	Definition of CP and other measures	Response Rate	Prevalence Estimates Pain parameters and use of health services among CP sufferers
Buskila et al., 2000 [24] (cont'd)					Information on pain complaints, use of health services over the past 6 months (number of visits to a physician, drug consumption, hospitalisation) and effect of pain on work status (lost work days). Questions cueing: 1. Duration 2. Localisation of pain. 3. Classification according to pain categories. 4. Effects of CP on other outcomes (service utilisation and work-related problems).		**Reported comorbidity among those with CWP:** Ischemic Heart Disease = 15% Hypertension = 33% Diabetes = 18% Dyslipidemia = 15% Chronic lung disease = 8% **Distribution of service utilization and work related problems among those with CP:** Number of visits to physician in last 6 months 0 = 1% 1-3 = 3% 4-6 = 43% 7 + = 1% Drugs over last 6 months Any drug: 95% Analgesics: 90% NSAID: 75% Steroid injections: 26%

Table 4: Characteristics of the included studies (cont'd)

Study Country/Date of conduction and Setting	Sample Size and Sample characteristics	Study Design	Sampling Frame	Method of Data Collection	Definition of CP and other measures	Response Rate	Prevalence Estimates Pain parameters and use of health services among CP sufferers
Catala et al., 2002 [27] Spain (1998) General population	N = 5,000 respondents 11980 eligible participants 18 to 95 years **Median/mean age:** Not available **Distribution by gender:** ♂ = 48.3% (2416/5000) ♀ = 51.6% (2584/5000)	Population-based Cross-sectional survey	Random sample from phone numbers (not otherwise specified)	Phone interview	CP as one of the primary outcomes. **CP definition:** Pain for longer than 3 months. IASP definition. **Validity and reliability data of the instrument to measure CP:** Pilot study in a sample of 800 subjects. Results under peer review (personal communication with the first author). **Question:** Have you had pain that has lasted more than 3 months? There was no specific information for the group of patients with CP.	54.6% (6546/11980) 1546 interviews exceeding quotas were discontinued by interviewers.	**Total prevalence:** 23.4% **By gender:** ♂ = 14.8% (357/2416) ♀ = 31.4% (811/2584)

Table 4: Characteristics of the included studies (cont'd)

Study Country/Date of conduction and Setting	Sample Size and Sample characteristics	Study Design	Sampling Frame	Method of Data Collection	Definition of CP and other measures	Response Rate	Prevalence Estimates Pain parameters and use of health services among CP sufferers
Croft et al., 1993 [18] United Kingdom (1991) General population	N = 1,340 responders 2034 eligible participants 18 to 85 years **Median age:** 46 years range: 20 to 85 years **Distribution by gender:** ♂ = 42.7% (572/1340) ♀ = 57.3% (768/1340)	Cross-sectional survey	Random sample from registered population in two general practices (stratified by age)	Postal questionnaire	CWP as the primary outcome. **CP definition:** 1. Pain: a report of any pain during the last month which had lasted for longer than 24 hours. 2. Chronic pain: pain, as defined above, which had started more than 3 months ago. 3. Widespread pain. Using the drawings of subjects who reported pain, widespread was defined as the presence of marking along the axial skeleton and in at least 2 contralateral quadrants of the body (ACR definition). Pain which has not widespread by this definition is referred as regional pain. 4. Chronic widespread pain: Widespread pain, as defined above which had started more than 3 months ago. **Validity and reliability data of the instrument to measure CP:** Not available. **Question:** Presence of any pain during the previous month which had lasted longer than 24 hours and which had started more than 3 months ago.	75% (It was not clear how the authors calculated this response rate. It seems to be more realistic the other figure that was provided: 66% (1340/2034)	**Total prevalence:** 13% Chronic Widespread Pain **Recalculated without spoiled questionnaires:** 12.7% (164/1340) **Adjusted by age & sex figures to adult population of England and Wales in 1985:** 11.2% **By gender:** ♂ = 8.9% (51/572) ♀ = 14.7% (113/766) **Chronic Pain:** 35%

Table 4: Characteristics of the included studies (cont'd)

Study Country/Date of conduction and Setting	Sample Size and Sample characteristics	Study Design	Sampling Frame	Method of Data Collection	Definition of CP and other measures	Response Rate	Prevalence Estimates Pain parameters and use of health services among CP sufferers
Croft et al., 1993 [18] (cont'd)					**Questions cueing:** 1. A screening question about the presence of any pain during the previous month which had lasted longer than 24 hours. 1. A second question to establish whether any such pain had started more than 3 months ago. 2. Four line drawings of the body to locate the pain. 3. Questions about somatic symptoms other than pain: poor quality sleep, daytime fatigue, subjective swelling of joints, numbness of limbs, altered bowel habit, dry eyes or mouth, white painful fingers. 4. Three statements from the General Health Questionnaire covering inability to overcome difficulties, loss of sleep over worry, and feeling unhappy and depressed. **5.** An open ended question about the perceived cause of pain		

Table 4: Characteristics of the included studies (cont'd)

Study Country/Date of conduction and Setting	Sample Size and Sample characteristics	Study Design	Sampling Frame	Method of Data Collection	Definition of CP and other measures	Response Rate	Prevalence Estimates Pain parameters and use of health services among CP sufferers
Elliot et al., 1999 [26] Scotland (date was not specified) Primary care setting (Not in general population as stated by the authors)	N = 3,605 4379 questionnaires delivered 25 years and over **Mean age:** Not available **Distribution by gender:** ♂ = 48.3% (1741/3605) ♀ = 51.7% (1864/3605)	Cross-sectional survey	Random sample of patients from 29 general practices using a community health register	Postal questionnaire	CP as a primary outcome. **CP definition:** Pain or discomfort that persisted continuously or intermittently for longer than 3 months. IASP definition **Validity and reliability data of the instrument to measure CP:** Instrument was developed and validated for the study. **Question:** 2 questions. Not clearly defined. **Questions cueing:** 1. Case-screening questions: Two questions: one question to assess whether pain or discomfort was present, and a second to establish whether this pain or discomfort had started longer than 3 months ago. 2. A question on the cause of pain (given a choice of responses such as angina, arthritis, back pain, injury, women's problems, don't know and other). 3. Chronic pain grade questionnaire: seven-item questionnaire that measures severity of chronic pain in three dimensions: persistence, intensity and disability: grade 0 (pain free), grade I (low disability, low intensity), grade II (low disability, high intensity), grade III (high disability, moderately limiting), and grade IV (high disability, severely limiting). 4. Level of expressed needs questionnaire: measure of patients' response to chronic pain in a way that reflects demand for and uptake of health service resources: Have you sought treatment for your pain or discomfort often? Have you taken painkillers for your pain or discomfort recently? Have you taken painkillers for your pain or discomfort often?. Five levels of expressed needs for patients with CP: level 0 (no expressed need, answered no to all four questions) to level 4 (high expressed need, answered yes to all four questions).	82.3% (3605/4379)	**Total prevalence:** 50.4% (1817/3605) range: 39.4 to 61.2% **By gender**: ♂ = 48.9% (852/1741) range: 37% to 61.4% ♀ = 51.8% (965/1864) range: 41.8 to 61.1% **CP of Grade III and IV severity among the general population:** 10.7% (389/3605) **Self-reported cause of pain among those with CP:** Back pain: 16% Arthritis: 15.8% Injury: 5.9% Angina: 4.5% Women's problems: 3.9% Don't know: 4.3% **Level of severity among those with CP:** Grade I: 48.7% Grade II: 24.4% Grade III:11.1% Grade IV: 15.8% **Expressed need of patients with CP:** Level 0: 17.2% Level 1: 16% Level 2:24.7% Level 3: 14.2% Level 4: 28.0%

Table 4: Characteristics of the included studies (cont'd)

Study Country/Date of conduction and Setting	Sample Size and Sample characteristics	Study Design	Sampling Frame	Method of Data Collection	Definition of CP and other measures	Response Rate	Prevalence Estimates Pain parameters and use of health services among CP sufferers
Gureje et al., 1998 [29] Multicentre World Health Organisation study (1991-1992). Chile, Germany, Brazil, Turkey, France, Netherlands, England, India, USA, Italy, China, Greece, Japan, Nigeria Primary care (15 centres)	5438 participants 8729 eligible participants Adults 18 to 65 years. **Mean age:** Not available **Distribution by gender:** ♀ = 35.3% (1919/5438) ♂ = 64.7% (3519/5438)	Cross-national and cross-sectional survey	Consecutive primary care attendees were screened (25916 patients) and then stratified random samples were interviewed.	Face-to-face interview	Pain as a secondary outcome within a WHO Collaborative Study of Psychological Problems in General Health Care **CP definition:** Current and persistent pain that was present most of the time for a period of 6 months or more during the prior year **Validity and reliability data of the instrument to measure CP:** The instrument to measure CP was a question from the WHO primary care version of the Composite International Diagnostic Interview. Data on validity and reliability were provided elsewhere **Question:** Not available in the article. **Questions cueing:** 1. General Health Questionnaire (GHQ-12) used as screening instrument to obtain a stratified random sample. 2. Second stage evaluation used the Composite International Diagnostic Interview. Patients needed to report that at some time during their lifetime they talked to either a physician or other health professional about the pain, had taken medication for the main more than once, or had reported that the pain had interfered with life or activities a lot. 3. Disability assessed by the "Occupational Role" section of the Social Disability Schedule. This semi-structured interview rates disability on the basis of work role performance relative to cultural expectations. Ratings were made on a 4-point scale: 0 (no disability), 1 (mild disability), 2 (moderate disability), and 3 (severe disability). **4.** Health perceptions.	Response rate for screening: 96% (25916/26996) Response rate for the second-stage evaluation: 62% (5438/8729)	**For all centres combined:** **Total prevalence:** 21.5% (1169/5438) (range among centres: 5.5% - 33%) When calculated directly from the raw figures provided by the author, the prevalence is estimated in 28.9% (1569/5438) **By gender:** ♂ = 16.2% ♀ = 24.8% **Moderate to severe work role interference due to CP in the primary care population:** 6.7% (367/5438)

Table 4: Characteristics of the included studies (cont'd)

Study Country/Date of conduction and Setting	Sample Size and Sample characteristics	Study Design	Sampling Frame	Method of Data Collection	Definition of CP and other measures	Response Rate	Prevalence Estimates Pain parameters and use of health services among CP sufferers
Gureje et al., 1998 [29] (cont'd)							**Anatomical site among subjects reporting CP:** Back pain: 47.8% Headache: 45.2% Joint pain: 41.7% Arms or legs: 34.3% 68% reported pain in at least 2 anatomical sites. Unfavourable health perceptions were reported by 33.4% of those with CP. 31.4% of those with persistent pain were rated as having moderate to severe work role interference. 41.2% with < 3 activity-limitation days in the prior month.

Table 4: Characteristics of the included studies (cont'd)

Study Country/Date of conduction and Setting	Sample Size and Sample characteristics	Study Design	Sampling Frame	Method of Data Collection	Definition of CP and other measures	Response Rate	Prevalence Estimates Pain parameters and use of health services among CP sufferers
Helme and Gibson, 1997 [23] Australia (1996) General population	N = 1,000* 1428 eligible participants (calculated from the response rate provided) * Data from 990 participants Adults 65 years and over. **Mean age:** Not available **Distribution by gender:** Not available	Cross-sectional survey	Random sample from electoral rolls (voting is compulsory in Australia)	Face-to-face interview	Pain as a secondary outcome within a survey on health status of older people (persistent or bothersome pain that limits activities over the preceding 12 months) **CP definition**: Pain for more than 3 months. IASP definition. **Validity and reliability data of the instrument to measure CP:** Not available in the article. ***Questions:*** 1) "In the past 12 months, how often have you felt pain that is persistent or bothersome or limits your activities?" 2) About how long ago did you start having (your most severe) pain?" 3) In the past 12 months…. Where is your pain? (maximum of three) **Questions cueing:** 1. List of active disease states, functional ability, and attitudes about health. 2. A brief physical examination completed the interview. 3. A brief series of questions on pain, its expectation and frequency, and then the site, severity, presumed cause, and treatment.	70% (1000/1428)	**Total prevalence**: 50.2% (497/990*) **By gender:** Not available * Data from 900 participants for this calculation. **Pain parameters among individuals with CP:** Pain site more common in the past 12 months among CP sufferers: Joints, back, legs, and feet.

Table 4: Characteristics of the included studies (cont'd)

Study Country/Date of conduction and Setting	Sample Size and Sample characteristics	Study Design	Sampling Frame	Method of Data Collection	Definition of CP and other measures	Response Rate	Prevalence Estimates Pain parameters and use of health services among CP sufferers
MacFarlane et al., 1997 [20] United Kingdom (date was not specified) General population, although sub-analysis in primary care.	N = 1,953 18 to 65 years **Mean age:** Not available **Distribution by gender:** ♂ = 42.8% (835/1953) ♀ = 57.2%(1118/1953)	Cross-sectional survey	Random sample from a population registered to receive treatment care in a general practice. Although the sampling frame was from general practice registers, given that over 95% of the UK population are registered there, the authors considered that this provided a convenient population-sampling frame.	Postal questionnaire + face-to-face interview with those reporting CP	CWP as a primary outcome **CP definition:** CWP for more than 3 months. ACR definition. **Validity and reliability data of the instrument to measure CP:** Unclear **Question:** Unclear **Questions cueing:** 1. Information on whether pain (lasting at least 24 hours) had been experienced during the past month. 2. Subsequent questions established the duration of pain and whether subjects had sought a medical consultation with their general practitioners for the reported symptoms. 3. Shading on a body manikin indicated the site of any pain reported. 4. From these responses, it was determined whether subjects satisfied the CWP definition. 5. GHQ-12, Somatic Symptom Scale, Fatigue Questionnaire, The 9 Illness Attitude Scales, The Self-Care.	75% (1953/2602)	**Total prevalence:** 13% (252/1953) **By gender:** ♂ = 10.5% (88/835) ♀ = 14.7% (164/1118) From those with CP, 72% (181/252) consulted a general practitioner for this reason. In those that consulted a general practitioner for CP: ♂ = 69% (60/88) ♀ = 73% (120/164) **Pain parameters among individuals with CP:** Of those with CWP, 72% reported having consulted a general practitioner regarding the pain.

Table 4: Characteristics of the included studies (cont'd)

Study Country/Date of conduction and Setting	Sample Size and Sample characteristics	Study Design	Sampling Frame	Method of Data Collection	Definition of CP and other measures	Response Rate	Prevalence Estimates Pain parameters and use of health services among CP sufferers
Perquin et al., 2000 [25] Netherlands (1996) General population	N = 5423 6636 eligible participants Children 0 to 18 years **Mean age:** ♂ = 9.1 years (SD=5.0) ♀ = 9.4 years (SD=4.9) Not provided for the whole sample. **Distribution by gender:** ♂ = 49% (2653/5424) ♀ = 51% (2770/5424)	Cross-sectional population survey	**For the 0 to 3 years old group:** Random sample from a register of population **For the 4 to 18 years old group:** 27 primary schools and 14 secondary schools (non stated as random)	**For the 0 to 3 years old group:** Postal questionnaire completed by parents **For the 4 to 18 years old group:** Questionnaire sent to school **For children older than 8 years:** Self-completed questionnaire. Non validated instrument.	Pain as primary outcome (pain experienced within the previous 3 months) **CP definition:** Recurrent or continuous pain for more than 3 months **Validity and reliability data of the instrument to measure CP:** A structured pain questionnaire was designed especially for the study. No further information was available. **Question:** "Did you/your child experience pain in the previous three months?" **Questions cueing:** 1. Question about pain experience in the previous three months?. 2. Additional information about the (location, frequency, duration and intensity). 3. From a list of possible locations (head, abdomen, limb, ear, throat, back, unknown and elsewhere), subjects were asked to tick all locations where they had experienced pain in the previous 3 months. 4. Frequency of occurrence: < 1 x month, 1 x month, 2-3 x month, 1 x week, 2-6 x week, each day. 5. Duration of pain: < 4 weeks, between 4 weeks and 3 months, > 3 months. 6. Intensity of pain: visual analogue scale: How bad is the pain usually? (100 mm long line with the verbal anchors "no pain" versus "the worst pain you can imagine".	82% (5423/6636)	**Total prevalence:** 25% (1358/5423) **By gender:** ♂ = 19.5% (517/2653) ♀ = 30.4% (841/2770) **Very frequent and more intense CP in the general population:** 8% (438/5423) **Pain parameters among individuals with CP:** 49% indicated a frequency of occurrence of at least once a week, 21% less than once a month and 30% somewhere in between. Weekly pain: 49%. Mean age of children reporting weekly pain: 11.0 years (SD = 3.8). Mean intensity of chronic pain: 54.4 (SD = 24.2). Prevalence rates for headache, abdominal pain and limb pain: 23, 22 and 22%, respectively. Mean number of reported locations = 1.87 (SD = 1.11). 31.7% of chronic pain sufferers experienced very frequent and more intense pain.

APPENDIX G: RESULTS OF THE METHODOLOGICAL ASSESSMENT OF THE INDIVIDUAL STUDIES

Table 5: Results of the methodological assessment of the individual studies

Study	Random sample	Unbiased sampling frame	Adequate sample size	Valid and reliable measures	Adequate response rate	Point prevalence estimates provided	Confidence intervals provided	Definition and duration of CP	Study subjects described	Total score	Comments
Andersson et al., 1993 [28]	10	1	10	10	10	8	10	9	9	86	Estimates should be checked for consistency. Some data were presented just in a graphic way.
Buskila et al., 2000 [24]	10	10	8	7	9	10	10	10	10	84	
Perquin et al., 2000 [25]	9	9	10	7	10	10	7	10	10	82	Check of inconsistent data on response rate in the report.
Blyth et al., 2001 [22]	10	10	10	7	7	10	10	9	7	80	
Brochet et al. [30], 2002	10	9	9	6	10	10	6	8	10	78	
Birse and Lander, 1998 [19, 54]	10	10	9	6	6	10	7	10	8	76	
Elliot et al., 1999 [26]	8	8	8	8	9	9	9	9	8	76	
Catala et al, 2002 [27]	10	8	10	7	4	10	7	10	10	76	
Croft et al., 1993 [18]	9	10	8	6	5	10	7	8	9	72	
Bowsher et al, 1991 [21]	10	8	9	6	1	10	6	10	10	70	

Table 5: Results of the methodological assessment of the individual studies (cont'd)

Study	Random sample	Unbiased sampling frame	Adequate sample size	Valid and reliable measures	Adequate response rate	Point prevalence estimates provided	Confidence intervals provided	Definition and duration of CP	Study subjects described	Total score	Comments
MacFarlane et al., 1997 [20]	6	7	7	7	8	8	7	8	8	66	
Helme and Gibson, 1997 [23]	9	7	9	2	10	7	7	6	7	63	
Gureje et al., 1998 [29]	5	5	6	6	5	8	6	10	7	58	

APPENDIX H: SAMPLE SIZES AND PREVALENCE DATA FOR WEIGHTED MEAN CALCULATIONS*

Table 6: Sample sizes and prevalence data for weighted mean calculations

Study	Sample size (n)	Prevalence (%)
Bowsher et al. [21]	1,037	11.5 (CP - IASP definition)
Croft et al. [18]	1,292	13 (CWP - ACR definition)
Andersson et al. [28]	1,609	55.2 (CP - IASP definition)
MacFarlane et al. [20]	1,953	13 (CWP - ACR definition)
Elliot et al. [26]	3,605	50.4 (CP - IASP definition)
Catala et al. [27]	5,000	23.4 (CP - IASP definition)
Buskila et al. [24]	2,210	10.2 (CWP - ACR definition)

APPENDIX I: PRIMARY STUDIES INCLUDED IN SYSTEMATIC REVIEWS ON CP

Table 7: Primary studies included in systematic reviews on CP

Study	Verhaak et al. (1998) [10]	Nickel and Raspe (2001) [13]	HTA report	Status
Andersson et al. (1993) [28]	✓	✓	✓	❶
Birse and Lander (1998) [19]	✗	✓	✓	❹
Croft et al. (1993) [18]	✓	✗	✓	❸
Brochet et al. (2002) [30]	✗	✗	✓	❼
MacFarlane et al. UK (1997) [20]	✗	✗	✓	❼
Bowsher et al.(1991) [21]	✓	✓	✓	❶
Elliot et al. (1999) [26]	✗	✓	✓	❹
Catala et al. (2002) [27]	✗	✗	✓	❼
Perquin et al. (2000) [25]	✗	✗	✓	❼
Helme and Gibson (1997) [23]	✗	✗	✓	❼
Blyth et al. (2001) [22]	✗	✗	✓	❼
Buskila et al. 2000 [24]	✗	✓	✓	❹
Gureje et al.(1998) [29]	✗	✗	✓	❼
Potter and Jones (1992) [50]	✓	✗	✗	❺
Kohlmann (1991) [52]	✓	✓	✗	❷
Von Korff et al. (1988) [55] (1990) [56] (1993) [57]	✓	✓	✗	❷
Frølund and Frølund (1986) [58]	✓	✗	✗	❺
Crook et al. (1984) [16]	✓	✓	✗	❷
Magni et al. (1990) [59] (1992) [49]	✓	✗	✗	❺
Andersson (1993) [28]	✓	✗	✗	❺
Sternbach (1986) [60]	✓	✗	✗	❺
Mäkélä and Heliövaara (1991) [53]	✓	✗	✗	❺

Table 7: Primary studies included in systematic reviews on CP (cont'd)

Study	Verhaak et al. (1998) [10]	Nickel and Raspe (2001) [13]	HTA report	Status
Andersen & Worm-Pedersen (1987) [61]	✓	✗	✗	❺
Brattberg et al. (1989) [15]	✓	✓	✗	❷
James et al. (1991) [17]	✓	✓	✗	❷
Taylor and Curran (1985) [62]	✗	✓	✗	❻
Magni et al. (1993) [48]	✗	✓	✗	❻
Millar (1996) [34]	✗	✓	✗	❻
Chrubasik et al. (1998) [63]	✗	✓	✗	❻
Eriksen et al. (1998) [64]	✗	✓	✗	❻
Bassols et al. (1999) [14]	✗	✓	✗	❻
Schumacher and Brahler (1999) [65]	✗	✓	✗	❻

❶ Included in Verhaak et al. (1998) [10], Nickel and Raspe (2001) [13] and HTA report: 2 studies.
❷ Included in Verhaak et al. (1998) [10] and Nickel and Raspe (2001) [13]: 5 studies.
❸ Included in Verhaak et al. (1998) [10] and HTA report: 3 study.
❹ Included in Nickel and Raspe (2001) [13] and HTA report: 3 studies.
❺ Included only in Verhaak et al. (1998) [10]: 7 studies.
❻ Included only in Nickel and Raspe (2001) [13]: 7 studies.
❼ Included only in HTA report: 8 studies.

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Trigger Point Injections for Non-Malignant Chronic Pain (Technote)

Alberta Heritage Foundation for Medical Research

ALBERTA HERITAGE FOUNDATION
FOR MEDICAL RESEARCH

Technote

TN 39 DECEMBER 2002

TRIGGER POINT INJECTIONS FOR NON-MALIGNANT CHRONIC PAIN

Request: This response addressed a request from Alberta Health and Wellness and the Regional Health Authorities. The objective of this Technote is to describe the current evidence on the efficacy/effectiveness of using trigger point injections for the management of non-malignant chronic pain and to determine the feasibility of delivering this procedure to patients in regional communities.

BACKGROUND

A definitive definition of pain is elusive because the perception of pain is a combination of subjective experience and physical and psychological response [1]. Pain is generally categorised as acute, cancer-related or chronic. In contrast to acute pain, which is a normal response to tissue damage and resolves as healing progresses, chronic pain is pain that persists after the healing process is complete or is associated with progressive non-malignant disease [2]. The most frequently cited definition of chronic pain is "an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage" that has persisted beyond the normal tissue healing time (usually taken to be three months) [3].

What is a trigger point?

Trigger points can occur in muscle, ligaments, periosteum, tendons, and skin and are associated with many chronic pain conditions including fibromyalgia, myofascial pain syndrome, cervicogenic headache, and reflex sympathetic dystrophy [4-6]. They are

Technotes are brief reports, prepared on an urgent basis, which draw on limited reviews and analysis of relevant literature and on expert opinion and regulatory status where appropriate. They are not subject to an external review process.

hyper-irritable areas which, when palpated, cause pain in distant areas, or referred pain zones, which are specific for each trigger point [4, 5, 7]. This specificity of pain referral is consistent between patients and allows clinicians to find the distantly located trigger points [4, 8].

A myofascial trigger point is a discrete focal tenderness, 2-5 mm in diameter, that is located in distinct tight bands or knots of skeletal muscle [5, 8, 9]. Trigger points can be felt as hard nodular structures within the muscle or fascia and produce a local twitch response when the muscle knot is snapped or palpated [5, 7-9]. The most sensitive spot in the taut muscle band is called the tender spot and differs from a trigger point in that the pain is not referred to a distant area but is experienced in the exact position of the tender point [4].

Trigger points generally occur in stable anatomic positions (most commonly the head, neck, shoulder girdles and lower back) [5], 71% of which correspond to acupuncture points [10]. A trigger point may be active or latent. Both types are hypersensitive but the former display continuous pain in the zone of reference with or without palpation while the latter, which are more common, do not generate spontaneous pain but rather cause restricted movement and muscle weakness [5, 7, 8, 11]. Trigger points are further defined as primary, secondary or satellite. Primary trigger points develop independently of other trigger points while secondary trigger points result from the stress and muscle spasm caused by neighbouring trigger points. Satellite trigger points develop in the referred pain zone as a result of persistent resting motor unit activity [5]. Trigger points can cause muscle spasm and stiffness, hinder muscle extension, reduce the range of motion, and occasionally lead to motor dysfunction and autonomic phenomena (vasoconstriction, coldness, sweating, pilomotor response, ptosis) [12-14].

Epidemiology of non-malignant chronic pain

Chronic muscle pain covers many diagnostic categories including muscle strain, whiplash, repetitive overuse syndrome, fibromyalgia, myofascial pain syndrome, tension headache and low back syndrome [15]. Chronic and recurrent muscle pain is the second most common medical condition behind upper respiratory illness and constitutes the third largest health problem in the United States [1]. Chronic pain affects between 10% and 20% of the American population [15] and these patients, many of whom have had multiple failed interventions, make 70 million visits to physicians and 425 million visits to alternative health care providers each year [16-18]. Consequently, chronic pain is a significant financial burden on the health system.

Patients between the ages of 30 and 49 years have the highest prevalence of trigger points, with women representing a higher proportion of sufferers than men [5]. Myofascial pain is the most common cause of persistent regional pain. Two studies of pain clinic populations found that myofascial pain was responsible for 55% of chronic head and neck pain and 85% of back pain [19, 20].

Trigger point injection

The more invasive therapies available to alleviate chronic pain include acupuncture, electro-acupuncture and trigger point injection. Trigger point injection is the most common interventional technique used in pain medicine [7]. The main objective of trigger point injection is fast pain relief and elimination of muscle spasm in order to break the pain cycle. This facilitates physical therapy aimed at reducing muscle contracture and increasing range of motion [7, 8, 21]. Trigger point injection is rarely used in isolation but is generally part of a multi-disciplinary approach aimed at treating both the trigger points and reducing all contributing factors. Thus, treatment may also include patient education, psychosocial support, oral medications, and physical therapy to improve the strength and flexibility of the affected musculoskeletal systems [7, 9, 13].

Trigger point injection, or direct wet needling, involves injection of fluid directly into the trigger point located in the taut muscle band. Other needling therapies include indirect wet needling in which fluid is injected into the skin or subcutaneous tissue over the trigger point; direct dry needling where a hypodermic or solid needle is aimed directly at the trigger point; and indirect dry needling in which a needle is placed superficially or deep into classic acupuncture points but not directly into the trigger point [12]. Unlike normal muscle, injecting a trigger point is painful [7, 14] but addition of a local anesthetic to the injected fluid can reduce the pain and tissue irritation caused by the needling [8, 22]. A variety of fluids have been injected into trigger points including water, normal saline, local anesthetics (procaine, lidocaine, bupivacaine), vitamin B solutions, long-acting corticosteroids, acetylsalicylate, and Botulinum toxin [7, 14, 23].

The effective treatment of pain that originates in musculoskeletal structures and nerve fibres requires precise identification of its cause and location [22]. Snapping palpation of a taut muscle band can generate a local twitch response which is a valuable objective sign that the trigger point has been accurately pinpointed during needle therapy [13]. Usually, approximately three treatments are necessary to abolish a trigger point completely and these can be performed at intervals ranging from twice a week to once every two weeks [7, 14]. A number of trigger points may be injected in one session, but rarely more than five [7]. The pain relief may last for the duration of the anesthetic to many months, depending on the chronicity and severity of the trigger points and the concomitant treatment of perpetuating factors [8]. Botulinum toxin injection is usually carried out at three monthly intervals [7]. Contraindications for trigger point injection include acute cases of muscle trauma, allergies to anesthetic agents, bleeding disorders, local or systemic infection, and patients taking anticoagulants [5, 13].

How does trigger point injection work?

The precise mechanism by which trigger point injection inactivates the trigger point is currently unknown but several mechanisms have been proposed. These include mechanical disruption of the abnormal muscle fibres and nerve endings; depolarisation of nerve fibres by the intracellular potassium released from disrupted muscle fibres;

interruption of the positive feedback mechanism that perpetuates pain; local dilution of nociceptive substances; increased metabolite removal caused by the vasodilatory effect of the local anesthetic; focal necrosis of the trigger point by the injected substance; and counter-stimulation analogous to the effect of acupuncture [5, 8, 11, 13, 24]. In contrast, more is known about the mechanism of action of Botulinum toxin injection which achieves a reduction in muscle spasm by blocking the release of acetylcholine at the motor end plates [7].

The doubt surrounding the mechanism of action of trigger point injection, together with the fact that dry needling is considered by many authors to be as effective as trigger point injection, has led to suggestions that trigger point injection has little value beyond placebo effect. In addition, it has been suggested that the precise location of the trigger point during injection is more important than the fluid being injected and that it is essential to elicit local twitch response during trigger point injection in order to obtain successful pain relief [13]. The results from a number of studies assessing the reliability of trigger point localisation clearly show that experienced examiners are more reliable than inexperienced ones and that findings derived from palpation are technique sensitive. Thus, trigger point injection has suffered scepticism not only for the perceived lack of benefit when it is used as an isolated treatment but also because doubt still remains as to whether trigger points themselves exist and can be reliably pinpointed.

Potential complications

The most common avoidable complication of trigger point injection is a vasovagal syncopal episode [7, 25]. Other complications can include bleeding, transverse cuts or tears in the muscles, injury to nerve fibres, damage to blood vessels (ecchymosis, hematoma), infection, anaphylactic reaction, allergic reaction to the injected fluid [11, 25], compartment syndrome [25], and injury to internal organs such as the lungs (pneumothorax), intestine, stomach, liver, or kidney [13, 25].

The specific mechanism of action of Botulinum toxin injection means that adverse effects are rare. The most common side effects of Botulinum toxin injection are pain at the injection site, a short-lived flu-like syndrome, malaise, local weakness, and dysphagia [7, 26]. However, serious side effects can develop when muscle weakness is greater than intended or occurs in a non-targeted area. For example, it can be potentially dangerous if the toxin spreads into the muscles that control swallowing following an injection into trigger points near the larynx [26].

DOES TRIGGER POINT INJECTION WORK?

Evidence of the efficacy/effectiveness of trigger point injections

Only one systematic review [12] was available that assessed trigger point injection. However, the review included studies of patients with chronic and acute pain, and it

was impossible to separate the results for the chronic pain patients from those with acute pain. Thus, the review was excluded from assessment but its reference section was examined for any relevant articles that may not have been retrieved by the literature search protocol.

Only three randomised controlled trials (RCTs) met the inclusion criteria (Appendix A). One of these RCTs [27] compared trigger point injection and dry needling in patients with non-malignant chronic craniofacial pain and found no difference between trigger point injection, dry needling, and placebo, even though all of the treatments resulted in a therapeutic benefit. This suggests that a non-specific placebo-related effect was at work rather than an actual treatment effect. However, the follow-up for this study was only 24 hours after each treatment over a study period of three weeks. In addition, the patients were not permitted to undertake any adjunctive treatment while participating in the trial. Therefore, this study attempted to quantify the effects of trigger point injection as an isolated therapy. However, since trigger point injection is not generally recommended as a primary treatment for non-malignant chronic pain but rather as an adjunctive treatment [28, 29], this study offers little in terms of understanding the efficacy of trigger point injection as part of the multi-disciplinary approach to chronic pain management that currently seems most promising [30]. The patient group in this study was also highly selected in that patients with a history of psychiatric illness or drug abuse were excluded. Consequently, these study participants may not be representative of the typical patient presenting with chronic pain.

Another RCT [31] demonstrated that trigger point injection was more effective than sphenopalatine ganglion block in treating myofascial pain in the head, neck and shoulders but with, again, extremely short follow-up of only one week. Psychological details of the study participants were not reported so the potential effect of these factors on prognosis could not be quantified. In addition, patients were permitted to continue other pre-existing therapies during the course of the trial. Since these adjunctive therapies were not described the study results must be interpreted cautiously, as the authors themselves acknowledge, given the likelihood of confounding of treatment outcomes by these additional therapies.

The third RCT [32] found no significant difference between ultrasound therapy and trigger point injection with respect to subjective and objective pain measures in patients after three months follow-up, but both treatments were more effective than neck stretching exercises alone. No attempt was made to exclude patients with psychological problems, which made the study results more generalisable to the 'typical' chronic pain sufferer. Levels of depression and anxiety were measured with the Beck Depression Inventory and the Taylor Manifest Anxiety Scale, respectively, but there was no significant correlation between these indices and measures of pain intensity or pain threshold after treatment. However, the omission of many important details, such as the timing of the treatments and whether the follow-up period was calculated from the initial or final treatment in the protocol, severely limited the value of the study results.

It was also unclear whether the patients were participating in any additional pain management therapy that may have confounded the results.

CLINICAL PRACTICE GUIDELINES

A number of position statements and practice guidelines for the treatment of non-malignant chronic pain have been introduced since 1995, the majority of which recommend an inter-disciplinary treatment team approach that includes physicians, psychologists, and physical/occupational therapists [33]. Trigger point injections are generally considered to be adjunctive rather than a primary form of treatment for chronic pain [28, 29].

In 1999, an evidence-based revision of practice guidelines specifically designed for chronic non-malignant pain syndrome patients was published [33]. The original guidelines, published in 1995, were adopted by the American Academy of Physical Medicine and Rehabilitation in 1996. However, these were based primarily on common practice and consensus among the original authors. The updated evidence-based guidelines found no evidence to support the routine application of trigger point injection for the treatment of patients suffering from chronic pain syndrome. While the guidelines acknowledged that trigger point injection may be widely used in practice, its routine use in chronic pain syndrome patients was not recommended until further evidence demonstrated its efficacy. The routine use of Botulinum toxin injections was also not recommended for these patients because of a similar dearth of evidence [33].

EXPERT OPINION

Expert opinion was obtained from a physician practising in Alberta who specialises in physical medicine and musculoskeletal rehabilitation (Dr Robert Burnham, MD). In his opinion, trigger point injection is not commonly performed in Alberta and is not generally considered to be a mainstream treatment for patients suffering non-malignant chronic pain. However, the technique is routinely used by certain specialised clinician groups such as interventional anesthetists or physical medicine and rehabilitation specialists practicing pain management. Currently there are no clinical practice guidelines available for the use of physical treatments, such as trigger point injection, in treatment of non-malignant chronic pain.

From the clinical perspective, trigger point injection is considered to be an adjunct treatment for chronic soft tissue pain disorders. Trigger point injection acts to dampen the pain enough to allow patients to be more effective with their exercise program and, as such, trigger point injection is a short-term treatment option that compliments rehabilitation or self-applied physical treatments. Even though the art of injecting trigger points is not commonly taught in conventional medical training, expert opinion suggests that it is not difficult to learn and is within the skill set of most general practitioners. In Dr Burnham's opinion, the diagnosis of myofascial pain (in particular,

the correct identification of underlying primary sources of pain that are contributing to the secondary myofascial pain), the palpatory examination required to identify the trigger point(s), and the implementation of appropriate rehabilitation modalities are the most demanding aspect of trigger point injection in terms of the skill and expertise of the practitioner.

Expert opinion was also obtained from an anaesthetist practising in Alberta who specialises in pain medicine (Dr Saifee Rashiq, MD). His views on trigger point injection contrast slightly with those of Dr Burnham in that he believes that this technique is used widely within Alberta by a variety of medical practitioners, most commonly as an isolated treatment rather than as part of a multi-disciplinary pain program. In Dr Rashiq's opinion, trigger point injection is safe, easy to learn, requires minimal equipment, and offers enough pain relief to allow patients to participate in guided exercise therapy. Therefore, it is a good partial solution to pain management for patients in regional/rural areas who may not have access to a multi-disciplinary pain management program, provided that there is a general practitioner available who can offer guidance in remedial exercise therapy.

CONCLUSIONS

Efficacy/effectiveness of trigger point injections

Obtaining unalloyed data on the treatment of chronic pain with trigger point injection was hampered by poor reporting and the common but inappropriate pooling of outcomes from both chronic and acute pain patients, the prognosis of which differs substantially between the two. There was no convincing evidence in the recent literature to indicate that the efficacy of trigger point injection is any more certain than it was a decade ago. There was no proof that trigger point injection is more effective than acupuncture or placebo treatments that mimic trigger point injection, and the only apparent advantage of injecting anesthetic into trigger points is that it reduces the pain of the needling process. This was in agreement with evidence-based clinical practice guidelines for chronic non-malignant pain syndrome which did not recommend the routine use of trigger point injection in patients with this condition. However, drawing any definitive conclusions from the three included RCTs was problematic because they were very heterogeneous in terms of patient population, treatment regimen, injection sites, and experimental protocol. In addition, trigger point injection was only analysed as a stand-alone treatment, except in one study where the other treatment modalities were not specified. Consequently, no information was available to assess the value of trigger point injection within the kind of multi-disciplinary approach to chronic pain management that is currently advocated in clinical practice.

Implications for the use of trigger point injection in rural/regional areas

It is clear that any benefit for trigger point injection is inextricably linked to the training and expertise of the provider. The current literature was unclear as to what type of

provider gives the best results. The search for a palpable band and referred pain are highly sensitive to the amount of examiner training, with the twitch response being the most demanding of training and skill [6]. Consequently, there is still some controversy surrounding the existence of trigger points because of the lack of reproducibility of diagnosis between different examiners [5, 12]. Attempts to establish agreement between examiners on the presence or absence of trigger points in a reliable and reproducible manner have proved difficult, but acceptable inter-rater reliability has been achieved by providing a short period of training to experienced clinicians in order to establish uniform examination techniques [12]. Since there is disagreement between the published literature and expert opinion as to the degree of skill and provider experience required to achieve good results with trigger point injection, it remains unclear whether this will be an important aspect of trigger point injection in rural/regional areas where specific clinical expertise may not be available.

The goal of treatment for chronic pain is not only to reduce pain but also to enable the patient to cope with it [5]. Non-specific general treatment procedures usually fail to remove the etiological factors causing the pain and associated symptoms [22]. Therefore, a multi-disciplinary approach with a therapeutic team comprising an anesthesiologist, clinical psychologist, physical therapist, psychiatrist and social worker is often needed [5]. Trigger point injection is only one of a number of therapies available to alleviate chronic pain. This plethora of treatment options is testimony to the fact that no one strategy has proven successful in all patients and that therapy must be tailored to the needs of the individual patient. It has become increasingly accepted that chronic pain is most successfully treated with a multi-disciplinary approach that requires expertise from a number of medical and non-medical specialties, with trigger point injection comprising only one small facet of such a management program. However, it appears that trigger point injection may be used widely in rural/regional areas in Alberta because it is a simple and safe way of providing patients with enough pain relief to enable them to participate in exercise therapy. Therefore, it is not known whether a lack of availability of multi-disciplinary pain management programs in rural/regional areas currently limits the use of trigger point injection or encourages it.

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APPENDIX A: SUMMARY OF TRIGGER POINT INJECTION RCTS

Trigger Point Injection versus Dry Needling

Authors/ Location	Intervention	Study	Study Population	Results	Comments
McMillan et al. [27] United Kingdom	**1) Active Procaine and simulated dry needling** Percutaneous injection of 0.5 mL of 1% Procaine in the active trigger point with a 27 gauge needle. An acupuncture needle was also placed just into the skin over a non-tender part of the muscle and then removed immediately. **2) Dry needling and simulated local anesthetic** Percutaneous insertion of an acupuncture needle into an active trigger point. The needle was left in situ for 1-2 minutes. A drop of isotonic saline was also introduced just below the skin using a 27 gauge needle over a non-tender part of the muscle. **3) Simulated dry needling and simulated local anesthetic** Insertion of an acupuncture needle just into the skin over a non-tender part of the muscle and then removed immediately. A drop of isotonic saline was also introduced percutaneously in the same area. Treatments were given on three occasions one week apart. **1), 2) & 3)** Adjunctive Treatments: No other medication or treatment was permitted during the study period.	Randomised double-blind double-placebo concurrently controlled trial Follow-up: 24 hours after each treatment Provider: Doctor Setting: Dental hospital admissions department and Temporomandibular Joint Clinic Outcome Measures: ▪ Subjective pain measured on a visual analog scale ▪ Pain pressure threshold measured using an algometer	Sample Size: **1)** n = 10; **2)** n = 10; **3)** n = 10 Patient Diagnosis: Craniofacial pain of myogenous origin Duration of Condition: At least three months Mean Age: **1), 2) & 3)** Range 23-53 yrs Gender Mix: **1), 2) & 3)** F = 100%	Pain pressure thresholds increased slightly after each treatment irrespective of the treatment modality. Pain intensity and unpleasantness scores decreased significantly at the end of the study in all groups. There were no significant between-group differences in pain pressure thresholds and visual analog scale scores at the end of the study.	Highly selected patient group (excluded those with a history of psychiatric illness, drug abuse) that may not be representative of a typical patient experiencing chronic pain. Small sample size.

Trigger Point Injection versus Dry Needling (cont'd)

Authors/ Location	Intervention	Study	Study Population	Results	Comments
Ferrante et al. [31] United States	**1)** **a) Sphenopalatine ganglion block (SPGB) with 4% lidocaine** **b) trigger point injection with 1% lidocaine** **c) SPGB with saline** **2)** **a) SPGB with saline** **b) trigger point injection with 1% lidocaine** **c) SPGB with 4% lidocaine** Each respective treatment within each protocol was given sequentially at one-week intervals. **1), 2) & 3)** Adjunctive Treatments: Other medication or treatment was permitted during the study period but no details of these adjunctive therapies were given.	Double-blind placebo-controlled randomised crossover study Follow-up: One week after each treatment Provider: Not stated Setting: Pain Medicine Centre Outcome Measures: Subjective pain intensity measured on a visual analog scale	Sample Size: **1)** n = 13; **2)** n = 10 Patient Diagnosis: Myofascial pain in the area of the head, neck and shoulders Duration of Condition: ≥ 6 months Mean Age: **1)** 42 yrs (SE ± 3.1) **2)** 38 yrs (SE ± 2.9) Gender Mix: **1)** M/F = 3 (23.1%)/10 (76.9%) **2)** M/F = 3 (30%)/7 (70%)	There was no difference between SPGB with 4% lidocaine and SPGB with placebo for myofascial pain. The analgesic effect of trigger point injection was greater than for SPGB with either 4% lidocaine or saline.	Extremely short follow-up No quantification of possible confounding psychosocial factors. Small sample size.

Abbreviations: SE = Standard error of the mean

Trigger Point Injection versus Ultrasound Therapy

Authors/ Location	Intervention	Study	Study Population	Results	Comments
Esenyel et al. [32] Turkey	**1) Ultrasound therapy plus neck stretching exercises** Ultrasound therapy directed to the trigger point and to the pain referral zone for six minutes in 10 sessions. **2) Trigger point injection plus neck stretching exercises** 1% lidocaine; number of sessions not stated. **3) Neck-stretching exercises** No details stated. **1), 2) & 3)** Adjunctive Treatments: Not stated	Randomised non-blinded concurrently controlled trial Follow-up: 3 months (it was unclear whether the follow-up time started from the initial or final treatment) Provider: Not stated Setting: Patients recruited from the out-patient clinic of the Physical Medicine and Rehabilitation Department and the Pain Clinic of a hospital Outcome Measures: ▪ Subjective pain intensity measured on a visual analog scale ▪ Pain threshold measured using an algometer ▪ Range of motion measures using a large-scale goniometer	Sample Size: **1)** n = 36; **2)** n = 36; **3)** n = 30 Patient Diagnosis: Myofascial trigger points in one side of the upper trapezium muscle Duration of Condition: Range 6 months to 7 years Mean Age: **1)** 32 yrs (SD ± 5.5) **2)** 30 yrs (SD ± 7.7) **3)** Not stated Gender Mix: **1)** M/F = 16 (44.4%)/20 (55.6%) **2)** M/F = 14 (38.9%)/22 (61.1%) **3)** Not stated	Group 1 and 2 had statistically significant increases in pain threshold and range of motion together with a decrease in pain intensity, compared to group 3. These beneficial effects were independent of the severity or duration of pain present before treatment. No significant difference in treatment outcomes between groups 1 and 2.	Patients were highly selected; young patients were chosen to minimise confounding from pain caused by accompanying degenerative disc disease and joint disease.

Abbreviations: SD = Standard deviation

APPENDIX B: SEARCH STRATEGY

Tables 1 and 2 list the databases and information sources searched to identify literature and related materials. Searches were limited to studies published from 1997 onwards.

Table 1: Search strategy for trigger point injection - database searches

Database	Platform	Edition	Search Terms[†]
Cochrane Library		Issue 3, 2002	Pain AND trigger AND injection*
CINAHL	Ovid	Week 1/1982 to February 2002	Pain AND trigger AND injection* (exp Chronic pain/[Prevention and Control, Drug Therapy, Symptoms, Epidemiology, Therapy] OR exp Myofascial Pain Syndromes/) AND trigger
EMBASE	Ovid	Week 1/1988 to June 2002	pain and injection* and trigger (exp Chronic pain/[Prevention, Disease Management, Drug Resistance, Drug Therapy, Epidemiology, Therapy] OR exp Myofascial Pain/) AND trigger
PubMed	NCBI Gateway	Searched 21/08/02	#1 Myofascial Pain Syndromes[MESH] OR chronic disease[MESH] OR pain[MESH] #2 injections[MESH] OR drug therapy[MESH] OR Botulinum toxins[MESH] OR Botulinum Toxin Type A[MESH] OR acupuncture therapy[MESH] OR injection*[all fields] #3 #1 AND #2 #4 #3 AND trigger[all fields]
Science Citation Index	Web of Science	Week 1/1975 to 19/08/02	Pain AND trigger AND injection*
CLIP Database (Clinical Improvements)		Searched 21/08/02	"Chronic pain"; "trigger point" as keywords
Clinical Trials Database (US)		Searched 21/08/02	Pain AND injection; "chronic pain"
CMA Clinical Practice Guidelines Database		Searched 21/08/02	Pain AND trigger AND injection
National Guideline Clearinghouse		Searched 21/08/02	Pain AND trigger AND injection*
NHS CRD (UK)		Searched 21/08/02	Pain AND trigger AND injection*
NHS HTA (UK)		Searched 21/08/02	Pain AND trigger AND injection
National Research Register (UK)		Issue 2, 2002	Pain AND trigger AND injection*
TRIP Database		Searched 21/08/02	"chronic pain" AND injection AND trigger

Note: * is a truncation character that retrieves all possible suffix variations of the root word e.g. surg* retrieves surgery, surgical, surgeon, etc. In databases accessed via the Ovid platform the truncation character is $; [†]Searches limited to human and English language.

Table 2: Search Strategy for Trigger Point Injection - Internet Searches

Search Engine	Date Accessed	Web Address	Search Terms
ANZWERS	21/08/02	www.anzwers.com.au/index.html	Trigger point injection
Google	21/08/02	www.google.com	Trigger point injection
Metacrawler	21/08/02	www.metacrawler.com	Trigger point injection Chronic AND pain AND (trigger OR injection)
Northern Light	21/08/02	www.northernlight.com	Trigger point injection
SCHARR	21/08/02	www.shef.ac.uk/~scharr/ir/netting	“chronic pain”

APPENDIX C: METHODOLOGY

Inclusion and Exclusion Criteria

Types of Studies

Only systematic reviews or RCTs published in English from 1997 onwards were included for analysis. An article was deemed to be a systematic review if it met all of the following criteria as defined by Cook et al. [34]:

1) focused clinical question
2) explicit search strategy
3) use of explicit, reproducible and uniformly applied criteria for article selection
4) critical appraisal of the included studies
5) qualitative or quantitative data synthesis

Participants

Data was collected on patients diagnosed with non-malignant chronic pain of myogenetic origin that had persisted for longer than three months. Patients with acute pain, pain secondary to a defined disease, or pain related to trauma, injury or an organic musculoskeletal disability were excluded unless the data subset for the patients with myofascial pain could be separated from the aggregate data. Animal studies were not included.

Intervention

Trigger point injection, or direct wet needling, involving the injection of fluid directly into a trigger point(s) located within a taut muscle band.

Comparative Intervention

Any medical, mechanical or surgical intervention designed to treat patients with non-malignant chronic pain. Placebo and no treatment comparisons were also included as were studies comparing different treatment regimens within the therapeutic modality of trigger point injection.

Outcomes

The papers included must contain information on at least one of the following outcomes of the new or comparative intervention. These may include but not be limited to:

- Post-treatment morbidity of patients which may include:
  - bleeding
  - nerve injury
  - infection
  - vasovagal syncope
  - allergic reaction

- Post-treatment efficacy measures which may include:
    - pain pressure threshold
    - range of motion
    - subjective pain

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POSTERS

POSTERS

A MODEL FOR PHYSICIAN FUNDING OF PROGRAM DEVELOPMENT ACTIVITIES AS A TOOL TO ENHANCE PHYSICIAN INTEGRATION INTO INTERDISCIPLINARY TREATMENT TEAMS – FIRST TWO YEARS

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ABSTRACT

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Aim of Investigation: To determine the quantity and nature of physician program development (not direct patient care) time required to integrate physicians into an interdisciplinary diagnostic and rehabilitative management program for chronic pain from start-up until 24 months of operation.
Methods: A billing schedule was developed with categories for describing the types of activities in which physicians engaged which were relevant to Centre activities including: team program development, centre program development, projects/meeting preparation, quality improvement, evaluation, professional development*, self-directed learning*, teaching/presentations* – providers, students* and general public, and research* (*funded with prior consent). Six participating physicians who worked at the Centre from 1.0 to 2.5 days per week were requested to submit monthly time sheets specifying the hours and category of activity in order to be paid a fixed hourly rate for these activities. Satisfaction by physicians and Centre staff with the program development funding arrangement was assessed by external outcome evaluators.
Results: Total program development hours submitted by the six physicians in year 1 was 1387 and during the first 6 months of year 2 was 707 (full year 2 results will be available after June 30, 2002). Physicians and Centre staff indicated satisfaction with this funding model.
Conclusions: This funding model is an effective tool to enhance the integration of physicians into interdisciplinary rehabilitation teams.
Acknowledgements: Supported financially by the Calgary Health Region.

BACKGROUND

- Statistics Canada data indicate that 3% of adult Canadians suffer from severe chronic non-cancer pain (1).
- Extensive medical research published over the past 25 years clearly establishes that effective management of severe chronic pain requires the development of interdisciplinary teams and programs (2).
- The Calgary Chronic Pain Centre (CCPC) which opened in July, 2000, is an interdisciplinary, ambulatory, community-based, demonstration project funded by the Alberta Medical Association (AMA), Alberta Health and Wellness (AHW) and the Calgary Health Region (CHR). It currently has 3 patient care programs: musculoskeletal (MSK) pain, pelvic pain in women (PP) and chronic daily headache (HA).
- The Centre integrates physician services into a comprehensive, diagnostic and interdisciplinary, rehabilitation model through the dual strategies of:
  1) a sessional-based Alternate Payment Plan (APP) funded through the AHW Medical Services Budget (MSB) for *identifiable patient associated services*, and
  2) physician program development funding funded by the CHR for *program and Centre related services*
- The interdisciplinary team includes: physical therapists, occupational therapists, psychologists nurses, a dietician, a kinesiologist, a pharmacist and physicians.
- There has been extensive review of physician payment systems primarily addressing direct patient care activities. Little attention has been paid to indirect patient care activities (3-7).
- Procedural specialties improve efficiency with improved technologies. Cognitive specialties improve efficiency and accessibility through the development of "systems of care" utilizing interdisciplinary teams and programs (8-9).
- Physician program development funding facilitates collaboration by physicians with interdisciplinary teams and health care administrators, bridging the gap between health care planning and health services delivery.
- Typically there is no remuneration for community-based physicians for program development activities in a publicly funded, community-based, outpatient, facility such as the CCPC.
- A "disconnection" exists in the planning for delivery of health care services, in that physicians who are the most knowledgeable with regard to patient care issues are not remunerated for their contributions as health planners and consultants.

PURPOSE

1. To document the character and quantity of physician program development activities from start-up until 24 months of operation.
2. To determine physician satisfaction with this program development funding strategy.

METHODS

1. Physician Program Development Hours

A billing schedule was developed with categories for describing relevant program development activities: team program development, centre program development, program development projects/meeting preparation, quality improvement, evaluation, professional development*, self-directed learning*, teaching/presentations* to providers, students* and the general public, and research* (*funded with prior consent).

All participating physicians (5 in year 1, 6 in year 2) who worked at the Centre from 1.0 to 2.5 days per week were requested to submit monthly time sheets specifying the hours and category of activity in order to be paid a fixed hourly rate for these activities. Physician specialties included Physical Medicine and Rehabilitation (N=1, year 1; N=2, year 2), Obstetrics/Gynecology (N=2), Family Medicine/Osteopath (N=1), and Neurology (N=1).

2. Satisfaction Surveys

Toward the end of year 2, survey items were developed by the authors to query physician and non-physician clinician attitudes regarding program development activities. The survey format followed a standard Likert-scaling format which required the participant to use the following response scale:

5	4	3	2	1
Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree

All respondents had the opportunity to add their comments at the end of the survey. Respondents included physicians from the three programs (MSK, PP, HA) and non-physician clinicians including nurses, psychologists, physical therapists, occupational therapists, a kinesiologist and a nutritionist. Physician specialties included Physical Medicine and Rehabilitation (N=2), Obstetrics/Gynecology (N=2), Family Medicine/Osteopath (N=1), and Neurology (N=1). All responses were anonymous.

RESULTS

1. Physician Program Development Hours

Tables 1 and 2 report the hours which physicians spent in program development activities from July 2000 to June 2001, and July 2001 to June 2002, respectively.

Graphs 1 and 2 show the distribution of program development hours by category from July 2000 to June 2001, and July 2001 to June 2002, respectively.

Graphs 3 and 4 show the distribution of program development hours by physician from July 2000 to June 2001, and July 2001 to June 2002, respectively.

Footnote: The Medical Director/MSK Program Director (PB) was responsible for the majority of the non-designated hours due to the lack of initial billing schedule and the wide diversity of activities in the first 6 months. These activities were primarily in descending order, centre program development meetings, program development projects and team program development meetings.

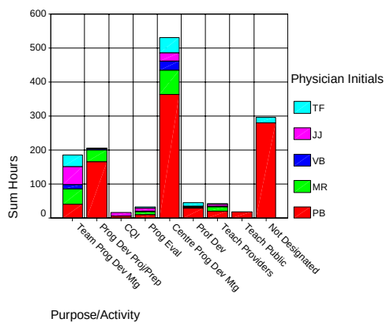
Table 1. First Year -- July 2000 to June 2001

			Physician Initials					First Year Total
			PB	MR	VB	JJ	TF	
			Sum	Sum	Sum	Sum	Sum	Sum
Purpose/Activity	Team Prog Dev Mtg	Hours	41.00	43.75	13.00	53.25	35.50	186.50
	Prog Dev Proj/Prep	Hours	164.50	36.49	3.00	.	2.00	205.99
	CQI	Hours	6.00	.75	.	10.00	.	16.75
	Prog Eval	Hours	10.00	9.00	1.00	9.25	2.50	31.75
	Centre Prog Dev Mtg	Hours	363.25	71.40	26.25	24.50	45.00	530.40
	Prof Dev	Hours	28.75	2.75	1.00	2.00	9.50	44.00
	Teach Providers	Hours	21.00	12.00	2.00	5.00	2.00	42.00
	Teach Public	Hours	19.25	.	.	.	.	19.25
	Not Designated		279.00	.	.	.	17.50	296.50
First Year Total			932.75	176.14	46.25	104.00	114.00	1373.14
		Monthly Avg.	77.73	14.68	3.85	8.67	9.50	114.43

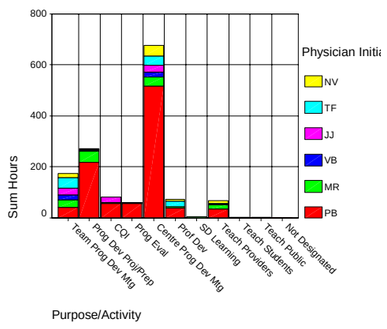
Table 2. Second Year -- July 2001 to June 2002

			Physician Initials						Second Year Total
			PB	MR	VB	JJ	TF	NV	
			Sum	Sum	Sum	Sum	Sum	Sum	Sum
Purpose/Activity	Team Prog Dev Mtg	Hours	40.25	30.00	18.75	28.50	40.50	15.25	173.25
	Prog Dev Proj/Prep	Hours	218.75	43.00	1.00	5.00	2.00	1.25	271.00
	CQI	Hours	58.50	1.00	.	22.75	.	.	82.25
	Prog Eval	Hours	57.00	.50	1.25	.	1.00	1.00	60.75
	Centre Prog Dev Mtg	Hours	516.25	37.00	18.50	28.25	33.50	43.00	676.50
	Prof Dev	Hours	38.50	4.00	.	.	24.00	5.75	72.25
	SD Learning	Hours	.	6.00	.	.	.	.	6.00
	Teach Providers	Hours	34.25	17.25	2.00	.	5.00	8.75	67.25
	Teach Students	Hours	3.25	.	.	.	.	.	3.25
	Teach Public	Hours	2.50	.	.	.	.	.	2.50
	Not Designated		.25	.	.	1.00	.	.	1.25
Second Year Total			969.50	138.75	41.50	85.50	106.00	75.00	1416.25
		Monthly Avg.	80.79	11.56	3.46	7.13	8.83	6.25	118.02

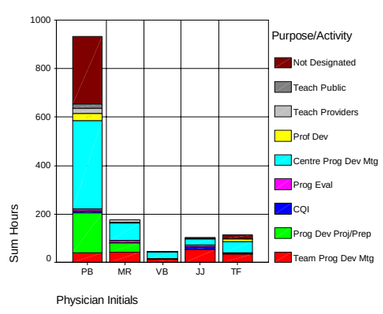
Graph 1 – Dist. of Prog. Dev. by Category July 00 to June 01



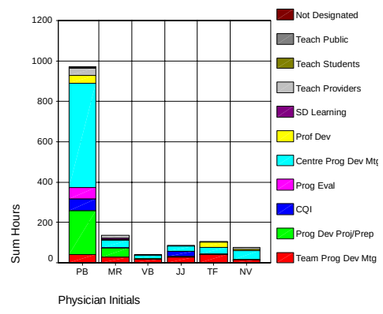
Graph 2 – Dist. of Prog. Dev. by Category July 01 to June 02



Graph 3 – Dist. of Prog. Dev. by Physician July 00 to June 01



Graph 4 – Dist. of Prog. Dev. by Physician July 01 to June 02



2. Satisfaction Surveys

All physicians and 11 of 14 non-physician clinicians returned the surveys. All survey-items were completed. Table 3 is a summary of the quantitative results from the physician survey. Two physicians offered additional comments which are listed verbatim in Table 4. Table 5 is a summary of the quantitative results from the non-physician clinician survey.

Table 3. Physician Satisfaction Survey Responses

	Min.	Max.	Mean
Q.1: I have ample opportunities to participate in program development activities.	3	5	4.50
Q.2: Because I have a physician perspective, I make a unique contribution to the development of the Centre and its programs.	4	5	4.67
Q.3: I believe that my contribution to program development is appreciated.	3	5	4.33
Q.4: Participating in program development activities is a good use of my time.	4	5	4.83
Q.5: I believe that my participation in program development activities improves the quality of patient care at the Centre.	4	5	4.83
Q.6: If I spent more time in program development activities, the Centre would be more effective.	4	4	4.00
Q.7: I feel that I am appropriately compensated for the time which I spend in program development activities.	4	5	4.17
Q.8: Funding is an important enabler for my participation in team and centre program development activities.	4	5	4.67
Q.9: I would participate in program development activities to the same extent as I currently participate even if they were not funded.	2	4	2.33
Q.10: Non-physician clinicians have ample opportunities to participate in program development activities.	4	5	4.50
Q.11: Because of their specific discipline perspectives, the non-physician clinicians make a unique contribution to the development of the Centre and its programs.	4	5	4.83
Q.12: I appreciate the contribution non-physician clinicians make to program development.	4	5	4.83
Q.13: Participating in program development activities is a good use of non-physician clinician time.	4	5	4.50
Q.14: I believe that non-physician clinician participation in program development activities improves the quality of patient care at the Centre.	4	5	4.67

Table 4. Physician Satisfaction Survey Comments

Case	Additional Comments:
1	It has also led to improvements in education and research. Therefore rounds development, MAPP development, and an IASP abstract/paper.
2	The necessary patient programs at the CCPC are complete and involve our time. It is essential that they be carefully planned and adjusted as needed to meet patient needs. This takes time and multi-disciplinary discussion, but makes programs more effective.
3	Program development is a unique opportunity for physicians and non-physicians to communicate, share skills, educate one another and problem solve and lends to the success of the center as a whole.

Table 5. Clinician Satisfaction Survey Responses

	Min.	Max.	Mean
Q.1: I have ample opportunities to participate in program development activities.	2	5	4.09
Q. 2: Because I have my specific discipline (e.g., PT, OT, Psychology, Nursing, etc.) perspective, I make a unique contribution to the development of the Centre and its programs.	1	5	4.27
Q. 3: I believe that my contribution to program development is appreciated.	3	5	4.00
Q. 4: Participating in program development activities is a good use of my time.	4	5	4.36
Q. 5: I believe that my participation in program development activities improves the quality of patient care at the Centre.	4	5	4.45
Q. 6: If the physician on our team spent more time in program development activities, the Centre would be more effective.	2	5	3.55
Q. 7: The physicians have ample opportunities to participate in program development activities.	2	4	3.27
Q. 8: Because of their physician perspective, the physicians make a unique contribution to the development of the Centre and its programs.	3	5	4.09
Q. 9: I appreciate the contribution physicians make to the program development.	4	5	4.27
Q. 10: Participating in program development is a good use of physician time.	3	5	4.18
Q. 11: I believe that physician participation in program development activities improves the quality of patient care at the Centre.	3	5	4.18

PB – Medical Director/MSK Program Director; MR – Pelvic Pain Program Director; VB – Headache Program Director; JJ – Pelvic Pain Physician; TF & NV – MSK Physicians

CONCLUSIONS

1. Physician Program Development Hours

- Program development activities are integral to the on-going operation of an interdisciplinary centre as comparable numbers of hours were submitted in both the first (1373.40 hours) and second years (1416.25 hours).
- The majority of program development time was spent in centre program development meetings, followed by individual time spent on program development projects and thirdly, team program development meetings.
- The monthly physician commitment was highly variable ranging from 3.85 to 77.73 hours in the first year and from 3.46 to 80.79 hours in the second year.
- The monthly physician commitment was proportional to the physician role in the Centre as well as the amount of new development required by the program in which the physician participated.
  - o VB was the program director for the Headache Program which had the least amount of new development as this program was a modification of a well-established pre-existing headache clinic;
  - o MR was the program director of the Pelvic Pain Program which is a prototype in Canada and likely North America;
  - o PB was the medical director for the Centre as well as the program director for the MSK Program.

2. Satisfaction Surveys

Physician and non-physician clinicians:

- Viewed participation in program development activities as a highly valued professional activity
- Valued the contributions of others
- Believed that their contributions were:
  - o unique due to their discipline perspective
  - o lead to improvements in quality of care
  - o appreciated by others

Non-physician clinicians:

- Were less certain than physicians:
  - o that physicians have ample time to contribute to program development
  - o that further physician involvement in program development would lead to further improvement in quality care

Physicians:

- Viewed funding for program development activities as an important enabler of participation
- Indicated that participation in program development activities would be reduced if program development activities were not funded

3. Overall

- To our knowledge, this is the first documentation of the quantity and character of program development time from start-up until 24 months, required to integrate physicians into an outpatient, interdisciplinary, diagnostic and rehabilitative management program for any patient population, including chronic pain.
- Program development funding has been an effective tool to enhance the integration of physicians into interdisciplinary rehabilitation teams.

RECOMMENDATIONS

1. When initiating new interdisciplinary programs, it is critical to budget for physician program development funding.
2. An administrative paradigm shift is needed in which the physician contribution to the development of "systems of care", interdisciplinary teams and specialized comprehensive programs is considered a valid and justifiable health care expense in order to improve the performance of the health care system.

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ACKNOWLEDGEMENTS

The authors would like to acknowledge the financial support of: the Calgary Health Region for providing physician funding for these program development activities; the Alberta Medical Association and Alberta Health and Wellness for funding the physician alternate payment plan; and Alberta Health and Wellness for most other aspects of the Calgary Chronic Pain Centre.

The Intimacy Group: Enhancing Sexual Functioning of Women Living with Chronic Pain.

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calgary health region
Care in the Community

INTRODUCTION

- Paucity of research on treatment of the effects of chronic pain on sexuality
- Health care practitioners may avoid addressing sexual difficulties due to time pressure, lack of knowledge, and discomfort
- Treatment of sexual functioning in other pain populations often dichotomized between psychological and physiological factors

SETTING

- The treatment approach at the Calgary Chronic Pain Centre (CCPC) integrates medical management, rehabilitation, and self management and is provided via individual and group formats, within an interdisciplinary setting

AIM

- To determine the effectiveness of a group treatment designed to target the effects of chronic pain on women's sexuality

METHOD

Participants

- 27 women, ages 20 to 57 years
- With Musculoskeletal, Pelvic, and Daily Headache pain
- Self-identified impact of chronic pain on sexuality
- 3-6 participants per group (6 groups)

METHOD

Measures

- Sexual Activity Questionnaire (SAQ) (Fallowfield, 1996), instructions modified with permission
- Treatment Helpfulness Questionnaire (THQ)

Procedure

- SAQ administered pre-group and 1 month post-group
- THQ administered at last session

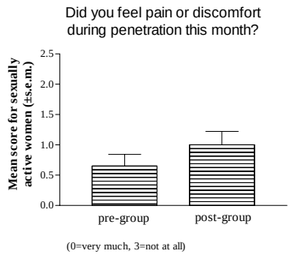
Treatment Group

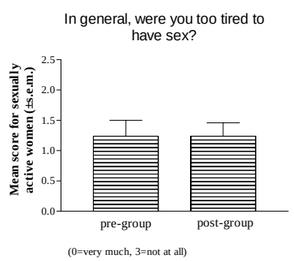
- Four 2-hour sessions over one month.
- Co-facilitated by physical therapist and psychologist.
- Content of the group:
  - ***Impact of pain on sexual functioning***
  - ***Myths related to sexuality***
  - ***The "Pleasure Model" versus Traditional/Goal Oriented Model***
  - ***Communication re: sexuality***
  - ***Sensate focus***
  - ***Fantasies***
  - ***Pelvic floor muscles***
  - ***Relaxation***
  - ***Positions***
  - ***How to manage pain increases related to sexual activity***

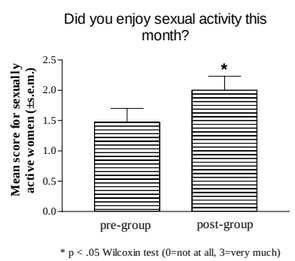
Data Analysis

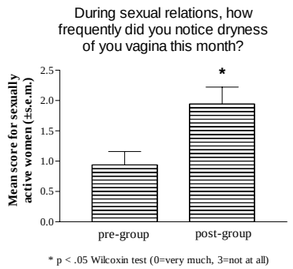
- Wilcoxon Signed Rank Tests for SAQ scores of women sexually active pre-group and post-group (n = 17)
- Content analysis of qualitative data, participants' comments on the THQ

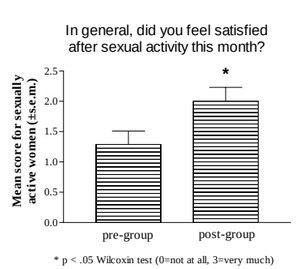
RESULTS

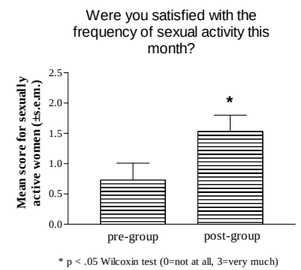












Qualitative

- Content analysis revealed themes including:
  - **"eye opener", "working toward a broader view"**
  - **"better connection"** with partner**, "material helpful to share", "learned many ways of communicating"**
  - "**not very different from other women**", "**more comfortable with self", "more capable**"
  - **"sensate focus most beneficial part", "now aware of the role of relaxation",** and, overall, "**opened up a ton of new possibilities**".

Other

- 66% (6/9) of women not sexually active prior to group became sexually active after group
- 74% (n= 20) strongly agree and 26% (n= 7) agree the group was helpful

DISCUSSION

- No significant difference in pain during penetration
- Yet, the women reported increased enjoyment, lubrication, satisfaction after sexual activity, and satisfaction with frequency
- Mechanism of change?
  - Physical? No change in pain level or fatigue level
  - Cognitive? Restructuring of expectations, broadening view of sex to include non-penetrative activities
  - Behavioral? Successful engagement in sexual activities with the application of tools such as sensate focus
  - Interpersonal? Improved communication with partner

CONCLUSIONS

- Sexual functioning of women with chronic pain can be significantly enhanced via group treatment without significant change in pain level during intercourse
- Future research will include: control group, identification of the mechanisms of change, durability of change, and inclusion of partners and male clients

http://www.calgaryhealthregion.ca/ccpc

Improving Patient Flow in a Multidisciplinary, Client-Centered Pain Program

Calgary Chronic Pain Centre, Calgary, Alberta

Mission

To improve patient flow by:

- Increasing the number of patients in active treatment
- Decreasing number of no-show/cancellations
- Decreasing resource utilization
- Decreasing treatment duration

Commencement Date

November 2001

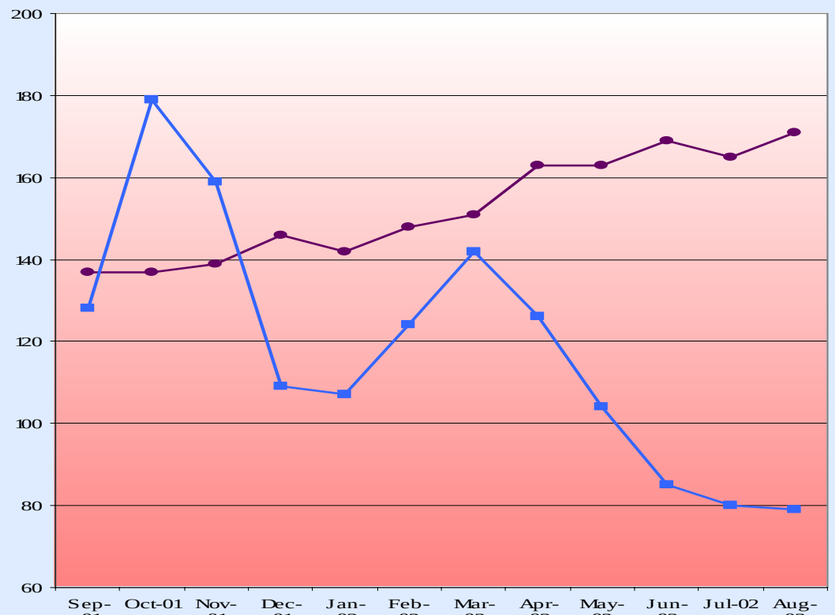
Changes Made

- Specialized goal attainment measures
- Detailed “Decision Rules”
- Tracking Database to Monitor Resource Utilization (see Gantt Chart)
- No-Show/Cancellation Policy

Challenges

- Complexity of Task
- Customization of changes to suit each program Team

Number of Patients in Active Tx & No-Show/Canc.

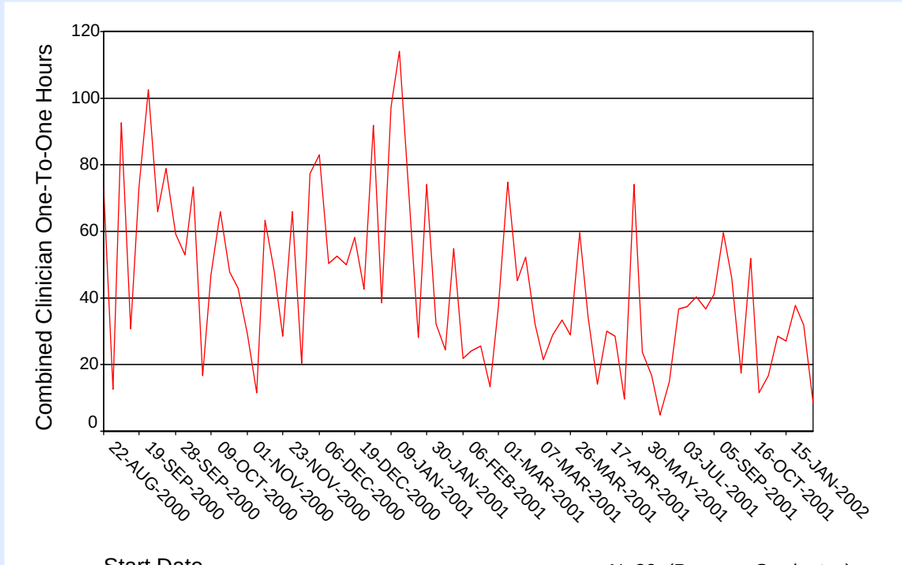


Future Plans

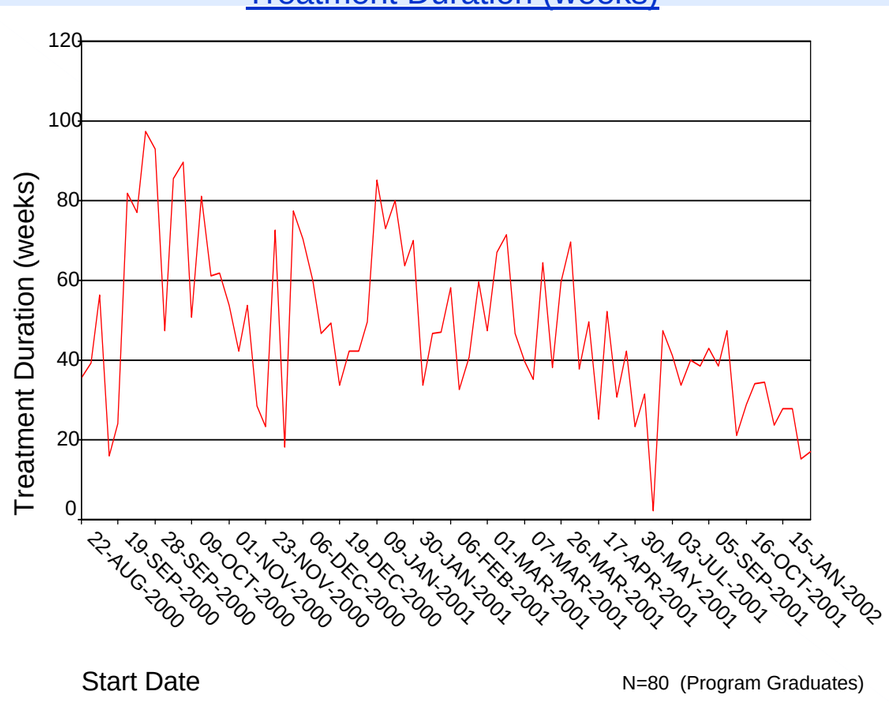
- Further testing and wider implementation of changes proposed by the project team
- Monitoring indicators (e.g., number of patients in active treatment, no-show/cancellations, resource utilization, treatment duration)
- Ongoing re-evaluation of changes and continuous quality improvement

In addition to improving patient flow, another anticipated outcome is the reduction of resource utilization and length of time in the program for those patients who are not making progress toward their goals – i.e., not benefiting from treatment resources/programs.

Resource Utilization (hours)



Treatment Duration (weeks)



Team Members: P. Taenzer, PhD; P. Barton, MD; J. Jarrell, MD; S. Habermann, MEd; G. Schultz, PhD; S. Basiuk, RN; K. Bannister, MOA; Y. Claveau, MScPT; D. McNamara, RN

Nutrition Programming within a Chronic Pain Setting

calgary health region
Care in the Community

T. Riege, RD. Calgary Chronic Pain Centre, Calgary, Alberta, Canada

Purpose

❑ To describe a triage nutrition intervention model for the chronic, non-cancer pain population which improved the utilization of limited nutrition program resources.

Process

❑ Nutrition intervention progressed from a team referred, individual counseling model to a triage intervention model involving patient or team initiated referrals, group teaching and individual follow-up.

Project Summary

❑ Patients learned the relationship between nutrition and chronic pain during a mandatory introductory lecture.

❑ Interested patients self- referred or were referred by the team to the nutrition program and were channeled into the nutrition workshop or to individual counseling.

❑ Post-workshop, those with more specific nutrition concerns continued with individual follow-up.

Outcomes

❑ 50% reduction in dietitian time per patient

❑ 2 hours per patient to assess and provide basic nutrition education on a individual basis.

❑ 45 minutes per patient to reach the same level of assessment and education in a group setting.

Conclusions & Recommendations

❑ The practitioner to patient time ratio improved using the triage intervention model.

❑ Implementation of the following will further improve the utilization of limited (0.4 FTE) nutrition program resources:

- A nutrition screening tool
- Independent learning tools
- Nutrition education modules specific to the chronic pain population.

Patient Profile

❑ Three interdisciplinary programs – chronic daily headache, pelvic pain in women, musculo-skeletal pain;

❑ Nutrition concerns in chronic pain include:

- Food sensitivities
- Headaches with food triggers
- Irritable bowel syndrome
- Macro- & micronutrient insufficiencies
- Medication induced bowel dysfunction
- Disordered eating & weight concerns

Table 1. Nutrition Program Impact

Centre Admissions (Sept. 2000 to March 2003)	Nutrition Program Patients (April 2001 to March 2003)	Impact
370	135	36.5%

Figure 1. Nutrition Education Triage Process

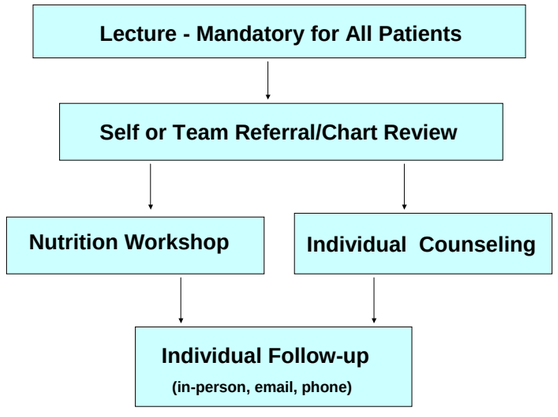


Table 2. Triage Nutrition Intervention Model Outcomes

Parameter	Total	Workshop	Counseling
Number of Referrals (Sept 2001 to May 2003)	126	59	67
Total Time Utilization (hours)	181	46	135
Average Time/Session (hours)	__	2.9	2.0
Average # Patients/Session	__	3.7	1.0
Average Time/Patient	__	47 minutes	2.0 hours

Figure 2. Proposed Nutrition Education Triage Process

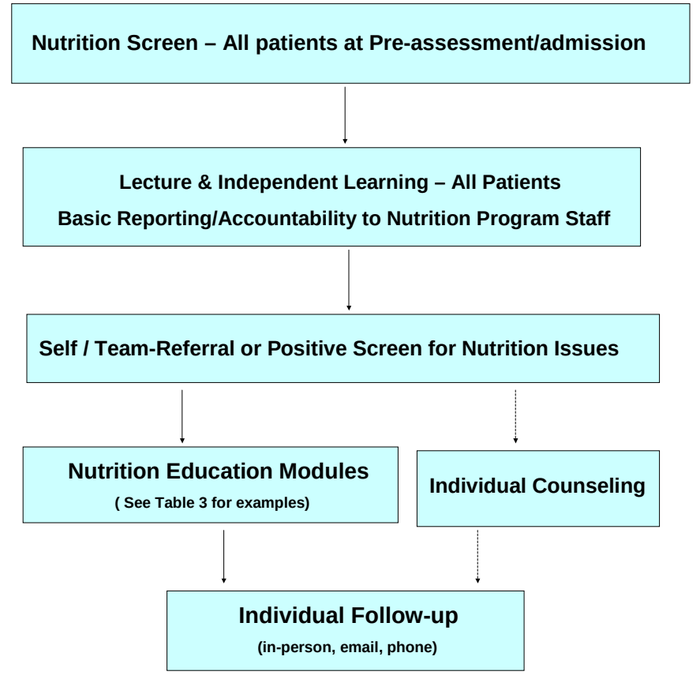


Table 3. Proposed Nutrition Education Modules

- Nutritional Management of Irritable Bowel Syndrome
- Nutritional Management of Medication Induced Bowel Dysfunction
- Determining Food Sensitivities – Elimination and Challenge Diets
- Managing Food Sensitivities - What to Eat?
- Headaches and Food Triggers – Beyond Red Wine and Chocolate!
- Vitamin and Mineral Nutrition in the Management of Chronic Pain
- Nutrition Alternatives in Chronic Pain Management

Table 4. Projected Outcomes for Proposed Triage Process

Nutrition Intervention	Impact
Nutrition Screening	100% of patients
Lecture & Independent Learning	100 % of patients
Advanced Nutrition Modules	60%
Individual Counseling	10%
Follow-up (in-person, email, phone)	70%

Preliminary Outcomes for an Innovative Community-Based Interdisciplinary Chronic Pain Centre

Pamela Barton, MD, FRCPC, Paul Taenzer, PhD, Geoffrey Schultz, PhD, Sharon Habermann, MA, MEd – Calgary Chronic Pain Centre, Calgary AB

AIM

The Calgary Chronic Pain Centre was established in July 2000 as a two-year pilot project funded through the Alberta Tripartite Process on Health Care Reform. The aim of this project was to assess the impact of this model of care on the clinical outcomes and quality of life for patients with chronic non-cancer pain (CNCP).

METHODS

Program Description

The program offers a comprehensive, interdisciplinary assessment and treatment for patients who have CNCP in three areas:

1)Chronic daily headache

2)Pelvic pain in women

3)Musculoskeletal pain

The individualized patient-centered care integrates specialized medical and other interventions directed toward resolving pain generators with patient skill development in pain self-management strategies, appropriate lifestyle modifications and physical reconditioning. Treatment is provided in both individual and group formats.

Treatment intensity and length of stay in the program are dependent up individual patient needs and goal attainment. During the pilot project, patients were required to meet specific entry criteria in order to access services at the Centre.

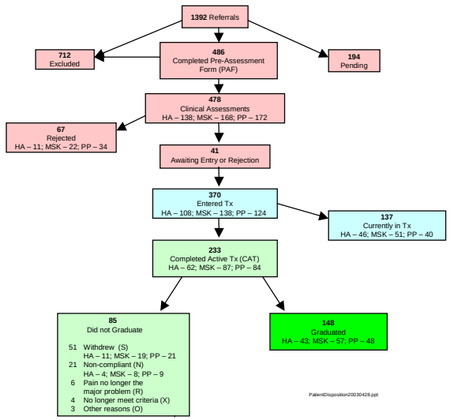
Outcome Measures

Pain intensity changes, Multidimensional Pain Inventory (MPI), Pain disability Index (MPI), Headache Disability Inventory (HDI), SF 36 Quality of Life Scale, and patient satisfaction with care

RESULTS

Clinical outcomes are presented for patients who had graduated from the CCPC program as of March 31, 2003.

Figure 1. Disposition of all patients referred during the study period.



Figures 2a, 2b, 2c. Demographic characteristics of program graduates (N=148)

2a. **Gender & Age**	MSK	Headache	Pelvic	Total	% of Total
Males	9	9	0	18	12.2
Females	48	34	48	130	87.8
Average Age (yrs)	46.1	42.5	36.3	41.9	

Figure 2b. **Marital Status**

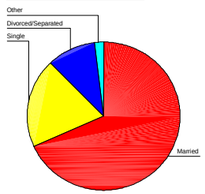


Figure 2c. **Education**

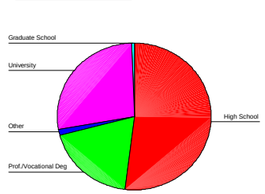


Figure 3. Average number of treatment hours.

Figure 4. Reductions in average pain intensity (N=95/148).

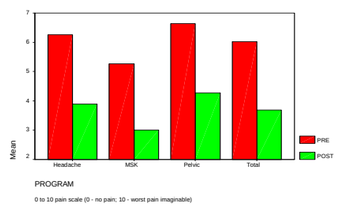


Figure 5. Change in Pain Disability Index scores (MSK & Pelvic only, N=42/105).

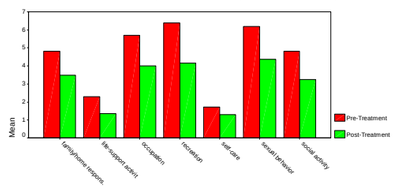


Figure 6. Change in Headache Disability Inventory scores (Headache only, N=29/43).

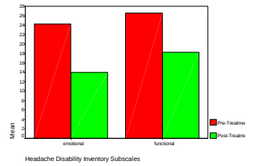


Figure 7. Change in Multidimensional Pain Inventory scale scores (N=77/148).

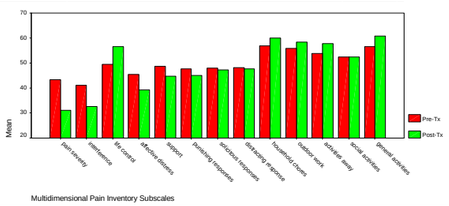


Figure 8. Change in SF 36 scale scores (N=40/148).

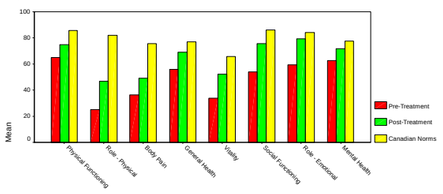


Figure 9. Patient satisfaction with treatment (N=78/148).

Patient Satisfaction

	Program			
	MSK	Headache	Pelvic	Total
	Mean	Mean	Mean	Mean
Overall Assessment	4.50	4.28	4.31	4.35
Overall Treatment	4.56	4.41	4.42	4.46
Coordination of Care	4.32	4.55	4.35	4.41
Communication with GP	3.78	3.77	3.95	3.83
Overall Program	4.56	4.61	4.56	4.58

Based on a 5-point rating scale: 1 = Extremely Harmful, 2 = Harmful, 3 = Neutral, Helpful, 5 = Extremely Helpful

CONCLUSIONS

These data suggest that this model of care is effective for these patient populations. Further research is required to determine the societal and health-care system impacts of the model.

PRESENTATIONS

A

HEALTH AND WELLNESS

Prevalence and Management of Chronic Pain

Maria Ospina, Christa Harstall, Don Juzwishin
Alberta Heritage Foundation for Medical Research

Prevalence and Management of Chronic Pain

Christa Harstall, Maria Ospina,
Don Juzwishin

September 17, 2003

Objectives

- Highlights from our two recent reports
- Snapshot of worldwide interest

Prevalence

- Acceptable quality
- Chronic pain (CP) prevalence estimates varied from 10% to 55% (wt mean 35.5%)
- Estimates of severe CP 10% to 13% (wt mean 11.8%)
- Increased prevalence in females
- Significant use of health care resources
- Wide variations preclude generalization

Multidisciplinary Pain Programs

- CPGs recommend interdisciplinary or multidisciplinary team approach
- Low back pain (effective)
- Pelvic pain (likely to be effective)
- Neck and shoulder pain, fibromyalgia and widespread pain (inconclusive)
- Economic impact (inconclusive)

Worldwide Interest

- Worker's Compensation Board (Alberta)
- Aetna (U.S.)
- International Association for the Study of Pain

Chronic Pain in Alberta: A Portrait from the 1996 National Population Health Survey and the 2001 Canadian Community Health Survey

Dr. Saifee Rashiq
Paul Taenzer
Donald Schopflocher

Chronic Pain in Alberta:

A portrait from the 1996 National Population Health Survey and the 2001 Canadian Community Health Survey

Donald Schopflocher
Alberta Health and Wellness
Paul Taenzer
Calgary Pain Centre
Saiffee Rashiq
University of Alberta

Overview

- Individuals were defined as suffering chronic pain from responses to the 1996 NPHS survey
- Prevalence estimates were derived
- Further analyses consisted of comparisons between individuals with and without chronic pain
  - on NPHS variables
  - on linked health utilization measures

The National Population Health Survey Pain Questions

Prelude (presented at the beginning of the HUI questions):
The next set of questions asks about your day-to-day health. The questions are not about illnesses like colds that affect people for short periods of time. They are concerned with a person's usual abilities.

Are you *usually* free of pain and discomfort?

1. Yes (skip to next section)
2. No

How would you describe the *usual* intensity of your pain or discomfort?

1. Mild
2. Moderate
3. Severe

How many activities does your pain or discomfort prevent?

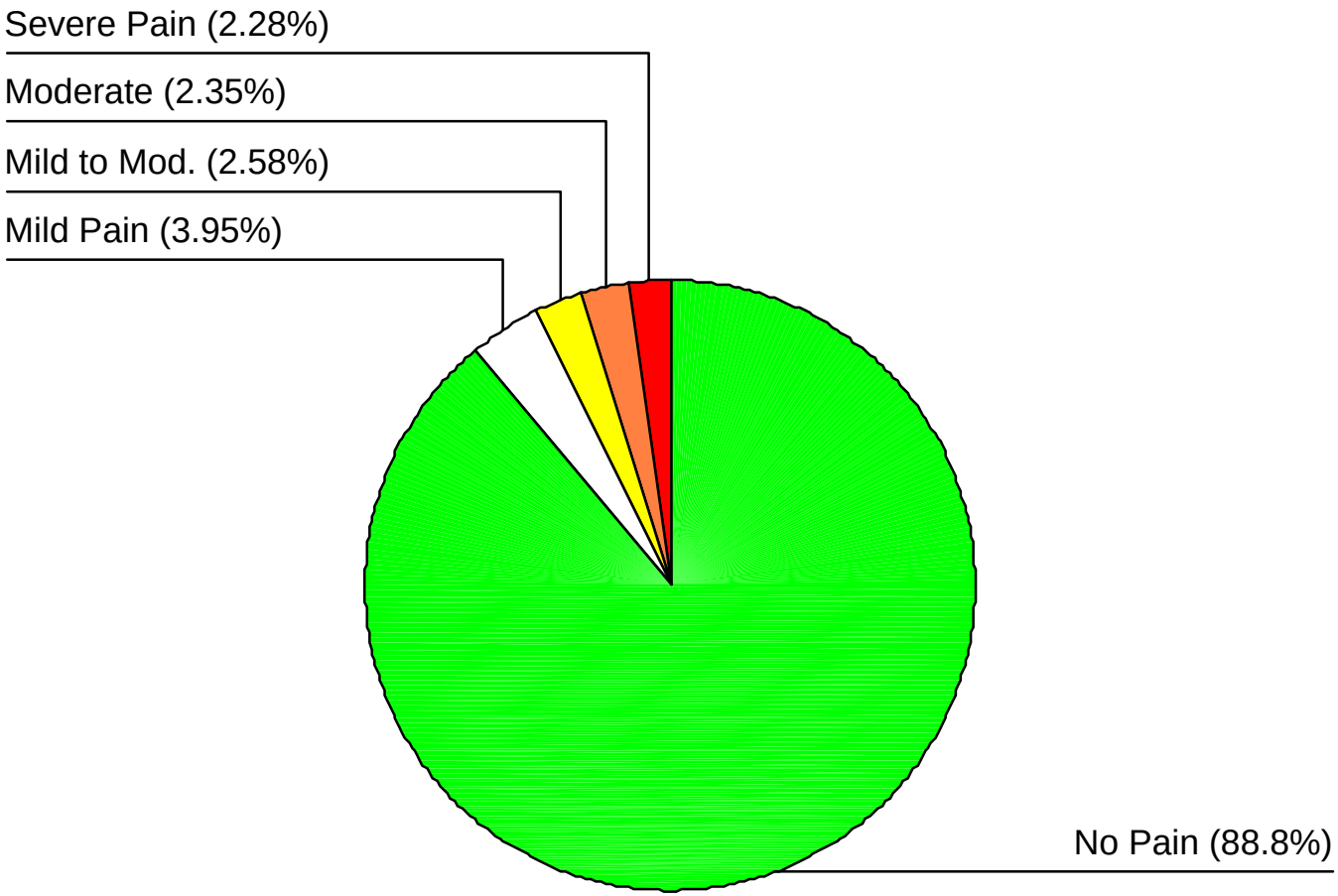
1. None
2. A few
3. Some
4. Most.

Estimated population by pain categories

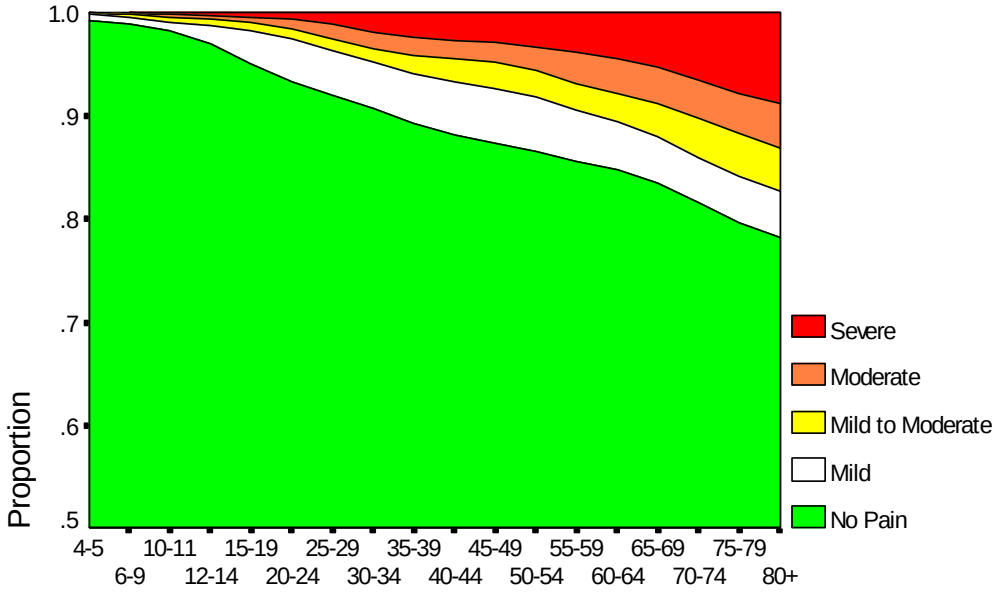
	Severity				
	No Pain	Mild	Moderate	Severe	
Activity					Total
No Pain	2,284,477				2,287,447 88.8%
Doesn't Prevent Activities		40,248	27,648	**2,941**	70,836 2.8%
Prevents Few Activities		33,756	**47,181**	**3,460**	84,396 3.3%
Prevents Some Activities		**16,337**	**52,511**	**9,508**	78,356 3.0%
Prevents Most Activities		**4,498**	**26,952**	**22,151**	53,600 2.1%
Total	2,287,447 88.8%	94,838 3.7%	15,4291 6.0%	38,059 1.5%	2,571,666 100%

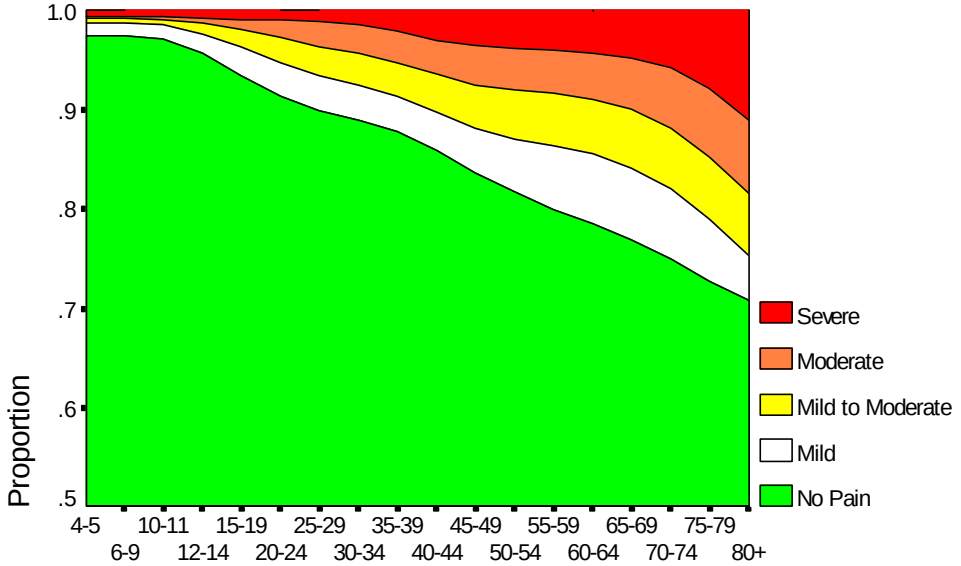
Red indicates severe chronic pain, orange indicates moderate chronic pain, and yellow indicates mild to moderate chronic pain.

Proportion of Albertans age four and over by chronic pain category, 1996

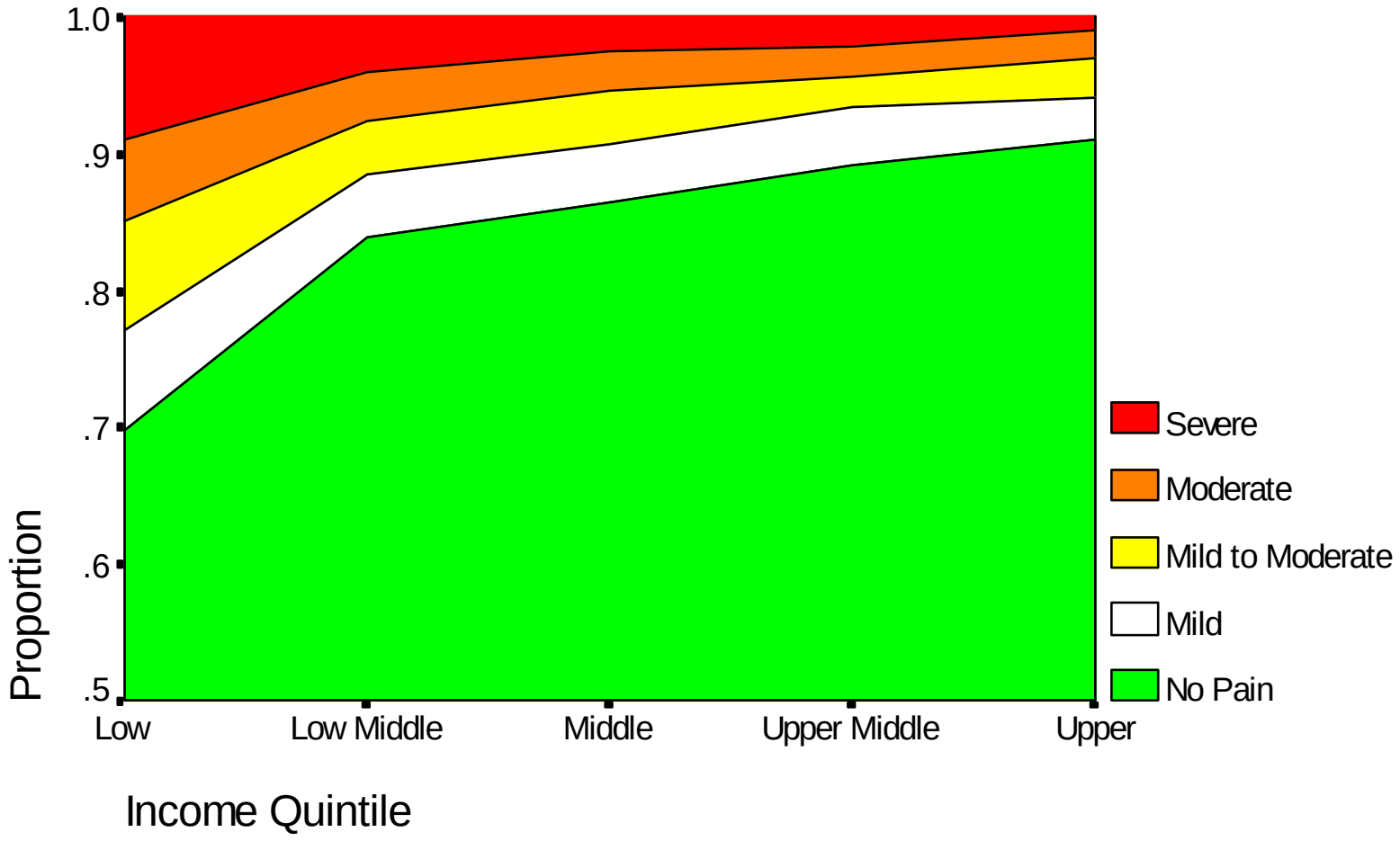


Relationships with Age and Sex





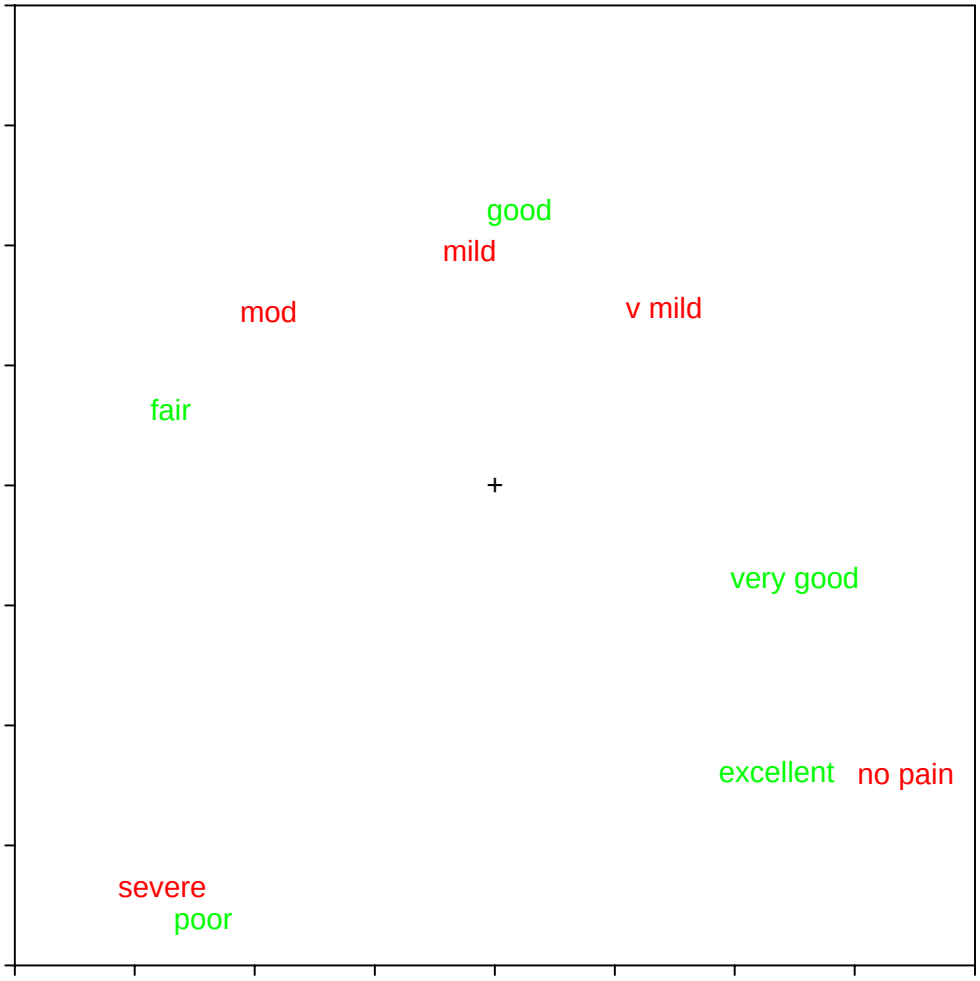
Relationships with Family Income



	Pain Classification				
Self Reported Health	No Pain	Mild	Mild to Mod	Mod	Severe
Excellent	32.9	13.3	4.7	4.0	3.0
Very Good	38.9	31.2	23.8	11.8	10.1
Good	23.5	37.5	37.9	32.0	19.9
Fair	3.9	16.2	25.6	39.3	31.9
Poor	0.7	1.8	8.0	12.9	35.2

Relationships with Self Reported Health

Biplot: Self-Reported Health and Self Reported Chronic Pain



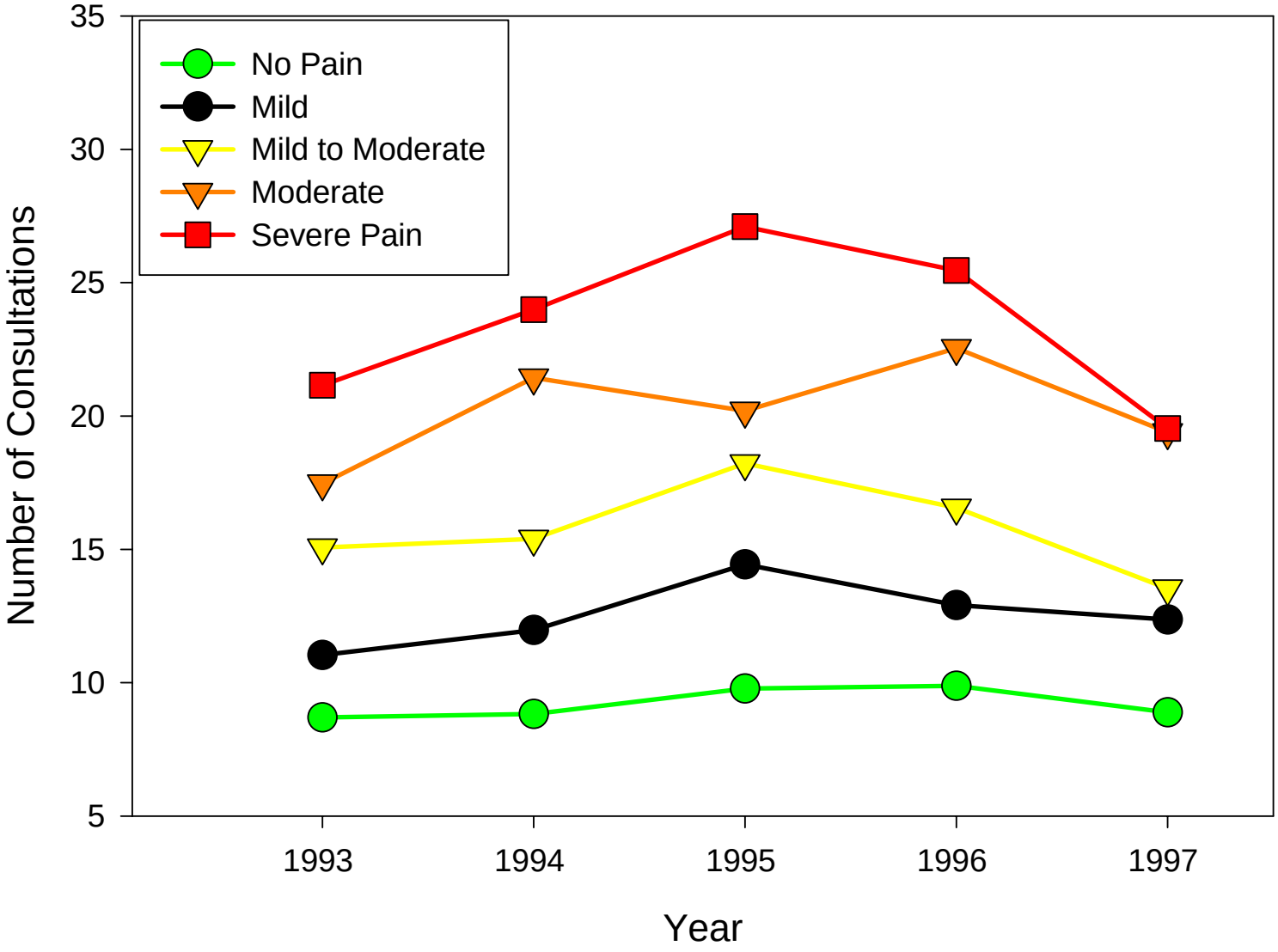
Relationships with health status measures

	Pain Classification					
	No Pain	Mild	Mild to Moderate	Moderate	Severe	
Distress Scale	2.26	3.46	3.74	4.53	6.45	
Probability of Depression	.04	.11	.14	.16	.25	
Number of Chronic Diseases						
0	48.1	21.3	10.2	8.3	4.2	
1	27.7	27.1	23.4	20.7	17.7	
2	13.3	25.2	26.5	20.6	22.2	
3	6.2	11.7	14.5	15.4	17.1	
4 or more	4.7	14.7	25.4	35.0	38.8	
Activity Limitations	.10	.27	.53	.64	.85	
Proportion Inactive	.04	.11	.14	.16	.25	
Disability Days	.63	1.15	2.35	3.19	6.19	

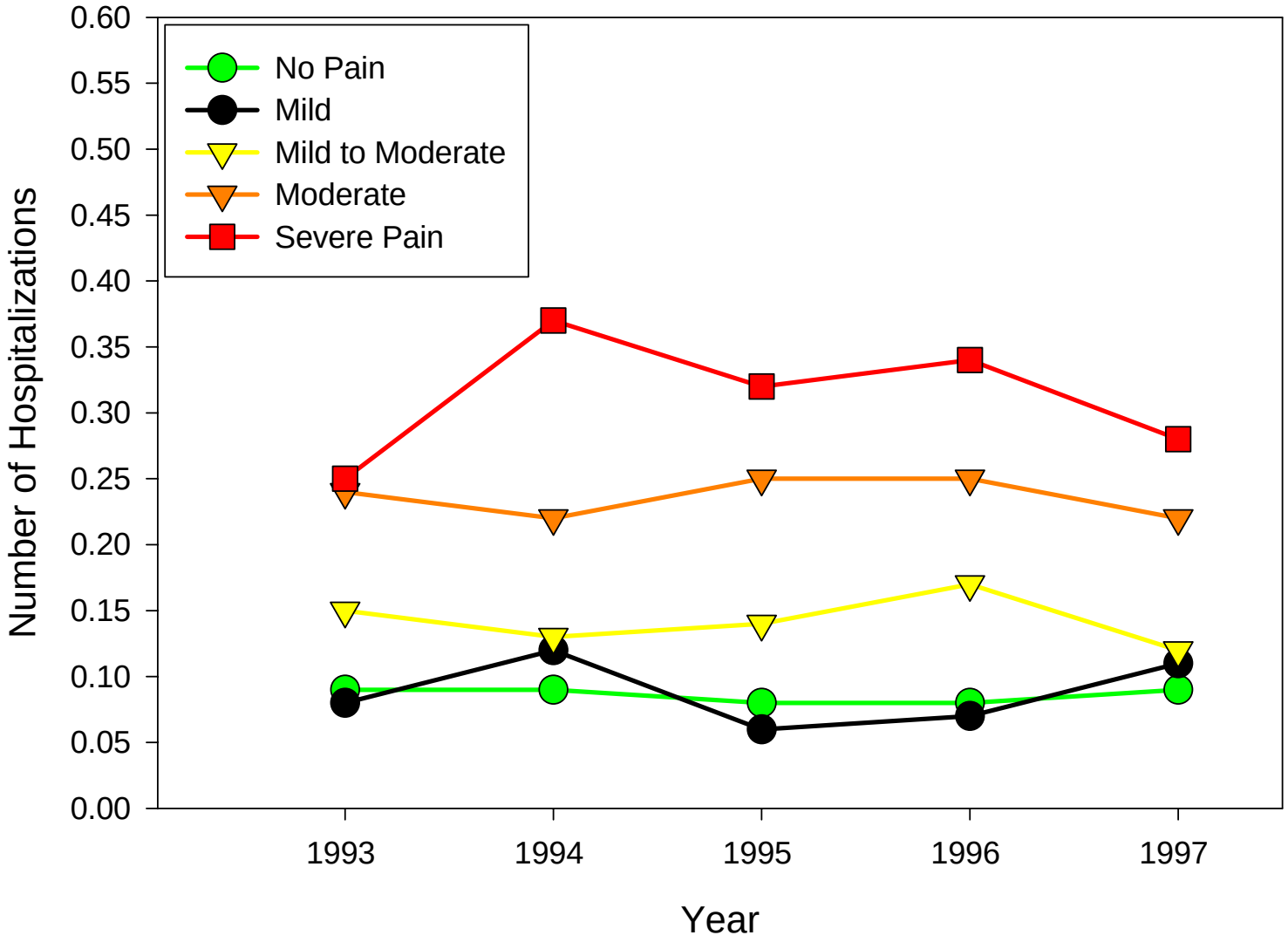
Relationships with self-reported health utilization measures

	Pain Classification					
	No Pain	Mild	Mild to Moderate	Moderate	Severe	
Proportion Hospitalized	.06	.08	.14	.16	.24	
Consultations	3.43	5.79	8.90	9.93	13.42	
Prop. Unmet Needs	.06	.14	.19	.25	.29	
Alternate care	.07	.11	.13	.17	.15	
Self Help Group	.03	.04	.04	.08	.07	
Pain Relievers	.67	.81	.86	.87	.88	
Narcotics	.05	.10	.16	.18	.31	
Number of Medications	.79	1.23	1.80	2.03	2.85	

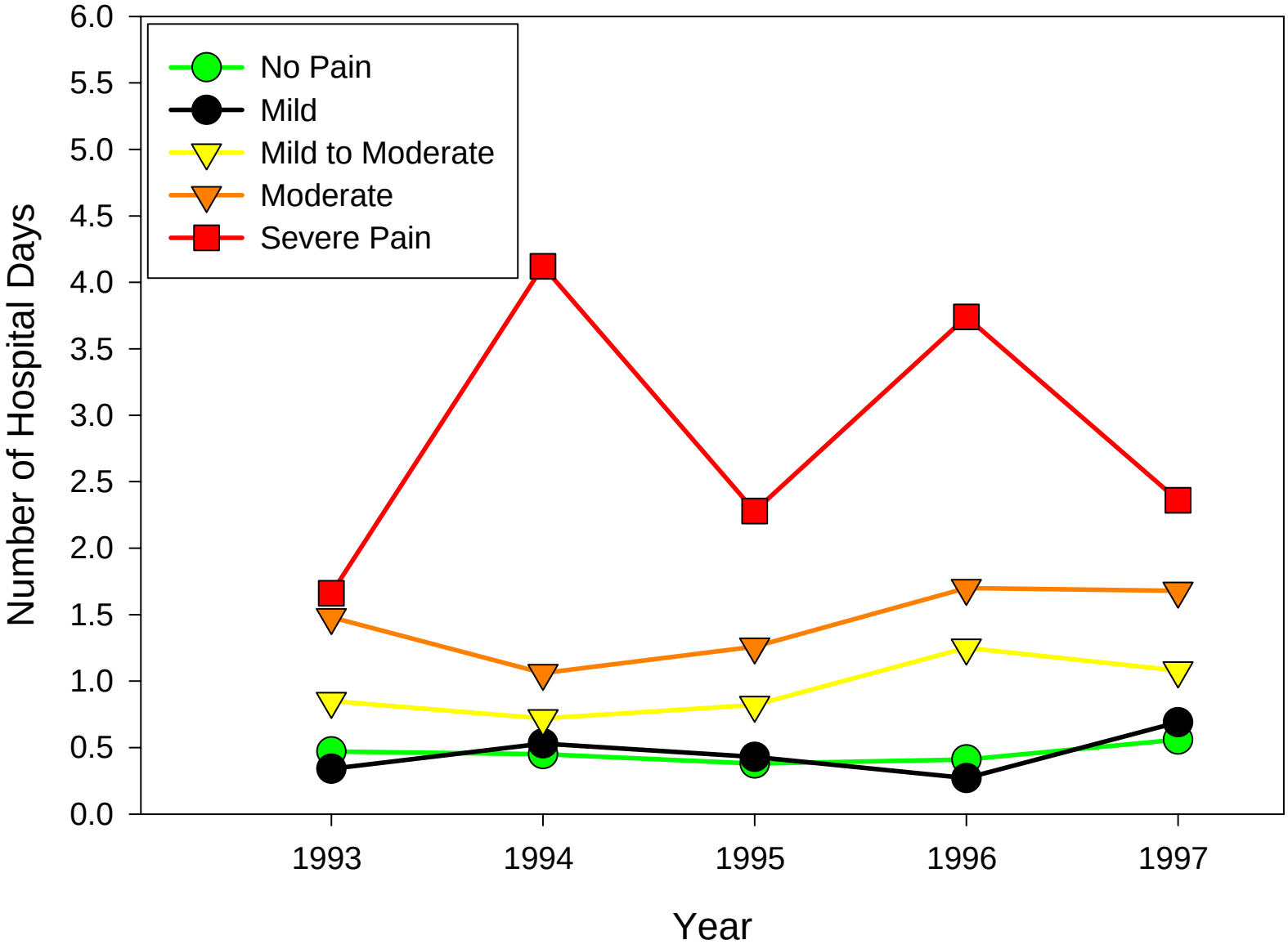
Pain Category and Outpatient consults



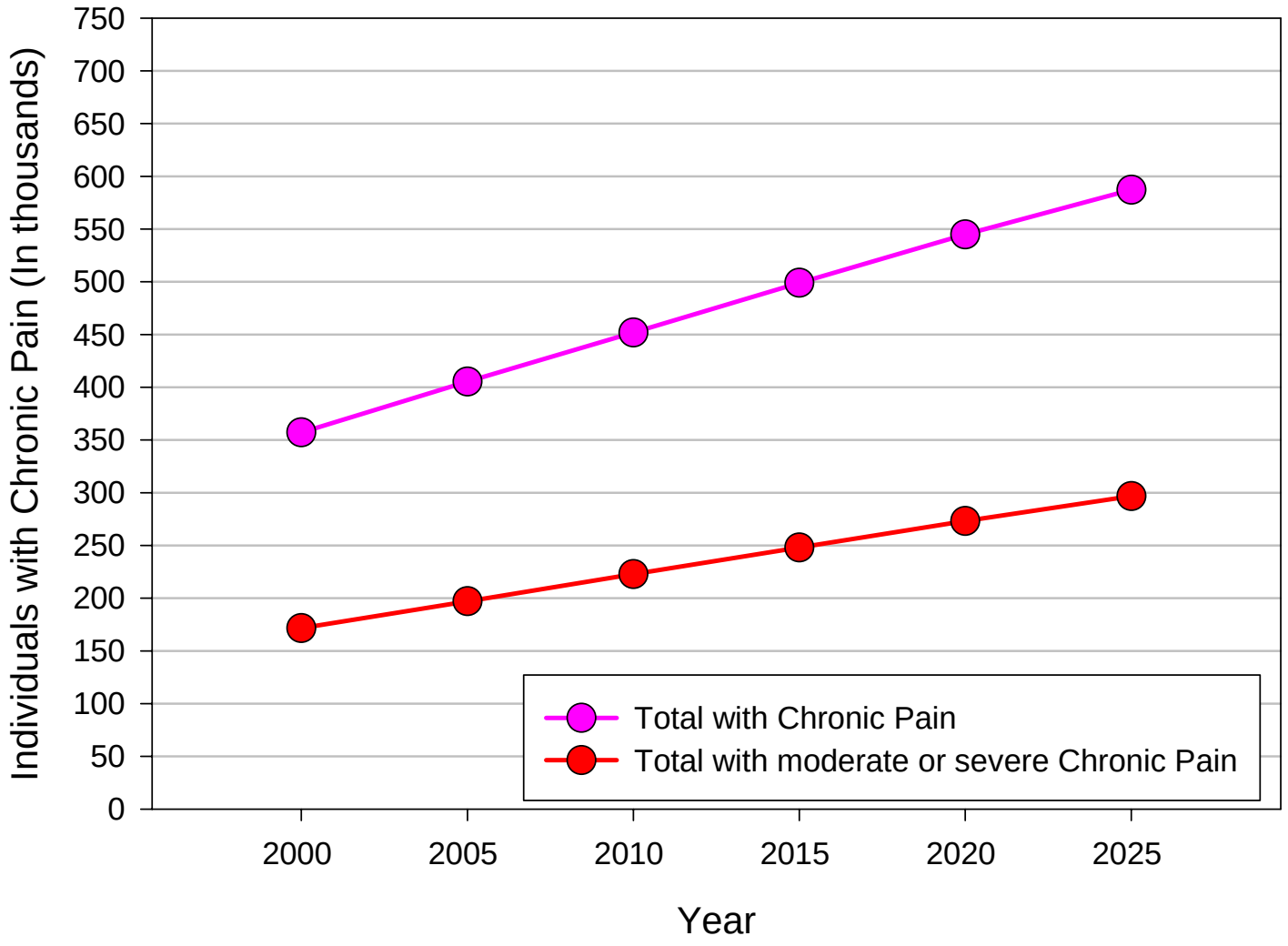
Pain Category and Hospitalizations

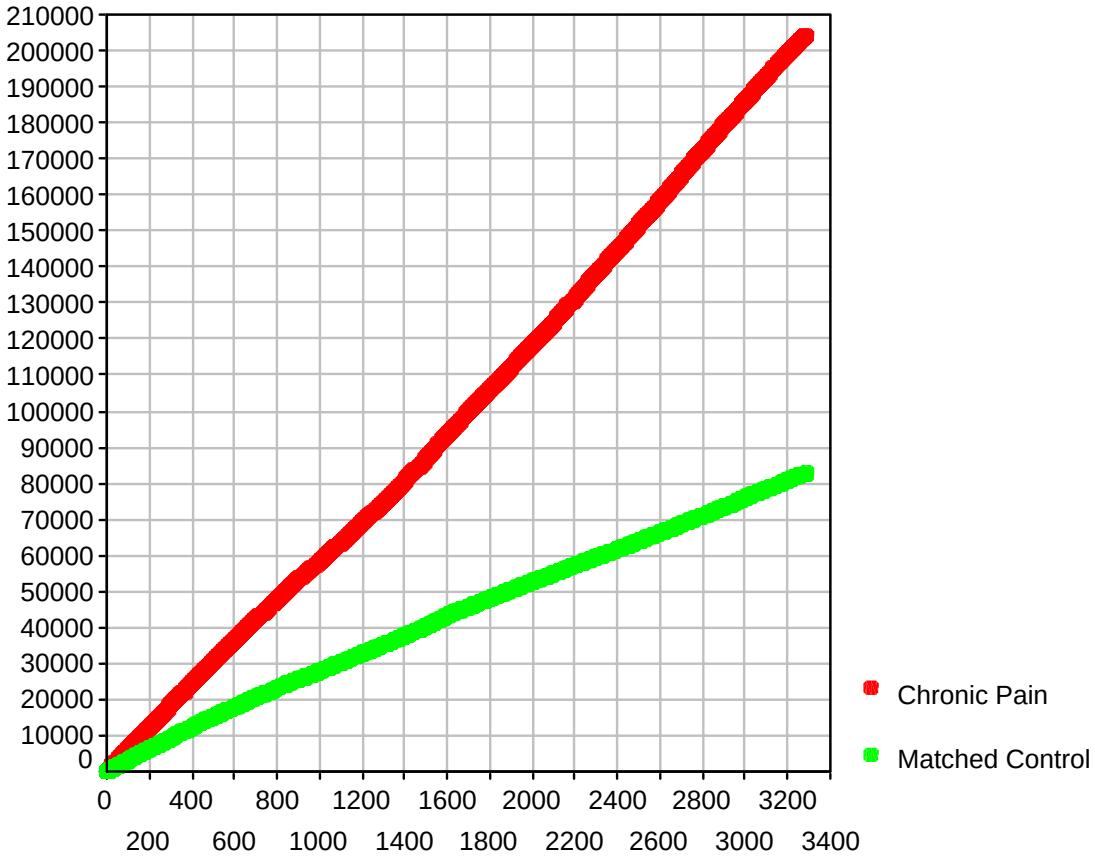


Pain Category and LOS in hospital



These projections hurt!

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3000
3200
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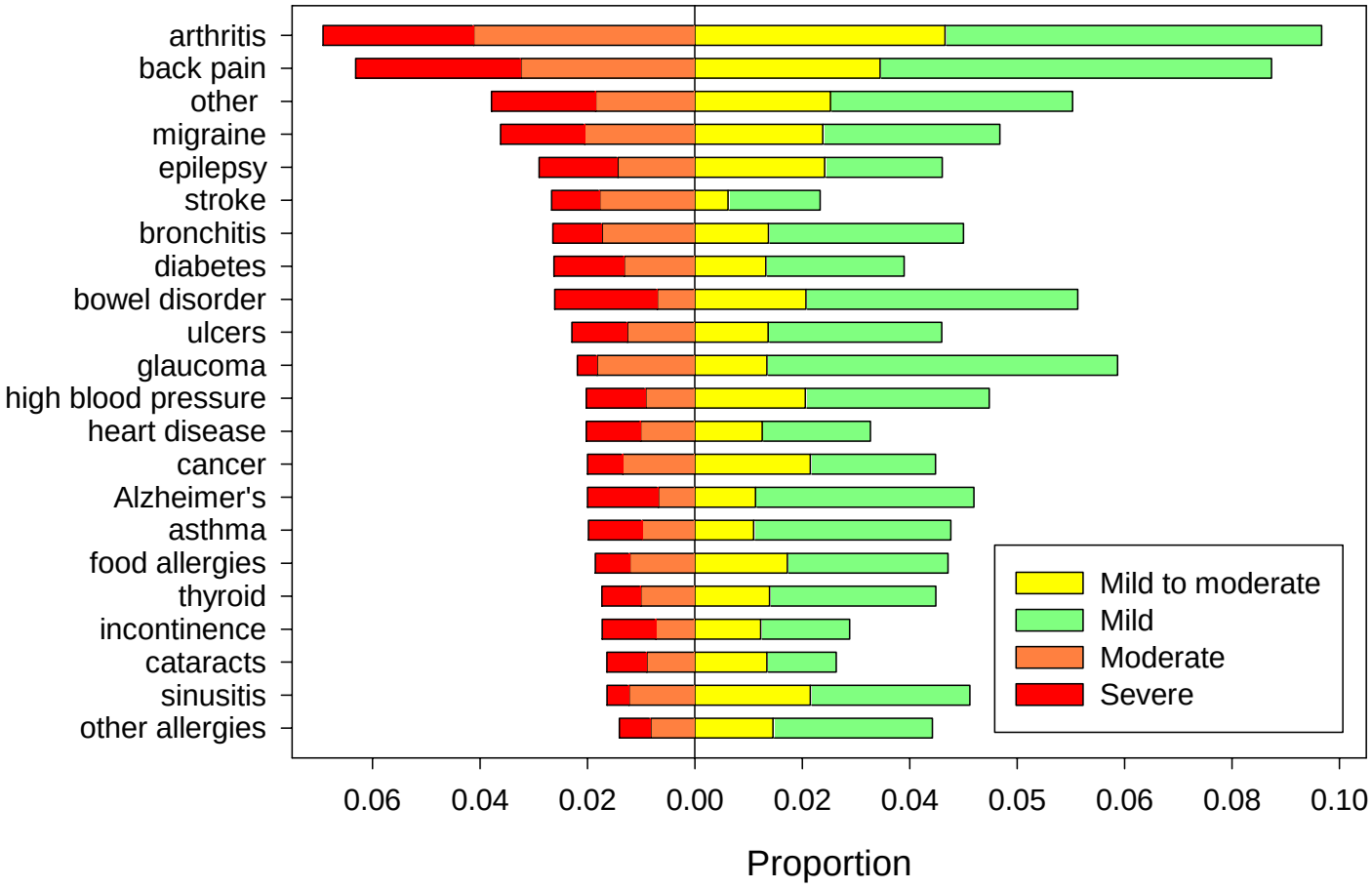
Chronic Pain
Matched Control

Relationships with self-reported Chronic Diseases

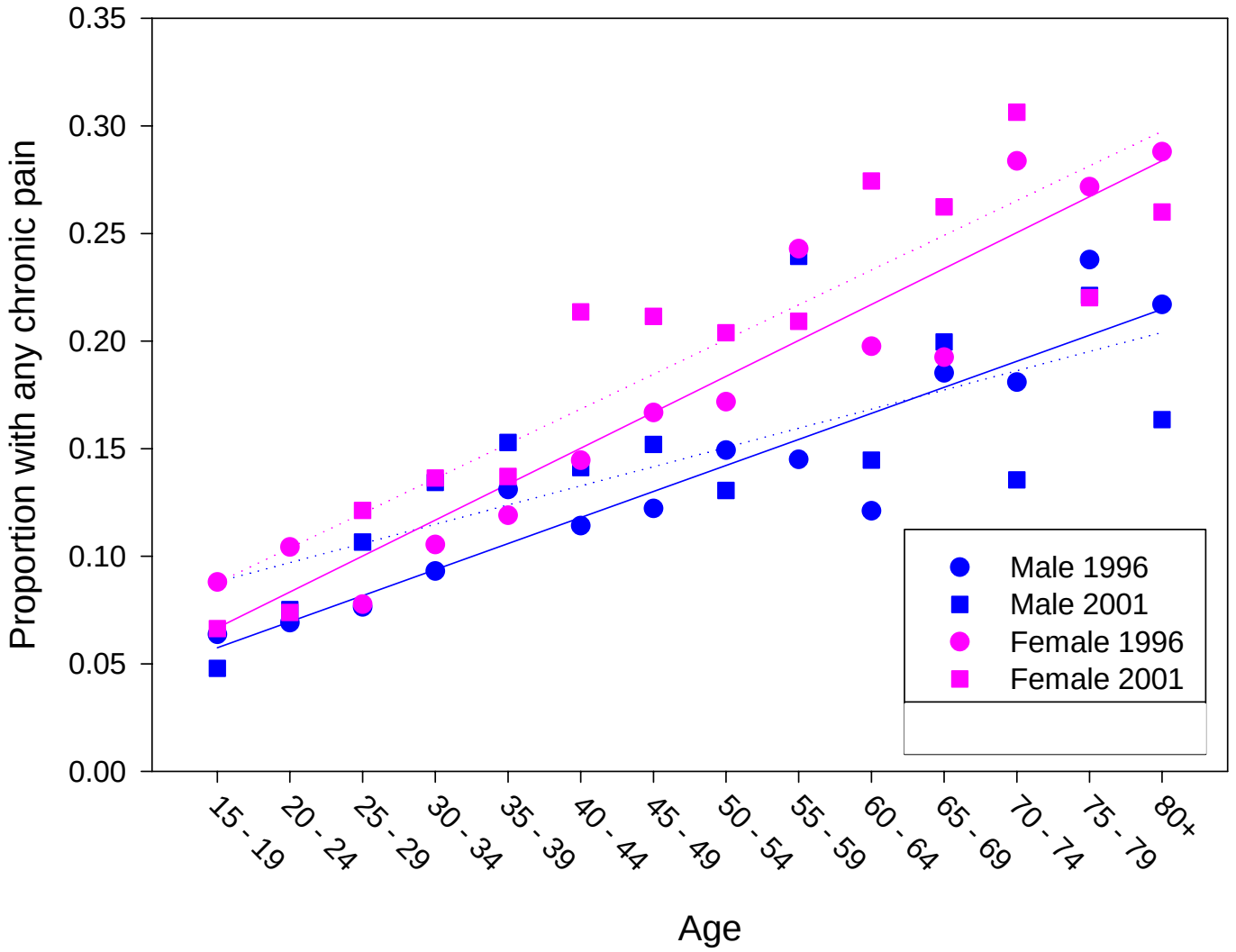


Linkage

- NPHS 1996 Alberta sample
  - Longitudinal (1996) 1332
  - Cross sectional (Buy-in) 16030
- Completed Linkages

– Longitudinal	1002	(75.2%)
– Cross sectional	5010	**(31.2%)**
	6012	**(34.6%)**

NPHS 1996 and CCHS 2001 age-sex estimates



Physician and Patient Perspectives on Chronic Pain Management in the Calgary Health Region

Dr. Geoffrey Hawboldt
University of Calgary

calgary health region

Breaking the Cycle of Pain

Physician and Patient Perspectives on Chronic Pain Management in the Calgary Health Region (CHR)

UNIVERSITY OF CALGARY

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Breaking the Cycle of Pain

PROJECT TEAM

Martin Scanlon MD PhD
Assistant Professor, Dept. of Anesthesia, U of C

Geoffrey Hawboldt MD
Assistant Professor, Dept. of Anesthesia, U of C

Donald Bakal PhD Professor, Dept. of Psychology, U of C

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Breaking the Cycle of Pain

AGENDA

- **Purpose**
- **Methodology**
- **Findings**
- **Conclusion**

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Breaking the Cycle of Pain

PURPOSE

To identify assets and needs of the CHR for Calgarians suffering from various chronic pain syndromes.

To address the following questions:

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Breaking the Cycle of Pain

- **How many CNMP patients do GPs have?**
- **Can they manage them by themselves?**
- **What help do they want?**
- **Can they get the help they need?**
- **What would help them manage better?**

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Breaking the Cycle of Pain

METHODOLGY

We invited random samples of the following key informants:

- **147 GP's - 56 females, 59 males**
- **142 specialists -108 males, 34 females**
- **GP=893 and specialists=661 were available through CPSA**

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Breaking the Cycle of Pain

- **23 item survey (long version)**
- **Condensed survey (short version)**
- **Trained interviewers**
- **Telephone contact, fax or phone response**
- **At least 2 contact attempts**
- **“Reminder” two weeks after contact**

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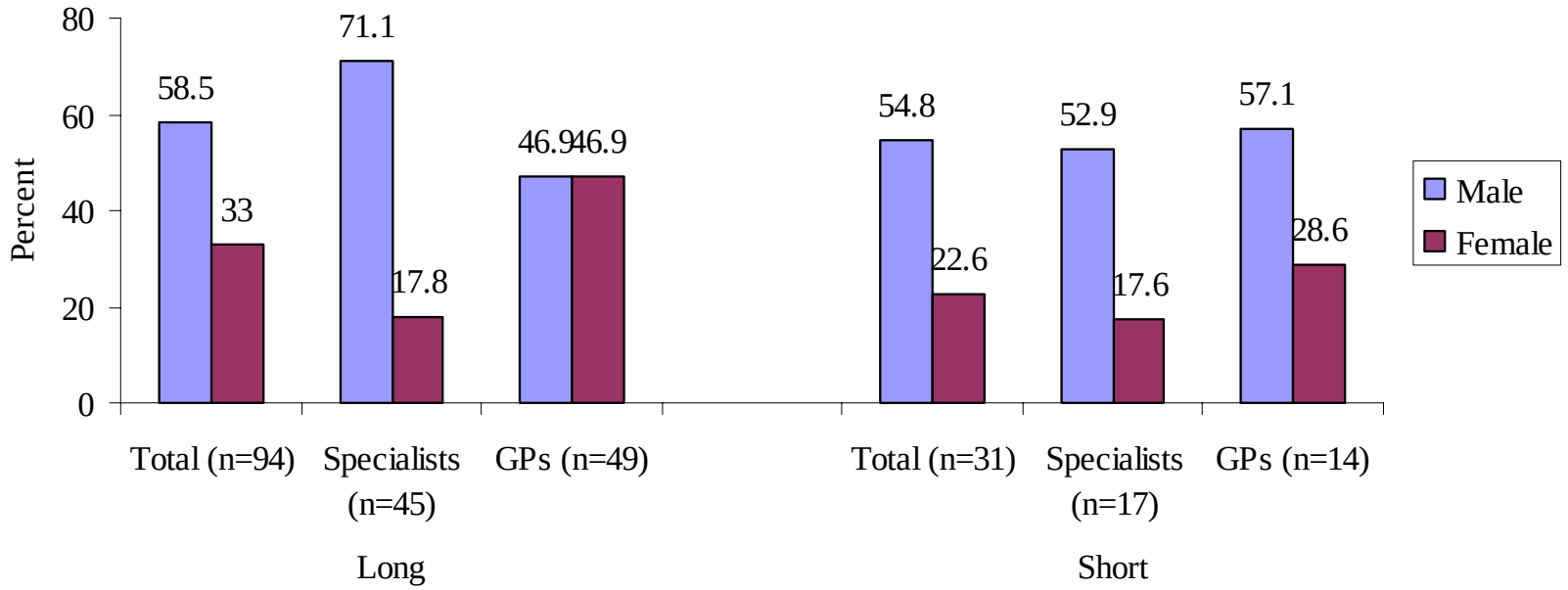
Physician Gender Profile for Long and Short Versions of the Survey



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FINDINGS: Physicians' Experience

- **Mean patients in personal practice: 4224**
- **Mean years since graduation: 21.5**
- **Mean hours worked per week: 35.8**

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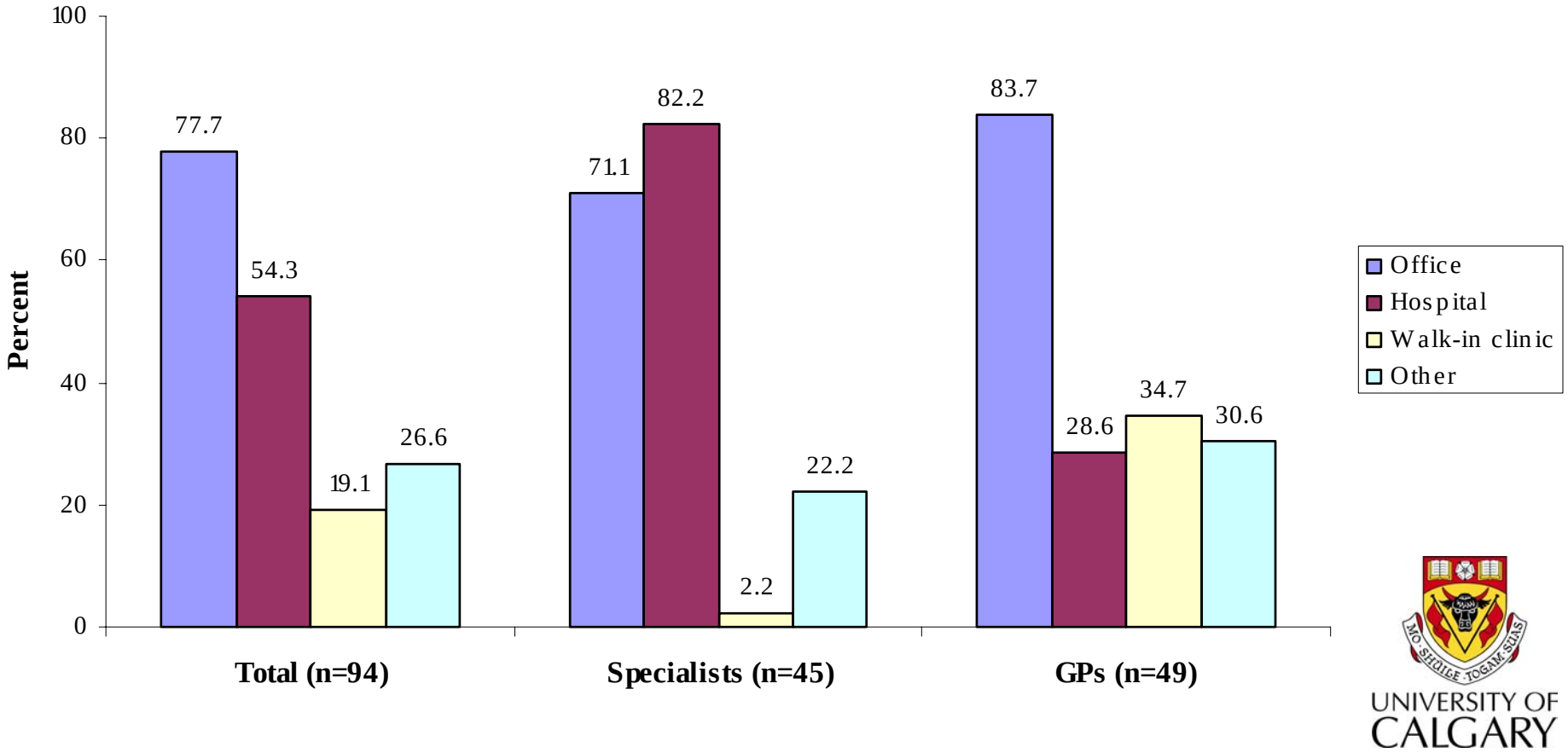
Location Physician (GPs and Specialists) Managed Patients



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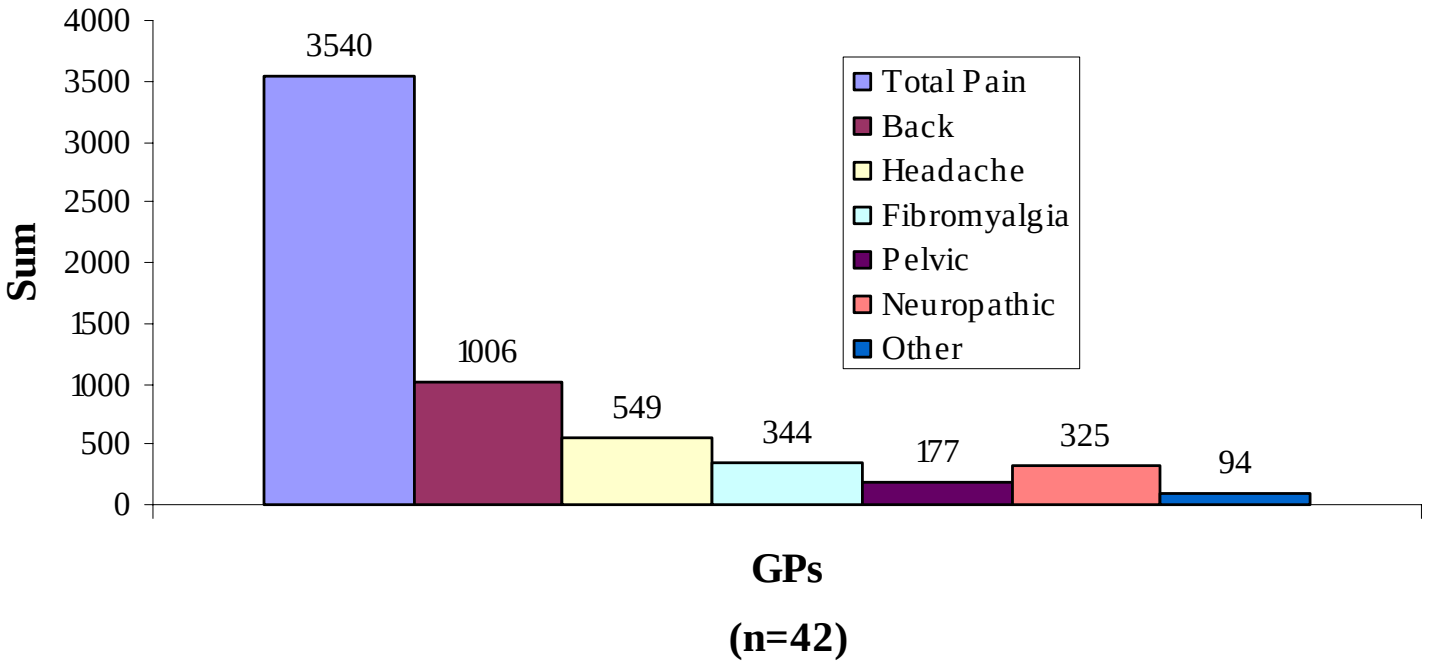
Number and Type of Pain Patients Managed by GPs



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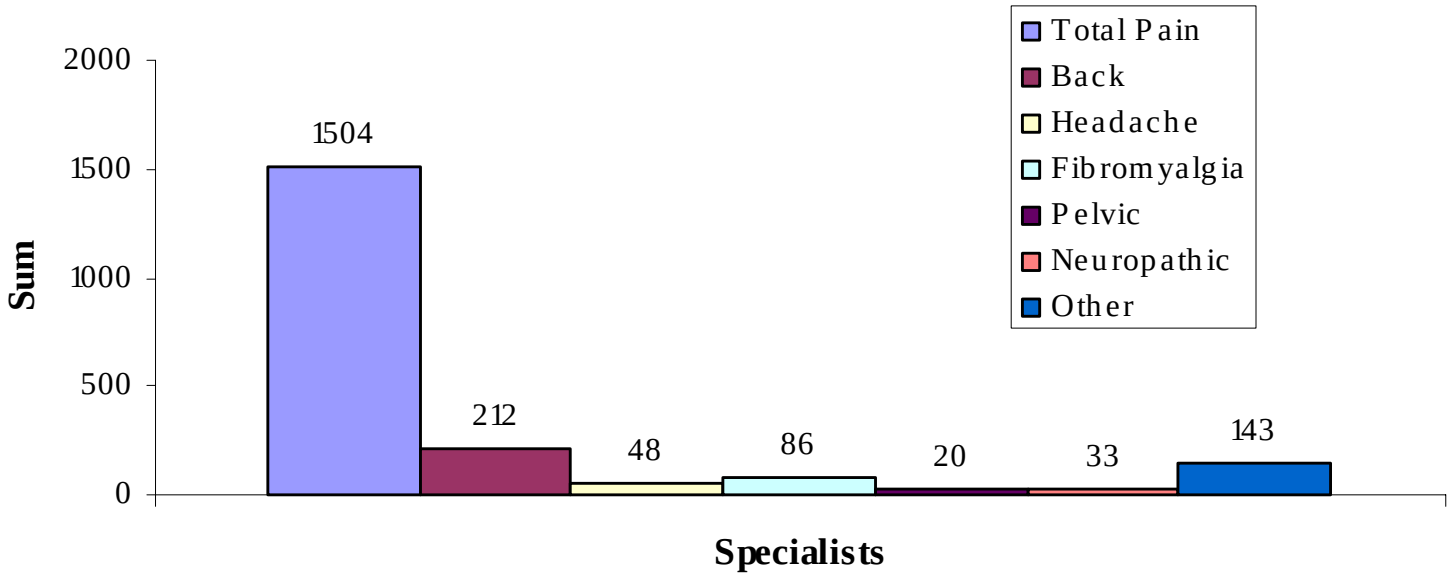
Number and Type of Pain Patients Managed by the Specialists



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- GPs had 3540 CNMP patients between them
- 12% were WCB
- 38% were geriatric age group

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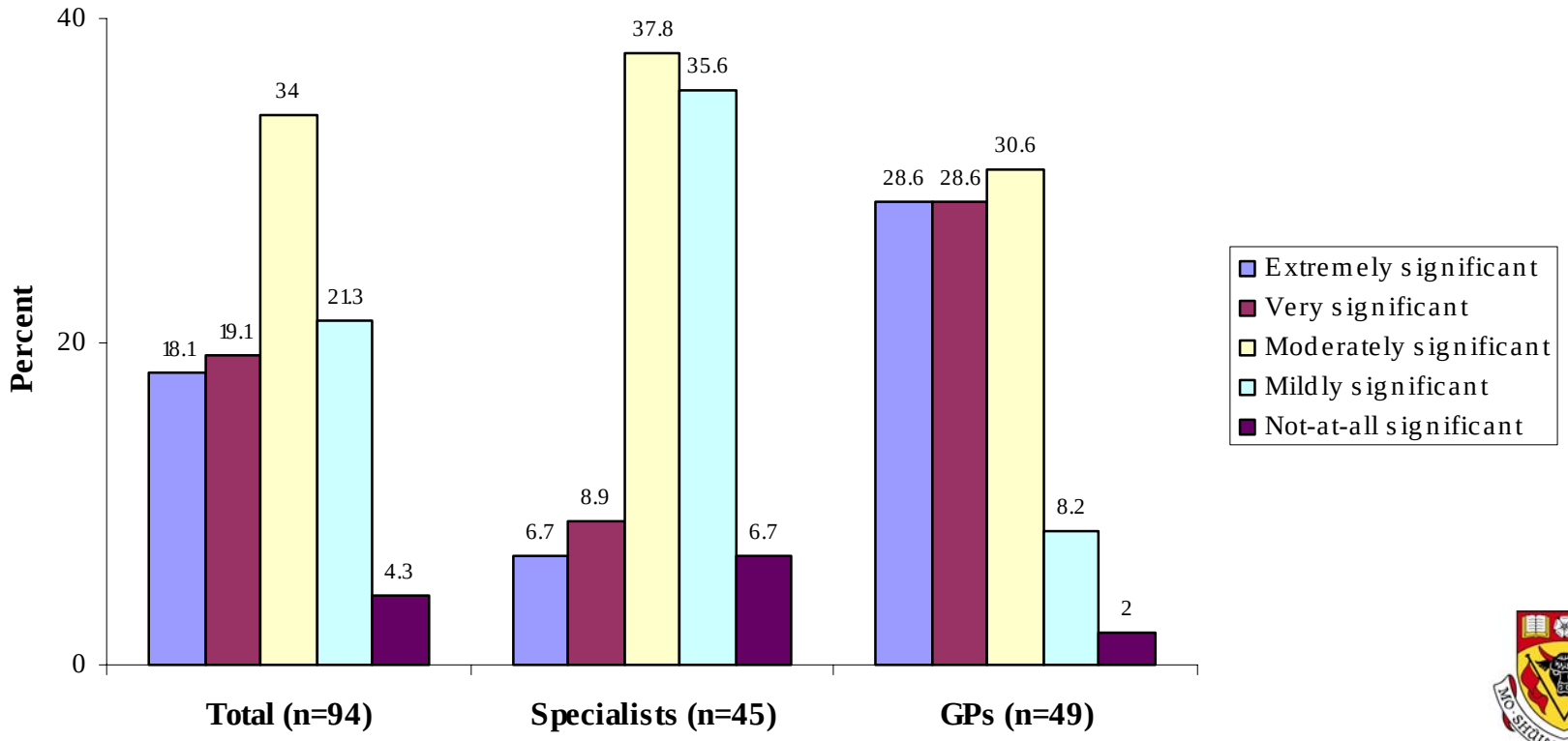
Breaking the Cycle of Pain

Significance of Chronic Pain in Physicians' Practices



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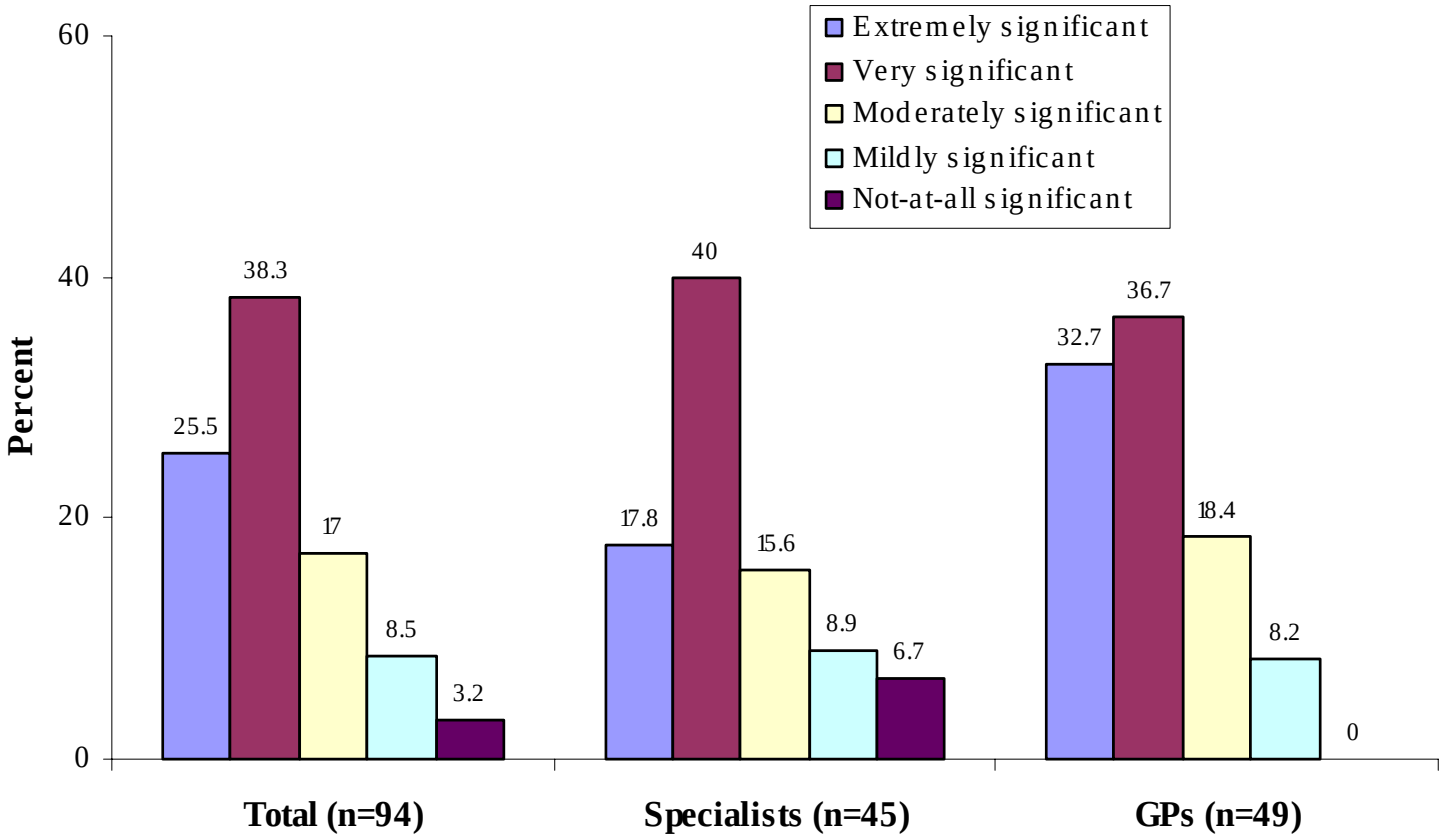
Significance of Somatization in Physicians' Practices



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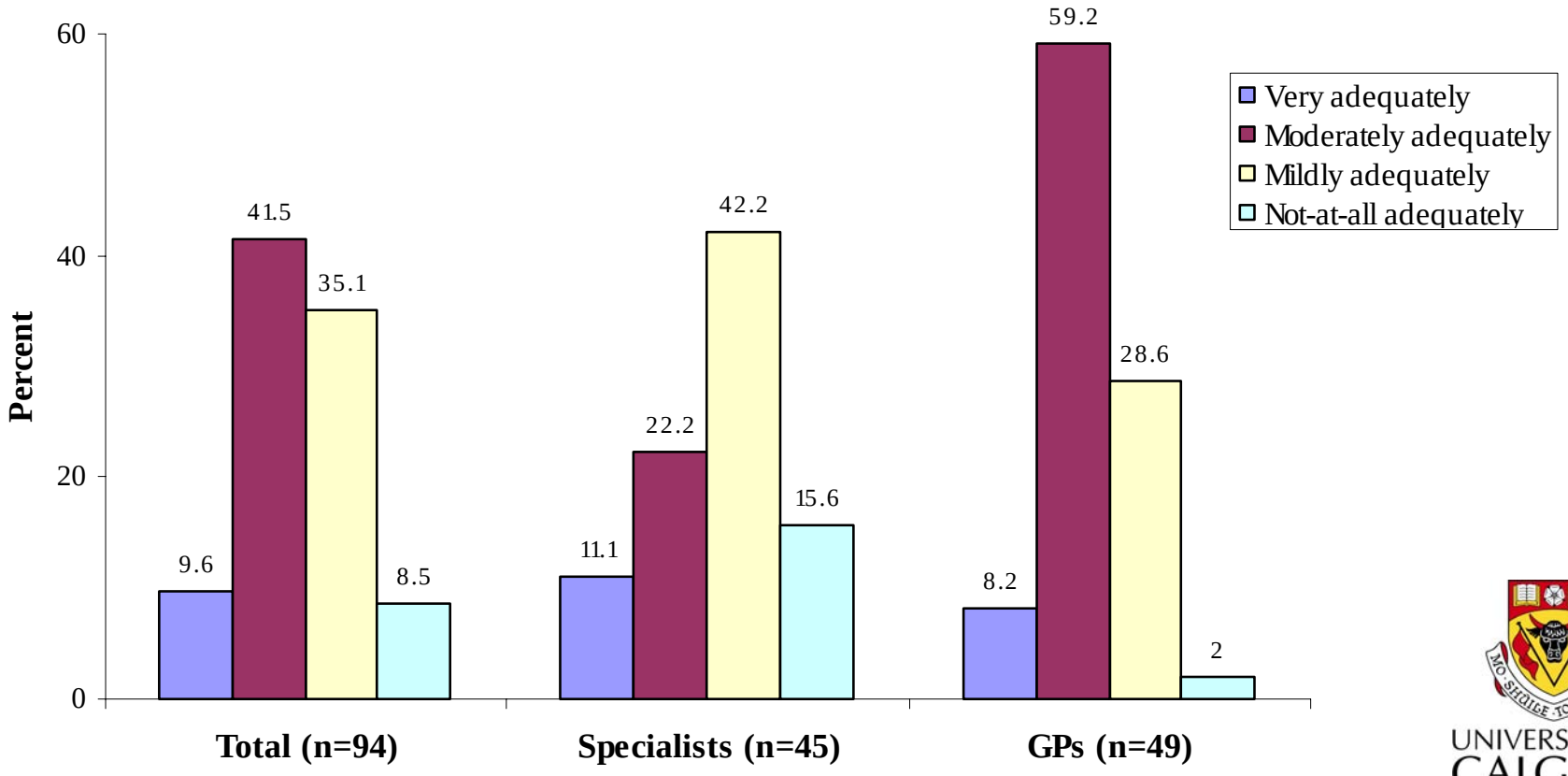
Preparedness to Manage Chronic Pain



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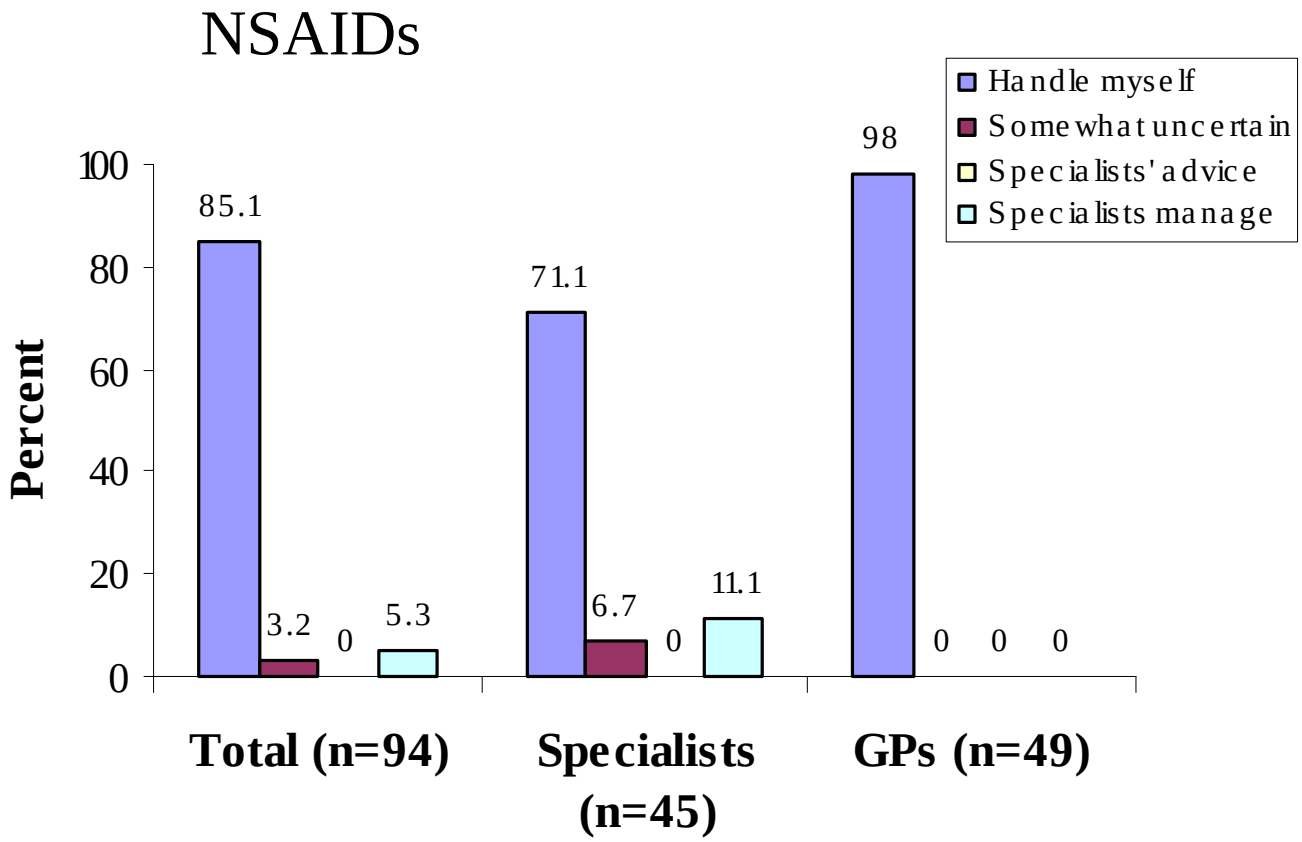

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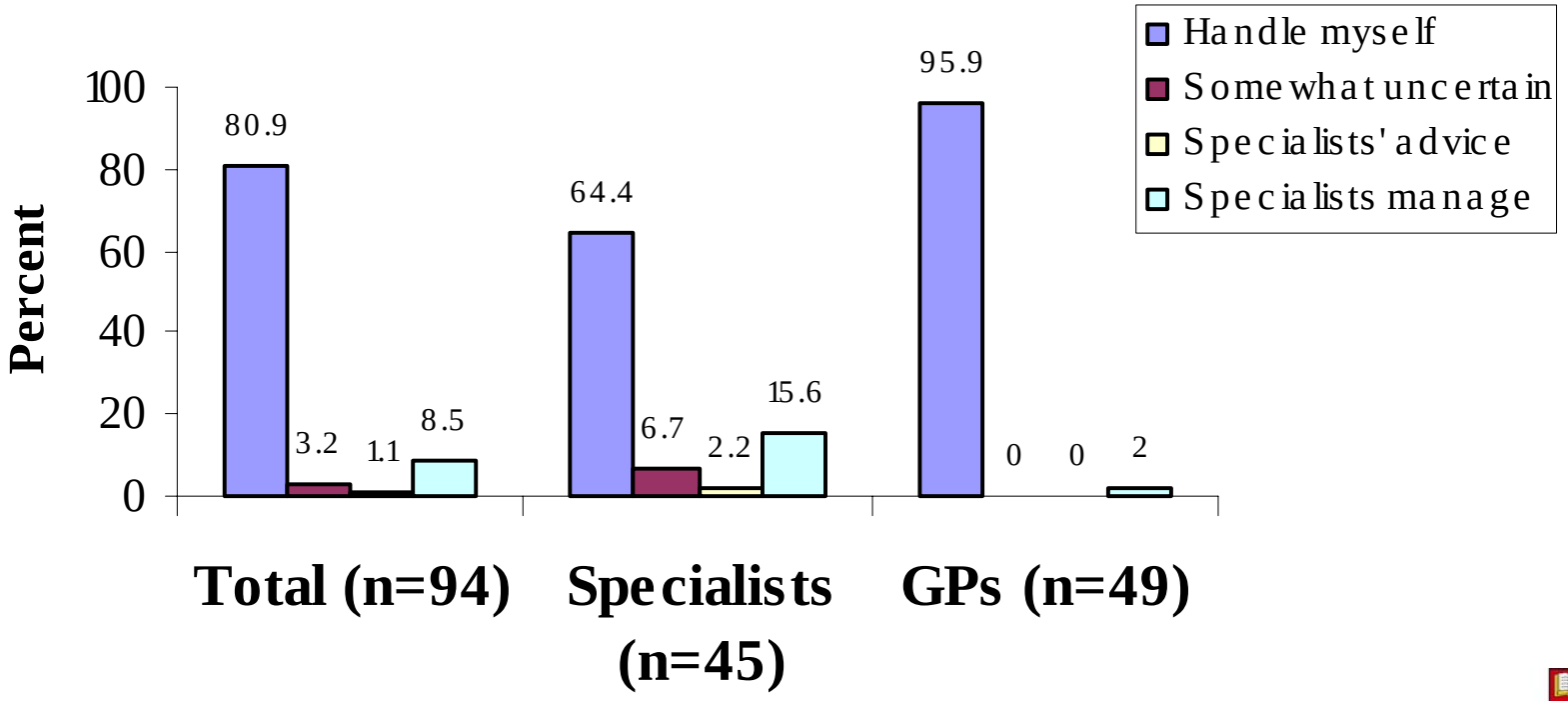
Tylenol #3



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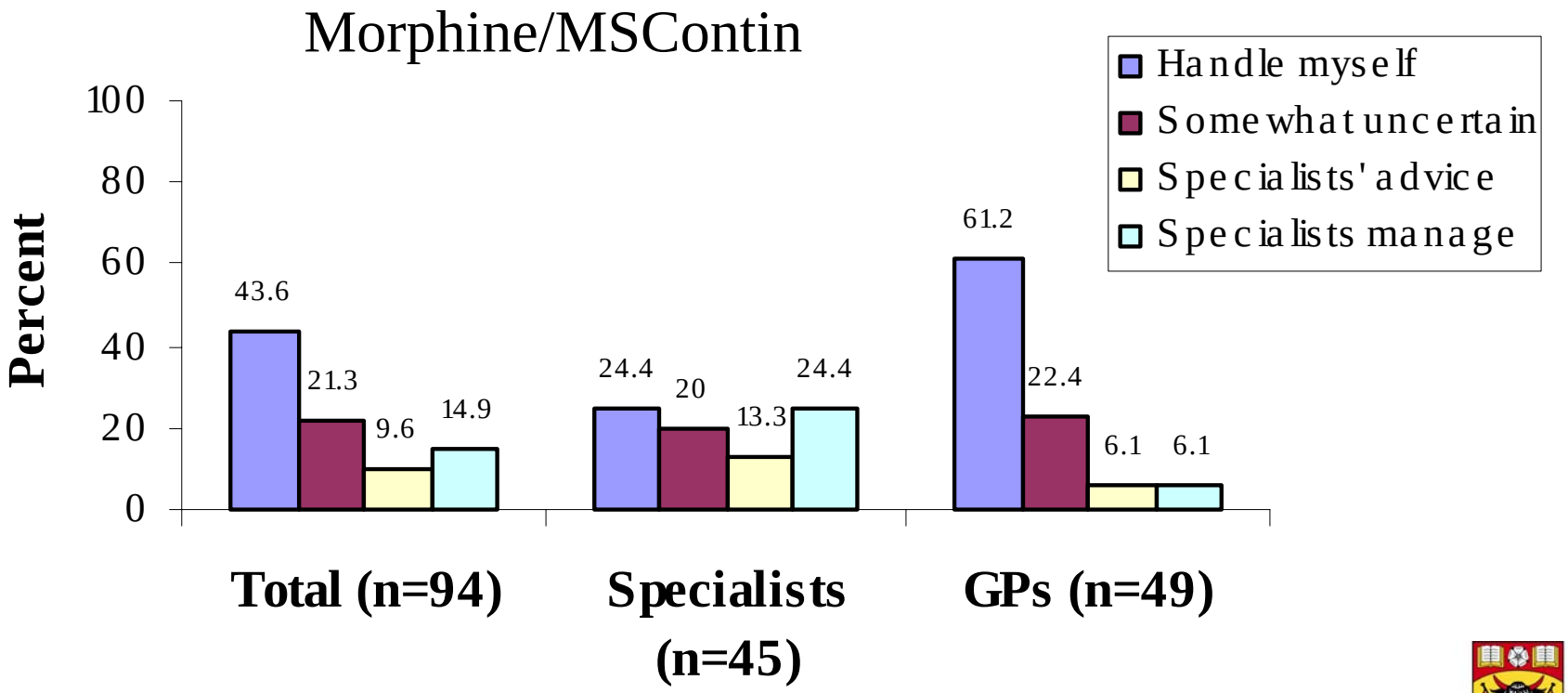
Breaking the Cycle of Pain



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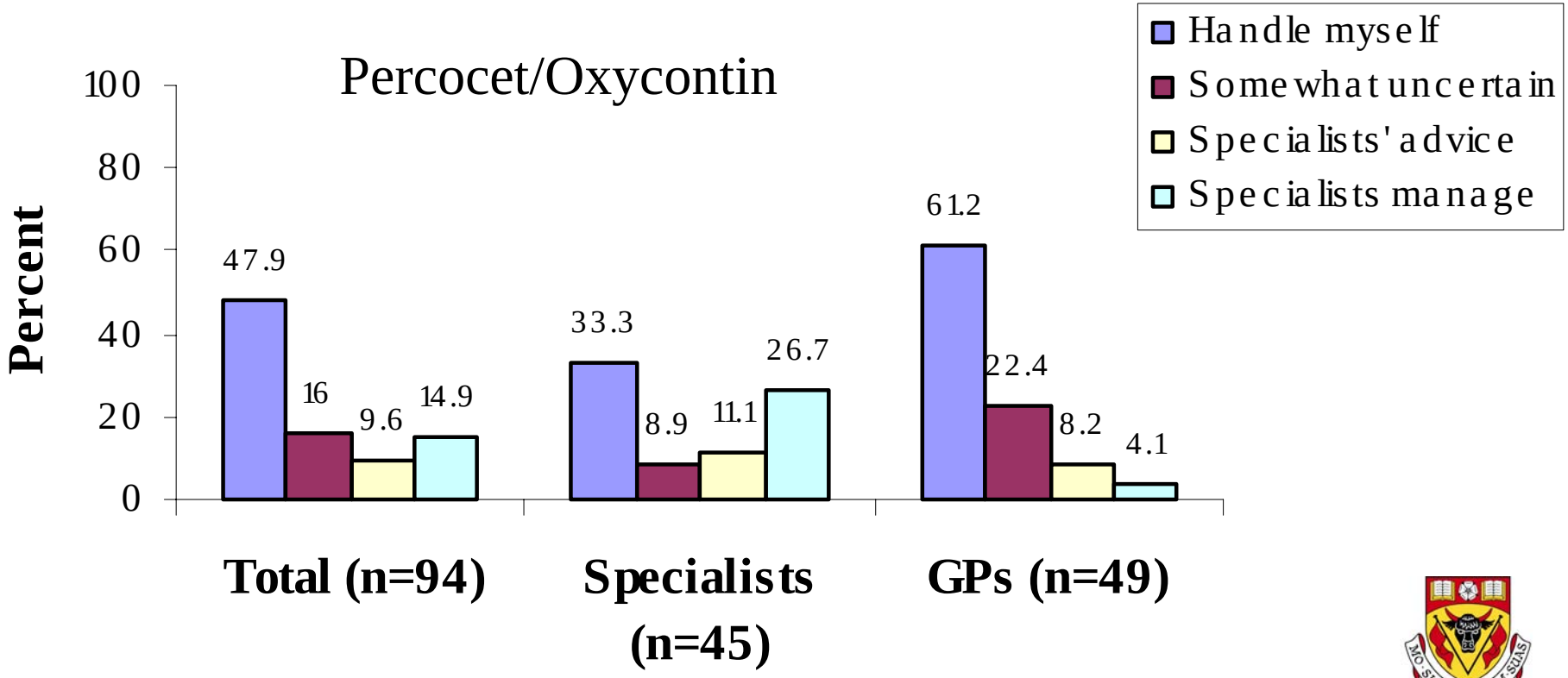

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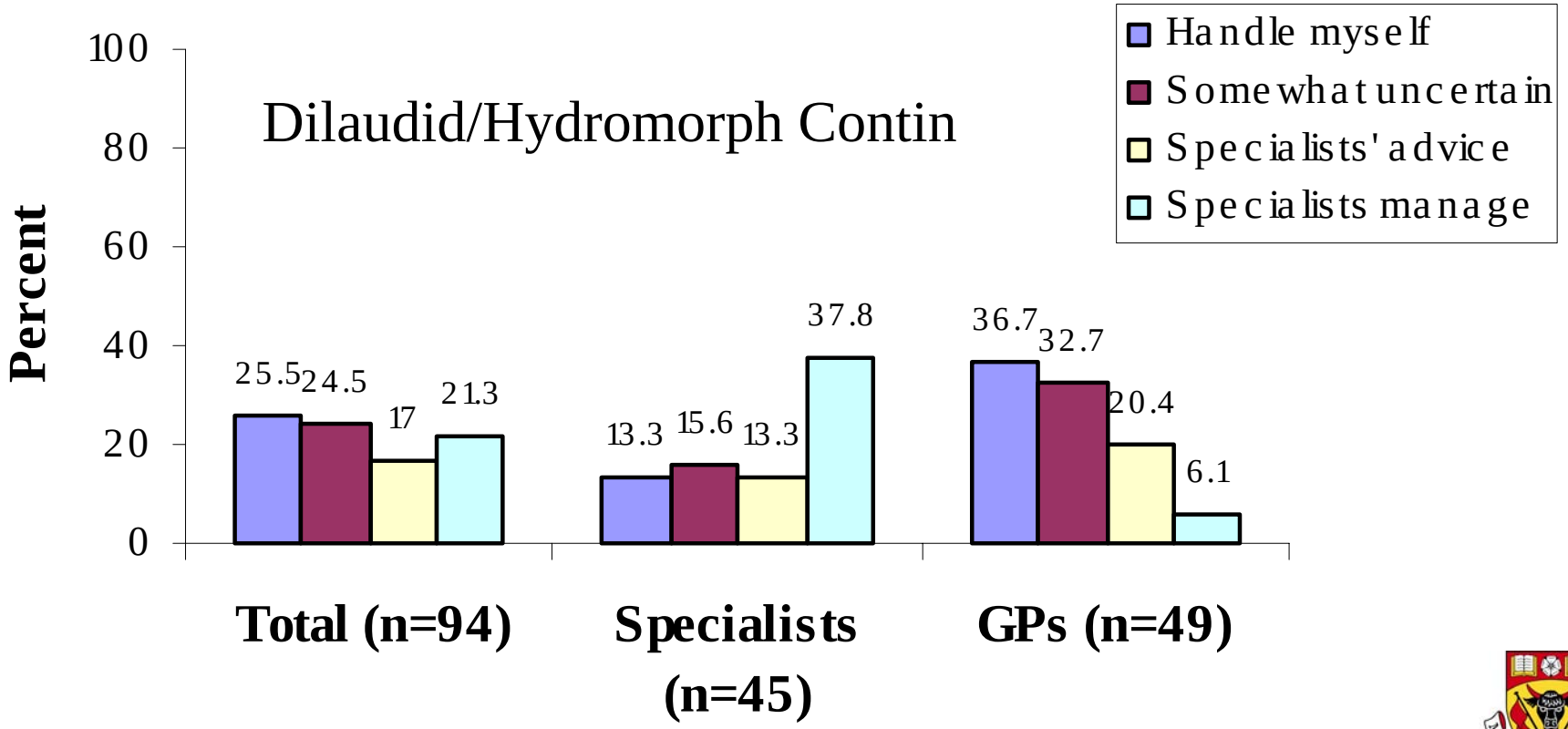
Breaking the Cycle of Pain



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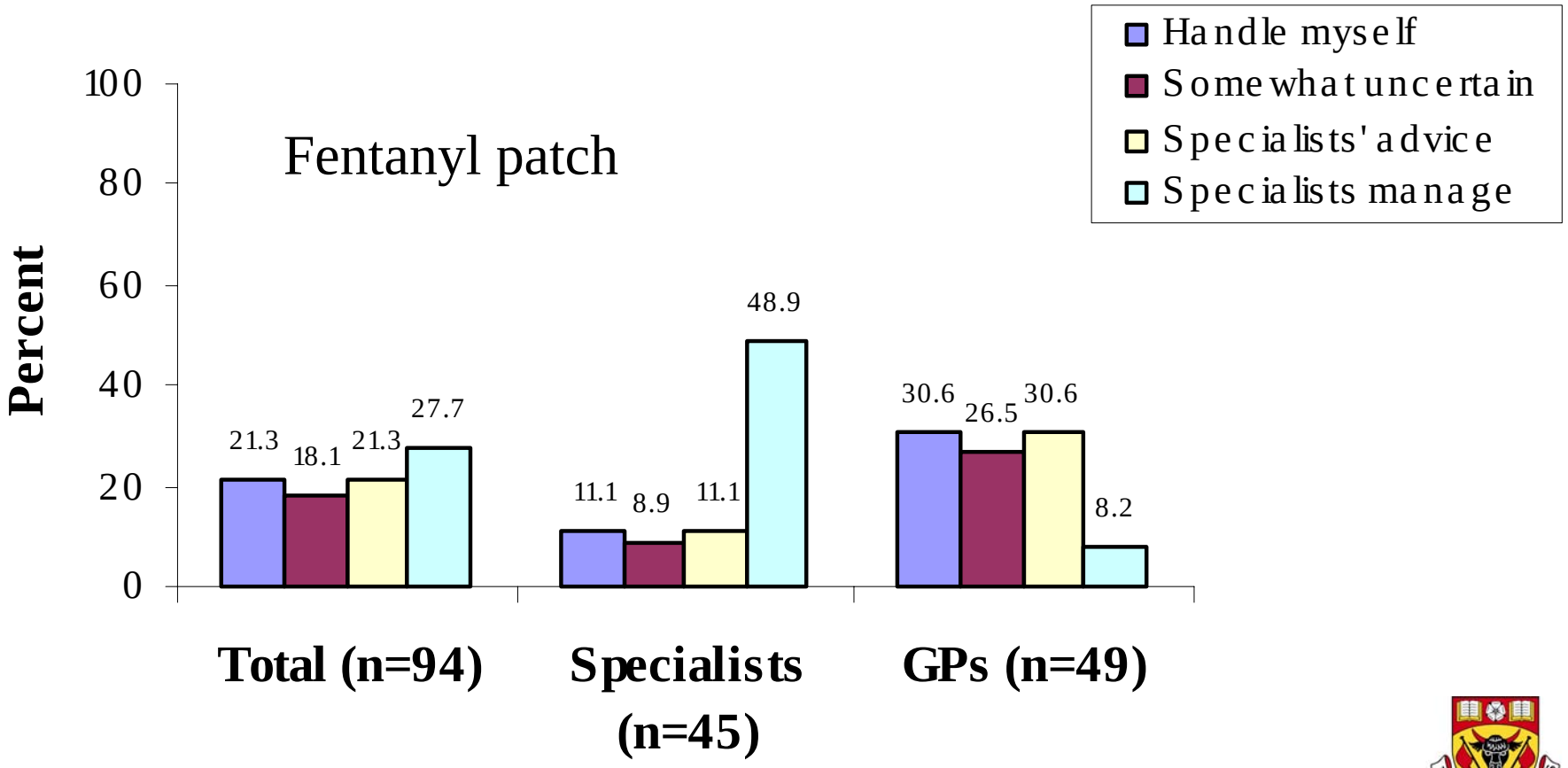
Breaking the Cycle of Pain



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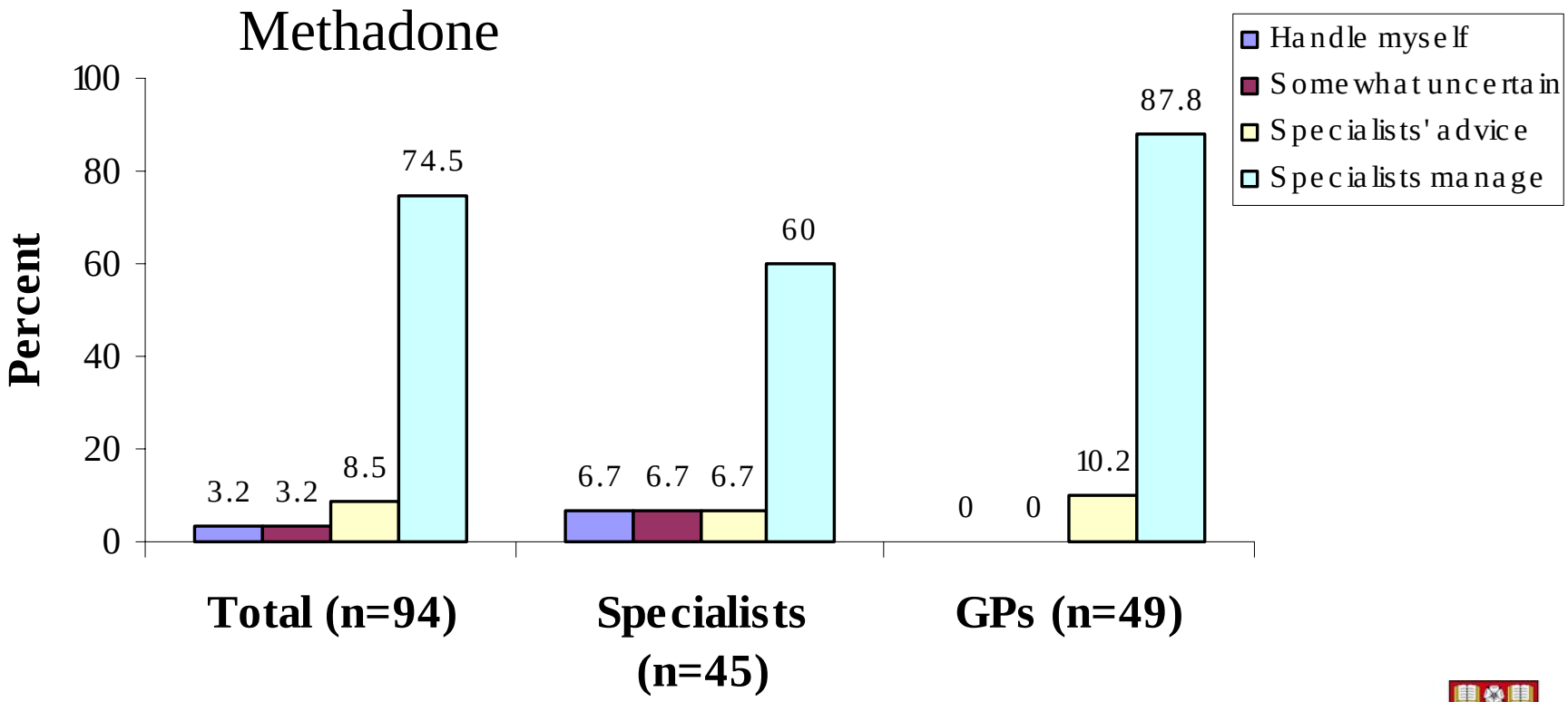
Breaking the Cycle of Pain



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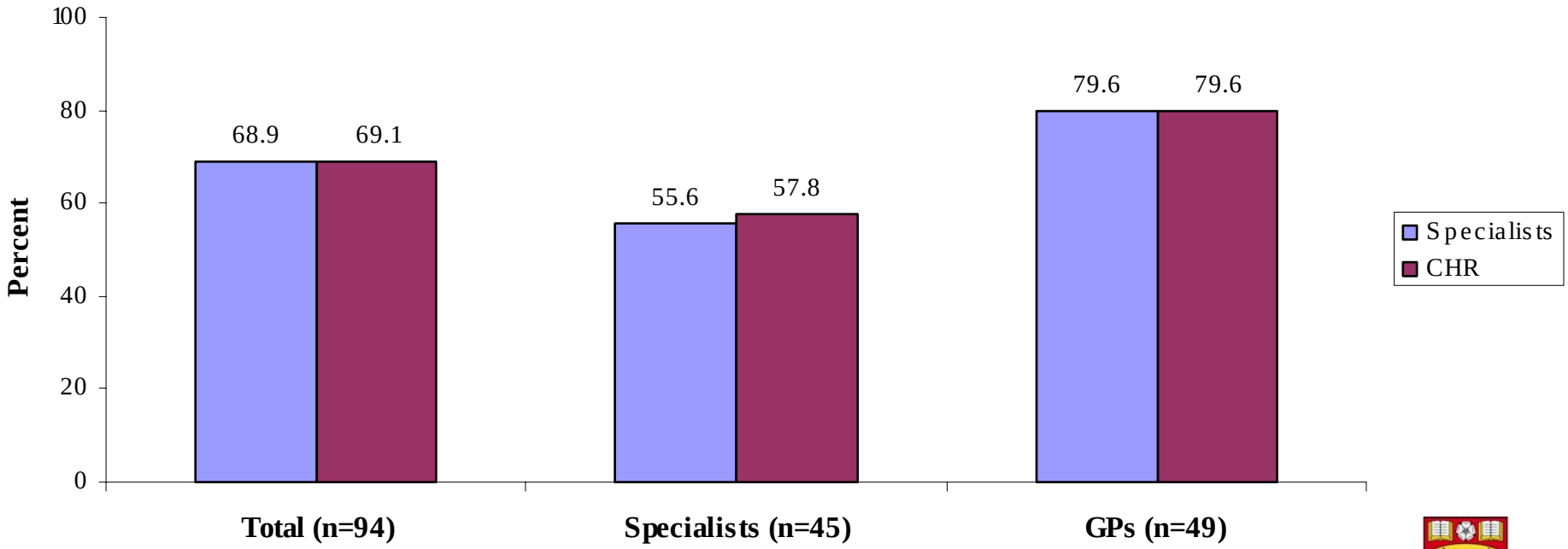
Breaking the Cycle of Pain

Frequency of Physicians Perceiving Lack of Support from Specialists and the CHR



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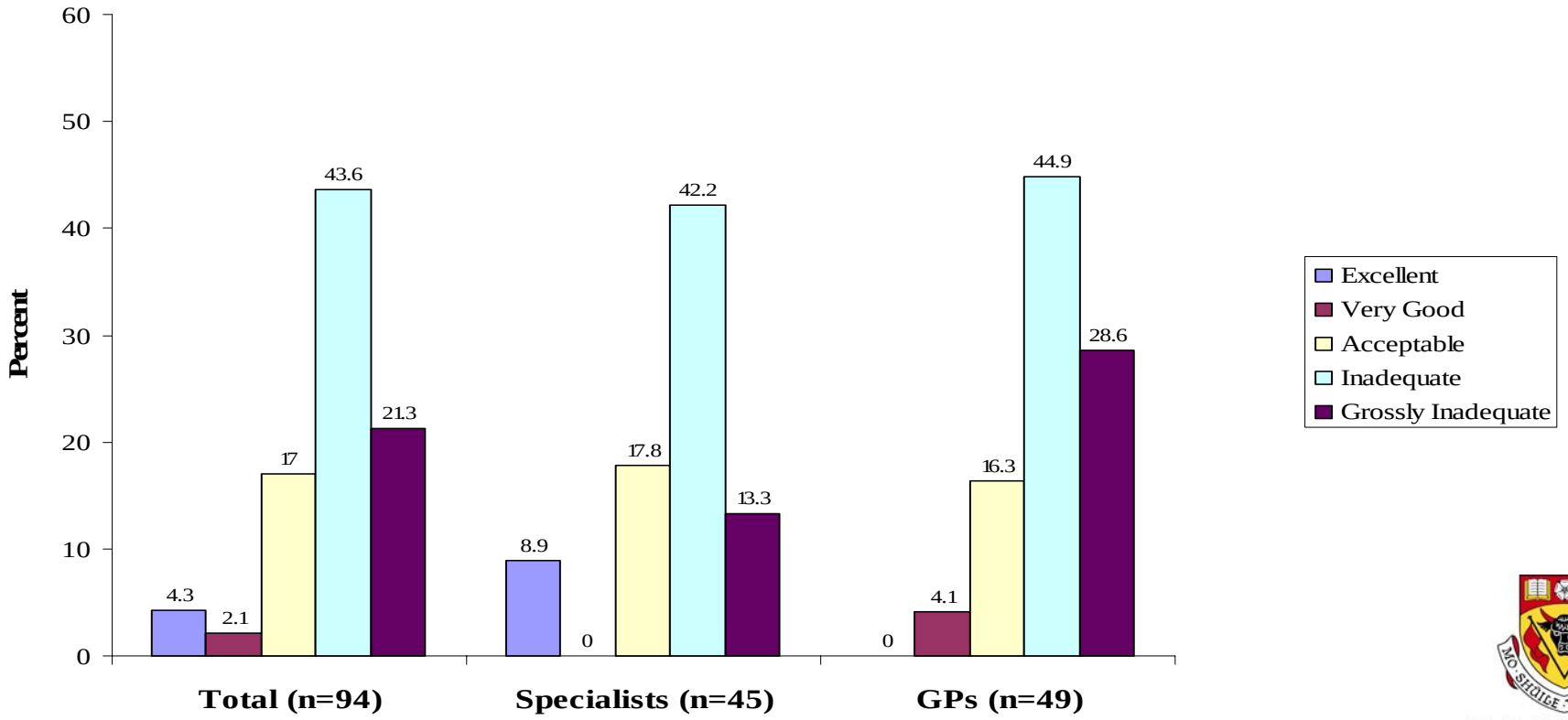
Breaking the Cycle of Pain

Rating the Referral Services for Chronic Pain in the CHR



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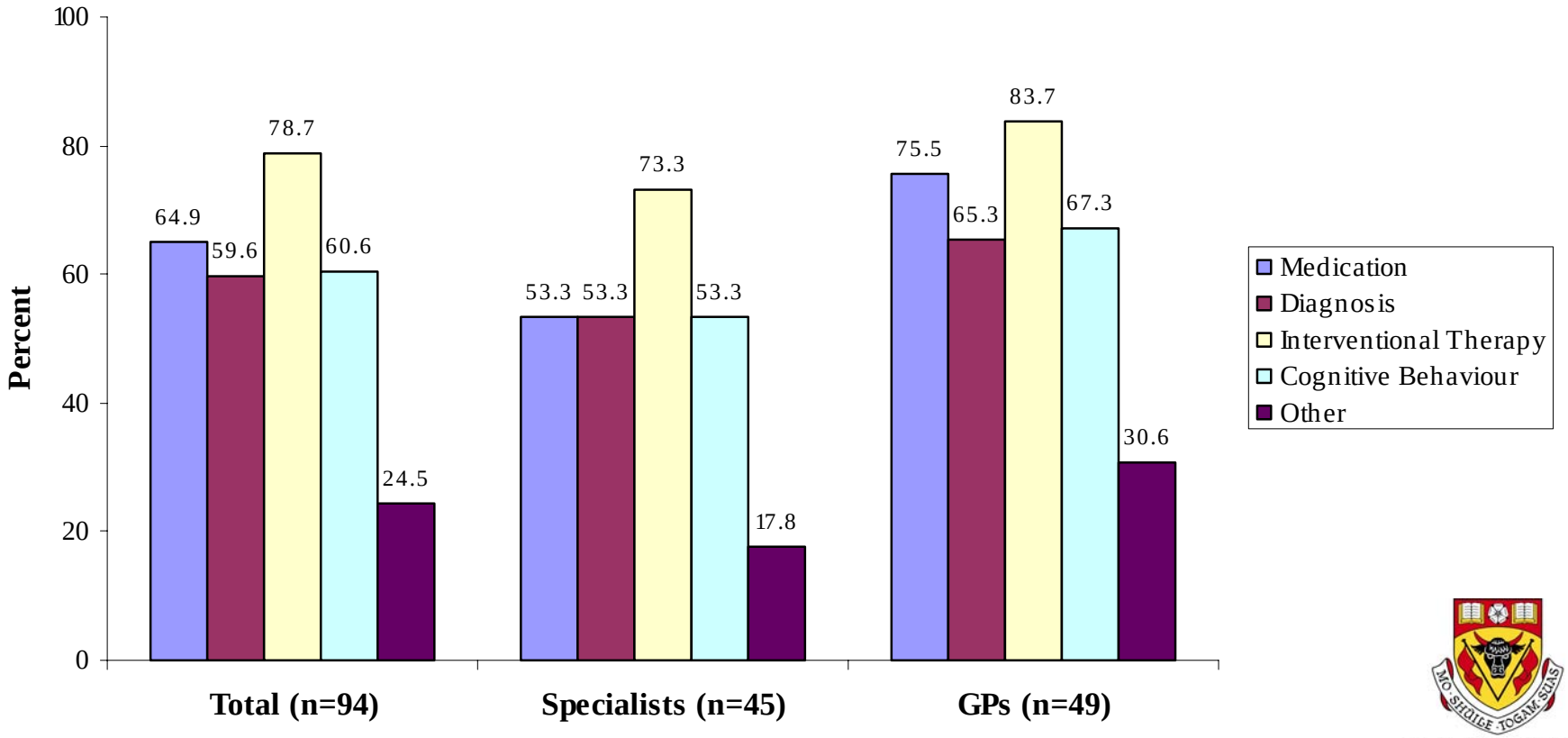
Type of service needed by referring physicians



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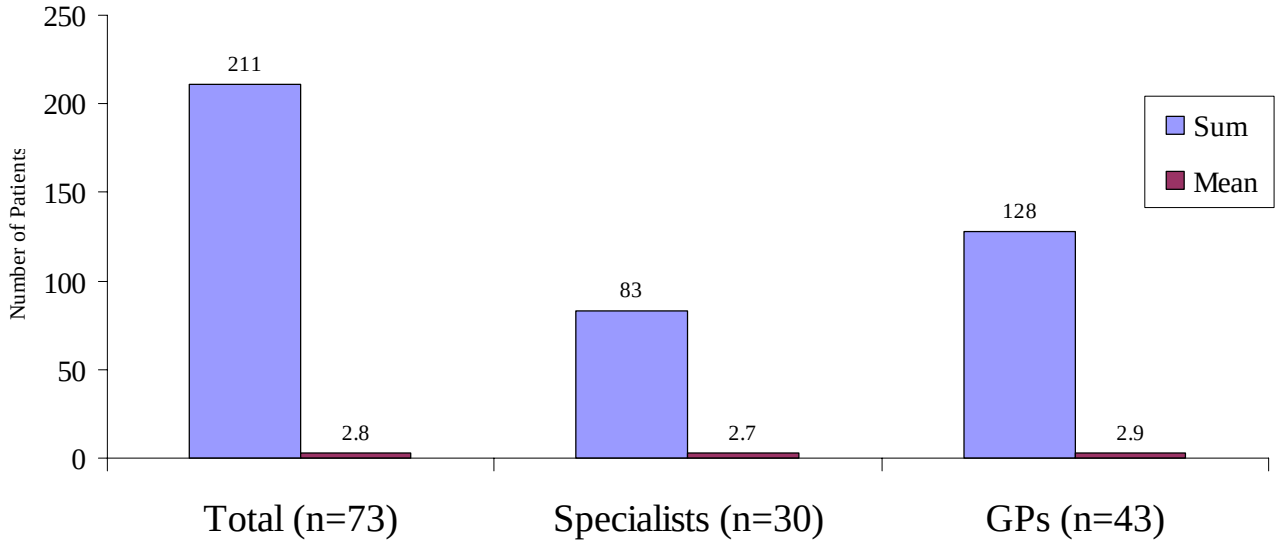
Potential Number of Referals to a Pain Specialist Per Month



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- The 43 GPs who responded to this question would collectively refer 128 patients per month
- Extrapolation to all GPs in CHR would yield about 2000 referrals per month!
- Current wait for GP to get patient in: 52 wk
- For specialist, 12 weeks (values are mode)

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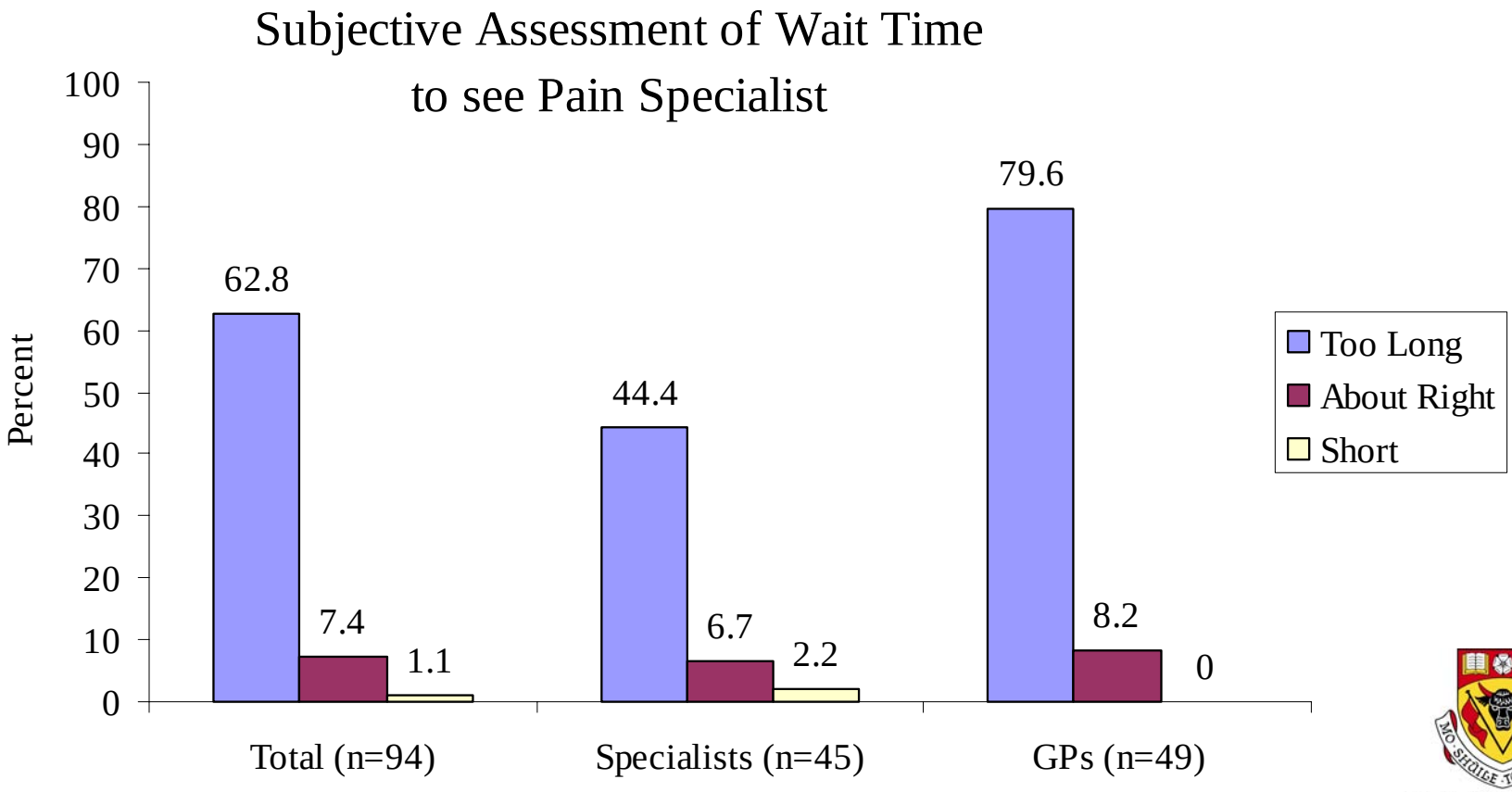

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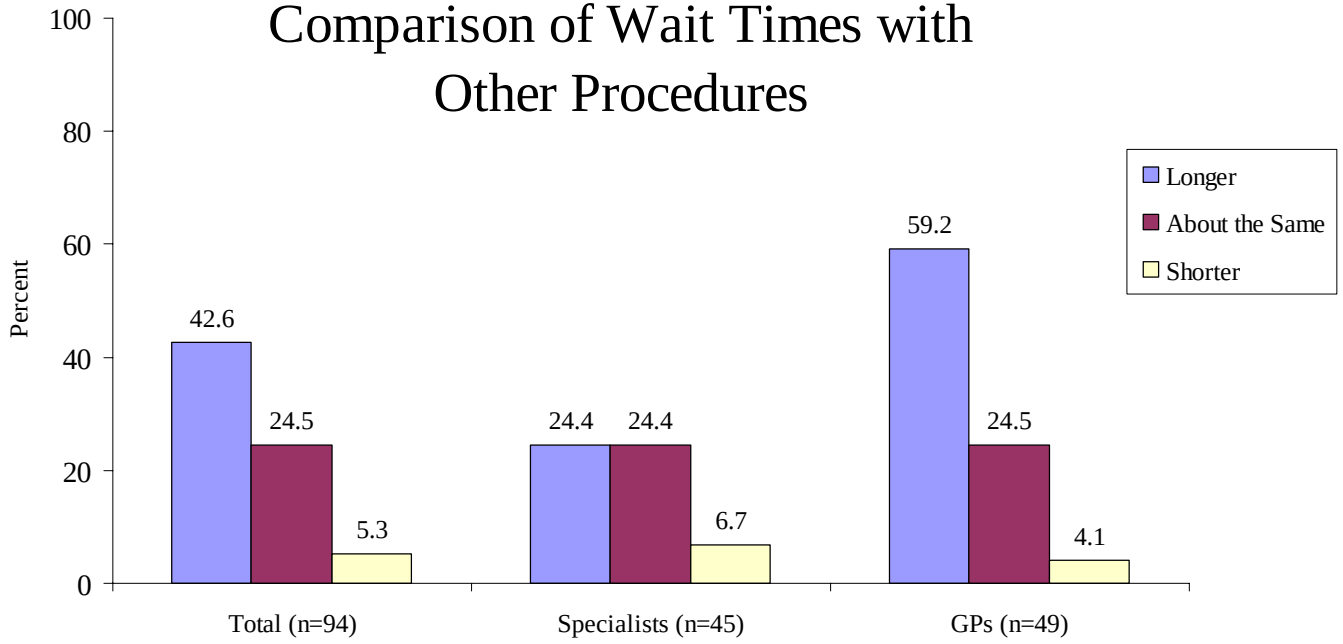

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Breaking the Cycle of Pain

- What do physicians do while waiting?
  - 74% manage by themselves
  - 40% refer to other specialists
  - 6% refer to complementary practitioners
  - 75% of GPs access other health services eg physio, psych, acupuncture, massage
  - 50% are confident in doing so

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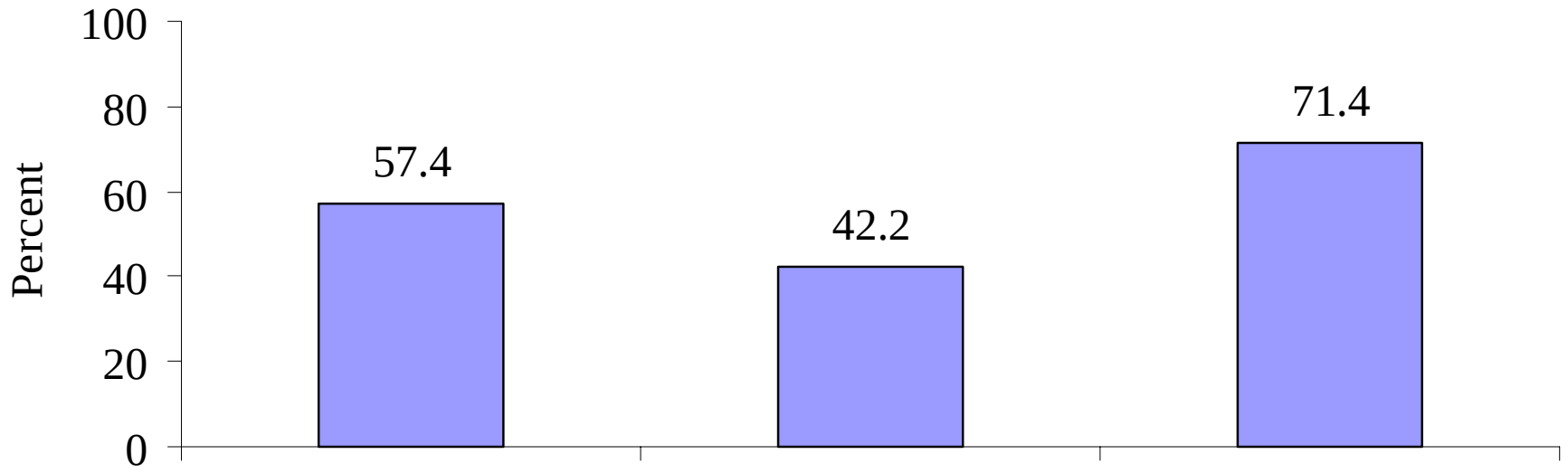
Need For CME



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Breaking the Cycle of Pain

Conclusions

1. **Chronic Pain management in CHR does not meet the needs of referring physicians**
2. **The demand on any new pain management centre is likely to be huge: to meet this demand, we need more people and funding**
3. **GPs and specialists must be provided with better training to manage CNMP**

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Executive Summary

The Physician Partnership Steering Committee (PPSC) funded the Rockyview General Hospital Chronic Pain Management Centre (RGHCPMC) to assess physicians' and patients' perspectives on the management of chronic non-malignant pain in the Calgary Health Region (CHR).[1]

The purpose of the study was to identify the CHR's needs and assets from the perspective of the patients and physicians. Random samples of both the physicians (289, GPs=147, Specialists=142) and the patients (205) were invited to participate in structured telephone interviews (consisting of both closed- and open-ended questions) between January and March 2003. Two versions of the physicians' surveys were generated, long and short. The latter provided the investigators a strategy to collect salient data even from potential non-respondents. Thirty-two GPs and 32 patients were invited to pre-test the two instruments. The following seven questions were posed:

1. How many patients with chronic pain do the primary care physicians and various specialists consult or manage?
2. To what extent can primary care physicians and specialists deal with chronic pain without the intervention of pain specialists? How well prepared do these primary care physicians and specialists feel in managing chronic pain patients on their own?
3. To what extent do the primary care physicians and specialists require help in managing/treating their chronic pain patients?
4. What kind of deficiencies/barriers (system-wide and other) do the primary care physicians and specialists perceive in managing/treating their chronic pain patients?
5. How do primary care physicians and specialists propose to redress the negative effects of the system-wide deficiencies (if any), e.g., do they want more training?
6. To what extent does the RGHCPMC help patients with chronic pain?
7. What is the utilization pattern among the patients who visit the RGHCPMC, i.e., what is the frequency of use of various procedures and services available through this clinic?

For the actual surveys 125 physicians (GPs=63, specialists=62) responded: 94 completed the long survey whereas 31 completed the short survey. The results show that physicians (GPs or specialists) are not satisfied with the current situation with respect to chronic pain management in the CHR and reported a myriad of deficiencies. These deficiencies are as simple as a lack of basic equipment or as complex as a lack of pain specialists to consult. Physicians believe these deficiencies lead to constant delays and long waiting lists that in turn negatively impact their patients' quality of life. These negative impacts affect their psychological well-being, employment, and family life. The findings reveal that:

1. There is an astonishingly large number of Calgarians suffering from chronic pain. The physicians surveyed reported 5,044 pain patients of various types in their collective practices. Based on the current data, we are able to compute rough estimates of the total load for 893 GPs practicing in Calgary. An estimated 64,478 Calgarians consult GPs for chronic pain at any given time, with back pain representing 28.4% of these cases.
2. As a group, the physicians felt ill-prepared to manage chronic pain cases. The largest group[2] (41.5%) felt only moderately adequately prepared. Both GPs and specialists felt a degree of discomfort administering opioid drugs, such as Dilaudid/Hydromorph Contin, fentanyl patch and methadone. However, the majority of the participants felt comfortable prescribing NSAIDS (non-steroidal anti-inflammatory Drugs) and Tylenol #3. A statistically higher percentage of GPs (81.4%) expressed a need for Continuing Medical Education (CME) in chronic pain management compared with the specialists (42.2%): χ^2 (Continuity Correction) =9.03, d.f.=1, p=.003.
3. A large majority of physicians (69%) felt that there was a lack of support available to them within the CHR in terms of pain specialists' consultation, facilities, treatments, and procedures. Reasons for their negative reaction included: a) long waiting time; b) lack of human/material resources; c) existence of strict inclusion/exclusion criteria; d) lack of a firm plan; e) barriers to accessibility; f) expense of private facilities; and g) existence of unnecessary bureaucracy.
4. Physicians needed pain specialists' input for: a) appropriate medications (64.9%), b) accurate diagnosis (59.6%), c) interventional therapies (78.7%), and d) cognitive behavioural therapy (60.6%).

---

[1] In the amount of $44,000.00 as of April 2002. Project title: Breaking the Cycle of Pain
[2] Consisting of both GPs and specialists.

5. The physicians waited anywhere from 4 to 104 weeks for their patients to be assessed by a pain specialist. Both GPs and specialists considered wait time to be too long: total sample=62.8%, GPs=79.6%, specialists=44.4%. In the interim, the physicians relied on themselves (74.4%), i.e., improvised, consulted other specialists (51.9%) who are not pain specialists and/or referred their patients to alternative forms of therapies. Half of the participants felt confident doing the above interim referrals and relying on their own expertise
6. An overwhelming majority of the physicians (86.2%) felt that an integrated health care model would help improve patient outcomes. However, very few physicians conveyed the meaning and the processes of integration. (This assumes that current chronic pain management is perceived as quite fragmented.)

Patients also reported general dissatisfaction and negative experiences with the current system. First they had to wait a long time for an initial consultation and assessment. The majority of patients had to wait approximately one year. When they finally received the specialist's treatment, it had partial effectiveness: 59.7 % of patients reported invasive procedures to be effective to a degree, 53.7% and 13.4% considered medications and psychologist consultation respectively effective. The outcome was short–lived: of 40 patients who felt a degree of relief from invasive procedure(s), only 14 (35%) were relieved for more than six weeks. The majority of patients (67.9%, 74 of 109) accessed from one to six other services and facilities during the same time as they were accessing the RGHCPMC. In concordance with the physicians' data, physiotherapists were the number one health care source, followed distantly by massage therapists.

To summarize, both patients and physicians have identified chronic pain as a multifaceted medical concern requiring a myriad of disciplines for its management. They also have pointed out deficiencies in the system, such as lack of resources, lack of expertise and lack of integration. To redress these weaknesses, discussions are in progress to combine the strengths of the two existing major pain centres, RGHCPMC and Calgary Chronic Pain Centre (CCPC), in the CHR. This study provides a preliminary model for an integrated multidisciplinary chronic pain management centre.

Calgary Chronic Pain Centre: Regional Learning and Future Directions

Dr. Pamela Barton, Medical Director
Dr. Paul Taenzer, Clinical Service Manager
Calgary Health Region

Calgary Chronic Pain Centre

Regional Learnings and Future Directions

Dr. Pamela Barton, Medical Director
Dr. Paul Taenzer, Clinical Service Manager

September 17, 2003

Prevalence of Chronic Pain

- Population Health Survey
  - January, 1998
  - 1812 Calgarians between 18 & 64

    17.6% of Calgary population experience chronic pain
- 3% have *severe* chronic pain
  - intensity distressing or more
  - significant interference with activities
  - 17,000 Calgarians in this age group

Program Description

Partners:

- Alberta Health and Wellness $4.6million
  - Implementation budget
  - Start-up costs
  - Non-MD staff funding
  - Independent Evaluation
- Medical Services Budget (AHW and AMA)
  - Alternative Payment Plan for physicians
- Calgary Health Region
  - Medical Services Agreement for physicians
  - MD program development funding for physicians
  - In-kind Services

What:

- 2 year demonstration project
- Coordinated interdisciplinary care
- Individuals with chronic pain

When:

- Endorsed, May, 1997
- Opened, July, 2000
- Completed August 2002

Project Goals

To improve the *quality of life* of CP patients

To improve the *quality of the service environment for providers*

To *reduce ineffective utilization* of health care services

To *generate knowledge* about CP care

To *disseminate information* about CP care

How:

- Model of Care Blends:
  - Conventional medical interventions
  - Rehabilitation interventions
  - Self-management model
  - Client centred model

Where:

- Organizationally
  - Care in the Community, CHR

Setting:

  - 13,000 sq ft, Holy Cross Centre

Focus: Flexible Treatment Intensity and Scheduling

- Treatment components determined by patient's goals
- Treatment intensity determined by the patient's fitness level and availability
- Scheduling to accommodate patient's other commitments
- Length of treatment determined by progress towards goal attainment

Who: 3 patient populations:

- Three clinical teams:
  - Musculoskeletal (within 24 months of onset or deterioration),
  - Chronic Daily Headache,
  - Female Pelvic Pain
- Pain of at least 6 months duration
- Medical closure not required
- Residents of the Calgary region
- Age between 18 and 65

Achieving Interdisciplinary Care

- Physicians
  - integral members of the team
  - provide team leadership and medical direction
- Team members
  - work together with patients, families and referring physicians
  - identify issues, set goals, plan treatment and achieve outcomes
  - coordinate treatment to synergize benefit for patient

Individual Care

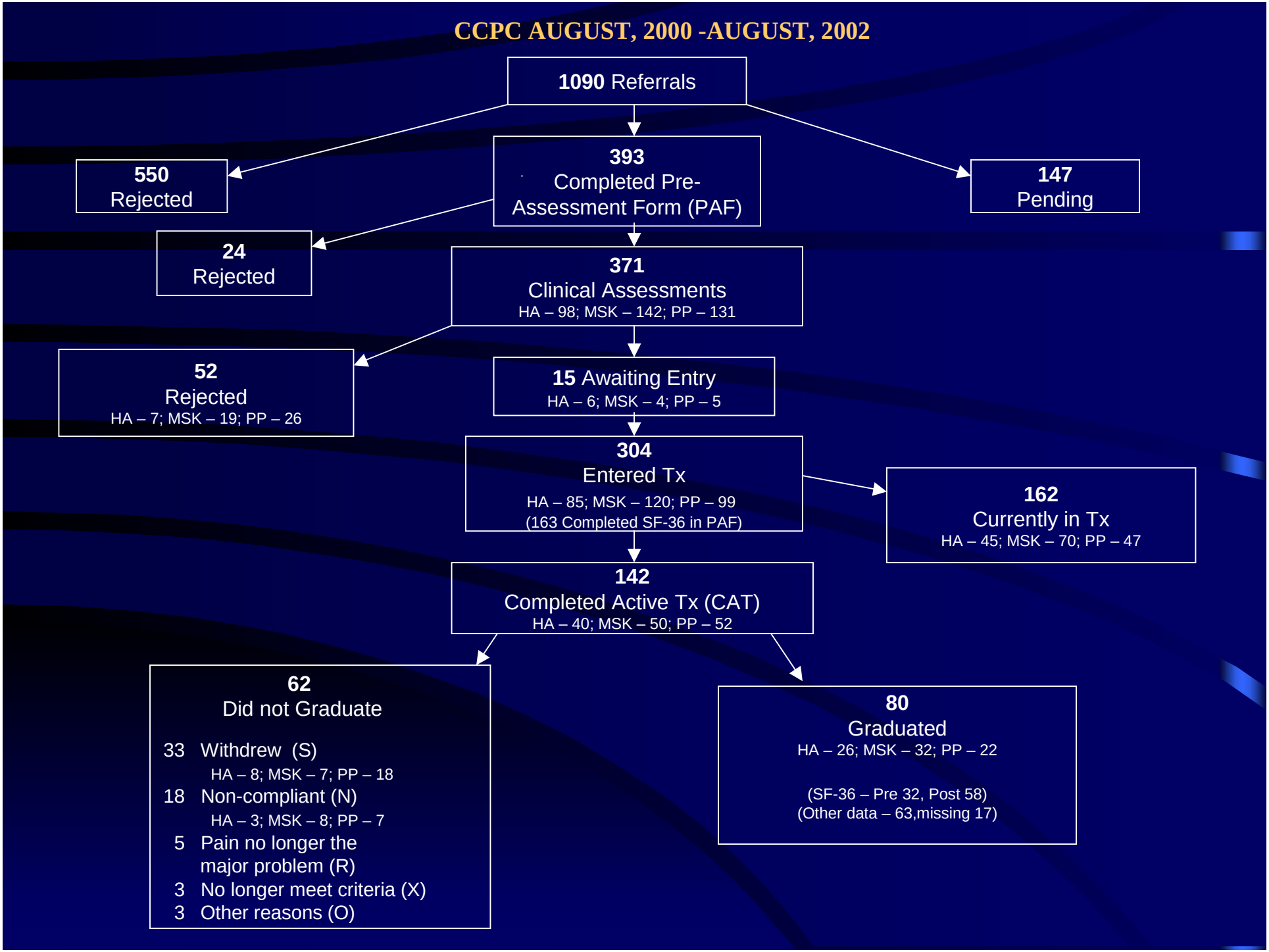
- MD, PT, OT, RN, Psych, Kin, Nutrition, Pharm.

Group Care:

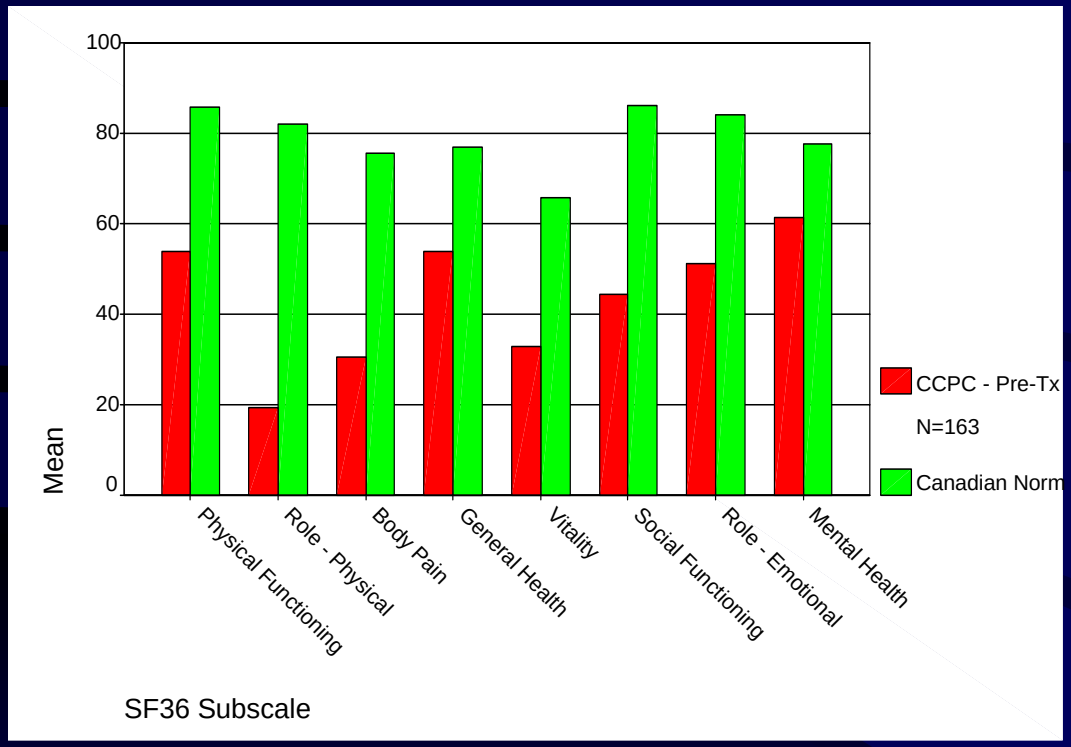
- ★ Orientation
- ★ Self-Management
- ★ Maintenance
- ★ Sleep Module
- ★ Healthy Eating
- ★ Exercise
- ★ ‘OT tips’
- ★ Rebuilding Self and Relationships
- ★ Family Workshop
- ★ Smoking Cessation
- ★ Intimacy Module
- ★ Transition to the Community

Program Outcomes

CCPC AUGUST, 2000 -AUGUST, 2002



SF-36: CCPC Pre-Treatment vs. Canadian Norms

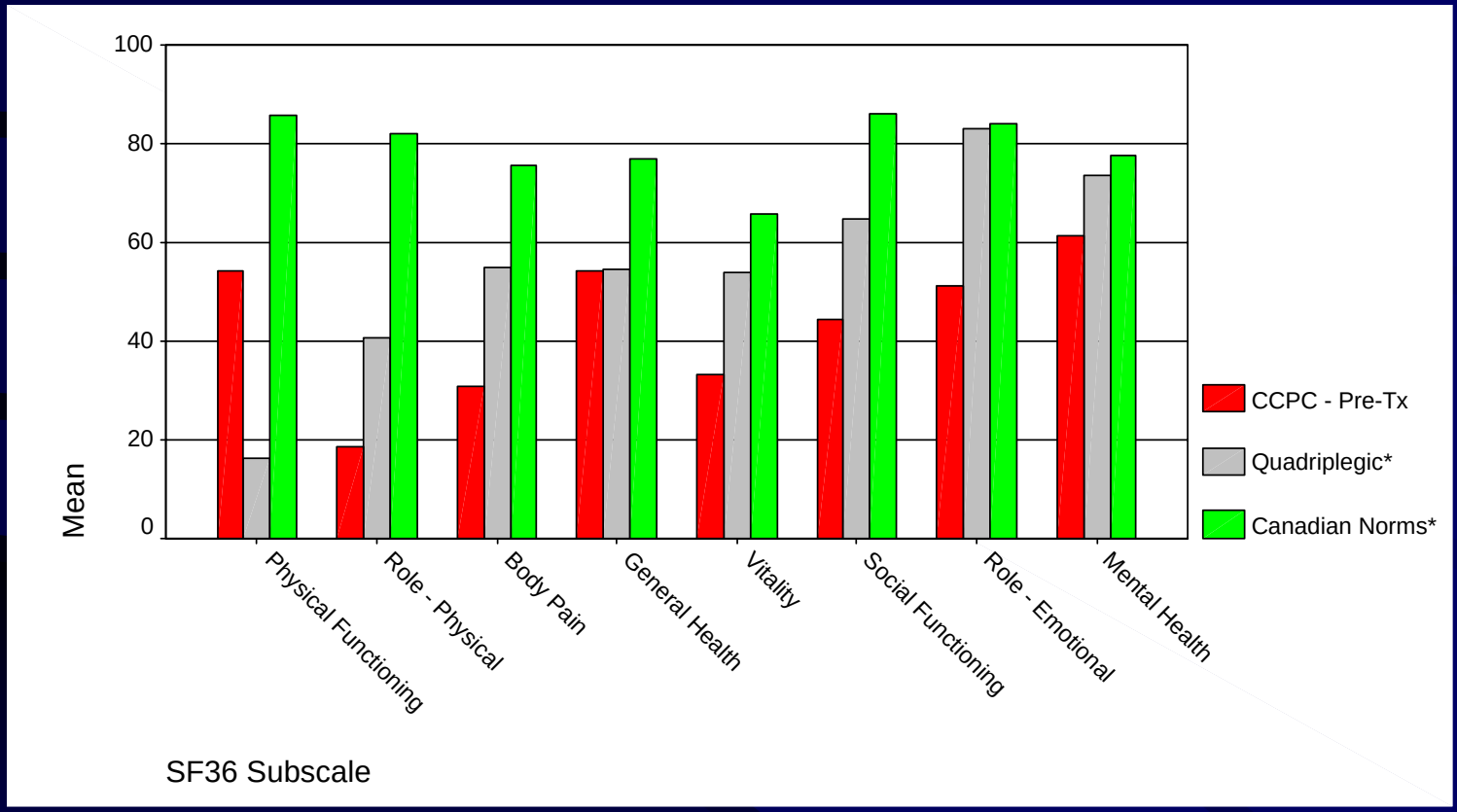


CCPC – Pre-Tx: N = 163

MSK:	N = 56
Headache:	N = 61
Pelvic:	N = 46

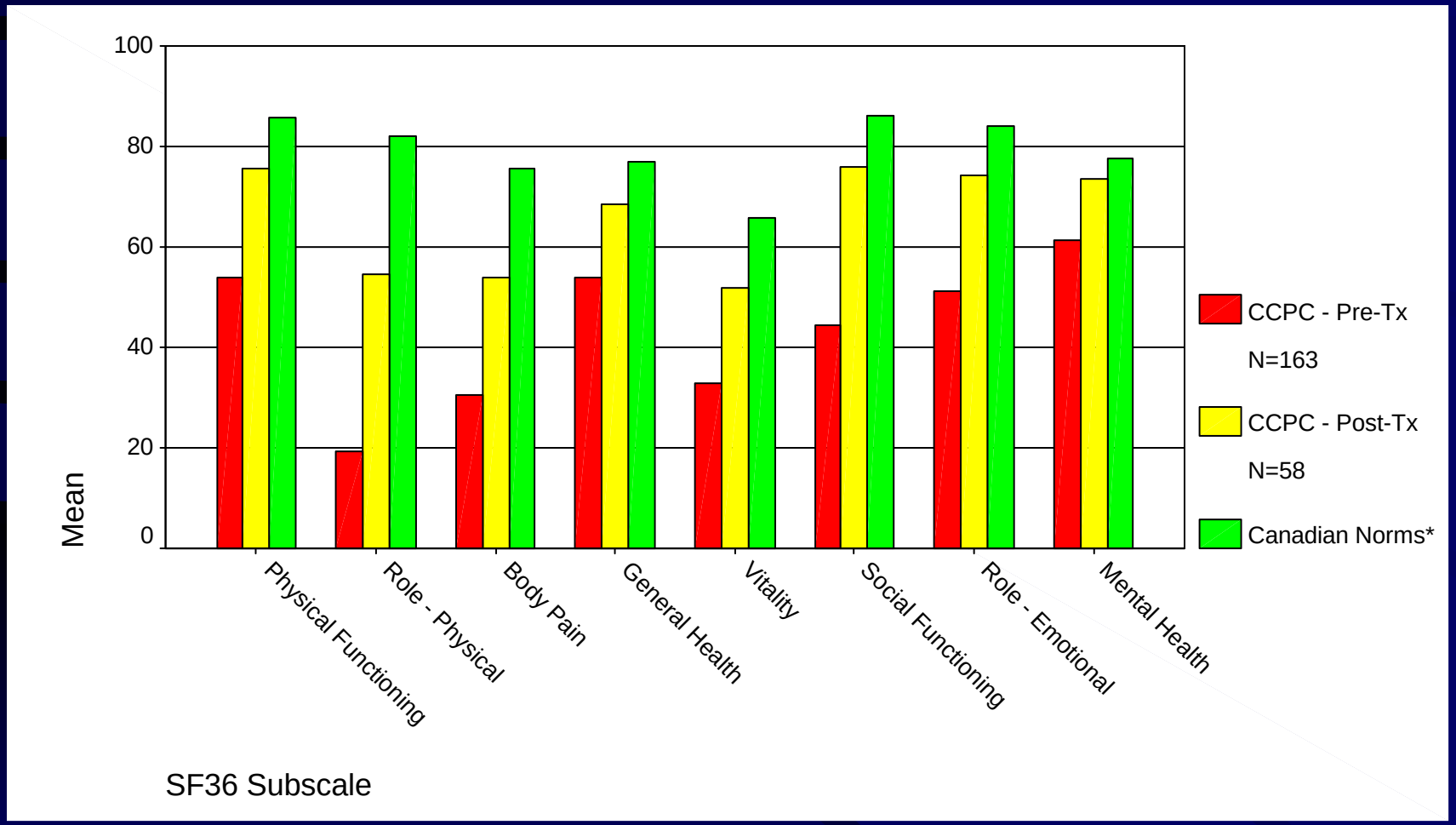
*Canadian Norms: N=9423; Hopman, W.M., Towheed, Tanveer, Anastassiades, Tassos, Tenenhouse, Alan, Poliquin, Suzette, Berger, Claudie, Joseph, Lawrence, Brown, Jaques P., Murray, Timothy M., Adachi, Jonathon D., Hanley, David A., Papadimitropoulos, and Emmanuel (2000). Canadian normative data for the SF-36 health survey. *CMAJ: Canadian Medical Association Journal*, *08203946*, *163*(3).

Quadriplegics



*Quadriplegic: N=82; Andreson, E. M., Fouts, B. S., Romeis, J. C., and Brownson, C. A. (1999). Performance of health-related quality-of-life instruments in a spinal cord injured population. *Archives of Physical Medicine & Rehabilitation*, *80*(8), 877-884.

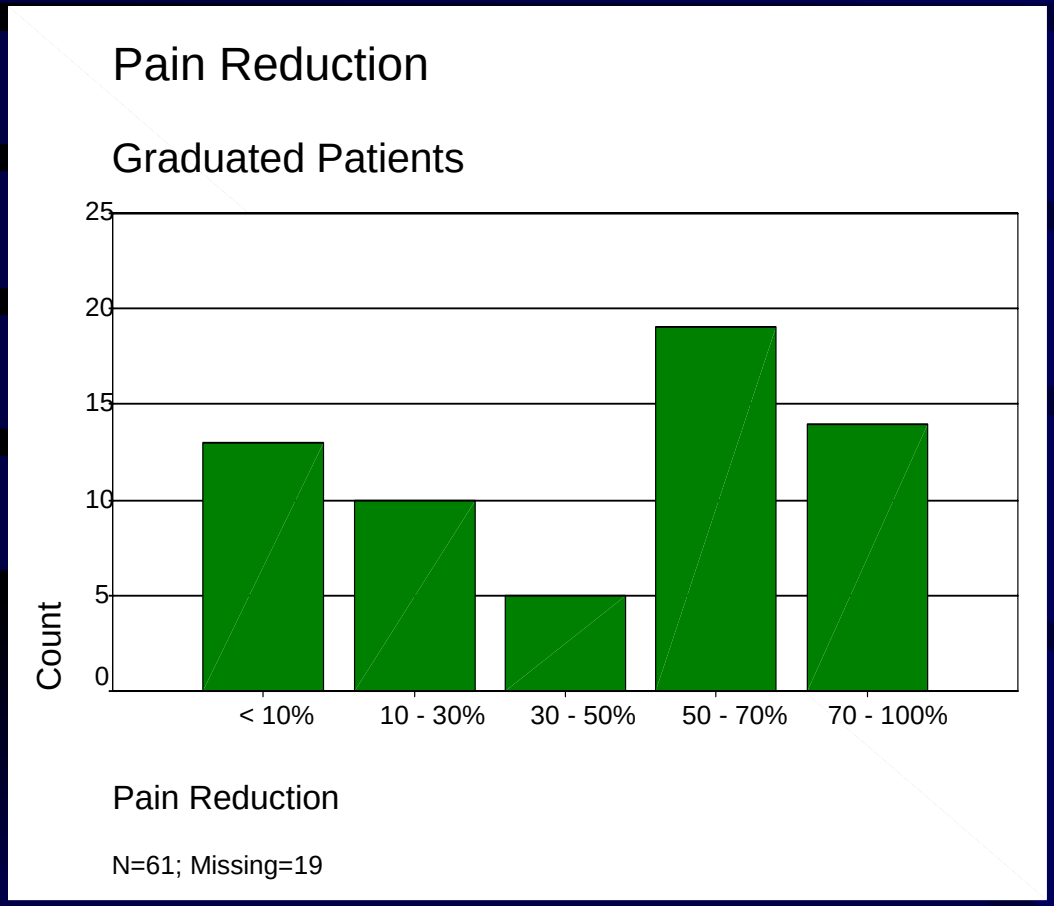
CCPC Pre & Post Treatment



Pre-Tx: MSK – N=56; Headache – N=61; Pelvic – N=46

Post-Tx: MSK – N=23; Headache – N=18; Pelvic – N=17

Pain Intensity Reduction

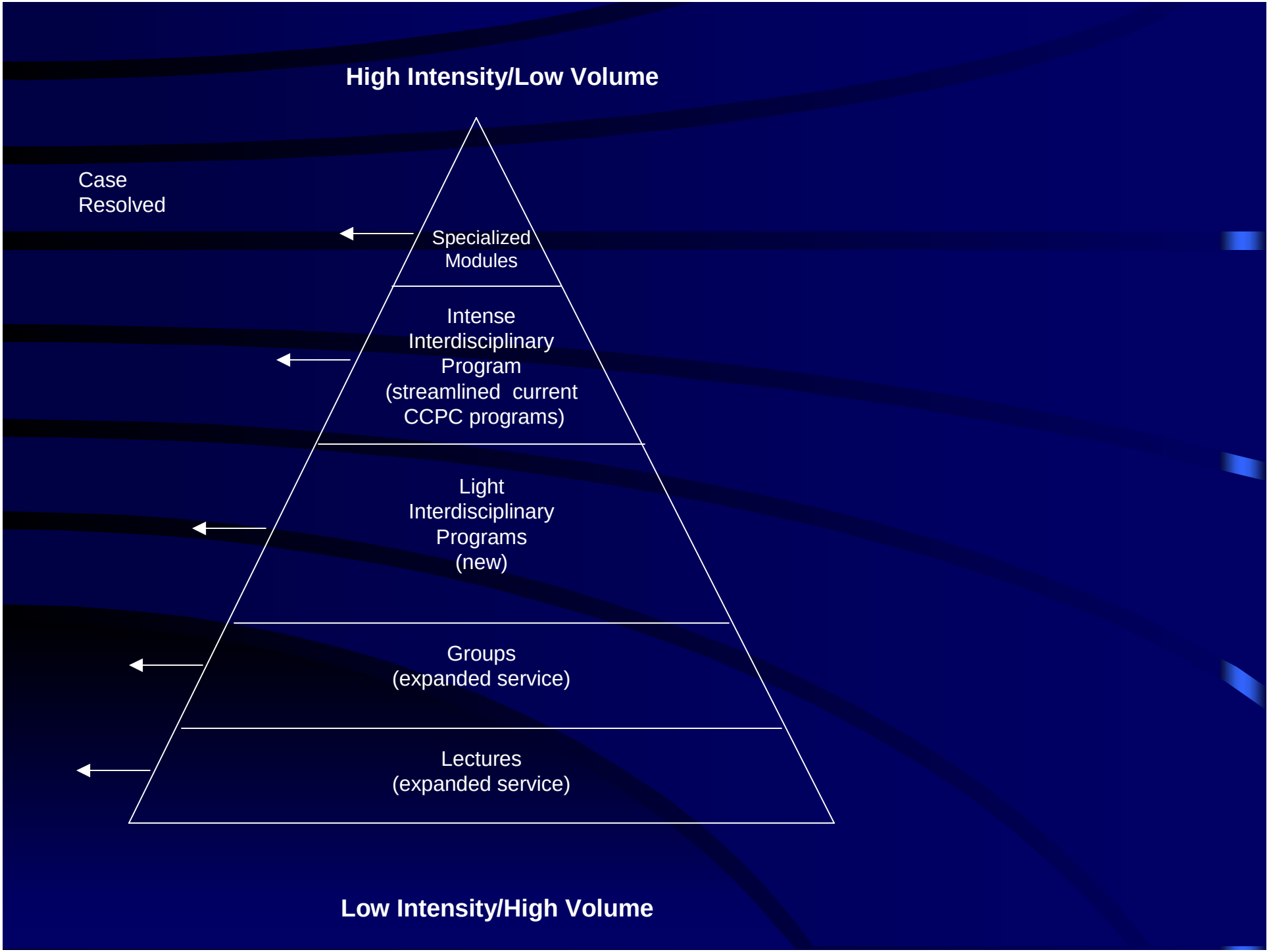


Graduates N=80

62% of patients report clinically meaningful pain reduction of 30% or greater*

*Rowbotham, MC. What is 'clinically meaningful' reduction in pain? Pain 94(2001)132,132.

Future Configuration for Chronic Pain


High Intensity/Low Volume
Case
Resolved
Specialized
Modules
Intense
Interdisciplinary
Program
(streamlined current
CCPC programs)
Light
Interdisciplinary
Programs
(new)
Groups
(expanded service)
Lectures
(expanded service)
Low Intensity/High Volume

Regional Learnings

Effective Care

- Initial clinical outcomes strongly positive
- Average cost per patient for this model is approximately $7,000
- Long term clinical and economic outcomes yet to be determined

Hi-energy Practice Environment

- Interdisciplinary innovation
- Practice paradigm shifts
- Practice flexibility
- Can integrate patient skill & knowledge enhancement, with discipline and team interventions

Successes are at the Interfaces

Each player has a contribution:

- Patient: motivation for skill & knowledge enhancement
- Discipline: knowledge & expertise
- Team: processes & attributes

APP

- Enabled Centre Physician Involvement
- Physician satisfaction and retention
- Staff satisfaction with physician engagement
- Physician costs are revenue neutral

Program Development Funding

- Enabled physician engagement in program planning
- Highly valued by physicians and staff
- Physician satisfaction high (4.4/5)

Patient Satisfaction

- Like 1 stop shopping, expertise & case coordination
- Pain is validated and treated with respect
- Do not keep retelling their stories
- Previously untreatable succeed
- Overall patient satisfaction 4.5/5.0

Community Physician and Staff Satisfaction

- Referring physicians highly satisfied
- Staff satisfaction and retention high

Evaluation – Outcomes & Utilization

- Critical for advocacy
- Integrate into clinical processes
- Track tenaciously in *ambulatory* population

Potential Enhancements

for

Future Projects

Clear Strategy for Success

- Avoid “Orphan Pilot Syndrome”
- Need clear definition of success
- If success is achieved then ……..

Governance/Steering Committee

- All stakeholders
- All aspects of project
- Consistent project “champions”

Future Directions

- Funding crisis precipitated a comprehensive review of chronic pain services in the CHR
- Formation of steering committee to oversee the development & integration of comprehensive pain services for the CHR

Regional Pain Program

Vision

To develop a comprehensive ***Regional Pain Program*** for the Calgary Health Region and Southern Alberta for all adult and pediatric clients, including prevention, assessment, management and outcome evaluation.

Regional Pain Program

Short Term Goals – 2 years

- Redesign of chronic pain services
- Implement a regional integrated CP program
- Develop an effective urban and rural outreach
- Organize pediatric pain services
- Organize geriatric pain services
- Develop benchmarks and standards of care

Regional Pain Program

Long Term Goals - 2 to 5 Years

- Increase awareness of appropriate pain management within the CHR
- Develop a regional strategic plan including prevention, assessment and management
- Develop a comprehensive research program

Thank You

Capital Health and LifeMark Health Institute Pilot Pain Program

Jennifer Rees, Capital Health
David van Driesum, LifeMark Health Institute
Dr. Ian Forster, LifeMark Health Institute

Alberta Health & Wellness: Chronic Pain Initiatives Day

Capital Health & LifeMark Health Institute Pilot Pain Program

September 17, 2003

Jennifer Rees, Capital Health

David van Driesum, LifeMark Health Institute

Dr. Ian Forster, LifeMark Health Institute

Capital Health

History

- Spring 1998
  - Relationship established with Gross Rehab Clinic
  - AH&W, AMA, Capital Health and Gross Rehab developed an APP for chronic pain services

Capital Health

History

- June, 1999
  - LifeMark Health purchased Gross Rehab Clinic
  - Renamed “LifeMark Health Institute” (LMHI)
  - Critical evaluation of program resulted in major redesign
    - » Developed specific program modules for clients

Capital Health

Summary - Program Modules

- Initial Medical and Team Assessment
  - Directs client to:
    - » Medication Management Program
    - » Psychosocial Program
    - » Active Rehabilitation Program

Capital Health

Summary - Program Modules

- Medication Management Program
  - Full time program
  - Average - 6 months
- Psychosocial Program
  - 2 week program - half day sessions
- Active Rehabilitation Program
  - Average 6 week program
  - 5 days/week - 4-5 hours/day

Capital Health

Pilot Project

- Pilot Project APP/Non Services Agreement
  - May 1, 2001 - April 30, 2003.

Capital Health

Outcome of Medical Assessment

- May 1, 2001 - April 30, 2003
  - Total number of clients assessed: 2737
  - # assessed and entered into a LifeMark Health Program: 1260 (46.0%)

Capital Health

Outcome of Medical Assessment

- # assessed and not referred to a LifeMark Program: 922 (33.7%)
  - Unsuitable (medically unstable, better served by single discipline)
  - Client issues resolved during the assessment
  - Referred to community rehabilitation

Capital Health

Outcome of Medical Assessment

- # assessed, recommended for program, who **did not** attend: 555 (20.3%)
  - Client declined
  - Unable to contact

Capital Health

Referrals - Program Modules

Type of Program	Number of Clients Scheduled For Specific Programs	Percent
Psychosocial Only	29	4.8%
Active Rehabilitation Only	227	37.6%
Medication Management Only	148	24.5%
Medication Management and Active Rehabilitation	7	1.2%
Psychosocial and Active Rehabilitation	170	28.1%
Psychosocial and Medication Management	9	1.5%
Psychosocial, Medication Management and Active Rehabilitation	14	2.3%
Total	604	100.0%

Capital Health

Outcome Evaluation

Active Rehabilitation Pre / Post SF36 Health Questionnaire

- SF36 score
  - Females: Improvement in 8/8 categories (ss)
  - Males: Improvement in 7/8 categories (ss)

Active Rehabilitation Pre/Post COPM

- COPM Scores - (self reporting)
  - Performance (ability to do activity)
    N= 311 - improved 60.7% (ss)
  - Satisfaction with performance
    N=312 - improved 123.4% (ss)

Pre/Post Valpar Functional Lift and Carry

- Functional Lift and Carry

		Pre	Post
Males:	lift	*Sed light	Medium (ss)
Females:	lift	Sed light	Sed light (ss)
Males:	Carry	Sed light	Medium (ss)
Females:	Carry	Sed light	Medium (ss)

**Sedentary*

Pre/Post Bruce (Cardiovascular Improvement)

- Males: 18.4% (ss)
- Females: 35.7% (ss)

Discharge Status from Active Rehabilitation

	# of Clients	Percent
■ Potential return to work fit for modified or full return to work	212	53.5%
■ Improved function	67	16.9%
■ Improved at discharge	279	70.5%
■ Other: no change, further medical investigations, non-attendance, other health issues	117	29.9%
Total number of clients	396	100.00%

Pre/Post Battery for Health Improvement (BHI)

- Improvement in 12/14 categories (ss)

Anxiety	Borderline
Depression	Perseverance
Pain Complaints	Somatic complaints
Family Dysfunction	Chronic Maladjustment
Hostility	Symptom Dependency
Muscular Bracing	Substance Abuse
Physician Dissatisfaction	Job Dissatisfaction

Capital Health

Psychosocial Program Client Discharge Status

Discharge Status	# of Clients	
Improved	152	69.4%
No Change	59	26.9%
Worse	7	3.2%
Other	1	0.5%
Total	219	100.0%

Medication Management Summary 15D Functional Status

- Client population has very high disability level
- Overall improvement in patient status (ss)
  - Better than TKR, similar to THR as rated by 15D

Capital Health

Medication Management Summary
15D Functional Status

- Improvement in 5/7 worst case categories (ss)

Sleeping

Discomfort

Distress

Sexual activity

Usual activities

Depression

Vitality

Capital Health

Medication Management Program
Client Discharge Status

	# of clients	%
Stabilized and transferred	128	71.5
Unsuccessful and transferred	17	9.5
Non-compliant	24	13.4
Withdrew	6	3.4
Other	4	2.2
Total	179	100.0

Overall Client Satisfaction With LMHI

- 16 categories
- Positive responses ranges - 61.8 - 95.3%
  - Lowest rating - “wait time for assessment”
  - Highest rating - “staff assisted you in following the program”
- Average overall # of positive ratings - 87%

Capital Health

Overall Client Satisfaction with the 3 Programs

- 10 categories
- Positive responses: ranges 73.6 - 98.7 %
- Average overall # of positive ratings: 85.4%

Capital Health

Conclusion

- Results of the 2 year pilot project
  - An excellent 3 way working relationship between Capital Health, Alberta Health & Wellness and LifeMark Health Institute

Capital Health

Conclusion

- Subjective and objective benefits for clients in Capital Health region

- Renewal of project for additional 3 years

DISCUSSION

DISCUSSION

A

HEALTH AND WELLNESS

FULL GROUP DISCUSSION

NEXT STEPS:

- More opportunity to study models on Chronic Pain to give us a better idea of where we are going
- Research on patients not meeting the criteria of the current programs
- Consistent process for education of physicians, patients and other providers
- What resources are available for the professionals in this area?
- Consistent evaluation of programs
    - *Standardized evaluation framework*
- Research on how to use good implementation skills in hospitals
    - *Better sharing of 'best practice'*
- Fund a strategy to develop 'pain' expertise in Alberta
- Patient access to alternative therapies
- Give Chronic Pain the same status as such things as 'Joint Replacement'
- Consultant to provide initiative to pool resources and develop a coordinated approach for Chronic Pain
- More objective assessment of treatment
    - *Common data source*
- Collect data on what happens to the patients in the individual programs
- More research done on Chronic Pain (ie. CIHI)
- Common data set for all Chronic Pain in the province
- Choose a specific Chronic Pain problem (ie. Lower back pain) and establish some clinical care guidelines
- Why patients in primary care who are well cared for are separate from the ones needing appropriate/better care
- Further develop existing Chronic Pain centres to encompass a larger patient care area (ie. Increase the sphere of influence)
- Develop a registry of these patients to track them and monitor long-term outcomes
- Measure more qualitative aspects of Chronic Pain such as positive behavioral changes
- Better coordination and availability of community resources (ie. Local social workers, swimming pools, etc.)
- Publicly funded therapies need to be accountable to the outcomes

HOW TO GET THIS DONE:

- Fellowship program, Calgary Regional Health Program
  - Has to be funded
- Process to prioritize choices/recommendations
  - Forming a steering committee
- Better liaisons between those who deal with 'pain'
- Provincial Steering Committee
  - Commission in 60 days
- Develop a Provincial Steering Committee to formalize a provincial network and proper management
- Steering Committee would include all relevant stakeholders (ie. Regions, AHFMR, etc.)
- Who moves these initiatives forward – government? Regions?
- Create a standardized outcome assessment for the province. The assessment should take into consideration the variability of the Chronic Pain populace.
- Need to involve the decision makers

Chronic Pain Day Meeting Survey Summary

Question Number	Frequency Distribution						Question Score
	1	2	3	4	5	6	
	Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree	
1	8	9	0	0	0	0	26
2	4	9	4	0	0	0	34
3	4	12	1	0	0	0	31
4	6	10	1	0	0	0	29
5	10	7	0	0	0	0	24
Total	32	47	6	0	0	0	144

Notes: n=17 with a maximum allowable total score of 510 and minimum score of 85. Individual questions have a maximum score of 102 and minimum of 17. The lower the score the better the agreement.

Survey Questions
1. The Chronic Pain Day Session was a worthwhile and useful experience.
2. The session allowed me to share information and learn more about current chronic pain initiatives.
3. Throughout the day there were useful discussions surrounding opportunities and challenges relating to chronic pain.
4. There were opportunities to learn from other participants and create new networks.
5. The Chronic Pain Day Session was organized and facilitated effectively.

Survey Comments:

1) I particularly enjoyed the presentation of the Calgary Chronic Pain Group pilot projects. We need more pilot studies to show that this is a necessary area to fund.

2) Would like to keep the information flowing. How to get the information out there; How do we refer the more complex and difficult cases. Can telephone consultation be done? Who do we call?

3) Excellent meeting. Lots of great ideas for future planning.

4) Please form a Provincial Steering Committee for chronic pain with a mandate and budge to effect change. We have the opportunity in Alberta to be world class leaders in this field.

5) This is a good first step and look forward to further discussions. Would encourage the development of a Provincial Steering Committee to further the issue of pain management, both acute and chronic.

6) Good initial step. Let's build on it together.

Chronic Pain Day Meeting Survey Summary