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Classification in Nonspecific Low Back Pain: What Methods do Primary Care Clinicians Currently Use?

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Study Design. Postal survey.

Objectives. To describe the signs and symptoms that clinicians think represent nonspecific low back pain (NSLBP) subgroups, and to report the labels that clinicians give to those subgroups.

Summary of Background Data. The cause of most low back pain (LBP) cannot be diagnosed. Consequently, approximately 80% of primary care LBP presentations are most accurately labeled as NSLBP. Most Australian primary care clinicians think that NSLBP is heterogeneous and treat patients differently based on that heterogeneity. This research sought to identify the subgroups clinicians believe are recognizable within that heterogeneity.

Methods. Analysis of survey data from 651 primary care clinicians from 6 professional disciplines: physiotherapy, manipulative physiotherapy, chiropractic, osteopathy, general medicine, and musculoskeletal medicine.

Results. There was little consensus among participating clinicians regarding the signs and symptoms that identify NSLBP subgroups. Most clinicians give labels to NSLBP subgroups that imply putative pathoanatomy, however, the evidence that these labels are valid is scant and controversial.

Conclusions. A lack of consensus among participating clinicians regarding NSLBP subgroups and a lack of evidence for the validity of NSLBP subgrouping are a compelling argument for further research into this clinical practice.

Key words: nonspecific low back pain, treatment, classification, diagnosis, subgroups. **Spine 2005;30:1433–1440**

Nonspecific low back pain (NSLBP) represents approximately 80% of primary care low back pain (LBP) presentations.[1,2] Currently, it is not possible for clinicians to reach NSLBP pathoanatomical diagnoses with certainty because of the poor correlation between our knowledge of pathoanatomy and clinical presentation. In the absence of diagnostic precision, most Australian primary care clinicians use signs and symptoms to classify patients with NSLBP.[3] They do this because most primary care clinicians believe that NSLBP is heterogeneous and treat patients with NSLBP differently based on that heterogeneity.[3] This practice is prevalent even though there is little evidence for its validity, and despite the arguments of some investigators that NSLBP outcomes would be improved if NSLBP were considered homogeneous and treated with a generic approach.[4–9]

There are many advocates of NSLBP heterogeneity and many classification schemes that have been suggested.[10–24] Advocates of NSLBP heterogeneity argue that recognizing patterns of signs and symptoms as identifiers of discrete subgroups assists with making a prognosis and allows refinement of treatment selection.

Currently, there is a paucity of evidence that proposed NSLBP subgrouping schemes validly infer different prognoses. There are known risk factors for NSLBP chronicity,[25–40] but these factors are not typically included in subgrouping schemes. We are not aware of any longitudinal outcomes data that test the prognostic use of specific NSLBP subgrouping schemes. There are studies that show the potential prognostic use of isolated assessment findings such as centralization[41–45] but not the prognostic use of the combined components of a comprehensive subgrouping scheme.

We propose that NSLBP subgrouping only has treatment selection use if this practice positively impacts patient outcome. Currently, the evidence for this is sparse and of varying quality. Only a small number of randomized controlled trials have quantified the therapeutic effects achieved for patients treated with the protocols suggested by specific subgrouping schemes, compared with the therapeutic effects achieved with generic treatment protocols. Some trials have shown higher therapeutic effect with NSLBP subgrouping protocols,[46–49] and some have not.[50,51] Randomized controlled trials showing higher therapeutic effects with subgrouping protocols included differential treatment based on those protocols. Hence, when outcomes differ for subgroups, it is not clear whether it is because of the different treatment or the membership of a particular subgroup. What is not known is whether the prognosis for subgroups varies when no treatment is provided or when treatment is uniform.

Given the prevalence of NSLBP, its social and economic costs, and the prevalence of subgrouping in NSLBP treatment, there is a compelling argument for further longitudinal studies that examine the relationship between subgroup membership and outcome. A preliminary step in this process is knowledge of the current subgrouping practices of primary care clinicians. Studies in Britain, Ireland, and Washington state report that

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physiotherapists use the McKenzie subgrouping method, with 44% to 67% of patients with LBP.[52–54] Little is known about the physiotherapist's use of other subgrouping methods or the current subgrouping practices of clinicians across primary care professional disciplines.

Of Australian primary care clinicians who responded to a recent survey,[3] 74% thought that it is currently possible to recognize NSLBP subgroups, and 93% treat NSLBP differently based on patterns of signs and symptoms. Therefore, the first aim of this research was to gather data on the signs and symptoms that clinicians think represent various NSLBP subgroups. The second aim was to report the labels that clinicians give to those subgroups.

■ Methods

Survey. A survey of Australian primary care clinicians was conducted to assess aspects of their current NSLBP subgrouping practices. Questionnaires were mailed to 200 randomly selected clinicians from each of 6 primary care disciplines: chiropractors, general medical practitioners, manipulative physiotherapists, musculoskeletal medicine practitioners, osteopaths, and physiotherapists. There were 651 (59.8%) completed questionnaires returned. Details of the survey design, method, response, and the views of clinicians regarding NSLBP heterogeneity have been published.[3] The survey also collected data on the assessments that clinicians use in acute NSLBP, and these will be reported in a subsequent article.

The survey included 2 questions. Question 1: "There is a view in the medical and research community that LBP that is not due to serious pathology (cancer, fracture, infection etc) and not due to nerve root or thecal irritation, is best labeled 'non-specific low back pain' (previously called mechanical LBP). Do you think that it is possible for you to recognize sub-groups of non-specific low back pain and therefore reach a more precise working diagnosis (disc lesions, instability, postural syndrome, facet syndrome, etc)? Yes/No."

Question 5: "If Yes, for the three most common non-specific LBP conditions that you see, list the examination findings that you think are discriminative. For example list the findings that suggest to you that a condition is present, and (if possible) what diagnostic or descriptive label you give each of these conditions."

No temporal characteristics of NSLBP were nominated because information was sought on NSLBP clinical reasoning regardless of duration of the condition. Clusters of signs and symptoms responses to Question 5 were tabulated in a spreadsheet and reviewed. The primary researcher developed "themes" from the responses (Appendix 1, available for viewing on ArticlePlus only). For example, "limited forward bending," "limited flexion," "flexion restriction," "reduced forward bend," "unable to touch toes," and "unable to forward bend" were all listed as occurrences of the theme named "flexion reduced." Ultimately, 78 themes encapsulated all of the signs and symptoms reported by the clinicians. There were 1068 subgroup responses to Question 5 from 416 clinicians (a mean of 2.5 subgroups nominated by each responding clinician). The mean number of signs and symptoms for each subgroup response was 3.5 (3722 signs and symptoms responses in total). Two independent reviewers coded these signs and symptoms responses. Every response was successfully coded under one of these 78 themes. The initial coding resulted in 73% complete agreement between the 2 reviewers, and the differences in initial coding (27%) were commonly of a minor nature and were resolved by negotiation.

The descriptive labels given to subgroups were also themed using the same process. For example, all labels that referred to a facet or zygapophysial joint lesion were coded as "facet syndrome." The coding labels were facet, contained disc, instability, sacroiliac joint, postural, muscle, piriformis, spondylolisthesis, degeneration, iliolumbar, miscellaneous pathoanatomy, nonpathoanatomy, and no label. The initial coding resulted in 93% complete agreement between the 2 reviewers. The coding instructions, coding categories, and precoded and coded data are available by request from the first author (P.K.).

Data Analysis. These subgroup data were analyzed in a number of ways. The frequencies of subgroup label use (proportions ±95% confidence intervals) were determined for the cohort as a whole and also compared across disciplines.

The frequency with which particular signs and symptoms were nominated for particular subgroups was calculated. Arbitrarily, we only included subgroups in this analysis if they had been nominated by more than 5% of clinicians. Clinicians reported a large number of signs and symptoms, but some were reported infrequently. Arbitrarily, we only included signs or symptoms in this analysis if they met 2 criteria. First, they had to have been nominated by more than 10% of respondents who nominated that subgroup. Second, the lower limit of the 95% confidence interval around the proportion of clinicians nominating a particular sign or symptom had to be more than zero. The signs or symptoms for which there was no overlap between subgroups was determined by tabulating the signs and symptoms (by subgroup), and deleting any that were nominated in more than one subgroup.

The agreement between responses to the question on specific combinations of signs and symptoms was determined for each of the 5 most frequently nominated subgroups. All subgroup responses that were coded under the same label were identified. The most frequently nominated sign or symptom for that subgroup was then identified. The proportion of clinicians that agreed on the most common single sign or symptom as representing that particular subgroup was calculated. This process was repeated for the subgroup responses that included the 2 most frequently nominated signs or symptoms and again for the 3 most frequently nominated signs or symptoms for that particular subgroup. The proportion of clinicians that agreed that the most frequently nominated combinations of 2 specific signs or symptoms indicated particular subgroups was examined by professional discipline to determine whether this agreement traversed disciplines.

Cluster analysis was performed using a hierarchical approach on the entire data set of signs and symptoms. This cluster analysis ignored the descriptive labels, and explored underlying patterns of signs and symptoms that clinicians nominated as specific subgroups to test the possibility that disciplines might be using different labels for the same set of signs and symptoms. The Ward hierarchical clustering algorithm was used because the analysis was exploratory. Nonhierarchical clustering would have required the *a priori* estimation of nonrandom seed points (centroids).[55]

Tests for significant differences in proportions across disciplines were conducted using Bonferroni adjusted ($P = 0.003$) inferential confidence intervals and presented graphically as

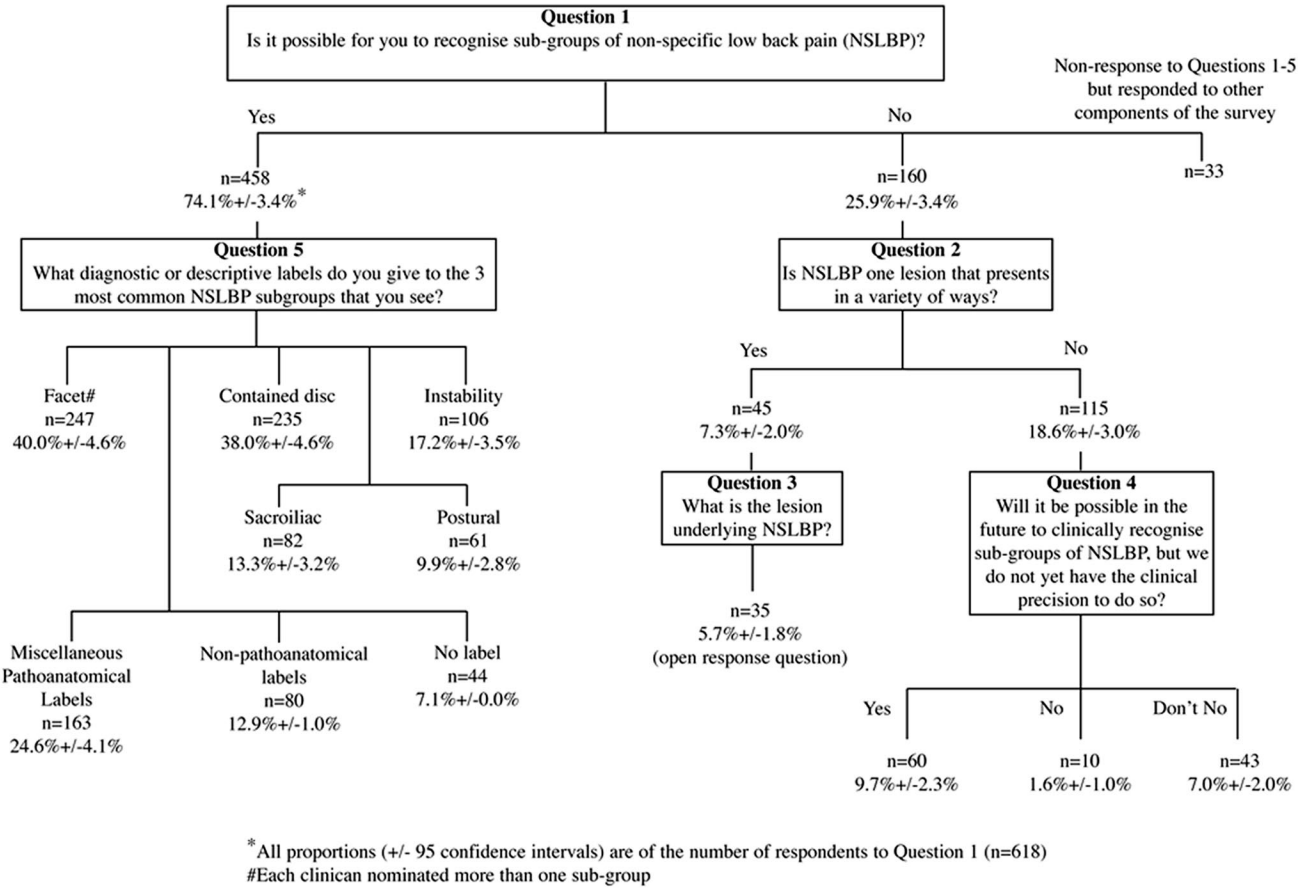


Figure 1. Clinician's responses to the survey's subgrouping questions and the proportion of clinicians nominating each subgroup.

described by Tryon.[56] The alpha level for each comparison was determined using the calculation: "alpha/number of comparisons" where the number of comparisons = (n x (n-1))/2. There were 6 groups in the comparisons described, rendering 15 pair-wise comparisons: (n x (n-1))/2 = (6 x^{6-1})/2 = 30/2 = 15. This resulted in resetting the alpha level for 95% confidence in results of any pair-wise comparison to (0.05/15) = 0.003. Inferential confidence intervals are Bonferroni adjusted confidence bands. Where no visual or numerical overlap occurs between these confidence bands, a difference between proportions can be concluded with 95% confidence. Statistical analysis was conducted using SPSS 10 (SPSS Inc., Chicago, IL) and Excel X (Microsoft Corp., Redmond, WA).

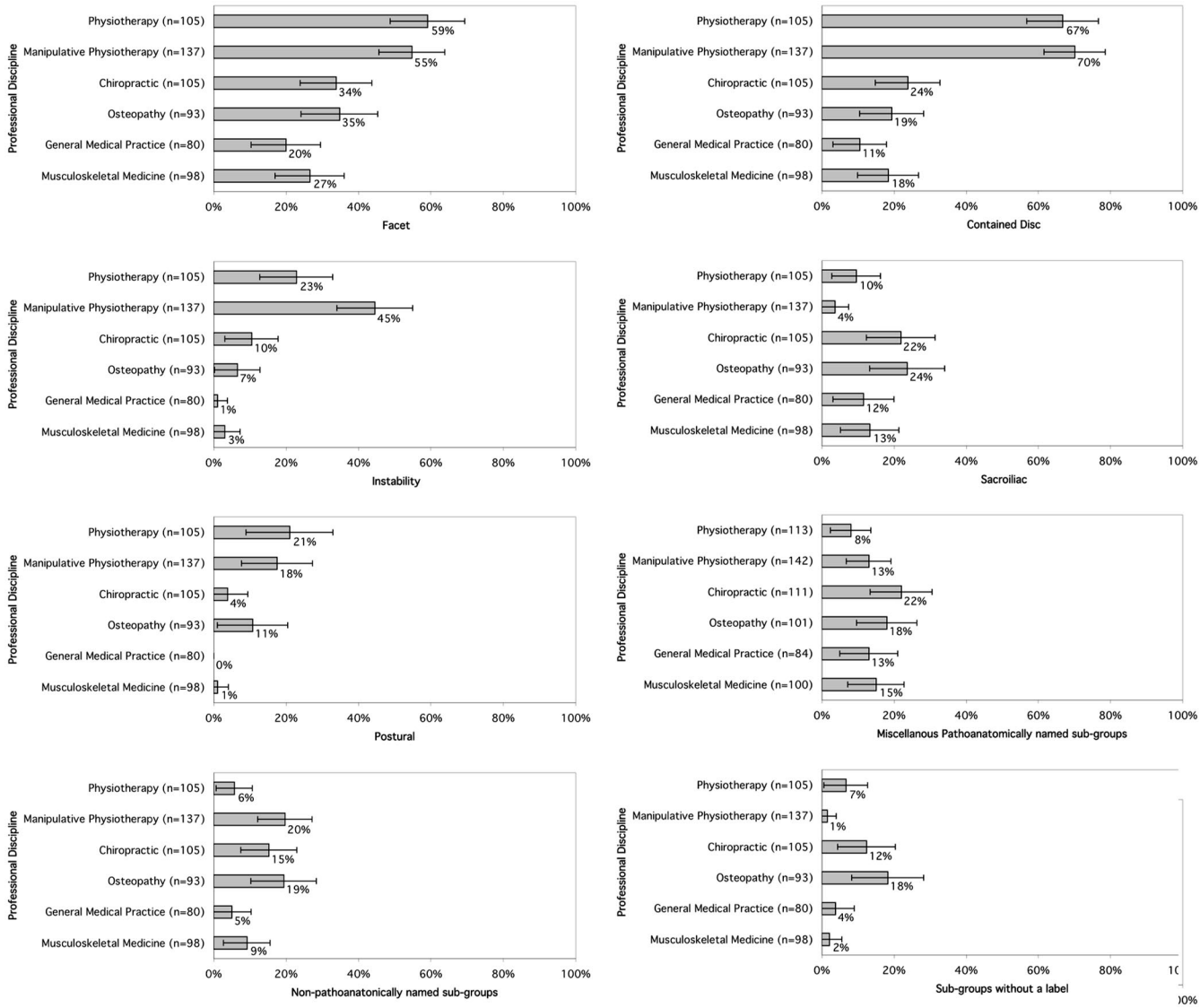
■ Results

Subgroup Labeling

The nominated subgroup labels were divided into 3 categories. The first category was referred to as "Pathoanatomical" because these labels, such as facet syndrome, contained disc lesion, imply a putative pathoanatomical source of pain. Of all nominated subgroup labels, 88.3% were in this category. The second category was referred to as "Nonpathoanatomical" because these were labels, such as acute back, nonspecific, that did not imply a pathoanatomical source of pain. Of all nominated subgroup labels, 7.5% were in this category. The third category was made up of subgroups for which the clinician did not volunteer any label. Of all nominated subgroup labels, 4.1% were in this category. The proportions of clinicians nominating subgroups in these broad categories (*i.e.*, pathoanatomical, nonpathoanatomical, and no label) were similar across professional disciplines.

There were only 5 pathoanatomically named subgroups that were reported by more than 5% of clinicians: facet syndrome, contained disc lesion, instability, sacroiliac joint problems, and postural syndrome. Therefore, the other pathoanatomically named subgroups were included in the miscellaneous pathoanatomy subgroup for subsequent analysis. The clinician's responses to the survey's subgrouping questions and the proportions of clinicians nominating each subgroup are shown in Figure 1.

In Figure 1, the proportions of clinicians nominating particular subgroup labels have been calculated using inferential confidence intervals to allow observation of significant differences in the frequency of reporting of these labels. Facet syndrome (40.0% ± 4.6%) and contained disc (38.0% ± 4.6%) were the most frequently nominated subgroups, suggesting that clinicians consider these subgroups to be prevalent. There were significant differences in the rate of reporting of particular subgroups across disciplines (Figure 2). A higher proportion of physiotherapists and manipulative physiothera-



Respondents to Question 1 included both those who thought that it is, and those that thought it is not, currently possible to recognise NSLBP sub-groups.

The width of the 95% confidence intervals have been adjusted (Tryon, 2001) such that where no visual overlap occurs between confidence intervals for any particular comparison, a difference between these proportions can be concluded with 95% confidence

Figure 2. The proportion of all respondents to Question 1 (*i.e.,*"Is it possible to recognize NSLBP sub-groups?") from each discipline who nominated particular subgroups.

pists reported the facet and contained disc subgroups than did the other disciplines.

More physiotherapists and manipulative physiotherapists reported the instability subgroup than general medical practitioners and musculoskeletal medicine practitioners. A higher proportion of manipulative physiotherapists reported the instability subgroup than chiropractors and osteopaths. More chiropractors and osteopaths reported a sacroiliac joint subgroup than did manipulative physiotherapists.

A higher proportion of physiotherapists and manipulative physiotherapists reported the postural subgroup than general medical practitioners and musculoskeletal medicine practitioners. More osteopaths reported the postural subgroup than did general medical practitioners. A higher proportion of osteopaths reported unnamed subgroups than did musculoskeletal medicine practitioners and manipulative physiotherapists.

Subgroup Composition

The signs and symptoms for which there was no overlap among subgroups were determined (Table 1). The proportion of respondents nominating these signs and symptoms ranged from 9.5% to 54.7%.

The signs and symptoms for the 5 most commonly nominated subgroups (*i.e.,* facet syndrome, contained disc lesion, instability, sacroiliac joint problems, and postural syndrome) are shown in Appendices 2.1−2.5

Table 1. The Signs and Symptoms Nominated for Particular Subgroups for Which There was No Overlap Among Subgroups

Facet	Contained Disc	Instability	Sacroiliac	Postural
Extension: reduced (38.8% ± 6.1%)	List (31.3% ± 5.9%)	Mid range catch (44.8% ± 9.5%)	Asymmetry SIJ (palpatory or movement) (54.7% ± 10.5%)	Postural abnormalities (42.6% ± 12.4%)
Lateral flexion: reduced (22.9% ± 5.2%)	SLR: positive (30.5% ± 5.9%)	Palpatory hypermobility (27.6% ± 8.5%)	SIJ provocation test: positive (29.1% ± 9.6%)	Pain with prolonged postures (36.1% ± 12.0%)
Palpatory hypomobility (20.0% ± 5.0%)	Pain sitting (28.8% ± 5.8%)	Recurrent pain (12.4% ± 6.3%)	Pain buttock (29.1% ± 9.6%)	Muscle tightness (21.3% ± 10.3%)
Posterior quadrant: reduced (18.8% ± 4.9%)	Impulsion: positive* (23.2% ± 5.4%)	Pain: standing (10.5% ± 5.8%)	Pain: leg (19.8% ± 8.4%)	Cause: nonspecific (11.5% ± 8.0%)
Restricted movement (16.7% ± 4.7%)	Extension helps (13.7% ± 4.4%)	Imaging findings positive (9.5% ± 5.6%)		
Pain: paracentral (11.8% ± 4.0%)				

The proportions of clinicians nominating these signs and symptoms within each subgroup are shown in parentheses.
* Coughing, laughing, Valsalva maneuver.
SIJ = sacroiliac joint; SLR = straight leg raising.

(available for viewing online through ArticlePlus only). Overall, there was low agreement on specific combinations of signs and symptoms for each of these 5 subgroups. The range of agreement for the *single* most common sign or symptom was 42.6% ± 12.4% to 54.7% ± 10.5%. Agreement on the 2 most common signs or symptoms for each subgroup ranged from 11.5% ± 8.0% to 18.6% ± 8.2%. Agreement on the 3 most common signs or symptoms for each subgroup ranged from 2.9% ± 2.1% to 8.6% ± 3.6%. Put simply, at best, only 1 in 10 clinicians could agree on the most common combination of 3 signs or symptoms that indicate these subgroups.

The proportion of clinicians who agreed that the combination of 2 specific signs or symptoms indicated these subgroups was examined by professional discipline. These data show that between 69.2% and 100.0% of the clinicians who agreed on a combination of 2 specific signs and/or symptoms as indicating facet, contained disc, instability, or postural subgroups were either physiotherapists or manipulative physiotherapists. Of the clinicians who agreed that the combination of 2 specific signs or symptoms indicated sacroiliac joint, 50.0% were osteopaths, and 31.3% were chiropractors. Most agreement appeared to be discipline specific.

The results of the cluster analysis (*i.e.,* dendrogram) displayed a smooth transition from solutions with high numbers of clusters continuously down to 2 clusters. These results indicate that cluster analysis of the pool of all the signs and symptoms was unrevealing because heterogeneity in the data prohibited empirical detection of any inherent clusters of signs and symptoms.

■ Discussion

Subgroup Labels

Most clinicians (84%) nominated NSLBP subgroup labels that inferred a putative pathoanatomical source or cause of pain. This pattern was similar across professional disciplines. Almost exclusively, the signs and symptoms that clinicians nominated as being indicative of subgroups were those derived from the clinical assessment of pain and other physical impairment. The capacity to determine underlying pathoanatomy from these data is controversial. A definitive method to assess whether a cluster of signs and symptoms can correctly identify the source of pain is to compare the results of clinical tests to a gold standard that is known to be a valid test for the source of the pain. There are no gold standards in NSLBP diagnosis, and the accuracy of the available reference standards remains the subject of debate. Presently, provocative diskography is used to investigate disc lesions,[57–60] and anesthetic blocks are used to investigate facet joint pain and sacroiliac joint pain.[60–69] Using these methods, some researchers have concluded that there are no patterns of signs and symptoms that are capable of accurately identifying pathoanatomy in NSLBP.[58,59,66–70] Other researchers have concluded that particular signs and symptoms may have clinical use.[57,60,63,71]

NSLBP pathoanatomical models based on these reference comparisons are controversial as a result of: (1) concerns about the accuracy of inferences regarding primary pain generation because of false-positive rates of provocative diskography and anesthetic injections;[72–74] and (2) concern that workup, selection, and spectrum biases[75] may limit generalizability to a broader clinical population.[76–79]

Subgroup Composition

There was low agreement regarding the signs or symptoms that are indicative of pathoanatomically named subgroups and a lack of discrete clusters seen in cluster analysis. Therefore, although the specific signs and symptoms nominated for particular subgroups have been illustrated in Table 1 and Appendix 2 (available for viewing on ArticlePlus only), these results should be interpreted with caution.

The low agreement found in the current study is similar to that found in a recent survey of British osteopaths regarding clinical indicators of disc herniation in which

agreement for specific signs and symptoms ranged from 2% to 34%.[80] It is also similar to the agreement (46%) found between rheumatologists diagnosing shoulder pain.[81] In the absence of identifiable pathoanatomy, clinical concordance regarding the signs and symptoms of specific conditions appears to be low.

Most agreement in this study was confined to particular professional disciplines. Reasons for this result might include discipline specific insightful clinical observation, monocultural educational training, and/or an untested discipline specific belief. Furthermore, there were significant differences across disciplines in the reporting rates of particular pathoanatomically named subgroups. This result may reflect the views of different "clinical cultures" or different case mix.

Evidence is not currently available to determine if the views held by any of the professional disciplines are more or less valid than the views held by any other discipline. These data also suggest that most clinicians who responded to this survey use subgroup labels to describe NSLBP heterogeneity and that these labels are recognized across disciplines. It may be that some clinicians believe these labels represent accurate pathoanatomic diagnoses, while other clinicians use these labels as a "shorthand" to communicate a particular cluster of signs and symptoms. However, when using these labels, clinicians may have quite different interpretations as to what that label implies. For example, when one clinician refers to facet syndrome, another clinician's interpretation of the signs and symptoms associated with this may be quite different. This difference represents a significant barrier to communication within and between the primary care disciplines that treat NSLBP.

The strengths of this survey design and results are: (1) data were gathered from a comprehensive selection of primary care practitioners, and (2) the survey population was comprised of primary care clinicians who deliver the bulk of NSLBP treatment in Australia. The weaknesses of this survey design and results are: (1) the response rate was 59.8%, (2) nonrespondent bias could not be determined, (3) the data relied on the accuracy of clinician self-report, (4) signs and symptoms data were gathered using an open question that required recoding, and (5) the results may not be generalizable to other countries.

Furthermore, in Question 5, the questionnaire asked clinicians to nominate NSLBP subgroups, and the examples given to clarify the intent of the question were "disc lesions, instability, postural syndrome, facet syndrome etc." These examples were chosen because they were labels commonly nominated by the participants in the pilot study of the questionnaire. The labeling data collected in the questionnaire mimicked the labels derived from the pilot study. This result may be because the pilot study participants nominated labels that are widely used by primary care clinicians. However, it is also possible that the labeling examples provided in Question 5 may have biased the clinician's responses.

■ Conclusions

Most Australian primary care clinicians who responded to this survey think that NSLBP is heterogeneous and treat patients differently based on that heterogeneity. Clinicians think that it is possible to describe the causative pathoanatomy of subgroups within that heterogeneity, and to describe the patterns of signs and symptoms that demarcate those subgroups. However, currently, there is little empirical evidence to support the validity of these views. Furthermore, there is little consensus among clinicians regarding the signs and symptoms that demarcate patterns within that heterogeneity, and the use of descriptive labels, such as facet syndrome, may mask that lack of consensus. NSLBP is a highly prevalent condition for which optimal treatment strategies remain uncertain. There is a clear need for research that examines the outcome validity of subgrouping schemes.

■ Key Points

- Of the primary care clinicians who thought that is was currently possible to recognize NSLBP subgroups:
- Nine out of 10 times, clinicians nominated a descriptive label indicating a putative pathoanatomic source of pain.
- There was low agreement regarding the specific signs and symptoms that indicated NSLBP subgroups. At best, only 1 in 10 clinicians agreed on the 3 most common signs and symptoms suggestive of any subgroup.
- Most consensus regarding the specific signs and symptoms that indicated NSLBP subgroups came from within the clinical culture of one professional discipline. There was little consensus across professional disciplines.
- Although the labels given to subgroups were similar across disciplines, descriptive labels such as "Facet Syndrome" should be used with caution because there is little consensus regarding the signs and symptoms indicative of these conditions.

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Note: Appendices can be viewed online through ArticlePlus only.

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