

## Subgrouping Patients with Low Back Pain for Physical Therapy: Classification of the Problem Versus Problems in Classification- a Critical Review

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### Background

Low back pain (LBP) is one of the most common and costly musculoskeletal pain syndromes of modern society with up to 80% of people having LBP at some time in their life (Ehrlich 2003; Woolf et al 2003). This reported prevalence shows that nearly all adults would have at least one episode of LBP in their lifetime. Also, the incidence of LBP was higher in men than in women, and the incidence was highest in the age group 25 to 64 years, the age group of working life (cited in Danneskiold-Samsøe 2004). This alarms the rehabilitation needs that would be in demand in the near future for this world-wide so-called "epidemic".

LBP is not only a major clinical and a public health problem, but also major problems do exist right from its definition (Dionne et al 2008) to its classification (Anderson 1977). Clinical dilemmas exist in diagnostic, classification and therapeutic decisions for LBP. The therapeutic dilemma is whether to address symptomatic, anatomical, functional, and psychological and education paradigms. Perspectives involved range from those of general practitioners, specialists, therapists, patients, scientists and the society (Negrini 2004). Classifying

LBP has been described similar to a quest for The Holy Grail (Waddell 2005). In this report, an attempt to unveil the secrets of this Grail is done critically using a systematically sound approach and a suggestion for a comprehensive mixed system for classifying LBP patients is presented using an evidence-informed model suggested by Haldeman et al (2008).

### Search Methods

The databases of PubMed, CINAHL, SPORTDiscus, PsycARTICLES, SocINDEX, and OVID were searched for studies published in English, from 1980 till Nov 2009. Cross references of the obtained articles were also accessed and electronic/hand search was also done on relevant journals. The search strategy yielded articles which were descriptively summarized as below.

#### *"Classification" versus "Classification Systems" for LBP*

Classification is a single step whereas classification system is a multi-level process. Among the very common clinically known classifications of LBP are:

Acute, sub-acute and chronic LBP – based on duration of pathogenesis

Specific and non-specific LBP – based on clinical diagnostic terminology

Localized and generalized LBP–based on area of symptoms (Jacob et al 2006)

Organic and non-organic LBP–based on psychosocial factors (Kroenke et al 2007)

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Mechanical and Inflammatory LBP–based on signs and symptom behavior (Walker et al 2009)

Bothersome and not-so bothersome LBP–based on subjective perception of bothersomeness (Dunn et al 2005)

The mentioned classifications are to be differentiated from the “systems” of classification which are proposed, developed and validated in LBP patients with an organized set of classification items.

#### *Need for Classification systems for LBP*

The classification systems are for sorting the complex elements of reality into reasonable and logical entities. The medical classification system deals with disease location expressed as diagnosis. The main purpose of classification system in diagnosing is to find the causes, to predict the outcome, and to determine a specific treatment of a disease (cited in Danneskiold-Samsøe 2004).

The majority of patients with low back pain offer no objective clinical findings on which to make a diagnosis on the basis of physical examination (Mooney 1989). Therefore, treatment decisions invariably depend upon classification systems of LBP.

The clinical patterns and patient presentations in LBP are so diverse that management strategies cannot be efficiently applied unless the patients are subgrouped into nearly homogenous categories (cited in Hall et al 2009). This role is just only attempt and is done by the process of a system of classification. While different classification systems were proposed relevant to different specialties and geographical locations (Billis et al 2007b), the plethora of classification systems however make their clinical application less useful and meaningful (May 2009). Some of the older classification systems have been outdated and suggested for updating and many new classification systems are getting proposed and widely accepted in rehabilitation decision-making for LBP patients.

There are earlier excellent reviews on classification systems on LBP and this paper would just touch upon them in the background whereas the main aim of this report is to update the rehabilitation clinician with the currently developed classification systems and their common pitfalls and potentials to be considered during clinical decision making.

#### *Reviews on Classification systems in LBP*

One of the most elaborate and comprehensive reviews was given earlier by Riddle (1998). He

reviewed 10 classification systems proposed earlier by various authors and groups – Quebec task force, McKenzie, Bernard, Kirkaldy-Willis and mostly emphasized and recommended the treatment-based classification by Delitto and colleagues (Delitto et al 1995; George 2005). The other classifications proposed by Moffroid et al, Coste et al, Marras et al, Binkley et al. Mooney, Sikorski did not receive much attention and they were not critically appraised in his review. Description and review of those classification systems is outside the scope of this article and the readers are suggested to refer the original source by Riddle (1998) for much detailed information.

McCarthy et al (2005) did a comprehensive systematic review of 33 classification systems for LBP which also included those already reviewed by Riddle (1998) and they summarized the findings of their review into the two types of deriving classification systems as judgmental and statistical cluster analysis approaches. They found that their assessment scores were higher for the latter method and they also found that among the 33 classification systems, 7 were patho-anatomical (MacDonald; Humphreys; Binkley et al; Newton et al; Laslett and Van; Wijmen; Peterson et al), 15 were based on clinical features (McKenzie; Heinrich; Sikorski; Spitzer et al; Barker; Coste et al; DeRosa and Porterfield; Rezaian et al; Moffroid; Delitto et al; Langworthy and Breen; van Dillen et al; Wilson et al; Bendebba et al; McKenzie and May), 7 were based on psychosocial methods (Keefe et al; Coste et al; Main et al; Klapow et al; Strong et al; Bergstrom et al; Ozguler) and 4 (Harper et al; Krause; Steifel et al; Halpern et al) were on work-related biopsychosocial methods. They concluded that categorizing patients solely by biomedical characteristics will be insufficiently discriminatory, as would the use of purely psychological or social characteristics. In order to discriminate between clinically meaningful subgroups of patients with LBP, it was then likely that assessments of biomedical, psychological and social domains were needed.

Ford et al (2007) in their extensive review of 77 classification systems for LBP, found of those, the patho-anatomical dimension was selected as a component of the classification system in 36 (47%), the signs and symptoms dimension in 45 (58%), the psychological dimension in 39 (51%), and the social dimension in 11 (14%). 42 (55%) of the classification systems were unidimensional, and only 5 (6%) utilised all dimensions.

Of the 77 papers reviewed, 57 had the primary aim of classification system development. Statistical

methodology was present in 17 of the 57 papers (30%). Of the papers using a judgmental methodology, 43 (75%) relied on investigator judgment and 34 (60%) used literature review. The judgmental methodologies of mechanistic and expert panel were less frequently used at 17 (30%) and 4 (7%), respectively. The validity of the classification system was evaluated in 60 of the 77 papers reviewed. The most frequent methodologies of classification system validation were concurrent validity (24 papers from 60 or 40%), discriminant validity (22 papers or 37%) and predictive validity (20 papers or 33%). Reliability as a methodology of classification system validation was used in 10 papers (17%).

Billis et al (2007b) did another comprehensive review of classification systems with a primary objective of a cross-country comparison for the various systems and found that the majority of the selected studies (28 out of 39) were classified by biomedical paradigm, less studies (7) by psychosocial

paradigm and only 4 utilized a biopsychosocial (mixed) approach. The authors concluded that despite cultural factors are not yet taken into consideration in classification studies, it appears that there are some trends within countries. It may be, that the cultural setting may have an impact on the natural history of LBP and thus it would seem sensible for health professionals to complement their biomedical assessment with an evaluation of the psychosocial and cultural aspects of their patients i.e. their attitudes, beliefs, interactions etc. which seem to be driving the history of the condition.

#### *Summary from reviews of classification systems on LBP*

The authors of the four reviews- Riddle (1998), McCarthy et al (2005), Ford et al (2007) and Billis et al (2007b) in total reviewed 159 classification systems for LBP and this explains the very basis of "the dilemma". Critical comparison of the four reviews is given in table-1.

**Table 1:** Showing comparison of reviews on classification systems of LBP

Author & Year	Type of review	Number of LBP classification systems reviewed	Method of appraisal of the classification systems	Domain for review	LBP type	Main findings of review
Riddle (1998)	Non-systematic (Descriptive/narrative)	10	4 studies- Qualitative; 6- not appraised	Relevance to physical therapy	LBP	Classification systems should use commonly accepted measurement principles
McCarthy et al (2005)	Systematic review	32	Buchbinder et al criteria- Quantitative appraisal (Reliability, validity, Feasibility, Generalizability, Purpose)	Biopsychosocial model	NSLBP	There is a need for integrated classification system with biomedical, psychological and social constructs
Ford et al (2007)	Systematic review	77	Qualitative appraisal	Development and Validation methodology	LBP	Combined judgmental and statistical methodology for development and prescriptive validity for validation would be better. The LBP subgroups should involve description of socio-cultural factors in their description
Billis et al (2007b)	Systematic review	39	Buchbinder et al criteria	Cross-country comparison	LBP	

#### **LBP–Low Back Pain; NSLBP–Non-Specific Low Back Pain**

Most of the classification systems were reviewed by Ford et al (2007) and the systems for LBP developed and validated after 2007 will follow further.

Firstly, proposed by a renowned physiotherapist– Shirley Sahrman (2002), based on her extensive clinical expertise and experience, the movement system impairment based classification and subgroups of movement impairment syndromes. This classification is purely based on a

biomechanical basis and treatment decisions are made on an integrated model. This classification provides the foundation stone for mechanical LBP once the therapist has screened the patient based on history.

*I. Movement System Impairment-Based Classification and categories for Mechanical LBP (van Dillen et al 2003):*

The five categories/ syndromes hypothesized to exist in patients with mechanical LBP are (1) lumbar flexion, (2) lumbar extension, (3) lumbar rotation, (4) lumbar rotation with extension, and (5) lumbar rotation with flexion.

The reliability of this classification system in LBP was studied by many authors (van Dillen et al 1998; Trudelle-Jackson et al 2008; Harris-Hayes et al 2009) and also for successful patient management and treatment outcomes (Maluf et al 2000; van Dillen et al 2005). The characteristics of subgroup syndromes were also studied using validated methods by some others (van Dillen et al 2007; Gombatto et al 2007).

Secondly, as an extension of subjective examination and history-taking is the process of clinical reasoning (Jones 1992). Expert clinicians use a process of pattern recognition to identify patient clinical patterns from the clues obtained during therapist-patient interaction which are then used for clinical decision making. One such classification system was pattern-recognition classification of LBP.

*II. Pattern-recognition classification system for LBP (Hall et al 2009):*

Hall et al (2009) studied the effectiveness of treatment based on pattern classification versus treatment without one on LBP outcomes as an observational cohort study. The use of classification system resulted in significantly better outcomes. The following patterns were classified and studied;

Pattern-1: Back-dominant pain aggravated by flexion

Pattern-2: Back-dominant pain aggravated by extension

Pattern-3: Leg-dominant pain aggravated by back movements

Pattern-4: Leg-dominant pain aggravated by activities

This system however is not that simple as it appears, and it requires highest level of clinical expertise and professional skills of clinical reasoning. This system is still in infancy. Wilson et

al (1999) earlier found acceptable reliability for this pattern-recognition classification in LBP patients.

Thirdly, most important application of clinical decision-making process is for treatment of LBP patients. Hence a treatment-based classification (TBC) system was proposed and established (Delitto et al 1995). The original TBC is extensive and is beyond the scope of this text.

*III. Treatment-based classification system (revised):*

Fritz et al (2007) suggested a proposed revision of the treatment-based classification of Delitto et al (1995) and updated the system with then evidence. The four sub-groups for LBP which were manipulation, stabilization, specific exercise and traction were updated with added revisions. This revised system is outlined in table-2.

However, Widerstrom (2007) proposed another treatment-based classification for LBP into four subgroups as pain modulation, stabilization, mobilization and training. The sub-groups are outlined in the table-3.

The similarities between both the above-mentioned treatment-based classification systems of Fritz (2007) and Widerstrom (2007) are obvious in their common source system that is the original classification system of Delitto (1995). The sub-group characteristics between the two are different in their clinical application per se. The traction group of Fritz (2007) is definitely not comparable to pain modulation group of Widerstrom (2007). The specific exercise group in Fritz (2007) incorporates on the line of McKenzie (1981) based on directional preference to centralization of symptoms which is useful in intervertebral disc conditions whereas the training group of Widerstrom (2007) is more specific to chronic low back pain rehabilitation using aerobic conditioning and graded activity programs.

The treatment-based classification (TBC) was studied extensively and found to be reliable for its decision-making algorithm (Fritz et al 2006) and also for subgroup identification between therapists in different populations of LBP by various authors (Fritz et al 2000a; Fritz et al 2000b; Heiss et al 2004). Fritz et al (2003) also found that treatment of acute LBP resulted in significantly better clinical outcomes when clinical decisions were based on treatment-based classification system rather than clinical practice guideline-based. Various authors have found positive results in different LBP subgroups when treated using this system (Brennan et al 2006; Browder et al 2007; Pinto et al 2007). The TBC system

Table 2: Treatment-Based Classification System for LBP (Fritz et al, 2007). Revised from Delitto et al (1998).

Sub-group		Criteria	Interventions
Manipulation		<ul style="list-style-type: none"> <li>▪ No symptoms distal to the knee</li> <li>▪ Recent onset of symptoms (&lt;16 d)</li> <li>▪ Low Fear Avoidance Beliefs Questionnaire Work subscale (FABQW) score &lt;19.</li> <li>▪ Hypomobility of the lumbar spine</li> <li>▪ Hip internal rotation ROM (&gt;35° for at least 1 hip)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Manipulation of the lumbopelvic region</li> <li>▪ Active ROM exercises</li> </ul>
Stabilization		<ul style="list-style-type: none"> <li>▪ Younger age (&lt;40 y)</li> <li>▪ Greater general flexibility (postpartum, average SLR ROM &gt;91°)</li> <li>▪ “Instability catch” or aberrant movements during lumbar flexion/extension ROM</li> <li>▪ Positive findings for the prone instability test</li> <li>▪ For patients who are postpartum:                             <ul style="list-style-type: none"> <li>- Positive posterior pelvic pain provocation (P4), and ASLR and modified Trendelenburg tests</li> <li>- Pain provocation with palpation of the long dorsal sacroiliac ligament or pubic symphysis</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ Promoting isolated contraction and cocontraction of the deep stabilizing muscles (multifidus, transversus abdominus)</li> <li>▪ Strengthening of large spinal stabilizing muscles (erector spinae, oblique abdominals)</li> </ul>
Specific exercise	Extension	<ul style="list-style-type: none"> <li>▪ Symptoms distal to the buttock</li> <li>▪ Symptoms centralize with lumbar extension</li> <li>▪ Symptoms peripheralize with lumbar flexion</li> <li>▪ Directional preference for extension</li> </ul>	<ul style="list-style-type: none"> <li>▪ End-range extension exercises</li> <li>▪ Mobilization to promote extension</li> <li>▪ Avoidance of flexion activities</li> </ul>
	Flexion	<ul style="list-style-type: none"> <li>▪ Older age (&gt;50 y)</li> <li>▪ Directional preference for flexion</li> <li>▪ Imaging evidence of lumbar spinal stenosis</li> </ul>	<ul style="list-style-type: none"> <li>▪ Mobilization or manipulation of the spine and/or lower extremities</li> <li>▪ Exercise to address impairments of strength or flexibility</li> <li>▪ Body weight-supported treadmill ambulation</li> </ul>
	Lateral shift	<ul style="list-style-type: none"> <li>▪ Visible frontal plane deviation of the shoulders relative to the pelvis</li> <li>▪ Directional preference for lateral translation movements of the pelvis</li> </ul>	<ul style="list-style-type: none"> <li>▪ Exercises to correct lateral shift</li> <li>▪ Mechanical or autotraction</li> </ul>
Traction		<ul style="list-style-type: none"> <li>▪ Signs and symptoms of nerve root compression</li> <li>▪ No movements centralize symptoms</li> </ul>	<ul style="list-style-type: none"> <li>▪ Mechanical or autotraction</li> </ul>

went further a step ahead in that positive response subgrouping was also researched and clinical prediction rules have been derived and their characteristics were studied by various authors. (Fritz et al 2007b; Teyhen et al 2007).

Fourthly, further classification could be applied based on an empirical assumption that stabilization subgroup is directly implicating the treatment of LBP patients with motor control impairment. Hence, the following system adds to its value of management for LBP patients using a stabilization programme.

**Table 3:** Showing another Treatment-based classification for LBP, 2007) (Widerstrom)

Subgroup	Criteria	Treatment
Pain modulation	<ul style="list-style-type: none"> <li>▪ Severe symptoms</li> <li>▪ Difficulties to perform daily activities</li> <li>▪ High irritability</li> <li>▪ High disability scores</li> <li>▪ Inconclusive spinal segmental examination findings</li> <li>▪ Positive neurological tests</li> <li>▪ Signs &amp; symptoms of neurogenic disorder</li> </ul>	<ul style="list-style-type: none"> <li>▪ Pain reduction measures to reduce pain intensity thus enabling further objective examination</li> </ul>
Stabilization exercise	<ul style="list-style-type: none"> <li>▪ minimal perturbations causing severe limitations and pain</li> <li>▪ clinical signs of lumbar instability as aberrant active movements</li> <li>▪ positive active stability tests</li> <li>▪ excessive segmental mobility when passive segmental movements are tested (hypermobility)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Measures to improve dynamic stability and control of the lumbar spine as well as reduce associated pain</li> </ul>
Mobilization	<ul style="list-style-type: none"> <li>▪ Subjective stiffness</li> <li>▪ clinical signs of physical impairment as movement restriction and pain</li> <li>▪ a specific movement pattern,</li> <li>▪ unilateral signs,</li> <li>▪ decreased specific segmental mobility (hypomobility)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Measures to normalize physiological movement using specific mobilization techniques</li> </ul>
Training	<ul style="list-style-type: none"> <li>▪ Low functional disabilities</li> <li>▪ Low pain scores</li> <li>▪ Patients from other sub-groups once they improve and they are towards return-to-function stage.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Physical exercise with increasing load to increase motor control and improve tolerance for loading</li> <li>▪ Measures to improve function and prevent recurrence</li> </ul>

#### IV. Motor Control Impairment Classification System of LBP

O'Sullivan (2005) proposed classification of nonspecific chronic LBP first into three categories as; serious (red flags/ patho-anatomical) pathology, non-organic pathology (psychosocial): and a third category which was again subdivided into movement impairment and motor control impairment types. The sub-classification of the motor control impairment sub-type further sub-typed into 5 patterns such as- flexion pattern, flexion-lateral shift pattern, active extension pattern, passive extension pattern, and multidirectional pattern was found to be reliable by Dankaerts et al (2006). Of the 5 types of motor control impairment, the flexion pattern and active extension pattern was validated using lumbar spine kinetic and kinematic analysis in their ability to be distinguished from healthy subjects a little while later by the same authors (Dankaerts et al 2009). Detailed explanation is beyond the scope of this review and readers are suggested to refer the original work to

enhance reliability with this classification method (Dankaerts et al 2006). The instability group was also validated by studying muscle activation strategies by other authors (Silfies et al 2009).

Fifthly, the pain modulation subgroup of Widerstrom (2007) could further be subgrouped depending on the dominant pain mechanism. Understanding of pain mechanisms have improved physical therapy management by expert clinicians (Smart 2007). One of the comprehensive pathomechanism-based classification system for LBP was proposed by Schafer et al (2009a).

#### V. Pathomechanism-based classification of LBP

Schafer et al (2009a) proposed four categories based on pain mechanisms into;

Central sensitization

Denervation

Peripheral sensitization

Musculoskeletal

The author further extended his work by validating its inter-rater reliability (Schafer et al 2009b) and they found that the subgroup identification was reproducible between examiners with a kappa value of 0.72. The four subgroups were also found to be different in disability and psychosocial factors as measured by Oswestry disability scores and fear avoidance beliefs thus, establishing its predictive validity (Walsh et al 2009). This type of sub-classification is required in challenging conditions such as low back pain which then could be applied to either treatment-based or other classification subgroups of LBP (Cook 2009).

Assessment of physical functioning is an integral component of evolving and developing a successful classification system for LBP since therapist's goals should match the patient concern and preferences (Tomey and Sowers 2009). One such very detailed and a comprehensive classification system is the International Classification of Functioning, Disability and Health.

*VI. International Classification of Functioning, Disability and Health (ICF- Core set) cited by Stier-Jarmer et al (2009)*

One of the most comprehensive and elaborate biopsychosocial-model for classifying LBP patients is the ICF model (Roe et al 2009). Therefore, the components of the model correspond to the components of the classification. Each component (body functions—b, body structures—s, activities and participation—d, and environmental factors—e) contains an exhaustive list of ICF categories, which are the units of the classification. The ICF categories are hierarchically organized and are denoted by unique alphanumeric codes. The categories are arranged in a stem/branch/leaf scheme within each component.

An example for a patient with LBP;

- b<sub>2</sub> Sensory functions and pain (first level)
- b<sub>2</sub>80 Sensation of pain (second level)
- b<sub>2</sub>801 Pain in body part (third level)
- b<sub>2</sub>8013 Pain in back (fourth level)

Qualifiers are used to denote the level of functioning and health or the severity of the problem. The WHO proposes that all categories in the classification be quantified using the same generic scale.

- 1. No problem (none, absent, negligible) 0% to 4%
- 2. Mild problem (slight, low) 5% to 24%

- 3. Moderate problem (medium, fair) 25% to 49%
- 4. Severe problem (high, extreme) 50% to 95%
- 5. Complete problem (total) 96% to 100%
- 6. Not specified
- 7. Not applicable

Soukup et al (2000) found the ICIDH-2 to offer a tool to enhance the precision of statements and descriptions in current clinical practice. Furthermore, they suggested that by using the ICIDH-2, physiotherapists might broaden their perspective and perform a multidimensional evaluation of functioning related to patients with LBP and the WHO-ICFDH model was used to successfully treat both acute and chronic LBP by physiotherapists. (Rundell et al 2009). The relation between work status and CLBP was multidimensional, as was illustrated by using the biopsychosocial model of the ICF. Patients with a low educational level, a low self-reported physical or mental health were more likely to be non-working. Self-reported limitations and physical and mental health were more important in explaining work status than objective measurements of performance (Kuijjer et al 2005).

**Discussion**

The role of clinical and cultural factors was found to have a major impact on the classification process of LBP by Bills et al (2007a). In their study, the differences were observed between doctors, clinicians and postgraduates in the manner how they developed categories within the History and Physical Examination. All three groups identified three cultural categories to influence the classification of LBP patients in clinical practice; Attitudes of Health Professionals, Patients' Attitudes and Health System influences. Patients' response to rehabilitation depended upon three well-known spheres of influence namely the depression, attribution and expectation (Umlauf and Frank, 1983). Clancy (2007) found that appropriate application of classification systems earlier in the course of occupational LBP resulted in better treatment outcomes and compensation costs.

Whilst the current evidence era witnesses misdirected guidelines for LBP (Tygiel et al, 2008), rehabilitation clinicians still continue to use treatment guidelines for their clinical decisions. Specialist and non-specialist clinicians did not differ much in their ability to use a patho-anatomical and patho-physiological classification approach for

acute and sub-acute LBP patients when the classification was based on history-taking and clinical examination testing, provided they went through an initial period of training on the classification system (Paatelma et al, 2009). The never-ending war between treatment guidelines and classification systems for producing better outcomes in patients with LBP (Fritz et al, 2003) resulted in better quality of treatment guidelines (Bowmeester et al, 2009) over the years in response to the rapid development of number of LBP classification systems. Monodisciplinary guidelines are getting replaced by multidisciplinary ones to combat this global challenge (Breen et al, 2006).

Classification system development should consider using multiple dimensions that incorporate all of the factors likely to be relevant to LBP presentation and prognosis. Concurrent use of statistical and judgmental approaches to classification system development may increase the validity of the system. The use of expert panels and a mechanistic approach may be of particular value. Methodologies of preliminary validation including reliability, concurrent validity and discriminant validity are also of value. Given that the primary purpose of classification systems for LBP is to direct more specific and effective treatment to homogeneous subgroups, predictive validity may be the most

relevant and effective tool in classification system validation (Ford et al, 2007).

#### *Two-Level Classification System for LBP and its sub-groups*

##### First level–Clinical:

An integrated classification system model is illustrated in fig-1 which is derived from 1a, 1b, 1c and 1d sub-levels.

1a–Combined treatment-based classification system (pain modulation, mobilization, stabilization, specific exercise, training, traction)

1b–Pain modulation- pathomechanism-based classification system (central sensitization, denervation, peripheral sensitization and musculoskeletal)

1c–Movement system impairment-based classification system

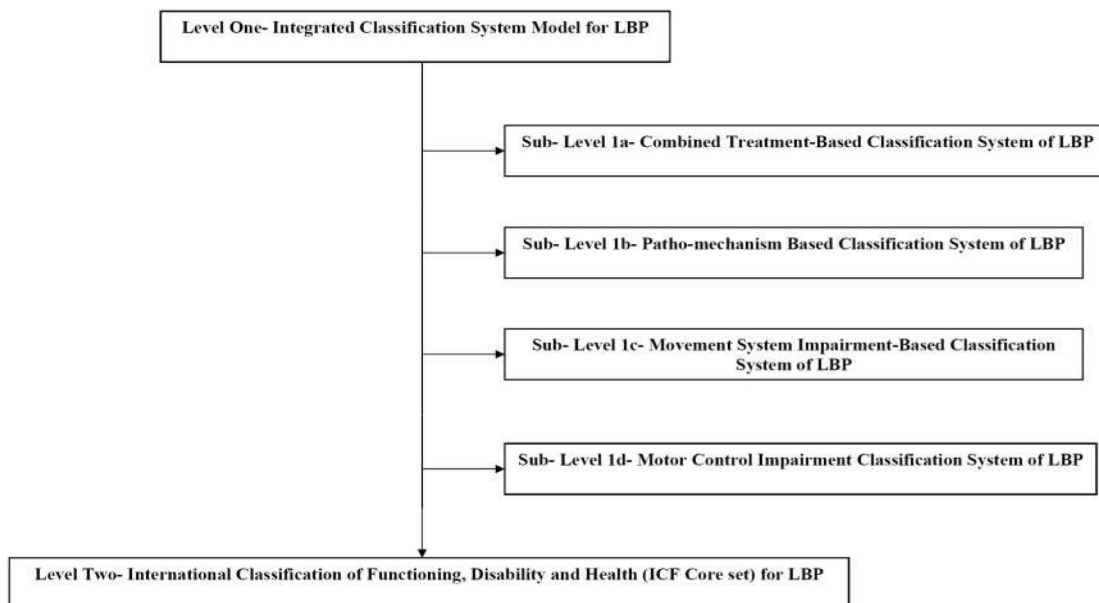
1d– Stabilization- motor control impairment classification system

##### *Second level–Biopsychosocial (Community)*

ICF Core set for LBP.

#### **Limitations of the review**

**Fig. 1:** showing Two-Level Classification System for Rehabilitation LBP patients



One of the limitations of this review was the adoption of non-systematic methodology. The review was intended to be evidence-informed (Haldeman et

al 2009) rather than evidence-based. The third limitation was the methodology for the development of two-level classification system of LBP is judgmental mechanistic which is the weakest method (Ford 2007) and is yet to be validated. Further insights into pain

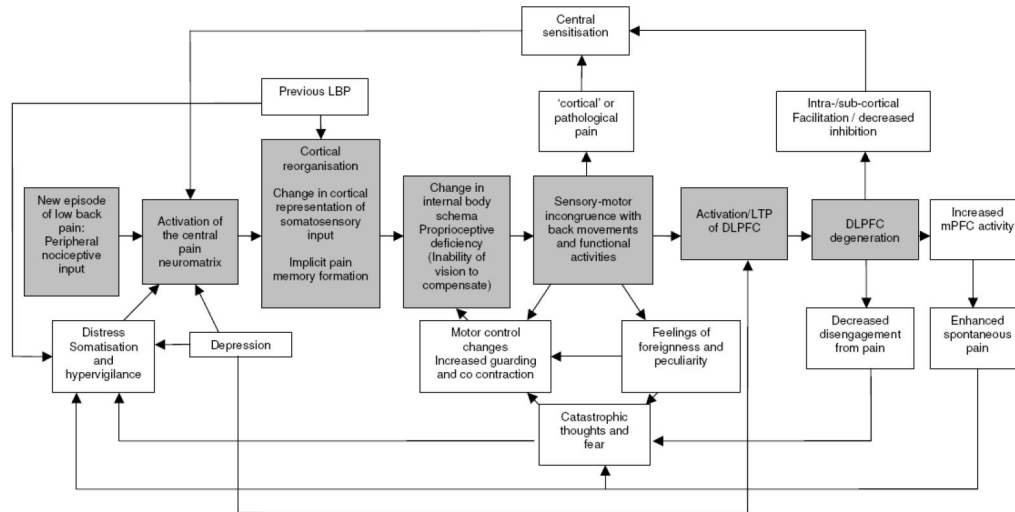


mechanisms should alert rehabilitation clinicians more towards mechanism-based treatment approach rather than subgroup-based. Cortical dysfunction

model was well explained by Wand et al (2008) in relation to CLBP and the model is shown in fig. 2.

### Conclusion

**Fig. 2:** Showing the Cortical Dysfunction Model for Chronic non-specific LBP. (Reproduced under open access permission from Wand et al, 2008)



A Cortical Dysfunction Model of Chronic Non Specific Low Back Pain. Abbreviations: LTP = Long Term Potentiation, DLPFC = Dorsolateral Prefrontal Cortex, mPFC = medial Prefrontal Cortex.

Subgrouping LBP patients using various classification systems are to be taken and interpreted with extreme caution by researchers and clinicians in LBP since the classification systems should take into account that the subgroups should be identified using high-quality randomized controlled trials, the investigation should be limited to a relatively small number of potential subgroups for which there is a plausible rationale, subgroup effects should be investigated by formally analyzing statistical interactions, and findings of subgroups should be subject to external validation (Hancock et al 2009).

The Integrated Classification System (ICS) model for LBP is presented here using a judgmental mechanistic approach and is warranted for further validation so that it can be applied at first level (for rehabilitation clinicians with any level of experience). The ICS model is however derived from a combination of three well-validated systems of classification- (1) the original treatment-based classification of Delitto et al (1995) developed further by Fritz et al (2007), (2) motor control impairment classification by O'Sullivan (2005) and (3) pathomechanism-based classification by Schafer et al (2009a). Individually each of the constituent systems have been validated and applied in various LBP patient populations with variable success rates. It is expected that a integrated

classification system model would serve its purpose for the rehabilitation clinicians in their improved understanding of LBP and its management.

Classifying LBP is a difficult field, that requires a fully biopsychosocial rehabilitative approach with an ability to integrate scientific knowledge, psychological and social attention, in creating partnership and quality of care. As in all other situations, it is not possible to delegate, to forget, to underestimate which otherwise, will lead to loss of our fight against LBP; as physicians, as rehabilitation specialists, as patients, as society as well (words of Negrini 2004).

It appears that, despite the plethora of studies developing classification systems, yet again, a question remains "why hasn't any system been internationally established or successful?" The answer to this could lie on the fact that most systems address only one dimension of LBP presentation (i.e. biomedical or psychological), while there is evidence supporting a biopsychosocial LBP presentation (Billis et al 2007). This solution could only be offered by using ICF core set as a classification system for LBP patients in the second level of application intended for use by the experienced and trained rehabilitation clinicians.

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