

**FEATURE COMMENTARY: 2013 MDT CONFERENCE OF THE AMERICAS**

*Surrounded by the majestic Colorado Rocky Mountains, Denver was host to the 2013 MDT Conference of the Americas in late July. Over 400 attendees from 12 countries indulged in two and half days of educational challenges and social networking encompassing the conference theme of MDT for Peak Patient Outcomes. The conference opened in fitting tribute to Robin McKenzie with a beautiful slideshow and [poignant words from Colin Davies](#), PT, Dip. MDT, Senior Instructor from Canada. We are happy to share with you highlights from four of the interactive workshops. You can also [view photos](#) from this event and past MDT Conferences—and here is another nicely summed up account from attendee Allan Besselink, PT, Dip. MDT on [his blog](#).*

---

**The Joys of Lumbar Flexion: Not Just the Opposite of Extension**

*Brian McClenahan, PT, Dip. MDT*

**FLEX...the “Four Letter Word”**

Mechanical Diagnosis and Therapy (MDT) is often only associated with extension. Perhaps this is the result of the many patients that achieve success with a direction that, at one time, was considered taboo. Whatever the reason, there is no doubt that some MDT clinicians can develop a ‘clinical bias’ toward extension. In our efforts to ‘fix’ all our patients as posterior derangements, we may find ourselves trying to fit a square peg into a round hole. “Fear Avoidance” on the part of the clinician may ultimately lead to an unsuccessful outcome. The “Joys of Flexion” break out session sought to emphasize the importance of testing flexion through discussion of conditions requiring flexion, role playing to challenge testing algorithms, and presentations of variations on flexion techniques.

**Spinal Conditions that REQUIRE Extension:**

1. Posterior Derangement
2. Extension Dysfunction

**Spinal Conditions that REQUIRE Flexion:**

1. Anterior Derangement
2. Flexion Dysfunction
3. ANR
4. Nerve Root Entrapment
5. Symptomatic Stenosis
6. Symptomatic Spondylolisthesis

Clearly, many more conditions require flexion loading and only by thoroughly testing this direction will these conditions be identified.

**Discussion Points and Hallmark Findings of Spinal Conditions/Situations Requiring Flexion:****Anterior Derangement****History:**

- Symptom duration: Acute, Subacute, chronic pain location: local, referred
- Constant/intermittent
- Worse: walking, standing
- Better: possibly sitting

**Inside This Issue:**

2013 MDT Conference of the Americas Commentary - Guest Commentary - Literature Review - Business & Marketing Corner

Exam:

- Sitting posture: fair-good
- Major loss of flexion
- Little or no loss of extension
- No neural tension signs or neurological deficit
- Repeated flexion in lying, sitting, standing: decrease/better
- Repeated extension in standing, lying: NE/increase/worse (Sustained extension exposes anterior derangement)

### ***Flexion Dysfunction***

History:

- Symptom duration: chronic
- Unchanging
- Pain location: local
- Intermittent
- Worse: bending, sitting
- Sitting posture: fair-good

Exam:

- Movement loss: flexion; possible ipsilateral deviation
- Repeated flexion in lying/standing: P/NW
- Repeated extension in lying and standing: NE, consistent

### ***ANR***

History:

- Symptom duration: chronic (6-8 weeks)
- Improved from onset, now unchanging
- Pain location: referred, radicular, +/- LBP
- Intermittent
- Worse: spinal flexion with knee extended, bending, long sitting

Exam:

- Loss of lumbar flexion with ipsilateral deviation
- No loss of extension
- Repeated lumbar flexion in standing: P/NW
- Repeated lumbar flexion in lying: NE
- Repeated lumbar extension in standing and lying: NE

### ***Nerve Root Entrapment***

History:

- Symptom duration: chronic (>12 weeks)
- Status: unchanging
- Pain location: referred, radicular +/- LBP
- Constant pain
- Increase no worse: all movements
- Better: not much, possibly sitting, lying down (relatively)

Exam:

- Movement loss: flexion and extension are both limited
- Repeated flexion in standing: increase/NW\* (\*increase ROM no >10 min)
- Repeated flexion in lying: increase/NW, decrease/NB, NE
- Repeated extension in standing and lying: increase/NW

### ***Symptomatic Stenosis***

Important Points:

- Distinguish leg symptoms from vascular claudication by establishing a clear effect of lumbar movements/positions on symptoms
- THEN distinguish from lumbar derangement
- NOTE - Derangement may cause previously asymptomatic stenosis to become symptomatic
- Reduction of derangement returns patient to previous asymptomatic status

- Clinicians are advised to utilize MDT assessment information as the primary rationale upon which treatment decisions are based.

History:

- Age: 50 +
- Pain: referred, radicular +/- LBP
- Worse: Standing, Walking
- Better: Bending, Sitting, Lying – supine LE's up

Exam:

- Sitting Posture: fair/poor
- Standing: lordosis reduced
- ROM: flexion full, extension mod/major loss; SG mod/major lost
- Usually negative neural tension signs
- Repeated movements: flexion – decrease/abolish – NB; extension – produce/increase – NW

**Symptomatic Spondylolisthesis**

Important Points:

- Many patients with spondylolisthesis on imaging do not behave as spondylolisthesis on mechanical exam
- Evidence to support that the disc at an adjacent segment is responsible for the pain vs. the slip
- Clinicians should base treatment on mechanical response to loading

History:

- Symptom duration: Acute, Sub acute, Chronic
- Pain location: local, referred, radicular
- Constant/intermittent
- Worse: walking, standing
- Better: prolonged sitting

Exam:

- Sitting posture: fair-poor
- Mod/major loss of extension
- Little or no loss of flexion
- Repeated flexion in lying, sitting, standing: decrease/no better, can only use better with derangement
- Repeated extension in standing, lying: increase/no worse – BUT no obstruction to flexion as a result

Recommendations:

- Grade 1 & 2 – assess directional preference
  - If present – directionally specific RX
  - If directional preference extension/lateral - treat as posterior derangement
  - If directional preference flexion/asymmetrical flexion – treat similar to anterior derangement.
  - No directional preference & special test + Recommend stabilization training & bracing in neutral
- Grade 3 & 4 - Flexion/extension or distraction/compression radiographs
  - If 'instability' present – stabilization
  - If no 'instability' directional preference assessment – RX in directional preference

**Recovery of Function - Posterior Derangement**

- Time to test for recovery of flexion when the patient is no longer having symptoms or obstruction due to derangement
- Either pain-free for 3-5 days or symptoms consistent with dysfunction

Robert Medcalf made an excellent teaching point during the breakout. He posed the following question prior to initiating the examination:

**“Has this patient convinced me NOT to flex them?”**

If the answer is NO, perhaps you should exhaust the sagittal plane toward flexion first.

**A Everything You Always Wanted to Know About Hips: But Were Afraid to Ask**

*Cora Aytona, PT, Dip. MDT, Chris Chase, PT, Dip. MDT and Michelle Miller, PT, Dip. MDT*

“Everything you wanted to know about hips but were afraid to ask” had four subsections that addressed different themes designed to help clinicians successfully treat the hip joint with MDT.

One section was comprised of a review of the MDT classification in the extremities. The key features of posture, dysfunction, derangement and other categories specific to the extremities were discussed. Following the summary of the classification system, the group analyzed a case study involving a patient with complaints of chronic anterior hip pain, which turned out to be contractile dysfunction. The key to the diagnosis of contractile dysfunction is in the consistency of the production of pain during movement, but not remaining worse after. No rapid symptomatic or mechanical changes occur with repeated movement testing. The goal of this workshop was to enhance the participants' classification skills by using the process of ruling in or out potential diagnoses, also known as funneling, through careful questioning during the history and appropriate testing in the physical examination. The group highlighted the importance of classification in determining a treatment plan as well as predicting patient outcomes.

In a second section, participants learned to differentiate between the lumbar spine, hip and SI joint. It was determined that when evaluating these areas, there should always be a consistent order of assessment. The lumbar spine should always be evaluated first, followed by the hip and then the SI. This is due to the fact that if the SI is evaluated first or second, the lumbar spine and hip can give false positives to the SI provocation tests. Next, elements of the history were discussed to see which characteristics help in narrowing down the origin of the symptoms. It was determined that not many elements of the history shed light on determining lumbar vs. hip vs. SI. The two most helpful elements were (1) asking about parathesia, because these are uncommon in the hip and SI, and (2) symptom location, as the hip and SI never refer above the belt line or cross midline and rarely refer below the knee. When SI does refer below the knee, it will never refer into the foot. Finally, the examination characteristics were looked at to determine which ones are the most beneficial to differentiate between the three joint areas. The examination proves to be significantly more helpful in the differentiation process. Hard neuro findings, acute deformities and centralization also directly point to lumbar spine. Hips and SIs can localize, but not truly centralize. As alluded to earlier, SI tests will be positive for an SI, but can also show false positives for a (+) hip or lumbar spine; thus, order of assessment is crucial for accuracy.

A third section, “Hips in Jeopardy”, was a fun, game show style learning experience where contestants (conference attendees) answered trivia questions that focused on hip specific trivia about MDT, findings in research and other fun facts. The groups competed for bragging rights and had a great time buzzing in while learning information about the hip joint that will lead to successful treatment using MDT.

The final section focused on hip specific force progressions and time to practice hip procedures that were included in the conference manual. The practical session focused on force progression, self treatment procedures and making sure patients achieve end range with overpressure. Other discussion included using appropriate amounts of force to treat dysfunction and common derangement treatment directions. The most common directions, extension, internal rotation, and combined extension in internal rotation, were then demonstrated and discussed.

“Everything you wanted to know about hips but were afraid to ask” was an informative workshop with different activities that utilized different learning styles. Participants were given tools to better use MDT when both assessing and treating the hip joint.

## **Shouldering the Load**

*Kristi Maguire, PT, Dip. MDT*

The 'Shouldering the Load' workshop began with discussions on the importance of ruling out the cervical and upper thoracic spine as full or partial contributors to shoulder pain. Research has shown that orthopedic special tests have poor reliability in differentiating shoulder pathology (Hegedus EJ 2008 & May et al. 2010). Imaging studies have also been found to have poor reliability in determining shoulder pathology, as it has been shown that approximately 40% of the asymptomatic population has been found to have rotator cuff tears on MRI with a higher prevalence in the older population (Schibany N. 2004 & Ann R. 2006). Schneider G. (1989) found that the cervical spine may cause movement restrictions in the shoulder in a non-capsular pattern.

Unreliable special tests and imaging, and the high prevalence of pathology without pain and loss of function, prove the importance of utilizing symptomatic and mechanical responses to loading in order to differentiate spinal involvement in the presence of shoulder pain and dysfunction using the MDT assessment. This involves setting proper symptom and mechanical baselines of the shoulder followed by loading the spine in a specific direction and reassessing baselines for change. Important points were made that both the c/spine the upper t/spine must be fully explored, often involving the need for sustained extension and mobilizations in the sagittal or lateral directions to expose the spinal component.

Three case studies were presented in this workshop to demonstrate the MDT assessment process and affects of loading strategies. Patient one with the diagnosis of frozen shoulder with pain rated at 9/10 demonstrated major limitations in all directions of the shoulder with end range pain. This patient required upper t/spine extension to reduce pain to 4/10 and increase shoulder range of motion and function with return to work in the first four sessions. The shoulder improved, but with limitations remaining. The addition of flexion and extension of the shoulder was introduced with a production of end range pain consistently. This led to further improvement in range of motion and function. This patient demonstrated both a cervical component and shoulder articular dysfunction.

A video of patient two with a shoulder derangement was presented. This patient was a 26 y/o male active in sports with a three week history of left shoulder pain brought on by playing water polo. The symptoms were intermittent, worse with lying on left side and playing sports. When worse, his shoulder does not move as well with increased pain. His mechanical baselines were end range limitation of flexion and abduction with an increase in pain. Internal and external rotation and extension were full and pain free. This presentation demonstrated a commonly seen pattern (pattern 2) by some institute faculty, with pain and limited elevation, but full and pain free extension and internal rotation, which led to the assessment of repeated horizontal adduction that will commonly be the reductive load. However, this resulted in a worsening of pain and significant decrease in shoulder abduction with increase pain. Therefore, the opposite direction of horizontal abduction was chosen next resulting in full reduction of pain and full restoring of abduction and flexion without pain. The message with this patient was that not all patients fit the pattern, and if one direction makes it worse, then look at the opposite direction.

Patient three was a 56 y/o female with a nine week worsening history of right intermittent shoulder pain. Pain worsens with forward and lateral elevation and internal rotation. The cervical and thoracic spine were ruled out. Her mechanical baselines were major loss of internal rotation and horizontal adduction, a moderate loss of extension and min loss of abduction and flexion all with end range pain. Due to the significant loss of internal rotation, this was assessed repeatedly resulting in produced, nw affect with an increase in internal rotation, flexion and abduction. Self treatment was internal rotation every two hours. This patient returned 50% better with improvement in all directions. Further assessment of internal rotation resulted in no further change. Extension was assessed resulting in an increase in internal rotation and improvement in abduction strength. Self treatment was changed to extension every two hours.

Patient returned the same. Due to the major obstruction still present into horizontal adduction, this was chosen as the next loading strategy to assess resulting in produced, nw with no change in baselines. Continuation into horizontal adduction adding an isometric resisted component with produced, nw affect resulted in a moderate increase in horizontal adduction and improved tolerance. Self treatment was horizontal adduction with isometric resistance every two hours. The patient returned 85% better. She had full internal rotation and horizontal adduction with end range pain, full elevation and less pain with abduction

resistance. Horizontal adduction was progressed to active with theraband with an isometric push at end range resulting in full restoration of horizontal adduction. This became her self-treatment and ultimately discharged with an excellent outcome.

The message with this patient is that when directional specific movements reach a plateau, assess resisted movements in the direction of greatest obstruction. Most commonly, this will be flexion or horizontal adduction. When a patient presents with a painful arc without movement loss, use small amplitude theraband resistance through the target zone.

The final topic of the workshop discussed patterns of shoulder derangements that have been seen commonly in the clinic.

Common patterns all have a loss of flexion/elevation.

- Loss of medial rotation and extension, but patient improves with repeated movements in these directions.
- No loss of medial rotation or extension. Horizontal adduction is reductive.
- Limited medial rotation and extension, but repeated movement worsens. Lateral rotation at 90 degrees of flexion is reductive.

For a more detailed description see Scott Herbowy's video posted on YouTube, [https://www.youtube.com/watch?v=Ecga\\_FHd754](https://www.youtube.com/watch?v=Ecga_FHd754).

These patterns are emerging in the clinic and are intended to guide the clinician. Always keeping in mind that not all patients fit these patterns. Therefore, close attention to symptomatic and mechanical responses to loading strategies will and should always be our guide.

## References:

1. Ann R. (2006) Dead men and radiologists don't lie: a review of cadaver if and radiological studies of rotator cuff tear prevalence. Coll Surg Engl. 88: 116-121.
2. Hegedus EJ. (2008) Physical examination tests of the shoulder: a systematic review with meta analysis of individuals. Br J Sports Med. 42; 80-92.
3. May Et al. (2010) Reliability of physical examination tests used in the assessment of patients with shoulder problems: a systematic review. Physiotherapy. 96; 179-190.
4. McClatchie L. Et al. (2009) Mobilizations of the asymptomatic cervical spine can reduce signs of shoulder dysfunction in adults. Manual Therapy. 14; 369-374.
5. Schibany N. (2004) Rotator cuff tears in asymptomatic individuals: a clinical and ultrasonographic screening study. European J Radiology. 51; 263-268.
6. Schneider G. (1989) Restricted shoulder movement: capsular contracture or cervical referral-a clinical study. Australian J Physiotherapy. Vol. 35: 2; 97-100.



**MDT Techniques: Indications, Contraindications & Application***Fortino Gonzalez, PT, Dip. MDT, FAAOMPT*

The theme for the 2013 McKenzie Conference of the Americas was Peak Patient Outcomes. Peak patient outcomes are no accident; they are not tricks, nor are they special tools that you learn in a class. Peak patient outcomes begin with strong foundational work that is meticulous, detailed, and reproducible. Within the McKenzie Institute, there are dedicated individuals at multiple levels working towards this common goal, and it will take each and every one of us to contribute. We are especially called to arms this year. Now more than ever, it is crucial that we do our part in furthering what Robin McKenzie started.

The breakout workshop session, MDT Manual Therapy Techniques, was developed to help all of us right the sails of our ship. This workshop's goal was to review the MDT procedures, as written in our McKenzie textbooks, *The Lumbar Spine Mechanical Diagnosis and Therapy* and *The Cervical and Thoracic Spine Mechanical Diagnosis and Therapy*. Faculty of the McKenzie Institute have noticed some inaccuracies being performed by clinicians when utilizing common mobilization techniques. The aim of this workshop was to address these issues and provide us with a list of tips and common errors made. The following were the procedures reviewed in the workshop, including some common errors associated with them, as well as some tips to help achieve them correctly. For a complete description, refer to our McKenzie text books.

**Procedure #17: Manual Correction of Lateral Shift**

One of the greatest problems with forced application is being able to push and pull equally, applying a small amount of movement and working into end range. Proper force application is force on and then slightly released; much different than other techniques, in which force is fully released. Furthermore, this technique requires a longer hold period of 3-5 seconds to allow time for symptoms to reduce. The movement is a side glide, not a side bending. The clinician must achieve end range and then back off but maintain overcorrection assuring proper extension movement so that the patient does not fall backwards. Like most of these maneuvers, starting position is most crucial. Some of the most commonly found errors were patients not having their feet the appropriate distance apart, the patient's elbow not clearing the ilium, and the placement of the clinician's shoulder not being on the distal humerus, as well as the improper positioning of the clinician's feet.

**Procedure #12: Extension in Lying with Hips Off-Center with Clinician Over Pressure (frontal plane)**

For starters, the clinician must make sure that the plinth is the appropriate height, not too high, so that enough lateral force can be sustained throughout the maneuver. The clinician should be on the side of the plinth so that the hips are off center, and hand placement is on lateral ribs and iliac crest (not on the floating ribs and greater trochanter). Maintaining the appropriate force through the frontal plane and not rotating the pelvis was another area of concern. The clinician's chest must be over the lumbar spine to allow enough lateral force, and the clinician should maintain enough pressure throughout the repetitions. Many times, it was found that the pressure was decreased toward the end of the technique.

**Procedure 4C: Lateral Flexion Mobilization**

Some of the key points that were noted throughout the workshop included the patient's sacrum not being against the back of the chair in an upright position and not getting into and/or maintaining the position of cervical retraction. The clinician's elbow should not push down or back on the patient's shoulder; it should rest on the patient's shoulder. The clinician should side flex the head to end range, rather than creating a shearing force. Oftentimes, the clinician loses retraction during the mobilization. It is crucial for the clinician to maintain both arms in the frontal plane throughout the maneuver.

**Procedure 2B: Retraction and Extension with Rotation and Clinician Traction in Supine**

The clinician must get his/her body in the patient's sagittal plane and then cradle the mandible, avoiding the two finger approach. Slowly retract to end range, with the hand under the occiput allowing movement, while making sure not to "scoop". It is important not to maintain retraction while extending the cervical spine. However, it is also important to maintain traction throughout the maneuver and slowly achieve end range extension. Rotation can be applied to further end range extension, and when returning to the starting position, it is essential to move slowly so that the movement is passive.

#### **Procedure #24: Lumbar Rotation Mobilization in Flexion**

With regard to position, the plinth should be at appropriate height, which is mid-thigh level. The clinician should stand on the side of rotation in step standing with inner thigh toward the plinth and his/her hip flexed to about 30 degrees. The patient's ankles should be on the clinician's hip, not the patient's tibia on the clinician's hip. This helps maintain the patient's hip at 90 degrees of hip flexion throughout the rotation mobilization. (At times, the clinician may flex the hips past 90 degrees depending on patient response.) A patient lying too close to the edge of the table can cause the whole pelvis to rotate off the table. Since this is a mobilization procedure, it is important to stabilize the patient's trunk adequately, preferably on the shoulder, before mobilizing. The force application should always be perpendicular to the floor.

#### **Procedure 1C: Retraction Mobilization**

The proper patient position is to have the sacrum against the back of chair; however, the thoracic spine should not contact the back of the chair. The clinician should not use the edge of his/her hand on the patient's chin; the hand should cup the chin softly. While maintaining proper posture throughout the technique, the clinician's mobilizing hand should be on the upper thoracic spine, not on the cervical spine. The clinician should retract the patient's head gently. Gentle pressure should be placed on the chin to maintain retraction. Do not drive the mandible through the back of the skull. As with most of these mobilization techniques, the application of force should be a slow pressure on and pressure off.

The goal of this write-up is to identify and describe some of the common errors that have been observed throughout multiple McKenzie courses and examinations. A special thanks goes out to the dedicated and hardworking faculty and faculty facilitators, who contributed the feedback to help make this workshop a tremendous success. There was great feedback from clinicians at all levels, from first year Part A participants to experienced Diplomates that have been practicing for years. The Techniques Team encourages you to get together and form practice groups to review techniques and refine hands-on maneuvers. Always keep in mind that the McKenzie Method includes hands-on manual maneuvers when appropriate in the progression of force application. It is important to keep our swords not only sharp but polished at all times as we "carry on" with Robin McKenzie's vision of "further, further, further." I hope you find these clinical tips and observations useful when dispensing these mobilization procedures as we all work toward peak patient outcomes.



**Where to for Spinal Publications NZ Ltd?**

*Rachel Mason, CEO - Spinal Publications NZ Ltd.*

Robin McKenzie's three sons have taken over the reigns as the Board of Directors for Spinal Publications NZ Ltd, much to the relief of his wife Joy. They come into the company with a fresh perspective, energy and a determination to uphold Robin's legacy and follow his vision of the McKenzie Method® being part of everyday life.

It is exciting times for all involved as we work towards improving market share, increasing our number of markets and providing new products. These are early days and we look forward to giving you a more comprehensive update in the future.

As Robin always said, he learnt so much from his patients. In order for us to provide what they need, we welcome and very much appreciate your ideas, recommendations and complaints, as you are the ones interacting with the patients.

Please feel free to contact Rachel Mason, CEO anytime at [Rachel@endpain.co.nz](mailto:Rachel@endpain.co.nz).

We will "CARRY ON" providing the citizens of the world with the tools to eliminate their back pain.

The Team at Spinal Publications NZ Ltd

***And a message from The McKenzie family:***

***"We would also like to extend our personal gratitude for the overwhelming support you all gave our family through this difficult time."***

**Summary and Perspective of Recent Literature**

Stephen May, PhD, MA, FCSP, Dip. MDT, MSc (UK)

*Synopsis: Clinical criteria provide operational definitions for mechanical, nerve root and maladaptive pain mechanisms; further mapping of mechanical syndromes, and strengthening adds very little to the treatment using Mechanical Diagnosis and Therapy.*

**Smart KM, Blake C, Staines A, Doody C. The discriminative validity of “nociceptive”, “peripheral neuropathic”, and “central sensitization” as mechanism-based classifications of musculoskeletal pain. Clin J Pain 2011;27:655-663.**

**Objective**

To validate the discriminate validity of mechanism-based classifications of pain through clusters of clinical criteria to discriminate back pain, with or without leg pain, of nociceptive, peripheral neuropathic, or central sensitization origins.

**Design**

Cross-sectional between patients design.

**Setting**

In hospitals and physiotherapy departments in Ireland and London.

**Patients**

Data collection was done by 15 experienced physiotherapists. The patient sample size was based on the need to have 10 patients per predictor variable, of which there were 40, necessitating a minimum sample of 400. In total, 464 patients were recruited, who had a range of back and leg symptoms, were slightly more female, and had acute to chronic duration of symptoms, but the majority were chronic.

**Intervention**

The therapists conducted a standard assessment, including screening for yellow and red flags, and screening for pain-related symptoms and signs, such as spontaneous pain and allodynia. The clinicians then classified the patients' pain mechanism as either nociceptive (mechanical back pain), peripheral neurogenic (nerve root pain), central sensitization or mixed based on their clinical judgement. They then completed a 38 item Clinical Criteria Checklist, which consisted of 26 symptoms and 12 signs.

**Main outcome measurements**

Univariate analysis was used to exclude non-discriminatory criteria. Multivariate analyses were then used to identify discriminatory clusters of criteria associated with nociceptive, peripheral neurogenic, and central sensitization pain mechanisms. A series of models were used to exclude weakly discriminate criteria, and to compare definite criteria from one pain source with definite criteria from the other two sources. Final models were given for each of the pain mechanisms with regression coefficients and odds ratios, with 95% confidence intervals (CI), for each of the remaining criteria.

**Main results**

Gender and age were not significantly associated with pain mechanism, and so were excluded from multivariate analysis. Patients were classified as follows: 256, 102, and 106 respectively with nociceptive, peripheral neurogenic, and central sensitization pain mechanisms. Table 1 presents final models for the different pain mechanisms, with odds ratios greater than one being positively associated and odds ratios less than one being negatively associated.

The final models had a sensitivity, specificity and positive likelihood ratio of 91%, 91% and 10.1; 86%, 96% and 21.6; 92%, 98% and 40.6 respectively for nociceptive, peripheral neurogenic, and central sensitization pain mechanisms. The diagnostic odds ratios were 100.7, 150.9 and 486.6 respectively; meaning that these models were respectively 100 times, 150 times, and over 480 times more likely to accurately than inaccurately predict the pain mechanism.

**Table 1. Final criteria for nociceptive, peripheral neurogenic, and central sensitization pain models**

Criteria	Odds ratios	Lower 95% CI	Upper 95% CI
<b>Nociceptive</b>			
Intermittent	4.25	0.99	18.25
Localised	69.79	25.13	193.81
Clear aggravating/ easing	18.41	5.91	57.37
<b>Negatively associated</b>			
Burning	0.28	0.14	0.57
Dyesthesias	0.15	0.06	0.37
Night pain	0.22	0.11	0.46
Antalgic	0.24	0.11	0.53
<b>Peripheral neuropathic</b>			
History of nerve injury	12.64	3.59	44.49
Dermatomal	24.29	6.33	93.18
Nerve movements tests	14.64	5.59	38.37
<b>Central</b>			
Pain disproportionate to injury	15.19	4.39	52.48
Disproportionate aggravating/ easing	30.69	8.41	112.03
Psychosocial symptoms	7.65	1.64	35.79
Diffuse palpation	27.57	6.28	121.09

## Conclusions

Each cluster of criteria was found to have high levels of classification accuracy. Further studies are required to evaluate the construct and criterion validity of these mechanism-based classifications of musculoskeletal pain.

## Comments

This is an important paper from a number of perspectives. Firstly, it is one of the few papers that has attempted to present epidemiology about the proportion of patients with low-back pain that originates from 'normal' mechanical (nociceptive), nerve root (peripheral neuropathic) or maladaptive pain responses (central sensitization) causes. These definitions of mechanical, nerve root, and maladaptive pain responses are not actually used by the authors, but seem reasonable alternative definitions to those used based on the descriptive criteria. The proportions are clearly biased by the very chronic nature of the population; about 74% had had symptoms for more than three months, and so this is not a 'normal' back pain population, if such a thing exists, with a likely disproportionate number in the latter group. Despite this, 55% had mechanical back pain, 22% had nerve root pain, and 23% had 'central pain'. It is not clear if this latter group had pain that was maintained by psychosocial mechanisms or neurophysiological changes in the central nervous system, or a mixture of both. These neurophysiological changes are highlighted in much of the pain sciences literature, but with little attempt to define the epidemiology and the extent to which this exists in the chronic pain population. Although those with 'chronic' symptoms (> 3 months) was higher in this group, it was high in all groups; 94% compared to 68% in the mechanical and nerve root groups. Clearly, the focus on maladaptive pain mechanisms needs to be balanced by an on-going consideration and assessment for pain of mechanical origin.

Another point of interest, especially for McKenzie therapists, is the validation that this study provides for pain descriptions supplied in the textbook (McKenzie and May 2003). All Mechanical Diagnosis and Therapy trained clinicians would recognise the mechanical nature of back pain that is described as intermittent, localized and with clear aggravating and easing factors. Pain that is in a dermatome pattern with nerve root tension signs would clearly be classified as pain of nerve root origin. Many clinicians would recognise that a patient has maladaptive pain when it appears to be disproportionate in responses and to the original injury, accompanied by psychosocial symptoms, and if the patient displays diffuse tenderness away from the site of pain.

Additionally noteworthy are the statistics, as the odds ratios are huge for some of these items. Likelihood ratios, a different way of evaluating risk or outcome, of over 10.0 are said to be very strong evidence for the value of that item in a diagnostic pathway (Jaeschke et al. 1994). As can be seen in Table 1, many of these odds ratios are much greater than this. Likewise, the sensitivity and specificity are very high (>90%) for nearly all items, which is very unusual as mostly these statistics tend to be in a see-saw rela-

tionship – as one goes up, the other goes down. What these statistics mean overall is that we can be very confident about the pain models that the authors have mapped.

The reliability of the classification system has been tested and found to be good to excellent for inter-tester and intra-tester reliability with kappa values of 0.77 (95% CI: 0.57, 0.96), and 0.96 (95% CI: 0.92, 1.00) respectively (Smart et al. 2010). The construct validity of the classification system has been tested against a number of self-reported pain, functional, and physical and mental related health-quality related outcome measures in a subsequent study, which therefore addressed the construct validity of the classification (Smart et al. 2012a). There were significant differences between groups in most outcomes used ( $p=0.001$ ). Patients with central sensitization reported significantly more severe pain, poorer general health-related quality of life, and greater levels of back-pain related disability, depression and anxiety compared to the two other groups. There was a similar pattern when peripheral neuropathic pain group was compared to the nociceptive pain group. For instance, central sensitization, neuropathic, and nociceptive groups respectively were as follows: pain – 7.2, 5.8, 4.5; Roland-Morris – 14.0, 11.9, 8.7; depression – 9.5, 7.0, 4.9. Obviously these are relative differences only, not dichotomous ones, but they are still sizeable differences.

Each of the three groups have been explored in more depth in subsequent studies using the same data that also includes a discussion of the underlying biological plausibility of the symptoms and signs assigned to the different criteria (Smart et al. 2012b, 2012c, 2012d). There was a strong association between central sensitisation and: *‘disproportionate, non-mechanical, unpredictable pattern of pain provocation in response to multiple / non-specific aggravating / easing factors; pain disproportionate to the extent of injury or pathology; strong associations with maladaptive psychosocial factors (e.g. negative emotions, poor self-efficacy, maladaptive beliefs and pain behaviours; and diffuse / non-anatomic areas of pain / tenderness on palpation’*. (Smart et al. 2012b). There was a strong association between peripheral neuropathic pain and: *‘pain referred in a dermatomal or cutaneous distribution; history of nerve injury, pathology or mechanical compromise; and pain / symptom provocation with mechanical / movement tests (e.g. active / passive, neurodynamic) that move, load, or compress neural tissue’* (Smart et al. 2012c). There was a strong association between nociceptive pain and: *‘clear / proportionate mechanical / anatomical nature to aggravating and easing factors; usually intermittent and sharp with movement / mechanical provocation, maybe a more a more constant dull ache or throb at rest; with an absence of dyesthesias, disturbed sleep, antalgic postures, burning / shooting / electric-shock like pains’* (Smart et al. 2012d).

## References

1. Jaeschke R, Guyatt G, Sackett DL. Users' guide to the medical literature, III: how to use an article about a diagnostic test. J Am Med Ass 1994;271:389-391.
2. McKenzie R, May S. The Lumbar Spine, Mechanical Diagnosis and Therapy. Spinal Publications, Waikanae, New Zealand, 2003.
3. Smart KM, Curley A, Blake C, Staines A, Doody C. The reliability of clinical judgement and criteria associated with mechanism-based classification of pain in patients with low-back disorders: a preliminary reliability study. J Man Manip Ther 2010;18:102-110.
4. Smart KM, Curley A, Blake C, Staines A, Doody C. Self-reported pain severity, quality of life, disability, anxiety and depression in patients classified with 'nociceptive', 'peripheral nociceptive', and 'central sensitisation' pain. The discriminant validity of mechanisms-based classifications of low back (+) pain. Man Ther 2012a;17:119-125.
5. Smart KM, Blake C, Staines A, Thacker M, Doody C. Mechanisms-based classifications of musculoskeletal pain: Part 1 of 3: Symptoms and signs of central sensitisation in patients with low back (+ leg) pain. Man Ther 2012b;17:336-344.
6. Smart KM, Blake C, Staines A, Thacker M, Doody C. Mechanisms-based classifications of musculoskeletal pain: Part 2 of 3: Symptoms and signs of peripheral neuropathic pain in patients with low back (+ leg) pain. Man Ther 2012c;17:345-351.
7. Smart KM, Blake C, Staines A, Thacker M, Doody C. Mechanisms-based classifications of musculoskeletal pain: Part 3 of 3: Symptoms and signs of nociceptive pain in patients with low back (+ leg) pain. Man Ther 2012d;17:352-357.



**Mbada CE, Ayanniyi O, Ogunlade SO, Orimolade EA, Oladiran AB, Ogundele AO. Rehabilitation of back extensor muscles' inhibition in patients with long-term mechanical low-back pain. Rehabilitation, in press**

**Mbada CE, Ayanniyi O, Ogunlade SO. Patterns of McKenzie syndromes and directional preference in patients with long-term mechanical low-back pain. Romanian J Phys Ther 2013;19:62-68.**

**Mbada CE, Ayanniyi O, Ogunlade SO. Effect of static and dynamic back extensor muscles endurance exercise on pain intensity, activity limitation and participation restriction in patients with long-term mechanical low-back pain. Medical Rehabilitation 2011;15:11-20.**

*Note: These three articles are part of a recent PhD work, and as they appear to be reporting on different aspects of the same population, they have been reviewed together. They look at the distribution of the mechanical syndromes, but also at the effect of the McKenzie protocol by itself, but also with the addition of static or dynamic back endurance exercises, which are illustrated in Mbada et al. (in press).*

## **Objective**

To evaluate the proportion of mechanical syndromes in a back pain population, and to compare the effects of the McKenzie protocol by itself, but also with the addition of static or dynamic back endurance exercises.

## **Design**

Randomised controlled trial, with three groups.

## **Setting**

Department of Medical Rehabilitation, Ile-Ife, Nigeria.

## **Patients**

Consecutive patients with a history of back pain for at least three months, with exclusion criteria being red flags, neurological compromise, pregnancy, spinal surgery, and Roland-Morris score less than four or greater than 20. Ninety-one patients were invited to participate, 89 accepted and 84 met inclusion / exclusion criteria; 79 and 67 were re-assessed at four and eight weeks respectively. The mean age was about 52 and 52% were female.

## **Intervention**

McKenzie lumbar assessment forms were used to assess patients who performed end-range repeated movements in standing or lying, into extension, flexion or lateral direction to establish directional preference. The therapists were described as credentialed therapists in MDT. Mechanical syndromes were recorded. In the randomised controlled trial (RCT), there were three groups: the McKenzie protocol by itself, but also with the addition of static or dynamic back endurance exercises as well as the MDT protocol. Treatment was given three times weekly for eight weeks.

## **Main outcome measurements**

The proportion of mechanical syndromes (Mbada et al. 2013) in the RCT outcomes were as follows: visual analogue scale for pain, overall, at present, average, best and worst, Roland-Morris and Oswestry scales for disability at four and weeks, and static and dynamic muscle endurance and muscle endurance using the Biering-Sorensen and arch-up tests. Analysis was conducted for each of the three groups over time and also between the groups (Mbada et al. 2011; Mbada et al. in press).

## **Main results**

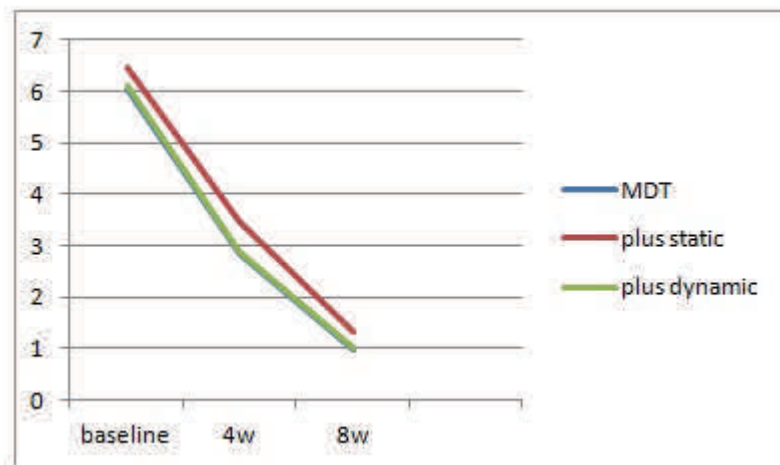
In 89 patients with chronic low-back pain, the prevalence of mechanical syndromes was as follows: derangement 80%, dysfunction 7%, postural syndrome 13%; 94.5% had a directional preference for extension, 3.5% for flexion, and 2% had no directional preference (Mbada et al. 2013).

There were significant differences over time in all groups in static and dynamic muscle endurance and muscle fatigue. The MDT protocol plus the dynamic endurance exercise group had a statistically significantly higher mean change in static and dynamic muscle endurance and muscle fatigue at four and eight weeks (Mbada et al. in press).

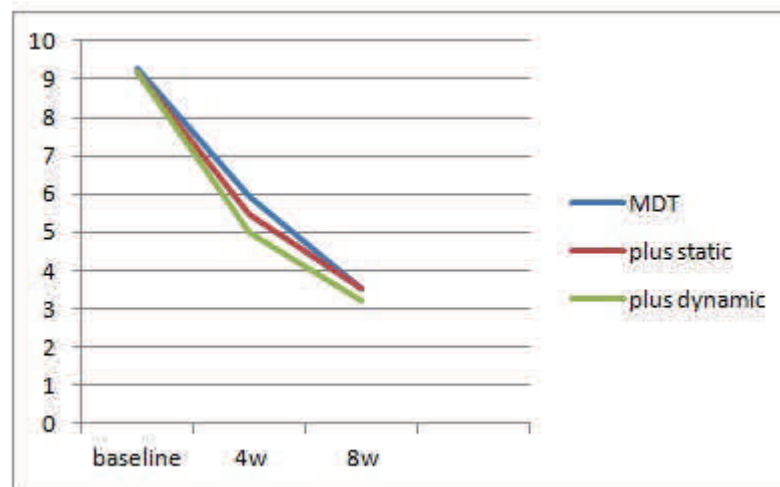
There were significant improvements in all three groups over time in terms of pain and functional disability. Between groups, there was no statistical difference in terms of pain and Oswestry scores, but there was a statistical significant better improvement in the MDT protocol plus the dynamic endurance exercise group in the Roland-Morris score at four weeks ( $P=0.001$ ), but only of less than one point (Mbada et al. 2011).



**Figure 1. Mean pain scores at baseline, four and eight weeks.**



**Figure 2. Mean Roland-Morris scores at baseline, four and eight weeks.**



## Conclusions

Derangement was the most prevalent mechanical syndrome, and directional preference was most commonly found using extension exercises (Mbada et al. 2013). MDT protocol, with or without static or dynamic back extensor muscle exercises were effective in improving back extensor muscle endurance and fatigability, but the MDT protocol with static endurance exercises led to a significantly higher effect (Mbada et al. in press). However, this had no effect on improvements in pain and Oswestry scores, which improved in all groups with no significant differences; there was a significant difference in Roland-Morris at four weeks favouring the MDT protocol plus dynamic exercises, but this was unlikely to have been of clinical relevance (Mbada et al. 2011).

## Comments

The static and dynamic back extensor endurance exercises used in these studies were high load and unlike motor control exercises, which have relatively low load and put the emphasis more on control than endurance. However, these studies do make some attempt to answer the question, do strengthening exercises add any extra benefit to a MDT protocol, which is asked so often on McKenzie courses? The answer is ambiguous. The back extensors might have more endurance with static endurance exercises in addition to the MDT protocol, though this improves somewhat with the MDT protocol alone, but it is not clear what clinical relevance this has. This is hardly surprising that strengthening exercises strengthen, but does it have any clinical relevance? In terms of pain and disability, there really was no difference with the addition of either static or dynamic endurance exercises. The one statistical difference at four weeks is of negligible clinical significance. The conclusion has to be that strengthening adds very little to the clinical outcome over and above the MDT protocol.



Limitations of these studies must be recognised. Only 67 out of the 84 patients enrolled were followed up (80%), the longest follow-up was eight weeks at the end of treatment, with no long-term follow-up for patients with a chronic problem, and there was no sample size calculation, which can mean that a statistical difference that really exists might be missed. All these are serious limitations and biases to the work. However, the researchers were blinded to the recruitment, randomization and assessment procedures.

**BUSINESS & MARKETING CORNER**

In this issue of the MDTWP Business & Marketing Corner, Georg Supp, PT, Dip.MDT seeks to help us better understand what physicians are often looking for in reports from PT's. The McKenzie Institute thanks Georg for translating his original article, published in February 2013 in *Physiopraxis*, from German to English. We hope you find Georg's tips and advice useful.

What techniques do you use that other MDT clinicians around the world might also be able to use to improve their business bottom lines? Please feel free to send us details how you have improved your clinic's business by utilizing new and innovative business and marketing approaches.

Many thanks in advance,

**Yoav Suprun, DPT, Dip. MDT**

*MDTWP Business & Marketing Corner Editor*

**What Doctors Prefer**

*Georg Supp, PT, Dip. MDT—McKenzie Institute Germany*

*(Reprinted with permission from the Editor - Physiopraxis, February 2013)*

**Statutory provisions differ from country to country. Physical therapists must sometimes provide referring physicians with reports on evaluation and treatment of patients. Georg Supp, MDT Senior Faculty in Germany, and owner of a private PT clinic, surveyed more than 100 doctors on that topic. This text is a modified and translated version of an article Georg published earlier this year in a German PT journal.**

In Spring 2011, orthopedic doctor, Dietmar Goebel, inflamed the passions of his colleagues in Germany with an article in a journal for orthopedics and surgeons (Goebel und Schultz 2011). His conclusion, from a research project on 260 physical therapy prescriptions, was simple and sharp: most of the time PTs ignore the doctor's request for a report on the referred patient. If they send a report, the content is rubbish and the demand for further prescriptions is near to 100%.

The reactions of PTs and doctors were quite predictable. Physicians did find support for their bias on lazy physical therapists who just beg for the next prescriptions. Conversely, PTs complained that doctors seemed uninterested and wouldn't cherish good reports anyway (Supp 2011). Thus, the question came up: Who sets the standard for PT reports?

**What helps?****Not statutes...**

The German juridical guidelines on this topic leave it to generic advises (Gemeinsamer Bundesausschuß 20.01.2011/19.05.2011)

**...Or statistics either...**

In Germany, the prescribing doctor can tick a box on the prescription and ask for a report from the physical therapist. An analysis of more than 250,000 prescriptions in 2011 has shown that doctors tick that box on the form in only 18 – 20 % of all cases. (Abrechnungszentrum azh/zrk 2011). Why do the physicians use this easy form of communication in only one-fifth of the prescriptions? What do they want to read? What's bothering them about the present reports?

**109 Doctors Surveyed**

To move away from pure assumptions and the hope of some kind of inter-human osmosis of knowledge, our clinic ran a survey of 109 doctors in our hometown of Freiburg, Germany (see **"the survey and its results"**). We sent a letter with a return fax to our 40 main referring physicians. Furthermore, we chose 70



additional doctors from different fields of specialty out of 1,100 colleagues in town. We acted quite subjective, going by the motto: "This name seems familiar to me, he may answer". Admittedly, this is quite nonscientific and biased, but pragmatic and cost efficient.

The addressees of the survey were 49 orthopedics, 34 GPs, 16 surgeons, five neurologists, two pain specialists, two rheumatologists and one gynecologist.

31 doctors returned the answer fax in the next ten days. Following a reminder fax, another 31 of the addressees answered. In total, we received 62 answer-backs, equaling 57% of those surveyed - a plenty good result!

### **Quotations show the plurality of opinions**

Taken as a whole, we received a good impression from our referring physicians. We didn't really expect an improvement of our knowledge from questions 1 – 3 (see **"the survey and its results"**). Rather, we hoped for a slightly pedagogical effect. The options put forth by question 3 are suitable to convince doctors of the benefit of reports.

While the survey may be unrepresentative, my personal bottom line is absolutely positive based on the fact that more than half of the physicians did send feedback. Many doctors went beyond just ticking a box on the return fax, but also provided us with very helpful comments. For example, under "other reasons", we identified interesting hints regarding the possible aspects that motivate doctors to ask for a report or not. Two doctors who never use the possibility of asking for a report explained their behavior as follows: "I can see the progress" and "If physical therapy is indicated, our diagnostic labels match. In many other cases, the viewpoints are too subjective". Another physician, who asks for reports only once in a while, stated: "The reports are very seldom of adequate quality. I can't use the information. Often they lack important aspects." Yet another doctor admitted that he often forgets to tick the box. Two advocates of the reports argued with the content. "I like to know which techniques were used so I may be able to conclude why the treatment hasn't been successful" and "In this way, I can get feedback on the compliance of the patients".

### **Be concrete!**

The physicians were also asked to express their wishes for an effective report.

The answers speak for it as follows:

- "If you ask for a subsequent prescription, provide a good reason why that makes sense."
- "Which self treatment exercises did you prescribe?"
- "Define a goal and tell me whether it's achievable."
- "Did you achieve the treatment goal? If not, why?"
- "Be precise. Please don't write: "Range of motion improved" or "It feels better"."

### **Black sheep**

Dietmar Goebel identified some "black sheep" in the PT community (Goebel und Schultz 2011). These bad apples also exist in doctors. "I didn't know at all that this possibility exists", one physician stated frankly. Another doctor, who had never asked for a report in our clinic, was obviously not aware of the usual procedure. Nevertheless, he complained: "I don't get reports." The fact that both doctors are surgeons leaves a bad taste. These specialists should be highly interested in the further management of their operated patients. Todd Wetzel once explained the relation between surgery and rehabilitation to the point "Surgery prepares the body for proper rehabilitation." (Wetzel 2010)

### **Leave it to 5 - 10 sentences**

Let's stick to the white sheep. Pragmatic management helps. The fact that Physicians in Germany use the possibility of a PT report in only 20% of all prescriptions may be superficially interpreted as a lack of interest. However, this must not lead to the conclusion of not writing reports or to writing lousy ones.

Instead, PTs have to ask what is reasonable content for a report? Reports of high quality express competency and can convince doctors of the benefits of this kind of interdisciplinary communication.

The survey shows that physical therapists and doctors are not too far apart. Doctors like to receive information in 5 – 10 brief sentences. Topics, familiar to physical therapists, may include:

- Which physical therapy interventions were used?
- Which self treatment exercises did the patient learn?
- How is the compliance?
- What comprehensible reasons account for a further prescription?

Against expectations, movement tests and measurements of joint motion are of less interest. Information on PT assessment can be restricted to a minimum. Additionally, special expressions commonly used by physical therapists are often unknown to doctors, and thus, can be left out.

### Write a report quick and easy

Very often therapists use lack of time or insufficient payment to justify their refusal of reports. As far as I can see, that's horseplay. Reports don't actually require additional time and don't generate extraordinary costs.

A simple solution to that is as follows:

1. At the beginning of the last appointment, the therapist tells the patient that a report for the prescribing physician should be written.
2. Together, with the patient, the therapist fills in the form and. writes the report. In this manner, the therapist can be sure to adequately cover the patient's situation. The patient is aware of interdisciplinary communication and realizes that he's actively involved.
3. At the end of the session, the therapist sends or faxes the report to the physician.

Writing short and meaningful reports gives therapists the chance to show competency and improve communication between disciplines – for the sake of the patient.

### References:

1. Abrechnungszentrum azh/zrk (2011): Auswertung Physiotherapeutischer Mitteilungen 2011 Primärkassen und VdeK.
2. Gemeinsamer Bundesausschuß (20.01.2011/19.05.2011): Richtlinie über die Verordnung von Heilmitteln in der vertragsärztlichen Versorgung Heilmittel-Richtlinie, HeilM-RL. In: Bundesanzeiger 2011; Nr. 96 (S. 2247). Online verfügbar unter [http://www.g-ba.de/downloads/62-492-532/HeilM-RL\\_2011-05-19\\_bf.pdf](http://www.g-ba.de/downloads/62-492-532/HeilM-RL_2011-05-19_bf.pdf), zuletzt geprüft am 27.12.2012.
3. Goebel, D.; Schultz, W. (2011): Ambulante Physiotherapie in Orthopädie und Unfallchirurgie: Kann der Erfolg überhaupt beurteilt werden? In: *Z Orthop Unfall* 149 (01), S. 17–21.
4. Supp, Georg (2011): Studie zur Arzt-Therapeuten-Kommunikation: Ein Kommentar - Peinliches Ergebnis. In: *physiopraxis* 9 (05), S. 33–35.
5. Wetzel, Todd (2010): The Role of MDT in Diagnostic and Surgical Decision Making. McKenzie Institute Americas Region. Baltimore, 06.08.2010.

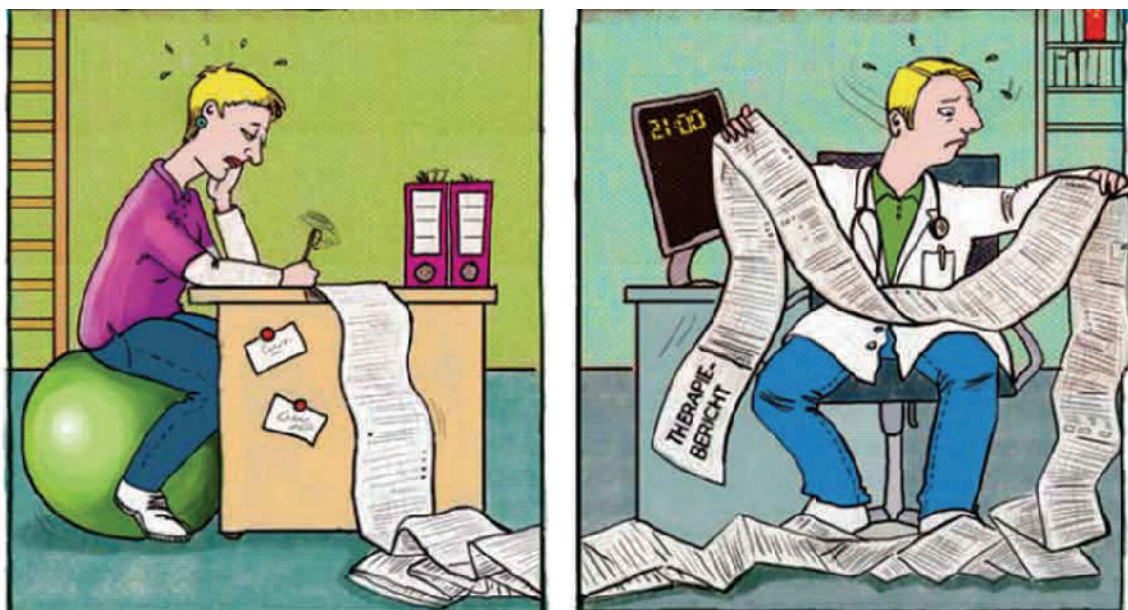


Image Courtesy of: S. Schaaf

## THE SURVEY AND RESULTS

### Why doctors do/do not use reports

In a survey, the certified McKenzie PULZ in Freiburg, Germany asked referring physicians about their expectations of physical therapy reports. Five questions, with open and closed answers, confirmed that it makes sense to write meaningful reports. Here are the results:

#### I never ask for a report, because... (13%)

- I don't have time to read it (1)
- Administration on that produces too much work load for me and / or the therapist (5)
- I prefer to ask the patient (4)
- Other reasons (see below "summarized results")

#### I ask for a report once in a while, because... (21%)

- It's only relevant for some patients (10)
- Other reasons (see article)

#### I ask for a report every time, because... (66%)

- The report helps me to decide, whether further prescriptions make sense (39)
- I can use the report to justify the costs of PT prescription (33)

### Wishes for the report

The report should cover the following aspects:

- PT assessment (23)
- Range of joint motion and results of movement tests (19)
- PT interventions (41)
- Compliance of the patient (36)
- The report should not be longer than:
  - 5 sentences (16)
  - 10 sentences (12)
  - 15 sentences (3)
  - No maximum length (9)

### Doctor Complaints

A sample of the answers shows the following picture

- "Please don't send the patient with specific claims."
- "Stop the therapy once in a while to see whether it makes a difference at all."
- "Some clinics ALWAYS ask for further prescription."

### Summarized results

- 95 % use the report to decide about further prescription of physical therapy
- 80 % use the report as support in recourse claims of insurance companies (in Germany doctors can run into trouble if they prescribe too much physical therapy)

### Use of request for reports according to professional group (56 answers could be allocated)

- Orthopedics: report always 79 %, sometimes 13 %, never 8 %
- GPs: report always 55 %, sometimes 35, never 10 %
- Surgeons: report always 29 %, sometimes 29 %, never 42 %

### What doctors like to read?

- 67 % want to know about the applied physical therapy interventions
- 58 % want information on compliance of the patient
- 37 % are interested in the PT assessment
- 40 % want to read five sentences or less