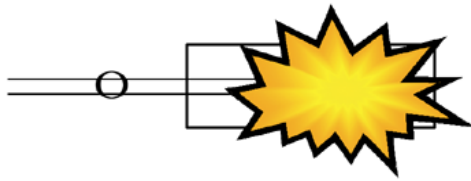


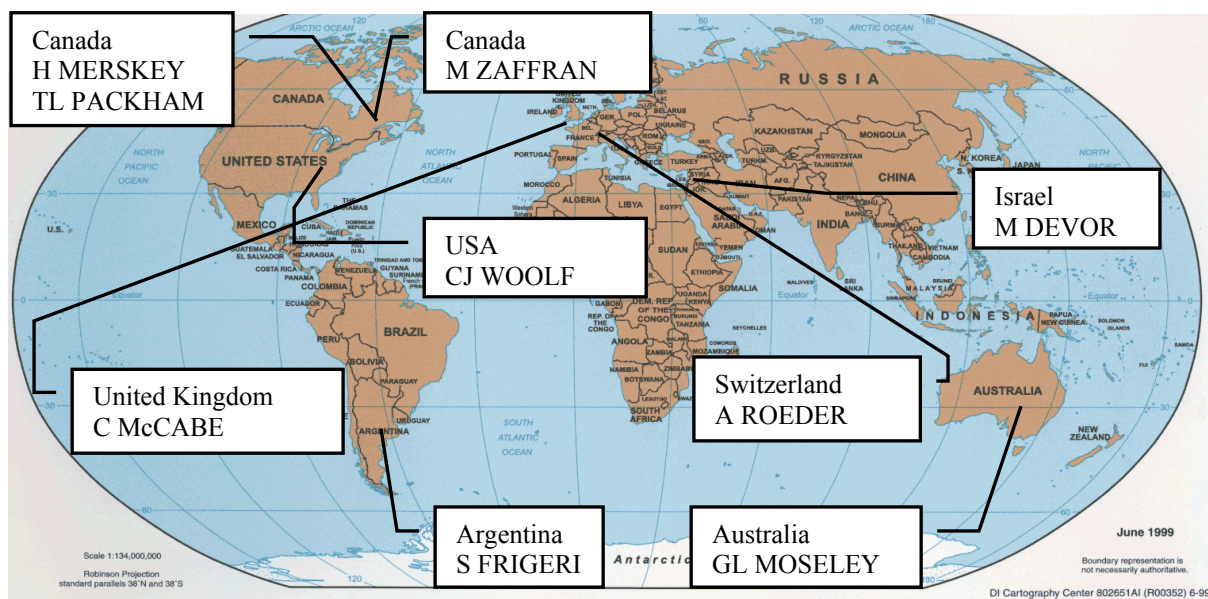
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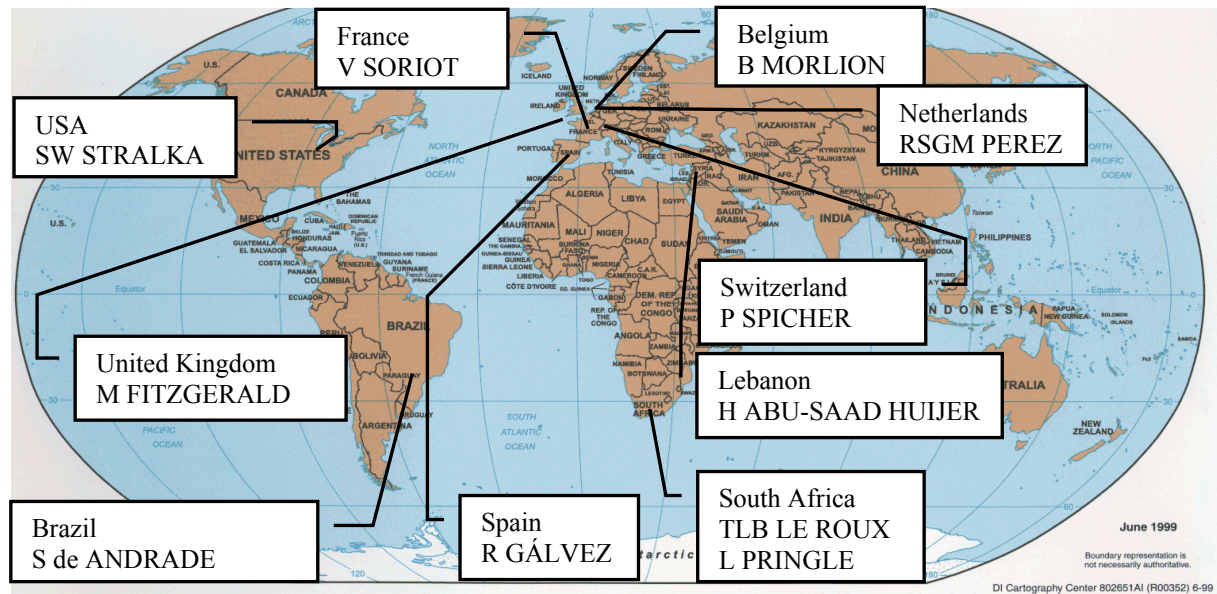
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Ronald MELZACK's
Special issue

e-News for Somatosensory Rehabilitation



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Ronald MELZACK's



**Special issue
chosen**

by Claude J. SPICHER

EDITORIAL

We had a dream

To MD. 🌟🌟🌟 To neuroscientist 🌟🌟 To patient 🌟 To therapist 🌟🌟🌟

Claude J. SPICHER, BSc OT¹

The wonderful adventure the editorial board have dreamed about has become a reality with the publication of this "Ronald Melzack special issue", including an article by Prof. Ronald Melzack himself.

To highlight the universality of the Ronald MELZACK's works, we invited authors from the different continents (See the maps of the Table of Contents).

We requested one-page submissions about the influence of the Ronald MELZACK's works on understanding of pain and daily practice. It was very easy to collect them, with very positive answers as: "Fantastic! Absolutely"; "I will participate with enthusiasm", "He spoke to me and treated me as an equal which bowled me over!"

These twenty tributes are written by medical doctors, therapists and/or researchers. We are delighted and feel very honoured that they accepted our invitation.

They reflect the ongoing contributions of the Gate Control Theory, the McGill Pain Questionnaire, the International Association for the Study of Pain, the journal of Pain, the Wall & Melzack's Textbook of Pain. But the cornerstone of his works is his personal charm, thoughtfulness and kindness as colleague and as teacher.

Personally, I use the McGill Pain Questionnaire daily with each neuropathic pain patient who enters our clinic. However I discovered Ronald Melzack in 1994 through his Textbook of Pain. When in 2006 I learnt about the publication of the 5th Edition by McMahon & Koltzenburg I immediately bought it. As a therapist and as a researcher, it is exactly what I needed.

Thank you very much indeed Ron from all of us, to whom you are a role model, in particular from all patients whose pains were not recognized.

I trust you will enjoy the reading of this special issue.

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FOREWORD**Relief of pain and suffering endured by millions of people**

To MD    To neuroscientist    To patient    To therapist   

Ronald MELZACK, OC, OQ, FRSC, PhD²

The recognition that pain is a multidimensional experience determined by psychological as well as physical factors has broadened the scope of pain therapies. Patients with chronic pain need every possible therapy to battle the pain. Chronic pain is not a symptom but a syndrome in its own right, and requires therapists from a wide range of disciplines.

Psychological therapies, which were once used as a last resort when drugs or neurosurgery failed to control pain, are now an integral part of pain management strategies. The recognition that pain is the result of multiple contributions gave rise to a variety of psychological approaches such as relaxation, hypnosis and cognitive therapies. So too, transcutaneous electrical nerve stimulation and other physical therapy procedures emerged rapidly, bringing substantial pain relief to large numbers of people.

The field of pain continues to develop and there are reasons to be optimistic about its future. First, imaging techniques have confirmed pain-related activity in widely distributed, highly interconnected areas of the brain. An implication of the concept is that neural programs that evolved in the brain to generate acute pain as a result of injury or disease may sometimes go awry and produce destructive chronic pain. Future imaging research may reveal the sites of abnormally prolonged activity in chronic pain patients. Second, the detailed knowledge and technical skills developed by scientists for research on the spinal cord can be used to explore brain mechanisms in humans and animals, especially in the brainstem reticular formation, which is known to play a major role on chronic pain. Third, our knowledge of the genetic basis of pain as well as the development of the brain is growing rapidly. Genetic factors are known to contribute to a large number of chronic pain syndromes and future research will highlight their brain mechanisms. The inevitable convergence of these three approaches will hopefully lead to the relief of pain and suffering now endured by millions of people.

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Original article
Ron Melzack in Canada

To MD    To neuroscientist    To patient    To therapist   

Harold MERSKEY, DM, FRCPC.³

Ron Melzack has had an unparalleled influence here as a local expert and an international authority. His contribution to pain studies has been enormous, particularly that part of it which focused around the gate theory of pain. The gate theory was published in 1965 and immediately stimulated research on the physiology of pain as well as its concomitant psychological features. This basic theory inspired international interest when first published by Ron Melzack and Patrick Wall in *Science*. It was actually preceded by the work of William Noordenbos, professor of neurosurgery in Amsterdam, who pointed out from histological studies that an imbalance of input from large and small fibres was the basis for the continuing chronic pain of post-herpetic neuralgia and pathological pain.

Melzack and Wall had come to the topic of paradoxes and difficulties in understanding pathological pain from nerve damage after a consideration of the difference in rates of conduction between large and small nerve fibres and offered their theory on how pain was produced normally by a physiological imbalance between two types of fibre, which affected the substantia gelatinosa. The details of this location were never satisfactorily established and became a focus for fierce argument but the basic idea remained and led to greater understanding of the relationship between pain and damage to the body.

Until then, the major emphasis in connection with pain had to do with the attempt to understand the physiology of severe pain produced by nerve damage. Wall and Melzack recognized the priority of Noordenbos and gave him full credit for his discovery and he equally supported them in their theory, which confirmed his own and which they brought to a much larger audience of scientists and clinicians. Their work was a great stimulus to further research on pain. Probably everyone contributing to this number will have said something similar, and so I can direct my attention to other contributions by Melzack.

Melzack offered a broad approach to the psychology of pain and to its study by psychologists. His pain questionnaire, with a list of words has served as a research tool, taking us beyond the mere statement that some people exaggerate their symptoms (a totally inappropriate way of

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describing the psychological phenomenon) into trying to appreciate how English has been used to characterize acute and chronic pain. This applies not only to English but also to the many versions of McGill pain questionnaire in other languages. In a different field, one of his earliest works had to do with the experience of phantom pain. The reader who wants to know about this impressive analysis of patients experience may well look to the careful original description and discussions of phantom pain, which he did in his work with Livingston.

Most important, besides, his great contributions mentioned is his influence as a teacher of ideas, and the guide to postgraduate students and undergraduates for research. This has brought many psychologists into work on the experiences of patients with pain and the care of patients with pain. Within Canada he became an iconic figure engaged in facilitating the participation of young graduates in advancing knowledge of basic science and its clinical importance in understanding pain. The Canadian Pain Society, and all those who work on pain in Canada continue to appreciate his influence worldwide.

Original article

The intuitively sensible and elegant nature of the Neuromatrix Theory

To MD  To neuroscientist  To patient  To therapist 

G. Lorimer MOSELEY, PhD, FACP⁴

When I did my clinical training, Melzack and Wall were so firmly established as forefathers of modern pain science that for some time I thought the gate theory was the brain child of one person called Melzackinwall. Clearly the gate theory was a revolution, no doubt. However, working clinically, I found myself drawn towards patients with chronic and complex pain problems - problems for which the gate theory was not enough. That no one seemed to be able to help these patients was probably the very thing that drew me to them. However, I could not help them either. So I went searching for better explanations for their pain. That is when I came across the neuromatrix theory (NMT). On the surface, the NMT seemed pretty intuitive - the brain consists of a whole bunch of neurones that connect with and modulate each other, and particular neurosignatures bifurcate to provide a perceptual and motor version of the one output. The NMT may not have been the first to propose that pain is an output of the human brain, rather than an input, but for me it was clearly the most eloquent.

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A mildly modified version of the NMT is a driving theory in much of what I now do. In my research work, the NMT provides a workable framework with which to make sense of the many factors, aside from nociception, that can modulate pain. Importantly, the NMT accommodates the potent modulatory influence of nociceptive input without creating an erroneous divide between pain caused by nociception and pain caused by something else. Perhaps, however, the more profound application of Melzack's NMT is in my clinical work. In a book I wrote with Dr David Butler, called *Explain Pain*, we describe a modified version of the NMT - Melzack's neurosignature is relabelled a neurotag, and the neuromatrix is equated to an orchestra in the brain. These ideas are integral to *Explain Pain* and to reconceptualising pain from a measure of tissue damage, to a conscious experience that serves to protect our body tissues. For people in pain, this reconceptualisation is liberating and relieving and is often the first step in their road to recovery. We know this not just from clinical anecdotes but from robust randomised clinical trials. In the sense that our work directly descends from the principles outlined in the NMT, and that we are just one of many groups who have been strongly influenced by this work, Ron Melzack must be having an immeasurably massive ripple effect on humankind.

I only met Ron Melzack once. It was over lunch with about 150 other people. I did not know what he looked like so I was relieved to see him wearing a name badge, his humility evident in simply having 'Ron', written in black pen. I was also relieved to see him sitting on his own, remarkably unbothered by the crowd gathered around some other fellow on the next table. I introduced myself and proceeded to give him a rapid-fire spiel about my gratitude for the way his work had given me a sense of possibility and opportunity; an energy for the pursuit of a better solution for the problem of pain. He looked a little confused. I soldiered on - praising the intuitively sensible and elegant nature of the NMT and floating the possibility that if we could disengage enough of the multifactorial influences over the pain neurosignature, could we retrain the brain to stop activating it?⁵ I told him how powerful the model is when we teach patients about it and give them a sense of the unbridled power of the brain. He looked overwhelmed. He shook his head slowly and said 'I think you should talk to Professor Melzack' and nodded at the crowd at the next table. My emphatic message never got to the real Ron. It is therefore with a touch of relief and a very large sense of honour to be invited to

⁵ These thoughts began the development of graded motor imagery, a treatment for pathological pain that is now supported by level 1 evidence.

contribute to this special issue, to be in such esteemed company in doing so, and to be able to say it all again.

Original article
The heart and soul behind phantoms

To MD 🌟🌟🌟 To neuroscientist 🌟🌟🌟 To patient 🌟🌟🌟 To therapist 🌟🌟🌟

Candida S. McCABE, PhD, RGN⁶

A tribute to Professor Ronald Melzack

As academics we read a vast amount of literature and some author's work we relate to easily whilst others may prove more challenging. However, above all of these there runs another, much smaller layer of authors whose published work has the ability to change the direction of all research that follows it and their names become legendary. These people seem to exist in a different sphere to the rest of us and their mystery is heightened because we are seldom likely to meet them in person. Professor Ronald Melzack is without doubt one such legend and his work and personal input has had a profound impact on the direction of my research.

As a new doctoral student in early 2000 I had just completed a study looking at altered body perceptions in people with Rheumatoid Arthritis. These people described a perception of increased swelling in joints that were either chronically or severely affected by the disease and yet this excessive swelling was not visible to others, or even the patients themselves, when the joints were actively viewed. My co-researchers and I looked to the phantom limb literature to help us to understand these altered perceptions as it struck us there were obvious similarities between amputee phantom limb pain and rheumatoid arthritis phantom swelling¹. This was a new sphere of literature for me but I quickly became aware of Professor Melzack's significant contribution to this field. What struck me most were the painstaking descriptions, both verbal and detailed drawings, he and his co-authors presented so that the person behind the phantom was revealed^{2,3}. His neuromatrix theory⁴ gave me a framework in which to set our emerging research theories and his textbook, with Professor Patrick Wall, "The Challenge

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of Pain”⁵ became my bible. In slow time I started to see, from Professor Melzack's detailed and inspirational work, how amputee phantom limb pain may have a significant bearing on how we should view chronic pain in other conditions and most importantly, how the patients' voice must inform this work.

In March 2000 the First International Consensus meeting on the Management of Phantom Limb Pain was held at the University of Oxford in association with the British Pain Society. Filled with the ideas and thoughts from my very early research I was delighted to attend this and listen to Professors Melzack, Wall and Ramachandran speak so eloquently on their work in this area. I had so many questions but was too terrified and inexperienced to ask these in the vast auditorium. However, at the coffee break I found myself standing next to Professor Melzack and we quickly fell into conversation. At no point did he treat me as anything other than an equal and his genuine interest in my research left me feeling incredibly excited to continue to research chronic pain. Soon after the conference I received a copy of his latest publication in the post with a personal message of support that I still treasure today. It taught me that no matter how far you may progress in your chosen field, taking time for new, junior researchers can have a profound impact on future career paths.

From those early links with Professor Melzack I felt I had a supportive colleague “out there” in the challenging world of chronic pain research and colleagues and I corresponded again with him in later studies when we described phantom rheumatoid stiffness⁶. Once again we received thoughtful and timely advice given in the most generous of manners.

Professor Melzack will always be an academic legend to me. His publications had, and still do have, a profound impact on my research. However, I think it is his personal charm, thoughtfulness and kindness that I learnt from the most. Without these traits he would have been a distant figure but with them he became a role model for us all.

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Original article
No brain, no pain

To MD    To neuroscientist    To patient    To therapist   

Clifford J. WOOLF, MB, BCh, PhD⁷

Tribute to Ron Melzack

I first met Ronald Melzack in the very early 1980's on one of his frequent trips to London to visit the other half of the Melzack-Wall Spinal Gate Control Theory, Pat Wall, in whose lab I was then working in University College London.

Ron was an amazingly sympathetic listener to a young, enthusiastic and inexperienced research fellow, particularly when at that time our world view on pain was quite divergent. I was trying to take pain apart to identify its genetic, molecular and cellular mechanisms, using as "hard science" techniques as I could find, while Ron was about putting things together, synthesizing at a very high level how the brain works to produce human perception and behavior. I distinctly remember Ron shuddering when I first used the term "pain gene", as if I had somehow blasphemed. Impetuous and stubborn I may not have at that time fully appreciated Ron's sage advice and insights, and his mantra "no brain no pain".

Nevertheless, even though I have largely continued on my deterministic path, I often feel Ron metaphorically sitting on my shoulder, gently ribbing me for sometimes not seeing the wood for the trees and reminding me that a gene is one very small thing and a human sensation another very large thing.

Thank you Ron for helping me not to forget the bigger picture, and for showing me how there are many different, valid, and important ways to study how the nervous system works. You must be rightly proud of all your enormous contributions to the study and understanding of pain.

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Original article
Avenues to the Future of Pain Research... Ron's Picks

To MD    To neuroscientist    To patient    To therapist   

Marshall DEVOR, PhD⁸

The names Melzack and Wall are inseparable of pain research. My active involvement in Pain Science began in the spring of 1975 when I traveled to London to begin a postdoctoral fellowship with Patrick D. Wall. I had just completed doctoral work at MIT on sex, pheromones and neuroplasticity, and previous to that undergraduate work at Princeton on hunger and limbic system reward. I went to Pat, one of the most creative figures in neuroscience, with the ambition of pursuing the hard question: how do electricity and chemicals yield emotion and motivation. As a platform for research the pain system had it all a precise definable input that rapidly evokes a compelling conscious experience, and one that is by definition both sensory and emotional in character. The potential for pain research to relieve suffering was an added bonus. It was a decade after Pat had published the Gate Control theory together with Ron Melzack (Melzack and Wall, 1965) and a good time to ponder the underlying scientific ideas and why they went viral.

Before actually meeting Pat in 1975 I had read pretty much all of his published articles. The first thing that struck me was that all of the neurophysiology captured by the famous sketch of the spinal Gate Control (Fig.1) had been in place long before. But nobody had paid much attention. Pat didn't really know why, but suspected that the high-impact publication venue of Melzack and Wall (1965) was only part of the answer. Most of the credit, he felt, was due to Ron's (largely conceptual) input. Put briefly, Ron had pointed out the obvious that the brain has something to do with pain. The facts that distraction and placebo can diminish pain, and that fear and anticipation can enhance it, were nothing new. But these psychological processes were normally assigned to higher levels of brain processing. Melzack and Wall, with a speculative flourish and only snippets of evidence, added the little box labeled

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“CENTRAL CONTROL” to the Gate Control sketch (Fig. 1). Their suggestion was that the brain might gate pain using the same spinal gating mechanism as afferent touch input. That little box gave the brain a concrete handle with which it could control the spinal machine. The engineering scheme of presynaptic gating was thus merged with the ephemeral mind by Pat Wall, the cool impassionate neurophysiologist famed for his wit and cutting repartee, and Ron Melzack, the warm and gushy psychologist with his heart right out there on the surface. If Pat was my intellectual father, then Ron is my intellectual uncle.

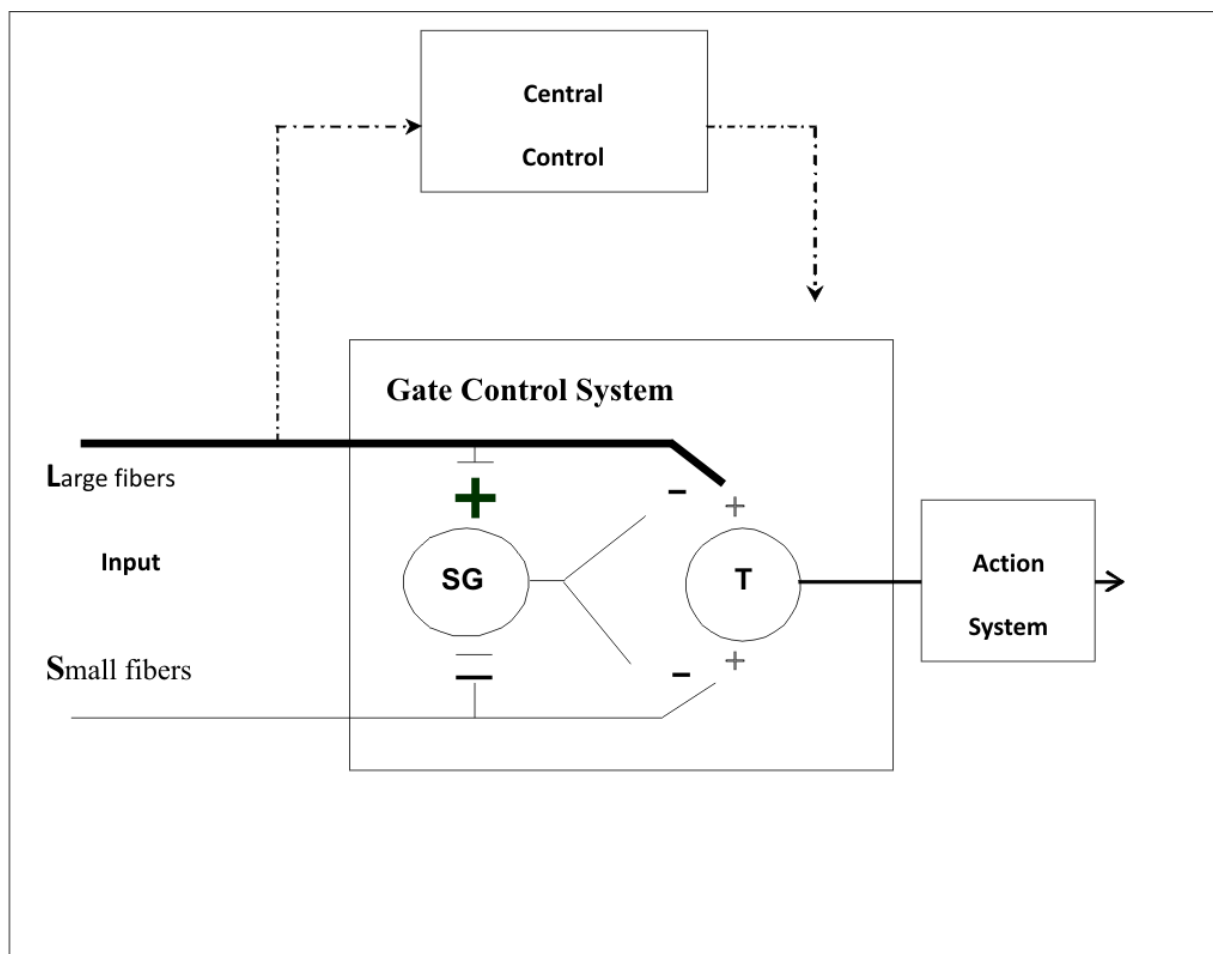


Fig.1: Summary sketch of the Gate Control theory of pain (Fig. 4 from Melzack and Wall, 1965).

S G: *substantia gelatinosa*

This special issue of *e-News for Somatosensory Rehabilitation* devoted to Ron Melzack presents another opportunity to ponder big scientific trends in the pain arena. In his foreword Ron has treated us to the benefit of his insight and experience by highlighting three trends that he feels will lead pain research into the future. The view in Ron's crystal ball is characteristically optimistic with focus, of course, on the brain. His predicts that: 1) brain

imaging in chronic pain patients might reveal the altered neural activity that constitutes pain experience, 2) the powerful tools that have helped unravel pain processes in nerves and the spinal cord might yield important insights when finally be applied in earnest to the brain (with a nod towards the ever mysterious reticular formation), and finally 3) that the study of pain genes might illuminate brain mechanisms of pain. As a tribute to Ron and his picks, I would like to deliver a quirky comment on the first of his three themes, some food for thought.

Brain imaging and the pain matrix

Pain is experienced by a conscious brain. It would be odd to argue that an isolated nerve or spinal cord can suffer pain. But where in the brain does neural activity transform into the raw feel of pain ? In the imaging community, as elsewhere, there has never been much doubt that the pathways leading to pain perception, like all other conscious experience, end in the cerebral cortex. In fact, functional imaging in humans shows excitations in an entire matrix of cortical areas following pain-provoking stimulation of the skin and internal organs. Some of these structures are classical components of the somatosensory system (e.g. S1 and S2) while others did not really come into prominence until functional imaging began (e.g. anterior cingulate cortex (ACC) and the posterior insula). Several subcortical areas are also activated, of course. As expected, noxious stimulation of different body areas and different organs reveals different, if overlapping, patterns of cortical activation, appropriate to the different "feels" evoked. Moreover, activation in some cortical areas tracks pain unpleasantness, not just stimulus intensity, when the two are dissociated by manipulations such as placebo and hypnotic suggestion. For most authors these observations, taken together, make an open-and-shut case for the cortex as pain analyzer. Closer consideration of this dogma, however, raises some perplexing questions (Devor 2008).

The most important is that direct electrical stimulation of the cortical convexity, including exposed areas of the pain matrix, almost never evokes a report of pain in awake patients (Penfield and Rasmussen, 1955; Libet 1973). Likewise for transcranial magnetic stimulation (TMS). This contrasts with stimulation of cortical areas associated with vision, hearing, smell and (non-painful) touch which readily arouses the corresponding percept. One could argue that the structure(s) relevant for pain sensation is buried in the mid-sagittal (ACC) or Sylvian sulci (insula) and hard to access by surface stimulation. A related explanation is that unlike the other senses, multiple cortical areas must be activated simultaneously to evoke a sensation of pain. However, in epileptic seizures cortical discharge is frequently widespread and

includes, indeed often favors, these buried limbic cortices. Nonetheless, whereas auras of smell, taste, tingling and light are common harbingers of epileptic seizures, very few patients (3-4%) report auras with a painful component (e.g. Nair et al., 2001; Young and Blume 1983). The one potential exception is a recent series of reports of pain evoked by stimulation and seizures in the posterior cingulate cortex (Mazzola et al. 2006; Isnard et al. 2011). Although this occurs in only a small fraction of patients and merits independent replication, it is an exciting observation.

A frequent retort concerning the failure of pain to be evoked by activation of the cortical pain matrix is that pain is particularly complex and multiply represented in the cerebrum. As such, unlike vision, hearing, smell and touch, to evoke pain would require precisely patterned stimulation, simultaneously, at numerous locations. This condition is not met by Penfield-type stimulation experiments, nor by natural seizures. However, if pain is not felt except in the presence of a precise and complex spatiotemporal fingerprint of activation, then it is necessarily fragile. Disruption of the patterning by lesions or TMS at any of dozens of loci in the network ought to eliminate the ability to feel pain, rendering individuals “blind” to both spontaneous pain and pain evoked by noxious stimuli. In fact, focal lesions in the pain matrix, and even massive cortical lesions, do not produce analgesia. On the contrary, strokes are frequently followed by chronic neuropathic post-stroke pain (Boivie et al. 1989). Patients with lesions in the right parietal cortex sometimes show sensory neglect, denying that a body part (arm, leg) belongs to them. However, noxious stimulation of the denied limb evokes normal wincing, autonomic responses and withdrawal. Pain is experienced and acknowledged, although it is missing a location in the body schema.

These observations demand that one at least consider the possibility that the neural computations that generate pain experience play out sub-cortically rather than in the cerebral cortex. Certainly focal electrical stimulation at many subcortical sites, from the spinal cord to the thalamus, is able to provoke pain sensation. Traditionally, pain evoked by subcortical stimulation is presumed to hurt because it activates cortical pain matrix areas. But could it be that the algorithm for pain experience, the neural activity that “is” pain, occurs in a cellular network that is not in the cortex? The observation of cortical activations is undeniable, but they may merely reflect the transmission of a subcortical message to cortical regions that need pain information to establish memories and plan action scenarios. For readers who are still with me, abandoning the dogma of cortex as the seat of pain has an additional challenging

consequence. Pain experience, like all experience, requires consciousness. We are trained to use the term “nociception” when referring to adaptive autonomic and behavioral responses to noxious stimuli when consciousness is absent or in question. But if activity in subcortical networks is sufficient to subserve (real) pain, then conscious experience *itself* must be sustainable by subcortical networks. Is the idea that consciousness may not be dependent on cortical function a dogma too rooted in tradition to be called into question?

Ron Melzack has made many contributions to Pain Science and Medicine. The little box labeled “CENTRAL CONTROL” in Figure 4 of his seminal 1965 paper with Pat Wall is only one of them. More than anything else, he has prodded those of us interested in the neural substrates of pain to go beyond nerves and the spinal cord, and think about the brain. In this regard interesting things can also be said about Ron's other two avenues to the future, 2) the reticular formation and 3) pain genes and the brain. But that will have to wait for another occasion.

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Artículo original
Gracias Dr. Ronald Melzack

Para Médicos



Para Pacientes



Para Neurocientistas



Para Terapeutas



Sandra B. FRIGERI, OT⁹

Cuando mi querido amigo Claude Spicher me propuso ser uno de los invitados al homenaje al Profesor Melzack se me estremeció el corazón y pensé cuan joven era aún en mi profesión para tener tan alto honor. Y no fue sino hasta después de muchos días que entendí la increíble oportunidad que me estaba dando, la oportunidad de ser tal vez una de las primeras personas de habla Hispana y de Sudamérica que podría contarle en forma directa y personal, como su trabajo pudo influenciar mi ejercicio profesional y mi manera de situarme ante lo que denominamos “Dolor”.

El haber nacido 6 años después de la 1era publicación de la “Teoría de la Puerta de Control del Dolor” y haber comenzado el ejercicio de mi profesión 28 años después de aquel evento, hizo que mi formación como Terapeuta Ocupacional estuviera enriquecida por sus hipótesis y que pudiera utilizarlas para los tratamientos de mis pacientes casi sin pensarlo. Pero esto no me impidió entender que para muchos, tanto esta teoría como el concepto de “neuromatrix”, significaron la caída de un paradigma.

Comenzar a pensar que el dolor es independiente de una noxa que lo origine y que el cerebro tiene tanto que ver en su génesis no ha resultado sencillo, ya que significa la caída del concepto de dolor que se desprende del modelo biomédico y que aún continúa vigente en el colectivo imaginario, donde persiste la convicción de que es un producto primario generado en tejidos lesionados. Pero las teorías de Melzack, nos han permitido no sólo comprender cómo las personas percibimos el dolor, sino también cómo podemos influir en él a través de la activación de circuitos neuronales. Nos han enseñado, en este caso a los rehabilitadores, a realizar tratamientos adecuados a cada paciente que contemplan determinadas características personales, tanto biológicas como psicológicas, así como factores sociales que influyen de manera importante en la percepción del dolor. Nos permiten pensar en un abordaje multimodal para poder influir en los diferentes mecanismos implicados.

En mi caso particular, también sus aportes me ayudaron a pensar y a enseñar a pensar en dimensiones y cualidades de dolor con múltiples calificativos. Este hecho ocurrió más tarde

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durante mi vida profesional, y fue fundamentalmente al familiarizarme con el Cuestionario de Dolor Mc Gill, que si bien con ciertas dificultades para la traducción en mi lengua nativa, ha resultado una herramienta primordial para intentar objetivizar lo subjetivo.

Estimado Profesor Ronald Melzack, como Terapeuta Ocupacional y Terapeuta de Mano desde Sudamérica, Argentina, es un honor para mí poder decirle GRACIAS por “abrir la puerta” a la comprensión del dolor como experiencia multidimensional, lo que me permite a diario entender y tratar lo que no parece real, lo que no siempre tiene una causa evidente y que solamente los pacientes saben y sienten.

Original article Tribute to Dr. Ronald Melzack

To MD    To neuroscientist    To patient    To therapist   

Tara L. PACKHAM, PhD Student, MSc, OT Reg (Ont)¹⁰

As an occupational therapist specializing in traumatic hand injuries, I see persons with pain on a daily basis in my practice. Early in my career, I utilized the elegant “gate theory” of pain from Drs Melzack and Wall to explain pain to my patients, to frame interventions and even to frame my own beliefs. However, I was challenged to think beyond that simple paradigm by the writings of Dr. Paul Brand. A renowned hand surgeon who spent much of his career in the leprosy colonies of India, Brand proposed that pain should be looked at as a gift. His exploration of the subject wove together diverse threads of anatomy, physiology, psychology, sociology and spirituality; and this re-awakened my awareness of the complex interplay of these factors in the rehabilitation and recovery processes of my patients.

Several years ago, I began to really take on a piece of the puzzle of pain, specifically delving into the challenge of complex regional pain syndrome (CRPS). I began to think about the taxonomy of pain, and how it reflects the words and labels used by clinicians and researchers, which in turn reflect differing theoretical underpinnings. This challenge drove me to graduate school, and also back to the wisdom of Dr. Melzack. I added to the patina of a well-worn copy of “The Puzzle of Pain” (1973) from the library, and found a crystallizing force for my jumbled thoughts as I thumbed through the pages. Reading that pain is “*a complex perceptual experience*” (p.45, The Puzzle of Pain) with a non-linear, multi-faceted, contextually dependent relationship between the stimulus and intensity brought validation to the diverse spectrum of patient experience I had witnessed in the clinic.

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My own research has come to focus on the assessment of the signs and symptoms of CRPS, for if we cannot accurately measure change, then we will not know if we are truly helping our patients to recover, or even be able to describe what recovery might look like. The guiding framework for this work has been that in order to meet the challenge of CRPS, we must reconcile both the objective and measurable aspects of the syndrome (such as allodynia, skin temperature asymmetry and hyperhidrosis) and the patient's lived experience of diverse and fluctuating symptoms (including burning pain, hypervigilance, body dysmorphia, mood changes and difficulty in participation in everyday activities). Recent advances in fMRI have created a unique opportunity to visualize the cortical changes associated with pain syndromes, building evidence for the theoretical linkages between the diverse properties of CRPS. But the challenge of putting theory to practice voiced by Melzack remains: "...If our theories do not lead eventually to effective treatment, they have failed.... The clinical problems of pain, in other words, represent the ultimate test of our knowledge." (p.73, *The Puzzle of Pain*).

Article original
Ronald Melzack : un bienfaiteur de l'humanité

Aux médecins 	Aux scientifiques en neurosciences 
Aux patients 	Aux thérapeutes 

Marc ZAFFRAN, MD (Martin Winckler)¹¹

Pour le médecin que je suis, Ronald Melzack est le savant qui a révolutionné mes conceptions et mon approche de la douleur. Pour avoir été formé en France dans les années 70 et avoir abordé le problème de la douleur au milieu des années 80 pendant ma collaboration à la revue *Prescrire* (nous avons été alors les premiers à détailler l'utilisation pratique de la morphine au stade terminal du cancer, et aucune revue française ne l'avait fait auparavant) je peux témoigner que cet élément fondamental de l'expérience humaine était (et reste) scandaleusement ignoré et sous-traité par le corps médical hexagonal. Dès mon passage à *Prescrire*, j'ai entendu parler de Melzack et quelques années plus tard, son *Handbook of pain assessment* est devenu un livre essentiel dans ma pratique.

J'ai lu sa conférence de 1989 sur les douleurs fantômes au milieu des années 90 et l'idée que la perception douloureuse d'un membre « fantôme » est une sensation physiologique qui reste produite par le cerveau même lorsque le membre a été amputé, m'a profondément frappé. La douleur n'a jamais été à mes yeux un simple symptôme. J'ai toujours pensé qu'il existait une relation étroite entre l'histoire sensible d'une personne et sa manière de ressentir la douleur –

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une relation physiologique, neurologique, biologique, pour laquelle les classiques « explications » psychanalytiques qui ont encore cours en France étaient notoirement insuffisantes. Cette relation, les travaux de Melzack nous permettent de la comprendre et de l'appréhender dans sa réalité scientifique. En cela, il est à mon sens rien moins qu'un bienfaiteur de l'humanité.

Le fait que Melzack travaille à McGill, la grande université anglophone de Montréal, est une des raisons qui m'ont fait m'intéresser aussi à la manière dont les Canadiens (et les Québécois en particulier) abordent les questions de santé – je ne trouvais pas le même intérêt en France. C'est pourquoi, aujourd'hui, je suis heureux de baigner moi aussi dans le bouillon de culture et de créativité qu'on trouve au Québec, et particulièrement à Montréal. La question de la douleur et la compréhension de ses mécanismes reste à mes yeux une question fondamentale, tout particulièrement quand on envisage l'éthique de la relation de soin – et la manière dont les patients parlent de leur corps sensible, ce dont je m'efforce de témoigner dans mes livres.

Original article
**Ronald Melzack – Einfluss seiner Arbeit auf meine
klinische Arbeit am Patienten und mit Studierenden in der
Physiotherapie**

To MD 🌟🌟🌟 To neuroscientist 🌟🌟🌟 To patient 🌟🌟🌟 To therapist 🌟🌟🌟

Angie ROEDER, PT¹²

Die Gate Control Theorie nach Melzack & Wall (GCT-1) war der mutige Meilenstein in der Welt der Schmerzforschung, des Schmerzverständnisses und mit einiger Verzögerung auch in der Schmerztherapie – dies bereits 1965.

Aber auch die Ergebnisse seiner Arbeit 1996 zur Neuromatrix Theorie waren neben vielen anderen Ansätzen und Erkenntnissen wegweisend und für das heutige Verständnis ein unabdingbarer Beitrag rund um das Phänomen Schmerz.

In meiner täglichen Arbeit am Schmerzpatienten der letzten 10 Jahre begleiteten mich diese Vorstellungen bzw. Modelle direkt im Patientenkontakt. Wenn auch dieses Model wie auch Theorie stetig erweitert wurde und weiterhin erweitert werden muss, so half es mir am Patienten und in der Lehre auf unterschiedliche Weise.

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Am Patienten bot sie eine Möglichkeit sie von ihren oftmals rein biomedizinischen Vorstellungen zu einem bio-psycho-sozialen Schmerzverständnis zu führen – was eine grundlegende Einsicht auf dem Weg zu einer erfolgreichen Therapie darstellt. Hierzu wurden ihnen die Modulations- und Transmissionszugänge der GCT in einfachen Modellen narrativ vermittelt. Aber auch und im Wesentlichen die Bedeutung psycho-sozialer Phänomene als Beeinflussungsfaktor der Schmerzwahrnehmung. Dies nicht nur in Hinsicht auf die Verstärkung der Schmerzproblematik sondern auch als wertvoller Nutzen in der Aktivierung von Ressourcen gegen den Schmerz und/oder -verstärkung. Eine wichtige und starke Unterstützung in der Therapie schmerzbedingter Einschränkung bzw. reduzierter Partizipation, welche sich viele Patienten grösstenteils hilflos gegenüber stehen sehen.

Somit hat die GCT seit langem Einzug in die physiotherapeutischen Arbeit gehalten, die insbesondere bei chronischen Schmerzpatienten betont neben Wahrnehmung und Aktivierung auch die Edukation über neuro-biologische und psycho-soziale Erkenntnisse einsetzt. Es gibt mittlerweile einschlägige Literatur, welche die GCT aber auch die Erkenntnisse der Neuromatrix u.a. darstellt und dies auch für den Patienten in deren Sprache vorstellt und nutzbar einsetzen lässt. Ich habe hier viele „Aha-Effekte“ mit Patienten erfahren, die nach dem Verstehen der Hintergründe sich nun vollends auf eine selbstverantwortliche Zuwendung des eigenen Schmerzphänomens in der Therapie ausgerichtet haben. Sie sind hierdurch selbst zum Schmerzmanager geworden. „Ich will lernen, das selbst („den Schmerz“) zu lenken – zu kontrollieren, nicht der Schmerz mich“ ist ein Originalzitat eines Patienten. „Ich weiss nun, dass ich am Steuer bin“. Das sind sicherlich Sternstunden, doch eindeutige und wertvolle Erfahrungen in der Arbeit am Patienten.

Ähnliches gilt auch für Physiotherapiestudenten. Sie hatten oftmals bereits Kontakt mit Schmerzpatienten vor den Unterrichtseinheiten zum Thema Schmerzmanagement. Oftmals hörte ich Frust und Resignation heraus – aufbauend auf der Erfahrung wenig mit den Patienten erreicht zu haben. Auch hier ist es bereits in der Ausbildung essentiell, ein Verständnis für das Phänomen Schmerz detailliert zu vermitteln – im Theoretischen wie im Praktischen. Die GCT wie auch die Neuromatrix-Ansätze dienten mir hier für das Verständnis und die eigene therapeutische Hinwendung der Studenten zu dieser speziellen Klientel.

Wir können nicht vom Patienten ein so komplexes Verständnis abverlangen, ohne uns zunächst bestmöglich mit dem Thema und seinen vielseitigen Hintergründen als multidimensionalem Phänomen auseinander gesetzt zu haben.

Mein grosser Dank gilt Ronald Melzack für seine jahrzehntelange Arbeit, welche die Schmerzwissenschaft und gleichermassen die klinischen Arbeit am Patienten im Wesentlichen so vielfältig bereichert und voran gebracht hat.

Article original Hommage à Ronald Melzack

Aux médecins



Aux scientifiques en neurosciences



Aux patients



Aux thérapeutes



Pascale SPICHER, PhD¹³

Monsieur Ronald Melzack m'a envoyé une porte à la figure un soir mémorable entre tous : le 31 décembre 1999. Les quelques heures qui me restaient à tuer avant de changer de millénaire, je les passais à avancer mon travail en vue de ma thèse de doctorat en psychologie. Les enfants dormaient, mon époux lisait et moi, je suis tombée sous le choc. Je pense que je ne me suis toujours pas relevée. J'ai commencé par lire l'article qui m'intéressait le plus, celui qui traitait de la trace que laissent les toutes premières douleurs chez l'enfant. C'était tout de même le sujet de ma thèse (Melzack & Scott, 1957) et j'ai tout de suite aimé.

Néanmoins, comme je tentais de trouver des arguments à la théorie du pattern ou à celle de la spécificité, en me plongeant dans un article des désormais célèbres compères que sont Ronald Melzack et Patrick Wall, j'ai compris que le point le plus discutable de la théorie de von Frey est le postulat psychologique qu'il en a tiré : « Tout aspect psychologique de l'expérience somesthésique entretient une relation exclusive avec une seule caractéristique du stimulus et avec un type donné de récepteur de la peau. » (Melzack & Wall, 1962, p. 331).

Convaincus que la théorie de la spécificité avait tout de même encore un rôle à jouer, mais qu'il fallait l'adapter aux connaissances psychologiques, Melzack et Wall ont proposé un raisonnement reposant sur une mosaïque spécifique de récepteurs de la douleur.

Et c'est ce même soir du 31 décembre 1999 que la porte s'est grande ouverte pour moi.

Inspirée des travaux de Head (1905), la théorie du portillon explique la perception nociceptive dans une région du corps privée de son innervation par un état d'excitation anormale des neurones de la corne postérieure de la moelle épinière. Moi, petite chercheuse helvétique, devant sa cheminée, je découvrais qu'elle a été élaborée en 1965, l'année où je suis née. Faisant suite aux partisans de la spécificité, Melzack et Wall ont élaboré leur théorie notamment grâce aux apports de la neurophysiologie. Ils étaient d'avis qu'une fibre nerveuse ne pouvait à elle seule conduire toute une information depuis la perception, c'est-à-dire au niveau de la peau, jusqu'à l'élaboration de l'information, au niveau du cerveau. Le principe

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général de la théorie de la porte réside dans le fait qu'au niveau de la corne postérieure de la moelle épinière, à l'intérieur de la substance gélatineuse de Rolando, se trouvent des cellules inhibitrices qui agissent sur la conduction de la douleur. Le schéma désormais connu de toutes les lectrices et de tous les lecteurs de cet *e-news* qui est illustré dans la **figure 1** montre que la douleur est conduite par des fibres de petits calibres et que les fibres de gros calibres transportent des afférences non algogènes tendant à limiter les effets de la stimulation des fibres fines. La substance inhibitrice se trouve au niveau du cerveau et elle agit sur les fibres de gros comme de petits calibres.

Ce fameux neurone à convergence a la capacité de transmettre la douleur jusqu'aux centres cérébraux. Il est soumis continuellement à des influences dites positives (les influx douloureux), mais également à des influences inhibitrices (les contrôles locaux et les contrôles provenant du cerveau). C'est la fameuse balance, la résultante des actions contraires, qui fera que la porte sera ouverte (l'influx douloureux montera vers le cerveau), ou fermée (l'information douloureuse sera bloquée).

Outre son aspect totalement révolutionnaire, la théorie du portillon a eu l'avantage de nous mettre tous d'accord sur le fait que non seulement la conduction nociceptive entre en ligne de compte, mais que dès cet instant, le contrôle central au niveau du cerveau et du thalamus nous permet d'agir sur la douleur. Il ne fut pas étonnant de constater que ce qui s'appelait alors une véritable révolution scientifique ait mobilisé les forces des chercheurs durant les années qui ont suivi la publication de cette théorie. J'insiste à mon tour sur ce point, la théorie du portillon est une véritable découverte scientifique. Elle a l'apanage de résoudre le 90% des conceptions douloureuses et la recherche en pharmacologie continue de s'appuyer sur elle. La collectivité scientifique tient donc énormément à remercier les auteurs de cette théorie et je profite de l'opportunité qui m'est donnée ici pour me joindre à elle. Monsieur Melzack, grâce à vous, je suis entrée un peu moins ignorante dans le 3^{ème} millénaire grâce à une porte dans la figure.

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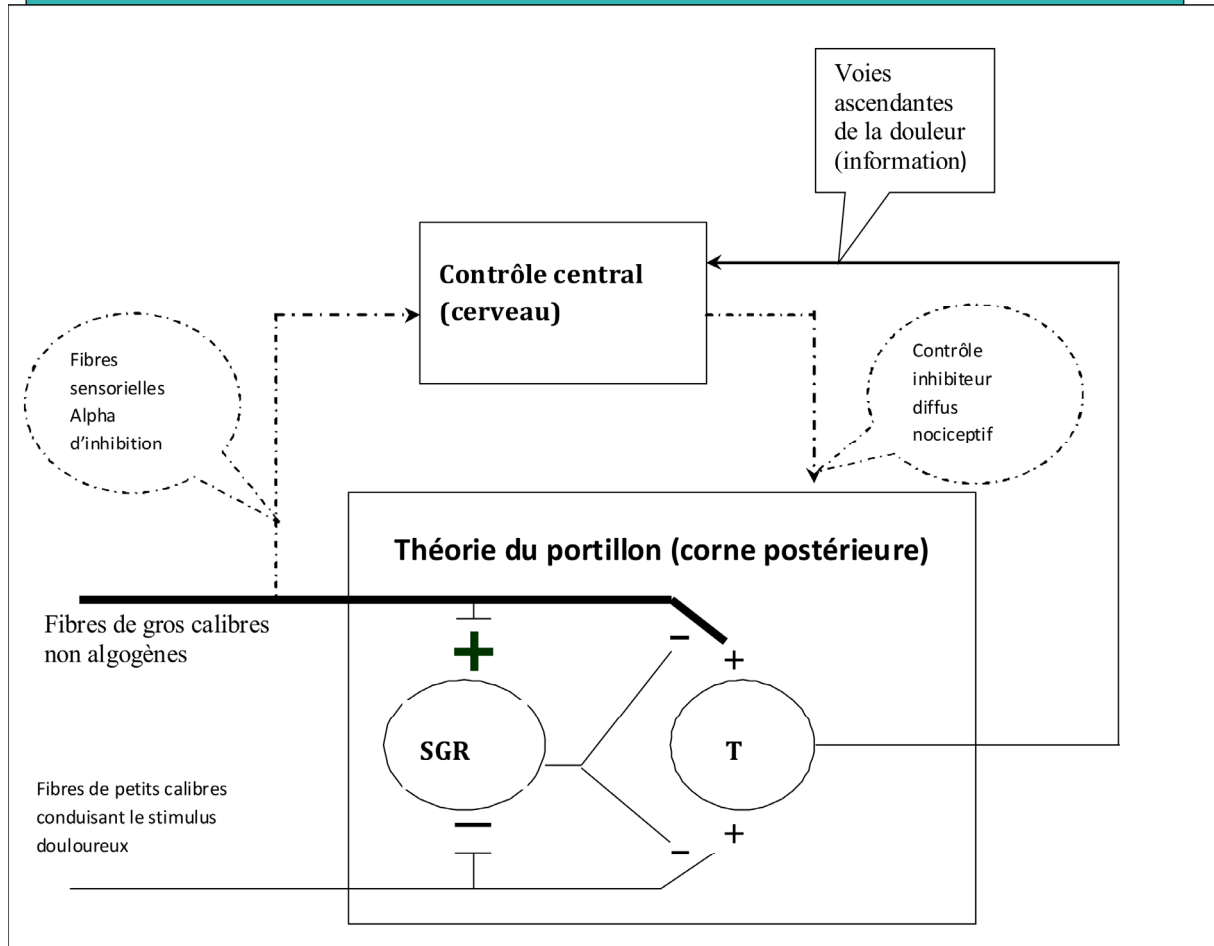
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FIGURE 1. - Théorie du portillon selon R. Melzack et P. D. Wall, 1965



SGR = Substance Gélatineuse de Rolando
 T = Premières cellules de Transmission

L'effet inhibiteur de SGR sur les terminaisons afférentes est augmenté par l'activité de fibres de gros calibres, et diminué par celles de petits calibres. Le déclencheur du contrôle central intervient au même moment. C'est alors que les mécanismes induits par les fibres de gros calibres renvoient des projections au système du portillon. Simultanément, les cellules T envoient des informations au système d'action. Le signe + représentant l'excitation ; le signe -, l'inhibition.

Original article
Tribute to Dr. Ronald Melzack

To MD    To neuroscientist    To patient    To therapist   

Roberto S.G.M. PEREZ, PT, PhD¹⁴

Ronald Melzack has to be considered a true pioneer of pain research. He is an inspiration to many pain scientists, including myself. At a time when pain was considered a relatively simple and rigid event, prof. Melzack recognised the individuality of the pain experience and the discrepancy between actual physical damage and pain experience: some individuals feel immense pain in cases where damage to the body appears to be minimal, while others with severe traumatic injuries report little or no pain until a later time. By establishing that pain is modulated on different levels within the patients as well as influenced by the environment, prof. Melzack not only gave pain its complexity, but also gave it a context.

With his work prof. Melzack laid the foundations for a change of perspective about pain, from a crude warning system to a plastic, dynamical individual mechanism encompassing many biological subsystems leading to the complex emergent property called pain as is it viewed today. Recognition of the different modalities of pain perception, i.e. sensory-discriminative, affective-motivational, and cognitive-evaluative, made it possible to study this phenomenon not only from a sense of intensity, location, and quality of pain, but also from a cognitive and cultural perspective.

Instrumental to this evolution is the development of the gate control theory, developed in concert with prof. Wall. These researchers hypothesized that both thin pain related nerves as well as large diameter (touch, pressure) related nerve fibres provide information from the injured area to the the dorsal horn. Neurons in the dorsal horn transmit the pain signal up to the brain, and inhibitory interneurons inhibit transmission cell firing. Signals from both thin and large diameter fibres excite transmission cells. Whereas thin nerve fibre activity promotes transmission cell firing by inhibiting interneuronal activity, large diameter fibres excite these inhibitory cells, therewith reducing inhibitory cell activity. Therefore, reduction of pain can be achieved by increased stimulation of touch, pressure and vibration compared to thin fibre activity.

Not only did this concept lead to complex therapies for pain modulation, but their theory also provided an explanation for common daily pain experiences, such as reduction of pain due to stroking or rubbing a painful area, and the analgesic effect of a parents' consoling words when a child has hurt its knee.

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Melzack and Wall made it possible to study pain from many different perspectives (social, psychological, pathophysiological, epidemiological). Together with the emergence of pain's complexity came the emergence of pain medicine as a multidimensional, multidisciplinary approach that it is today.

All of this was achieved by listening to the patient in the first place, and letting them describe pain in their own words. The McGill pain questionnaire derived from the expressions of pain patients, is still used in many chronic pain research projects, and has been used as basis for validation of many other pain related questionnaires.

As a clinical scientist I am indebted to prof. Melzack and his co-workers. The story of prof. Melzack tells us that we can learn a lot by carefully looking and listening to our patients. His current work on the pain matrix shows us that there still is much to be learned. Individualized mechanistic profiling of a patient's pain pathology will become the next challenge. Most probably we would not have arrived at this point if it hadn't been for the work of this champion of pain research.

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Article original**Quels sont les apports des travaux de Melzack dans ma pratique quotidienne ?**To MD    To neuroscientist    To patient    To therapist   **Vincent SORIOT, MD¹⁵**

J'ai découvert en 1998 la théorie de la porte (*gate control*), lors de mon premier diplôme post doctorat en médecine. Sensibilisé à la prise en charge de la douleur des personnes âgées voir très âgées avec des troubles de la communication du service de médecine où j'exerçais en tant qu'assistant, nous avons découvert cette année là une échelle permettant d'évaluer cette douleur (Echelle « Dolopus » qui sera validée en 1999). Cette découverte ouvrait de nouvelles portes : maintenant que l'on savait dire que ces personnes souffraient comment les prendre en charge? Une amie gériatre m'a présenté le « Diplôme Universitaire de prise en charge de la douleur des personnels de santé » et je me suis de nouveau retrouvé sur les bancs de la faculté de médecine d'Amiens.

Alors que nous abordions l'enseignement anatomique sur les voies lemniscales et extralemniscales, j'ai découvert la théorie du *gate control* de Wall et Melzack. Trente deux ans après ces grands hommes, je découvrais enfin une explication à mon quotidien personnel et professionnel de la contre stimulation tactile à visée analgésique ! Pourquoi certaines infirmières expérimentées appliquaient un doux frottement cutané pour soulager une injection intramusculaire. J'avais appris des méthodes médicales sans que l'on m'en explique les mécanismes ! Quel plaisir désormais de s'ouvrir à un champ d'application au quotidien.

Par la suite, j'ai découvert la technique d'analgésie non médicamenteuse qu'est la neurostimulation transcutanée (NSTC – SENT - TENS). Cette technique de stimulation électrique cutanée en regard du trajet d'un nerf sensitif, permet de contre stimuler les voies de la douleur. Elle est l'application clinique de la théorie du *gate control*. Depuis la Neurostimulation transcutanée est devenu un pilier de ma thérapeutique, la plus souvent plurimodale.

Au sein de la consultation de douleur chronique dont je suis responsable, nous prenons en charge environ 700 nouveaux patients par an, 50% d'entre présentant des douleurs pour lesquelles, l'utilisation de la NSTC est recommandée. L'infirmière de la consultation éduque environ 350 patients par an à l'utilisation de cet appareil. A l'issu d'un programme d'éducation thérapeutique patient, ils seront autonomes pour l'utilisation de la NSTC.

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Original article
My first introduction to Dr Ronald Melzack

To MD    To neuroscientist    To patient    To therapist   

Prof (Col) Theo L.B. LE ROUX, MD¹⁶

I was privileged to work as a Senior Registrar at 1 Military Hospital, Pretoria, South Africa doing part of my residency. During this time we were involved in the War in Southern Angola and at this stage the war was at its peak. We saw many injuries, either from training or from war situations and a lot of these young soldiers presented with nerve injuries and many of them had causalgia, due to these injuries.

At this hospital I was very privileged to meet Dr Wienand, who later became my mentor and he introduced me to the Gate Theory of Melzack. He was in charge of the Upper limbs and Rehabilitation Units at 1 Military Hospital and it was his duty to deal with these injuries. Like I said, he introduced me to the Gate Theory and then told me that there is a nice book in the library, which was written by Sir Sydney Sunderland on Nerves and Nerve Injuries. I read the part about Melzack's The Gate Theory and then the whole picture became clear to me. I read about the large and the small fibres and the gate in the substantia gelatinosa and suddenly I could understand how this works. At this stage the Military Hospital, had a wonderful Rehabilitation Unit for the Upper limb injuries and we did see a lot of these patients, as I mentioned before, but because we used this theory, we stimulated the large fibres and at the end of the day we could get fairly good success in treating these patients with this terrible pain syndromes.

Even today, after 20 years, we still use this stimulation patterns and with the help of the newer medication, we can still help these patients and we can make them better.

Luckily we do not see many of these injuries as before, because there is no war anymore and the numbers of patients has decreased.

In summary, I was very privileged to work in 1 Military Hospital and then later decided to join this hospital, the Rehabilitation Unit and the treatment of upper limb and nerve injuries. I was also privileged to be introduced to Melzack and his Gate Theory, by my mentor, Dr Wienand. We are still applying this today in the treatment of our patients. Thank you

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Original article**The beginning of pain – a personal tribute to Ronald Melzack**To MD    To neuroscientist    To patient    To therapist   **Maria FITZGERALD, BA, PhD, FMed Sci¹⁷**

When does an infant begin to feel pain? How does the developing brain distinguish noxious from non-noxious inputs? Is pain perception influenced by sensory experience in early life? These questions have driven my research over the years and have led me to explore the synaptic development and plasticity of pain and to introduce neurophysiological studies of pain processing in human infants.

Ron Melzack's ideas and research have strongly shaped my approach to these problems. As a young scientist, trained in Pat Wall's laboratory, I understood the importance of the gate theory and its experimental basis and was convinced that the answers to my questions lay in the maturation of central circuits rather than in peripheral nociceptive inputs. Melzack's emphasis on the brain as 'an active system that filters, selects and modulates inputs' and the dorsal horn as a site of 'dynamic inhibition, excitation and modulation'¹ directed my research. Over the years, we and others have built up a picture of pain development in infants and children that focusses on CNS modulation and the postnatal maturation of local and descending pain control²⁻⁴.

Melzack's neuromatrix theory of pain also had a developmental perspective that is often overlooked. He proposed that the neuronal connections underlying pain are initially laid down by genetic instructions and later sculpted by sensory inputs^{1,5}. Recently we have described the changing patterns of neuronal activity that underlie the onset of pain and touch discrimination in the preterm infant brain. We have shown a transition in brain response to tactile and noxious stimulation from non-specific, evenly dispersed neuronal bursts to modality-specific tactile and nociceptive evoked potentials. Thus the 'neuromatrix', specific neural circuits necessary for discrimination between touch and nociception, emerges at 35-37 weeks gestation out of an earlier more diffuse activation in the infant human brain⁶.

But what is the role of sensory experience in this process? In 1957, Melzack observed that sensory deprivation in young dogs altered their reactivity to pain and suggested that past experience is required for the selection of patterns of neural activity that subserve normal perception^{7,8}. Without this control over sensory information at successive synaptic levels of the nervous system, stimuli are not filtered and have no 'meaning'⁸. This concept of

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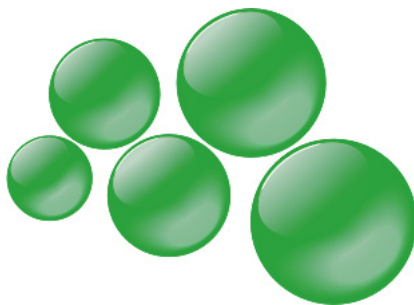
experience or activity dependent maturation of pain modulatory circuits at critical stages of development is fully supported by our own research^{2,9,10} and has raised important questions about the influence of early life experience upon adult pain¹⁰.

Finally – on a personal note, I will always be grateful for Melzack's wonderful Bonica lecture 'The Myth of Painless Childbirth'¹¹. This paper breathed scientific sense into the tyranny of 'natural, pain-free childbirth' that pervaded the 1980s. Melzack's call for honest presentation of information, pain preparation and skilled epidural analgesia was invaluable to me during the delivery of my first child, Tom, in 1984.

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Original article
Tribute to Dr. Ronald Ronald Melzack:
Briljante geest en ingenieur-architect
van de moderne multimodale pijnbestrijding.

To MD    To neuroscientist    To patient    To therapist   

Bart MORLION, MD, PhD¹⁸

Elke maatschappelijke stroming, elke wetenschap elke kunst kent zijn “grote geesten – great minds. Voor de moderne pijnbestrijding behoort de Canadese psycholoog Ronald Melzack zonder enige twijfel tot deze “grote geesten”.

Hij wordt vaak in één adem met Patrick Wall vermeld, wat begrijpelijk is gezien hun gemeenschappelijke publicatie van de baanbrekende “Poorttheorie”. De integratie van de toenmalige wetenschappelijke gegevens en observaties in hun “Nieuwe theorie rond pijn” heeft zowel het wetenschappelijk onderzoek als ook de pijnbestrijding een totaal nieuw elan gegeven. Maar Ronald Melzack betekent voor mij persoonlijk veel meer dan enkel de poorttheorie.

Sinds vele jaren doceer ik pijnbestrijding aan studenten geneeskunde aan de Katholieke Universiteit Leuven. Ik besteed inderdaad in mijn colleges ook altijd aandacht aan de “Poorttheorie”. Ondanks de vele aanpassingen en verfijningen van deze pijnconcepten die in de laatste decaden gepubliceerd werden blijft het een mijlpaal. Er bestaat geen betere methode om het concept “pijnmodulatie” bij studenten te introduceren. De belangrijke rol van verstoorde descenderende inhibitie vanuit de hersenstam in chronische pijn is actueler dan ooit. Tegelijkertijd onderwijs ik echter ook de recentere theorieën van Ronald Melzack. Het concept van de “Neuromatrix” uit de jaren negentig is briljant om de enorme inter-individuele verschillen in pijnperceptie en de complexiteit van pijn te illustreren. De context van pijn bepaalt in grote mate de pijnperceptie met een uiterst individuele “Neuro-signature” tot gevolg. Vele neuronale netwerken en interacties werden pas tijdens de laatste 10 jaren aangetoond middels gesofisticeerde functionele beeldvorming. Melzack postuleerde het bestaan hiervan al 40 jaar geleden.

Ook in de dagelijkse klinische patiëntenzorg voor patiënten speelt het werk van Melzack tot op vandaag een belangrijke rol. Zijn concepten komen expliciet aan bod in onze psycho-educatieve sessies voor pijnpatiënten en familieleden. Impliciet passen we de concepten toe in onze multidisciplinaire pijnprogramma's en individuele patiëntencontacten. De

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pijnvragenlijsten die hij in de jaren zeventig ontwikkelde zijn nog altijd actueel. Velen gebruiken dagdagelijks de McGill Pain Questionnaire, niet wetende dat hierachter Ronald Melzack schuilt.

Ik had het genoeg tijdens de laatste 15 jaren talrijke boeiende lezingen te kunnen volgen van deze grote man. Zijn werk heeft in belangrijke mate het uitzicht van het "pijnlandschap anno 2011" bepaald en zal het nog lang in de toekomst beïnvloeden. Laat ons "onze grote geesten" dankbaar zijn en koesteren.

Original article

The beginning of pain – a personal tribute to Ronald Melzack

To MD    To neuroscientist    To patient    To therapist   

Sibele de ANDRADE MELO Knaut, PT, MSc, PhD

As a clinician physiotherapist, the contributions of Dr Ronald Melzack's research are part of my routine. The gate control of pain theory, described by Dr Melzack and Patrick Wall in 1965, is remembered every day when I have to choose the most appropriate therapeutic approach to manage patient's pain. As we know, the gate control of pain theory is the base to determine the therapeutic parameters of *Transcutaneous Electrical Nerve Stimulation* or other low bass frequency electrical stimulation. In this theory, it is postulated that neural gates in the spinal cord can be opened or closed by signals descending from the brain, but also, by sensory information ascending from the periphery. In other words, the stimulation of the large A-alpha and A-beta fibers (touch, pressure, and vibration) decreases or stops the course of the stimulus of small A-delta and C fibers.

Equally, since evaluation of the patient is necessary to plan the rehabilitation program, as well as monitoring patient changes (improving or getting worse) is essential to measure the efficacy of our work, the McGill Pain Questionnaire is another important contribution of Dr Melzack in my daily practice. With this multidimensional questionnaire, the pain measurement becomes more effective, since it involves sensory-perceptual affective-motivational and cognitive aspects, which interact and contribute to the ultimate painful response, and not only to the degree of pain intensity.

Certainly, Dr Melzack has greatly contributed to my professional practice, and it is true for many of my colleagues; however, for sure, the major beneficiaries of his research are the patients themselves.

Professor na Faculdade Inspirar Pas, Coordenadora da pós graduação em reabilitação neurofuncional, Curitiba, Brazil, sibelemelo@gmail.com;

Original article
Tribute to Ronald Melzack

To MD    To neuroscientist    To patient    To therapist   

Lynne PRINGLE, OT, BA Psych¹⁹

I have incorporated, and quote hereunder, some of Dr Ronald Melzack's work in my practice. Even though pain is a factor for most patients, I want to talk specifically of my amputation patients.

Pain is indeed a subjective and multidimensional experience. As regards to phantom pain, specifically his neuromatrix theory of pain applies, in that we are born with a genetically determined neural network that generates the perception of the body, the sense of self, and can also generate chronic pain, even when no limbs are present.

I regularly deal with traumatic amputations, forearm level as well, however more specifically digits. I now use massage for every patient (as soon as sutures are removed). Increase of blood flow to the stump and surrounding tissues is evident, and this then enhances somatosensory input, is relaxing, acting as a distraction as well.

The trauma and resultant psychological stress does impact on their pain experience. We see that these patients often react more strongly in their affective output patterns of their pain perception.

During therapy we need to be aware that insufficient or exaggerated coping strategies are simply part of the patient's action programs as output patterns of their self-body neuromatrix. These output patterns produce the multiple dimensions of their pain experience as well as concurrent homeostatic and behavioural responses. For inexperienced therapists this assists them not to readily label the patient as noncompliant.

Of the 4 output action programmes, as a therapist, I am able to influence 3: voluntary action patterns, social communication, and coping strategies. This is achieved through patient education, more specifically regarding the healing process and precautions, listening to them, providing appropriate and excellent hand therapy, professional empathy, splinting to protect, prevent or enhance ROM, muscle strengthening and suppleness, independence in ADL, firm guiding and emotional support when required. From my experience, the undesirable involuntary action patterns often decrease concurrently.

¹⁹ Hand therapist, Cape Town, South Africa, lpringle@iafrica.com

Manual Edema Mobilization for the full upper limb works wonders as a distraction as well, and follows the gate control theory. Most patients experience phasic input issues such as expectations, anxiety, some depression, some denial, some won't even look at the stump, memories of pain, anticipation of pain.

The wound of the stump may be healed, and, even though different patients react differently to input triggers, the phantom limb or digit is still real to the patient and may still generate chronic pain for a considerable time, which affects function. Exercise patience, and remember not to discharge them too soon!



Susan W. STRALKA, PT, DPT, MS²⁰

As a physical therapist, educator, and researcher the puzzle of pain is less of an enigma thanks to the pioneering work of Melzack. Starting with the gate control theory, and progressing to his neuromatrix theory in treating pain, we now understand that pain does not occur in a single pathway but has multiple triggers which must be addressed to obtain pain control. His identification of the stress response impacting multiple systems (including the suppression of the immune response and the inflammation relationship) has reinforced the emphasis on dysregulation of the cortisol system.

Since pain is multifactorial, an interdisciplinary plan is invaluable in treating pain. In reflecting Melzack's work, there must be a major change in how clinicians address not only tissue damage in the body, but also the changes that pain cause in the brain. Therapists must now address the cognitive behavioral aspects and the neuromatrix mechanisms that underpin for chronic pain.

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Artículo original
Fundación de la Sociedad Española del Dolor con la presencia de Ronald Melzack

Para Médicos		Para Pacientes	
Para Neurocientistas		Para Terapeutas	

Rafael GÁLVEZ, MD²¹

Era el año 1990 y un grupo de profesionales españoles, entre los cuales tuve el privilegio de encontrarme, se reunieron en Madrid en el hotel Eurobulding, para fundar la Sociedad Española del Dolor, capítulo español de la IASP.

De allí salió constituida por votación la primera Junta Directiva de la que sería la futura Sociedad Española del Dolor. Como Presidente estaba el Dr Jose Luis Madrid, como Secretario Tesorero el Dr Enrique Reig y como vocales la Dra Margarita Puig, el Dr Jose Antonio de Vera, el Dr Luis Aliaga, el Dr José Vicente Barberá y yo Rafael Gálvez.

Aquella fecha tuvo un doble atractivo para todos los que asistimos y por supuesto para mí, uno relacionado con la fundación de la Sociedad Española del Dolor (SED) y otro ligado a la presencia en esa reunión de una eminente persona, miembro fundador y presidente pasado de la IASP (1984-1987), llamado Ronald Melzack.

El Dr Melzack estuvo ese día 20 de junio de 1990 en dicha reunión, dándole aval científico y reconocimiento fundacional a través de la propia IASP. Para nosotros fue un privilegio el tener presente y compartir ese día con una eminencia científica, humana y profesional, del calibre del Dr Ronald Melzack. En ese momento su participación representó para la mayoría de nosotros, no solo el aval de la IASP, sino también y por encima de todo, el poder conocer a la persona relacionada con el descubrimiento de la “Teoría de la puerta de entrada”, uno de los grandes pilares en todos los tiempos, de la medicina del dolor, que daba respuesta y servía como razonamiento para algunos de los tratamientos empleados en la terapia del dolor. Igualmente era el padre de uno de los cuestionarios de dolor más relevantes, como era el McGill Pain Questionnaire y que íbamos a utilizar en tantas ocasiones.

Ahora cuando vemos la foto fundacional de la SED, de aquel día del año 90, echamos en falta a varias personas, pero por encima de todos, al Dr Melzack que tuvo que marcharse al aeropuerto rápidamente para no perder su vuelo. Sin embargo, siempre quedará en mi mente y en la de los afortunados que vivimos aquel día, el recuerdo imborrable del Dr Melzack.

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Original article

We are proud to have such an extraordinary role model

To MD 🌟🌟🌟 To neuroscientist 🌟🌟🌟 To patient 🌟🌟🌟 To therapist 🌟🌟🌟

Huda ABU-SAAD HUIJER, RN, PhD, FEANS, FAAN²²

The Gate Control Theory and the McGill Pain Questionnaire developed by Dr. Melzack have guided the work of many clinicians and researchers in the field of pain and I am one of them. We are all indebted to his vision, wisdom, unprecedented work in the field, and most importantly to his milestone contributions which have helped develop the field of pain to where it is now.

In my capacity as current President of the Lebanese Society for the Study of Pain and on behalf of my colleagues in Lebanon, we take this opportunity to extend our best wishes and warmest thanks to Dr. Melzack for his enormous contributions to the field of pain.

We are proud to have such an extraordinary role model.

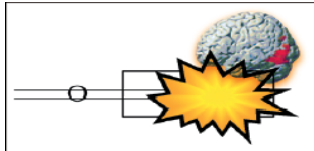
Ronald MELZACK's

Special Issue

E N D

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