PAIN: THE RED FLAGS, THE YELLOW FLAGS, GAIT ABNORMALITIES AND THE WAY OUT OF SUFFERING

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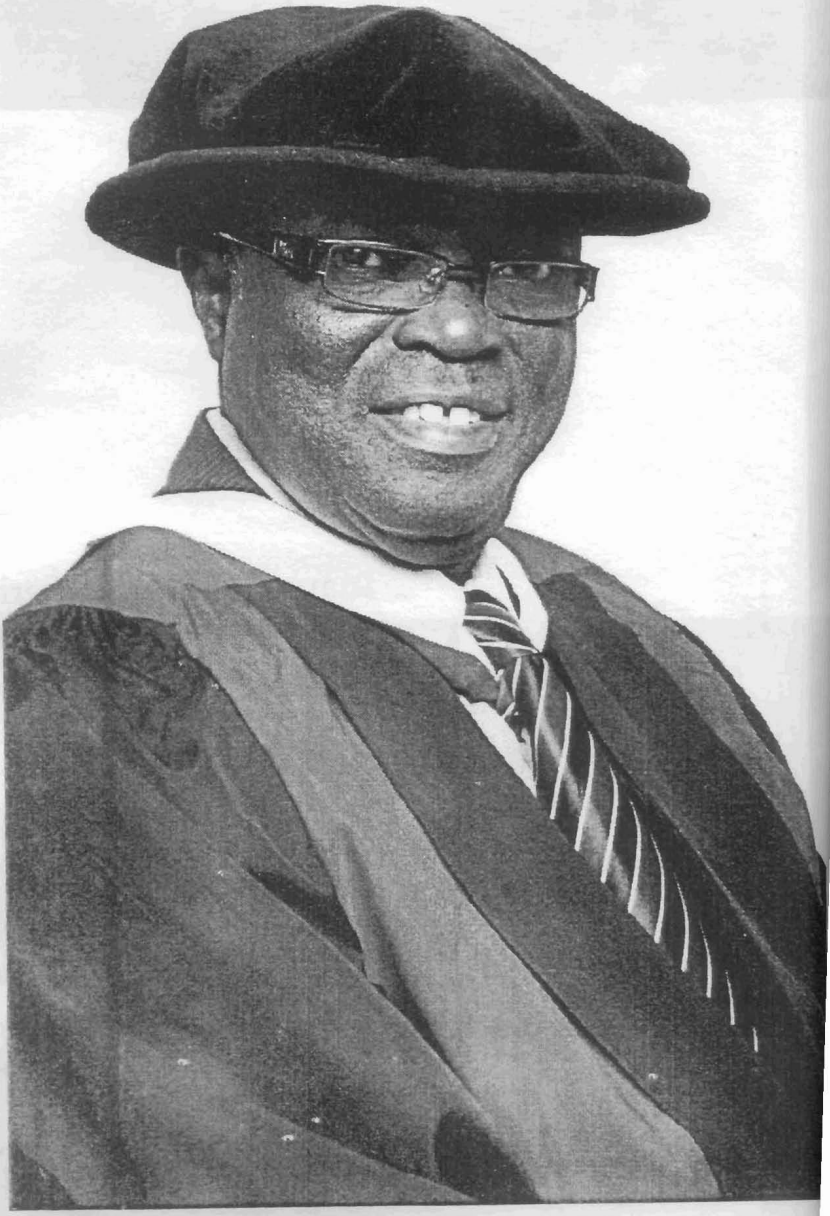

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Mr Vice-Chancellor Sir, distinguished colleagues, distinguished ladies and gentlemen, first of all I want to thank God for this privilege of delivering the 242nd inaugural lecture of this great university and the 2nd in its Department of Medical Rehabilitation. In Nigeria, it is the 4th inaugural lecture by a professor of physiotherapy after those of Emeritus Professor VCB Nwuga of this university, Professors IO Owoeye of the University of Lagos and Arinola Sanya of the University of Ibadan. I welcome you all to the lecture on a topic that concerns every living being, and most especially man. It is a topic that focuses on an apparently unfriendly word "pain", yet it is most essential for our survival and without it some of us could not have been alive today.

The first mention of **pain** in the Holy Bible is a reward of disobedience of Mother Eve ..." ***in pain you shall bring forth children....*" *Genesis 3:16***. Based on this fact an anonymous author has suggested that women see pain as part of life, as a natural heritage and that women's satisfaction is not enhanced if obstetric pain is abolished altogether; men on the other hand see **pain** as a nuisance, they endure it as an undeserved punishment (Tribune-Monday, 22nd, July, 2002).

I. WHAT IS PAIN?

Pain can be explained in the following domains:

- Acutely **unpleasant** physical discomfort **experienced** by somebody who is violently struck, injured, or ill.
- **Sensation** of **discomfort** in a particular part of the body
- Severe **emotional** or **mental** distress

- Somebody or some thing that is extremely **annoying**, or causes many problems.
- **Social isolation,** stigmatization, or irresistible behaviors, like kidnappers binding and overpowering the captive.

Pain, therefore may mean many things to many people, at different times, but the first three domains- unpleasant experience, sensation of discomfort and severe emotional/ mental distress- are universal characteristics of pain and are my areas of concern. The International Association for the Study of Pain (IASP) has defined Pain as: "**Unpleasant, sensory** and **emotional** experience associated with **actual** or **potential** tissue ***damage*** or described in terms of ***it***" (Readyard and Edwards, 1992). Pain is a leading cause of morbidity worldwide (Langford, 2006). It is a sensation that causes many people to seek medical care but they are often **not** treated effectively. Pain sufferers are worldwide. Chronic pain afflicts about 20% of adult population- musculoskeletetal and joint disorders 30-40%, neck and backpain-30%, headache and migraine-10%, cancer related pain constitutes 1-2% and unrelieved acute pain 30-70% (Carr, 2009) . Pain is also very common in children (Soyannwo ,2000) and it has been suggested as the 5th vital sign (Soyannwo, 2011). Globally, the control of pain has been viewed as a fundamental human right and interest in effective pain management has led to the huge successes in pain research and advocacy for availability of effective pain relieving agents into which I have made my modest contribution. Frank et al (2007) declared "Because pain management is the subject of many initiatives within the disciplines of medicine, ethics and law, we are at an "inflection point" in which unreasonable failure to treat pain is viewed worldwide as poor medicine, unethical practice, and an abrogation of a fundamental human right".

Classifications of pain.

Pain can be classified in temporal terms as **acute** or **chronic.** Another systematic analysis of literature has shown that about 46.5% of adult population have chronic pain *[some of us here are with our chronic pains]*; 5.6% have severe pain [*those with severe pain may not be here*] and 8.2% are of neuropathic origin (Harstal, 2003). Pain can also be classified according to causes or sources, as **nociceptive** (when the nociceptors are stimulated), **neuropathic** (when there is damage to the nervous tissues), **sympathogenic** (when there is damage to the sympathetic arm of the nervous system) and **visceral** (Budd,1966). In qualities pain can be **sharp, dull, aching, nagging, burning, stabbing, throbbing** and **boring** (Ogunniyi, 2005). Clinical and physiological evidences also classify sensation of pain into **fast** and **slow** (Wood, 2002). Fast pain (a sharp and highly localized sensation), is believed to be carried by the Aä Group of fibers (2-5im diameter). It is the nature of the projection of the Fast pain impulses to the primary sensory cortex that enables the localizing of the pain to a particular area. Slow pain (characterized by a dull, intense and diffused feeling), is believed to be mediated by the unmyelinated type C nerve fibers system. An **instantaneous** pain [present/prevailing pain] can belong to combination of these classifications.

Transmission of Pain

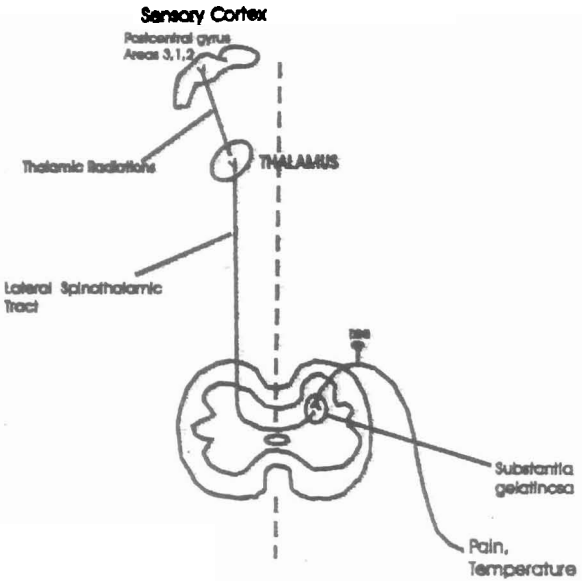


Diagram of pain pathway
(Ogunniyi, 2005)

Pain neural pathways are usually complex but the mechanisms include increase in the electrical activities of the nociceptor neurons and transmission of the impulses from the affected tissues/organs through the spinal cord (tracts) to the subcortical centers and to the cortex. The impulse patterns for pain via the lateral spinothalamic tract to the thalamus, where they relay to the postcentral gyrus in the neocortex.

Pain is often accompanied by inflammation, immunologic mechanisms, metabolic derangements, neurologic damage, endocrinologic disturbance, cardiovascular changes

movement disorders with gait deviations when the locomotor apparatus are involved (Carr, 2009).

II. THE FLAGS

Red flags

A flag is an emblem usually consisting of a rectangular piece of cloth of distinctive design, it is a symbol, an indicator, and a means of communication; when you flag you communicate. Red is a colour symbol for danger or caution just as pain itself is symptom of danger or warning, although surprisingly, to the Chinese red symbolizes peace. **Red flags** are indicators of serious possible pathologies (Ferguson, 2009). If a red flag is discovered, attention is required but one does not necessarily need to run around panicking or worrisome, but it should not be ignored. When pain, for instance low back pain, is associated with a red flag it should not be ignored. It is an indication of possible spinal pathology (Waddell, 2004). You can hope [and pray] that it will disappear or be sought out by the physician or therapist. The identification of a red flag is important but the presence does not guarantee that the patient has anything serious going on. However their disappearance does not guarantee that everything is fine. In effect red flags may link a disorder to another serious pathology or severe mechanical problem. Early or timely consultation and effective attention are, therefore, desired.
Examples of red flags are as follows:

A. Signs and symptoms requiring emergency referral/ attention. Examples are:

- Pain/difficult micturition/urination
  Chest pain from myocardial infarction
- Acute and severe abdominal pain.

Red Flags can also be

B. Signs and symptoms not requiring immediate emergency referral.

- Pain while coughing or sneezing
- Pain with a recent history of trauma (eg. Recent fall or a road traffic accident)
- Labour pain
- Toothache
- Acute headache

Other common red flags are:

C. Constant progressive non-mechanical pain (Constant- Pain – 24 hour every day and night regardless of what patient does or does not do. (This constant pain increases or decreases in intensity, but is there all the time). Symptoms may be affected by movement or positioning activities:

- A night pain – pain increases so that patient has to get up from bed to seek relief. Patient gets sleep by sleeping in a chair
- Pain following a past medical history of cancer – Most cancer involving the spine is metastatic from breast, lung or prostrate cancer (Atlas and Deyo, 2001)
- A steroid use for rheumatic disease and inflammatory bowel disease, osteophorotic changes in the spine may also cause pain on movement.

There are also non-painful red flags, which however may elicit pain following concomitant injuries or secondary infections, and these may include

D. **Widespread neurological changes like-**

Tripping over
Leg giving way
Widespread loss of sensation and later
Pain in the limbs.

There is another non-painful (or silent) red flag.

E. **A painless lump in the breast** which may later become metastatic with symptom of pain.

Effective treatment for red flags is a right and it is advocated as it:

-improves patient quality of life
-reduces risks of complications
-facilitates recovery
-reduces short and long term cost of cares.

According to Jean Martin Charcot, "Symptoms in reality are nothing but the cry from the suffering organs."

Access to Pain Management is a Fundamental Human Right by Montreal declaration (IASP,2010). To the concerned health care giver, failure to provide pain management is a professional misconduct. If a patient reports to me with a red flag, in the clinic or in the office, at home (even elsewhere including social gathering) or over the phone I try my best to give primary educational counselling, effective attention , appropriate referral and adequate recommendation as the case may be.

What of Yellow Flags?

Informal meaning of **yellow** is "easily frightened". It also means showing or experiencing a state of disordered feeling or distorted judgment as through bitterness or melancholy. A yellow person is said to be cowardly or treacherous or is jaundiced. He is chicken-hearted or sensationalistic.

In medical slangs, yellow flags are psychological risk indicators that highlight the risk of developing chronic pain (Ferguson,

2009). Attention seeking behaviors may also be yellow flags. However, specific yellow flags have been identified.

A. **Some attitudes** and **beliefs/ideas** that pain is harmful can result in **fear, avoidance behaviors, guarded movements or fear of movement.** There is a belief that pain must be completely resolved before returning to work or daily normal activities or functions. There is also the worry that the pain will increase with return to work or get worse on movement. Always thinking the worst. With yellow flags there is passive attitude to rehabilitation which I have often encountered. As a non-pharmacological pain specialist, I have advocated for the role of education and counseling in dealing with the yellow flags of attitude and belief about pain (Olaogun, 2005). I hope to still do so in this inaugural lecture.

B. **Behaviours can be yellow flags**: There is avoidance of normal activity and withdrawal from day to day function or work. Rest (like lying down or sitting) as a personal means of fighting pain may become a habit. This is an incorrect association between rest and pain (Ferguson, 2009). Overrating pain intensity like 12 over 10 or 20 out of 10 (in a maximum intensity rating of 10) is a yellow flag. We have effectively used operant behavioral therapy, a non-pharmacological approach, in treating these behaviors (Olaogun and Koph, 2009).

C. **Compensation** issues may also constitute a yellow flag. Patient may raise complaint when there is benefit or monetary compensation when blame is established. In the presence of ongoing legal issues or financial incentive to return to work, patient's response to treatment is influenced.

D. **Diagnostic Language** as **in inappropriate** or inconsistent messages and ineffective intervention by medical professionals may determine how patient think and behave in response to pain (Ferguson, 2009, Olaogun and Koph, 2009). Medical or diagnostic language leading to fear, e.g. "You have a very serious problem". Whereas my telling a patient that "this pain will not kill you" has dealt with the fear and the pathophysiological sequelae associated with this yellow flag. (Olaogun and Koph,2009).
This is a case report of Mrs "M" with generalized back pain, scoliotic posture, antalgic gait, and hypertension: Hearing "This pain will not kill you" made a turning point in her responsive pain behavior and general health. Our next meeting was at a social function after about 6 months. " You know what?" she remarked "Since you told me the pain will not kill me, I started feeling better. My doctor even told me about a month ago to reduce the dose of my hypertension medicines, and with the advise you gave me I can say I am not feeling that pain again but I have not been faithful with the exercise. May be it could have gone *patapata* "..

E. **Emotions** can constitute yellow flags as people respond to different stressful situations in different ways. Fear, mood, inability to maintain sense of control, longing for a compensatory escape can affect patients' responses to pain management. "Please give me an excuse duty for a week" is the common request from clients. With the excuse duty certificate, some patients may decide to travel out of town. " How can I go to the office with a walking stick?" a patient once asked me. I told her I did with cervical collar at one time and with a pair of crutches for four 6 weeks at another time." I added "I was going to work on crutches". That emboldened her

to start using an elbow crutch and her hip pain on the contralateral side was relieved.

F. Ability of patients to cope with pain or the patients' responses to pain management also depend on the response of other people around the patient. If there is an overprotective partner or care giver at home, worry, anxiety and fear of **family** members affect patients' responses to pain management. Identification of this yellow flag followed by family education is very important in reducing (or sometimes eliminating) the socioeconomic burden of pain on the individual sufferer and the caregivers.

G. Very often yellow flags may be the result of undertreatment and the sufferer may be predisposed to irresistive behavior. **Generally** they withdraw further and further from family, job and social network. Advocacy for effective treatment of pain is one of the cardinal objectives of the Society for the Study of Pain, Nigeria, of which I have been an active member for the past 13 years.

III. IS PAIN OF ANY VALUE ?

The biologic value of pain is that it alerts the host to actual or impending injury and its report calls for appropriate attention. Pain signals a serious and immediate natural threat to an individual survival that might be avoided or overcome if noticed early. Early detection of these threats is efficiently accomplished through nociceptive repertoire by sensing pressure (crush/swelling), stretch (ripping or shearing of flesh), heat (burn), cold, and mediators of infection or ischemia. **Were it not for pain human race could have been extinct a long time ago. Both physical and emotional pains signal danger.**

If disease do not cause pain we will think nothing about them and would let them run their course until it is too late to do any thing about them. If injuries do not cause pain we will continue to move about until the injured parts are out of place entirely or become avenues for secondary infections or disposition of essential body materials. Physical pain has a purpose; *even though it hurts it turns out to be our friendly watchman/policeman guiding us against life's dangers*. Even in life threatening (terminal) conditions the period of pains gives room for palliative care which in turn allows the sufferer enough time to ***put his house in order*** before life is terminated (Olaogun and Koph, 2009).

Concern for pain is one of my contributions to reflection on human instincts for fairness and empathy in the face of suffering. In my ventures into pain management. I, like many other scholars, have discovered that pain is often underreported; and when reported it is undertreated. With undertreatment, the biologic value of pain is often outlived. Despite the fact that pain is often undertreated there is a high level of satisfaction by patients with their pain management even when inadequate. When pain is treated it is often underestimated. This situation often results into chronication of pain with accompanying yellow flags. With persistent/ chronicated pain, the restorative capacity of the body is turned upside-down. This restorative capacity includes stoppage of bleeding, release of endogenous opiates for pain modulation, identification of microbes and their neutralization, strengthening of bone after a fracture, closing of wounds after an injury and covering with new skin. Hyperalgelsia, disuse atrophy, contracture, hypomobility, pain-avoidance gait, helplessness, depression, anxiety, social isolation and stigmatization in various degrees of combination become the norm of persistent or undertreated and uderrated pain. The rating or estimation of pain is still a subject of searches and

researches for absolute objectivity and universality. I have contributed to the rating of physical pain with our innovations of Modified Verbal Rating Scale (Olaogun et al, 2003) and Semantic Differential Scales (Olaogun et al, 2004). The advantages of our scales are the overcoming of language barriers and rating the intensity of the pain with essential dynamic functions in daily activities.

IV. GAIT ABNORMALITIES

The normal human gait is bipedal plantigrade; it has both kinetic and kinematic characteristics with symmetry of features in the two lower limbs as a characteristic of the norm. We have demonstrated that in a unilateral lower limb dysfunction there is asymmetry (Oyebisi et al, 1994; Obembe et al, 2009). Gait can be normal or abnormal depending on

- Muscular competence or incompetence of the antigravity muscles
- Neuromuscular coordination/incoordination
- Limitation of or normal ranges of motion at the hip, knee and ankle and foot
- Propioception adequacy or inadequacy
- Maturity/ Ageing .(Odebiyi et al, 2008; Olaogun et al., 2010; Obembe et al, 2010)).

During ambulation gait is determined by the following phenomena

- Pelvic Rotation
- Pelvic Tilt
- Knee Flexion in Stance Phase

- Foot and ankle mechanisms
- Lateral Displacement of the Pelvis .

These phenomena may not be noticed in most males, often with android or platipeloid pelvis, but they are observable features in females endowed with large gynoecoid pelvis and hips.

The mechanisms above ensure propulsion at push-off, control of forward movement and shock absorption at heel strike. Where and when there are limitations caused by injuries or disease or developmental problems on one or both lower limbs the gait becomes abnormal, if the individual can walk. In a collaborative project between the Department of Medical Rehabilitation and Department of Electrical and Electronic Engineering, we developed, tested and used a computer based telemetry systems to obtain normal gait force time records and determine gait asymmetry in hemiplegic gaits (Buraimoh-Igbo et al, 1997, Obembe et al, 2010).

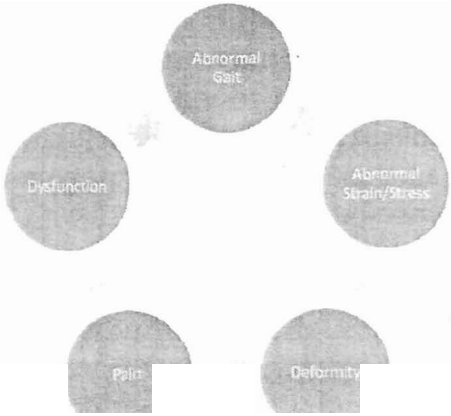
The Causes of Abnormal Gaits

The cause of abnormal gaits may be summarized as: a) Neuromuscular aetiologies, like stroke resulting in hemiplegic gait; b)Musculoskeletal problems as in osteoarthritis resulting in antalgic gait and c) Isolated muscle weakness as in unilateral quads weakness resulting from trauma on the muscle or prolonged immobilization of the knee.

It is important to note that PAIN is not always the cause of abnormal gaits but PAIN could result from them and the PAIN sustains the abnormality or promotes secondary abnormalities if it is inadequately treated. In other words, pain may be or may not be the cause of abnormal gait, but pain would result from it. Pain sustains the abnormality or promotes secondary abnormalities.

Abnormal gait may put a mechanical strain and stress on the soft tissue of the locomotor apparatus- the lower limbs: thigh, legs and foot and the joints. If the mechanical stress is allowed to persist or recur, deformity may result. Stress on deformity leads to recurrent or chronic pain and musculoskeletal dysfunction results. I have developed this model to explain this phenomenon (Olaogun, 2011).

Pain-Abnormal Gait –Pain Cycle



This cycle is broken by adequate medication and effective Nonpharmacological therapy with preventive rehabilitative management, if applicable. This may include surgery and post operative physiotherapy and occupational therapy. Preventive management in rehabilitation means all methods of forestalling avoidable secondary conditions that may lead to increased disability.

On gait rehabilitation

In combating gait abnormality resulting from knee dysfunction I designed a space saving, technically feasible and cost effective knee goniometer and stiff knee mobilizing device –the knee board [Olaogun, 1984]. This is widely used in clinical physiotherapy. Following the procedure of Grieve, Leggeth and Wheatherstone (1978) Olaogun and Chapman (1990) obtained the kinematic records of the three major lower limb joints (hip, knee and ankle) in stepping manouvres, using the polarized light goniometer (Polgon) at the School of Kinesiology, Simon Fraser University, Canada. Sequel to our innovative ventures on the analysis of stepping movements, the Forward Upward Leading Step Test (FULST) was developed by my colleagues and me in the Department of Medical Rehabilitation of this University. FULST was introduced to clinical use (Olaogun et al, 1989). It was conceived that information that could be hidden in ground level or treadmill gait analysis would be revealed in stepping analysis. This test, published in the maiden issue of Clinical Rehabilitation, Putney, London, detects and categorizes locomotor disability presenting with gait asymmetry/ abnormalities. It can also assess the functionalities of some orthotic devices such as ankle foot orthosis and monitors locomotor status following treatment by subjecting patients to periodic step tests.

With the aid of the University grant, the collaborative effort by the Medical Rehabilitation and Electrical/Electronic Engineering Departments designed and developed a Telemetry System (mentioned earlier above) for Monitoring Ground Foot Forces in pathologic gaits. Vertical Force-Time records with bilateral symmetry were obtained in normal subjects. Gait asymmetry was clearly demonstrated in patients with lower limb discrepancy (Oyebisi et al, 1994). There was an improvement on the original telemetry system for faster

data acquisition and continuous monitoring. We, for the first time, reported this technical feat in the Rehabilitation Research and Development, Baltimore USA (Buraimoh-Igbo et al, 1997). The gait wave form obtained for normal subjects was true representation of well known patterns. It is a challenge, and one that calls for serious concern, that we are yet to introduce this system for wider clinical use in Nigeria.

My research ,therefore, in the study of musculoskeletal pain has continued, and it is ongoing, *pari parsu,* with that in gait studies because **pain** in the musculoskeletal system in a major factor in locomotor dysfunction exhibited in abnormal gait patterns.
In addition to combating pain in abnormal gaits, we have also researched into the causes of deficit in balance confidence and standing balance performance in stroke survivors with hemiplegic gait. In one of our studies we reported that the range of movement of the involved limb and the quadriceps strength of the both (involved and uninvolved) limbs are strong predictors of these variables (Olaogun et al, 2011). It was therefore recommended that the kinesitherapeutic techniques to restore the normal range of movement to the involved limb and to strengthen the quadriceps femoris muscle of both limbs should be emphasized in the neurorehabilitative management of stroke survivors.

Pain modulation in antalgic gait

Antalgic gait is an unsteady and asymmetric gait usually associated with pain in one or more joints of the lower limb. Osteoarthritis (OA) is one of the major causes of disability especially in the elderly and it is often associated with pain on ambulation and antalgic gait characterized with slow cadence and difficulty in stepping . With increasing trend to Western life this condition is on the increase in Nigeria. Studies showed that non steroidal anti-inflamatory drugs (NSAIDS) that are

commonly prescribed for the treatment have deleterious effects on cartilage metabolism and are not often recommended for patients with gastrointestinal ulcers as it worsens the latter condition (Adedoyin et al 2002, Olaogun et al 2007). The need for alternative/complementary approach to pain relief is inevitable. We studied the use of Transcutaneous electrical nerve stimulation (TENS), Interferential Current Therapy (IFC), Exercise Therapy and Shorwave Diathermy in search of evidence for the use these modalities in physiotherapy because their efficacies (of these modalities) have been challenged. We examined the therapeutic benefits of IFC on osteoarthritic knee pain in black Nigeria population. IFC is one of the electrophysical agents in physiotherapy. Many reports on IFC were not written in English as at the time of study. The literature in English were in form of case studies, observations and anecdotes (Adedoyin et al, 2002). Our study revealed that IFC demonstrated significant therapeutic benefit in modulating pain and enabling the patient to exercise in other aspect of the treatment regime to improve the strength and the function of the locomotor apparatus; normal gait recovery or effective gait reeducation followed . The first report of this work was presented by me at the 1st Pan African Congress on Pain which held 8th – 10th Nov. 2000 in Alexandra, Egypt. The work was eventually published in the London Journal of Physiotherapy. Our studies have been able to demonstrate that both TENS and IFC are effective in the management of knee osteoarthritis and back pain (Adedoyin et al, 2002, Adedoyin et al, 2005, Olaogun et al, 2007). Our study also supported the longer lasting effect of exercise therapy (Olaogun et al 2007). Overall, the results of our work have provided evidence to support the use of these modalities and have been useful to clinicians for decision in managing osteoarthritis and effecting prospective gait reeducation/rehabilitation. These articles are included in international physiotherapy evidence data base (PEDro).

Pain assessment.

I have contributed to knowledge in addressing the aspect of underrating of pain. We studied the reliability and concurrent validity of Visual Analogue Scale (VAS) and a Modified Verbal Rating Scale (MVRS) and Semantic Differential Scale (SDS), which are our innovations, in rating osteoarthritc knee pain and back pain (Olaogun et al, 2002; Olaogun et al, 2004). In order to solve the problem of language barrier in rating pain in a large number of our (illiterate) patients we developed the Semantic Differential Scale (SDS) in Yoruba. The innovations in MVRC and SDC are that patients' pains were rated during provocative activities of stepping and bending respectively. The results of our studies showed that the two pain rating scales were reliable and our procedures for applications were recommended for wider clinical trials.

V. THE BURDEN OF PAIN

Worldwide there is increasing awareness of human suffering, health care burden, and impact created by undertreated pain of all types- including acute pain, chronic pain, pain caused by health conditions such as cancer and HIV/AIDS, and pain caused by treatments such as surgery and radiotherapy (IASP,2009). The IASP (2009-2010) Global Year Against Pain was on Musculoskeletal Pain. For the current Global Year (2010-2011) it is Against Acute Pain i.e. **pain of recent onset and probable limited duration.** Acute pain usually improves with time, has an identifiable relationship to tissue injury or disease and results in stress reaction of "fight" or flight". Although unpleasant, acute pain serves a protective function and promotes survival. Nevertheless it has several undesirable effects with increased risk of morbidity and mortality. Poor management of acute pain puts patients at increased risk, creates needless suffering, increases costs of care, and may lead

studies have suggested that analgesic does not only reduce pain but also

i) influences disease progression and acts in synergy with adjuvant drugs
ii) enables kinesitherapy, which is my speciality
iii) promotes relaxation and sleep and
iv) in ways restores brain functions .

With the use of effective analgesic, patients expectations becomes more realistic and adherence to physiotherapeutic instructions more rewarding.

However the patient's, the doctor's and the physiotherapist's goals and the realization depend on early intervention, early referral (there may be need for combination or multimodal approach) and patients' compliance.

VI. WAY OUT OF SUFFERING

In suffering from pain, I would say in the words of Marcus Aurelius, (1964) "When in pain always be prompt to remind yourself- There is nothing shameful about it. Bear in mind also that many other things which we find uncomfortable are of the same nature as pain – feeling of lethargy or loss of appetite for example". Don't be ashamed because of pain , seek for expert attention; don't be ashamed to become a patient because of pain. This is the first way *The word* ***patient*** *often used for clients seeking relief from signs and symptoms of ill health (like pain) is derived from the Latin word* ***patior parti parsus – sum*** which *means to* ***suffer.*** *So also is the word* ***patience*** *which is* ***needed to endure waiting not only for the relief of physical pain but*** *also for other ventures/questions of life that need waiting for answers.* If you have pain and the pain is lasting, you are suffering. But you do not need to have pain to suffer. You may ask why do we suffer from pain? I may not give an acceptable answer but from personal experience I would say that suffering in this way

may come out of our ignorance or impatience, recklessness, carelessness or accidents, or from situation beyond our control; suffering may also be inevitable if it is secondary to a life saving or rehabilitative events or managements. I suffered for six weeks three days when one of my two legs was in cast following the repair of my ruptured Achilles tendon. Of course I had suffered a very horrible acute pain when the injury occurred. The pain was excruciating. I rated it 12 over 10. This was yellow flag upon red flag. While the involved leg was in cast (after the surgical repair and was not bearing weight and was pain free, the other leg and my two upper limbs had recurrent joint pains (while ambulating with crutches) throughout the period of immobilization. Suffering may become inevitable when the resources (both human and materials) to prevent or stop the suffering are not available. When we think of what to do or what to say when we suffer we would see the benefit and lessons from suffering. There is always a way out of it with lessons to deal with it in the future. I consoled myself with a verse of the preacher that once in a while, ***Sorrow is better than laughter for sadness has a refining influence on us*** (*Ecclesi*astes 7:3).

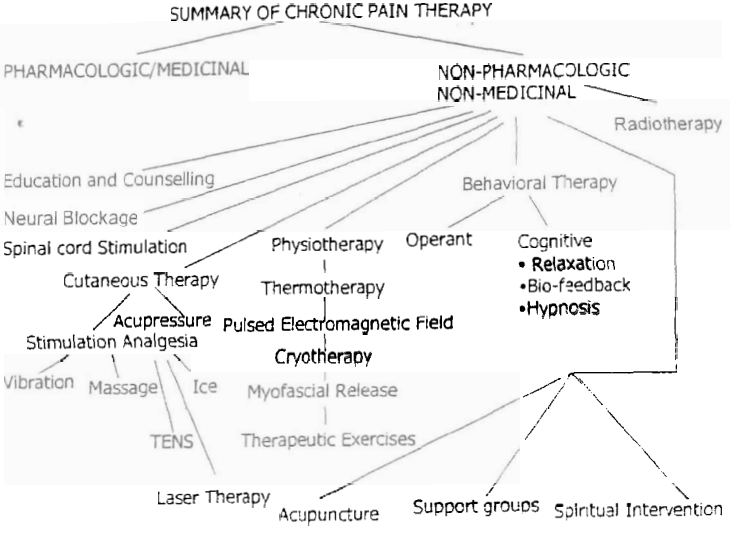
i) Effective Interventions in Pain Management.

The foremost way out of suffering from pain, secondary to freedom from shame about it, is **effective treatment**. In my case report the injection of tramadol plus diclofenac relieved me of the acute pain before my shoe was removed. The surgical repair took place about 3 hours after the trauma. The treatment was effective. Ineffective treatment is tantamount to ignoring the biologic/survival value of pain which may lead to chronication and avoidable secondary conditions. The components of effective treatment include:

a) Patient and personnel education on the pain.
b) Enhanced knowledge, skill and experience of staff

Pharmacologic intervention includes: **Non-opioid analgesics (oral, suppository), NSAIDS (best), Oral opioid analgesic, Wound infiltration (lavage) with Local anaesthesia, Peripheral nerve blocks, Peripheral opioids, Intermittent bolus opioid injection- subcutaneusly, intramuscularly or intravenously (Soyanwo, 2011).**

In 2005 at a training of the trainers' workshop on Pain Management (supported by IASP grant) I designed and presented a schematic summary of non-pharmacologic chronic pain management (Olaogun, 2005).



(Olaogun, 2005)

Bennett and Closs (2010) categorized the techniques in the scheme into physical, psychological and clinical processes – viz.

P – Physical: Acupunture, TENS (Transcutaneous electrical nerve stimulation) Therapeutic Touch and Massage, Myofascial Release, Occupational Therapy, Musical Therapy.
P – Psychological: Hypnosis, Relaxation and Cognitive Behavioral Therapy.
C – Pain Assessment, Physical advise and nomination about pain, education and counseling (patient, professional, care givers).

In non-pharmacological intervention, which is my subspecialty area, patients' education ,again, precedes all forms of procedures. In education and counseling, patients are provided with educational information which will enable them to reduce their pain and disability using their own resources and understanding. They therefore become independent of long term repeated courses of manual physical therapy.

Musculoskeletal Pain often results from abnormal prolonged stresses on the musculoskeletal system and from minor traumata on particular soft tissue imposed by repetitive abnormal postures and sustained overload. The commonest results of abnormal stresses and minor traumata on the human body are manifested as overuse syndrome and degenerative diseases which are painful. These include low back pain and osteoarthritic pain. The basis for patients' education has been reported in some of our scholarly publications (Olaogun, 1986; Olaogun, 1999, Odebiyi et al, 2006). I have explained the basic bio-mechanics of the low spine as a structure and as a mechanism (Olaogun, 1995). Physical demands in terms of forces imposed on the spinal column at the low back were explained with the concepts of classical physics (Olaogun, 1999). Implications of abnormal stresses of the particular joints of the vertebrae resulting in pain when the back muscles fail to protect the joint were spelt out (ibid). Techniques of using the back safely to obviate tendency to pain and injury in our daily

activities were carefully outlined. Olaogun and Odebiyi (1998) in their laboratory experimental work, at the Federal School of Physiotherapy, Dala, Kano, correlated body weight, stature, trunk positions and surface myoelectric potentials of the dominant extensor muscles of the spine. Our findings revealed that body weight accounts significantly for the tonicity of the back muscles and can be used as a predictor of tissue loading of the back muscle. Our results also revealed that the back pain at truncal position of about 45^0 flexion is due to inadequate protection of the vulnerable lumbar and lumbosacral intervetebral joints. **Prophylactic measures against re-injury is the gain of effective education and counseling.**

ii) Advocacy for Early Report and Consultation

Empirical evidence in this part of the world has shown that failure of early (or timely) report of pain and for effective attention often precipitates handicapping situation which on the long run are uneconomical and uncosmetic for the patients concerned. The consequences of lateness in neurological, obstetrical and surgical conditions have often necessitated reconstructive or corrective operations for a re-institution into more favourable states for rehabilitation (Olaogun, 1992). Incompleteness of health care by lack of consideration for timely physiotherapy was addressed in many of my research efforts. Physiotherapy has a major role in preventing avoidable secondary conditions that may lead to chronic pain and disability in locomotion (Olaogun et al, 1993). We have advocated that in musculoskeletal disorders where physiotherapy is often indicated timely consultation or referral is ideal and beneficial.

Eighty percent (80%) of patients come to consult the clinician or seek health care service of a sort because of pain. What is sought is either relief or re-assurance that the condition is not serious. Others may come because of lameness or weakness or

feeling of numbness or loss of function of a part. In fact empirical evidence and experience have shown that one patient out of four consult the practitioner and are referred for physiotherapy for pain related to the locomotor apparatus. Among the most frequent causes of such pain are inflammation of bursae and tendons, various osteoarticular lesions and certain neuromuscular conditions. Instituting treatment becomes the responsibility of the physician or clinician first consulted. The outcome of treatment depends on the accuracy of the diagnosis, appropriateness of therapy and timely referral for complementary intervention to effect cure or relieve symptoms. Since therapy should always endeavor to be curative, in the first instance, or rehabilitative, in case of secondary body function impairment or activity limitation, ***mere treatment of symptoms is certainly not sufficient***; it acts only on the secondary manifestations of the primary pathology, and as such can be no more than palliative. My search for pain modulation without the use of medicines have taken me beyond the scope of the domains of the popular physiotherapeutic modalities to novel areas such as behavioral therapy, biofeedback and remote intercessory prayers.

iii) Pursuit of wellness and exercising. Health promotion for physical fitness and enhanced functional ability through regular and specified exercising and preventive physiotherapy is also a way out from suffering. Many apparently healthy individuals need to engage in appropriate fitness programme for at least 30 minutes daily for a minimum of 3 times a week. Initial assessment and health education can be administered by the physiotherapist trained in the use of the appropriate facilities. These facilities and services are available at the Physiotherapy Department of Obafemi Awolowo University Teaching Hospital (OAUTHC) where I also work as consultant physiotherapist. Health promotion programme includes sporting activities like badminton and lawn tennis, flexibility

exercises in the gymnasium, and health walk. However, the political "Keep Fit" programme in which governments at various levels engage staff, once a week or once a month, to jog through a predetermined distance and time has been observed to be dangerous (Sanya, 2011). The exercise is usually carried out in full press coverage but the casualties resulting from it may not be publicized.

iv) Minimising your sitting time / Sitting correctly

In most of our natural activities for survival- whether tending our crops or hunting wild antelopes, most of our lives as human are on our feet. But with the advent of television, computers, desks jobs we are sitting down more than ever before in history. Sitting time adds up- whether at desks or in the car, while waiting to board a plane and in the plane (hours or more), even more time than we spend sleeping (7.7). Our bodies are not made for that and that is starting to take its toll. The price in **suffering** is musculoskeletal **pain**.

YOU MIGHT WANT TO STAND UP FOR THIS

Prolonged sittings have adverse effects. As soon as you sit, some reflex activities in your leg muscles are closed , calories burning drops, enzymes that help break fats drop, after 2 hours, good cholesterols drop, insulin effectiveness drops and the risk of diabetes rises .

YOU MAY SIT NOW.

For many of us, sitting for 8 hours or more at our job is inevitable. But it is the extra sitting outside of work that turns a serious problem deadly.
(www.godblessnigeriachurch.org/ July,16, 2011).

I have conducted several workshops on **war against back pain and the management of the spinal column** in several settings in the last 10 years- for both academic and socio-religious groups. My emphasis has been that for those whose jobs require prolonged sitting, the sitting should be interrupted whenever possible (Olaogun 2008).

STAND UP TO ANSWER A PHONE CALL.

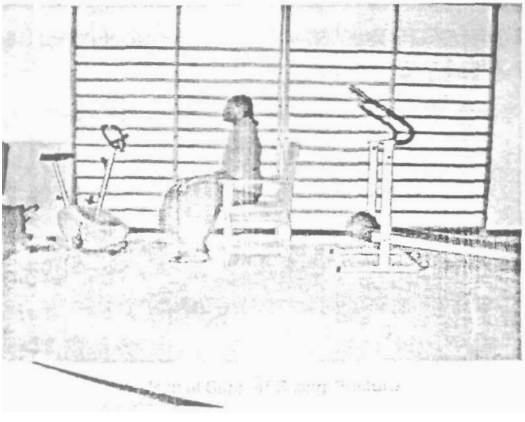
STRETCH.

STAND UP AND WALK/MARCH IN A PLACE.

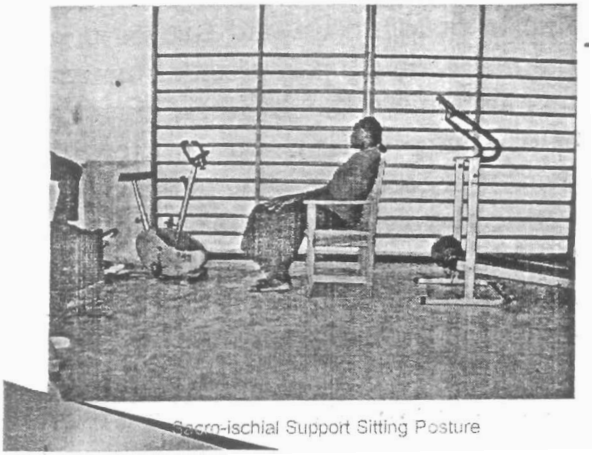
When you sit be careful to adopt a good sitting attitude. Without prejudice to the inclination of the back rest, I have taught 3 types sitting positions and advised on the best which is **ischiofemoral.**

Types of sitting:

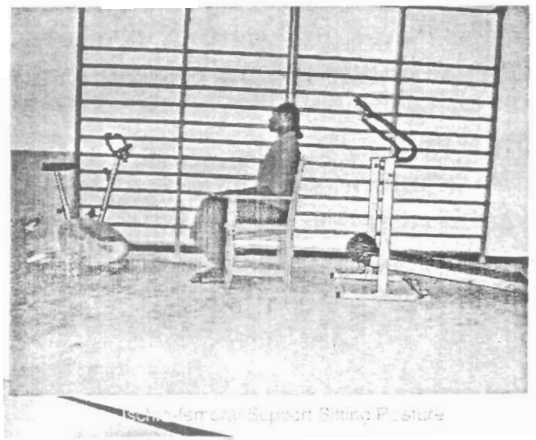
Ischial support



Sacroischial



Ischiofemoral.



iii) Use of ambulatory aids and orthoses when necessary for pain relief.

Depending on the nature/cause of the pain, ambulatory aids like canes (walking sticks), crutches are prescribed in order to unload the joints and reduce the painful stress on periarticular tissues in arthritic pains and make the sufferers physically active while recuperating or undergoing rehabilitation. It is regrettable some patients prefer to be indoor or display yellow flags in order to avoid being identified as "physically challenged" because of the walking aids. The consequent physical inactivity has its toll on the general health of such patients - indigestion/constipation, deep vain thrombosis, **low vital capacity reserves**, and energy imbalance are a few of the effect of physical inactivity due to non-use/under-use of rehabilitation aids. Orthoses in form of splints and braces when appropriately used can support a body part to prevent movement that can either cause pain or predispose the body to further injury. Splints limit or restrict movement within safe range, complement residual potential of individual and assist movement.

iv) Beware of yellow flags.

Yellow flags arising from attention seeking behavior do not promote pain relief or aid restoration to normal activities on the long run. Appropriate attention to yellow flags is a way out of suffering in patients with chronic pain (Olaogun and Koph, 2010).

CONCLUSION

My professional career in physiotherapy started in Kwara State as a National Youth Service Corps member in August, 1974. I was the first physiotherapist in the State. On completion of my service I was compelled to stay and work by the State Government. I was eventually sponsored for my post graduate

studies in Canada in 1979. At that time there was no postgraduate studies in Physiotherapy in Nigeria. The Department of Medical Rehabilitation, Obafemi Awolowo University (then University of Ife) was the first University Department in Nigeria to start Master of Science Degree in physiotherapy in 1986, under the headship of Emeritus Professor VCB Nwuga. My academic career in Physiotherapy started in 1985 as a Lecturer II in the Department of Medical Rehabilitation of this University. Upon my assumption of duty I was appointed Chief Course Coordinator of Bachelor of Medical Rehabilitation Programme. I had the privilege of being mentored by Professor VCB Nwuga, the first Professor of Physiotherapy in Africa, and Mrs. Gladys Nwuga. I inherited from her a position as an investigator in a project (Awarded by University -grant number AY4207) to be jointly executed by the Departments of Medical Rehabilitation and Electrical and Electronic Engineering. The project title was "Design, Development and Testing of Telemetry System for the Monitoring of Poliomyelytic Gait". Although two scholarly publications were produced from the project- on the design and development and the testing, the system was not assembled compact for exhibition and patenting. Failure to assemble this initial/original system (by the latter department) was a great setback for some of the items on my mission in academic pursuit. This would not have happened if a gait laboratory were available at the Department of Medical Rehabilitation. **I therefore propose the construction of a standard Kinesiology/Gait laboratory with facilities for gait studies in the department. This will boost the morale of upcoming dedicated faculties who are also in the area of gait studies.** The telemetry system (mentioned above) had however undergone a series of updating and redesigning and has all along been used for teaching and research as I mentioned earlier. So far, I have supervised the first two PhD theses in the Department of Medical Rehabilitation. I also co-supervised

a PhD theses in the Department of Physiological Sciences. My research focus and contribution to Knowledge have been on Rehabilitation of locomotor dysfunction and Neurologic Physical Therapy. I have a special thrust on Non-Pharmacological Management of Pain. I have also contributed in Measurement and Evaluation in Medical Rehabilitation, Professional and Educational Development and Community Physiotherapy Practice (Olaogun, 1986; Abereoje et al, 1986) . In November 1989, I went on a "secondment" as Principal to the Federal School of Physiotherapy ,Dala, Kano (under the Federal Ministry of Health). Aside admitting the first three sets of students to the school, I successfully (though very eventful) affiliated the School to Bayero University, Kano for the Award of BSc (Physiotherapy) Degree. I returned to OAU as Senior lecturer in November, 1995. A year later I was appointed Head of Department of Medical Rehabilitation, the office I held for 9 years until I became the Dean of the Faculty in 2005. I became a reader October, 1997 and a full professor in October, 2003. Also in 1996 I was appointed Consultant Physiotherapist/Head of Department of Physiotherapy OAU Teaching Hospitals Complex (OAUTHC), the positions I held until I went for my Sabbatical at the University of Ghana, Accra, Ghana in July 2008.

I must also appreciate the following people for their involvement at very crucial times in my professional and academic career: Dr Theophilus A Oshin, the first African Physiotherapist, Professor Femi Soyinka, former dean of the then Faculty of Health Sciences, Professor Shukla (of blessed memory) former Dean, Faculty of Medicine, Bayero University, Kano, Professors Wale Omole, former Vice Chancellor of OAU, Roger Makanjuola, former Chief Medical Director (CMD), OAUTHC and former Vice Chancellor OAU, David Olavinka Akinola, former CMD, OAUTHC, Olusanya Adejuyigbe, former Provost, College of Health Sciences and current CMD,

OAUTHC, Joseph Abiodun Balogun, distinguished professor and dean College of Health Sciences, University of Chicago, USA, Arinola O Sanya, Head Department of Physiotherapy University of Ibadan, Issac Owoeye of the University of Lagos, Dr Olajide Olawale, Ag Head Dept of Physiotherapy , University of Lagos, Professors Edwin Wiredu, dean School of Allied Health Sciences, University of Ghana, Muheez Durosimi, former dean Faculty of Basic Medical Sciences, Mike Faborode, former VC OAU, Olaitan Soyannwo, Foudation President of the Society for the Study of Pain, Nigeria, Babafunso Sonaiya, former dean, Faculty of Agriculture, Bamidele Olaniyi of the Department of Physics and Dr (Mrs) BY Oladimeji . I recognize and appreciate all physiotherapists with whom I have worked at both academic and clinical settings. There are too many others that time constraints will not allow me to mention.

I must not fail to appreciate my parents of blessed memories (Pa MO and Mrs EO Olaogun) who laboured and believed that the best legacy for me is sound education.

I owe a lot to the Federal Government of Nigeria the Scholarship of which I enjoyed from Form 2 at St Finbarrs College, Akoka, Yaba, Lagos through Federal Government College, Warri to the University of Ibadan.

I appreciate my siblings, Jimi, Titi, Abayo, Biodun and Kayode together with their spouses who are here.

I acknowledge the invaluable support of my reliable and faithful wife, Adenike Olaogun, and those of our children Funbi, Funke Tunji and Fehintolu.

Mr Vice-Chancellor Sir, I must appreciate you too. When my professorship was announced in 2005 I thought I had come to a resting station in my race in academics. I did not know I just

began then. It had been more work including reviewing the publications of other prospects within and outside this university for the top of academic ladder. Since after your vice chancellorship was announced, any time I look at the group photograph of the Committee of Deans 2006/2007, in my sitting room, I feel proud that three of us have attained this exalted position of Vice Chancellor. I appreciate and congratulate you again.

Above all, let me confess that I give all glory to God for this golden opportunity of giving the account my sojourn in the academic world. May I recapitulate that I have tried to explain the biologic value of pain and the burden it imposes when this value is outlived. I have shown **part of my contribution** to the management of pain in relation to locomotor dysfunctions and general movement disorders resulting from injuries and from orthopaedic and neurologic diseases. I have proposed that a standard gait laboratory be built in the Department of Medical Rehabilitation. I have also tried to show the way out of suffering from avoidable and treatable pain. But can we ever be free from this pain, with the vicissitudes in nature and increasing population of the aged? Let me, therefore, conclude by mentioning when and where I believe this suffering from pain would end finally. At the other side, in the new Jerusalem. "... Look God's home is now among His people! He will live with them, and they will be His people. God Himself will be with them. He will wipe every tear from their eyes, and there will be no more death or sorrow or crying or pain..." Rev 21:1-4.

Thank you for your attention.

References

Adedoyin RA, **Olaogun MOB**, Fagbeja OO (2002). Effect of interferentialCurrent Stimulation in the management of Osteoarthritic knee pain, *Physiotherapy*, 88, 8: 493-499

Adedoyin RA, **Olaogun MOB** and Oyeyemi AL (2005) Transcutaneous Electrical Nerve Stimulation and Interferential Current Combined with Exercise for the treatment of Knee Osteoarthritis: A Randomised Control Trial. *Hong Kong Physiotherapy Journal.* Vol. 23 13-19.

Adedoyin RA, **Olaogun MOB**, Onipede TO, Ikem IC, Egwu MO and Bisiriyu LA (2006) Effect of different Swing Patterns of Interferential Current on Patients with Low Back Pain: A single control trial. *Fizyoterapi Rehabilitasyon*, Vol.16, No.2

Atlas and Deyo (2001) Evaluating and managing acute LBP in primary care setting *J. Gen Intern Med.* 2001; 16:120.9

Anonymous.. Tribune- Monday 22nd July, 2002

Aurelius M (1964). Meditations, Staniforth M, translator. London, Penguin, pp 167-171.

Budd K (1996) Chronic Pain and its treatment. *Therapy Express.* No 106, Dec 4

Bennett MI and ClossSJ (2010) Methodological Issues In Nonpharmacological Trials for Chronic pain. *PAIN* CU: May 2010 (Vol,X VIII, issue 2).

Buraimoh Igbo L.A. **Olaogun M.O.B.** and Jibril A.M. (1997): Measurement of Ground-foot Reaction Force to Determine Gait Asymmetry using Computer Based Telemetry System. *Rehabilitation Research and Development Reports.* (1996) Vol. 34. May 1997. Pp 55-53. (Baltimore, USA).

Carr D.B. (2009) What does pain hurt. *PAIN: Clinical Updates* Vol. XVIII, Issue 3 July, 2009.

Christa Harstal (2003). *PAIN. Clinical Updates* Vol. II No. 2, June, 2003.

Ferguson F (2009) Managing Lower Back Pain. Church Livingstone, Elsevier

Frank Brennan, Danniel B Carr, Michael Cousins, *Anaes. Analg*. 2007

Holy Bible.KJV. Genesis 3:16; 21: 1-4.

International Association of the Study of Pain. IASP pain terminology: Pain (on line). Available from URL: http://www.iasp.org [accessed 2010 June 2]

Langford RM, Pain management today; What have we learned? *Clin Rheumatology* 2006; 25 Supp. 1 S2-8.

Odebiyi DO, Akinpelu AO, and **Olaogun MOB**; (2006): Effect of a Back School Protocol on the Referral Rate of Patients with Low Back Pain to an Industrial Physiotherapy Clinic. *SA Journal of Physiotherapy*, 2006, V0l 62, No4, pp 17-20.

Ogunniyi A (2005); Neuropathic pain magement. Presentation at the Trainers Workshop.....Society for the Study of Pain, March, 2 005, Ibadan, Nigeria

Olaogun M.O.B (1984) Introducing the Knee Board: A Simple Device for Knee Goniometry and Mobilization of the Stiff Knee. ABUH PHYSIO, Vol.7, No. 3 July-September, 1984.

Olaogun, M.O.B.(1986): The Oyo State Community Physiotherapy Scheme. Preventive and Promotion Measures in Nigeria. *Physiotherapy Practice* 2, 174-176

Olaogun, M.O.B. (1986) Adams' Closed-loop concept of learning and motor performance: Its application in Behavioral Kinesiology and patients education in rehabilitation. *Int.* J. *Rehab. Research* 1986, 2, 174-176.

Olaogun M.O.B, Abereoje K.O. and Obajuluwa V.A. (1989): Forward Upward Leading step test for the clinical evaluation of locomotor ability. *Clinical Rehabilitation* (1989), 248-253.

Olaogun, M.O.B and Chapman A.E. (1990): The step Height and the stepping distance as important Predictor of the Maximal Knee Joint. Angle in Stepping Movements – A proposal for the reconditioning of the injured knee. *J. Nig. Soc. Physio* (Aug. 1990) Vol. x, 1, 25-34.

Olaogun, M.O.B. (1992): A case report on socio-economic and behavioral results of late Physiotherapy in Nigeria. *J. Nig. Soc.of Physiotherapy.* Vol. xi, No 2, 21-23

Olaogun, M.O.B., Olaogun A.A.E. and Awojulu S.O. (1993): Incidence of Vesico Vaginal Fistula in an Urban Hospital in Nigeria. – The Need for Physiotherapeutic Intervention. *J.Nig.Soc.Physiotherapy.* Vol. xii, 1, 32-36.

Olaogun M.O.B. (1995) Biomechanics of the Spinal Column in Object Lifting. A case for Prophylactic measure in combating Low Back Pain. *J. Nig. Soc. Physiotherapy* Vol. xii, No. 1, 18-20

Olaogun M.O.B. and Odebiyi, D.O. (1998) Relationship between weight, Height and Myoelectric Potentials of Longissimum Dorsi at Different Arthrokinetic Positions of Low Vertebral Joints. *Jorn Nig. Medical Rehab, Therapists* Vol. 13 No. 6 pp 20-23.

Olaogun M.O.B. (1999) Pathomechanics and Force analysis at the low back during physical Task. *Journ. MRTB* Vol4.No7, pp7-11.

Olaogun M.O.B. Oladimeji BY, Adedoyin RA, Olaogun AAE, Akiloye AA, Egwo MO. Oyelese BO, folorunsho TJ (2002): Paterns of Present Musculoskeletal Pain in selected Occupational *J Nig Soc. Physio.* Vol.14,1,24-29

Olaogun M.O.B, Adedoyin RA Anifaloba RO (2003) Reliablity and Concurrent Validity of visual analogue Scale and Modified verbal Rating Scale of Pain Assessment in Adult Patients with Knee Osteoarthritis. *South African Journal of Physiotherapy* Vol. 55 No.2 pp12-15.

Olaogun M.O.B. Adedoyin RA, Ikem IC, Anifaloba OR (2004) Reliability of rating low back pain with a visual analogue scale and a semantic differential scale. *Physio Theory and Practice* (USA), 20, 135-142

Olaogun MOB, Ojoawo AO, Ojofeitimi, EO (2007): Effect of Short Wave Diathermy in the Management of Osteoarthritic Knee Pain, *Journal of Physical Education and Research;* Vol XII, No. 1, 1749-1756.

Olaogun MOB (2008): Vertebral Column Management. Workshop on Care of the Back. Anniversary Celebration of Calvary Princes and Princesses of Calvary Baptist Church, Ile ife, 16th Oct. 2008.

Olaogun MOB and Kopf A (2009): "Chronic Unspecific Back Pain" in N Patel and A Kopf [Eds] Guide to Pain Management in Low Resource Settings, IASP , Seattle, pp 173-179.

Obembe AO, **Olaogun MO** and Adedoyin RA (2010); Gait characteristics of hemiparetic stroke survivors in Osun State, Nigeria: *African Journal for Physical Health Education, Recreation and Dance* Vol.16, No.4 Dec 2010; pp 545-559.

Obembe AO, **Olaogun MOB**, Jubril AM and Adedoyin RA (2010) Development of Low cost Wireless insole for assessment of Gait in Stroke: Presentation at WCPT-Africa Region Congress in Accra Ghana, July 19th-23rd .

Olaogun M.O.B. Ojoawo AO and Obembe AO (2010) Depth-EMpulse Therapy Device: Case Report of benefit in Pain Modulation *Nig. J.H.Sc.* Vol.10.pp

Olaogun MOB, Lamidi RE and Obembe OA (2011): Balance Confidence and Standing Balance Performance among Stroke Survivors with Hemiparesis: *Journal of Medicine and Medical Science*; Vol.2(3) pp 750-757, March 2011.

Oyebisi T.O., Kehinde L.O., Buraimoh-Igbo L.A. and **Olaogun M.O.B** (1994). Computer based Data Acqising System for Ground Foot Forces in pathologic Gait. *J.Comp. Science and its Application* Vol. 6, No 1,1-15.

Readyard IB and Edwards WT (1992) Management of Acute Pain: A Practical guide. IASP Publication 1992. Seattle : 2.3

Sanya AO (2010): Physiotherapy and wellness: Rungs of the ladder. Inaugural lecture, 2009, University of Ibadan, 25th March, 2010.

Soyanwo OA , SD Amanor-Boadu(2000) Pain Assessment in Nigeria- Visual Analogue Scale and Verbal Rating Scale compared. *W.A.J.M* Oct-Dec 19(4): 242-5.

Soyannwo OA (2011) Acute Pain Management in Nigeria-Addressing the Gap. Society for the Study of Pain Globay Day Against Acute Pain, March 1st, 2011. National Sickle Cell Centre, Idi Araba, Lagos.

Waddell G (2004) The Back pain Revolution. [2nd Edition] . Churchill Livinstone, Edinburgh.

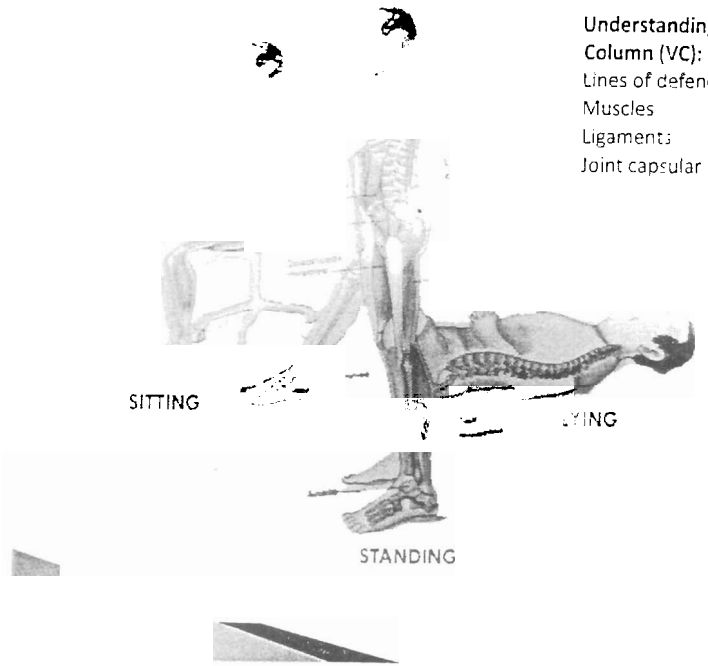


Figure 1:The vertebral column in sitting, standing and crook lying positions (Olaogun, 2008)