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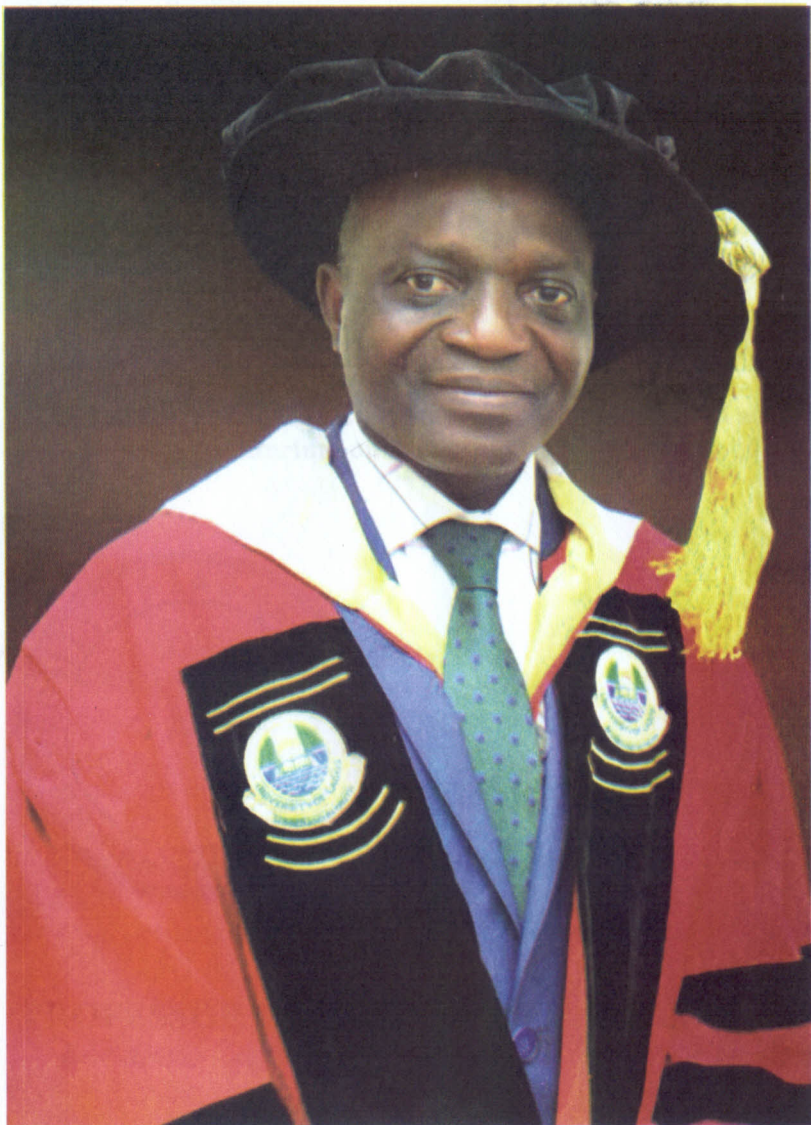
**LIFE AFTER STROKE:
MORE THAN A SURVIVAL
OF THE FITTEST**

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LIFE AFTER STROKE: MORE THAN A SURVIVAL OF THE FITTEST

An Inaugural Lecture of University of Lagos delivered at
JF Ade-Ajayi Auditorium on Wednesday 17th February 2021



By

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Distinguished Ladies and Gentlemen.

PREAMBLE

I am indeed grateful to God Almighty for giving me the privilege to be among the living and to stand before you today to deliver an Inaugural Lecture of the University of Lagos. I wish to express my profound gratitude and appreciation to the Vice-Chancellor, University of Lagos for giving me this great opportunity. It is indeed a great opportunity for me – for I am the 3rd Professor from my department (and the 9th in any university in Nigeria) to give an Inaugural Lecture in Physiotherapy.

I attended an inaugural lecture for the first time in 1985/1986 academic session, while undergoing a Master's degree programme at the University of Ibadan. The lecture was delivered by Professor Bassey Andah

(now of blessed memory) and it was titled: Archaeology in Nigeria: No Past, No Present, No Future. I must have been captivated by the scholarly and scintillating delivery of the lecture and the thought crossed my mind that I, too, will, one day, deliver an inaugural lecture; and I will give it the title: Physiotherapy in Nigeria: No Past, No Present, No Future. I quickly dismissed the thought from my mind, knowing full well that only professors could deliver an inaugural lecture. At that time, I was a Physiotherapist Grade II with Ogun State Hospitals Board – and there was no way I could have risen through the ranks of clinical physiotherapy cadre and become a professor. But see what has happened!!! The journey might have taken so many years but – that momentary thought, that seemingly impossible dream – has finally been realised. So, who am I not to be grateful to God? I'm so glad, I'm standing here today.

Mr Vice Chancellor sir, I intend to make this Inaugural Lecture a true town-and-gown affair. I have elected to speak on the topic: **Life after stroke: more than a survival of the fittest**. Stroke is a very common condition. There is no one present in this hall today who can claim ignorance of it. It is either you have a relative living with it, or you know someone who has succumbed to it, or living with it. From the title of this lecture, we can have a glimpse of the fact that a person can survive a stroke and continue to live thereafter. In this lecture, we will try to understand the meaning of rehabilitation (the tool needed by a stroke survivor to hold on to meaningful life); we will appreciate the role of physiotherapy in the rehabilitation of a stroke survivor; we will try to understand the origin and meaning of the expression "survival of the fittest" and see whether it applies to the life of a stroke survivor. Finally, I will give an account of my odyssey as an expert in the field of stroke

rehabilitation and also as an accomplished academic, a researcher and a trainer of trainers.

REHABILITATION

Rehabilitation, in the health care parlance, is the process of assisting someone to improve and recover lost function after an event, illness or injury that has caused functional limitations. It may also be defined as a set of interventions needed when a person is experiencing or is likely to experience limitations in everyday functioning due to ageing or a health condition, including chronic diseases or disorders, injuries or traumas. Rehabilitation enables individuals of all ages or conditions to maintain or return to their daily life activities, fulfil meaningful life roles and maximise their well-being. Rehabilitation is a highly person-centred health strategy that may be delivered either through specialised rehabilitation programmes (commonly for people with complex needs), or integrated into other health programmes and services, for example, primary health care, mental health, vision and hearing programmes. It is a highly integrated form of health care that complements other health interventions, such as medical and surgical interventions, helping to achieve the best outcome possible. Rehabilitation involves the identification of a person's problems and needs, relating the problems to relevant factors of the person and the environment; defining rehabilitation goals; planning and implementing the measures and assessing the effects.

Purpose of Rehabilitation

The purpose of rehabilitation is to restore some or all of the patient's physical, sensory, and mental capabilities that were lost due to injury, illness, or disease. Rehabilitation includes assisting the patient to compensate for deficits that cannot be reversed

medically. It is prescribed after various types of injury, illness, or disease, including amputations, arthritis, cancer, cardiac disease, neurological problems, orthopaedic injuries, spinal cord injuries, stroke, and traumatic brain injuries. Rehabilitation encompasses a broad spectrum of goals that include the prevention of loss of function; slowing the rate of loss of function; improvement or restoration of function; compensation for loss of function; and maintenance of current function. Specifically, rehabilitation is aimed at:

1. Enabling people living with disability reach and maintain their optimal physical, sensory, intellectual, psychological and social functional levels.
2. Providing disabled people with the tools they need to attain independence and self-determination.
3. Teaching people new skills to help manage their activities.
4. Keeping people out of hospital, or permanent residential care, unless this really is the right choice.
5. Promoting social and community reintegration and enhancing good quality of life.

The Benefits of Rehabilitation

Rehabilitation can reduce the impact of a broad range of health conditions, including diseases (acute or chronic), disorders, injuries or trauma. For example, rehabilitation can help to prevent complications associated with many health conditions, such as spinal cord injury, stroke, or a fracture. Rehabilitation can also help to minimise or slow down the disabling effects of chronic health conditions, such as cardiovascular disease, cancer and diabetes by equipping people with self-management strategies and the assistive products they require, or by addressing pain or other complications.

Rehabilitation is an investment, with cost benefits for both the individuals and society. It can help to avoid costly hospitalization, reduce hospital length of stay, and prevent re-admissions. Rehabilitation also enables individuals to participate in education and gainful employment, remain independent at home and minimise the need for financial or caregiver support.

Rehabilitation is an important part of universal health coverage and is a key strategy for achieving Sustainable Development Goal 3 – “Ensure healthy lives and promote well-being for all at all ages”.

Global Need for Rehabilitation

The world population is 7,837,000,000 billion as of 1st January 2021. Fifteen per cent (15%) of the world population (i.e. 1,175,550,000 people) are living with disability. Eighty per cent (80%) of them (i.e. 940,440,000 people) live in developing countries, including Nigeria. These people need different forms of rehabilitation. Current demographic and health trends are placing new demands on the health system, and as such the need for rehabilitation is rapidly growing. There is an increase in ageing populations, with the number of people over 60 years of age predicted to double by 2050. In addition, more people are living with non-communicable diseases and the consequences of injuries. The prevalence of non-communicable diseases alone has increased by 18% in the last 10 years. These health conditions often impact on an individual's functioning and are associated with increased levels of disability.

Affordability of health services and transportation are the two main reasons why people living with disability do not receive needed rehabilitation. A 2018 literature review found that there are significant unmet needs for

rehabilitation across all world regions, and in some countries, more than 50% of people who require rehabilitation services do not receive them. Several studies from Africa, for example, show that between 62.5% and 82.5% of those needing rehabilitation services don't receive them (Mozambique 62.3%; Malawi 76.2%, Zambia 62.5%; and Lesotho 82.5%).

Today, the demand for rehabilitation is going largely unmet due to a number of factors, including:

1. Lack of prioritisation, funding, policies and plans for rehabilitation at a national level.
2. Lack of available rehabilitation services outside urban areas, and long waiting times.
3. High out-of-pocket expenses and non-existent or inadequate funding mechanisms.
4. Lack of trained rehabilitation professionals, with less than 10 skilled practitioners per 1 million people in many low- and middle-income settings.
5. Lack of resources, assistive technologies and devices.
6. Lack of robust research and data on rehabilitation.
7. Lack of inter-professional teamwork.
8. Poor or lack-lustre advocacy.
9. Ineffective and under-utilised referral pathways to rehabilitation.

Integration of Rehabilitation into Health Systems

In 2017, WHO launched the Rehabilitation 2030 initiative, which calls for concerted and coordinated global action by all stakeholders to scale up rehabilitation. In order to achieve this, 10 priority areas for action were identified to strengthen health systems to provide rehabilitation. These action areas are:

1. Creating strong leadership and political support for rehabilitation at sub-national, national and global levels.
2. Strengthening rehabilitation planning and implementation at national and sub-national levels, including within emergency preparedness and response.
3. Improving integration of rehabilitation into the health sector and strengthening inter-sectoral links to effectively and efficiently meet population needs.
4. Incorporating rehabilitation in universal health coverage.
5. Building comprehensive rehabilitation service delivery models to progressively achieve equitable access to quality services, including assistive products, for all the population, including those in rural and remote areas.
6. Developing a strong multidisciplinary rehabilitation workforce that is suitable for country context, and promoting rehabilitation concepts across all health workforce education.
7. Expanding financing for rehabilitation through appropriate mechanisms.
8. Collecting information relevant to rehabilitation to enhance health information systems including system level rehabilitation data and information on functioning utilising the International Classification of Functioning, Disability and Health (ICF).
9. Building research capacity and expanding the availability of robust evidence for rehabilitation.
10. Establishing and strengthening networks and partnerships in rehabilitation, particularly between low-, middle- and high-income countries.

Misconceptions about Rehabilitation

- i. Rehabilitation is not a disability-specific service for those with long-term impairments, nor is it a service only for people with physical impairments. Rather, rehabilitation is a core part of effective health care for anyone with a health condition, acute or chronic, impairment or injury that limits functioning, and as such should be available for anyone who needs it.
- ii. Rehabilitation is not only delivered in specialised rehabilitation settings, but can also be highly effective when integrated in wider health programmes.
- iii. Rehabilitation is not a luxury or optional health service for those who can afford it. Nor is it a fallback strategy when preventive and curative interventions fail. For the full extent of the social, economic and health benefits of rehabilitation to be realised, timely and affordable rehabilitation interventions should be available to all. In many cases, this means commencing rehabilitation in the early phase of recognition of a health condition and continuing to deliver rehabilitation alongside other health interventions.

Examples of Rehabilitation

Some examples of rehabilitation are:

- a. Exercise training to regain coordination, dexterity and movement of an affected limb following a stroke.
- b. Early interventions to address developmental outcomes of a child with cerebral palsy, such as fitting an orthosis, or providing training in sensory integration and self-care, which in turn can improve participation in education, play, and family and community activities.

- c. Interventions that improve safety and independence at home and reduce the risk of falls for an older person, such as balance training or modifying their home environment.
- d. Interventions that optimise surgical outcomes after a hip fracture, including exercise prescription, provision of a walking aid and education about hip movements to avoid during the recovery process.
- e. Cognitive behavioural therapy and interventions aiming to increase exercise for an individual with depression.
- f. Environmental adaptation to enhance integration and functioning for people living with disability.
- g. Interventions that support daily activities and community access for individuals with vision loss, such as providing strategies to complete personal care tasks and training in the use of a cane.

Rehabilitation Professionals

There are broad ranges of health professionals who provide rehabilitation interventions. They include physiotherapists, occupational therapists, speech and language therapists, orthotic and prosthetic technicians, osteopaths, podiatrists, chiropractors, rehabilitation nurses, medical social workers, clinical psychologists and physical medicine and rehabilitation physicians. The range of professionals also includes engineers, psychologists, orthotists, prosthetists, and vocational therapists/counsellors. Family members are often actively involved in an individual's rehabilitation programme.

Rehabilitation nurses

Nurses specialising in rehabilitation help survivors relearn how to carry out the basic activities of daily living. They also educate survivors about routine health care, such as how to follow a medication schedule, how to care for the

skin, how to manage transfers between a bed and a wheelchair, and special needs for people with diabetes. Rehabilitation nurses also work with survivors to reduce risk factors that may lead to a second stroke, and provide training for caregivers.

Nurses are closely involved in helping stroke survivors manage personal care issues, such as bathing, feeding, grooming, preventing aspiration pneumonia and controlling incontinence. Most stroke survivors regain their ability to maintain continence, often with the help of strategies learned during rehabilitation. These strategies include strengthening pelvic muscles through special exercises and following a timed voiding schedule. If problems with incontinence continue, nurses can help caregivers learn to insert and manage catheters and to take special hygienic measures to prevent other incontinence-related health problems from developing.

Occupational therapists

Occupational therapists help the patient regain the ability to do normal everyday tasks. This may be achieved by restoring old skills or teaching the patient new skills to adjust to disabilities through adaptive equipment, orthotics, and modification of the patient's home environment. Occupational therapy may be prescribed to rehabilitate a patient after amputation, arthritis, cancer, cardiac disease, head injuries, neurological injuries, orthopaedic injuries, pulmonary disease, spinal cord disease, stroke, and other injuries/illnesses. The duration of the occupational therapy programme varies depending on the injury/illness being treated and the patient's response to therapy.

Occupational therapy includes learning how to use devices to assist in walking (artificial limbs, canes,

crutches, walkers), getting around without walking (wheelchairs or motorized scooters), or moving from one spot to another (boards, lifts, and bars). The therapist will visit the patient's home and analyse what the patient can and cannot do. Suggestions on modifications to the home, such as rearranging furniture or adding a wheelchair ramp will be made. Recommendations can also be made concerning health aids for bathing and grooming.

Speech therapists / Speech-language pathologists

Speech therapists help the patient correct speech disorders or restore speech. Speech therapy may be prescribed to rehabilitate a patient after a brain injury, cancer, neuromuscular diseases, stroke, and other injuries/illnesses. The duration of the speech therapy programme varies depending on the injury/illness being treated and the patient's response to therapy.

Performed by a speech-language pathologist, speech therapy involves regular meetings with the therapist in an individual or group setting and home exercises. To strengthen muscles, the patient might be asked to say words, smile, close his mouth, or stick out his tongue. Picture cards may be used to help the patient remember everyday objects and increase his vocabulary. The patient might use picture boards of everyday activities or objects to communicate with others. Workbooks might be used to help the patient recall the names of objects and practice reading, writing, and listening. Computer programmes are available to help sharpen speech, reading, recall, and listening skills.

Many specialised therapeutic techniques have been developed to assist people with aphasia. Some forms of short-term therapy can improve comprehension rapidly.

Intensive exercises such as repeating the therapist's words, practicing following directions, and doing reading or writing exercises form the cornerstone of language rehabilitation. Conversational coaching and rehearsal, as well as the development of prompts or cues to help people remember specific words, are sometimes beneficial. Speech-language pathologists also help stroke survivors develop strategies for circumventing language disabilities. These strategies can include the use of symbol boards or sign language. Recent advances in computer technology have spurred the development of new types of equipment to enhance communication.

Speech-language pathologists use noninvasive imaging techniques to study swallowing patterns of stroke survivors and identify the exact source of their impairment. Difficulties with swallowing have many possible causes, including a delayed swallowing reflex, an inability to manipulate food with the tongue, or an inability to detect food remaining lodged in the cheeks after swallowing. When the cause has been pinpointed, speech-language pathologists work with the individual to devise strategies to overcome or minimise the deficit.

Vocational therapists

Approximately one-fourth of all strokes occur in people between the ages of 45 and 65. For most people in this age group, returning to work is a major concern. Vocational therapists perform many of the same functions that ordinary career counsellors do. They can help people living with residual disability identify vocational strengths and develop resumés that highlight those strengths. They also can help identify potential employers, assist in specific job searches, and provide referrals to stroke vocational rehabilitation agencies.

Most important, vocational therapists educate disabled individuals about their rights and protections as defined by the Americans with Disabilities Act of 1990. This law requires employers to make "reasonable accommodations" for disabled employees. Vocational therapists frequently act as mediators between employers and employees to negotiate the provision of reasonable accommodations in the workplace.

Orthotist — This is a health care professional who is skilled in making and fitting orthopaedic appliances.

Prosthetist — This is a health care professional who is skilled in making and fitting artificial parts (prosthetics) for the human body.

PHYSIOTHERAPY

History of Physiotherapy

(1) British Perspective

The Chartered Society of Physiotherapy (CSP) was established in 1894 as the Society of Trained Masseuses by four nurses - Lucy Marianne Robinson, Rosalind Paget, Elizabeth Anne Manley and Margaret Dora Palmer - who wished to protect their profession (with an emphasis on high academic standards and a medical model for massage training) after stories in the press warned young nurses and the public of unscrupulous people offering massage as a euphemism for other services.

In 1900 the Society acquired the legal and public status of a professional organisation and became the Incorporated Society of Trained Masseuses. Under the new name of the Chartered Society of Massage and Remedial Gymnasts, the society was granted a Royal

Charter by King George V on 11 June 1920. In the same year, the Society amalgamated with the Institute of Massage and Remedial Gymnastics. Also in 1920, men were permitted to join the Society. The society adopted its present name in 1944.

In 1976, The Northern Ireland School of Physiotherapy at the Ulster College, Belfast started the first undergraduate course in physiotherapy. The London Hospital School of Physiotherapy which subsequently became the North East London Polytechnic began its degree course in 1981. In 1982 a degree course began at Queen's College, Glasgow. The Society is certified as an independent trade union. In 1987, Membership of the Chartered Society of Physiotherapy (MCSP) ceased to be a recognised qualification and was replaced by degree courses. In 1992, Physiotherapy became an all graduate entry profession. In 2002, the first physiotherapy consultant, Paul Watson, was appointed honorary consultant physiotherapist at University Hospitals of Leicester Trust.

(2) American Perspective

Physicians like Hippocrates and later Galen are believed to have been the first practitioners of physical therapy, advocating massage, manual therapy techniques and hydrotherapy to treat people in 460 BC. The earliest documented origins of actual physical therapy as a professional group date back to Per Henrik Ling, "Father of Swedish Gymnastics," who founded the Royal Central Institute of Gymnastics (RCIG) in 1813 for manipulation, and exercise. The Swedish word for a physical therapist is *sjukgymnast* (someone involved in gymnastics for those who are ill). In 1887, physical therapists were given official registration by Sweden's National Board of Health and Welfare. Other countries soon followed. In 1894, four

nurses in Great Britain formed the Society of Trained Masseuses which later became the Chartered Society of Physiotherapy. The School of Physiotherapy at the University of Otago in New Zealand in 1913, and the United States' 1914 Reed College in Portland, Oregon, which graduated "reconstruction aides", were two of the pioneer training institutions. Since the profession's inception, spinal manipulative therapy has been a component of the physical therapist practice.

Modern physical therapy was established towards the end of the 19th century due to events that had an effect on a global scale, which called for rapid advances in physical therapy. Soon following, American orthopaedic surgeons began treating children living with disability and began employing women trained in physical education, and remedial exercise. These treatments were applied and promoted further during the Polio outbreak of 1916. During the First World War, women were recruited to work with and restore physical function to injured soldiers, and the field of physical therapy was institutionalized. In 1918 the term "Reconstruction Aide" was used to refer to individuals practicing physical therapy. The first school of physical therapy was established at Walter Reed Army Hospital in Washington, D.C., following the outbreak of World War I. Research catalysed the physical therapy movement. The first physical therapy research was published in the United States in March 1921 in "The PT Review." In the same year, Mary McMillan organised the American Women's Physical Therapeutic Association (now called the American Physical Therapy Association (APTA)). In 1924, the Georgia Warm Springs Foundation promoted the field by touting physical therapy as a treatment for polio. Treatment through the 1940s, primarily consisted of exercise, massage, and traction. Manipulative

procedures to the spine and extremity joints began to be practiced, especially in the British Commonwealth countries, in the early 1950s. Around the time that polio vaccines were developed, physical therapists became a normal occurrence in hospitals throughout North America and Europe. In the late 1950s, physical therapists started to move beyond hospital-based practice to outpatient orthopaedic clinics, public schools, colleges/university health-centres, geriatric settings (skilled nursing facilities), rehabilitation centres and medical centres. Specialisation for physical therapy in the U.S. occurred in 1974, with the Orthopaedic Section of the APTA being formed for those physical therapists specialising in orthopaedics. In the same year, the International Federation of Orthopaedic Manipulative Physical Therapists was formed, which has ever since played an important role in advancing manual therapy worldwide.

(3) Nigerian Perspective

Physiotherapy was introduced into Nigeria in 1945 by two British Chartered Physiotherapists; Miss Manfield and Mr Williams. They were employed by the government of Nigeria and attached to the Royal (now National) Orthopaedic Hospital, Igbobi, Lagos. Their primary assignments were; first, to treat wounded and disabled Nigerian soldiers who returned home from Burma and other countries during World War II. Secondly, they were to start a training programme in physiotherapy. The three-year diploma course was attended by a number of Nigerians. On completion of the training and passing out of the school, they were designated as Assistant Physiotherapists. They were specifically asked to work strictly under the supervision of Chartered Physiotherapists who had trained in England.

With time, the training programme at Igbobi was discontinued. Just before then, plans were in progress to start a diploma course at University College Hospital, Ibadan. This was later changed to the Bachelor of Science degree programme in Physiotherapy at the University of Ibadan. The course took off in October 1966. The graduation of the foundation students in Ibadan in 1969 was a landmark in the annals of physiotherapy in Nigeria. Thus, the University of Ibadan was the first in Nigeria and West Africa, to award a degree in physiotherapy.

In 1971, the University of Lagos commenced a three-year diploma course, which was upgraded to Bachelor of Science degree programme in 1977. The University of Ife, Ile-Ife (now Obafemi Awolowo University) followed Ibadan and Lagos in 1977. The programme at Ile-Ife was a four-year Bachelor of Medical Rehabilitation. The University of Nigeria, Nsukka (Enugu Campus) also commenced a degree programme in 1987. In addition to Ibadan, Lagos, Ile-Ife, and Nsukka, the other universities with programmes in physiotherapy are Bayero University, Kano, University of Maiduguri and Nnamdi Azikiwe University, Awka, (Nnewi Campus). Physiotherapy training programmes had also commenced at the University of Benin, Benin City, Bowen University, Iwo, University of Ilorin and University of Calabar. As at 1st January 2021, the National Universities Commission (NUC) had also given approval for the physiotherapy training programmes at the Redeemer's University, Ede, Yobe State University, Damaturu and Kaduna State University, Kaduna.

The physiotherapy practice had spread all over the nation in the last five decades. The products of our universities are practising as physiotherapists in many

establishments in the country and abroad. Some are lecturers in universities in Nigeria and overseas. The vogue at home has gradually shifted from working in teaching, state and specialised hospitals to venturing into private practice by a handful of practitioners.

The Nigeria Society of Physiotherapy (NSP) was formed in 1959. Physiotherapy became a regulated profession in Nigeria when the Medical Rehabilitation Therapists (Registration) Board of Nigeria (MRTB) was inaugurated on Tuesday, December 29, 1992.

What is Physiotherapy?

Physiotherapy provides services to individuals and populations to develop, maintain and restore maximum movement and functional ability throughout the lifespan. This includes providing services in circumstances where movement and function are threatened by ageing, injury, pain, diseases, disorders, conditions or environmental factors. Physiotherapy is concerned with identifying and maximising quality of life and movement potential within the spheres of promotion, prevention, treatment/intervention, habilitation and rehabilitation. This encompasses physical, psychological, emotional, and social well-being. Physiotherapy involves the interaction between the physiotherapist, patients/clients, other health professionals, families, caregivers and communities in a process where movement potential is assessed and goals are agreed upon, using knowledge and skills unique to the physiotherapist.

Physiotherapists are known in some countries as physical therapists. They are experts in developing and maintaining people's ability to move and function throughout their lives. They promote wellness, mobility and independence with an advanced understanding of

how the body moves and what keeps it from moving well. They treat and prevent many problems caused by pain, illness, disability and disease, sport and work-related injuries, ageing and inactivity. Physiotherapists are educated over several years, giving them full knowledge of the body's systems and the skills to treat a wide range of problems. This education is usually university-based, at a level that allows physiotherapists to practise independently. Also, continuing education ensures that they keep up-to-date with the latest advances in research and practice.

Many people with long-term health conditions or disabilities lead fulfilled lives. But some do not, because they do not receive the right kind of support. This can be devastating to individuals and this waste of potential also has a cost to others: families, communities and the nation. This waste would have been prevented if such people had access to a wide range of professionals, including the physiotherapist, who would have provided the right kind of support needed to overcome the disabilities. Physiotherapists operate as independent practitioners, as well as members of health service provider teams. They are able to act as first contact practitioners, and patients/clients may seek direct services without a referral from another health care professional. The education and clinical practice of physiotherapists will vary according to the social, economic, cultural and political contexts in which they practise. However, it is a single profession, and the first professional qualification, obtained in any country, represents the completion of a curriculum that qualifies the physiotherapist to use the professional title and to practise as an independent professional.

Where is Physiotherapy Practised?

Physiotherapy is an essential part of the health and community/welfare services delivery systems. Physiotherapists practise independently of other health care/service providers and also within interdisciplinary rehabilitation programmes that aim to prevent movement disorders or maintain/restore optimal function and quality of life in individuals with movement disorders. Hence, physiotherapists practise in a wide variety of settings. The practice settings will vary according to whether the physiotherapy is concerned with health promotion, prevention, treatment/intervention or rehabilitation. Physiotherapists are guided by a professional code of ethical principles. Thus, they may have any of the following purposes:

1. Promoting the health and well-being of individuals and the general public/society.
2. Emphasizing the importance of physical activity and exercise.
3. Preventing impairments, activity limitations, participatory restrictions and disabilities in individuals at risk of altered movement behaviour due to health factors, socio-economic stressors, environmental factors and lifestyle factors.
4. Providing interventions/treatment to restore the integrity of body systems essential to movement, maximise function and recuperation, minimise incapacity, and enhance the quality of life, independent living and workability in individuals and groups of individuals with altered movement behaviour resulting from impairments, activity limitations, participatory restrictions and disabilities.
5. Modifying environmental, home and work access and barriers to ensure full participation in one's normal and expected societal roles.

Specialty Areas in Physiotherapy

The body of knowledge of physiotherapy is large. Therefore, physiotherapists may specialise in a specific clinical area. The following are the available specialty areas:

- Cardiopulmonary PT
- Musculoskeletal (Orthopaedic) PT
- Sports, Recreational and Health Promotion PT
- Neurological and Mental Health PT
- Paediatrics (Child Health) PT
- Geriatrics PT
- Women's Health PT
- Community Health PT
- Integumentary PT
- Aquatic Physical Therapy
- Ergonomics and Occupational Health PT
- HIV/AIDS, Oncology, Hospice and Palliative Care PT.

SURVIVAL OF THE FITTEST

Charles Darwin (full name Charles Robert Darwin) was born on February 12, 1809, in Shrewsbury, England. He died on April 19, 1882 in Downe, Kent. He was an English naturalist whose scientific theory of evolution by natural selection became the foundation of modern evolutionary studies. Darwin, at first, shocked religious Victorian society by suggesting that animals and humans shared a common ancestry. His non-religious biology appealed to the rising class of professional scientists, and by the time of his death evolutionary imagery had spread through all of science, literature, and politics. Darwin, himself an agnostic, was accorded the ultimate British accolade of burial in Westminster Abbey, London.

Darwin was the second son of society doctor Robert Waring Darwin and Susannah Wedgwood, daughter of

the Unitarian pottery industrialist Josiah Wedgwood. Darwin's mother died when he was eight, and he was cared for by his three elder sisters. He studied at Anglican Shrewsbury School between 1818 and 1825. He hated the rote learning of Classics at the school, and this was a time when science was considered dehumanising in English public schools. His father sent him to study medicine at Edinburgh University in 1825. Later in life, Darwin gave the impression that he had learned little during his two years at Edinburgh. In fact, it was a formative experience. Darwin was witnessing the social penalties of holding deviant views. The young Darwin learned much in Edinburgh's rich intellectual environment, but not medicine: he loathed anatomy, and surgery sickened him. His freethinking father, shrewdly realising that the church was a better calling for an aimless naturalist, switched him to Christ's College, Cambridge, in 1828. In a complete change of environment, Darwin was now educated as an Anglican gentleman. He obtained a Bachelor of Arts degree in 1831.

He went on a voyage around the world aboard *HMS Beagle* between 1831 and 1836. The circumnavigation of the globe would be the making of the 22-year-old Darwin. Five years of physical hardship and mental rigour, imprisoned within a ship's walls, offset by wide-open opportunities in the Brazilian jungles and the Andes Mountains, were to give Darwin a new seriousness. As a gentleman naturalist, he could leave the ship for extended periods, pursuing his own interests. As a result, he spent only 18 months of the voyage aboard the ship. On the last leg of the voyage, Darwin finished his 770-page diary, wrapped up 1,750 pages of notes, drew up 12 catalogues of his 5,436 skins, bones, and carcasses – and still he wondered: Was each *Galapagos*

mockingbird a naturally produced variety? Why did ground sloths become extinct? He sailed home with problems enough to last him a lifetime. But he now had the courage to look beyond the conventions of his own Victorian culture for new answers.

Darwin formulated his bold theory in private in 1837–39, after returning from the voyage, but it was not until two decades later that he finally gave it full public expression in *On the Origin of Species* (1859), a book that has deeply influenced modern Western society and thought. Darwin realised that population explosions would lead to a struggle for resources and that the ensuing competition would weed out the unfit. It was an idea he now applied to nature (he had previously thought that animal populations remained stable in the wild). Darwin called his modified Malthusian mechanism "natural selection." Nature was equally uncharitable, went the argument: overpopulated, it experienced a fierce struggle, and from all manner of chance variations, good and bad, the best, "the surviving one of ten thousand trials," won out, endured, and thus passed on its improved trait.

The phrase "Survival of the fittest" was coined by Herbert Spencer in 1864 after reading Charles Darwin's *On the Origin of Species*. It is a phrase that originated from Darwinian evolutionary theory as a way of describing the mechanism of natural selection. The biological concept of fitness is defined as reproductive success. In Darwinian terms, the phrase is best understood as "Survival of the form that will leave the most copies of itself in successive generations". In *On the Origin of Species*, Charles Darwin introduced the phrase in the fifth edition published in 1869, intending it to mean "better designed for an immediate, local environment", not the common modern meaning of "in the best physical shape". The phrase

"survival of the fittest" is often used to mean "natural selection". It is avoided by modern biologists because the phrase can be misleading. For example, survival is only one aspect of selection, and not always the most important. Another problem is that the word "fit" is frequently confused with a state of physical fitness. In the evolutionary meaning "fitness" is the rate of reproductive output among a class of genetic variants.

The phrase "Survival of the fittest" was also used by late Bob Marley in one of his popular reggae hits. "Could You Be Loved" is a song by reggae group Bob Marley & the Wailers. It was released in 1980 on their last album 'Uprising' and is included in Bob Marley & The Wailers greatest hits album 'Legend'. Excerpts from the song:

Don't let them change ya, oh! -
Or even rearrange ya!
Oh, no!
We've got a life to live
They say
Only
Only
Only the fittest of the fittest shall survive -
Stay alive! Ehh!

To be 'fit' in the real sense may not be as demanding as the Bible puts it in 1 Chronicles 12:8. But with a clear understanding of the phrase "Survival of the fittest" as coined by Herbert Spencer in 1864, adopted by Charles Darwin in 1869 and used by Bob Marley in 1980, we get a glimpse of its application in the life of an individual who has survived a stroke. Life is full of many challenges. These challenges take on different dimensions in the life of a stroke survivor. To survive a stroke entails being fit

before the attack, to continue to live after stroke demands being fit for life thereafter. So, what is a stroke?

What is a Stroke?

All parts of the body require adequate and uninterrupted supply of blood. A stroke or "brain attack" occurs when brain cells die because of inadequate blood flow. When blood flow is interrupted, brain cells are robbed of vital supplies of oxygen and nutrients. Stroke or cerebrovascular accident (CVA) is a sudden focal neurological deficit resulting from ischaemic or haemorrhagic lesions in the brain. It arises when blood flow to an area of the brain is hampered, either by a vessel clog or vessel rupture causing blood to leak into the brain tissue. The standard World Health Organization (WHO) definition of stroke is "A focal (or at times global) neurological impairment of sudden onset, and lasting more than 24 hours (or leading to death), and of presumed vascular origin". Stroke varies in severity from recovery in a day, through incomplete recovery, to severe disability, to death.

Stroke is a major health problem in every part of the world. It is the most life-threatening neurological condition of the elderly and the most common cause of adult disability. A large number of survivors are left with a variety of deficits, including impairments of sensory, motor, mental, perceptual and language functions. These significant disabilities among survivors have a great impact on healthcare and society. Stroke survivors often live with lasting effects of the impairments; and those with chronic stroke generally receive little or no rehabilitation due to a perceived motor recovery plateau.

Types of Stroke

There are two main types. An ischaemic stroke occurs when a blood vessel supplying blood to the brain is obstructed. It accounts for 87 percent of all strokes. The blood clot is often due to atherosclerosis, which is a buildup of fatty deposits on the inner lining of a blood vessel. A portion of these fatty deposits can break off and block blood flow in the brain. A haemorrhagic stroke occurs when a blood vessel in the brain ruptures or breaks, spilling blood into the surrounding tissues. Uncontrolled high blood pressure can cause weakening of the small blood vessels in the brain and result in haemorrhagic stroke.

Basic Facts on Stroke

Let us have a glimpse of some basic facts on stroke – summaries of many population studies from different parts of the world and fact sheets obtainable from organisations such as World Health Organisation, World Stroke Organisation, American Heart Association, American Stroke Association etc.

- Stroke affects people of all socio-economic strata.
- 1 in 4 people worldwide will suffer a stroke in their lifetime.
- Every two seconds one person in the world have a stroke.
- Every five seconds someone in the world dies as a result of stroke.
- Fifteen (15) million people suffer stroke worldwide each year.
- Stroke is the second single most common cause of death in the world causing 6.7 million deaths each year.
- Almost 1 in 8 (11.9%) deaths worldwide is caused by stroke.

- Stroke causes twice as many deaths a year in women as breast cancer.
- Stroke causes more deaths a year in men than prostate and testicular cancer combined.
- Stroke is the largest cause of complex disability - over half of all stroke survivors are left with a disability.
- Stroke has a greater disability impact on an individual than any other chronic disease.
- The burden of disease (disability, illness and premature deaths) caused by stroke is set to double worldwide by 2030.
- Physical inactivity and a sedentary lifestyle increase the risk of ischaemic stroke by 50%.
- Being overweight increases the risk of ischaemic stroke by 22% and being obese by 64%.
- Up to 80% of all strokes could be prevented if the risk factors are managed appropriately.
- Moderate exercise can reduce the risk of stroke by up to 27%.
- Studies have shown regular exercise to be as important to stroke prevention as medication.
- The greatest phase of recovery is usually within the first days and weeks after stroke – however, some improvements can still be made months and years after stroke.
- Neuroplasticity, the 're-wiring' or 're-routing' of the brain, has shown it is still possible to make improvements years after stroke.

World Stroke Day

Each year, **October 29** is observed as World Stroke Day to raise awareness and reduce the incidence of stroke across the world. The slogan for 2019 was: "1 in 4 of us will have a stroke. Don't be the one." The slogan for 2020 was "Join the movement, don't be the one". The latest

analysis of the Global Burden of Disease shows that the lifetime risk of stroke for over-25s has increased and now stands at 1 in 4. The objective of the yearly campaign is to emphasize the huge and increasing burden of stroke and raise awareness of strategies for prevention, treatment and rehabilitation.

Warning Signs of Stroke

Some people have no warning signs prior to a stroke or symptoms are so mild that they are not noticeable. Sometimes, people experience warning signs before a stroke occurs. The most common signs are:

- Weakness or numbness of the face, arm, or leg on one side of the body.
- Loss of vision or dimming in one or both eyes.
- Loss of speech, difficulty talking, or understanding what others are saying.
- Sudden, severe headache with no known cause.
- Loss of balance or unstable walking, usually combined with another symptom.

Detection of Stroke

A quick awareness that a person has suffered a stroke is very important. It ensures that the individual receives immediate attention and this will ensure full recovery and/or reduce the number and severity of impairments associated with stroke. The National Stroke Association (USA) came up with an easy way to recognise a stroke -

F.A.S.T.

- F: Drooping of one side of the "Face" when the person smiles.
- A: Difficulty in lifting both "Arms".
- S: Slurring of "Speech".
- T: If any of these signs are noticed, it's "Time" to call emergency.

Risk Factors for Stroke

The traits and lifestyle habits that increase the risk of a disease are called risk factors. They may indicate an association with increased likelihood of having a disease but the presence of risk factors should not be taken to imply causality. The modifiable risk factors for stroke are high blood pressure, atrial fibrillation, uncontrolled diabetes, high cholesterol, smoking, excessive alcohol intake, obesity and carotid or coronary artery disease. The non-modifiable risk factors for stroke are age (>65 years), gender (men have more strokes, but women have deadlier strokes), race (blacks are at increased risk) and family history of stroke. The risk of stroke is greater if one or more of the risk factors are present, or if the abnormality of any one factor is great.

Main Clinical Features of Stroke

Stroke survivors often face physical, emotional or cognitive challenges as a result of the stroke. Stroke affects each person in a different way. Patients may experience a range of physical limitations, including but not limited to:

- Difficulty with language and speech
- Vision problems
- Imbalance
- Difficulty swallowing
- Paralysis of one side of the body

Prevention of Stroke

Even where advanced technology and facilities are available 60% of those who suffer a stroke die or become dependent. Given these dismal statistics and the high cost of treatment of stroke, high priority should be accorded to preventive strategies. Strokes cannot be prevented completely, but by modifying risk factors, up to 80% of all strokes are preventable. The general

guidelines for the primary prevention of stroke emphasize the importance of lifestyle changes in reducing modifiable risk factors. The key prevention strategies include:

1. Reduce high blood pressure: High blood pressure increases the risk of stroke. It is the most important, most prevalent and most common risk factor for stroke. Hence, it is necessary to take medications as prescribed to reduce blood pressure and maintain it below 140/90 mm Hg.
2. Eat a healthy diet: It is essential to reduce the consumption of junk food, saturated fat and salt. Experts recommend eating Mediterranean-type diet that is high in olive oil, legumes, cereals, fruits, and vegetables; and low in saturated fat, cholesterol, and sodium.
3. Reduce obesity: Higher fat content in the body is another risk factor for stroke. Maintaining an ideal weight could prevent the occurrence of diseases such as high blood pressure and diabetes, both of which increase the risk for a stroke. Ideally, attempts should be made to keep body mass index (BMI) below 25 kg/m^2 .
4. Exercise regularly: Exercise is essential for stroke prevention. It ensures adequate blood flow through the arteries, reducing the risk of clot formation as well as that of other diseases that could be a potential risk factor for stroke. For optimal health, one may engage in exercises such as brisk walking, jogging, cycling, or swimming for 30 to 60 minutes at least four days a week.
5. Limit alcohol consumption: Studies indicate that having one drink a day might decrease the risk but having two increases stroke occurrence. It is advisable to reduce binge drinking and limit drinks to no more than one per day. One drink is defined as

12 ounces of beer or 5 ounces of wine, or $1\frac{1}{2}$ ounces of distilled liquor.

6. Treat atrial fibrillation: Atrial fibrillation causes irregular heartbeat which is a major inducer of clot formation – that clot can make its way to the brain and result in a stroke. Atrial fibrillation increases the risk of stroke by five times.
7. Control diabetes: High blood sugar negatively affects blood vessels by setting up a favourable environment for clot formation. Hence, blood glucose control should be encouraged.
8. Quit smoking: Smoking makes the blood thicker and induces plaque formation in the arterial walls, thereby increasing the probability for a stroke.
9. Do not use illegal drugs: It is essential to refrain oneself from using illegal drugs known to contribute to stroke. Such drugs include cocaine and methamphetamines.
10. Reduce stress: Stress is a generalised organismic reaction to situational demands. It is defined as the non-specific response of the body to any demand made upon it in order to maintain physiological equilibrium. We experience stress in daily activities. When it persists for a long time, it may lead to high blood pressure, which is an important risk factor for stroke.

Outcome of Stroke

About 20% of patients with stroke die within a month, the prognosis being much better for cerebral infarction than for intracerebral haemorrhage (about 10% vs 50% dead). Death is usually due to the brain lesion itself or indirect consequences of the brain lesion (pneumonia and pulmonary embolism) or concurrent cardiac diseases. After the first month, death can occur in 10% of the patients from further stroke or ischaemic diseases. Thirty

per cent of the patients may make a full recovery while 40% will have a residual neurological deficit. Among the survivors, predictors of final recovery are the initial mild deficit, no cognitive impairment and the patient's age. Poor prognosis is associated with incontinence and poor premorbid status of the patient.

The pattern of recovery after stroke is this: Ischaemic infarct lesions present suddenly and the full extent of the initial injury is apparent. The extensive impairment initially seen in haemorrhagic stroke is due to localised inflammation and the initial recovery in this type of stroke can be attributed to the resolution of this inflammation. The majority of the patients who do not regain consciousness within 24 hours after the CVA may not regain consciousness. For those who regain consciousness, greatest recovery may occur in the first 3 months. Thereafter, the potential for improvement may exist for many months or years. More people are surviving the initial stroke with disabilities which might have been minimised if they had received the kind of early, intensive physical rehabilitation that researchers find can improve function and reduce long-term disability.

Factors determining recovery include:

1. Premorbid lifestyle of the patient.
2. Stable medical condition.
3. Age of the patient.
4. Size and site of lesion.
5. Cognitive status of the patient.
6. Social support system.
7. Patient's personal motivation.
8. Bladder and bowel function status.
9. Comorbidity control.
10. Availability of specialised care, e.g. Acute Stroke Units (ASU).

Causes of Death from Stroke

Stroke carries a high risk of death. Predictors of death from stroke include prior strokes, atrial fibrillation, high blood pressure (SBP>160mmHg), impaired glucose tolerance, cigarette smoking and coronary heart disease.

Resumption of General Activities after Stroke

Resuming work

Unless the stroke has reduced their awareness of impairment, the stroke survivor is the best judge of when to return to work or other regular activities. How soon a person can return to work after a stroke depends partly on their level of disability, the type of work involved and any feelings about returning to work they might have. Some people feel quite tired after a stroke, and have difficulty carrying out any kind of physical activity for any length of time. Part-time work, at least in the early stages, may be a good idea.

Returning to school

An individual with a stroke may have physical and/or cognitive changes that may affect return to school. The parent/legal guardian should contact the school to request an evaluation to determine their student's educational needs. It may be necessary to have an individualised education plan (IEP), which allows a student to have therapy services at school, transportation, one on one aide, and time spent outside of the regular education classroom, in a classroom more specialised for a student with a disability.

Driving

Even someone who appears to have made a full recovery after a stroke should not drive a car for at least one month, since the risk of another stroke is greatest

during this time. Stroke can affect skills that are important for safe driving such as reaction time, ability to multi-task, visual and perceptual skills. Also, a stroke may have left subtle impairments, not always apparent, such as poor coordination, lack of awareness on one side, difficulties in judging distance, difficulties in concentration and confusion between left and right. In many countries, there may also be the need to take into account relevant government regulations guiding return to driving after stroke. Sometimes it is recommended that a more extensive driving evaluation be conducted at a facility that specialises in driving evaluations after a stroke.

Sexual activity

People who have had a stroke are encouraged to resume sexual activity. Most couples experience some difficulty in their sex life, but this is usually due to psychological factors rather than any disability caused by the stroke. However, the stroke survivor may need to seek medical intervention to deal with sexually related problems such as erectile dysfunction (ED).

Sport and exercise

Physical activity and hobbies are an important part of rehabilitation. Such activities should be resumed as soon as physically possible. For safety reasons, stroke survivors should only engage in exercise under the supervision of a suitably qualified professional. Also, they should not engage in contact sports and activities which carry a high risk of falling.

Alcohol consumption

Drinking excessive amounts of alcohol should be avoided after a stroke because it may trigger an adverse reaction with medication and might raise blood pressure or affect

judgment resulting in injury. Alcoholic consumption should be moderate (i.e. 2 standard drinks per day).

Factors that could Interfere with the Quality of Life after Stroke

Fatigue

Fatigue is a very common side effect after a stroke. About 25% of stroke survivors experience extreme fatigue post-stroke. An additional 33% experience moderate fatigue post-stroke. The effects of stroke-related fatigue can continue for many years, and this will affect the quality of life after stroke.

Fear of another stroke

If a person has had a stroke, their risk of having another increases. It is estimated that one-fourth of people who have had a stroke will have another within five years. More than half (60%) of stroke survivors live in this fear of another stroke and this may interfere with life after stroke.

Stigmatisation

Many stroke survivors find it difficult to talk about their stroke and its effect on their lives. They feel friends and family treat them differently. This feeling tends to affect the type of life they live after stroke.

Inability to meet family commitments

After a stroke, many individuals are unable to care for their family in the same way as before. Closely related to this is the fact that many had broken up with their partners or considered doing so.

Chronic pain

Chronic pain is one of the most disturbing sequelae of stroke. It interferes with and slows down the rehabilitation process. The shoulder is a particularly vulnerable part as far as pain is concerned. Hence, quality of life post-stroke is diminished.

Fear of falls

Patients with stroke who have balance problems are prone to falls. The fear of falls has a negative effect on the patient's motivation and this will slow down the rehabilitation.

Post-stroke depression

Post-stroke depression (PSD) is a common and serious complication after stroke. According to epidemiological studies, nearly 30% of stroke survivors develop depression, either in the early or in the late stages after stroke. Although depression may affect the functional recovery and quality of life after stroke, such condition is often ignored. In fact, only a minority of patients is diagnosed and even fewer are treated in common clinical practice. Individuals with PSD are at a higher risk for suboptimal recovery, recurrent vascular events, poor quality of life, and mortality. Although PSD is prevalent, uncertainty remains regarding predisposing risk factors and optimal strategies for prevention and treatment.

Post-stroke suicide thoughts

Stroke survivors with previous mood disorders and who have post-stroke depression are at particular risk for suicidal thoughts. Having had a stroke not only increases the risk of suicidal thoughts, but also the risk of suicide. Studies have shown that suicide risk is particularly high in relatively young patients and becomes higher with time (years) after stroke. Studies have shown that patients

living alone at stroke onset had an increased risk of attempted suicide compared to married or cohabiting patients. Moreover, patients with primary or secondary school education and patients with low and middle income also had an increased risk compared with university-educated and high-income patients. Stroke severity (being drowsy or unconscious on hospital admission) was another factor related with the risk of attempted suicide. Stroke type and comorbidities (diabetes, atrial fibrillation, and previous stroke) were not significantly associated with attempted suicide. Patients born outside Europe had a markedly lower risk of attempted suicide.

Traditional beliefs about stroke

Spiritual and traditional beliefs have a significant place in stroke rehabilitation in Africa. The meaning attached to the cause of an illness will determine the type of treatment contemplated thereafter. In the traditional African setting, the belief is that most illnesses are not due to natural occurrence but to factors such as voodoo, the wrath of the ancestors or spiritual attack by enemies. So, as far as stroke is concerned, it appears that when people have difficulties in identifying its real cause, the easy way out is to attribute the cause to somebody or some supernatural powers. Traditionally, the cause of stroke is traceable to spiritual attacks, like witches and wizards, spells, voodoo, juju etc. Because of this, many people do not believe that hospitals have facilities for satisfactory treatment. Hence, they usually resort to the use of herbs and prayers. The factors influencing the choice between the spiritual or traditional approach and formal healthcare include traditional or religious inclination, level of education, hospital cost and hospital-related ill-treatment. Whatever the choice that is made, this has a great influence on life after stroke.

Restrictions in participation and autonomy

Many stroke survivors perceive and actually experience restrictions in the participation of everyday activities. They also feel a loss of personal autonomy. The barriers to free participation in activities may be environmentally-imposed or family-imposed. All of these will have an effect on life after stroke.

Life after Stroke; Is It Really more than a Survival of the Fittest?

Surviving a stroke is only a starting point of the individual's fight for full and independent life. Stroke recovery is a lifelong process. Life after stroke describes the wide plethora or a complex mix of events, activities, physical and psychosocial conditions that typify a stroke survivor. Life may look like a mere four-letter word but has an ocean of meanings hidden in it. For a stroke survivor, this paradox has found a place – a place where no two stroke survivors meet.

We may then pose this all-important question: **Life after Stroke; is it really more than a survival of the fittest?**

The answer is **YES**. This is because life after stroke involves living with a number of impairments. These include:

1. Impairment of motor function: The common picture at the early stages of stroke is flaccidity with no voluntary movement. This is later replaced by spasticity, hyper-reflexia and mass patterns of movement (synergies).
2. Impairments in sensation: People with stroke may experience impairments in sensation, on the hemiplegic side which rarely disappears. Loss of superficial touch, pain and temperature sensation is common and it accounts partly for the risk of self-injury.

3. Paralysis of one side of the body: Usually, there is paralysis of the muscles on one side of the body, contralateral to the side of the brain in which the lesion occurred. This is called *hemiplegia*. One-sided weakness is called *hemiparesis*.
4. Pain: Pain is common and it is one symptom that gives great concern to patients with stroke e.g. shoulder pain syndrome.
5. Cognitive impairments: These include memory impairment, reduced attention span and reduced motivation.
6. Communication impairments: The speech centre is located in the cortex of the dominant hemisphere (typically the left hemisphere). If the lesion affects this region, the patient may have speech and language impairments.
7. Functional loss: Patients with stroke have significant problems with mobility skills such as rolling, sitting up, standing up, transfers and walking. Basic activities such as feeding and dressing are also affected.
8. Neglect/Inattention: Hemispatial neglect is the lack of awareness of one side of the body or a lack of response to stimuli on one side. Hemispatial inattention is a difficulty with attention to stimuli on one side of the body.
9. Gait dysfunction: Post-stroke hemiplegic gait is a mixture of deviations and compensatory motion dictated by residual functions. The patient stands with unilateral weakness on the affected side, arm flexed, adducted and internally rotated. Leg on the same side is in extension with plantar flexion of the foot and toes. When walking, the patient will hold his or her arm to one side and drags his or her affected leg in a semicircle (circumduction) due to weakness

of distal muscles (foot drop) and extensor hypertonia in the lower limb.

10. Sexual dysfunction: Strokes are rarely a direct cause of sexual dysfunction. But some factors may contribute to sexual dysfunction post-stroke. They include fear of another stroke, immobility and depression.
11. Balance disturbance: Balance is the ability to maintain a centre of gravity over the base of support; it is often severely affected following a stroke. Balance difficulties and falls are two of the serious medical complications associated with a stroke. The ability to regain functional motor skills and increase the intensity of exercise and practice in rehabilitation centres around the acquisition of balance.
12. Psychological and emotional dysfunction: A large number of people struggle with psychological and psychosocial issues and depression following a stroke. Depression, grief, and sadness have an enormous impact on stroke survivors and their caregivers. People who were accustomed to living independently suddenly become reliant on others – either voluntary or hired. This results in physical, psychological, and financial adjustments that must be made to their day-to-day life.
13. Fatigue: Post-stroke fatigue is very common and may continue for many years after a stroke. Post-stroke fatigue is not like typical tiredness. Unlike usual tiredness, post-stroke fatigue does not always improve with rest and it is not related to how busy or active the patient has been.
14. Bladder and bowel dysfunction: It is common for people to have problems controlling their bladder and/or bowels after a stroke. Though initially very distressing, these problems often resolve with time.

Besides biological dysfunctions, stroke survivors also face a lot of psychosocial challenges – fear of being a burden, social isolation, stigmatisation, job loss, financial lack etc. There is deprivation of personal freedom which soon leads to burden, apathy and depression.

Hence, to remain alive and continue to enjoy a meaningful life after stroke, the individual must be able to overcome or live with these impairments. This is a Herculean task and it takes real physical and mental fitness to be able to do it. So, **it is really more than a survival of the fittest.**

Caregiving for the Stroke Survivor

Every stroke survivor needs to be cared for by at least one other person. Studies have shown the importance of caregivers' role but have also pointed to the negative impact of caregiving, including an overwhelming feeling of hopelessness or transferred aggression. Because of the great dependency on caregivers, with time caregivers become burdened, and maybe depressed because of slow recovery and longtime caring. Caregivers would have experienced significant life changes after their loved one has had a stroke. They too struggle with meeting new challenges and are searching for new paths to happiness, health, and independence. In order for caregivers to effectively help with their stroke survivor's rehabilitation and life circumstances, they must first look after their own physical and mental well-being. A caregiver's attitude is important to the health and well-being of the person for whom they care. As the caregivers take care of their stroke survivors, they must also take care of themselves. It is important to eat well, get enough sleep, manage stress, and continue to make time for enjoyable things. Caregivers are not being selfish by tending to their own needs, rather they are ensuring

that they can be the best possible caregiver without compromising their own well-being.

The Stroke Survivor and Their Spouse

There are limited physical functioning and personality changes after stroke. The first person to perceive this is the spouse. For the survivor and his/her spouse, the common emotions are shock, helplessness and worry. Immediately after a stroke, it is not unusual for the partner to feel overwhelmed, fearful and uncertain about their new role as a caregiver. Fear of another stroke is common and the spouse must recognise that it is their duty to help prevent it. Stroke alters the relationship between the survivor and their loved one. In addition to previous responsibilities, the spouse may have to take on more household chores and other tasks that the stroke survivor once handled.

Stroke Rehabilitation

For most acute conditions, discharge from the hospital means that the patient has almost or completely recovered. But when it comes to stroke, discharge is just the beginning of a journey towards recovery. Following a stroke, rehabilitation is important to promote function and prevent secondary complications. A major focus of rehabilitation is a motor function which happens to be a goal for moderate to severe strokes which constitute about 60% of strokes. It should be noted that a major part of the expenditure related to stroke arises from a lengthy rehabilitation period. As far as stroke rehabilitation is concerned, it is important to take note of the followings:

1. Most motor and functional recoveries take place within 3 to 6 months post-stroke. Therefore, strategic targeting of this period is important in rehabilitation.

2. Rehabilitation matched with healthy lifestyle modification will help stroke recovery and help prevent a second stroke.
3. Immediate and intense rehabilitation, even while the patient is still hospitalised, is critical in stroke recovery. **This should be the standard practice.**
4. The new paradigm shift in the clinical management of stroke survivors emphasized shared decision making with patients, relatives and caregivers.
5. Rehabilitation of stroke survivors is multidisciplinary in nature, involving a team of rehabilitation specialists with a collaborative and integrated plan of care.

Rehabilitation of stroke survivors involves physicians (neurologists), physiotherapists, occupational therapists, speech-language therapists, rehabilitation nurses, medical social workers, psychologists and recreational therapists. The long-term goal of rehabilitation is to help the stroke survivor become as independent as possible. To achieve this, the physiotherapist employs many rehabilitation approaches. In chronic patients with stroke, the following rehabilitation approaches have been studied and are recommended: muscle strengthening exercises, constraint-induced movement therapy, mirror therapy, mental practice with motor imagery, high frequency-transcutaneous electrical nerve stimulation, repetitive transcranial magnetic stimulation, transcranial direct current stimulation, and virtual reality. For some Neurorehabilitation approaches, the severity of the initial motor deficit may impact the feasibility and effectiveness of the intervention. This is apparent for muscle strengthening exercises, constraint-induced movement therapy and virtual reality interfaces.

Rehabilitation Facilities

Many stroke survivors return home after acute care in a hospital setting. Others may move into specialised facilities for the continuation of care. At the time of discharge from the hospital, the usual practice is for the patient and family to arrange with hospital social workers to locate a suitable living arrangement.

Home-based rehabilitation facility

This involves undergoing treatment at home and it gives the patient the advantage of practising skills and developing compensatory strategies in the context of their own living environment. Home rehabilitation allows for great flexibility so that patients can tailor their rehabilitation programme and follow individual schedules. Stroke survivors may participate in an intensive level of therapy several hours per week or follow a less demanding regimen. The major disadvantage of home-based rehabilitation programmes is the lack of specialised equipment.

Inpatient rehabilitation units

Some hospitals have inpatient facilities where patients may stay for some time and engage in a coordinated, intensive rehabilitation programme. Such programmes often involve at least 3 hours of active therapy a day, 5 or 6 days a week. Inpatient facilities offer a comprehensive range of services, including full-time physician supervision and access to the full range of therapists specialising in post-stroke rehabilitation.

Outpatient units

Outpatient facilities are often part of a larger hospital complex and provide access to physicians and the full range of therapists specialising in stroke rehabilitation. Patients typically spend several hours, often 3 days each

week at the facility taking part in coordinated therapy sessions and return home at the end of treatment. Comprehensive outpatient facilities frequently offer treatment programmes as intense as those of inpatient facilities, but they also can offer less-demanding regimens, depending on the patient's physical capacity.

Nursing facilities

Skilled nursing facilities usually place a greater emphasis on rehabilitation. Services available at such facilities are more variable than are those at inpatient and outpatient units. In addition, fewer hours of therapy are offered compared to outpatient and inpatient rehabilitation units.

Complementary and Alternative Therapies for Stroke

Complementary and alternative therapies may be used by stroke survivors for recovery of functional status and pain relief. Some of these therapies have a scientific basis. They include:

- Acupuncture – for relief of pain and reduction of depression.
- Yoga – for balance and coordination
- Tai Chi – to improve balance
- Massage Therapy – to improve fine motor skills
- Aromatherapy – to relieve stress
- Herbal Supplements – to improve neurological functions

MY JOURNEY AS AN EXPERT IN THE FIELD OF STROKE REHABILITATION

In my odyssey as a physiotherapy expert in the field of stroke rehabilitation, I have utilised some approaches to assist stroke survivors regain lost functions and live independent lives after stroke. Specifically, I have directed most of my efforts to the use of exercise training – a simple therapeutic approach which has been found to

bring about desirable effects in patients with stroke. Many exercise training modalities are available for use during the rehabilitation of patients with stroke. These modalities include overground walking, treadmill walk, stair climbing and bicycle ergometry (arm, leg). Findings from different clinical studies had demonstrated the effects of these modalities on the recovery of function in patients with stroke. My contribution to the care of stroke survivors had culminated in the writing of a book: **There is life after stroke: A concise handbook for stroke survivors and the general public.**

In collaboration with my colleagues, we have explored different studies and the results of these studies have great implication for clinical practice. Time and space will permit me to present the results of only seven (7) of the studies:

1. Strengthening of muscles of the affected lower limb improved some gait parameters in patients with stroke

Individuals with stroke went through a 6-week exercise training regimen for the affected lower limb muscles. The exercise training resulted in improvement in the strength of the affected muscles and increases in gait parameters such as stride length, step length, natural gait speed and maximal gait speed.

2. There is a relationship between dynamic balance and the muscular strength of the unaffected lower limbs in patients with stroke

In this study, patients with stroke were measured individually on dynamic balance and muscular strength of the unaffected hip flexors, hip extensors, knee flexors and knee extensors. It was concluded that rehabilitation

for patients with stroke should include balance training; and the training should also involve the unaffected limbs.

3. Exercise training improves balance and reduces incidence of falls in patients with stroke

Patients with stroke who have balance problems are prone to falls. Participants in this study went through balance-specific exercise training for 8 weeks. The training resulted in significant improvement in balance and clinical reduction in the incidence of falls. It was concluded that balance impairments in patients with stroke should be addressed with balance-specific exercise training in order to reduce the incidence of falls.

4. Early physiotherapy rehabilitation enhances recovery of mobility in adult patients with stroke

Restoration of walking plays a prime role in the rehabilitation of stroke survivors. The earlier the rehabilitation programme is started, the better the gains made by the patient. In this study, patients with stroke went through an 8-week early physiotherapy management with an emphasis on mobilisation and functional activities. It was concluded that the recovery of mobility was enhanced by early physiotherapy rehabilitation.

5. Exercise training improves walking function in stroke survivors

In this study, we explored the effects of a 12-week treadmill walk and overground walking exercise training for recovery of walking speed and walking endurance in stroke survivors. The results of the study are: (a) Structured treadmill and overground walking exercise training, combined with conventional rehabilitation,

improved walking function in adult stroke survivors. (b) Overground walking showed therapeutic responses similar to those of treadmill walk and its use may be worth exploring for economic reasons.

6. Patients with stroke have chronic pain which may affect their health-related quality of life

Chronic pain is one of the most disturbing sequelae of stroke. In this study, we determined the correlation between post-stroke pain and health-related quality of life of stroke survivors. It was observed that chronic pain is very common in patients with stroke; and the pain has a significant impact on all domains of health-related quality of life of stroke survivors.

7. There are some predictive factors that could influence community reintegration in patients with stroke

People with stroke are faced with gait and balance difficulties which could impact on their community reintegration. In this study, we evaluated the predictors of community reintegration in patients with stroke. It was observed that community reintegration is influenced by cadence, functional mobility, balance self-efficacy, community balance/mobility and duration of stroke. Hence, improving balance and mobility during rehabilitation is important in enhancing community reintegration in patients with stroke.

Research Collaborations

In my academic pursuit, I have enjoyed the opportunity of working with other brilliant academics and researchers in inter-departmental and inter-faculty research activities. Time and space will permit me to present the results of two (2) of such collaborations.

1. In collaboration with Professor N.U. Okubadejo of Department of Medicine and Dr F.O. Awobajo of Department of Physiology, we designed a study to evaluate the recovery of hand function and monitor response to treatment with the use of biomarkers following somatosensory stimulation and task-oriented exercise training in patients with stroke. The recovery of hand motor function is considered to be of key importance during the rehabilitation of stroke survivors. Hence, physiotherapists employ different rehabilitation approaches to improve arm and hand motor function in stroke survivors. One unique technique is somatosensory stimulation therapy (SS), which is an experimental therapy that aims to utilise neural plasticity mechanisms to aid in the recovery of function after stroke. It utilises rapid stimulation of nerves in a section of skin to drive neuronal changes in the body. The nerves are electrically stimulated in a fashion referred to as coactivation. Somatosensory stimulation (SS) is a potential adjuvant to stroke rehabilitation but the mechanisms underlying its effect remain unknown. The application of biomarkers to assess a patient's clinical status and to guide therapy is an emerging and rapidly evolving field. A biomarker is any measurable physiological characteristic or substance that marks the risk for or manifestation of a stroke-related process. In this on-going study at the Lagos University Teaching Hospital, we are employing somatosensory stimulation and task-oriented exercise training to assist recovery of hand function in patients with stroke. Preliminary results indicated that low frequency and high frequency electrical stimulation combined with task-oriented exercises are effective for improving hand function in stroke survivors. The study is funded with a research grant (Ref No: 2018/01) from the Central Research Committee of University of Lagos.

2. I was also part of collaborative work in the Department of Paediatrics with Prof C.A.N. Okoromah, Prof. E.N. Ekure and Dr Ogochukwu Sokunbi. This cross-sectional study was aimed to determine the prevalence and distribution of abnormal ECG patterns in young athletes and controls. The study was conducted between November 2014 and July 2015; participants were 360 in number (180 athletes and 180 controls) and they were recruited from six secondary schools in Lagos, Nigeria. The evaluation included interviewer-administered questionnaires for relevant history, physical examination and resting 12-lead ECG for each participant. Abnormal electrocardiographic patterns were found in 48.3% of athletes and 35.6% of controls. Training-related ECG findings occurred in 40.6% of athletes and 27.8% of controls. Athletes and controls had 7.7% prevalence of training un-related ECG patterns respectively. Left ventricular hypertrophy was the most common ECG finding among athletes. Male athletes had a higher prevalence of ECG abnormalities. Participants had a high prevalence of training-related ECG patterns and similar proportions of ECG findings suggestive of underlying structural heart disease. It was recommended that cardiovascular evaluation inclusive of ECG should be performed for secondary school athletes prior to competition at any level and should also be considered part of the assessment prior to school entry for all children as this may be the only opportunity to detect some life-threatening cardiovascular pathologies.



Fig. 1: Treadmill walk and overground walking exercise training for stroke survivors



Fig. 2: Somatosensory stimulation of the hand in a stroke survivor

MY JOURNEY AS AN ACADEMIC PHYSIOTHERAPIST

This journey formally started on 22nd December 1997 when I joined the teaching staff of the Department of Physiotherapy, College of Medicine, University of Lagos. During this period I have been involved in teaching and conducting practical / clinical classes in physiotherapy for students at the undergraduate and postgraduate levels; as well as the assessment of students on continuous and end-of-semester basis. I have also engaged myself in the conduct of research in physiotherapy including supervision of students' research projects. Another area in which I have made a significant contribution is curriculum development. I have been involved in the development of undergraduate and postgraduate curricula for physiotherapy; I was a member of the committee that developed the curriculum for the Bachelor of Radiography degree programme of the University of Lagos; and a co-opted member of the committee that developed the curriculum for the Bachelor of Nursing Science degree programme of the University of Lagos.



Fig. 3: Inaugural lecturer with 2004 graduating set of Physiotherapists @ University of Lagos

My service as an academic physiotherapist goes beyond the four corners of the University of Lagos. It is on record that I have been invited and served as external examiner at **ALL** the universities in Nigeria with physiotherapy curricula and which had been graduating students as at December 2020. Among these universities are – the University of Ibadan, Ibadan; Obafemi Awolowo University, Ile Ife; Bayero University, Kano; University of Nigeria, Nsukka (UNEC); Nnamdi Azikiwe University, Awka (Nnewi Campus); and University of Maiduguri, Maiduguri. I wish to recollect a sad and unfortunate incident in 2011 in the course of one of my trips as an external examiner in which I almost lost my life. Travelling by road from Gombe to Maiduguri via Biu, my entourage was attacked by armed bandits at about 7.00 pm, a few kilometres to Maiduguri. God supervened and we all escaped unhurt. We lost material items including clothes, phones and marked students' projects but no life was lost.

In the course of my journey as an academic physiotherapist, I also served **The Commonwealth** as a technical expert under the Commonwealth Fund for Technical Cooperation (CFTC) between January 2005 and January 2008. This assignment was to plan and run the B.Sc. Programme in Physiotherapy at the School of Allied Health Sciences, College of Health Sciences, University of Ghana. I carried out this duty successfully and, with my UNILAG experience, the stamp of the University of Lagos remains indelible on the physiotherapy curriculum of the University of Ghana. In celebration of my success the then National Executive Council of the Nigeria Society of Physiotherapy (NSP) gave me the unofficial title of "Physiotherapy Ambassador to Ghana". Below is the message I sent to the World Confederation for Physical Therapy (WCPT) to

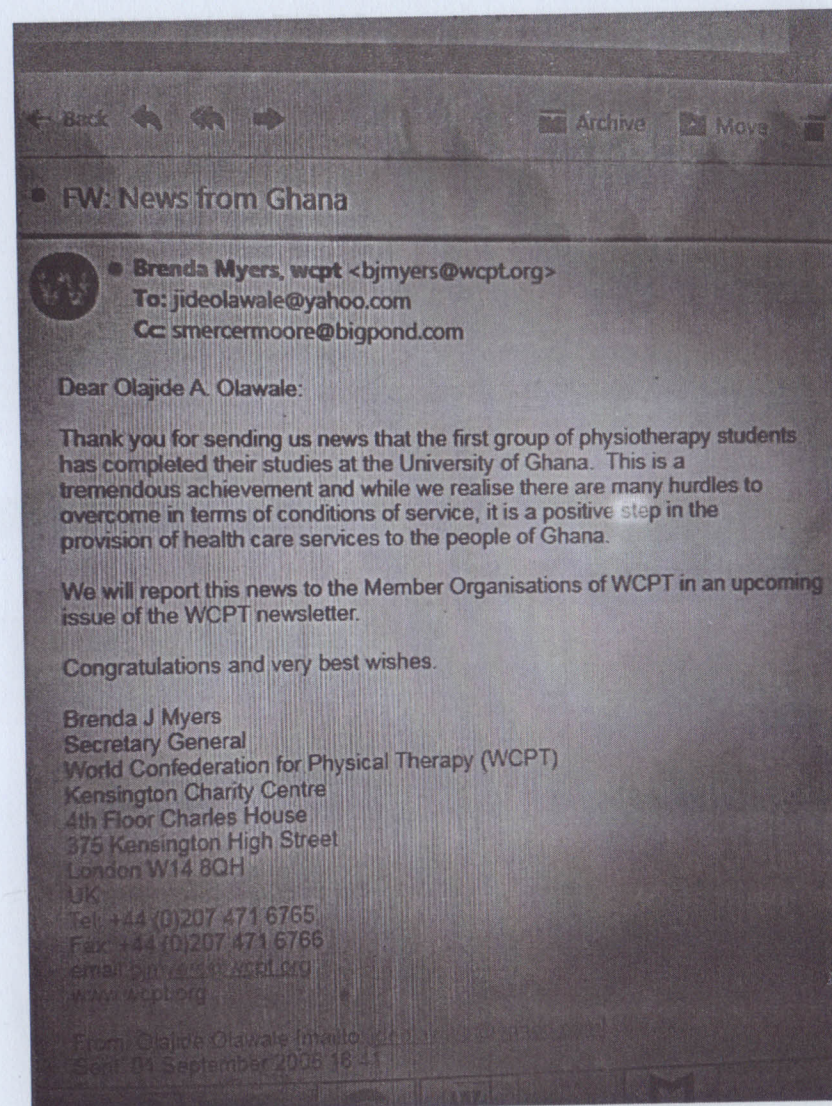
announce the graduation of the first set of locally trained physiotherapists in Ghana – a result of my assignment.

FIRST GHANA TRAINED PHYSIOTHERAPISTS PASSED OUT

The first batch of physiotherapists trained at the University of Ghana had completed their studies. The fresh graduands will soon start their internship after completion of employment formalities with the Ghana Health Service. This is a landmark achievement as the 13 fresh physiotherapists will be the first set of physiotherapists to be trained locally in Ghana - a country with about 35 physiotherapists to a population of 20 million. The few physiotherapists currently working in the country's major hospitals were trained abroad - mainly in Romania, Holland, Germany and England. The injection of the fresh graduates into the country's health care system is going to be beneficial to the country, since it would help improve upon quality physiotherapy service delivery. If the training programme is sustained, patients in various parts of the country will now have access to physiotherapy service instead of travelling abroad since they would get equally good service at home. Ghana's Ministry of Health should be commended for instituting the B.Sc. Physiotherapy training programme under the School of Allied Health Sciences, University of Ghana. Also, the Commonwealth Secretariat in London deserves commendation for sending an expert in Physiotherapy education, through the Commonwealth Fund for Technical Cooperation (CFTC), to assist the training programme. However, efforts should be made to keep the fresh graduates from seeking greener pastures abroad as the condition of service for physiotherapists in Ghana is nothing to write home about. On average, a physiotherapist currently earns about US\$250 monthly. Sgd.

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- And the reply from WCPT.



One important aspect of the Commonwealth Fund for Technical Cooperation (CFTC) assignments is that the CFTC expert must ensure human capacity development of the place of assignment. The importance of this is to ensure that the project can enjoy continuity after the

completion of the assignment. In fulfilment of this, I facilitated the recruitment of three lecturers (2 Ghanaians and 1 Nigerian) into the programme before the end of my stay. As at today one of them is an Associate Professor and two are Senior Lecturers. I also ensured that three (3) students among the first set of graduates of the programme were employed as Senior Research Assistants and later converted to Assistant Lecturers. It is worthy of note that two of them had obtained their PhD degrees as at today.



Fig. 4: Inaugural lecturer with 1st set of Physiotherapists trained at the University of Ghana (2005)

The narration of my journey as an academic will not be complete without mentioning my accomplishments as a mentor and a trainer of trainers. I have lost count of the number of undergraduate and postgraduate students who had, at one time or the other, been under my tutelage. They are now occupying different academic and clinical positions in Nigeria and abroad.

RECOMMENDATIONS

1. Government at various tiers and health professionals should implement public education programmes to increase awareness of stroke symptoms with an emphasis on at-risk populations.
2. Implementation of public education initiatives with an emphasis on quick identification of stroke attack and getting patients to the right hospital as quickly as possible.
3. There is a need to put in place, at various governmental levels, a stroke system of care which should provide comprehensive post-stroke care including primary care and specialised stroke services such as physical, occupational, speech or other therapies on discharge.
4. Early coordinated and multidisciplinary approach to the care of stroke survivors is very important and should be adopted in all hospitals – public or private.
5. Stroke survivors and their family members should be assisted in identifying and overcoming restrictions to participation in daily activities.

CONCLUSION

In this lecture, we have been able to see that there is life after stroke. We have been able to see that life after stroke involves living with a number of impairments. We have been able to appreciate the important role of physiotherapy in the rehabilitation of stroke survivors. We have also been able to see that a stroke survivor needs a lot of physical and mental fitness to be able to have a meaningful life after stroke. So, life after stroke **is really more than a survival of the fittest**. In spite of this, stroke survivors should adopt a positive approach to life. They should be stronger than the stroke and should not allow the stroke to erase them. When there are high moments, they should enjoy them; when there are low

moments, they should be strong enough to wade through them. Above all, they should be fit – physically and psychologically – for a life that has been shown to be **more than a survival of the fittest.**

ACKNOWLEDGEMENTS

All thanks and praise to God Almighty, the giver of life, the maker of heaven and earth. I appreciate the presence of the Lord Jesus Christ in my life and acknowledge His unending and unfailing love and help. My journey has been made easy through His grace and continued guidance and direction (*Deo duce*). I greet my spiritual fathers – The National President of The Apostolic Church Nigeria, Pastor (Dr) S.E. Igwe; The Vice President of The Apostolic Church Nigeria/LAWNA Territorial Chairman, Pastor (Dr) E.S. Awojide JP; The Agbelekale Area Superintendent of The Apostolic Church Nigeria, Pastor S.U. Unwaetor; Oke Odo District Pastor and Agbelekale Area Prophet/Evangelist, Pastor N.O.T. Akintola; and Akinola Assembly Pastor of The Apostolic Church Nigeria, Pastor E.A. Awanu.

I wish to thank the Vice-Chancellor of the University of Lagos, Professor Oluwatoyin Ogundipe for granting me the permission to deliver this lecture and share my academic and professional journey with the public. Your zeal to move this institution to greater academic heights is highly commendable and worthy of emulation. I am also expressing my thanks to the Deputy Vice-Chancellor (Management Services), Professor Ben Oghojafor and the Deputy Vice-Chancellor (Academics and Research), Professor Oluwole Familoni for their assistance. The Deputy Vice-Chancellor (Development Services) and a former Provost of College of Medicine, University of Lagos, Professor Folasade Ogunsola deserves a special mention: a beautiful amazon, a great achiever and a highly distinguished academic and researcher. Thanks for all your assistance.

I am highly grateful to the immediate past Vice-Chancellor of the University of Lagos, Professor Rahamon Bello, a leader par excellence, a highly cerebral academic and academician and a pillar of support to many. Thanks for all your assistance. I also express my thanks to all the past Vice-Chancellors of this great institution. You laid a solid foundation and others continued to build on it. My thanks also go to the Provost, College of Medicine, University of Lagos, Professor Afolabi Lesi for his vibrant and highly supportive leadership of the College. You are indeed a true friend and brother. Thanks for all your assistance. My big appreciations go to the Dean, Faculty of Clinical Sciences, University of Lagos, Professor J.D. Adeyemi, thanks a lot.

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The Lagos University Teaching Hospital deserves a place of mention in today's joyful story. I owe a lot of gratitude to the hospital for providing the clinical environment for me to contribute to patient care and clinical training in physiotherapy. Special thanks to the Chief Medical Director, Professor Chris Bode, immediate past CMAC, Professor O.A. Fasanmade and the current CMAC, Professor W.L. Adeyemo. My thanks also go to

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At a certain time during my academic sojourn, it seemed that there was no going forward (Yes, a lecturer without a PhD and no place to obtain it). An erudite professor of Physiology, Professor S.A. Adigun (of blessed memory) came to my rescue. He facilitated my admission into the PhD programme in the Department of Physiology and became my supervisor. On a day like this, I say a big thank you to him. Continue to rest in perfect peace. When Professor Adigun's health started failing and could not continue to supervise me, Professor Smith Jaja came to the rescue. Your intervention is highly appreciated. Thanks a million times. And to Professor Chikodi Anigbogu who co-supervised my PhD work, thanks for all your assistance.

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I remember where it all started at St Peter's Anglican School Joga Orile in Yewa North LGA, Ogun State. I still maintain contact with two great friends from the school – Seyi Adekeye and Segun Ojelabi; thanks for the camaraderie of over 50 years now. To my good friends from the defunct Yaba Academy, Abule Ijesha, Yaba, how can we forget the good old days in the school founded in the year of independence? Segun Olufelo, Nathaniel Apelehin, Bruce Otunba (I gave him his first name), Nta Henshaw, Iyabo Awolesi-Bisiriyu, Wakil Oseni, Kamoru Badewa, Monsuru Etiko, Fausat Akinbowale – *Afrika nactus est hanc exorna*. And from Baptist Academy, Obanikoro, Lagos where I gained the pedestal for university education. I remember my great classmates – Tunde Olugbodi, Paul Izuora, Kayode Oderinde, Ojemame Orevba, Segun Awe, Seun Awe, Francis Ofurie and the paramount ruler of Ilu-Ope in Ondo State, Oba (Dr) James Adeyemi.

I am a product of one of the best medical training institutions in Nigeria, the College of Medicine of the University of Lagos. I am a proud alumnus of the College and I have identified myself with its progress. On a day like this, I remember my colleagues in the 1978-81 physiotherapy class – Busola Adekoya (now Dr Mrs Oyefeso), Cynthia Akuneme (now Mrs Cynthia Nwakibu), Margaret Ekaette (now Dr Mrs Ukpong), Ayodeji Ogundeji (who passed unto glory in 2018 as Dr Mrs Akinsanya), Mr Yinka Babatunde, Mr Kanayo Chukwuka and Dr Taheeb Coker – thanks for the nice time we had together. My greetings go to my medical and dental student colleagues, now great men and women in their own rights. We are still having a great time on the MEDILAG 78-81/83 forum – Dr Kayode Adesina, Dr Kunle Oni, Oba (Dr) James Adeyemi, Dr Abayomi Ogunbekun, Dr Folusho Omodele, Dr Mathias Shoga, Dr Demola Oredipe, Dr Reuben Osho, Dr Segun Odejaye, Dr Ben Airevba, Dr Folarin Olubowale, Dr Diran Amosu, Rev (Dr) Segun Agbaje, Dr Adesina Oluwatosin, Professor Kumbi Banjo, Professor Oluranti DaCosta, Associate Professor Bunmi Orenuga, Dr V.O. Anyaegbunam and Dr Emeka Ubawuchi.

I owe a lot of gratitude to all the members of the Planning Committee for this lecture. You are wonderful.

My current and former students (undergraduate and postgraduate) at the Physiotherapy Department, Faculty of Clinical Sciences, College of Medicine, University of Lagos and the Physiotherapy Department, School of Allied Health Sciences, College of Health Sciences, University of Ghana deserve special commendation. In learning from me, you have taught me so much. Thank you all. My thanks also go to The Registrar, Medical Rehabilitation Therapists Board of Nigeria, Dr Olufunke Akanle.

Can I go back to my roots in Iboro, Yewa North LGA, Ogun State? I greet the paramount ruler of my town, The Aboro of Iboro Land, Oba Daniel Abayomi Salako, Agunloye IV, long may you reign. I greet my kinsman and dear brother, Senator Tolu Odebiyi (APC, Ogun West). Finally, I wish to thank my family for their love, support and encouragement. My late father, Mr Oseni Olawale-Erubami, never failed in ensuring that his children received a western education in spite of his own little educational background. My mother, Madam Iyabo Olawale-Erubami, remains a pillar of support and a shining example of motherhood even in her old age. I appreciate the love and support of all my siblings. God bless you all. My dear sister, Mrs S. Abeni Adekunle, who sacrificed her personal comfort to ensure that my education was not terminated at the end of primary school. Thanks for your unmeasurable support. I appreciate my wife, Serah Adepeju Olawale, for showering me with love and affection at all times and making our home a warm and friendly place. You are not only 'my jewel of inestimable value' (apologies to Papa Obafemi Awolowo) but also 'the oxygen of my life' (apologies to Papa Christopher Agboola Ajao). My children (MMIM) are part of this journey and they remain steadfast, helpful and accommodating. They endured many moments of apparent neglect, anger etc., especially when a simple statement like "You can see I am busy" suddenly turned to a shout "Can't you see I am busy"? – whenever they needed my attention; but I felt this was disturbing my concentration on the laptop. Moyosola Oluwa, Mosope Oluwa, Ibukun Oluwa and Modade Oluwa – I say thank you for being there for me. I could not have wished for more from God. God bless you all.

REFERENCES

- Agi, L.A., Margaritis, V. and Connors J. (2016). Perceptions of stroke risks among West African male immigrants in San Diego: A Qualitative Investigation. *Diversity and Equality in Health and Care* **13**(2), 65-67.
- American Stroke Association (2020). Types of stroke. Available @ <https://www.stroke.org/en/about-stroke/types-of-stroke>. Accessed on 28/02/2020
- Amosun, S.L., Nyante, G.G., and Wiredu, E.K. (2013). Perceived and experienced restrictions in participation and autonomy among adult survivors of stroke in Ghana. *African Health Sciences* **13**(1): 24-31.
- ATrain Education (2020). Stroke: Emergency care and rehabilitation. Available @ <https://www.atrainceu.com/content>. Accessed on 01/03/2020
- Bakewell, S. (1997). Illustrations from the Wellcome Institute Library: Medical Gymnastics and the Cyriax Collection. *Medical History* **41** (4): 487–495. doi:10.1017/s0025727300063067.
- Barimah, K.B. and Teijlingen, E.R. (2008). The use of traditional medicine by Ghanaians in Canada. *BioMed Central Complementary Alternative Medicine*. **8**: 30-36.
- Basson, A. (2010). History: Abridged version of IFOMPT History. International Federation of Orthopaedic Manipulative Physical Therapists (IFOMPT).
- Bialosky, J.E., Simon, C.B., Bishop, M.D. and George, S.Z. (2012). Basis for spinal manipulative therapy: A physical therapist's perspective. *Journal of Electromyography and Kinesiology*. **22** (5): 643–7.
- Chartered Society of Physiotherapy (2020). History of the Chartered Society of Physiotherapy. Available @ <https://www.csp.org.uk/about-csp>. Accessed on 28/02/2020.
- Chukwuneke, F.N., Ezeonu, C.T. and Onyire, B.N. (2012). Culture and biomedical care in Africa: The influence of culture on biomedical care in a traditional African

- society, Nigeria, West Africa. *Nigerian Journal of Medicine*. **21**: 331-3343.
- Everyday Health (2020). 6 Complementary and Alternative Therapies for Stroke. Available @ <https://www.everydayhealth.com/stroke/alternative-therapies-for-stroke-treatment>. Accessed on 15/02/2020.
- Frimpong, E., Antwi-Boasiako, C., Ababio, E., Ahenkorah, J. and **Olawale, O.A.** (2016). Effects of Task-Oriented Circuit Class Training on Physical Fitness of Stroke Survivors. *Journal of Exercise Science & Physiotherapy* **12**(2): 1-13
- Frimpong, E., **Olawale, O.A.**, Antwi, D.A., Antwi-Boasiako, C., and Dzudzor, B. (2014). Task-oriented circuit training improves ambulatory functions in acute stroke: a randomized controlled trial. *Journal of Medicine and Medical Sciences* **5**(8): 169-175
- Healthline Media (2020). What are the different types of strokes? Available @ <https://www.healthline.com/health/stroke-types>. Accessed on 28/12/2020.
- Klinterberg, M. (1992). The history and present scope of physical therapy. *International Journal of Technology Assessment in Health Care*. **8** (1): 4-9.
- McKenzie, R.A. (1998). The cervical and thoracic spine: Mechanical diagnosis and therapy. New Zealand: Spinal Publications Ltd. pp. 16-20. ISBN 978-0-9597746-7-2.
- National Institute of Neurological Disorders and Stroke (2020). Post-Stroke Rehabilitation Fact Sheet. Available @ <https://www.ninds.nih.gov/Disorders/Patient-Caregiver-Education/Fact-Sheets/Post-Stroke-Rehabilitation-Fact>. Accessed on 15/02/2020.
- Nweke, M.C. and Eze, C.K. (2019). The place of spiritual and traditional beliefs in stroke rehabilitation in sub-Saharan Africa: A Scoping Review. *Journal of Complementary and Alternative Medical Research* **8**(2): 1-16.

- Ofori, E.K., Frimpong, E., Ademiluyi, A. and **Olawale, O.A.** (2019). Ergometer cycling improves the ambulatory function and cardiovascular fitness of stroke patients—a randomized controlled trial. *J. Phys. Ther. Sci.* **31**: 211-216
- Olawale, O.A.** (2015). Maternal and Child Health: The Physiotherapy Story. 1st Annual Public Lecture of Ghana Physiotherapy Association; delivered on Thursday 5th November 2015.
- Olawale O.A.** (2019). Life after stroke – high moments, low moments, *real* moments. 6th Gathering Lecture of Faculty of Clinical Sciences, College of Medicine, University of Lagos; delivered on Monday 25th November 2019.
- Olawale O.A.**, Ajepe, T.O., Oke, K.I. and Ezeugwa, C.J. (2017). Chronic pain after stroke: A hospital-based study of its profile and correlation with health-related quality of life. *Middle East Journal of Rehabilitation and Health* **4**(1): e41874
- Olawale, O.A.**, Ajiboye, A.O. and Maduagwu, V. (2003). Relationship between dynamic balance and the muscular strength of the non-paretic lower limbs of patients with post-stroke hemiplegia. *Nigerian Journal of Health and Biomedical Sciences* **2**(1): 16-20.
- Olawale, O.A.** and Akinfeleye, A.M. (2002). Effects of strengthening of lower limb muscle groups on some gait parameters in adult patients with stroke. *Journal of Nigeria Society of Physiotherapy* **14**(2): 70-74.
- Olawale, O.A.** and Bansah, E.K. (2009). Early physiotherapy rehabilitation enhances recovery of mobility in adult patients with stroke. *Ghana Journal of Physiotherapy* **1**(1): 13-15
- Olawale, O.A.** et al. (2011). Exercise training improves walking function in an African group of stroke survivors: a randomized controlled trial. *Clinical Rehabilitation* **25**: 442-450
- Olawale, O.A.** and Julius, S.O. (2006). Evaluation of motor recovery in adult patients with hemiplegic stroke.

- Olawale, O.A.** and Ogunmakin, O.S. (2006). The effect of exercise training on balance in adult patients with post-stroke hemiplegia. *Int J Ther Rehabil* **13**(7): 318-22
- Olawale, O.A.**, Okafor, U.A.C. and Adeagbo, C.A. (2017). Effects of trunk rotation and limb activation in the management of unilateral spatial neglect in adult stroke survivors. *African Journal of Medicine and Medical Sciences* **46**(1): 83-91
- Olawale, O.A.**, Usman, J.S., Oke, K.I. and Osundiya, O.C. (2018). Evaluation of predictive factors influencing community reintegration in adult patients with stroke. *J Neurosci Rural Pract* **9**:6-10
- Stanford Medicine (2020). Gait abnormalities. Available@ <https://stanfordmedicine25.stanford.edu/the25/gait.html>. Accessed on 29/02/2020.
- Stroke Association (2012). Continence problems after stroke. Available@ <https://www.stroke.org.uk/>. Accessed on 01/03/2020.
- The Free Dictionary (2019). Rehabilitation. Available@ <https://medical-dictionary.thefreedictionary.com/rehabilitation>. Accessed on 26/11/2019.
- World Confederation for Physical Therapy (2015). What is Physical Therapy? Available at www.wcpt.org. Accessed on 8 September 2015
- World Health Organization (2019). Rehabilitation Fact Sheet. Available @ www.who.int/news-room/fact-sheets. Accessed on 26/12/2019.
- World Health Organization (2019). Rehabilitation. Available@<https://www.afro.who.int/health-topics/rehabilitation>. Accessed on 30/12/2019.
- Worldometer (2021). World population clock. Available@ <https://www.worldometers.info/world-population/>. Accessed on 01/01/2021.