A traditional bonesetter is a lay practitioner of bone manipulation, well versed—at least, according to the view of patrons and his community at large—in the medical art of restoring broken bones to full functionality. Agrawal opines that the traditional bonesetter in the modern day definition is “the unqualified practitioner who takes up the practice of healing without having had any formal training in accepted medical procedures” (Agarwal 2010, 8).

Traditional bonesetting dates back to the period when modern homo sapiens began to hunt, and invariably began to suffer from fractures. As man matured in the management of bone injuries and its treatment, it became a specialized field such that certain individuals became custodians of the increasingly complex healing knowledge of bone manipulations and adjustments (Green 1999a, 258). Remains of the Neolithic man show evidence of fractures, splinted with what appears to be bark and sticks and secured with bandages (Beckett 1999, 7). Ancient people have been known to devise creative ways to immobilize fractured limbs. The Shoshone Indians wrapped broken limbs in strips of fresh rawhide that had been softened by soaking in water for days. The rawhide is left to dry and harden around the affected area, thereby protecting the injured area. Certain tribes in the Amazon are also known to use splints made from clay (Beckett 1999, 7).

As human civilization expanded, specific people became known as healers and bonesetters, with the techniques often being transferred from one generation to another, almost always from father to son. The skills were mingled with spells and incantations, when appropriate in order to encourage healing. In Early History of Surgery, Bishop W.J noted that as early as 1900 BCE in Babylon, King Hammurabi organized a code of laws regulating medical practice, and stating penalties for infringement. Specifically, the “Ghallabu” or bonesetters who handled dental work, minor surgery and the branding of slaves were mentioned.

The earliest known written instructions for bone surgery can be found in the Edwin Smith Papyrus, radiocarbon dated to 1600 BCE. In it, the appropriate treatment of fractures of the upper arm is described.
Thou shouldst place him prostrate on his back, with something folded between his two shoulders in order to stretch apart his upper arm until that break falls into place. Thou shouldst make for him two splints of linen, and shouldst apply for him one of them both on the inside of his arm, and the other of them both on the underside of his arm. Thou shouldst bind it with ymwr (an unidentified mineral substance) and treat it afterward with honey every day until he recovers (Bishop 1960, 11).

For the skull fractures, the surgeon was to make a topical application of herbal paste made from ostrich egg around the wound while chanting incantations to the Egyptian fertility goddess Isis and then allow it to dry. Discovered also were writings, dated fifth-century ACE of the Sustra in India, in which was detailed instructions for the amputation of a gangrenous limb and the construction of iron prosthetics. Among the works of Hippocrates is a treatise on fractures and dislocation, renowned for its anatomical and physiological accuracy, and addressing such issues as “compound fractures, reduction, dressing and immobilization” (Bishop 1960, 12). Hippocrates also prescribes a form of wooden splint to be used in the treatment of femur dislocation and certain complex techniques for extension and counter extension (Bishop 1960, 14).

From Traditional Bonesetting to Modern Orthopaedic Medicine

These recorded advances in orthopaedic medicine slowed down with the collapse of the Roman Empire and the rise of the Roman Catholic Church as the world governing body for all social and religious activities (Bishop 1960, 15). The papacy was of the belief that sickness came in response to trespass and only pious supplication through prayer and fasting would cure such. Most forms of medical remedies previously subscribed were banned and declared paganistic, a breach of which led to the much feared excommunication and the eventual banishment of one’s soul from perpetual redemption. Rather than healers and bonesetters, the faithful turned to their patron saints to intercede on their behalf and when that failed, they beseeched the priests for assistance (Beck 1974, 79). For a period spanning almost ten centuries, no form of medical advancement was recorded in Western Europe. Worse still, the language of learning was Latin, and only the priests were allowed access to that language. It was impossible for the laity to understand medical treatises and information. By 1100 ACE, there was growing concern within the papacy that the priest’s involvement in the medical field could entail the clergy being guilty of bloodshed should a treatment go awry. To prevent this state of affairs, a series of statutes and laws were promulgated that barred priests, physicians and monks from performing surgical practices and attending public medical lectures. Only the servants of the priests, known as barbers were allowed by law to perform surgical operations (Beck 1974, 79).

Over the years, the barbers perfected their skills mostly through on the job training. They transferred such skills acquired to their children and apprentices. As they
worked, especially with the poor and defenseless, they were able to experiment without fear of retribution as they repaired damaged bones, pulled decayed teeth and performed other tasks which bonesetters were expected to perform. Nothing more than physical strength, dexterity and stamina qualified one to be inducted into the trade of bonesetting. Educational qualification was irrelevant. Apprenticeship rather than tutorials qualified one for practice and there was no training in science. The barbers preferred to treat the royalty, nobles, and their families due to the higher remuneration. The first barbers’ guild was formed in England in the fifteenth century to assist with the recruitment, training and regulation of its members (Bishop 1960, 20). It was necessary because other medical professions had banded themselves under guilds and were able to defend their rights and establish themselves and their works. The government overlooked these guilds, ensuring that their members kept to the limits prescribed by the law; “the surgeons and their guild competed with the barbers to treat the same ailments. The druggist mixed medications, but had to purchase chemicals from apothecaries” (Bishop 1960, 20). “By 1540, Thomas Vicary helped put an end to the fighting and confusion by securing the king’s permission to unify the guilds of barbers and surgeons; the same act also outlined the duties of the barber-surgeon, versus that of the physician or the apothecaries” (Bishop 1960, 25).

It was not until about 130 years ago that bonesetting became an integral part of Western medical teaching and practice (Green 1999a, 259). Green writes that, approximately 120 years ago, through a fortuitous accident of history, geography, and family connections, orthopaedists, that is, doctors of medicine dealing with pediatric deformities, expropriated bonesetting from early English surgeons and traditional healers (Green 1999a, 259). The journey from traditional bonesetting in the West began with the groundwork laid by renowned French surgeon and amputator, Ambroise Pare (1510–1590). Ambroise Pare’s work centered more on the treatment of battlefield bone injury and he did not delve much into the study of domestic or industrial injuries, or deformities that are bone related. It was Nicolas Andry de Beauregard, another French man who “framed the entire field of orthopaedics as a discipline worthy of standing on its own.” Nicolas Andry was trained as a medical doctor at the University of Reims and then Paris, graduating in 1697. The subject of his thesis, “The relationship in the management of diseases between the happiness of the doctor and the obedience of the patient,” revealed a humanistic side to a man who first went into the seminary to study to become a priest before he made a detour to medical school (Le Vay 1990). His medical research was focused on alleviating the pain and suffering of the patient, while offering him the best treatment option available. His numerous works in the field of parasitology, earned him a prestigious professorship in the Faculty of Medicine at the University of Paris, where he later became the Dean of the Faculty of Physick. The very first thing he did with his new found authority was to restrict the practice of barber-surgery, a practice that was widespread in Europe at that time. Andry considered the barber-surgeons to be quacks and unskilled, who posed more of a threat to their patients than a solution to their ailments (Le Vay 1990). As Andry continued with his research work at the
University of France and in his practice as a physician, his interest soon delved into bone matters. According to him, during the course of his practice, he came in contact with several bone and limb deformities, to which there was no immediate medical remedy. During his time, deformities which affected the bone and limbs were common place especially in children. This was attributed to the numerous types of public-health challenges which the people faced, ranging from congenital syphilis to rickets. In order to help alleviate the suffering of the children, and also having recognized that the skeletal system of a child remained malleable until his teenage years, Andry believed physicians had a unique opportunity to help the deformed person live a normal life as an adult if the problem is addressed early on in life (Le Vay 1990).

It was not to be until 1741, when Andry was 83 years of age that his very first work on orthopaedic medicine was published. *Orthopaedie, or in its longer forms, L'orthopedie, ou l'art de prevenir et de corriger dans les enfants, les difformites du corps, le tout par des moyens a la porte des peres et des meres, et de toutes les personnes qui ont des enfants a elever.* It was the very first ever use of the word orthopaedics, signifying the birth of an entire medical discipline. In the words of Andry: “As to the Title, I have formed it of two Greek Words, Orthos, which signifies straight, free from Deformity, and Paedis, a Child. Out of these two Words, I have compounded that of Orthopaedia, to express in one Term the Design I propose, which is to teach the different Methods of preventing and correcting the Deformities of children” (Le Vay 1990).

Andry’s work established orthopaedics as the branch of medicine which deals with conditions that affect the muscoskeletal system. Orthopaedic surgeons, as the practitioners are often referred to, employ both surgical and nonsurgical means to treat “muscoskeletal trauma, sports injuries, degenerative diseases, infections, tumors and congenital disorders” (Ponsetti 1991). What followed Andry’s seminal work was increased interest in the field now known as orthopaedics by several practicing physicians. In 1780, the first orthopaedic institute was established in France, dedicated to the treatment of skeletal deformities in children (Ponsetti 1991).

In the United Kingdom, it was the works of Evan Thomas, a traditional bone-setter of immense reputation in Liverpool—whose contented clients included Prime Minister William Gladstone—that transformed the field of traditional bonesetting to modern orthopaedic medicine (Green 1999a, 259). Thomas sought to obtain a hospital staff position, but was denied one as he did not possess a Doctor of Medicine. Hurt by this denial, Evan Thomas fought for his son, Hugh Owen Thomas, who had shown keen interest in orthopaedic medicine from an early age to attend medical school. After he obtained his MD degree, Hugh Owen Thomas set up a practice where he specialized in the correction of childhood deformities. As his father’s health deteriorated, Hugh expanded his practice to include bonesetting for adults, using the very same tools his father used in his traditional practice.¹ Upon the death of Hugh Owen

¹“Hugh Owen Thomas used his bracemaking experience to develop the Thomas Splint, a device that revolutionized the care of femoral shaft fractures, and which remains in widespread use today” (Green 1999a, 259).
Thomas from lung cancer at the young age of 58, his nephew Robert Jones whom he convinced to attend medical school and to join him in his practice thereafter, took over the practice.

Robert Jones had already learnt a lot of bonesetting skills from his late Uncle and also as an observer of his grandfather while he lived. It was very easy for him to continue with bonesetting as well as his regular practice as a certified MD. In a lecture “Cases that Bonesetters Cure,” published in the *British Medical Journal* in 1867, Sir James Paget, famous orthopaedic surgeon of the nineteenth century in consenting to the validity of the indigenous orthopaedic medical practitioners, stated, “Few of you are likely to practice without having a bonesetter for a rival; and if he can cure a case which you have failed to cure, his fortune may be made and yours marred. Learn then to imitate what is good and avoid what is bad in the practice of bonesetters.” It is worthy of note that the much acclaimed father of orthopaedic medicine in England, Hugh Owen was a traditional bonesetter (http://www.chirobase.org/05RB/BCC/07. html. 06/04/09).

At around the time Robert Jones’ practice took off, the British government commenced the construction of the massive canal connecting the port city of Liverpool to the inland manufacturing center of Manchester. The British government engaged over 20,000 workers in this effort. Jones was granted a permit to establish mobile clinics along the construction sites in order to treat occupational injuries sustained by the workers. The most serious fracture cases were referred to the clinic at Liverpool (Green 1999a, 259). With the volume of patients he handled during this period coupled with the complexities of their injuries, Robert Jones gained vast fracture care experience within a limited period. Soon, physicians, who were traveling from the world over to the British Isles through the port of Liverpool, dropped by Jones’ clinic for observation as his fame as a medical doctor specializing in bone injuries spread. By World War I, Jones had become the notable authority in large-scale care of bone casualties, and he was therefore called on to establish and head the Army’s orthopaedic services. Robert Jones was Knighted at the end of the war for his war time contributions and afterwards, founded the British Orthopaedic Association, an organization that was modeled after “a similar group established a few years earlier by his disciples in the United States” (Green 1999a, 259).

Over time, traditional bonesetters in the Western nations gradually became extinct, to be replaced with orthopaedic doctors trained in the medical colleges. Orthopaedic medicine became engrafted into the field of medicine in both pedagogy and practice. Apprenticeship, inherited knowledge and skill, on the job training and learning were soon replaced by a rigorous scientific mode of inquiry. Several assumptions and premises upon which the traditional bonesetters practiced were discarded, and replaced with new scientifically established facts. Since this transformation, there have been several improvements, new inventions and developments in the field of orthopaedic medicine. Antonius Mathysen a Dutch military surgeon invented the plaster of Paris cast in 1852. It is worth noting that some of the most notable inventions in the field of orthopaedics were made at the battlefield. Traction and splinting was developed in World War I, the use of rods for the treatment of femur and tibia fractures was pioneered during WW II and during the Vietnam War, the fixing of
The Case of Traditional Bonesetting and Orthopaedic …

Fractures without surgery was perfected by American soldiers (Ponsetti 1991). The USSR’S Gavril Abramovich Ilizarov, sent to Siberia in the 1950s to treat injured Russian soldiers, used bicycle scopes as external fixators to achieve realignment and lengthening to a previously unthought-of degree. Other advancements in the field of orthopaedics have taken place in research centers, and by doctors on the job practicing their skills (Le Vay 1990).

The United States is known as the country that is most advanced in the field of orthopaedic medicine. In the United States as in most other countries of the world, one must qualify as a trained physician first before proceeding to specialize in the field of orthopaedic surgery. After completing the specialty training in orthopaedics, an orthopaedic surgeon becomes eligible for board certification. Board certification implies that one has met the “specified education, evaluation, and examination of the Board, often preceded by the successful completion of standardized and oral exams, including a period of observed surgical practical work”.

In the United States, there are several subspecialties in orthopaedic medicine, which include: “hand surgery, shoulder and elbow surgery, total joint reconstruction (arthroplasty), pediatric orthopaedics, foot and ankle surgery, spine surgery, musculoskeletal oncology, surgical sports medicine, and orthopaedic trauma” (American Board of Orthopaedic Surgery www.abos.com). The United States board certification for orthopaedic medicine is regulated by the American Board of Orthopaedic Surgery (ABOS).

While the transition from bonesetters to orthopaedic doctors took place almost concurrently in the Western world, most of the developing world was left out of these developments. Traditional bonesetting still flourished as the only available option for the inhabitants of much of the world population well beyond the first half of the twentieth century. Through the years, traditional bonesetting has survived in the face of “modernization” and is now found mostly in the developing world. Despite technological advancement in modern medicine, traditional bonesetting has thrived as an alternative source of health service in India, Africa and South America. The profession is known as Kahuna Haihai in Hawaii, Sinikci in Turkey, Pahalwan in India (Green 1999a, 259). The developing economies are notable for having less developed healthcare resources, leaving indigenous bonesetters with a larger share of the population who are poor and denied access to the more expensive Western medical care.

2“In the United States and Canada, it is expected that orthopaedic surgeons have completed 4 years of undergraduate education and four years of medical school before going on to undergo residency training in orthopaedic surgery” (American Board of Orthopaedic Surgery www.abos.com).

3“In Canada, the certifying organization is the Royal College of Physicians and Surgeons of Canada; in Australia and New Zealand it is the Royal Australasian College of Surgeons. from 1999 to 2003, the top 10 common procedures (by order) performed by orthopaedic surgeons include: (a) Knee arthroscopy and meniscectomy; (b) Shoulder arthroscopy and decompression; (c) Carpal tunnel release; (d) Knee arthroscopy and chondroplasty; (e) Removal of support implant; (f) Knee arthroscopy and anterior ligament reconstruction; (g) Knee replacement; (h) Repair of femoral neck fracture; (i) Repair of trochanteric fracture. While the names used may sound bogus and intimidating to the uninitiated, they simply represent technical names for some common bone ailments and injuries which people are more often afflicted with” (American Board of Orthopaedic Surgery www.abos.com).
From Traditional Bonesetting to Modern Orthopaedic Medicine

Due to the underground and often unregulated nature of their practice, there are no reliable statistics to gauge the number of patients attended to by indigenous orthopaedic healers, however, it has been estimated that up to 40% of patients with fractures and dislocations in the developing world resort to indigenous orthopaedic doctors (Green 1999a, 263). In India, it is estimated that about 60% of the population patronize the over 70,000 bonesetters who ply their trade at any given time, second only to the Dais or traditional midwives.

Traditional bonesetters are renowned for their efficacy in the treatment of bone injuries in the communities where they practice. Like other variants of indigenous medicine, the knowledge of bonesetting is verbally passed from one generation to another, without resorting to formal documentation. Through the practice of apprenticeship and on the job training, traditional bonesetters pass down the knowledge of bone manipulation, herbal topical applications and sometimes oral ingestions to the next generation often consisting of family members. Indigenous bonesetters are take care to protect their reputation and therefore they give their very best to the restoration of their client’s bone health. Most traditional bonesetters are renowned men of competence in their field. Tella has pointed out that a “highly remarkable degree of expertise and skill is involved in the practice of traditional bonesetters, especially as there is no radiology staff employed in their practice” (Tella 1979, 610).

Teaching and Practice of Traditional Bonesetting in West Africa

The history of bonesetting in West Africa and the whole of sub-Saharan Africa by extension dates back to the first group of settlers to make a home out of the sprawling grasslands, thick rainforests, and mangrove swamps that dot the region. Some of the earliest recorded observations of bonesetting in West Africa were by anthropologists among the several ethnic groups that inhabit the area. Excavation of materials like dead bodies and skeletons for analysis was not considered as proof of existence of professional bonesetters, or evidence of the existence of bonesetting among any group of people. Adolph Schultz avers that “well-healed fractures are numerous among wild gibbons and other primates which are not likely to enjoy treatment by professional bonesetters” (Schultz 1939, 571). The anthropologists recorded the use of original casts, made from leather, chicle, or clay in the setting of injured factures, after massage and use of certain “magic” ointments (Ackerknecht 1947, 35). The Liberian Manos were known to practice systematic traction as part of hand fracture treatment, and the Akamba, the total immobilization of the limb being fixed, by pinning to the floor with pegs.

The bonesetter in precolonial Africa is recorded to actively massage the affected area from the time the case is presented. As a therapeutic procedure; this shows the universality of massage in the treatment of fractures. Ackerknecht avers that pre-colonial bonesetting in Africa had some elements of magic in its practice (1947, 28).
The plants used to make the massage ointments are said by the practitioners to possess magical powers. This is also shown in the use of animals such as chicken, whose leg is broken and, according to Ackerknecht, “the success of an otherwise “rational” fracture treatment depends entirely on the fate of a chicken whose bones are broken and treated like those of the patients” (1947, 28). Here, Ackerknecht echoes the view of several anthropologists, who lack understanding of the logic behind certain activities of their study group, preferring instead to judge the observed procedures based on their own often narrow understanding of what is acceptable reality. Other purported magical instruments employed by West African ethnic groups in the treatment of bone fracture and injury include the blacksmith tongs for reducing a dislocated mandible, and the treatment of fractures and dislocation by only those born with their feet forward or those struck by lightning (1947, 28). Amputation seems to be rare, from the accounts of anthropologists in West Africa. However, the Masai of East Africa were known to amputate severely damaged limbs or hopelessly complicated fractures. This amputation as recorded, is done with great skill and precision and prostheses are fashioned for the patients afterwards.

As a practice, traditional bonesetting is found in almost all communities of the world. In Turkey, for instance, the citizens express a high degree of confidence in the patronage granted to bonesetters, and not in the Western-styled orthopaedic doctors in the area (Hatipoglu 1995, 203). In West Africa, specifically among the Yoruba of Western Nigeria, traditional bonesetters rank second only to diviners in the ranking of traditional healers, while the herbalists and others trail behind.

In the West African country of Nigeria, traditional bonesetters were the only available option for fractures and bone injuries until 1873, when the very first orthodox hospital was built in Lagos, Nigeria. Although it is now almost 150 years since the first orthodox hospital was built in Nigeria, there is still a severe shortage of qualified medical personnel to adequately attend the teeming population. Omololu et al. avers that with a population of 150 million, there are less than 200 orthopaedic surgeons to service the entire country, making it one per 700,000 people. The gross national income per capita is $1,040 and the total expenditure on health per capita is $53, with $16 representing government contribution (Omololu et al. 2008, 466).

Much like Ghana, Nigeria operates a three-tier system of healthcare; primary, secondary, and tertiary health care. The primary healthcare is the foundation of Nigeria’s healthcare delivery system, and where the rural communities first go in the case of medical ailment. Unfortunately, primary healthcare delivery in Nigeria is bedeviled by several difficulties including personnel, finances, accessibility, and others. In the absence of orthodox healthcare providers, traditional healers, in some cases, provide 90% of primary health care to rural dwellers (Omololu et al. 2008, 393). These traditional healers vary in their areas of specialization—examples include traditional midwives, traditional herbalists, and traditional bonesetters.

Although modern technology and improved orthopaedic practices have made the practice of traditional bonesetting obsolete in developed countries, the practice thrives in developing countries and Africa in particular. Traditional bonesetters still treat the majority of fractures in sub-Saharan African countries, and there does not seem to be an end in sight to this practice in the foreseeable future. In Nigeria, up
to 85% of patients with fractures and bone injuries present themselves to be treated first by the traditional bonesetters and only end up at the orthopaedic hospitals in the case of gangrene (Omololu et al. 2008, 466).

Traditional bonesetting is a family practice in developing countries where they flourish; skills and knowledge are passed from one generation to another. Through apprenticeship, it is possible for certain outsiders who show keen interest at an early age and are sometimes “sanctioned by the gods” to learn the intricacies of the profession. Records are kept orally and instructions are transmitted through verbal interaction and observation (Onuminya and Onabowale 1998). Splints made from bamboo, rattan cane (*Oncocalamus yrightiana*), and palm leaf axis (*Elaeis guineensis*) are knitted closely together to form a mat-like splint that is used to immobilize the fractured area by tightly wrapping it around the affected site (Eshete 2005, 103).

While observing a traditional bonesetter at work in the rural South Western Nigeria, Omololu et al. (2008) proceeded to document his clinical sessions, consultancies, and treatment of fractures. First the bonesetter identifies the fractured area by taking note of such symptoms and signs as “swelling, pain, loss of function, angulations, abnormal mobility and crepitation on palpitation of the fracture site” (Omololu et al. 2008, 393). The traditional bonesetter does not employ the services of a trained radiographer, and neither does he personally use a radiographer to aid him in his diagnosis and treatment of bone injury. Upon diagnosis, the traditional bonesetter proceeds with treatment processes, which includes “reduction, application of herbal cream, splinting and bandaging.” The initial process is intense massaging and manipulation (reduction) aimed at restoring the fracture to its anatomical state. The pain during this process is intense, and members of the patient’s family forcefully hold the patient down as he screams out in pain. If the patient is unaccompanied—which is rare in a typical African setting—the apprentice of the traditional bonesetter does the job (Omololu et al. 2008, 393). An analgesic is administered at the end of bone manipulation exercises, and is composed of a mixture of several herbal drinks mixed in gin. The traditional bonesetter as observed by Omololu et al. was not forthcoming with disclosing the composition of the herbal mixture, holding some sort of intellectual property right over it, afraid that divulging the secret would lead to mass production and loss of their customers to competition. A large quantity of the herbal mixture is applied to the affected area with a bird’s feather and the site is splinted with a splint made of raffia palm, plywood, tree bark, and hard cardboard. A bandage is tied with pressure around the limb to hold the splint in place. Being an orthodox orthopaedic surgeon himself, Omololu asserts that the pressure of the bandage possibly impedes blood flow to the lower part of the limb. This, he contends is manifest through the swelling that is evident when the patient returns for a change of dressing and reaplication of ointment every 3–5 days (Omololu et al. 2008, 395). Upon inquiry, the traditional bonesetters state that the frequent change of the bandages is necessary in order to reapply the herbal cream that aids in the healing of the bone. In some instances, especially in the case of open fractures, it has been noted that the traditional bonesetters employs such mechanisms as incantations, to extract bone fragments from the fracture area, while amulets and charms are given to the patients to take home, with the belief that they will be protected from the forces of dark-
ness, which could hinder the healing of the bone (Omololu et al. 2008). In modern orthopaedic medical practice, analgesic, or even anesthesia is administered prior to fracture manipulation. Once reduction is achieved, a plaster of Paris cast is applied to stabilize the reduction and assist in healing. In modern orthopaedic medicine unlike traditional bonesetting, there is a near absence of cast removal and recasting—the cast remains in place until complete healing is achieved.

**Reasons for Patient Patronage**

It has been argued in certain quarters that the bonesetter’s lack of knowledge of anatomy, physiology, or radiography has brought about limb and life-threatening complications in several of his patients. These complications present in the form of acute compartment syndrome, tetanus, deformities, chronic osteomyelitis, gangrene, amputation, and death (Omololu et al. 2002, 335). In the Gambia, doctors have established that almost all cases of gangrene that occur in children, which eventually lead to limb amputation could be directly traced to traditional bonesetters in the rural areas (Bickler and Sanno-Duanda 2000, 1431). Yakubu et al. conducted a 10 year in-depth study of the complications of fracture management by traditional bonesetters and notes that 23% of the 320 adult limb amputations in their research were for post-fracture splintage gangrene (Yakubu et al. 1996, 104). Certain studies have also established that limb gangrene is just one of the many complications of fracture treatment by the traditional bonesetters. Most affected patients who are young and in their productive years end up with limb amputations, becoming disabled at a very young age.4

In a 10-month study conducted at the Wesley Guild Hospital Ilesa in Southwestern Nigeria between October 2003 and July 2004, 29 patients were consecutively studied at the outpatient clinic of the orthopaedic hospital (Ogunlusi et al. 2007). All of the 8 female and 21 male patients had come there after a failed attempt by traditional bonesetters to remedy their situation. The 29 patients had a total of 33 bone and joint injuries and were between an age range of 7–85 years (Table 6.1).

In the study, the patients claimed to have patronized the traditional bonesetters because they wanted quicker services that would enable them return to work sooner. Rather than what they hoped for, the patients ended up with poorly treated and complicated primary pathologies. The presence of certain complications in the management of traditional bonesetter injury is one of the most often presented critiques of its practice by the Western medical doctors. Of the doctors interviewed during the period of this research, all were of the view that, especially for cases of open fractures, traditional bonesetters were not qualified to treat or handle bone injuries.

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4Eighty five percent of patients with femoral fractures first present to traditional bonesetters (Katchy et al. 1991).
Table 6.1  Patient’s reasons for patronizing traditional bonesetters (Ogunlusi et al. 2007, 4)

| Reasons for patronizing TBS | Reasons     | No | Percentage (%) |
|----------------------------|-------------|----|----------------|
| Quicker services           | 12          |    | 41.4           |
| Cheaper services           | 9           |    | 31.0           |
| Fear of amputation         | 3           |    | 10.3           |
| Combination of above       | 4           |    | 13.8           |
| Strike in government hospitals | 1     |    | 3.5            |

| Reasons for seeking MOS    | Nonunion    | 16 | 55.1           |
|----------------------------|-------------|----|----------------|
| Malunion-LLD of lower limb | 6           |    | 20.7           |
| Malunion-deformity of UL   | 6           |    | 20.7           |
| Chronic osteomyelitis       | 1           |    | 3.5            |

*MOS = Modern orthopaedic services*

Practice of Traditional Bonesetting with Western Infusion

Several studies have been conducted on the merging of traditional bonesetting practice with some form of Western orthopaedic medical practice. In a study conducted by Onuminya (2006), between the periods January to December 2002, the performance of a trained traditional bonesetter was evaluated at a remote 75 bed facility traditional bonesetting clinic located in the rural area of Owan East Local Government Area of Edo State Nigeria. The bonesetting clinic, known as the Afuje traditional bonesetting center is situated in a town comprised mostly of subsistence farmers and their families. There is no orthopaedic center situated within even a 5-hour drive from the village. The proprietor inherited his knowledge from his father, and he is being assisted by his three sons, two of whom were university undergraduates.

The Afuje traditional bonesetting center has in its employ, a trained general practitioner. For diagnosis, rather than the age old method of the bonesetter feeling around the affected area to determine the nature of the injury, patients are sent to an x-ray facility, situated about 5 km away from the center, and again for check-up at the end of treatment. The medical director of the hospital is not employed by the government, but works closely with the chief patron of the Afuje center to handle cases such as “osteoclasis" and open reduction without fixation for cases of malunion and

\(^5\text{Osteoclasis is the surgical destruction of bone tissue performed in order to be able to repair a fracture.}\)
delayed union as requested by the traditional bonesetter” (Onuminya 2006, 4). The traditional bonesetter who runs the Afuje center does not handle fractures with open wounds, until the medical director has treated the open wound and supervised its complete healing. Only then is the case referred to him for fracture manipulation. Other Western or orthodox clinics around the area, which are all non-specialist in nature refer cases of fracture to the Afuje center for treatment.

Fracture patients at the Afuje center who were interviewed, stated their preference for patronizing the traditional bonesetter due to the easy accessibility of the center; the closest orthopaedic hospital to them being several miles away. Moreover, the patients stated that the bonesetter at the Afuje center is acclaimed for his efficacy, charges very little and his treatment comes with little or no risk of amputation. The role of the nurse in the Afuje center is that of a pharmaceutical dispenser, who sells analgesics and antibiotics and also immunizes certain at risk patients against tetanus. On the whole, Onumiya reports that the Afuje traditional bonesetting center represents a “well-organized ‘tradorthopaedic’ clinic” (Onuminya 2006, 4).

In the same study, Onumiya used another traditional bonesetting clinic as a control center. The control traditional bonesetting center is located in a similar rural setting at Ogua in Esan West LGA of Edo state in Nigeria. He notes at the commencement of the study that the two centers utilized “similar conservative methods of treating fractures and were both reputable traditional bone setting practitioners with good patronage within and outside their Local Government Areas” (Onuminya 2006, 3). Onumiya’s study began with teaching the traditional bonesetters at the Afuje center, during a one-day workshop, “safe conservative treatment of fractures with regard to diagnosis, patient selection, basic principles of fracture treatment, prevention of complications including transmission of HIV infection, referral services and outcome of treatment. Center B received no instruction.” (Onuminya 2006, 3). At the end of the course, a 2-year prospective study of the outcome of fracture treatment at the two centers was conducted in order to determine the success or failure of the course. The study was restricted to an analysis of the treatment of 40 tibial shaft fractures in both the Afuje center where the course took place and Center B where the course was not held. 6 The Table 6.2 shows the outcome of the tibial shaft fractures.

Onumiya records that in both clinics, no deaths were recorded during the study period. In the Afuje center, the median duration of stay for patients with tibia shift fractures was 4 months (in a range of 2–12 months), while it was 8 months (in a range of 2–18 months) in the control center B. Noticeable was also the disparity in the rate of voluntary discharge at both centers. Voluntary discharge arises when patients are dissatisfied with the treatment results especially in cases of nonunion, delayed union, infection or gangrene. The rate of voluntary discharge at Afuje center was 25% (10 patients) and 50% (20 patients) at center B. It was notable that the hygienic and sanitary conditions at both clinics were exceptional, as the traditional bonesetters had long ceased using the same blade for more than one patient in the

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6 At both centers, the male–female ratio was 3:1; the ages of the patients ranged from 20 to 65 years with a median age of 30 years, and the distribution of the pattern of fracture between the groups was fairly similar” (Onumiya SAMJ 96, 4, p. 5).
Table 6.2  Outcome of the treatment of Tibia Shaft fractures at Afuje and Ogua Centers (Onuminya 2006, 5)

| Outcome                        | Center B (No. %) | Center A (No. %) |
|--------------------------------|-----------------|-----------------|
| Acceptable union               | 19 (47.5)       | 5 (12.5)        |
| Malunion                       | 8 (20.0)        | 12 (30.0)       |
| Nonunion                       | 3 (7.5)         | 6 (15.0)        |
| Delayed union                  | 7 (17.5)        | 8 (20.0)        |
| Posttraumatic osteomyelititsa  | 2 (5.0)         | 5 (12.5)        |
| Limb gangrene b                | 1 (2.5)         | 4 (10.0)        |
| Total                          | 40 (100)        | 40 (100)        |

aAcute and chronic bone infection
bGangrene is the death of a considerable mass of body tissue

event of scarification. Patients were now required to bring their own blades when coming for treatment. At both centers, Onumiya notes that most of the patients in the study had initially voluntarily discharged themselves from orthodox hospitals before seeking treatment at the traditional bonesetters. The patients cited several reasons from family pressure to dissatisfaction with the consultation and treatment method and outcome of the orthodox hospitals.

Onumiya’s submission is typical of the outcome of several studies of traditional bonesetters in West Africa, which often is based on the fact that traditional bonesetters should learn to imbibe more orthodox practices. In his particular case, Onumiya notes that instruction on the appropriate application of a splint on the fracture did result in a remarkable decrease in cases of limb gangrene at the Afuje center. On the contrary, the center B where the instruction was not dispensed recorded 4 cases of gangrene, whereas only one case of gangrene was recorded at the Afuje center. In the case of gangrene, amputation became the only possible remedy, or death would have definitely occurred through tetanus and septicemia. Onumiya further asserts that the resultant casualties to gangrene noted in center B were as a result of the lack of awareness of the dangers of tight splints among traditional bonesetters.

Traditional bonesetters have traditionally been considered secretive, and it was difficult to teach them how complications could be prevented. However, with the cooperation of the modern traditional bonesetters, it was possible to arrange 1-day instructional courses on the safe fracture treatment. This has resulted in a considerable decrease in the rate of gangrenous limbs, infection, nonunion and malunion. There has been a significant increase in the rate of acceptable union among patients treated by the trained TBS compared with the untrained (Onuminya 2006, 322).

According to Bodkere and Burford (2007), the undue emphasis on the dangers of traditional bonesetter in West Africa could be due to several reasons, the main one being that “those who have the interest and capacity to report cases to professional journals rarely see successful treatments; of the many patients treated by traditional bonesetters, only those who have been failed will seek hospital care” (Bodkere and Burford 2007, 56).
One of the earliest publications of traditional bonesetting study by a Nigerian orthopaedic doctor was in 1986 (Oguachuba 1986). Through his article, Oguachuba enlightened the Nigerian medical community of the existence of such cases of traditional bonesetters’ mismanagement, encouraging the medical community to report them in medical journals. By 1991, three major articles had been published in *The Nigerian Medical Journal* denouncing the activities of traditional bonesetters (Eze 1991; Katchy et al. 1991; Adebule 1991)—this set the pace for several articles to follow, all following the same trend of negative reporting regarding the activities of traditional bonesetters in Nigeria and much of West Africa.

In another study, Onuminya et al. (2000) were able to demonstrate the bias of the medical publishing industry against traditional bonesetters, and how this has resulted in unjustified antagonism towards them in the medical professions. In Onomiyia’s study, of 100 major amputations performed on 96 patients in two major hospitals in Nigeria, 60 were established cases of fracture ill management occasioned by traditional bonesetters. The study was conducted over a 10-year period and although the number seems quite high at a cursory glance, when analyzed against the volume of patient traffic at the traditional bonesetting centers, and the fact that the two orthopaedic hospitals were almost the only available orthodox orthopaedic hospitals that serviced several millions of people, the number might not seem so distressing. It amounts to about six casualties per year in both regions whose catchment areas include states in the middle belt and eastern regions of Nigeria respectively.

Orthodox orthopaedic doctors are also prone to medical mistakes—there are several recorded cases where orthopaedic doctors could not treat patients and the patients resorted to traditional bonesetters where they were effectively treated. Oyebola (1980) reports of a patient with a tibia and fibula dislocation who after six weeks of intensive treatment at the State Hospital voluntarily discharged himself and checked into a TBS home where he received successful treatment and was discharged soon afterwards. On the whole, both orthopaedic medicine and traditional bonesetting can be mutually reinforcing in Africa’s education curriculum, rather than being mutually exclusive, as is presently the case.

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