



(REVIEW ARTICLE)



## Establishment of a functional Orthopaedic Department in a Nigerian Teaching Hospital: The problems, peculiarities and prospects

A.C Nwachukwu \*

*Department of Surgery, Chukwuemeka Odumegwu Ojukwu University Awka, Nigeria.*

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### Abstract

Establishing a functional orthopaedic department in a Nigerian teaching hospital faces challenges like staff attitude, equipment shortages, and regulatory hurdles. Solutions include infrastructure development, equipment procurement, and staff recruitment. Strategies for equipment shortages include capital investment and improved inventory management. Cultural competence training and community involvement address cultural factors impacting patient care. Quality control and innovation are crucial, necessitating audits and research collaborations. Ethical considerations, like patient consent, are paramount. Intramural Private Practice (IPP) integrates private and institutional healthcare, enhancing service delivery. Structured guidelines ensure operational integrity. Overall, a holistic approach focusing on staff management, quality, and patient-centred care is essential for a successful establishment. Keywords: orthopaedic department, challenges, solutions, cultural factors, quality control.

**Keywords:** Orthopaedic Department; Challenges; Solutions; Cultural Factors; Quality Control.

### 1. Introduction

An orthopaedic hospital is a specialized facility dedicated exclusively to diagnosing and treating disorders related to the musculoskeletal system. This specialization allows for a concentrated focus on orthopaedic medicine, which includes bone, joint, muscle, and ligament conditions. Thus, the hospital provides expert care and advanced treatments tailored to the specific needs of patients suffering from these types of ailments.

Amongst the numerous problems plaguing the hospital, particularly the orthopaedic department, several key issues stand out that compromise both the efficiency and the effectiveness of medical services provided to patients.

#### 1.1. Staff Attitude

There is a noticeable inertia among workers, especially when transitioning from a less demanding general hospital environment to a modern teaching hospital's fast-paced and competitive nature. The workers' diverse backgrounds further complicate this adjustment issue; some are from the ministry, and others are from the teaching hospital, creating a dichotomy affecting overall service delivery. Additionally, the disparity in salaries between teaching hospital staff and ministry staff has led to demotivation among the latter group, significantly reducing their willingness to invest fully in their responsibilities.

#### 1.2. Non-Residential Workers

A considerable number of staff do not reside near the hospital, such as the Awka metropolis. Many commute long distances from places like Enugu and other far stations. This geographical separation contributes to chronic punctuality issues, severely affecting the department's ability to respond promptly to emergencies. The distance is particularly

\* Corresponding author: A.C Nwachukwu

problematic for specialists who are critical to handling life-threatening emergencies, as their delayed response times can result in compromised emergency services.

### **1.3. Absence of High-Skilled Personnel and High Turnover of Needed Staff**

The orthopaedic department, along with other clinical departments, frequently faces a shortage of specialists required to handle complex and high-profile cases. Teaching hospitals are typically referral centres designed to manage advanced cases that other institutions are unable to treat. However, the lack of specialists often downgrades the facility's capability to function beyond primary or secondary care. The absence of these key professionals impedes the hospital's ability to provide comprehensive care and contributes to a high turnover rate among staff seeking better opportunities elsewhere due to inadequate professional support and growth within the institution.

Addressing these issues requires a multi-faceted approach that includes organizational changes, policy revisions, and a renewed focus on staff engagement and retention strategies to improve the overall functioning of the orthopaedic department and the hospital at large.

### **1.4. The lack of necessary equipment and operating sets in the orthopaedic department**

This severely impacts the quality of care provided to patients and the efficiency of the department. The implications and potential solutions are as below

#### *1.4.1. Reduced Quality of Care*

The absence of essential surgical instruments and diagnostic tools compromises the ability to perform complex surgeries and procedures with precision. This can lead to suboptimal outcomes for patients, including longer recovery times and increased risk of complications.

#### *1.4.2. Delays in Treatment*

Without the necessary equipment, surgeries and treatments must be scheduled based on the availability of the required tools, leading to delays. These delays can exacerbate conditions, turning potentially manageable issues into severe problems that are harder and more costly to treat.

#### *1.4.3. Increased Dependency on External Facilities*

A lack of equipment often forces hospitals to refer patients to other facilities that can provide the necessary care. This not only strains the patient's finances and comfort but also puts additional pressure on the healthcare system.

#### *1.4.4. Impairment of Training and Education*

Teaching hospitals are critical for training future orthopedic surgeons. Equipment shortages mean that trainees may not gain experience with standard tools and procedures, potentially compromising their education and readiness to handle real-world challenges after graduation.

#### *1.4.5. Staff Frustration and Turnover*

Repeatedly encountering barriers to providing adequate care can lead to frustration among healthcare providers. This dissatisfaction can contribute to higher turnover rates, as staff seek better-equipped workplaces where they can practice more effectively.

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## **2. Potential Solutions to Address**

### **2.1. Infrastructure Development in a Developing Country**

Developing an orthopaedic department in a teaching hospital in a developing country involves a comprehensive approach to infrastructure development, facilities design, equipment procurement, and ensuring reliable utility services. Each of these components must be tailored to local conditions while striving to meet international standards.

### **2.2. Facilities Design**

The design of the orthopaedic department should be patient-centred and optimized for workflow efficiency. This involves:

**Space Utilization:** Operating theatres must be spacious enough to accommodate modern surgical equipment and allow easy movement of staff. Outpatient clinics should be designed to handle high patient volumes efficiently, reducing wait times and improving patient flow.

### 2.3. Orthopedic Operating Theater

Orthopedic Operating Tables are specifically designed to facilitate the unique demands of orthopaedic surgeries. These tables are versatile, allowing for the integration of additional attachments tailored to different orthopaedic procedures. These include:

- **Orthopedic Fracture Table:** This attachment facilitates surgeries related to fractures and lower limb traction.
- **Femur Lateral Attachment:** Used for procedures involving the femur.
- **Knee Arthroscopy and Tibia Nailing Attachment:** Specialized for knee surgeries and tibia procedures.
- **Arm Surgery Table:** For surgeries involving the arm, enhancing both accessibility and precision.

### 2.4. Emergency Orthopedic Care

Emergency care in orthopaedics involves the immediate treatment of acute trauma and other urgent orthopaedic conditions within hospital emergency rooms. Facilities must be equipped to enable orthopaedic surgeons to deliver safe, high-quality care swiftly. This includes having the necessary surgical instruments and support staff ready at all times.

### 2.5. Orthopedic Intensive Care Unit (ICU)

The Orthopedic ICU is crucial for the care of severely ill patients who require constant monitoring and intensive treatment. Key considerations for the design of an Orthopedic ICU include:

- **Layout:** There should be sufficient space to accommodate medical equipment and patient mobility aids like wheelchairs. A forward-thinking design would allow for room expansion to accommodate future technological advances or additional functionalities.
- **Storage:** Adequate storage solutions must be implemented to house essential supplies, such as medical instruments, linens, and medications, which should be easily accessible to optimize workflow efficiency.
- **Lighting:** Proper lighting is critical, especially between the bed and the bathroom to prevent patient falls. Good lighting in medication preparation areas is also essential for the correct identification and treatment of patients.
- **Family Zone design** Family areas should be strategically placed within sight of medical staff but also configured in a way that maintains comfort for both visitors and patients, facilitating interaction without interfering with medical operations.

### 2.6. Surgical Intensive Care Unit (SICU)

A dedicated space near the Orthopedic ICU should be designated for the Surgical ICU, which caters to patients who require intensive care pre- and post-orthopedic surgery.

### 2.7. Radiology Department

The Radiology Department is integral to an orthopaedic hospital, requiring:

- **Facilities for X-Ray and CT Scans:** These should be installed in rooms with adequate shielding to protect against radiation exposure. Effective shielding materials include brick and concrete due to their availability, cost-effectiveness, and structural integrity.
- **Room Design:** X-ray rooms should preferably have a single entrance and windows that are positioned high above the external ground level to minimize radiation leakage. Doors should include hydraulic mechanisms to ensure they remain closed during procedures and should overlap at joints to prevent radiation streaming.
- **Equipment Layout:** Radiography and fluoroscopy equipment should be arranged thoughtfully to enhance functionality and safety. The control console should be placed as far away as possible from the x-ray tube to protect the operator, who should also have a mobile protective barrier equipped with lead-equivalent glass for viewing during exposures.
- **Infection Control:** Design elements should include non-porous surfaces, seamless floors, and efficient air filtration systems to minimize the risk of infections—a critical aspect given the higher infection risks in warmer climates typical of many developing countries.

- **Patient Safety:** Facilities should be designed with patient safety in mind, incorporating features like handicap-accessible entrances and emergency systems that are easily accessible in case of a sudden need.

Design considerations must also include the region's cultural, economic, and environmental contexts, which might affect how spaces are used and maintained.

## 2.8. Equipment Procurement

Procuring the right equipment is crucial for the functionality of the orthopaedic department:

**Modern Orthopaedic Tools:** Essential tools include C-arms for real-time imaging, which are crucial for precise surgeries; arthroscopy equipment for minimally invasive procedures; and prosthetic fitting devices which are essential for rehabilitation.

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## 3. Potential Solutions to Address Equipment Shortages

### 3.1. Capital Investment

Hospitals should prioritize budget allocations for purchasing critical equipment. This may involve securing funds through increased governmental support, partnerships with private investors, or financial assistance from international healthcare organizations.

### 3.2. Donation and Charity Involvement

Engaging with charities, non-profits, and philanthropic organizations that focus on healthcare could provide another avenue for acquiring necessary surgical tools and machines. Such organizations often run programs specifically designed to equip hospitals in underserved regions.

### 3.3. Improved Inventory and Maintenance Practices

Implementing robust inventory management systems can help ensure that available equipment is maintained properly and used efficiently. This includes regular maintenance schedules to extend the lifespan of existing tools and technologies.

### 3.4. Leasing or Shared-Resource Arrangements

Hospitals could consider leasing equipment or entering into shared-resource agreements with other hospitals. This approach allows access to modern and sophisticated equipment without the need for outright purchase.

### 3.5. Innovative Financing Models

Exploring innovative financing models like public-private partnerships (PPPs) can facilitate the acquisition of expensive technologies. These partnerships can allow for the sharing of financial burdens and benefits among public entities and private investors.

Addressing the lack of equipment in orthopedic departments is crucial for improving patient outcomes, enhancing the training of medical professionals, and ensuring that hospitals can fulfill their roles effectively within the healthcare system.

- **Cost-effective Strategies:** Given budget constraints typical in developing countries, phased procurement strategies can be employed where critical equipment is prioritized. Additionally, leasing high-cost equipment or entering into partnerships with manufacturers for long-term leases can reduce upfront costs and ensure equipment is up-to-date.
- **Sustainability:** Equipment choices should also consider long-term sustainability in terms of maintenance, repair services available locally, and training for local staff on the equipment's use and upkeep.

### 3.6. Utility Services

Reliable utility services are foundational to the continuous operation of medical facilities:

- **Electricity:** Reliable power is essential, not just for daily operations but for preserving critical medical supplies (like prosthetics and medicines) and ensuring that surgical and diagnostic equipment functions uninterrupted. In regions where power cuts are common, robust backup systems like generators are necessary.
- **Water Supply:** Water is crucial not only for sanitation but also for various medical processes within the department. In areas prone to water scarcity, creating reservoirs or having water recycling systems can be beneficial.
- **Internet Connectivity:** In today's digital age, internet connectivity is vital for accessing medical records, conducting telemedicine sessions, and for continuous medical education. Ensuring stable internet connections with redundancy (like having multiple service providers) is key in maintaining access to these resources.[1,3,6,12,16,119]

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## 4. Challenges and Strategic Considerations

Developing countries face unique challenges that can impact these plans, including:

- **Financial Limitations:** Budget constraints are often the most significant hurdle. Innovative financing models, such as public-private partnerships, can be explored to support capital-intensive projects.
- **Local Skill Shortages:** There may be a shortage of trained professionals to operate sophisticated equipment. Partnerships with educational institutions and international bodies can help provide the necessary training and development opportunities.
- **Regulatory Hurdles:** Navigating local regulations and import restrictions on medical equipment can be challenging. Establishing a good relationship with regulatory bodies and possibly advocating for more streamlined processes is crucial.[37,

### 4.1. Staff Recruitment

Building a successful orthopaedic department in a teaching hospital in a developing country requires not just physical infrastructure but also a strong foundation of skilled and motivated personnel. The recruitment, training, and retention of staff are crucial to ensuring high standards of care and the sustainability of hospital operations.

### 4.2. Recruitment

Recruiting the right staff is the first step towards establishing a robust department. The goal is to attract skilled professionals who can deliver high-quality care and contribute to the educational mission of the hospital:

- **Specialization and Qualification:** It's essential to hire individuals who are not only highly qualified but also specialized in areas critical to orthopaedics, such as orthopaedic surgery, nursing specialized in surgical care, anesthesiology, and radiology. This specialization ensures that the staff can handle the complex cases typical in orthopaedics.
- **Long-term Commitment:** Given the investments in training and development, it's beneficial to recruit individuals who are committed to long-term service within the hospital. This commitment can be encouraged through contracts that include career progression plans and other benefits.
- **Global Recruitment Standards:** Align recruitment practices with global standards, which might include using structured interviews, practical assessments, and rigorous background checks to ensure candidates meet the high expectations of a teaching hospital.[15,18]

### 4.3. Training and Development

Continuous learning and professional development are crucial, not just to maintain quality of care but also to keep the staff up-to-date with the latest medical advances:

- **Regular Training Programs:** Implement ongoing training programs, including workshops, seminars, and hands-on sessions, which are essential for keeping staff at the cutting edge of orthopaedic techniques and technologies.
- **Access to Online Learning:** Facilitate access to online courses and webinars, particularly those offered by renowned international orthopaedic institutions. This can be a cost-effective way to enhance skills and knowledge.

- **International Collaboration:** Establish partnerships with international hospitals and universities. These collaborations can provide opportunities for staff exchanges or short-term fellowships, exposing staff to different working environments and practices.

#### 4.4. Staff Motivation and Retention

Ensuring that staff are motivated and remain committed to the hospital involves creating a supportive work environment and addressing their professional needs:

- **Supportive Work Environment:** Foster a culture of respect, teamwork, and professional integrity. Regular meetings and team-building activities can help in nurturing this environment.
- **Performance-Based Incentives:** Implement a clear system of rewards that are tied to performance metrics. This not only motivates staff but also aligns their efforts with the department's goals.
- **Clear Job Descriptions and Feedback Mechanisms:** Define job roles clearly to avoid role confusion and ensure that every staff member knows what is expected of them. Regular performance evaluations and feedback can help staff improve and feel valued.
- **Fair Remuneration and Benefits:** Competitive salaries and benefits are crucial in retaining staff, particularly in regions where migration to higher-paying countries is common. Benefits might include housing allowances, health insurance, and support for continuous education.
- **Career Advancement Opportunities:** Provide clear pathways for career advancement within the hospital. This can include leadership training, specialist training, or opportunities to lead research projects.

#### 4.5. Addressing Challenges

Several challenges may affect these efforts:

- **Resource Limitations:** Financial constraints can limit the ability to offer competitive salaries and high-quality training programs.
- **Cultural and Social Factors:** These can influence recruitment and retention, where familial or societal obligations pull talented individuals away from long-term commitments in remote or underserved areas.
- **Regulatory Hurdles:** Bureaucratic processes can slow down the hiring process, particularly for foreign-trained staff, which can be frustrating and demotivating.[7,9,18]

#### 4.6. Operational Efficiency

Operational efficiency is critical in healthcare settings, particularly in orthopaedic departments where the complexity of cases and the need for precise, timely interventions are high. In teaching hospitals in developing countries, achieving this efficiency requires careful planning and implementation of effective systems and practices.

#### 4.7. Standard Operating Procedures (SOPs)

Standard Operating Procedures (SOPs) are fundamental for ensuring that all departmental activities are performed consistently, safely, and to the highest standard. These procedures must be clearly written, accessible, and regularly updated to reflect new knowledge and technologies. [35,36,37]

- **Development and Implementation:** SOPs should be developed in collaboration with experienced clinicians, nurses, and administrative staff to cover all critical processes. This includes patient intake, surgical procedures, postoperative care, and emergency response protocols.
- **Safety and Efficiency:** SOPs help minimize errors by providing a clear, step-by-step guide to performing tasks. This is especially critical in surgeries and postoperative care where precision and adherence to best practices directly impact patient outcomes.
- **Standardization of Care:** By standardizing care, SOPs ensure that every patient receives the same quality of treatment regardless of which clinicians are on duty. This is crucial in a teaching setting where many different hands may be involved in patient care.

#### 4.8. Case Management

A team-based approach to case management can significantly enhance the learning environment and improve patient outcomes by integrating various perspectives and areas of expertise.

- **Multidisciplinary Team Meetings:** Regular meetings should be held involving surgeons, nurses, physiotherapists, and other relevant healthcare professionals. These meetings are platforms for discussing upcoming cases, reviewing ongoing care, and evaluating outcomes of completed cases.
- **Enhanced Learning:** For a teaching hospital, these meetings also serve as educational sessions where residents and students can observe the decision-making process and learn from real-life cases.
- **Patient-Centered Care:** A collaborative approach ensures that all aspects of a patient's care are considered, leading to more comprehensive treatment plans and potentially better outcomes.

#### 4.9. Data Management

Implementing an efficient health information system is pivotal for the management of data in a busy orthopaedic department.

- **Record-Keeping:** A robust health information system enables accurate and secure documentation of patient data, surgical reports, and follow-up results. Digital records are preferable as they are easier to manage, retrieve, and update.
- **Data Analysis:** Such systems can also support data analysis, providing insights into patterns of illness, treatment outcomes, and departmental efficiency. This can guide policy-making and improve practices.
- **Support for Clinical Decision-Making:** Advanced health information systems can integrate decision support tools that help clinicians make evidence-based decisions, which is particularly useful in complex orthopaedic cases.
- **Administrative Efficiency:** These systems streamline administrative tasks such as scheduling, billing, and compliance reporting, freeing up more time for patient care.
- **Educational Tool:** For a teaching hospital, the data management system can also be used as a teaching tool, allowing students to learn through case studies and real-time data analysis.

#### 4.10. Challenges and Solutions

Implementing these operational efficiencies in a developing country's teaching hospital faces several challenges:

- **Resource Limitations:** Financial constraints can affect the ability to develop comprehensive SOPs, recruit multidisciplinary teams, and implement advanced data management systems.
- **Training Needs:** Staff may require significant training to adapt to new SOPs or to use sophisticated data management systems effectively.
- **Cultural and Behavioral Change:** Implementing SOPs and new systems often requires a change in culture and attitudes, which can be met with resistance from staff accustomed to existing workflows.

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### 5. Financial Management

Effective financial management is crucial for the sustainability and growth of orthopaedic departments in teaching hospitals, especially in developing countries where resources are often limited and healthcare demands are high. Managing finances in such settings involves meticulous budgeting, exploring diverse funding sources, and ensuring that financial practices support both the operational and educational missions of the department.

#### 5.1. Budgeting and Finance

Financial planning in a hospital environment must be both strategic and detailed, addressing immediate needs while also considering long-term sustainability.

- **Comprehensive Budgeting:** Budgeting should cover all necessary expenses, including but not limited to the procurement of medical equipment, maintenance costs, staff salaries, training programs, and other operational expenses. It's important to anticipate future needs and plan for the replacement of technology and equipment.
- **Cost Control and Monitoring:** Regular monitoring of expenditures against the budget is essential to ensure financial health. This involves not just tracking spending but also analyzing it against outcomes to ensure funds are used effectively.
- **Emergency Funds:** Setting aside funds for unexpected expenses, such as sudden equipment failures or necessary upgrades, is crucial. This helps maintain continuous service delivery without compromising patient care.

- **Efficiency Measures:** Identify areas where efficiencies can be improved to reduce costs, such as energy-efficient hospital designs or bulk purchasing of supplies to negotiate better prices.

## 5.2. Funding Strategies

Given the constraints of relying solely on government funding, which is often limited or unpredictable, orthopaedic departments must explore additional funding avenues:

- **International Health Organizations:** Grants from organizations such as the World Health Organization, Doctors Without Borders, or the Bill and Melinda Gates Foundation can provide significant financial support targeted at specific health projects or infrastructure improvements.
- **Private Sector Partnerships:** Collaborating with private businesses can open up mutual benefits, where companies contribute funds or resources as part of their corporate social responsibility initiatives. These partnerships might also offer access to newer technologies and systems.
- **Philanthropic Donations:** Engaging with local and international philanthropists or charitable organizations that focus on healthcare can yield donations. This requires maintaining active communication channels with potential donors and transparently reporting on the impact of their contributions.
- **Revenue-Generating Services:** Hospitals can also consider offering specialized services that generate additional revenue, such as elective surgeries, specialized diagnostic services, or partnership programs with private clinics.

## 5.3. Financial Challenges and Mitigation Strategies

Managing finances in developing countries poses specific challenges that require tailored strategies:

- **Fluctuating Funding:** Government allocations can be inconsistent and impacted by political changes or economic instability. Maintaining a reserve fund and diversifying funding sources can mitigate this risk.
- **Currency Instability:** Exchange rate fluctuations can affect the hospital's purchasing power, especially for equipment bought from abroad. Hedging strategies might be employed to manage this risk.
- **Corruption and Mismanagement:** Ensuring transparency and accountability in financial dealings is crucial to prevent mismanagement and corruption, which can be prevalent in some settings. Regular audits and strong governance structures can help address these issues.[23,24,25,26,27]

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## 6. Cultural and Social Considerations

### 6.1. Challenges

Cultural beliefs and social norms can significantly influence health behaviors and perceptions, including attitudes towards injury, surgery, recovery, and hospital care. These factors may affect patient compliance with medical advice and treatment plans. For instance, some cultural beliefs might prioritize traditional healing methods over modern medical treatments, or there may be misconceptions about the causes of illnesses.

### 6.2. Strategies for Improvement:

#### 6.2.1. Cultural Competence Training for Healthcare Providers:

Training staff in cultural competence can greatly enhance interactions with patients by increasing sensitivity to cultural and social contexts. This understanding can improve communication, foster trust, and facilitate better patient engagement.

#### 6.2.2. Inclusion of Community Leaders in Health Education:

Involving respected community leaders or local influencers in health education initiatives can help bridge the gap between medical advice and cultural beliefs. These leaders can advocate for beneficial practices and help dispel myths and misconceptions.

#### 6.2.3. Patient-Centered Care Approaches:

Adopting patient-centered care that respects individual patient needs, preferences, and values can improve treatment adherence. Tailoring healthcare services to align with cultural and social expectations can lead to better health outcomes.



#### 6.2.4. Developing Culturally Appropriate Health Materials

Creating health education materials that are culturally relevant and easily understandable can enhance comprehension and acceptance of medical information. This includes using local languages and culturally familiar imagery.

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## 7. Quality Control and Innovation

Quality control and innovation are pivotal in enhancing the standards of care in orthopaedic departments, particularly in teaching hospitals where the dual goals of patient care and education must be met. These aspects not only impact patient outcomes but also contribute to the advancement of medical knowledge and practices, especially critical in resource-limited settings.

### 7.1. Quality Assurance

Quality assurance in healthcare involves various strategies designed to monitor, evaluate, and enhance the standards of care provided to patients. In orthopaedic departments, this is crucial due to the complexity and risks associated with orthopaedic procedures.

- **Regular Audits:** Conducting regular audits helps in assessing adherence to established protocols and identifying areas of improvement. Audits can cover various aspects, from surgical outcomes and patient safety to administrative processes. These audits should be systematic and led by teams who can make unbiased evaluations.
- **Patient Feedback Mechanisms:** Implementing robust systems for collecting and analyzing patient feedback is vital. Feedback can provide insights into patient satisfaction, the effectiveness of treatments, and the patient care experience. This data is invaluable for driving improvements and enhancing patient-centered care.
- **Peer Reviews:** Peer reviews involve assessments by one or more members of the medical community to evaluate and improve clinical practices. This process promotes accountability, continuous learning, and adherence to high standards of medical care. Peer reviews often lead to the refinement of surgical techniques and better patient management strategies.
- **Continuous Training:** Quality assurance also involves continuous professional development for the staff. Training ensures that the medical team is up-to-date with the latest techniques, technologies, and safety protocols, thereby enhancing the overall quality of care.

### 7.2. Research and Development

Innovation through research and development is essential for progressing medical practices and improving patient outcomes. In developing countries, local research can address specific health challenges and resource constraints.

- **Clinical Research:** Encourage and facilitate clinical research within the department. This can include studies on the efficacy of different surgical approaches, pain management techniques, or the long-term outcomes of various treatment modalities. Research can also focus on the development of low-cost alternatives for expensive treatments.
- **Surgical Techniques and Patient Care Protocols:** Innovations in surgical techniques can be particularly valuable in settings where advanced technology may not be available. Developing new or modified surgical techniques that are adaptable to the available infrastructure can drastically improve outcomes.
- **Partnerships with Academic Institutions:** Collaboration with universities and other research institutions can provide access to resources, expertise, and additional funding for research initiatives. These partnerships can also facilitate the sharing of knowledge and skills, further fostering innovation.
- **Use of Technology:** Leverage technology to improve patient care. This can include the use of telemedicine to extend the reach of specialist orthopaedic care or the development of mobile apps for patient education and monitoring post-surgery.

### 7.3. Challenges and Mitigation

- **Limited Resources:** Often, the biggest challenge in implementing quality assurance and fostering innovation in developing countries is limited resources. Prioritizing investments in quality and innovation is crucial, even if it requires reallocating resources from less critical areas.

- **Cultural and Institutional Barriers:** Resistance from within the institution can hinder innovation and quality improvement efforts. Creating a culture that embraces change, continuous improvement, and values evidence-based practices is essential.
- **Regulatory and Ethical Considerations:** It is critical to ensure that all research and innovation comply with local and international ethical standards. Establishing or strengthening institutional review boards can help manage these concerns.[28,29,30,]

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## 8. Ethical Considerations

Ethical considerations are paramount in the medical field, especially in orthopaedic departments where the procedures often involve significant risks and complexities. In developing countries, the challenges of adhering to ethical standards can be amplified by resource constraints, cultural differences, and varying levels of regulatory oversight. Establishing robust ethical practices is crucial for ensuring patient safety, maintaining public trust, and upholding the integrity of medical research and practice.

### 8.1. Ethics and Compliance

- **Establishment of an Ethics Committee:** A dedicated ethics committee is vital in overseeing the department's ethical aspects of clinical care and research. This committee should include a diverse group of stakeholders, including clinicians, nurses, ethicists, and community representatives, ensuring a wide range of perspectives and expertise.
- **Role of the Ethics Committee:** The committee reviews all proposed clinical trials to ensure they meet ethical standards, oversees the patient consent process, and monitors ongoing compliance with ethical guidelines. The committee should also handle ethical dilemmas arising from patient care and advise on appropriate courses of action.
- **Training and Awareness:** All staff members should receive continuous education and training on ethical practices and compliance. Regular workshops, seminars, and discussion forums can help reinforce the importance of ethics in daily operations and ensure everyone is updated on the latest ethical guidelines and regulations.

### 8.2. Patient Consent Processes

- **Informed Consent:** Ensuring that patients give informed consent is a fundamental ethical requirement. This means patients must be fully informed about the procedures they will undergo, including the risks, benefits, and any alternative treatments available, and understand the information given to them.
- **Cultural Sensitivity:** In developing countries, it is crucial to consider cultural factors that may affect the consent process. This includes language barriers, varying levels of literacy, and cultural perceptions of authority figures. Materials and consent forms should be available in the local language and explained verbally in a manner that is understandable to the patient.
- **Vulnerable Populations:** Special care must be taken when dealing with vulnerable populations such as children, the elderly, or those with cognitive impairments. In these cases, consent must also be obtained from legal guardians or family members, adhering strictly to ethical and legal standards.

### 8.3. Compliance with National and International Standards

- **Adherence to Guidelines:** The department must comply with national health regulations and international ethical standards. This includes the Declaration of Helsinki for clinical research, which outlines the ethical principles for research involving human subjects.
- **Audits and Inspections:** Regular audits should be conducted to ensure compliance with these standards. External audits and inspections can provide an additional layer of oversight and help maintain transparency and accountability.
- **Data Privacy and Security:** With the increasing use of digital health records and data in research, ensuring the privacy and security of patient data is a critical ethical issue. Adherence to data protection regulations is mandatory to protect sensitive patient information from unauthorized access or breaches.

#### 8.4. Ethical Challenges and Solutions

- **Resource Limitations:** In resource-limited settings, there might be a temptation to cut corners in ethical practices. Despite these challenges, it is essential to maintain high ethical standards. Creative solutions, such as partnerships with international organizations, can provide support and resources.
- **Cultural Barriers:** Navigating cultural beliefs and practices that may conflict with standard medical ethics requires sensitivity and adaptability. Engaging with community leaders and involving them in the ethical discussion can help bridge these gaps.
- **Regulatory Variability:** In some developing countries, regulatory frameworks may be underdeveloped or inconsistently applied. Advocating for stronger regulatory systems and participating in policy development can help improve the ethical landscape.[32,33,34]

#### 8.5. Intramural Private Practice (IPP) in a Teaching Hospital: Enhancing Healthcare Delivery

Intramural Private Practice (IPP) is an innovative approach to healthcare delivery within the confines of a teaching hospital, allowing private clinical care to be conducted alongside the standard hospital operations. This practice aims to integrate the benefits of private and institutional healthcare to enhance service delivery, patient care, and hospital revenue.

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### 9. Objectives of IPP

#### 9.1. Prevent Patient Diversion

The primary goal of IPP is to reduce the tendency of diverting patients from the teaching hospital to external private facilities, ensuring that the hospital can maintain its patient base and provide continuous care within its infrastructure.

#### 9.2. Enhance Physician Income and Hospital Revenue

IPP allows practicing physicians to utilize their specialized clinical skills for personal income enhancement and contribute to the hospital's financial health. This dual benefit supports both the individual healthcare providers and the overall institution.

#### 9.3. Utilize External Expertise

By inviting external experts who are not primary employees of the hospital, IPP facilitates an influx of specialized knowledge and skills. This practice helps in managing complex cases within the hospital, fostering cross-fertilization of ideas, and enhancing the hospital's reputation as a center of excellence.

#### 9.4. Streamlined Patient Care

IPP enables patients to receive comprehensive care under one roof without the need to seek specialists outside the hospital. This "one-stop" treatment approach improves patient satisfaction and treatment efficiency.

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### 10. Guidelines and Procedures for Engaging in IPP

#### 10.1. Staff Participation

All levels of hospital staff are encouraged to participate in IPP, leveraging this provision to improve care delivery and professional practice.

#### 10.2. Leadership and Team Management

The IPP teams will be led by a medical consultant holding a fellowship from any of the recognized postgraduate medical colleges, either within or outside Nigeria. These teams are responsible for the direct management of patients in the hospital's private facility.

#### 10.3. Patient Admission and Management

Hospital staff can refer external patients to the teaching hospital's private facilities but must manage these patients under the supervision of a consultant.

Consultants have the flexibility to co-manage patients with colleagues from both inside and outside the hospital, ensuring that any external experts invited meet the required standards of qualification and expertise.

The managing consultant assumes full responsibility for patient outcomes and is also responsible for compensating any support staff involved in patient care.

#### **10.4. Operational Integrity**

Coercion of patients into opting for private wards is strictly prohibited. Patient choice must be respected in all instances, ensuring ethical practices are upheld.

Attending physicians are to utilize hospital facilities such as theaters, wards, laboratories, radiology departments, and pharmacies unless specific services are unavailable, in which case appropriate alternatives should be sought externally.

#### **10.5. Staffing for IPP**

The hospital will employ three medical officers to handle calls, administer medications, and coordinate with the consultants overseeing particular patients in the IPP.

Depending on budgetary allowances, these officers, along with additional nursing and support staff hired for the IPP, may either be dedicated exclusively to the private facility or rotate from the hospital's general staff pool.

#### **10.6. Patient Admission Policies**

Patients can be directly admitted to the private ward from the Accident and Emergency department if they choose to do so voluntarily.

By formalizing the practice of IPP within a teaching hospital, the institution enhances its service capacity and improves its operational efficiency and patient care quality. Orthopaedic surgeons with no private facility and teeming patients would be happier for it. This structured approach to private practice within a public institution represents a progressive step towards integrating the benefits of both healthcare delivery models. [20,21,22]

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## **11. Conclusion**

Establishing a successful orthopaedic department in a developing country's teaching hospital necessitates a comprehensive approach that includes strategic staff management, engaging stakeholders, and focusing on quality and innovation, ultimately enhancing service delivery and advancing orthopaedic education and patient care.

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