# Holistic, Enhanced and Leading Program in SPine surgical Care Initiatives in Hawassa, Ethiopia (HELP SPINE): project Executive Summary

This document is prepared to show the technical priorities and strategies for the establishment of spine surgical service in Hawassa, Sidama regional state, Ethiopia.

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# Executive summary:

This HELP SPINE document is prepared to highlight the status of spine service in Ethiopia, show the challenges and way forward. It also shows the three collaborative areas with NGOs, Institutions and Individuals to scale up the service in Ethiopia specifically in Hawassa.

In the contemporary Ethiopian condition, there is no single fellowship trained spine surgeon practicing in the country, but spine patients (mainly trauma cases) are primarily taking care of by neurosurgeons, and patients who can afford are travelling abroad for the diagnosis and treatment of there spine problem.

There are a lot of bottle neck for starting spine service in Ethiopia including lack of trained human resources (spine surgeons, nurses, anaesthesia teams, nutritionist, rehabilitation team), absence of implants and spine instruments, power instruments and absence of radiolucent spine table for intraoperative imaging. Since these challenges are interconnected and will not be solved by single institution or individuals, there is a big need of collaborative involvement to overcome the challenges and start the service in Ethiopia which will be breakthrough in the history of spine service. There are three areas of collaboration which includes **providing spine service start up kits (Instruments, implants and materials), networking with volunteer visitors and clinical research mentorship**.

All the contributors will be officially acknowledged at the university level as well as Minister of Health level

**AIM OF THIS DOCUMENT:**

The main objective of this document is to show the huge gaps in spine surgery service which is nil in Ethiopia (specifically Hawassa), show possible opportunities and call all collaborative organizations and individuals to help the establishment of holistic, enhanced and leading spine surgery service in Hawassa, Ethiopia.

**INTRODUCTION:**

According to the report from the Worldometer, from African countries, Ethiopia is the second largest and fast-growing population (nearly 117 million) following Nigeria (> 206 million). The World bank report also shows that Ethiopia is categorized under the Low-Income Countries (LICs) in sub-Saharan Africa. Based on the World health Organization (WHO) report, in 2019, health expenditure per capita in Ethiopia was approximately USD 75 (compared to USD 11,000 in the United States and USD 5,000 in the United Kingdom) which is extremely low.

Following the lack of resource and low per capita, the medical workforce shortages also represent a major challenge in low- and middle-income countries. Africa has 2.3 health care workers[1] per 1000 population, compared with the Americas, which have 24.8 health care workers per 1000 population[2].

The WHO has designated Ethiopia as having a 'critical' health workforce shortage and ranked it in the lowest quintile among African nations in terms of density of health care personnel[3]. In Ethiopia, the doctor, health officer, nurse and midwife to population ratio is 0.7 per 1000 population, far behind the minimum threshold of 2.3 doctors, nurses and midwives to 1000 population recommendations. The greatest deficit in health sector workforce density is for physicians, with 2.5 physicians per 100,000[4]. In addition to a low workforce density, an imbalance in skills distribution along geographic, gender and sector dimensions poses a serious challenge for the delivery of essential health care services, mainly in rural areas.



## Modern orthopedic surgery Care development in Ethiopia:

In Ethiopia, it used to be very difficult to provide safe, timely, sustainable, self-sufficient and affordable modern orthopedic care to all its citizen. Still now this is one of the big challenges observed even though the number of work force is significantly increased. One of the big challenges for the low coverage of orthopedic service in the country is lack of adequate number of orthopedic surgeons trained and working in the country. Until 10 years back, there was only

[1] Health care workers include medical doctors, nurses and midwives
[2] Naicker, S., Plange-Rhule, J., Tutt, R.C., Eastwood, J.B. (2009). Shortage of healthcare workers in developing countries – Africa. *Ethnicity & Disease, 19*(1 Suppl 1).
[3] WHO. (2011). Transformative scale up of health professional education.
[4] FMoH. Health Sector Transformation Plan 2015-19.

a single (Tikur Anbessa Specialized Hospital) orthopedic surgery specialty training center which gives residency training for the whole nation with average yearly residency acceptance rate of 7 residents and the total number of orthopedic surgeons were not more than 40. On top of that, most of the surgeons were working in the capital city of the country where the other regions were not having the access for modern orthopedic care. This was one of the bottle necks for decades with other many reasons. Currently there are around 500 practicing Orthopedic surgeons for the 117 million population which makes **orthopedic Surgeon to population density of 1 orthopedic surgeon for 234,000 population** which is very far from the WHO recommendations.

## Hawassa Orthopedics & Traumatology service

Hawassa University Comprehensive Specialized Hospital which is located in Sidama regional state in the southern part of Ethiopia is believed to serve around 20 million of catchment population from Sidama regional state, Oromia Regional state, South Nation Nationality and People Region (SNNPR) and other nearby regions. Currently the department of orthopedics has a total of 8 orthopedic & Trauma surgeons including one orthopedic trauma and arthroplasty consultant surgeon and three fellows (1Trauma and arthroplasty fellow in Assuit University, Egypt; 1 Spine Surgery fellow at Ganga Hospital and other one Pediatric Orthopedic Fellow at Cure International Hospital in Ethiopia)). There are around 24 orthopedic residents from first to third year of training. The department also has 3 clinical research staffs who are dedicated to work on research projects. There is a separate inpatient ward for adult orthopedic patients (34 beds) and separate pediatrics orthopedic patients (12beds). The department has newly inaugurated operation theater which has three operation rooms dedicated only for orthopedic services.



## Spine surgery service in Ethiopia:

Regarding the spine surgery service in Ethiopia, as of today, there is **No fellowship trained spine surgeon** who will take care of the spine problem in Ethiopia. Even though, spine trauma and other some basic services are covered by the neurosurgeons, most of the spine problems are still untouched throughout the country. There are thousands of spine deformity patients who are on just follow up and put on waiting list in every orthopedic residency teaching hospital and very few of them who have severe deformities are being send abroad (Specifically Ghana FOCOS hospital with the help of JDC Ethiopia, NGOs mainly working on surgical treatment of scoliosis) for surgical deformity correction of scoliosis. Most recently, there are discussions and agreements between Ganga Hospital, Coimbatore, India and JDC Ethiopia to bring some deformity patients from Ethiopia to Ganga Hospital for operative management which will be started soon in 2023.

This sending of patients abroad (Ghana) is reported to be very expensive which costs around 70,000 USD per patients (they will stay for around 3 months) which is a lot of money and can cover for more than 15 patients' operative management if the service is given in Ethiopia. The future plan should be that the Ethiopian government and all stakeholders must to focus on training of human powers (spine surgeons, nurses, anesthesia team, rehabilitation professionals and nutritionist), fulfilled the equipment and all the necessary implants to give the deformity correction service in the country which will be very economical for the patients, patient families, nations and for the whole country at large.

Apart from the deformity, a lot of patients with degenerative spine problems, major spine trauma cases including neglected one, myelopathies and other conditions are obliged to live with their problem unless they are able to travel to abroad for surgical management.

Generally, even though the neurosurgeons are giving the current basic spine service in the country, we can say that the service is nil and it needs the hand of different stakeholders including the Ethiopian government, Minister of Health, the health professionals, NGOs and other stakeholders to establish spine service in Ethiopia.



## Challenges of starting spine service in Ethiopia:

1. **Lack of fellowship trained spine surgeon**: There is no a single fellowship trained spine surgeon so far except three on training (two at Ganga Hospital and one in UK). Of course, in the existing medical practice of the country the Neurosurgeons are the ones dealing with basic spine care with all the limitations. The bad truth is that the number of neurosurgeons practicing in the country are less than 80 and they are not dedicated for spine care only, so most of the spine conditions are left untouched.
2. **Trained Operation Theater (OT) room nurse**: Since any OT nurse can't scrubbed in spine surgery due to unique nature of the instruments and implants, this used to be

as well as will be another big challenge which should be addressed with short term nurses training. It could be onsite training or sending 2-3 nurses abroad for 3-4 weeks and they will come back to Ethiopian and train the others.

3. **Lack of Spine surgery instruments**: Since the service was not adequately provided in the country before, there is No spine instrument set so far.  These includes basic spine set, cervical spine set, thoracolumbar set, deformity correction set, TLIF set, ACDF set and others. These all need to be bought and the service will be started from scratch.
4. **Lack of Implants**: There is no adequate supply of spine implant in the country at all. So far there is one spine implant private supplier in the country. These need further discussion and plan in order to have sustainable supply chain.
5. **Lack of power instruments:** in most centers of Ethiopia, it is very difficult to get high-speed burr, Misonix bone scalpel, Bipolar cautery machine with Cable which are very important for the appropriate execution of spine surgery. Unless these things are fulfilled slowly, spine surgery will not be helpful for the patient and it will be strange for the surgeon.
6. **Lack of Spine table:** There is no transparent spine table which is compatible with  C-arm.

**SWOT Analysis for Spine care in Hawassa, Ethiopia**

| **Strength** | **Weakness** |
|---|---|
| 1. Presence of dedicated Operation Theatre (OT)- three newly inaugurated OT<br>2. Presence of new brand C-arm<br>3. Presence of fellowship trained spine surgeon (Dr Mengistu will finish after 3 months; June 2023)<br>4. Dedicated staff, hospital administrative and supportive university board member<br>5. Good working environment and team work<br>6. Active clinical research involvement | 1. Absence of enhanced spine service in the hospital as well as in the country before<br>2. Lack of spine instrument and implants<br>3. Lack of spine operating tables<br>4. Lack of power instruments including high speed burr and Misonix bone scalpel<br>5. Absence of Bipolar cautery machine and cable |
| **Opportunities** | **Threats** |
| 1. Presence of supportive individuals and organizations<br>1.1. AO Alliance<br>1.2. SIGN International<br>1.3. ADFA<br>1.4. Ganga Hospital<br>1.5. NOTAA<br>1.6. HGOC<br>2. Training chance | 1. Less priorities of the governmental to support the contemporary spine service<br>2. Political instability |

## Strategic approaches to HELP SPINE project

This strategic plan of "**HELP SPINE**" project is prepared to start at least basic spine surgery service in Hawassa, Ethiopia from scratch level. The plan is to start from basic service and grow slowly to advanced spine service which is organized in three phases namely short-term plan (3-6 months), intermediate (1-3 years) and long-term (5-10 years) plan as summarized in the following table.

### 1. Short term HELP SPINE project plan (3- 6 months)

In the short-term plan of the HELP SPINE project, the main aim will be to establish the spine surgery service in Hawassa, Ethiopia. So, the focus on this first stage of the project will be to train nurses, buy basic instruments to give basic spine surgery service, avail implants and create network with volunteers who can come to visit Hawassa to give spine care and give on job training.

a. **Train Nurses**: Since major spine operation was not being done in the hospital before (except discectomy and decompression which used to be done by the neurosurgeon), our nurses are not aware of the all the instrument gajets and implants. So, one of the plans is to send 2-3 nurses to Ganga Hospital and make them be familiarized with the working environment, let them know the implants, instruments and teach them on the basic intraoperative c-arm manipulation techniques to take fluoroscopy pictures. Using C-arm intraoperatively will be very important for the success of the surgeries. Since we don't have any operation room technicians, until we train and arrange radiographic technicians, the nurses will be responsible to take care of all fluoroscopy manipulation
b. **Buy basic instrument sets and Implants:** It is really painful to think about spine surgery without the presence of all the necessary complete set of instruments and implants. In the contemporary situations, we don't have any spine instrument and implants. Just to start very basic spine surgery services in Hawassa, we need to have at least the following instrument sets and implants mentioned in the table below. The details of each instrument set are prepared in a separate document and will be shared.

**Table 1: Show basic spine instrument sets, implants and materials to be fulfilled**

| S. No. | Name | Number | Remark |
|---|---|---|---|
| 1. | Cervical posterior instrumented laminectomy set | 2 | |
| 2. | Posterior cervico-occipital fusion set | 2 | |
| 3. | Anterior Cervical Discectomy and Fusion (ACDF) set | 2 | |
| 4. | ACDF Cage Insertion set (PEEK cage, Cervical Cage) | 2 | |
| 5. | Thoracic pedicle instrumentation set | 3 | |
| 6. | Lumbar pedicle instrumentation set | 3 | |
| 7. | Microdiscectomy and Microdecompression set | 3 | |
| 8. | TLIF cage insertion set | 3 | |
| 9. | Basic Deformity correction set | 2 | |
| 10. | Table top rod cutter | 1 | |
| 11. | Thoracolumbar pedicle screw tray with full pedicle screw | 2 | Different size of screw |
| 12. | TLIF Cage tray | 2 | With different size cage |
| 13. | ACDF cage tray | 2 | With different size cage |
| 14. | Rod for thoracolumbar | 100 | |
| 15. | Rod for cervicothoracic junction | 40 | |
| 16. | Cervical posterior instrumentation rod | 50 | |
| 17. | Anterior cervical plate | 50 | Different size |
| 18. | High speed burr and saws | 1 | With different size of burr tips and saw size |
| 19. | Bipolar and cautery machine (combined) | 2 | |
| 20. | Skull traction kit | | |
| 21. | Halo gravity traction* | 10 | Walking frame, wheelchair & sleeping system |
| 22. | Dural tear repair set* | | *Detail will be given |
| 23. | Neuromonitoring system | | |
| 24. | Tubular microdiscectomy sets | | |
| 25. | Radiolucent table | | |
| 26. | Operating loupes with headlight | | |

c. **Network with volunteer visitors:** Here, the main aim is to create a link or network with spine surgeons throughout the world who are volunteer to come to Hawassa and give clinical service and train surgeons, residents and operation theatre personnel. This type of experience will help the physicians in delivering world class care in campaign and the local health professionals will benefited from the visiting surgeon experience. This will be also another good chance to get implants and instruments from the visiting surgeon and the teams.

## 2. Intermediate term HELP SPINE project plan (1- 3 years, up to 2027)

In this period, we hope that the basic spine surgery service will be fully established and it will be important to strengthen the service. Here in addition to the collaborator support, we will influence responsible bodies in the Ethiopian government to give attention to purchase, distribute and deliver basic materials for the spine care.

Within three years, all the spine surgery services including advanced care (major deformity correction, minimally invasive surgeries and new technologies will be introduced in the service. To achieve these goals, the following major activities should be done:

a. Another spine surgeon (s) should be trained with fellowship.
b. Nursing staff and OT personnel including technicians dedicated to spine should be established and trained.
c. Spine unit should be established under the department of Orthopaedics
d. Operating microscope, tubular system and endoscopic spine service should installed and should be practiced.
e. Reliable source of implant and instrument sets should be secured.
f. Short term training (4-6 weeks) on specific areas including deformity correction, endoscopic surgery, anterior lumbar surgeries and others should be arranged in order to give the service in high quality
g. There should be radiolucent Spine operating table at least in one room
h. One additional C-arm dedicated for spine surgery OT will be secured
i. High quality Clinical research pertaining about spine conditions will be produced
j. Research output from our centre should be presented Internationally
k. More networking with spine surgeons throughout the globe should be undertaken.

## 3. Long term HELP SPINE project plan (5-10 years):

In this phase, the main focus will be to build up the multidisciplinary team to take care of spine patients and we hope that spine surgery service will be one of the top named services in Hawassa, Ethiopia.

a. There will be multidisciplinary team of professionals who will manage patients from inception to follow up (Spine surgeon, physiotherapist, nutritionist)
b. There will be 4-5 spine surgeons
c. Spine surgery fellowship (sandwich program) will be started
d. Become one of the international spine researches center
e. Will be one of the excellences center in spine care in the country
f. Will have locally developed evidence-based care for the patients.

# The three main areas for collaboration

1. Establishment of spine service at Hawassa, Ethiopia, so the first thing is to get start up kit for spine service and slowly progress to advanced service
2. Create networking with volunteer spine surgeons throughout the world
3. Research mentorship and networking system

# Recognition of contributor

Those NGOs, Institutions and Individuals contributing in the establishment of spine service in Hawassa, Ethiopia will be officially acknowledged at Hawassa University as well as Minister of Health Level