



الهيئة النقابية للأطباء السودانيين

بالمملكة المتحدة

SUDAN DOCTORS' UNION

U.K. BRANCH

“December Revolution Centre for Rehabilitation of Traumatic Spinal Cord and Brain Injuries”

Options Appraisal

Date: 05/03/2020

1.0 Introduction

The purpose of this paper is to bring to the attention of the Sudan Doctors' Union – UK Executive Committee and the other stake holders the options and issues related to the proposed initiative by the Sudan Doctors' Union – UK. This initiative is related to the development of a 16 bedded specialist neurological rehabilitation centre in Khartoum for rehabilitation, medical management and ongoing review of December Revolution victims who suffered traumatic spinal cord injuries (SCI) and traumatic brain injuries (TBI). The primary funding for this project is charity money gathered through crowdfunding for the purpose of supporting the victims injured during the revolution. This was organised by and thanks to the Manchester Committee – a group of Sudanese expatriates from the city of Manchester in UK. However, this fund is still open for more support from charitable organisations to enable the development of this centre which will be the first Specialist Rehabilitation Services facility in Sudan.

2.0 Background

Currently in Sudan the Specialist Rehabilitation Services for major trauma and neurological conditions do not exist at governmental hospital and are extremely limited in private hospitals. Specialist Rehabilitation Services are composed of various programmes operating at inpatient, outpatient, day care and community settings. They include the following:

1. Traumatic and nontraumatic spinal cord injury rehabilitation
2. Traumatic and nontraumatic brain injury rehabilitation
3. Neurological rehabilitation for range of conditions e.g. inflammatory, hereditary and neurodegenerative conditions etc
4. Stroke Rehabilitation
5. Amputation rehabilitation
6. Paediatric rehabilitation

Specialist Rehabilitation Services are run by multidisciplinary team well-trained in managing patients with complex physical, cognitive, behavioural and psychosocial problems. The practice is based on agreed goals between the patients/families and professionals from various disciplines – medical, physiotherapy, occupational therapy, nursing, speech and language therapy, psychology, dietetic,

assistive technology and social care. Regrettably most of the disciplines are non-existing in Sudan and those available are very scarce. The process of rehabilitation should start as early as 48 hours following the injury/illness and take weeks to months during inpatients and years of follow-up with periods of inpatient re-admission as and when required. In view of the number of professionals involved and the length of the process, specialist rehabilitation is a very costly service compared to other specialities. In Sudan, the cost is exaggerated further by the lack of the rehabilitation services in the country and the need to seek treatment abroad. December Revolution victims faced this issue and some of them went abroad and returned still in need for slow stream rehabilitation. To address the ongoing rehabilitation needs of these victims, the Executive Committee of Sudan Doctors Union proposed the development of a specialist rehabilitation centre financed by charitable funds with the following objectives:

- To establish a Rehabilitation Centre for management and long-term review of December Revolution victims with traumatic spinal cord and brain injury called December Revolution Rehabilitation Centre.
- To mark the development of the first Specialist Rehabilitation Services in Sudan with the potential for further expansion to include non-traumatic neurological disorders and musculoskeletal disabling conditions.
- To raise the awareness for further development of specialist rehabilitation services at the national level

The available statistic related to the neurological injuries during the December Revolution (until August 2019) indicated 20 traumatic brain injuries and 11 spinal cord injury victims. In addition, there are cases of limbs amputations, skeletal and organs injuries. Regrettably, the Physical Medicine and Rehabilitation does not exist as a speciality in the healthcare system in Sudan. Rehabilitation for patients with neurological and physical injuries is limited to very small outpatient services in governmental hospitals lacking the appropriate space, trained staff and equipment. Furthermore, there are some private facilities working as outpatient clinics with limited scope of practice run by single discipline of rehabilitation professionals. In Sudan, individuals who suffer major trauma and sudden disabling conditions, after completing their acute care, seek rehabilitation treatment abroad with associated financial and psychosocial implications.

The proposed location for this national Specialist Rehabilitation Centre should be within a teaching hospital with a wide range of medical and surgical specialities as well as diagnostic services. The rehabilitation centre should be a sperate building dedicated for inpatient and outpatients care together with associated facilities. The rehabilitation team should include doctors, nurses, physiotherapists, occupational therapists, speech and language therapists, psychologists, dieticians, clinical engineers and supported with good management structure. The centre should be accessible to patients with physical disability as well as having the required equipment for provision of safe patients care.

3.0 Location Options for December Revolution Rehabilitation Centre

To progress with this vital initiative in Sudan, the Executive Committee of Sudan Doctors Union – UK communicated with 4 hospitals in Khartoum and one in Wad Madani to complete an option appraisal checklist as a first step to help in determining the preferable option for the location of the Specialist Rehabilitation Centre. Each hospital completed an option appraisal checklist and was visited by Rehabilitation Medicine professionals to check the availability of the facilities/space that can accommodate the centre as well as ascertain the associated services that are important to support the rehabilitation centre. The five options considered were:

- 1- Khartoum Teaching Hospital
- 2- Ibrahim Malik Teaching Hospital and Major Trauma Centre
- 3- University of Gezira Hospital
- 4- Omdurman Teaching Hospital
- 5- Soba University Hospital

4.0 Result of option appraisal checklists:

a) The building and associated facilities

Hospital facilities	Khartoum Teaching Hospital	Ibrahim Malik Hospital	University of Gezira Hospital	Omdurman Hospital	Soba University Hospital
Separate unit including wards and department	✓	✓	✓	✓	✓
Separate for 2wards with space for 8 beds each	✓	✗	✓	✓	✓
Big room for physiotherapy gym	✓	✓	✓	✓	✓
Orthotics clinic room	✗	✓	✓	✓	✓
Hydrotherapy Pool	✗	✗	✗	✗	? can be done
Big room Occupational Therapy room	✗	✗	✓	✗	✓
Room for Psychology	✓	✓	✓	✓	✓
Outpatient Clinics rooms	✓	✓	✓	✓	✓
Room for Wheelchair & equipment	Can be arranged	✓	✓	✗	✓
Room for Specialist Pharmacy	✓	✓	✓	✗	✓
Access to ITU	Can be arranged	✓	✓	✓	✓
Total Score	7	8	10	7	10.5

b) Human Resources

Hospital Staff	Khartoum Teaching Hospital	Ibrahim Malik Hospital	University of Gezira Hospital	Omdurman Hospital	Soba University Hospital
2 full time Rehabilitation Medicine Consultant	Can be arranged	✗	✓ only 1 available	✗	✗
Part-time consultant Neurologist	✓	✓	✓	✓	✓
3 Resident Doctors	✓	✓	✓	✓	✓
Visiting Neurosurgeon	Can be provided	✗	✓	✓	✓
Visiting Plastic Surgeon	✓	✗	✓	✓	✓
Visiting Urologist	✗	✓	✓	✓	✓

Visiting Trauma & Orthopaedic Surgeon	✓	✓	✓	✓	✓
Visiting Psychiatrist	✓	✗	✓	✓	✓
Ward Sisters x 2	✓	✓	✓	✓	✓
Staff Nurses x 12	✓	✓	✓	✗	✓
Physiotherapist x 3	✓	✓	✓	✓	✓
Occupational Therapists x 3	✗ can be trained	✗	✗	✗	✗
Clinical Psychologist x 2	✓	✗	✓	✗	✓
Speech & language Therapist x 2	✗	✗	✓	✗	✗
Dietician x 1	✓	✓	✓	✓	✓
Clerical Staff x 3	✓	✗	✓	✓	✓
2 Discharge Co-ordinator	✗ can be provided	✗	✓	✗	✓
Total Score	12.5	8	15.5	11	14

c) Equipment at the hospital that will accommodate the centre

Hospital Radiology	Khartoum Teaching Hospital	Ibrahim Malik Hospital	University of Gezira Hospital	Omdurman Hospital	Soba University Hospital
MRI Scanner	✗	✗	✓	✗	✓
CT Scanner	✓	✓	✓	✓	✓
USS Machine	✓	✓	✓	✓	✓
X-ray Machine	✓	✓	✓	✓	✓
Portable X-ray Machine	✗	✓	✗	✗	✓
Total score	3	4	4	3	5

d) Equipment needed for the rehabilitation Centre

Type of equipment	Khartoum Teaching Hospital	Ibrahim Malik Hospital	University of Gezira Hospital	Omdurman Hospital	Soba University Hospital
Built-in hoist machines	X	X	X	X	X
Mobile hoist machines	X	X	X	X	X
Rota-stand patient turners	X	X	X	X	X
Hospital beds	✓	✓	✓	X	✓
Air Mattress	X	✓	✓	X	✓
Total score	1	2	2	0	2

e) Equipment needed for the physiotherapy gym

Type of equipment	Khartoum Teaching Hospital	Ibrahim Malik Hospital	University of Gezira Hospital	Omdurman Hospital	Soba University Hospital
Built-in hoist machines	X	X	X	X	X
Mobile hoist machines	X	X	X	X	X
Rota-stand patient turners	X	X	X	X	X
Tilt table	X	X	X	X	X
Plinth table	X	✓	X	X	X
Parallel walking bars	✓	✓	X	X	X
Exercise bike	X	✓	X	X	X
Functional Electrical Stimulation bike	X	X	X	X	X
Oswestry standing frame	X	X	X	X	X
Frame walkers	✓	✓	X	X	X
Total score	2	4	0	0	0
Overall	25.5	26	31.5	21	31.5

5.0 Benefits & risks of each Option

Options	Benefits	Risks/Issues
Khartoum Teaching Hospital	<ul style="list-style-type: none"> Has a building under renovation with capacity limited to the inpatient only Serving the need of the victims Availability of most of medical specialities Accessible to the rest of the country by road, rail & air, however difficulty to access the hospital in central Khartoum due to heavy traffic Potential to service larger population in Khartoum (5,829,000) and further afield Psychosocial benefit to patients and their families because most people in Sudan have relatives in Khartoum There are 6 Physiotherapy Colleges in Khartoum with 6 to 7 graduated batches. 	<ul style="list-style-type: none"> Closure or loss of the building due to the demands of other services and strategic direction for the hospital Access to central Khartoum due to heavy traffic which could impact in staff performance and patient's attendance Lack of the potential for expansion of the rehabilitation services to more comprehensive multi programme rehabilitation service Human resources required for the service
Ibrahim Malik Hospital	<ul style="list-style-type: none"> Rehabilitation will start early for neuro-trauma patients Availability of some specialities Accessible to the rest of the country by road, rail & air, however difficulty to access the Hospital due to the location Potential to service larger population in Khartoum (5,829,000) and further afield Psychosocial support to patients and their families because most people in Sudan has relatives in Khartoum Potential to develop as Major Trauma Centre with hyperacute rehabilitation unit There are 6 Physiotherapy Colleges in Khartoum with 6 to 7 graduated batches. 	<ul style="list-style-type: none"> No dedicated space for the rehab centre and associated spaces Pressure from acute trauma services to evacuate rehab beds prior to completion of the rehibition of patients Local route is difficult within residential area away from main roads No potential for expansion of the rehabilitation services Human resources required for the service
University of Gezira Hospital	<ul style="list-style-type: none"> Building available require a lot of renovation Availability of other specialities Accessible by road and train? But no airport Has the potential for expansion of the rehabilitation services There is one physiotherapy college in University of Gezeira with 	<ul style="list-style-type: none"> Extensive refurbishment is required which likely to be costly and may not be meeting the need of patients with significant physical difficulties Human resources to run the services Will be serving small catchment area compared to Khartoum

	<p>potential to add curriculums for occupational therapy and speech & language therapy</p>	<ul style="list-style-type: none"> • Difficult national access in the absence of an airport • Psychosocial support to patients and their families because most of them may not have relatives in Wad Madani
Omdurman Hospital	<ul style="list-style-type: none"> • Building available require a lot of renovation • Availability of other specialities • Accessible by road & bridges • Nearby rail and airport • Potential to develop as Major Trauma Centre with hyperacute rehabilitation unit • There are 6 Physiotherapy Colleges in Khartoum with 6 to 7 graduated batches. 	<ul style="list-style-type: none"> • Extensive refurbishment is required would be costly and may not meet the need of patients with significant physical difficulties • Pressure from acute services • Human resources to run the services • Access by road via bridges which potentially could add to the problems of traffic if there is closure of the bridge due to technical reasons
Soba University Hospital	<ul style="list-style-type: none"> • There is very large two-story skeleton building with potential to accommodate the December Revolution Rehabilitation Centre for Spinal Cord and Traumatic Brain Injuries and other rehabilitation programs and services in the future • There is a separate large established building donated in the memory of a lady called Amira Karar. This building has the potential for Paediatrics programme and outpatient and day care • There are two wards assigned for Stroke management and rehabilitation. • Adjacent to the skeleton, there is an established building for Psychiatric Day Care which would be very supportive to rehabilitation centre • Near the skeleton building, there is Research and Education Centre which will be helpful for the educational needs of the Rehabilitation team for the new speciality of Physical Medicine and Rehabilitation • Availability of other specialities • The centre and future expansion will serve larger population locally as well as national service user 	<ul style="list-style-type: none"> • The commitment from the hospital to give the whole space for rehabilitation • Availability of financing on the short and long-term • Human resources to run the services; however, will have better chance for recruitment than other hospitals • Sustainability on the long-term

	<ul style="list-style-type: none"> • Accessibility for national traveller by road, rail and air • Good road links between the 3 cities of the capital and neighbouring provinces • Psychosocial support to patients and their families because most of Sudanese people have relatives in Khartoum • There are 6 Physiotherapy Colleges in Khartoum with 6 to 7 graduated batches. • The presence of potential Interventional Radiology (IR) services in Soba University Hospital will be very useful to the Rehabilitation Centre for interventions such radiology guided external ventricular drains for TBI patients and nephrostomy tubes for SCI patients. 	
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6.0 Financial Implications:

Sudan Doctors Union- UK needs to consider the financial implications of establishing this rehabilitation centre which include:

- Cost of renovating, adapting and completing an existing building
- Cost of associated facilities
- Cost of medications
- Cost of equipment & maintenance
- Cost of catering
- Cost of human resources
- Cost of staff training from different discipline

7.0 Current available fund

There is a substantial lump sum of money allocated to this project from the Manchester Committee crowd fund. However, this will not be enough and there will be a need for further financial support to enable the development of a rehabilitation centre to a high standard including infrastructure and equipment. There are opportunities to seek donations from private and voluntary organisations.

8.0 Preferred Option

The option appraisal checklist revealed that:

- All five options have problems with multi-professional staff to compose rehabilitation teams. The opportunity for recruitment would be better for a centre in Khartoum to attract individual working in private sectors as full or part time.
- All options do not have the appropriate equipment
- Options 1,2, &3 have issues with space and future potential for expansion to develop more comprehensive Specialist Rehabilitation Services
- Option 3 (Wad Madani):

Although the overall score is good, however, there are major concerns. The national access is restricted due to lack of airport and the catchment area is small compared to Khartoum, so the centre will serve less people. Most people would not have relatives in Wad Madani who are necessary for psychosocial support during rehabilitation. There is only one physiotherapy college (compared to 6 in Khartoum) which have not yet graduated physiotherapists.

- Although only one option would be the preferable one in relation to the Sudan Doctor Union-UK proposal; however, all the hospitals mentioned in this report and in other cities all over Sudan need to develop Specialist Rehabilitation Services to support people locally. In addition, institutes of higher education should develop strategies for education and training of the workforce required for future provision of Specialist Rehabilitation Services.

After taking in consideration the result of the options appraisal checklist together with the summary of benefit and risks of each option, it appears that option 5 (Soba University Hospital) is the preferred option for the following reasons:

- There is a large skeleton building which can be finished with the correct specification to accommodate the December Revolution Rehabilitation Centre for Spinal Cord and Traumatic Brain Injuries
- This skeleton building has the future potential for development of other rehabilitation programmes and services and will be the biggest National Rehabilitation Centre. Government and charity funds need to be sought for future expansions.
- There is a large completed building called Amira Karar Centre donated by her family in her memory. This building has the potential to run Paediatrics rehabilitation programme, outpatient and day care
- There are two wards assigned for Stroke management and rehabilitation in Soba University Hospital. These two wards will provide opportunity to support the training of the allied health professionals' clinical skills and teamwork.
- Adjacent to the skeleton building, there is a completed building for psychiatric day care which would be very supportive for TBI service.
- Near the skeleton building, there is established Research and Education centre which will help in the training and education of the new rehabilitation teams.
- Availability of other supporting medical and surgical specialities.
- Good accessibility for national traveller by road, rail and air.
- Good road links between the 3 cities of the capital and neighbouring provinces.
- Establishing Department of Physical & Rehabilitation Medicine in the Faculty of Medicine, University of Khartoum
- Psychosocial support of patients and their families during rehabilitation period from relatives living in Khartoum
- Raising the awareness about Rehabilitation Medicine through resident's rotation, medical students and other allied healthcare professionals training
- Links with universities to develop education and training to allied healthcare professionals
- There are 6 Physiotherapy Colleges in Khartoum with 6 to 7 graduated batches.
- The presence of potential Interventional Radiology (IR) services in Soba University Hospital will be very useful to the Rehabilitation Centre for interventions such radiology guided external ventricular drains for TBI patients and nephrostomy tubes for SCI patients.

9.0 Opportunities

- Development of Specialised Rehabilitation services for December Revolution Victims with SCI & TBI for their ongoing care.
- Potential to expand the specialist services in the centre to include other neurological and MSK conditions to become the national centre of excellence through support from national and international stakeholders and organisations.
- Set the standards to other hospitals and universities to develop Specialist Rehabilitation Services in the different regions in Sudan.

10.0 Conclusion

The need for Specialist Rehabilitation Services in Sudan is massive and has been long overdue. The sacrifices of the heroes who were injured during the December Revolution revealed, besides the brutality of the previous regime, the huge shortfalls in the healthcare system in the country. Sudan Doctors' Union-UK proposed the development of 16 beds centre for the management and rehabilitation of the victims injured during the revolution. The centre should be a separate building with all associated facilities located within a hospital setting with available support from various specialities and diagnostic services. Five hospitals were approached and asked to complete a checklist covering the essential components and logistics for the establishment of the centre. In addition, visits were conducted to check the potential sites in each hospital and the benefits and risks of having the centre at each hospital were appraised. The information gathered and appraised revealed that Soba University Hospital appears to be the best option.

11.0 Recommendations

- To establish the first National Specialist Rehabilitation Centre for traumatic spinal cord and brain injuries in Soba University Hospital under the supervision of a steering committee including representatives from the FMoH, Soba University Hospital, SDU – UK, RMAC and other stake holders.
- We recommend that the FMoH develops regional Stroke centres and Specialist Rehabilitation Centres in other big cities in Sudan such as Wad Madani.
- We recommend that the FMoH develops Major Trauma Centres in Sudan with access to Accident and Emergency Department, Trauma & Orthopaedics Surgery, Plastics Surgery, General Surgery, Neurosurgery and Cardiothoracic Surgery.
- We recommend that the FMoH develops hyperacute trauma rehabilitation units within the established trauma centres in Omdurman, Ibrahim Malik and University of Gezeira Hospitals.
- We recommend that the FMoH develops Pre-hospital Ambulance Services and Trauma care with links to all Major Trauma Centres.
- We recommend that the FMoH develops an Air Ambulance Service to transfer Major Trauma patients (including spinal cord injuries and traumatic brain injuries) to the Major Trauma Centres in Khartoum before transfer to the Specialist Rehabilitation Centre.
- We recommend that the Sudan Medical Specialization Board develops the specialty of Physical and Rehabilitation Medicine in Sudan in collaboration with the big universities in Sudan.
- We recommend that the FMoH and Federal Ministry of Higher Education develop undergraduate colleges for occupational therapy and speech & language therapy.

- Support to the patients and families should be sought from the Ministry of Social Development and Care during and after admission to the Specialist Rehabilitation Centre.
- Collaboration with other hospitals in Sudan (including outside Khartoum) is encouraged to establish training and development links to develop and expand rehabilitation services in the future.

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