THE REPUBLIC OF THE GAMBIA

Ministry of Health
NATIONAL EYE HEALTH PROGRAMME

REPORT ON MAINTENANCE AND SERVICING OF OPHTHALMIC EQUIPMENTS UNDER NATIONAL EYE HEALTH PROGRAMME

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1 Forward

The main mission of the Gambia Ministry of Health is to ensure provision of comprehensive Healthcare Services to the Gambian population. It is against this background that, National Eye Health Programme in collaboration with the Gambia Government is committed to ensuring efficient, safe and effective Healthcare delivery.

To ensure that available Medical Equipment safely serves for a long time, it must be managed efficiently. The way in which it is used and maintained may greatly affect its reliability and hence the quality of Healthcare delivered to patient.

Appropriate periodic/preventive and corrective maintenance is key to achieving safe and cost-effective management of medical equipment. It is important therefore that measures are taken to ensure that medical equipment is maintained and cared for by the Healthcare workers in order to maximize the investment made in its acquisition. For effective maintenance to be carried out by the maintenance unit, adequate operation and maintenance funds should be budgeted and allocated.

I would like to acknowledge and thank **Cataracts Are curable – The Gambian Project** for providing the necessary funds for this trip.

Special recognition goes to Mr. Sarjo Kanyi, the program manager of NEHP (National Eye Health Program) for facilitating the whole process for all the secondary units to get their satisfaction.

Lastly, I would like to extend my appreciation to the regional staff for their support and cooperation throughout the maintenance exercise.

2 Rationale

Medical equipment plays an important role in our Health Care system and numerous pieces of equipment are used. In the eye care facilities, ophthalmic equipment will range from slit lamp, keratometers, autoclaves, and microscopes all designed to help opticians carry out diagnosis and treatment of patients.

Optimal performance of medical equipment is required to ensure safety, accuracy and expected results. Keeping ophthalmic equipment in good working condition throughout The Gambia is the function of the maintenance unit in the health facilities.

Recently, in the month of April 2021, the maintenance unit embarked on a week-long maintenance and servicing exercise of ophthalmic equipment at various eye care centers across the country. This report attempts to detail the specific picture at each hospital or health facility and concludes with specific recommendations that are important to the overall achievement of efficient, safe and effective healthcare delivery.

S/N	Hospital / Health facility	Equipment	Equipment Location	Fault Detected	Work done	Recommendation	Date
	Banjul	HAAG STREIT 100-240V BULB:6V	CLINIC	Chin rest not holding	Fully serviced,chin rest tighten		14th April 2021
		SO -111TZ MICROSCOPE	THEATRE	Power cable to the bulb were cut	Serviced,the wires broken wires were soldered		14th April
		CARL ZEISS	THEATRE	NIL	Servicced		14th April
		MELAG AUTOCLAVE	THEATRE	I saw how to operate it	Is a new machine		14th April
		GETINGE AUTOCLAVE SN:00343474	THEATRE	I saw them in operation	Is a new machine		14th April
2	Fajikunda	Slit lamp 100-240v 6w,20w	Clinic	Machine was Installed	installed		22th April
3	Brikama	Slit lamp Haag Streit Bern 100-240v,12v output	Clinic	Bulb burn, fuse burn	Replaced bulb replaced,fuse		13th April
		C.T-80 Computerize tonometer SN:1589959	Triage	Blunt and dusty	Joy stick cleaned, wheel clean and lubricate		13th April
		Tower	Refraction	Power is not reaching to the headlight,projector,chair and slit lamp	Fuses replaced and the machine serviced	The board need to be replaced	13th April
		SO 111TZ MICROSCOPE	Theatre	Screws that hold the power board were loosen and some were lost	Screws were replaced and machine was serviced		13th April
		Carl zeiss microscope 100-240v Bulb:12v,100w	theatre	Nil	Serviced		13th April
		Elecktro Helids Autoclave	theatre	Nil	Nil		13th April
		Melag sterilisator Autoclave	Theatre	Nil	Nil		13th April
4	Bwiam	SO-111W OPERATING	Theatre	Faulty brightness adjusting nut.	Serviced.		10th April

		MICROSCOPE AC 100-240V OUTPUT:12V,50W PS-060702W		Microscope arm loosen.	Adjusting nut was regulated and tighten. Bulb replaced.		
		SES 2000 SN:SCB-8F-3892	Theatre	Faulty door	Service, filters clean, door rubber replaced, temperature detector clean		10th April
		Slit lamp 100-240v 6v output	Clinic	Nil	serviced		10th April
		Projector	Refraction	Nil	Serviced		1oth April
		Slit lamp	Refraction	Nil	Serviced		10th April
		Keratometer	Refraction	Nil	Serviced		10th April
		Tower	Refraction	Power board Faulty		Board need to be replaced	10th April
5	Essau	Scan Optics (SOIII)Bulb: LED bulb SN:11090501 Output voltage: 12v,5.4A Input:100-240v	Theatre	Brightness knob faulty	Serviced and the knob regulated		29th April
		SES	Theatre	Filter water reservoir blocked with dirt	Fully serviced		29th April
6	Farafenni	SCAN OPTIC MICROSCOPE	Theatre	Missing screws, Bright adjusting nut missing	Screws replaced and service		09th April
		MELAG	Theatre	NIL	Serviced		09th April
		SLIT LAMP MODEL L-0187 SNJ0245 VOLTAGE 220V OUTPUT 6V	Clinic	Light cover broken, Power board transformer faulty.	Transformer removed and will be repaired		
		SLIT LAMP SN215054 TOPCON CORPORATION VOLTAGE 100-240V OUTPUT 12V 20W	Clinic	NIL	Service		09th April

		Automatic tonometer 100-240v	clinic	Out of seerviced	Major breakdown		09th April
		Auto Refractor	clinic	Nil	serviced		9th April
7	Soma	Scan optic(111w)220-240v 12v,50w	theatre	Not bright	Serviced and adjusted		9th April
		MATACHANA AUTOCLAVE	Theatre	Nil	Nil		9th April
		NT-1000 MODEL SN:18729 220V	Clinic	Nil	Serviced		9th April
		Auto Refractometer SN:18792 NIDEK CO LTD	Clinic	Nil	Serviced		9th April
		SLIT LAMP (TOPCORN)12 V,20W SN:208548	CLINIC	Wires from the power board to the bulb faulty	Soldered and the machine was serviced		9th April
8	Bansang	SO-111 MICROSCOPE	Theatre	Not bright ,screws missen	Serviced and the screws were replaced		8th April
		Little sister autoclave(ESCHMANN)	Theatre	Nil	Serviced		8th April
		SLIT LAMP 240V OUTPUT:12V	Clinic	Nil	Serviced		8th April
		XPERT NCT220V	Refraction	Air puffing tube blocked with dirty	Serviced		8thApril
		TOPCON TONOMETER 100-240V	Refraction	Nil	Serviced		8thApril
		PROJECTOR	Refraction	Not turning on	Serviced		8th April
		LENSO METER	Refraction	Nil	Serviced		8th April
		KERATOMETER	Refraction	Nil	Serviced		8th April
		SLIT LAMP	Refraction	Nil	Serviced		8th April

9	Basse	SCAN OPTIC MICROSCOPE SN:PS-050802WF	Theatre	Electronic board not giving output. Head loosen, bulb fan burn.	Fully service, electronic board fuse replaced, missing screws replaced and power cable repaired.		13th April 2021
		SCAN OPTIC MICROSCOPE SN:PS-011009WF	Theatre	Deem bulb illumination. This is due to low output from the transformer. The transformer needs to be replaced.	Fully serviced		13th April 2021
		AUTOCLAVE	Theatre	Nil	Just explained the mode of operation to the users.		13th April
		SLIT LAMP XCEL12560 SN:20074-08	Clinic	Power box broken from the table, Eye screws loosen, Chin rest screws loosen	Completely serviced Power board was fixed back Screws to the eye piece were properly tighten Chin rest was also fixed firmly.		13TH APRIL
		Projector	Refraction Room	Transformer faulty	Nil	Needs to be replace	14th April
		Slit lamp	Refraction room	Transformer faulty	Nil	To be replace	14th April
		Keratometer	Refraction Room	Nil	Serviced		14th April

3 General Observation

I have noticed that ophthalmic technicians used to work on the equipment and that is a great concern. It was observed that these are non-trained personnel with no competency at all; however, the information gathered was that there was no other option since no effective service and maintenance personnel are in place.

It was also observed that in some units, the arm of the microscope was tied to other parts of the equipment in other to avoid the microscope head from falling on the patient during operation.

Another key issue: electricity; the vast majority of the centers are in rural or suburban areas where mains power is a challenge and even when available, such power is usually unreliable and unstable that it poses a threat to unprotected medical equipment. Increasing fuel costs and on-going maintenance problems mean that generators are not a viable option.

Lastly, most of the outreach roads are in a terrible state and often cause damage to the equipment.

4 General Recommendation

It is essential that inspection and maintenance of NEHP equipment is carried out at least every four months.
The MoH and the NEHP management must be committed to such a regime and the MoH must ensure that it is properly funded.

A strategy called: i) Planned Preventive Maintenance (PPM) and ii) Corrective Maintenance (or repair) should be adopted.

4.1 Planned Preventive Maintenance (PPM)

Refers to regular safety and performance inspection carried out on medical equipment to evaluate risk and reduce failure so as to enhance its safety, efficiency and reliability. It involves cleaning, regular function/safety tests and making sure that any problems are picked up before they cause a breakdown.

PPM is recommended for most of the medical equipment. It will enhance the efficiency, effectiveness and reliability of medical equipment and must be carried out at appropriate frequency as suggested by the manufacturer or workload.

4.2 Corrective maintenance

This is a task performed to identify and rectify a fault on a broken-down equipment, machine or system to restore it to its original operational condition.

Furthermore doctors, nurses and paramedics whose primary function is to use medical equipment for diagnosis and treatment of patients. Their main role will be to care for the

equipment including reporting equipment failure to the maintenance unit. These categories of staff should be trained on basic servicing and maintenance of these equipment so that they can be able to solve some basic technical faults by themselves,

This can be done through annual staff training on medical equipment.

Owing to the erratic nature of electricity provision in the country and the frequent power surge, it is advisable to connect certain if not all medical equipment via a UPS (uninterrupted power supply) abrupt equipment or device failure. Hard casing should be provided wherever and whenever possible for safe transportation of medical equipment particularly during outreach. All equipment should be cleaned and covered after use.

5 Specific Recommendation

The main objective for any maintenance system is to ensure prolonged use of available equipment to provide safe and reliable healthcare over its design life.

5.1 Guidelines for Medical Equipment Maintenance

To ensure efficient maintenance of equipment, NEHP needs to plan and budget for maintenance under two main categories:

- Planned Preventive Maintenance
- Breakdown maintenance

5.1.1 Planned Preventive Maintenance (PPM)

PPM is usually scheduled at specific intervals and includes specific maintenance activities such as lubrication, calibration, cleaning of filters or replacement of spare parts that are expected to wear out after stipulated time or workload.

Maintenance planning shall always ensure that essential medical equipment for basic diagnosis, infection control, surgery and treatment are kept in good working condition.

5.1.2 Corrective Maintenance Services

Corrective maintenance refers to corrective actions undertaken in the event of breakdown of a piece of equipment. In this case, the equipment is repaired or calibrated after failure. All equipment breakdown occurring in the wards should be recorded on the Complaint Form mentioned in **Annex 3: Complaints Form.**

5.1.3 Maintenance Policy

A maintenance policy should be developed to serve as a guiding principle for efficiency, effective and safe use and operation of equipment.

5.1.4 Levels of Maintenance

Maintenance and servicing need to be structured systematically, therefore three levels of maintenance are recommended:

5.1.4.1 First-line by the Equipment User

This refers to maintenance activities that can be carried out by the user such as doctors, nurses and paramedics or health facility-based technician. This will include dusting equipment, cleaning filters and lenses, checking fuses and checking power supply source without opening the unit and without moving it away from the point of use. Other first line maintenance activities could include the following:

- Equipment decontamination and sterilization
- Functional checks
- Calibration checks
- Safety checks.

5.1.4.2 By Technician

This refers to maintenance carried out by a technician when first-line maintenance cannot rectify a fault or when a regular scheduled check and calibration is due.

5.1.4.3 Specialized Maintenance by Technician or Engineer from Manufacturer's representative or Vendor

This refers to maintenance activities that need higher level technical expertise, troubleshooting techniques and tools. Ophthalmic instruments such as Operating microscope, slit lamp microscope, Automatic Laboratory Analyzer etc. need specialized engineers and technicians who have been trained to maintain this specific equipment.

6 Conclusion

It is recommended for the following forms to be adopted as stipulated in:

Annex 1: **Stickers Form, Equipment Condition A – F**

Annex 2: **Medical Equipment Inventory Form**

Annex 3: **Complaints Form**

Annex 1: Stickers Form, Equipment Condition A – F

CLASSIFICATION OF CONDITION FOR MEDICAL EQUIPMENT BY COLOR CODE: EQUIPMENT CONDITION A – F	
EQUIPMENT/DEVICE STATUS	**ACTION**
 GOOD AND IN USE	NO PROBLEM
 GOOD BUT NOT IN USE	USER TRAINING NEEDED
 IN USE BUT NEEDS REPAIR	MAINTENANCE NEEDED
 IN USE BUT NEEDS REPLACEMENT (OLD OR OBSOLETE)	PLAN FOR DECOMMISSIONING/DISPOSAL
 OUT OF ORDER BUT REPAIRABLE	MAINTENANCE NEEDED
 OUT OF ORDER AND SHOULD BE REPLACED (CANNOT BE REPAIRED, NO SPARE, OLD OR OBSOLETE)	DISPOSE

7 Annex 2: Medical Equipment Inventory Form

Health Facility:				Inventory Date:				Inspector's Name:			Tel:
Address:								Contact Person:			Tel:
Eq. Type Key: ME: Medical Equipment MF: Medical Furniture MI: Medical Instrument HP: Hospital Plant											
Condition Key: A: Good and in use C: In use but needs repair E: Out of order but repairable B: Good but NOT in use D: In use but needs replacement F: Out of order and should be replaced											
Ref Nr.	Department / Section	Room	Equipment Name	Eq. Type	Model	Serial No	Manufacturer	Qty	Product Data	Condition	Comment

8 Annex 3: Complaints Form

Date: _____

Hospital/Health Unit: _____ Tel: _____

Department/Unit: _____ Room: _____

Address: _____

_____

Equipment: _____ Model: _____ Serial No._____

Sticker on the Equipment: A, B, C, D, E, F (circle the label on the equipment)

Complaint being Reported:

_____

_____

_____

_____

_____

_____

_____

Reported By Name: _____

Title: _____

Tel: _____

Email: _____

Date: _____

Signature: _____