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Ministry of Health

Manual of Medical Equipment Management for National & CPA3 Referral Hospitals

Prepared by:

- Hospital Services Department
- National Maternal and Child Health Center
- JICA MEDEM2 Project



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ABBREVIATIONS

Abbreviation	Full Word
CPA3	Complementary Package of Activity 3
HSB	Hospital Services Bureau
HSD	Hospital Services Department
ME	Medical Equipment
MEDM	Medical Equipment Deputy Manager
MEM	Medical Equipment Manager
MEM-WG	Medical Equipment Management Working Group
MET	Medical Equipment Technician
MOH	Ministry of Health
PHD	Provincial Health Department

I. Introduction

1. Background

The Ministry of Health of Cambodia developed the policy, implementation plan, guideline of Medical Equipment (hereinafter called “ME”) maintenance and repairing on June, 2000. The plan / guideline provided the future model expecting a proper maintenance system which would achieve a goal for whole utilization of ME. However there was the big gap between current situations in the public hospitals that time and the future model.

Even the plan / guideline focus on maintenance with technical aspect, but there was no adequate management instruction about ME maintenance. On the other hand, the number of ME is increasing in national hospital and CPA3 referral hospital day by day. Proper ME management is required in order to improve quality of medical service for whole public hospitals in Cambodia.

The Hospital Services Department (hereinafter called “HSD”) and the Hospital Services Bureau (hereinafter called “HSB”), which have responsibility of promoting ME management, should introduce the methods of the ME management described step by step.

2. About this manual

The ME management consists of many kinds of work, thus sometimes it takes a time to understand properly. It is necessary to allocate appropriate management staffs who have enough experience about hospital management. However, it is difficult to allocate such a staff in whole Cambodia at current situation. Thus, HSB prepared this ME management manual in order to start actual management work.

The concepts of this manual are as follows:

- (1) Make simple system to understand for every person who involved with the ME Management.
- (2) Reduce workload as much as possible.
- (3) Focus on clear role and responsibilities on ME Management
- (4) Introduce the working procedure practically.

II. ME management

1. What is the Medical Equipment (ME)?

Medical Equipments have been created in order to perform medical diagnosis, treatment and examination. In addition, ME have following features:

1. ME are concerned for the patient and operator safety.
2. ME are ensured availability of corrective and effective operation.
3. ME are required economical operation and maintenance for sustainability.

Category of Medical Equipment

Generally, ME could be divided following three categories;

- ① Medical Instrument (No requires maintenance: Scissors, Knife, Bowel, etc.)



Fig. 1 Medical Instruments

- ② Medical Furniture (Easy maintenance: Patient bed, Wheelchair, Shelf, etc.)

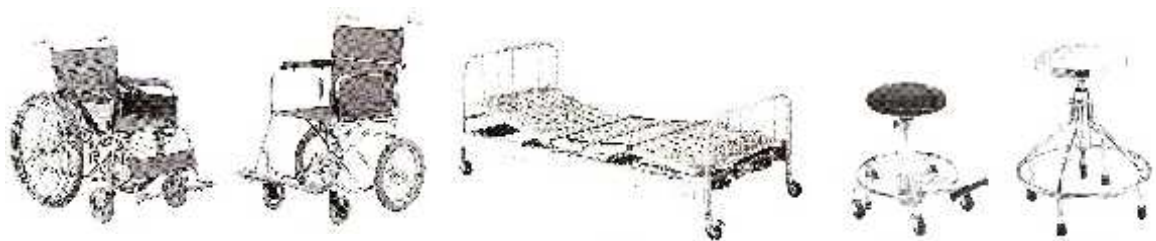


Fig. 2 Medical Furniture

- ③ Medical Equipment (X-ray machine, Centrifuge, Incubator, ECG, etc.)

Example:

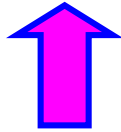


Fig. 3 Medical Equipment

Important: Main target of ME management is ③ Medical Equipment only.

2. Objective of ME management

ME management is essential condition for utilizing ME. Utilizing ME is affected by not only operation but also precise maintenance and certain administrative works. It means total managerial activities are important for utilizing ME. The followings are expected condition for utilizing ME.

- (1) All ME are managed to operate safely, correctly and effectively.
- (2) All ME are managed to maintain safety, accuracy and integrity.
- (3) All ME are managed to control with administrative work continually, efficiently and economically.

Note: “Maintain” be including repair and any other engineering services)

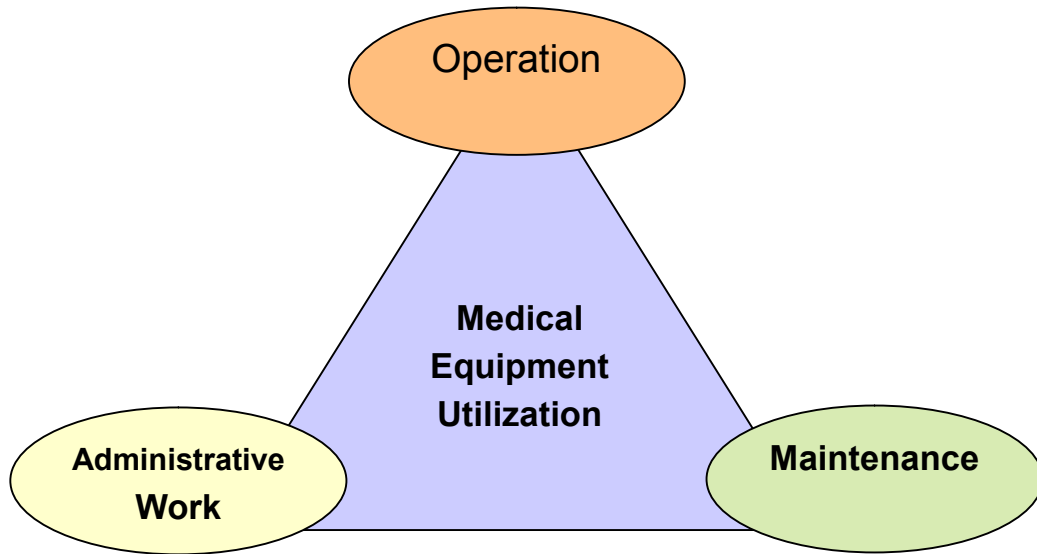


Fig. 4 Three managerial aspects

Fig. 4 indicates one ideal situation of ME utilization at hospital. The hospital has three managerial aspects such as “Operation”, “Maintenance” and “Administrative work” in order to maintain adequate condition of ME. As a particularity of this model, if one of them are missing or insufficient, the ME does not be operated properly neither sustain for long life. Therefore, the balance of these three aspects is important to contribute effective ME utilization. However, it is not easy to execute this situation in practice.

As a first step of ME management, please refer followings checkpoints.

- ✓ All ME are working in order
- ✓ All ME are operated properly by adequately trained personnel
- ✓ All ME are being utilized properly for medical diagnosis, treatment and other relevant purpose
- ✓ All ME are safe for patient and user (to ensure that no accident occurs)
- ✓ All ME are ensured satisfied medical treatment for hospital staffs and patients

3. Life Cycle of ME

The life of ME is managed continuously and synthetically during its life cycle: Start from procurement, operation, and maintenance up to disusing (Condemn) as shown in **Fig. 5**. In these procedures, technical evaluation of the equipment such as related location, training, inspection, record, etc., be carried out systematically and methodically.

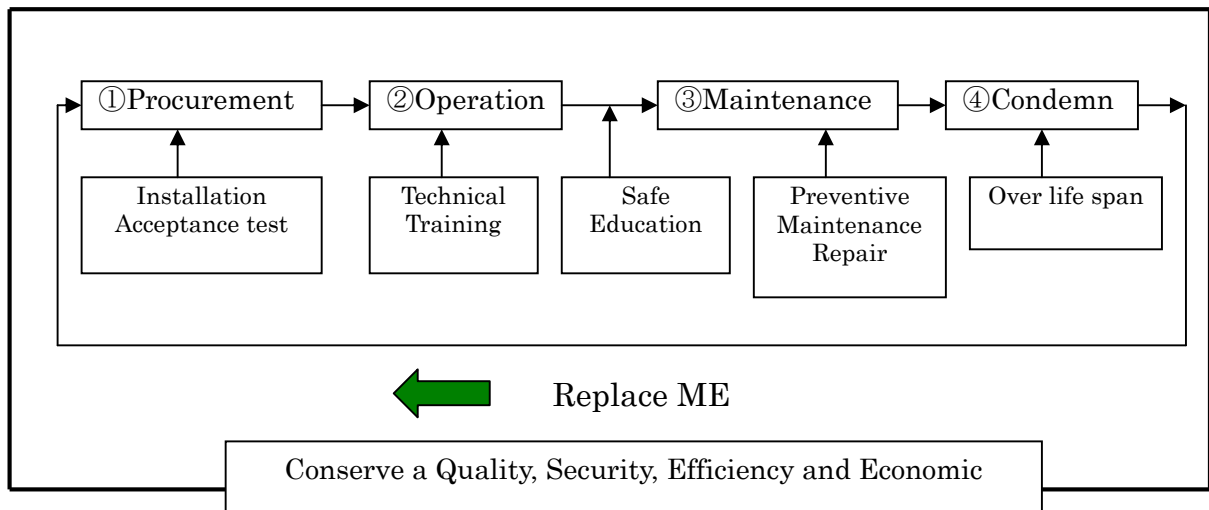


Fig.5 ME lifecycle

1) Main ME management activities in the life cycle are:

- ① Procurement → Planning and procurement of ME according to the medical requirement and level of available medical services.
- ② Operation → Supervision of operation of ME for safety, correctness, and effectiveness
- ③ Maintenance → Provision of accurate, rapid and economy ME maintenance services.
- ④ Condemn → Condemn process and planning of replacement
- ⑤ Overall → Organization of functional, continuous and economical administrative work and coordination of relationship with outsider.

4. Activities of ME management

The concept of the ME management is that more simple, easy and understandable management system as first step. Therefore, staffs concerned on ME management are required to learn and grasp exactly this structure and procedure as follows.

Following procedure all CPA3RH / NH carry out twice a year.

1st semester (From January to June)

2nd semester (From July to December)

Finally, according to the ME Management activity, you will be able to acquire the adequate cost for ME maintenance (Repairing cost and replacing cost) to estimate into AOP budget.

(1) Commissioning of ME

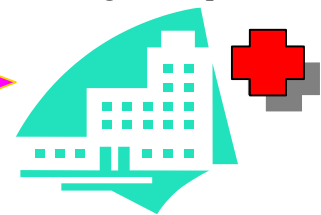
ME are commissioned properly according to the requirement for operation, maintenance and registration in each time when ME is installed.



Receive the ME whichever brand new or secondhand



Target Hospital

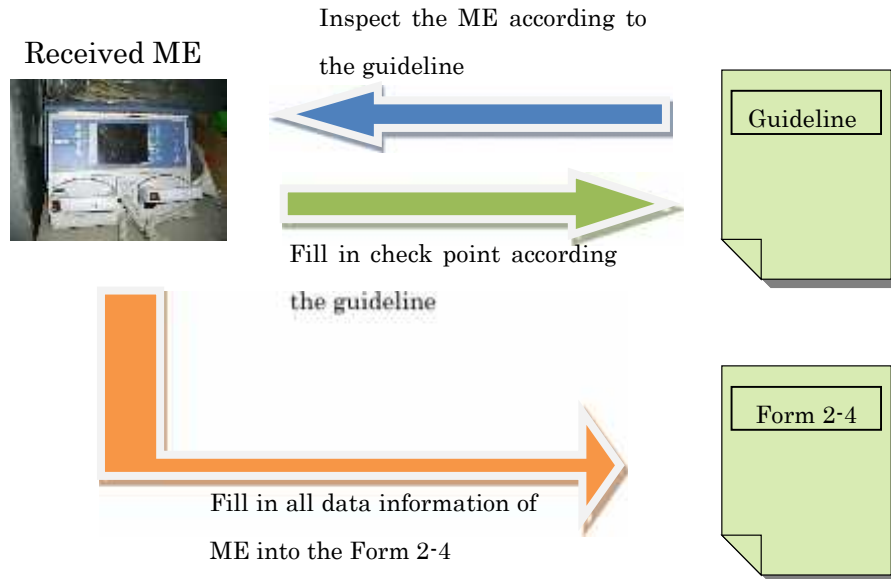


1st step:

Whenever your hospital receives any ME (whichever brand new or secondhand), from MOH, any donor or procured by your hospital, do inspection of received ME according to the Guideline for the commissioning of ME.

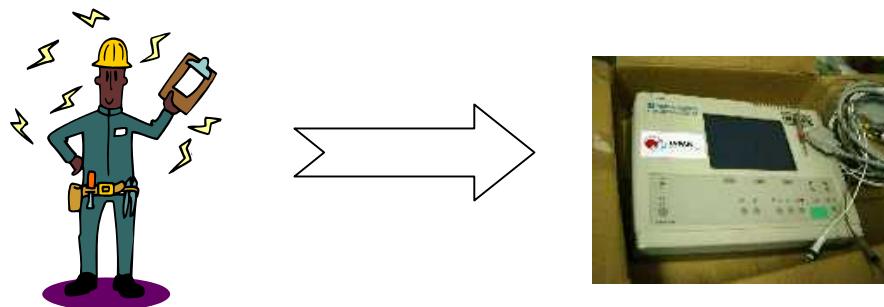
2nd step:

ME Deputy Manager should fill in all data information of ME to record into the Form 2-4 “ME Information sheet” and this paper hold to binder and keep it properly.

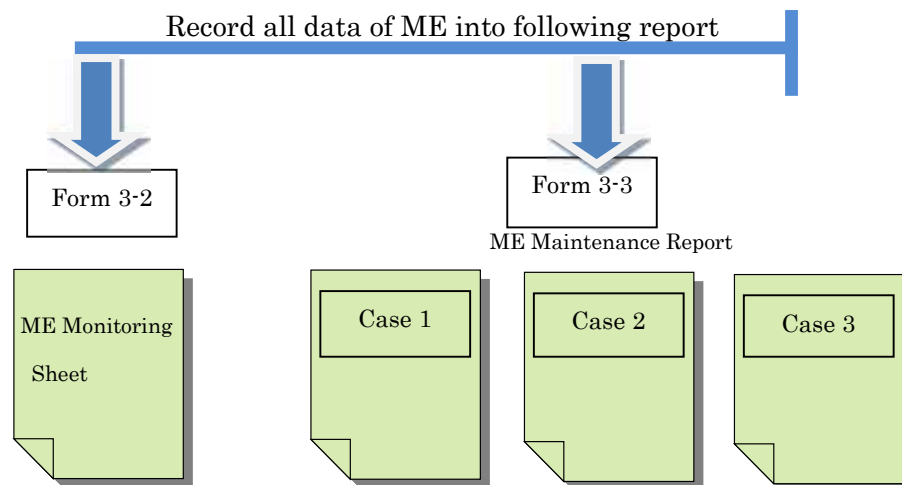


(2) Monitoring of ME conditions

ME are monitored utilizing and equipment condition at least twice a year. Results of monitoring are shown in management activities and making reports.



ME Technician should check condition for each ME.



After the check all ME at your hospital, ME Technician should fill in data of ME condition that divided two conditions:

- 1) Equipment condition (A: Good, B: Fair, C: Bad, D: Unknown)
- 2) Utilizing condition (a: Daily use, b: Sometime use, c: Not in use, d: Unknown)

Additionally, classify as following condition:

Case 1: ME is out of order and urgent attention needed
Extract the ME condition as following combination.

ME Condition	
Equipment	Utilizing
C (Bad)	c (Not in use)

Case 2: Equipment condition is “Good” or “Fair” but it does not in use.
Extract the ME condition as following combination.

ME Condition	
Equipment	Utilizing
A (Good) / B (Fair)	c (Not in use)

Case 3: Equipment condition is “Unknown” and Utilizing condition is “Unknown” or “Not in use”.

Extract the ME condition as following combination.

ME Condition	
Equipment	Utilizing
D (Unknown)	c (Not in use) / d (Unknown)

And, the ME which has above each condition should be record into the Form 3-3

(3) Check and record MTTR of essential ME

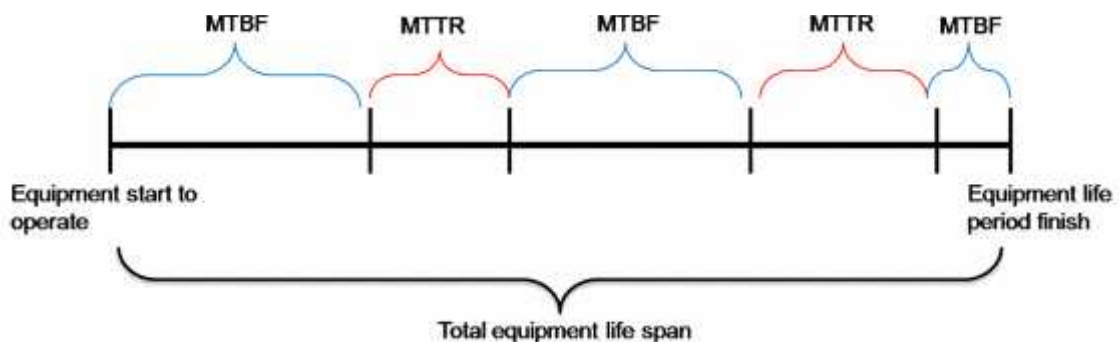
What is MTTR? The MTTR is Mean Time To Repair, means that a mean time to repair of equipment or machine during operation (From start to use or operate to the time which is impossible to repair (Life period of equipment is finished. It should be condemned.).

The MTTR also be one indicator to calculate for the Availability of operation of equipment. According to check this time MTTR, we could judge for each equipment how much percent of operating availability have.

In case the time MTTR will be long, availability of equipment will be stand for closing to 0%. Namely, frequency failure of equipment will be increased. Finally it wouldn't be able to repair, the life period of the equipment finish. In this time is occasion for condemn. Therefore, this indicator MTTR will be contributed to grasp the life period of ME with quantitative measurement as a useful data for your hospital.

It is better to record this data MTTR for entire number of ME at CPA3RH/NH essentially. However, this type of work will take a burden to ME Management WG. At first step, you'll try to check and record essential ME as follows (These ME was selected by NWT). Further detail procedure refers to Page 25 (3. Check and record MTTR of essential ME).

◇ Calculate for average availability for ME operation



Outline of equipment availability (structure with MTBF and MTTR)

a. MTBF (Mean Time Between Failures)

The mean time of non-failure term between one failures and other failures (the average available action time)

b. MTTR (Mean Time To Repair)

The mean time of repairing (the average unavailable action time)

c. AVAILABILITY

The time of availability / (available action time + unavailable action time)

$$A (\%) = (MTBF / (MTBF + MTTR)) \times 100$$

Example:

In case of ECG use for one year.

During one year (365 days), this ECG has the time MTTR = 100 days (could not be used due to broken or take for repairing)

Then:

$$\begin{aligned} & MTBF (265 \text{ days}) / (MTBF (265 \text{ days}) + MTTR (100 \text{ days})) = 0.72 \\ & 0.72 \times 100 = 72\% \end{aligned}$$

So that, this ECG has 72% of availability of operation in this year.

In fact, this percentage will be decrease year by year. Our main purpose why we need maintenance of ME, it must maintain this availability as long as possible.

(4) Supervising of ME Management

ME Management Working Group (hereinafter called “MEM-WG”) should hold the semiannual ME management meeting. Minutes of Meeting are made, and reflect to next annual plan and future ME management.

Participants:

- 1) Director
- 2) Chief of administration
- 3) Chief of accountant
- 4) Chief of Service
- 5) Chief of Nurse
- 6) MEM-WG
- 7) Others

ME Management Meeting



(5) ME management Report

MEM-WG should prepare ME management report twice a year.

1st semester (From January to June)

2nd semester (From July to December)

All report are submitted MoH though PHD. (Details are in page 20 IV. Methods of ME Management)

(6) Monitoring and follow-up for ME Management activities

After receive the ME Management Report from all CPA3RH/NH, NWT will check and analyze them. According to result of analysis, NWT will visit to your hospital one by one. And they will monitor your activities with specific evaluation criteria, if some hospital has a problem or still does not understand this system properly, NWT instruct to MEM-WG technically.

And also, NWT will support following activities:

※ First step, NWT will instruct following activities to Lead CPA3RH/NH.

Second step, Lead CPA3RH/NH will instruct to another CPA3RH/NH.

Finally, all targets CPA3RH/NH should carry out these activities by yourself.

- 1) Diagnosis and troubleshoot for the ME which has ME condition
Case 1: ME is out of order and urgent attention needed

ME Condition	
Equipment	Utilizing
C (Bad)	c (Not in use)

After troubleshoot, NWT will find which spare part need to replace.

Finally we will estimate the price of spare parts to ask to ME local agent in Cambodia. This price will be provided by HSD of MoH to mention on the ME Management Feedback Report.

Among the condition Case 1, they will be classified by the diagnosis and troubleshoot to two kinds of the ME which have as follows:

- ① The ME is possible to repair if it procures the spare parts.
- ② The ME is impossible to repair. It means that the spare parts cannot be procured from any place, even their manufacture.

In case of the ME condition such as ② (above mentioned), it should be replaced to new equipment. CPA3H/NH should ask to local ME agent about estimation of these ME which must replace.

- 2) Investigate for the case 2

Why the ME equipment condition is “good” but it not in use, NWT search the reason why about this problem.

Case 2: Equipment condition is “Good” or “Fair” but it does not in use.

ME Condition	
Equipment	Utilizing
A (Good) / B (Fair)	c (Not in use)

3) Investigate for the case 3

NWT search for the case 3.

Case 3: Equipment condition is “Unknown” and Utilizing condition is “Unknown” or “Not in use”.

ME Condition	
Equipment	Utilizing
D (Unknown)	c (Not in use) / d (Unknown)

4) Classify condemn ME

According to above three activities, it will classify the ME which should be condemn list

(7) Feedback report

After receiving the ME Management Report, HSB will send to your CPA3RH/NH. This report is consistent with the following data output (The format of Feedback report refer to Annex-3, Reference).

Explanations of items from ME Management Feedback Report

Items from ME Management Feedback Report	Explanation of items
1. Result of ME condition (Equipment & utilizing condition)	Indicate the total ME condition by category base
2. Indicator of equipment & utilizing condition	Rate of equipment condition (Good + Fair), and utilizing condition (Daily + Sometime)
3. Estimation cost of ME maintenance (1) Total repairing cost (2) Total replacement cost	Estimated repairing and replacement cost in total of the ME
4. Response to your request for MOH	Answers to requests and comments by target hospitals from MoH
5. Advise and recommendation for your ME management in the next semester	Advice and recommendation through management and technical aspects for next semester’s activities.

(8) Develop budget plan to incorporate to AOP

According to the activities “(6) during Monitoring & follow-up for ME management activities”, we can acquire the real cost of the ME maintenance as follows:

- 1) Total repairing cost of ME which is most urgent to recover for your hospital.
- 2) Total replacement cost of ME which is still necessary to use for your hospital.

These two costs above mentioned each hospital should put as maintenance budget for next year of your hospital to the AOP (Annual Operation Plan).

III. ME Management Working Group (MEM-WG)

1. Structure of MEM-WG

MEM-WG consists following 3 members as one team in the hospital.

- (1) ME Manager (MEM) (Recommend: deputy director level) :
Supervision of whole activity of ME management
- (2) ME Deputy Manager (MEDM) (Recommend: chief of administrator level) :
Administration work of ME management
- (3) ME Technician (MET) :
Maintenance work

Structure of MEM-WG is as follows.

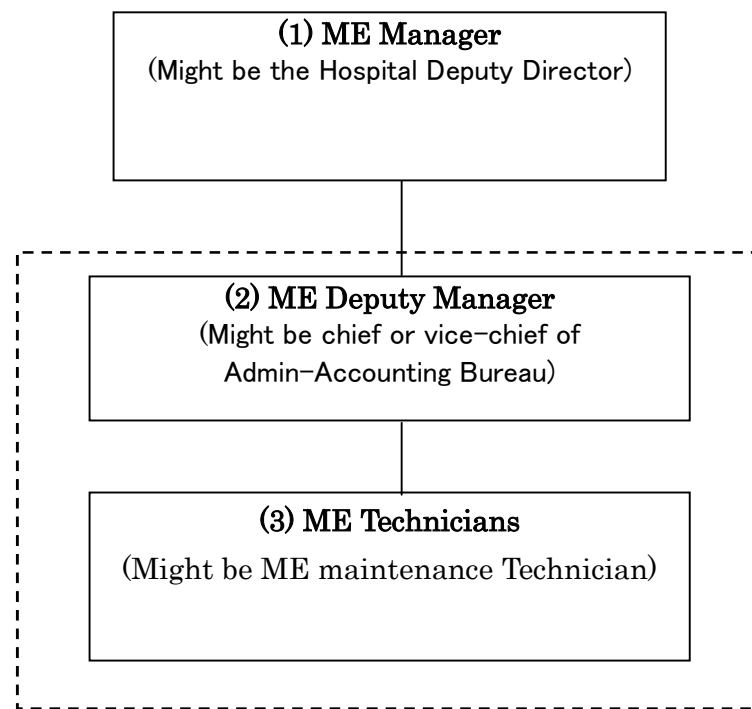


Fig. 6 ME Management Working Group (MEM-WG)
(Dot line means ME Deputy Manager and ME Technician are directly under the responsibility of ME Manager)

✧ Concepts of ME Management Working Group (MEM-WG)

MEM-WG should provide and realize adequate management and maintenance for ME to operate always be in good condition in the hospital.

If ME will be worked properly, it also could be contributed

proper medical services to the patient in the hospital.

However, ME maintenance and management cannot carry out by ME technician only. Therefore, it needs to establish a team or group due to working smoothly, effectively and organizationally.

And also, MEM-WG has following feature:

- ① Each MEM-WG member can work complementarily each other.
- ② Each MEM-WG member share the information of ME management.

2. Role of MEM-WG

1) Responsibilities

MEM-WG should provide and realize adequate management and maintenance of ME which operate always be in good condition in the hospital.

2) Ownership

MEM-WG should have ownership to commit the ME management at the hospital.

3) Team work

MEM-WG should consider Team Work for ME Management. Some work is quite difficult to complete by one person's knowledge, technique and experience. ME Manager should encourage MEM-WG members to share their idea and knowledge, and to collaborate with each other for completing work.

4) Instruction and Training

MEM-WG has to arrange their hospital staff a proper instruction and adequate training of ME operation and daily maintenance as much as possible. Many of equipment break down are caused by an operational failure.

Therefore, MEM-WG conducts to train operator properly in order to prevent some failure and broken.

3. Role of ME Manager

(1) Responsibilities

ME Manager coordinate and manage all related staff regarding ME management to realize better operation, adequate maintenance services and smooth administrative work.

ME manager will be the responsible person for all of operation,

maintenance and administrative work of ME in the hospital. ME manager has a responsibility to supervise all of hospital staff who deals with ME and to ensure that ME is safe for patient and medical staff, as well as functioning accurately for medical diagnostic and treatment of patients. Also, ME manager manages and coordinates about MEM-WG smoothly. Then ME manager should report correct information of ME to hospital director all the time.

(2) Job Descriptions

- 1) Make annual action plan of ME management and submit to the MoH through PHD.
- 2) Make ME management report of activities and submit to the MOH and PHD.
- 3) Prepare and conduct ME management meeting with chief / head of service and related staffs concerning operation and maintenance of ME, under the presence of the hospital director.
- 4) Manage the management and planning activities of ME Deputy Manager.
- 5) Manage the management and planning activities of ME Technician.
- 6) Manage the finance for operation and maintenance of ME.
- 7) Conduct supervision of operation and training of ME, but once a quarter at least.
- 8) Conduct supervision regarding Installation, Condemn and any other ME management activities.
- 9) Take action on countermeasure which is concerned with management of ME (e.g. internal and external communication and coordination, etc.).

Implementation Term of ME manager Duties and Documentations

Activities Semester	Commissioning	Monitoring of ME Condition	ME Management Meeting	ME Management Report	Annual Action Plan
1 st Semester January to June	Upon receiving ME	Start to check from end of April	End of April	Beginning of May	
2 nd Semester July to December	- Do -	Start to check from end of October	End of October	Beginning of November	Middle of November
Related Forms	Form 2-4	Form 3-2	Form 2-3	Form 1-2 Form 2-2 Form 2-3 Form 3-2 Form 3-3	Form 1-1 Form 2-1 Form 3-1

4. Role of ME Deputy Manager

(1) Responsibility

ME Deputy Manager will be the responsible person for all of administration of ME in the hospital. ME Deputy Manager has the responsibilities to support hospital staff directly for operation and maintenance of ME and represents as ME Manager if ME Manager is absence (during absence of ME Manager, hospital director may support the ME Deputy Manager).

ME Deputy Manager reports correct information of ME to ME Manager all the time.

(2) Job Description

- 1) Carry out the commissioning work of ME (acceptance test, input all data of ME to the ME information sheet, and installation).
- 2) Procurement of consumable item and spare parts.
- 3) Support ME Manager any work on ME management.
- 4) Support hospital staffs necessary administrative work for operation and maintenance of ME.

- 5) Arrange technical training of operation of ME for operator.
- 6) Make annual action plan and semiannual report.
- 7) Prepare and conduct updating of ME inventory and report of ME condition (Equipment and Utilizing) with ME Technician.
- 8) Support to ME Technician about check and record of MTTR.
- 9) Make the ME condition report (Form-2-2).
- 10) Make Minute of ME management meeting (Form-2-3).

Note: Take action on countermeasure which is concerned with administrative work of ME.

Implementation Term of ME Deputy manager Duties and Documentations

Activities Semester	Commissioning	Monitoring of ME Condition	ME Management Meeting	ME Management Report	Support to ME Technician about MTTR	Annual Action Plan
1 st Semester January to June	Upon receiving ME	Start to update work from end of April	End of April	Beginning of May	Upon the ME occur to failure	
2 nd Semester July to December	- Do -	Start to update from end of October	End of October	Beginning of November	- Do -	Middle of November
Related Forms	Form 2-4		Form 2-3	Form 2-2 Form 2-3	Log book of ME for MTTR	Form 2-1

5. Role of ME Technician (MET)

(1) Responsibilities

ME Technician will be the responsible person for all of maintenance (preventive maintenance, minor repair, etc.) work of ME and activities of the workshop in the hospital. ME Technician has responsibilities of providing adequate maintenance services for proper operation and management of ME. ME Technician should report any information of ME to ME Manager or ME Deputy manager all the time.

(2) Job descriptions

- 1) Maintain all of ME in the hospital to keep in good condition following to ME Maintenance Guidebook.
- 2) Manage and arrange the workshop properly.
- 3) Prepare and conduct Monitoring of ME condition (semiannual updating of ME) and make report of ME conditions (Form 3-2) collaborating with Deputy ME Manager.
- 4) Make ME maintenance report (Form-3-3)
- 5) Make annual action plan and semiannual report of activities of maintenance of ME and other work.
- 6) Take action (report to ME manager) for failure ME, which cannot be solved by ME Technician.
- 7) Check and record MTTR for targeted ME (essential use) at your hospital upon the ME occur failure or out of order. And fill in the data into the “Log book of ME for MTTR” (Form 3-4)
- 8) Execute minor repair of ME, if necessary.
- 9) Support ME Manager and ME Deputy Manager any work for maintenance and management of ME.
- 10) Support medical staff (ME operator) necessary to work for operation and maintenance of ME.
- 11) Take action on countermeasure which is concerned with ME maintenance.

Implementation Term of ME Technician Duties and Documentations

Activities Semester	Commissioning	Monitoring of ME Condition	ME Management Report	Check and record for MTTR	Annual Action Plan
1 st Semester January to June	Upon receiving ME	Start to update work from end of April	Beginning of May	Upon the ME occur to failure	
2 nd Semester July to December	- Do -	Start to update from end of October	Beginning of November	- Do -	Middle of November
Related Forms		Form 3-2	Form 3-3	Form 3-4	Form 3-1

IV. Method of ME Management

1. Registration of ME (Commissioning Work)

When the hospital receives brand new or secondhand, MEDMEM-WG should register it by the following procedures (Fill into the Form 2-4 “ME Information Sheet”)

Main Work	Procedures	Responsible person
ME Inspection	<p>1. MEDM should fill in the “ME Information Sheet” of necessary information of ME by collaborating with MET. MET should extract ME information from the name plate allocated back panel of main equipment. Then MET will give it to MEDM properly.</p> <p><i>IMPORTANT : Do not forget to fill each item of information (such as ID No., Date of installation, Product year, etc.) into the ME information sheet.</i></p> <p>* For more detail reference, please refer to how to fill in this form.</p> <p>2. Some of ME consist of several components and additional apparatus. So, be careful to write all of items name with each model name and serial number.</p> <p>3. Also, accessories must be recorded with all of information: name, model, quantity, etc</p> <p>4. Consumables are very important for operation. Record all of information such as name, model, unit, local price, etc and confirm local agent whether those are available or not.</p>	MEDM MET MEM

To be continued

Main Work	Procedures	Responsible person
Functional Test	<p>1. MET and MEDM with local agent or supplier, must check all functions of ME and its components.</p> <p>If functions are not complete, it must be replaced with functional one. And if the functional test is required medical knowledge, MEM or operator must attend inspection in order to confirm the ME's functions.</p> <p>(If any trouble about functional test, MEM-WG should connect and consult with National Workshop staff or HSB at the MOH)</p>	MEM MEDM MET
Installation	<p>1. Install the ME to the appropriate place by collaboration with MET and technician of local agent.</p> <p>2. If necessary, MEDM should be attending for installation.</p> <p>3. After finishing the installation, have to check and test again all function of ME.</p> <p>4. MET and MEDM should be informed to MEM and Hospital director on this ME inspection.</p>	MEDM MET

To be continued

Main Work	Procedures	Responsible person
User training	<ol style="list-style-type: none"> 1. MEDM must record the date and duration of training, attendant's name and contents of training. Also name of trainer and evaluation of training, it is enough or not. Ask the users and record properly. 2. MEM should attend the user training as much as possible. If you find any problem on training, please record to the "Remarks" in the ME Information Sheet. 3. If training is not enough, MEM-WG can ask agent or supplier of ME to train again. (If any trouble about the user training, MEM-WG should connect and consult with National Workshop staff or HSB at the MOH) 	<p>MEDM MEM MET NW HSB</p>
Maintenance training	<ol style="list-style-type: none"> 1. Some contracts did not include ME maintenance training for MET. But MEM and MET could ask maintenance training of some necessary ME to the agent or supplier. (In the case of, ME maintenance not provided even it is needed, inform and consult HSB to take action for better maintenance.) 2. If ME maintenance training was implemented, MEDM should record and evaluate it. 	<p>MEDM MET MEDM MEDM</p>
After commissioning	<ol style="list-style-type: none"> 1. MEDM should fill in the ME Information sheet completely. 2. The completed sheet submits to MEM to give approved signature. 3. Keep it properly. 	

2. Monitoring Work (ME Condition)

ME should be monitored its utilizing and equipment condition at least twice a year by the following procedures:

Main Work	Procedures	Responsible person
Monitoring of ME condition	<ol style="list-style-type: none"> 1. MET should visit each department which are installed target ME, and check the equipment condition and utilizing condition of each ME. 2. MET should fill the category data of ME condition (Equipment and utilizing condition) into Form 3-2 (ME condition sheet). 3. MET should be put the data of ME condition (Equipment condition A, B, C or D and Utilizing condition a, b, c, or d correctly with refer to the “Definition of ME condition” 4. After completed the Form 3-2, MET should make Form 3-3. And hand over to MEDM immediately. 	MET MEDM

In order to monitoring of ME condition, we should know the definition of the following ME conditions:

Definition

The definition of ME condition is indicated below:

1. Equipment condition and
2. Utilizing condition to evaluate current condition of ME appropriately at all target hospitals.

Refer and follow to the following definitions:

1. Equipment condition
 - A. Good : The equipment operates without any problems; it means all functions are in perfect condition.
 - B. Fair : The equipment can be used basically, main function is in normal but some parts are broken or abnormal condition.

- C. Bad : The equipment is broken, main function is an abnormal condition; as a result, the equipment can not be used.
- D. Unknown: Nobody knows that the equipment can be operated or not.
The equipment can not be found wherever in the hospital.
2. Utilizing condition
- a. Daily use : The equipment is used almost every day.
- b. Sometime use : The equipment is used occasionally.
- c. Not in use : The equipment never used.
- d. Unknown : The equipment can not be found wherever in the hospital.

Example:

1) Dental chair:

Movement of up-down of chair is out of order however patient can sit in the chair. Moreover, able to diagnose and treat to the patient.

In this case:

Equipment condition: Fair / Utilizing condition: Daily or sometime use

2) Laboratory Incubator:

The chamber temperature does not control but laboratory technician put some medical material into the chamber which is not necessary to keep with desired temperature.

In this case:

Equipment condition: Bad / Utilizing condition: Not in use

3) ECG monitor:

ECG waveform images on CRT display but SPO2 signal can not viewed.

In this case:

Equipment condition: Fair / Utilizing condition: Daily or sometime use

4) X-ray machine:

The hospital received the second hand X-ray machine from NGO. Since receiving it nobody check it.

In this case:

Equipment condition: Unknown / Utilizing condition: Not in use

5) Microscope:

It could not be found wherever in the hospital

In this case:

Equipment condition: Unknown / Utilizing condition: Unknown

3. Check and record MTTR of essential ME

First of all, we have selected the ME which is target for the checking and recording of MTTR (Mean Time To Repair) as follows. These ME are often using at your hospital, and they are most necessary for diagnosis and treatment of medical service at CPA3RH/NH.

Main Work	Procedures	Responsible person
Check and record MTTR of essential ME	<p>Target ME for record of MTTR are as follows</p> <ol style="list-style-type: none">1) X ray diagnostic equipment2) Patient monitor3) Oxygen concentrator4) Electro surgical unit5) Steam sterilizer6) Dry oven7) Doppler Fetus Detector8) Centrifuge9) Suction unit10) Dental unit <ol style="list-style-type: none">1. When above mentioned ME occurs failure or out of order, MET should check to diagnosis its condition. Meantime, MET fill in the date of failure occur in ME on the Log book (Form 3-4).2. After finish to repair, MET fill in the date of repaired and number of the days took to repair it. Log book which filled in the data, should be kept on your binder.	MET MEDM

	3. When period of submitting the ME Management report (every November December), this log book attach to the Form 3-3.	
--	---	--

4. ME Management Meeting

Organize the meeting on ME Quality Improvement & record the discussions as following procedures:

Main Work	Procedures	Responsible person
ME Management Meeting	<ol style="list-style-type: none"> 1. MEM should organize the ME Management Meeting at least twice a year after monitoring and updating of ME condition. 2. All of stakeholders in the hospital should participate in this meeting. <ol style="list-style-type: none"> 1) Hospital director 2) Chief of department 3) Chief of administration 4) Chief of accounting 5) Chief of nursing 6) Others if necessary 3. ME condition (equipment and utilizing condition should be informed to all participants). 4. MEM should explain basically that ME maintenance is the responsibility of each department. 5. In ME Management Meeting should be discussed for improving the ME condition and clarify other problems in order to find out the solution of ME by all stakeholders. 	MEDM MEM

	6. In this meeting should, need to review the previous minutes of meeting and discuss remained issues.	
--	--	--

5. ME Management Report

5-1. Schedule and Responsible Person of Each Form

MEM-WG should prepare periodically management report twice a year. Followings are described each form's responsible person and time schedule.

MET should fill in the following reports and submit to ME Deputy Manager:

- ① Annual action plan of MET(Form 3-1)
- ② ME monitoring sheet (Form 3-2)
- ③ ME Maintenance Report (Form 3-3)

MEDM should fill in the following reports and submit to ME manager:

- ① Annual action plan of MEDM (Form 2-1)
- ② ME condition report (Form 2-2)
- ③ Minute of meeting on ME Management (Form 2-3)
- ④ When you receive newly ME, you should fill it in ME Information Sheets (Form 2-4)

ME manager should complete the following report:

- ① Annual action plan of ME manager (Form 1-1)
- ② ME Management Report (Form 1-2)

Finally, ME manager collect all reports from MEDM and MET, then submit them to PHD and MOH through hospital director.

Time Schedule and Periodical Report

Activities	Term of work	MEM	MEDM	MET
Commissioning	When you receive the ME all the time		Form 2-4	
Monitoring of ME condition	April and October		Form 2-2	
ME management meeting	May and November		Form 2-3	
ME management Report	May and November	Form 1-2	Form 2-2	Form 3-2 Form 3-3
Annual Action Plan	November	Form 1-1	Form 2-1	Form 3-1

5-2. Necessary Forms in Each Semester

MEM should collect the following-mentioned forms and documents, and then submit to MoH through Hospital Director and PHD, also send the copy to MoH directly in each time.

1 st Semester (Deadline End of May)		2 nd Semester (Deadline End of November)	
1.	Cover letter (with Director Signature)	1.	Cover letter (with Director Signature)
2.	Form 1-2	2.	Form 1-1
3.	Form 2-2	3.	Form 1-2
4.	Form 2-3	4.	Form 2-1
5.	Form 2-4 (if new equipment was received)	5.	Form 2-2
6.	Form 3-2	6.	Form 2-3
7.	Form 3-3	7.	Form 2-4 (if new equipment was received)
		8.	Form 3-1
		9.	Form 3-2
		10.	Form 3-3
		11.	Form 3-4

5-3. Annual Action Plan (Form 1-1, 2-1, 3-1)

Type of report	Procedures	Responsible Person
Annual Action Plan	<ol style="list-style-type: none"> MEM should complete the Annual Action Plan (Form 1-1) and then submit to PHD through Hospital Director, attached with the Annual Action Plan of MEDM (Form 2-1) and the Annual Action Plan of MET (Form 3-1), every the end of November . Copy of above Annual Action Plan (Form 1-1, 2-1 and 3-1) and sent to the HSB in MoH directly, also, in the end of November . 	MEM MEDM MET
Form 1-1	<ol style="list-style-type: none"> MEM should fill in the Form 1-1 of the Annual Main Schedule for ME management. <i>Do not forget to fill in "Year of plan", "Date", "Name of Hospital", etc.</i> 	MEM
Form 2-1	<ol style="list-style-type: none"> MEDM should fill in the Form 2-1 of the Annual Main Schedule for ME management. <i>Do not forget to fill in "Year of plan", "Date", "Name of Hospital", etc.</i> MEDM should send the Form 2-1 to MEM every the end of November . 	MEDM

Form 3-1	<p>1. MET should fill in the Form 3-1 of Annual Main Schedule for ME maintenance & management.</p> <p><i>Do not forget to fill in “Year of plan”, “Date”, “Name of Hospital”, etc.</i></p> <p>2. MET should submit Form 3-1 to MEDM every the end of November as soon as possible.</p>	MET
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5-4. ME Management Report (Form 1-2) completed by MEM

Type of Report	Procedures	Responsible Person
ME Management Report (Form 1-2)	<ol style="list-style-type: none"> 1. MEM should fill in the ME Management report (Form 1-2) and submit to MoH through PHD and Hospital Director, attached with other report made by MEDM (Form 2-2, 2-3) and MET (Form 3-2, 3-3) every the end of May and November (twice a year). 2. Copy of above the reports (Form 1-2, 2-2, 2-3, 3-2 and 3-3) and sent to the HSB in MoH directly, every the end of May and November (twice a year). 3. MEM should fill in the Form 1-2 properly are as the following: <ol style="list-style-type: none"> 1) Result of ME condition; 2) Issues on Managerial and Technical aspect 3) Comments on Activities of Deputy ME Manager 4) Comments on Activities of ME Technician 5) Comments on Activities of ME Management Working Group 6) Progress and achievement on ME management 7) Request or comment to Ministry of Health <p><i>Do not forget to fill in "Year of plan", "Date", "Hospital name", etc.</i></p>	MEM

5-5. ME Condition Report (Form 2-2) by MEDM

Type of Report	Procedures	Responsible Person
ME Condition Report (Form 2-2)	<ol style="list-style-type: none"> 1. MEDM should fill in the Form 2-2 properly: <ol style="list-style-type: none"> 1) Result of ME condition; 2) Indicator of ME condition 3) List of new installed equipment 4) List of condemned equipment 5) Issue and measure for ME management of ME Deputy Manager 6) Comment on ME management by ME deputy manager 7) Request to ME Manager 2. After completed the Form 2-2, MEDM must submit it to MEM every the end of May and November (twice a year). 	MEDM

5-6. Minutes of Meeting on ME Management (Form 2-3) completed by MEDM

Type of Report	Procedures	Responsible Person
Minutes of Meeting on ME Management	<ol style="list-style-type: none"> 1. MEDM should fill in the Form 2-3 properly are as the following: <ol style="list-style-type: none"> 1) Participants of meeting 2) Minutes of meeting, have to write the topics what agenda did you discuss 3) Conclusion, you should write the result of the topic one by one. 4) If you could not solve or conclude some topic, please write in the frame “Remained Issue”. 2. The minutes of meeting (Form 2-3) should be confirmed by MEM and submit a copy to Hospital Director. 3. MEDM should keep this report. 	MEDM

5-7. ME Information Sheet (Form 2-4) completed by MEDM

Type of Report	Procedures	Responsible Person
ME Information Sheet	<p>1. MEDM should fill in the Form 2-4 of ME Information Sheet properly are as the following:</p> <ol style="list-style-type: none"> 1) When you receive the ME, you should fill in this form for each ME. 2) Fill in all the data of ME which is mentioned in the sheet properly. <p><i>Note: This ME Information Sheet is used for recording the information of all ME in the hospital include existed ME and new received one and keep this sheet in the file properly.</i></p> <p>2. After completed the ME Information sheet, MEDM should submit it to MEM.</p> <p>3. MEDM should keep this document properly after got approval by MEM.</p>	MEDM MET

5-8. ME Monitoring Sheet (Form 3-2) by ME Technician

Type of Report	Procedures	Responsible Person
<p>ME Monitoring sheet (Form 3-2)</p>	<p>1. MET should fill in the Form 3-2 properly are as the following:</p> <ol style="list-style-type: none"> 1) After evaluation the ME condition (Equipment and Utilization Condition) for each ME, and then put the category mark A, B, C, D and a, b, c, d in the form 3-2. 2) If you find product date on the name plate placed on the back panel of the equipment, should fill into the frame “Product date”. <p><i>Note: Put the category of ME condition according to the definition of ME condition.</i></p> <p>2. After completed the Form 3-2, MET should submit it to MEDM every the end of May and November (twice a year).</p>	<p>MET</p>

5-9. ME Maintenance Report (Form 3-3) completed by ME Technician

Type of Report	Procedures	Responsible Person
ME Monitoring Report (Form 3-3)	<p>1. MET should fill in the Form 3-3 properly are as the following:</p> <p>1) After completed the updating of ME condition (Fill in the Form 3-2), and extract the updating of ME condition at each department.</p> <p>2) Classify to following case of condition of ME and fill in the ME condition data to appropriate case.</p> <p>CASE 1: ME is out of order and urgent attention needed. Extract the ME condition as following combination. Equipment condition: C (Bad) Utilizing condition: c (Not in use)</p> <p>CASE 2: Equipment condition is “Good” or “Fair” but it does not in use. Extract the ME condition as following combination. Equipment condition: A (Good) or B(Fair) Utilizing condition: c (Not in use)</p> <p>CASE 3: Equipment condition is “Unknown” and Utilizing condition is “Unknown” or “Not in use”. Extract the ME condition as following combination. Equipment condition: D (Unknown) Utilizing condition: c (Not in use) d(Unknown)</p> <p>3) Fill in the number of Job record which was done by you</p>	MET

	<p>* Also, Fill in by type of maintenance including: (Regular maintenance, On demand maintenance).</p> <p>4) List up the ME which is broken, etc. especially, for the ME which needs urgent attention.</p> <p>5) Write any comment of MET. If you have some problem, request to MoH, etc.</p> <p>6) Write any comment or request to ME Deputy manager.</p> <p>2. After completed the Form 3-3, MET should submit it to MEDM every the end of May and November (twice a year).</p>	
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5-10 Log Book of ME for MTTR (Form 3-4) ME Technician

Type of report	Procedures	Responsible person
Log Book of ME for MTTR (Form 3-4)	<p>2. MET should fill in the Log Book of ME for MTTR Form 3-4 properly.</p> <p>1) First conduct, MET should record the date when you start to check the MTTR for target ME.</p> <p>2) Fill in the date of failure occur in ME on the Log Book (Form 3-4) for each ME.</p> <p>3) After finish to repair the ME, MET fill in the date of repaired and number of the days took to repair it.</p> <p>4) MET attach the log book (Form 3-4) with the ME Management Report every November (2nd semester)</p> <p>5) Keep always the all of log book to the binder file properly.</p>	MET

Annex-1
ME Management Report Form

Form 1-1 Annual Action Plan of ME Manager

Year of Plan		Date	
Hospital Name		Name and signature	
Province Name		Position	

January

Week	Activity	Where	Day	Ref
1 st				
2 nd				
3 rd				
4 th				
5 th				

February

1 st				
2 nd				
3 rd				
4 th				
5 th				

March

1 st				
2 nd				
3 rd				
4 th				
5 th				

April

1 st				
2 nd				
3 rd				
4 th				
5 th				

May

1 st				
2 nd				
3 rd				
4 th				
5 th				

June

1 st				
2 nd				
3 rd				
4 th				
5 th				

July

Week	Activity	Where	Day	Ref
1 st				
2 nd				
3 rd				
4 th				
5 th				

August

1 st				
2 nd				
3 rd				
4 th				
5 th				

September

1 st				
2 nd				
3 rd				
4 th				
5 th				

October

1 st				
2 nd				
3 rd				
4 th				
5 th				

November

1 st				
2 nd				
3 rd				
4 th				
5 th				

December

1 st				
2 nd				
3 rd				
4 th				
5 th				

Reference No. and mention any issues

--

Form 1-2

ME Management Report

Term of Report: _____

Year		Date	
Hospital Name		Name and signature	
Province Name		Position	

1. Result of ME Condition

	Equipment Condition				Total No.	Utilizing Condition			
	Good	Fair	Bad	Unknown		Daily	Sometimes	Not use	Unknown
Total Number									
Percentage (%)									
Indicator	%				Indicator	%			

(Copy the data from Form 2-2)

2. Issues on Managerial and Technical Aspect

Managerial Aspect	
Technical Aspect	

3. Comments on Activities of Deputy ME Manager

Performance quality		
Improve	No change	Come down
Reason / Comment:		

4. Comments on Activities of ME Technician

Performance quality		
Improve	No change	Come down
Reason / Comment:		

5. Progress and achievement on ME Management Activities

Performance quality		
Improve	No change	Come down
Reason / Comment:		

6. Request or comment to Ministry of Health (Hospital Service Department)

--

Form 2-1 Annual Action Plan of Deputy ME Manager

Year of Plan		Date	
Hospital Name		Name and signature	
Province Name		Position	

January

Week	Activity	Where	Day	Ref
1 st				
2 nd				
3 rd				
4 th				
5 th				

February

1 st				
2 nd				
3 rd				
4 th				
5 th				

March

1 st				
2 nd				
3 rd				
4 th				
5 th				

April

1 st				
2 nd				
3 rd				
4 th				
5 th				

May

1 st				
2 nd				
3 rd				
4 th				
5 th				

June

1 st				
2 nd				
3 rd				
4 th				
5 th				

July

Week	Activity	Where	Day	Ref
1 st				
2 nd				
3 rd				
4 th				
5 th				

August

1 st				
2 nd				
3 rd				
4 th				
5 th				

September

1 st				
2 nd				
3 rd				
4 th				
5 th				

October

1 st				
2 nd				
3 rd				
4 th				
5 th				

November

1 st				
2 nd				
3 rd				
4 th				
5 th				

December

1 st				
2 nd				
3 rd				
4 th				
5 th				

Reference No. and mention any issues

--

Form 2-2 ME Condition Report (ME Deputy Manager)

Year		Date	
Hospital Name		Name and signature	
Province Name		Position	

1. Result of ME Condition

	Equipment Condition				Total No.	Utilizing Condition			
	Good	Fair	Bad	Unknown		Daily	Sometimes	Not use	Unknown
Total Number									
Percentage (%)									

(Copy of the data from Form 3-1)

2. Indicators of ME condition

Indicators of ME condition	Formulation	Calculation
Indicator of Utilizing condition		
Percentage	= Daily% + Sometime%	= () + () =
Indicator of Equipment condition		
Percentage	= Good% + Fair %	= () + () =

3. List of New installed equipment

ID No.	Information Sheet No.	English Name	Khmer Name	Maker / Model	Pre-condition	Unit price (US\$)	Provider

(If it is not enough with above list, please add extra paper)

4. List of Condemned Equipment

ID No.	Check sheet No	English Name	Khmer Name	Maker / Model	Used perio	Unit price (US\$)	Provider

(If it is not enough with above list, please add extra paper)

5. Issues and action taken on ME Deputy Manager activity

6. Comment on ME management by ME Deputy Manager

7. Request to ME manager

Form 2-3

Minutes of Meeting for ME Management

Place		Date	
Hospital		Name & signature	
Province		Name & signature of the chairman	

1. Participants of meeting

No.	Name of Participants	Title	Organization / Department

2. Minutes of Discussion

Ref.	Minutes of Discussion
1 2 3 4 5	Topic:
	Conclusions:
	Remained Issue:

Form-2-4

ME Information Sheet

Sheet No. : _____

Hospital Name : _____

ID No.		Date of Installation	/	/
Department				

Date of Inspection	Checked by (MET name & sign)
Date of Approval	Approved by (MEDM name & sign)

Name of Equipment			
Name of Equipment (Khmer)			
Manufacture		Model	
Serial No.		Price (US\$)	
Product year		Expire date of guarantee	

Specification of Power supply	Voltage	100 / 110 / 120 / 220 / 230 / 240 V AC
	Frequency	50 / 60 Hz
	Phase	Single / Three phase
	Power consumption	W / A

Manuals	Operation	Khmer / English / Other
	Service	Khmer / English / Other
	Holder	

Accessories	Model	Specification	Price (US\$)	Qty.

Consumables	Model	Specification	Price (US\$)	Qty.

Function Test	GOOD / FAIR / BAD / UNKOWN			
	Comment (In case except "GOOD"):			
Inspector				

Local Agent				
Person In-charge				
Address of Local Agent				
	TEL		FAX	

Provider	
----------	--

Record of User Training				
Date	Participants	Training detail	Instructor	Remarks

Record of Maintenance Training				
Date	Participants	Training detail	Instructor	Remarks

Date of condemn	
-----------------	--

Remarks:

Form 3-1 Annual Action Plan of ME Technician

Year of Plan		Date	
Hospital Name		Name and signature	
Province Name		Position	

January

Week	Activity	Where	Day	Ref
1 st				
2 nd				
3 rd				
4 th				
5 th				

February

1 st				
2 nd				
3 rd				
4 th				
5 th				

March

1 st				
2 nd				
3 rd				
4 th				
5 th				

April

1 st				
2 nd				
3 rd				
4 th				
5 th				

May

1 st				
2 nd				
3 rd				
4 th				
5 th				

June

1 st				
2 nd				
3 rd				
4 th				
5 th				

July

Week	Activity	Where	Day	Ref
1 st				
2 nd				
3 rd				
4 th				
5 th				

August

1 st				
2 nd				
3 rd				
4 th				
5 th				

September

1 st				
2 nd				
3 rd				
4 th				
5 th				

October

1 st				
2 nd				
3 rd				
4 th				
5 th				

November

1 st				
2 nd				
3 rd				
4 th				
5 th				

December

1 st				
2 nd				
3 rd				
4 th				
5 th				

Reference No. and mention any issues

--

Form 3-2

ME monitoring Sheet (ME Technician)

Date of issue: _____

Inspector Name: _____

No	Department	ID No.	General English Name	General Khmer Name	Model Name	Serial No	Manufacturer	Product Date	Installation Date	Provider	Condition	
											Equipment	Utilizing

Equipment Condition : **A** Good, **B** Fair, **C** Bad, **D** Unknown Utilizing Condition : **a** Daily Use, **b** Sometime Use, **c** Not in Use, **d** Unknown

Form 3-3 ME Maintenance Report (ME Technician)

Year		Date	
Hospital Name		Name and signature	
Province Name		Position	

1. Result of ME condition (By Department)

Department		Equipment Condition				Total	Utilizing Condition			
No.	Name	Good	Fair	Bad	Unknown	No.	Daily	Sometime	Not	Unknown
1	Out-patient Consultation									
2	Oral and Dental Service									
3	Emergency Medical/ Intensive care unit									
4	Pediatrics									
5	General Medical Ward for Adult									
6	Surgery Service									
7	Operation Theater and Anesthesia									
8	Gynecology and obstetric Ward									
9	Infection disease section:HIV/AIDS, TB, Malaria									
10	Ophthalmology									
11	ENT									
12	Dermatologic care and treatment									
13	Mental Health Service									
14	Laboratory and Blood Bank									
15	Pharmacy									
16	Radiography and Medical Imagery (Ultrasound)									
17										
18										
19										
20										
21										
22										
Total Number										

2. Number of Job Record

Regular Maintenance	On demand maintenance	Total

4. Comment by ME technician

--

5. Request to ME Deputy Manager or ME Manager

--

ID CODE	
EQUIPMENT NAME	
MAKER/MODEL	
SERIAL NO	
DEPARTMENT	

Date of Faliure oc in ME	Date of Repaired i ME	MTTR (Days)	Detail of Failure
	Total days of MTTR	0	

REMARKS:

Approved by ME Manager	
Inspected by ME Technician	

Target ME which should be checked MTTR

- 1 X-ray diagnostic equipment
- 2 Patient monitor
- 3 Electro-surgical unit
- 4 Steam Sterilizer
- 5 Dry Oven
- 6 Doppler Fetus Detector
- 7 Centrifuge
- 8 Suction unit
- 9 Dental Chair
- 10 Oxygen concentrator

Annex-2

Writing Sample of ME Management Report

Form-1-1 Annual Action Plan of ME Manager

Year of Plan		Date	
Hospital Name		Name and signature	
Province Name		Position	

January

Week	Activity	Where	Day	Ref
1 st				
2 nd				
3 rd				
4 th				
5 th				

February

1 st				
2 nd				
3 rd				
4 th	<p>Describe at least following annual plan of activity by MEM:</p> <ol style="list-style-type: none"> 1. Make annual action plan : Every November December 2. Prepare and conduct ME management meeting : Every April May & October November 3. Supervise monitoring of ME condition : Every April May & October November 4. Make ME management report by MEM : Every beginning of May June & November December 5. Submit all ME management report (F1 ~ F3) to MoH : Every end of May June & November December 			
5 th				
M				
1 st				
2 nd				
3 rd				
4 th				
5 th				

April

1 st				
2 nd				
3 rd				
4 th				
5 th				

Caution : Do not copy from this sample to write for your actual report

May

1 st	Prepare ad conduct ME management meeting			
2 nd				
3 rd				
4 th				
5 th				

Please describe at least minimum annual plan of activity like this example.

June

1 st				
2 nd				
3 rd				
4 th				
5 th				

July

Week	Activity	Where	Day	Ref
1 st				
2 nd				1
3 rd				
4 th				
5 th				

August

1 st				
2 nd				
3 rd	Commissioning work of new receiving ME by donor			1
4 th				
5 th				

September

1 st				
2 nd				
3 rd				
4 th				
5 th				

If you have the plan to achieve the remained issue, write the contents and put reference No.

October

1 st				
2 nd				
3 rd				
4 th				
5 th				

November

1 st				
2 nd				
3 rd				
4 th				
5 th				

December

1 st				
2 nd				
3 rd				
4 th				
5 th				

If you have remained issue last year, you should write in this frame.

Reference No. and mention any issues

1. NGO donated the operation light as second hand in December, 2007

Form 1-2

Select which semester mark with circle like this

ME Management Report

Fill in number of year

Term of Report **1** / 2

Year		Date	
Hospital Name		Name and signature	
Province Name		Position	

1. Result of ME Condition

	Equipment Condition				Total No.	Utilizing Condition			
	Good	Fair	Bad	Unknown		Daily	Sometimes	Not use	Unknown
Total Number									
Percentage (%)									
Indicator	%				Indicator	%			

Please write anything else about managerial aspect in ME management work such as examples:

(data from Form 2-2)

2. Issues on Managerial and Technical Aspect

Managerial Aspect	<p>1) <i>It is no good situation of relation ship between D MEM and MET. Therefore, Inform, notify and report are always delay.</i></p> <p>2) <i>I don't have a enough time to attend to the ME management.</i></p>
Technical Aspect	<p>1) <i>MET cannot repair the X-ray machine properly by his lack of technical skill.</i></p> <p>2) <i>Request to National work center (ID003)</i></p>

Do not copy from this paragraph

Mark it with circle like this

Please write anything else about technical aspect in ME management work such as examples:

3. Comments on Activities of ME Deputy Manager

Performance quality		
Improve	No change	Come down
Reason / Comment:		

Please evaluate about D MEM, his attitude, activity and skill, etc.

Mark it with circle like this

4. Comments on Activities of ME Technician

Performance quality		
Improve	No change	Come down
Reason / Comment:		
<p>Please evaluate about D MEM, his attitude, activity and skill, etc.</p>		

5. Progress and achievement on ME Management Activities

Performance quality		
Improve	No change	Come down
Reason / Comment:		
<p>Please write positive issue about improvement of whole ME management such as organization, coordination, indicator of ME condition and technical skill of MET, etc.</p>		

6. Request or comment to Ministry of Health (Hospital Service Department)

<p>If you have any request to MoH, please write in detail. Eg.;</p> <ol style="list-style-type: none">1) Give technical advise diagnostic and repair autoclave (ID-012).2) Provide spare parts of Centrifuge (ID-046).

Form-2-1 Annual Action Plan of ME Deputy Manager

Year of Plan		Date	
Hospital Name		Name and signature	
Province Name		Position	

January

Week	Activity	Where	Day	Ref
1 st				
2 nd				
3 rd				
4 th				
5 th				

Describe at least following **annual plan of activity** by MEDM:

Month	Activity	Where	Day	Ref
Feb	<p>1. Make annual action plan : Every November December</p> <p>2. Support to prepare ME management meeting : Every April May & October November</p> <p>3. Collaborate with MET for monitoring of ME condition : Every April May & October November</p> <p>4. Make ME management report by MEDM : Every beginning of May June & November December</p> <p>5. Make Minutes of ME management meeting : Every May June & November December</p> <p>6. Submit ME management report to MEM : Every middle of May June & November December</p>			
1 st				
2 nd				
3 rd				
4 th				
5 th				
Mar				
1 st				
2 nd				
3 rd				
4 th				
5 th				

April

1 st				
2 nd				
3 rd				
4 th				
5 th				

Caution : Do not copy from this sample to write for your actual report

May

1 st	Collaborate with MET for monitoring of ME condition			
2 nd				
3 rd				
4 th				
5 th				

Please describe at least minimum annual plan of activity like this example.

June

1 st				
2 nd				
3 rd				
4 th				
5 th				

July

Week	Activity	Where	Day	Ref
1 st				
2 nd				1
3 rd				
4 th				
5 th				

August

1 st				
2 nd				
3 rd	Commissioning work of new receiving ME by donor			1
4 th				
5 th				

September

1 st				
2 nd				
3 rd				
4 th				
5 th				

If you have the plan to achieve the remained issue, write the contents and put reference No.

October

1 st				
2 nd				
3 rd				
4 th				
5 th				

November

1 st				
2 nd				
3 rd				
4 th				
5 th				

December

1 st				
2 nd				
3 rd				
4 th				
5 th				

If you have remained issue last year, you should write in this frame.

Reference No. and mention any issues

1. NGO donated the operation light as second hand in December, 2007

Form 2-2 ME Condition Report (ME Deputy Manager)

Year		Date	
Hospital Name		Name and	
Province Name		Position	

1. Result of ME Condition

	Equipment Condition				Total No.	Utilizing Condition			
	Good	Fair	Bad	Unknown		Daily	Sometimes	Not use	Unknown
Total Number									
Percentage (%)									

(Conv of the data from Form 3-2)

2. Indicators of ME condition

Indicators of ME condition	Formulation	Calculation
Indicator of Utilizing condition		
Percentage	= Daily% + Sometime%	= () + () =
Indicator of Equipment condition		
Percentage	= Good% + Fair %	= () + () =

Do not miss input

Only copy the data from Form 3-2

3. List of New installed equipment

ID No.	Information Sheet No.	English Name	Khmer Name	Maker / Model	Pre-condition	Unit price (US\$)	Provider
KK091	101	Electrocardiograph		Fukuda / ECG001	Brand new	2,000.00	JICA
KK092	102	Vacuum extractor		Atom / PP123	Second hand	60.00	French coop.

List up the ME which you received in the term like this:

(If it is not enough with above list, please add extra paper)

4. List of Condemned Equipment

ID No.	Check sheet No	English Name	Khmer Name	Maker / Model	Used period	Unit price (US\$)	Provider
KK021	021	Oxygen concentrator		Fukuda / ECG001	11 years		
KK022	022	Examination light		Atom / PP123	15 years		

If you have any ME which transacted to condemned, please list up in this frame.

(If it is not enough with above list, please add extra paper

5. Issues and action taken on ME Deputy Manager activity

Fill in remained issue, took action about ME management by D MEM, please write here.

6. Comment on ME management by ME Deputy Manager

Fill in any comment about ME management. Problem, request to MoH or some achievement about ME management by D MEM.

7. Request to ME manager

Fill in any request to ME manager to improve your work effectively for ME management.

Form 2-3

Minutes of Meeting Management



Place		Date	
Hospital		Name & signature of recorder	
Province		Name & signature of the chairman	

1. Participants of meeting

No.	Name of Participants	Title	Organization / Department

Fill in person's name who participated in the meeting

Fill in department name of his / her belong to, such as OT, OPD, Administration, etc.

Fill in his / her title name, such as director, chief, doctor, nurse, etc.

2. Minutes of Discussion

Ref.	Minutes of Discussion
<p>1</p> <p>2</p> <p>3</p> <p>4</p> <p>5</p>	<p>Topic:</p> <p>What we will deal with the X-ray machine (ID003) broken.</p> <p>Need spare parts for the suction pump (ID013).</p>
<p>1</p> <p>2</p>	<p>Conclusions:</p> <p>Consult to HSB in MOH</p> <p>Procure by user fee next month.</p> <p><i>Do not copy this paragraph to your actual report</i></p> <p>Describe the topic by itemizing</p> <p>Describe the conclusion oppose to each topic by itemizing.</p> <p>If you remain any topics in this meeting, describe by itemizing. And discuss the remained issue at next meeting.</p>
	<p>Remained Issue:</p>

Form 2-4

ME Information Sheet

Sheet No.: _____

Hospital Name : _____

ID No.		Date of Installation	/	/
Department				
Date of Inspection	Checked by (MET name & sign)			
Date of Approval	Approved by (MEDM name & sign)			

Name of Equipment	Never forget to fill in.		
Name of Equipment (Khmer)	Ask supplier or agent		
Manufacture		Model	
Serial No.		Price (US\$)	
Product year		Expire date of guarantee	

Specification of Power supply	Voltage	100 / 110 / 120 / 220 / 230
	Frequency	50 / 60 Hz
	Phase	Single / Three phase
	Power consumption	W / A

Manuals	Operation	Khmer / English / Other
	Service	Khmer / English / Other
	Holder	

Accessories	Model	Specification	Price

Consumables	Model	Specification	Price	Qty.

Form 2-4

ME Information Sheet

Function Test	GOOD / FAIR / BAD / UNKOWN
	Comment (In case except "GOOD"):
Inspector	

Fill in the name of person and title who inspected particular ME.

Local Agent			
Person In-charge			
Address of Local Agent			
	TEL		FAX

Name of donor; JICA, GTZ, WHO, etc.

Provider	
----------	--

Record of User Training				
Date	Participants	Training detail	Instructor	Remarks

If organized such training to user, write all information

Record of Maintenance Training				
Date	Participants	Training detail	Instructor	Remarks

Date of condemn	
-----------------	--

Remarks:	
----------	--

In case the particular ME has problem, special notice, etc. please write some comment.

Form-3-1 Annual Action Plan of ME Technician

Year of Plan		Date	
Hospital Name		Name and signature	
Province Name		Position	

January

Week	Activity	Where	Day	Ref
1 st				
2 nd				
3 rd				
4 th				
5 th				

Caution: Do not copy from this sample to write for your actual report

February

1 st	Regular preventive maintenance of ME			
2 nd				
3 rd				
4 th				
5 th				

Please describe at least minimum annual plan of activity like this example.

March

1 st				
2 nd				
3 rd				
4 th				
5 th				

April

1 st				
2 nd	<p>Describe at least following annual plan of activity by MET:</p> <p>1. Make annual action plan : Every November December</p> <p>2. Regular preventive maintenance : According to preventive maintenance schedule</p> <p>3. Monitoring of ME condition (Update work) : Every April May & October November</p> <p>4. Make ME management report by MET : Every May June & November December</p> <p>5. Submit ME management report to MEDM : Every beginning of May June & November December</p>			
3 rd				
4 th				
5 th				
May 1 st				
2 nd				
3 rd				
4 th				
5 th				

June

1 st				
2 nd				
3 rd				
4 th				
5 th				

July

Week	Activity	Where	Day	Ref
1 st				
2 nd				1
3 rd				
4 th				
5 th				

August

1 st				
2 nd				
3 rd	Commissioning work of new receiving ME by donor			1
4 th				
5 th				

September

1 st				
2 nd				
3 rd				
4 th				
5 th				

If you have the plan to achieve the remained issue, write the contents and put reference No.

October

1 st				
2 nd				
3 rd				
4 th				
5 th				

November

1 st				
2 nd				
3 rd				
4 th				
5 th				

December

1 st				
2 nd				
3 rd				
4 th				
5 th				

If you have remained issue last year, you should write in this frame.

Reference No. and mention any issues

1. NGO donated the operation light as second hand in December, 2007

Form 3-2
ME monitoring Sheet (ME Technician)

Do not forget to fill in.

Date of issue: _____
 Inspector Name: _____

No	Department	ID No.	General English Name	General Khmer Name	Model Name	Serial No	Manufacturer	Product Date	Installation Date	Provider	Condition	
											Equipment	Utilizing

Check the name plate which placed on the back panel of main equipment. Do not confuse between Manufacture and Model.

Please fill in with capital

Please fill in with small letter

Equipment Condition : **A** Good, **B** Fair, **C** Bad, **D** Unknown Utilizing Condition : **a** Daily Use, **b** Sometime Use, **c** Not in Use, **d** Unknown

Form 3-3 ME Maintenance Report (ME Technician)

Year		Date
Hospital Name		Name and signature
Province Name		Position

1. Result of ME condition (By Department)

Department		Equipment Condition				Total	Utilizing Condition			
No	Name	Good	Fair	Bad	Unknown	No	Daily	Sometime	Not	Unknown
1	Out-patient Consultation									
2	Oral and Dental Service									
3	Emergency Medical/ Intensive care unit									
4	Pediatrics									
5	General Medical Ward for Adult									
6	Surgery Service									
7	Operation Theater and Anesthesia									
8	Gynecology and obstetric Ward									
9	Infection disease section:HIV/AIDS, TB, Malaria									
10	Ophthalmology									
11	ENT									
12	Dermatologic care and treatment									
13	Mental Health Service									
14	Laboratory and Blood Bank	27	14	4	2	47	39	2	4	2
15	Pharmacy	22	3	13	0	38	22	3	13	0
16	Radiography and Medical Imagery (Ultrasound)	15	6	9	0	30	17	3	10	0
17										
18										
19										
20										
21										
22										
Total Number		64	23	26	2	115	78	8	27	2

Data from Form 3-2 fill in to divide by

Do not mis calculate these

Number of calculation of these data accord to total number.

Number of calculation of these data accord to total

2. Number of Job Record

Regular Maintenance	On demand maintenance	Total

Fill in number of Job record which has made

3. Failure condition of ME (ME is out of order and urgent attention needed)

CASE 1 : ME is out of order and not in use

Please describe a condition of failure more detail

ME Condition	
Equipment	Utilizing
C (Bad)	c (Not in use)

ID No.	Job No.	Name	Model	Department	Detail of Failure
SN001	001	Suction unit	SCT-001	OT	Suction power decrease it.

List up the ME which

Extract the ME which you have evaluated the equipment condition: C or B, utilizing

CASE 2 : Equipment condition is "Good" or "Fair" but it does not in use

Please check and clarify the reason why these ME are not in use.

ME Condition	
Equipment	Utilizing
A (Good) or B (Fair)	c (Not in use)

ID No.	Job No.	Name	Model	Department	Reason why no use
SN003	004	Oxygen concentrator	OXG-001	ICU	Impossible to repair because no spare parts available

Extract the ME which you have evaluated the equipment condition: A or B, utilizing condition: c

CASE 3 : Equipment condition is "Unknown" and Utilizing condition is "Unknown" or "Not in use"

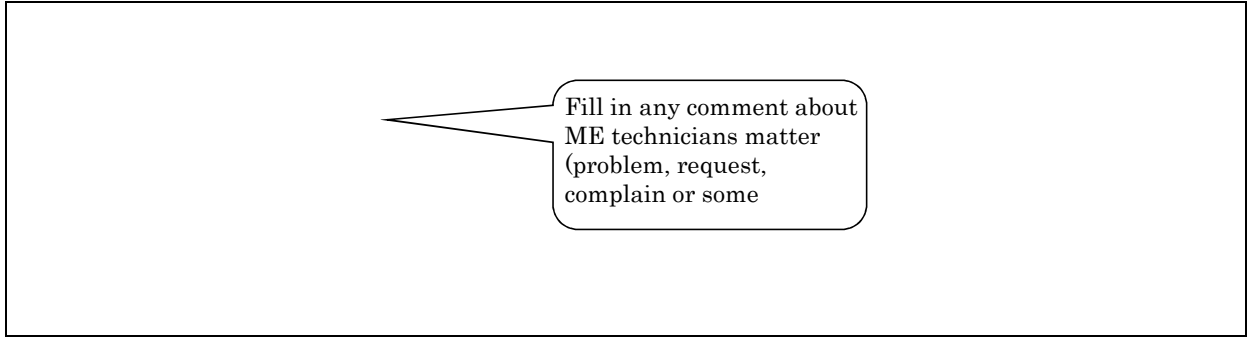
Please check and find these unknown ME

ME Condition	
Equipment	Utilizing
D (Unknown)	c (Not in use) or d (Unknown)

ID No.	Job No.	Name	Model	Department	Reason why unknown
SN018	006	Examination light	LBT	Ward	

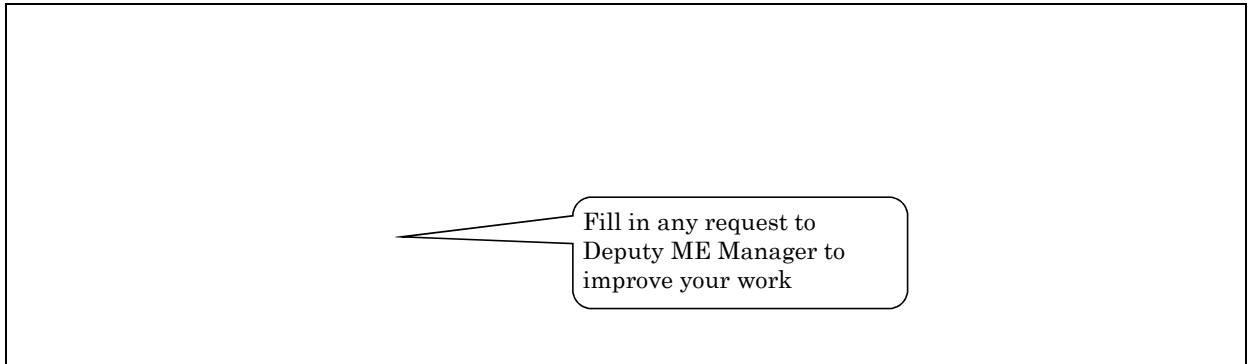
Extract the ME which you have evaluated the equipment condition: D, utilizing condition: c or d

4. Comment by ME technician



Fill in any comment about ME technicians matter (problem, request, complain or some

5. Request to ME Deputy Manager or ME Manager



Fill in any request to Deputy ME Manager to improve your work

ID CODE	KK-067
EQUIPMENT NAME	Dry Oven
MAKER/MODEL	Thermostat / 110-190
SERIAL NO	30385
DEPARTMENT	Dental

Date of Faliure occur in ME	Date of Repaired in ME	MTTR (Days)	Detail of Failure
1/08/2009	31/10/2009	92	Power supply circuit was broken
28/11/2009	18/12/2009	21	Heater was broken
Total days of MTTR		113	

This is writing sample

REMARKS:
Operation availability of KK-067:
MTTR=113 days, MTBF=21 days
A=252 / (252+113) = 0.6904 x 100 = 69.0%

Approved by ME Manager	
Inspected by ME Technician	

Target ME which should be checked MTTR

- 1 X-ray diagnostic equipment
- 2 Patient monitor
- 3 Electro-surgical unit
- 4 Steam Sterilizer
- 5 Dry Oven
- 6 Doppler Fetus Detector
- 7 Centrifuge
- 8 Suction unit
- 9 Dental Chair
- 10 Oxygen concentrator

Annex-3

Reference

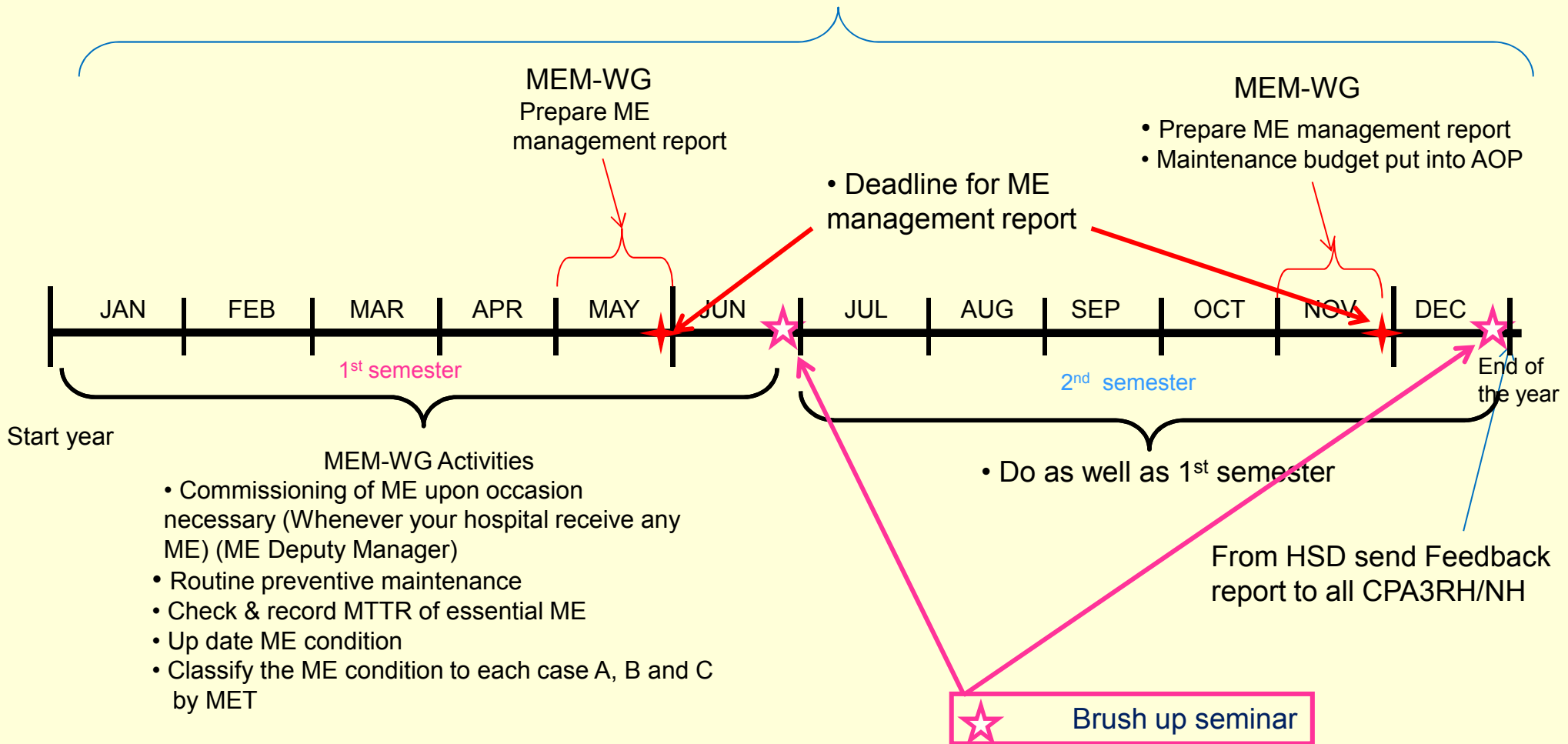
- 1. Process of the ME Management Activities (Annual base)**
- 2. ME Management Feedback Report**
- 3. Medical Equipment Standard List**

Process of the ME Management Activities (Annual base)

NWT support to all CPA3RH/NH

Monitoring & follow-up for ME Management activities

- Diagnosis for failure ME (For case A) and specified which spare parts need to replace.
- Investigate for the ME condition case B, C
- Classify condemn ME



ME MANAGEMENT FEEDBACK REPORT

Date of issue : / /

To Hospital name and director name

We would like to inform you about Feedback information of ME management report. Please use this data as your reference of ME management at your hospital.

Terms of report	Year: 1 st semester / 2 nd semester
-----------------	--

1. Result of ME condition

Category	Equipment condition				Total No.	Utilizing condition			
	Good	Fair	Bad	Unknown		Daily	Sometime	Not use	Unknown
Number of ME									
Percentage									

2. Indicator of Equipment & utilizing condition

Condition	Rate
Equipment condition	%
Utilizing condition	%

3. Estimation cost of ME maintenance

(1) Total repairing cost

(1) Total repairing cost of ME	US\$
--------------------------------	------

According to trouble shooting of each ME, MET specify which spare parts need to procure with support by NWT and Lead CPA3RH/NH.

And MEM-WG gets estimation for procurement of spare parts from local agent.

Above mentioned process we inform following list for the reference to put to AOP.

Spare parts for the ME which can be repaired at your hospital

ID No	Name of ME	Spare parts	Unit price (US\$)	Q'ty	Total price (US\$)	Local agent
		TOTAL PRICE				

(2) Total replacement cost

(2) Total replacement cost of ME	US\$
----------------------------------	------

According to troubleshooting by MET, you can specify which ME will be able to repair and which ME will not be able to repair with supporting by NWT.

In case of result of judgment, some ME cannot repair because of no procure spare parts even manufacture. In this case, existing ME should classify to condemn list. And instead of this ME need to replace as a renewal.

Now NWT provided following list that it necessary to replace ME instead of old ME

The ME which need to replace as a renewal

ID No	Name of ME	Maker / Model	Used year	Unit price (US\$)	Provider
		TOTAL PRICE			

4. Response to your request for MoH

HSB of HSD gives the response to your hospital request.

--

5. Advise and recommendation for your ME management in the next semester

(1) Management aspect
(2) Technical aspect

Thank you for your collaboration

Medical Equipment Standard List

No.	Name Equipment	Khmer Name
1	A Scan Biometer (For Eye)	ម៉ាស៊ីនថតភ្នែក
2	Adult Scale(Digital)	ជញ្ជីងអេឡិចត្រូនិចសម្រាប់មនុស្សចាស់
3	Aids test equipment	ម៉ាស៊ីនពិនិត្យមេរោគអេដស៍
4	Air Compressor for Ventilator	ម៉ាស៊ីនបំណែនខ្យល់សម្រាប់សម្រួលចលនាដង្ហើម
5	Air Massage	
6	Amalgam Mixer (Amalgamator)	ម៉ាស៊ីនលាយសារធាតុប៉ះឆ្នេញ
7	Analyzer (Na+, K+, CL-, Li+, Ca+, Mg+)	ម៉ាស៊ីនវិភាគ កាល់ស្យូម, ក្លរី, ម៉ាញ៉េស្យូម,
8	Anesthesia apparatus	ម៉ាស៊ីនដាក់ថ្នាំសណ្តំ
9	Anesthesia apparatus with ventilator	ម៉ាស៊ីនដាក់ថ្នាំសណ្តំដែលមានប្រដាប់បក់បញ្ចូលខ្យល់
10	Anesthesia gas exhaust pump	ឧបករណ៍បិតខ្សែចេញពីម៉ាស៊ីនដាក់ថ្នាំសណ្តំ
11	Anesthesia gas moniter	អេក្រង់សម្រាប់ពិនិត្យខ្សែរបស់ម៉ាស៊ីនដាក់ថ្នាំសណ្តំ
12	Argon Laser Surgical Unit	កាំរស្មីអាឡុងកុនសម្រាប់វះកាត់
13	Audiometer (Simple without Test Room)	ឧបករណ៍វាស់សំឡេង (សាមញ្ញដោយមិនបាច់មានបន្ទប់សម្រាប់តេស្ត)
14	Auto Analyzer for Biochemical	ឧបករណ៍វិភាគជីវគីមីដោយស្វ័យប្រវត្តិ
15	Balance electrical Lab & Pharmacy	ជញ្ជីងអគ្គិសនីសម្រាប់មន្ទីរពិសោធន៍ និង ឱសថស្ថាន
16	Bath Unit for Rehabilitation	ម៉ាស៊ីនកំដៅអវះយវះ
17	Bicycle	កង់សម្រាប់ការព្យាបាលដោយចលនា
18	Bilirubinmeter	ឧបករណ៍វាស់ប៊ីលីរូប៊ីន
19	Blood Cell Counter	ម៉ាស៊ីនរាប់គ្រាប់ឈាម
20	Blood Gas Analyzer (O2 CO2, PH)	ម៉ាស៊ីនវិភាគខ្សែក្នុងឈាម
21	Blood Mixer	ម៉ាស៊ីនលាយឈាម
22	Blood Taking Equipment	ម៉ាស៊ីនបូមឈាម
23	Blood Tube Sealer	ម៉ាស៊ីនបិទមុយយូស្តារូមឈាម
24	Blood warmer	ម៉ាស៊ីនរក្សាកំដៅឈាម
25	BP (Blood Presser) machine automatic	ម៉ាស៊ីនវាស់សម្ពាធឈាមដោយស្វ័យប្រវត្តិ
26	Breast Pump	ម៉ាស៊ីនបូមសុដន់
27	Broncho Fiberscope	ខ្សែកាំមេរា មើលក្នុងទ្រូង
28	Calorimeter	ឧបករណ៍វាស់កាឡូរី
29	Centrifuge (Microplate Washer)	ម៉ាស៊ីនលាងទីប

Medical Equipment Standard List

No.	Name Equipment	Khmer Name
30	Centrifuge (Table Top)	ម៉ាស៊ីនព្យាបាលស្រព្វសរុប
31	Centrifuge Hemacrit (Capillary)	ម៉ាស៊ីនព្យាបាលស្រព្វសរុប អេម៉ាតូក្រីត
32	Centrifuge Refrigerator	ម៉ាស៊ីនព្យាបាលស្រព្វសរុប ល្បឿន
33	Clean bench	ទូសុវត្ថិភាពសម្រាប់ធ្វើការងារពិសោធន៍
34	Coagulator (Surgical Unit)	ម៉ាស៊ីនវះកាត់
35	Coagulometer	ម៉ាស៊ីនវះកាត់ដោយអគ្គិសនី
36	Colonoscope (Fiber)	ខ្សែកាំមេរាទេវតាមតូច
37	Colpo scope	ឧបករណ៍ពិនិត្យមាត់ស្បូន
38	Compressor (L for ventilator, surgicsl drill, etc)	ម៉ាស៊ីនបំណែនខ្យល់ ខ្នាតធំ សង់ត្រាល់
39	Compressor (M for dental unit, etc)	ម៉ាស៊ីនបំណែនខ្យល់សម្រាប់ឧបករណ៍ព្យាបាលធ្មេញ
40	Compressor (S for dry, cleaning, etc)	ម៉ាស៊ីនបំណែនខ្យល់ ខ្នាតតូច
41	Crank gath bed	
42	Crank standard bed	
43	Cryo surgery	ម៉ាស៊ីនវះកាត់ ប្រើឧស្ម័នជំនួយ
44	Cryo surgery for Gynecology	ម៉ាស៊ីនវះកាត់មានឧស្ម័នជំនួយប្រើនៅរោគស្ត្រី
45	Cystoscope (Hard)	ឧបករណ៍ស៊ីយតូស្កូប
46	Deep Freezer	ទូទឹកកក
47	Defibrillator	ម៉ាស៊ីនកន្ត្រាក់បេះដូង
48	Densitometer	ម៉ាស៊ីនវាស់ដង់ស៊ីតេសារៈធាតុសរីរាង្គ
49	Dental Curring Light Unit (Ultraviolet Activator)	ម៉ាស៊ីនប៉ះធ្មេញប្រើកាំរស្មីស្វ័យអ៊ុលត្រា
50	Dental Micromotor Unit	ម៉ាស៊ីនព្យាបាលធ្មេញមានម៉ូតូម៉ូទ័រ
51	Dental Scaler (Ultrasound)	ម៉ាស៊ីនសម្អាតធ្មេញ
52	Dental Treatment Machine	ម៉ាស៊ីនព្យាបាលធ្មេញ
53	Dental Unit Chair (Electric)	ឧបករណ៍ពិនិត្យព្យាបាលធ្មេញមានកៅអីបញ្ជា
54	Dental Unit Chair (Manual)	ឧបករណ៍ពិនិត្យព្យាបាលធ្មេញ (ដោយដៃ)
55	Dialyser System	ម៉ាស៊ីនលាងឈាម
56	Differential (leucocyte) Counter	
57	Diluter	ម៉ាស៊ីនលាយទឹកបិត
58	Dispenser	ម៉ាស៊ីនបន្តក់ស្រព្វសរុប

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No.	Name Equipment	Khmer Name
59	Distiller (Water Still)	ម៉ាស៊ីនបិតទឹក
60	Dry oven (Hot air sterilizer)	ឧបករណ៍កំដៅរំងាប់មេរោគ (ប្រើខ្យល់ក្តៅ)
61	Drying cabinet (Dryer Machine)	ទូសម្ងាត់ (ម៉ាស៊ីនសម្ងាត់)
62	E.N.T Treatment Unit	ឧបករណ៍ព្យាបាលជំងឺ ត្រចៀក ច្រមុះ និង បំពង់ក
63	Electric Traction	
64	Electro surgical unit (Diathermy)	ឧបករណ៍វះកាត់ដើរដោយចរន្តអគ្គិសនី
65	Electrocardiograph(E.C.G Unit) recorder 1Channel	ឧបករណ៍តាមដានចលនាបេះដូង (កត់ត្រាបានមួយសញ្ញា)
66	Electrocardiograph(E.C.G Unit) recorder 3Channel	ឧបករណ៍តាមដានចលនាបេះដូង (កត់ត្រាបានបីសញ្ញា)
67	Electroencephalograph(E.E.G) recorder	ឧបករណ៍តាមដានចលនាបេះដូង (មានថតសម្រាប់កត់ត្រា)
68	Electrophoresis System	ម៉ាស៊ីនវិភាគប្រូតេអ៊ីន
69	Endoscopic TV or Video System	ទូរទស្សន៍អង់ដូស្កុប ឬ ប្រព័ន្ធទូរទស្សន៍
70	Endoscopic cabinet	ទូអង់ដូស្កុប
71	Endoscopic cleaner	អង់ដូស្កុបគ្លីនីន
72	ENT Fiberscope	អ៊ី.អែន.តេ ហ្វ៊ីប៊ែរស្កុប
73	Ergometer	
74	Examination Light (Spot lamp) Mobile	ភ្លើងបញ្ចាំងសម្រាប់ការពិនិត្យជំងឺ
75	Examination table for Gynecology	តុសម្រាប់ពិនិត្យជំងឺស្ត្រី
76	Fetal Doppler Detector (Doppler fetal detector)	ម៉ាស៊ីនតាមដានចលនាបេះដូងភ័ក្តិ
77	Fetal Monitor (CTG: Cardiotocograph)	អេក្រង់សម្រាប់បញ្ជាក់រូបភាពភ័ក្តិ
78	Film viewer (Negatoscope)	ឧបករណ៍បញ្ចាំងមើលរូបលើហ្វីល (នីកាតូស្កុប)
79	Flame Photometer (HEPA)	ឧបករណ៍វិភាគប្រើចំហេះ
80	Fume hood	
81	Fundus Camera	កាមេរ៉ាថតភ្នែក
82	Gastro fiberscope	ឧបករណ៍ឆ្លុះក្រពះ
83	Glucose Tester (checker handy)	ឧបករណ៍តេស្តក្លុយកូស (ពិនិត្យដោយស្នាប)
84	Glucose(Analyzer .)	ឧបករណ៍វិភាគក្លុយកូស
85	Goniometer	
86	Head Light	

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No.	Name Equipment	Khmer Name
87	Heamoglobinmeter	ម៉ាស៊ីនវាស់អេម៉ូក្លូប៊ីន
88	Hot Pack Unit	
89	Humidifier	ម៉ាស៊ីនផ្សើម
90	Humidifier for oxygen	ម៉ាស៊ីនផ្សើមសម្រាប់ឧស្ម័នអុកស៊ីហ្សែន
91	Humidifier paraffin block (Lab)	ម៉ាស៊ីនផ្សើម ដោយប្រេងបារ៉ាហ្វីន
92	Humidifier with oxygen regulator	ម៉ាស៊ីនផ្សើមមានរ៉ូលលីមអុកស៊ីហ្សែន
93	Hypo-Hypasamir(For operaton body temp)	
94	Immunassay Analyzer	
95	Incubator Laboratory	ទូរក្យាកំដៅប្រើក្នុងមន្ទីរពិសោធន៍
96	Incubator Laboratory CO2	ទូរក្យាកំដៅឧស្ម័នកាបូនិច
97	Infant (Baby) Incubator	កែវវិទិញើមទារក
98	Infant (Neonatal) Monitor	អេក្រង់សម្រាប់បញ្ជាងរូបភាពទារក
99	Infant Scale (Digital)	ជញ្ជីងធ្លឹងកុមារ អេឡិចត្រូនិច
100	Infant warmer	ឧបករណ៍រក្យាកំដៅទារក
101	Infrared Ray Lamp	អំពូលកាំរស្មីអ៊ីនហ្វ្រារេត
102	Infusion pump (Perfusor)	ម៉ាស៊ីនចាក់ថ្នាំ
103	Insufflator for Laparoscopes (CO2 , N2O, Gas)	
104	Keratometer	ម៉ាស៊ីនវាស់ភ្នែក
105	Laparoscope(Hard)	
106	Larygoscope	
107	Laryngo Stroboscope	
108	Lens Cutter	ឧបករណ៍កាត់កញ្ចក់វែនតា
109	Lens Frame Heater	ឧបករណ៍ កំដៅស៊ុកញ្ចក់វែនតា
110	Lens Pattern Marker	ម៉ាស៊ីនធ្វើស៊ុកវែនតា
111	Lensmeter	ឧបករណ៍វាស់កញ្ចក់វែនតា
112	Light Source for Endoscope	ឧបករណ៍ផ្តល់ពន្លឺសម្រាប់ម៉ាស៊ីនឆ្លុះ
113	Low Frequency Therapy Unit	ឧបករណ៍ព្យាបាលដោយប្រេកង់ទាប
114	Microplate Reader	
115	Microscope Binocular electric	មីក្រូទស្សន៍អគ្គិសនីដែលមានភ្នែកពីរ

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No.	Name Equipment	Khmer Name
116	Microscope Binocular electric with Camera or Video	មីក្រូទស្សន៍អគ្គិសនីដែលមានភ្នែកពីរ និង មានប្រដាប់ថត ឬ ទូរទស្សន៍
117	Microscope Binocular mirror	មីក្រូទស្សន៍ដែលមានភ្នែកពីរ
118	Microscope Fluorescence	មីក្រូទស្សន៍ ប្រើអំពូលម៉ែត្រ
119	Microscope Monocular	មីក្រូទស្សន៍ដែលមានភ្នែកតែមួយ
120	Microscope Teaching	មីក្រូទស្សន៍សម្រាប់បង្រៀន
121	Microtome	ម៉ាស៊ីនកាត់ភ្នាស
122	Microtome freezing	ឧបករណ៍កំណក់ត្រីពិសោធន៍
123	Microtome knife sharpener	ម៉ាស៊ីនសំលៀងកាំបិតកាត់ភ្នាស
124	Microwave Therapy Unit	ឧបករណ៍ព្យាបាលស្បែក ប្រើម៉ាយក្រូវេវ
125	Mixer (Touch)	ម៉ាស៊ីនលាយសូលុយស្យុង (កាន់ទប់)
126	Nebulizer (Electric compressor)	ម៉ាស៊ីនស្តង់
127	Nebulizer Ultrasonic	ម៉ាស៊ីនស្តង់ អ៊ុលត្រាសូនិក
128	Nerve stimulator	ឧបករណ៍សម្រាប់ដាស់សតិសរសៃប្រសាទ
129	Obstetric delivery table electric	តុអគ្គិសនីសម្រាប់សម្រាលកូន
130	Operation light Ceiling mounted	ភ្លើងសម្រាប់បញ្ជាក់ក្នុងបន្ទប់វះកាត់ ដាក់ជាប់និងពិដាន
131	Operation light mobile (stand Type)	ភ្លើងសម្រាប់បញ្ជាក់ក្នុងបន្ទប់វះកាត់ប្រភេទចល័ត (មានជើងបញ្ជ្រា)
132	Operation Microscope	មីក្រូទស្សន៍បម្រើការវះកាត់
133	Operation table electric	តុវះកាត់ដើរដោយចរន្តអគ្គិសនី
134	Operation table hydraulic	តុវះកាត់ដើរដោយកម្លាំងទឹក
135	Operation table mechanical	តុមេកានិចសម្រាប់បម្រើការវះកាត់
136	Operation table ophthalmology	តុវះកាត់ភ្នែក
137	Operation table orthopedic	តុវះកាត់កែទម្រង់កាយ
138	Ophthalmic elctrosurgical unit	ឧបករណ៍វះកាត់ភ្នែកដើរដោយចរន្តអគ្គិសនី
139	Ophthalmic Microscope (Operation for Eye)	ចក្ខុទស្សន៍ បម្រើការវះកាត់
140	Ophthalmoscope (handy)	ចក្ខុទស្សន៍ (កាន់ដើរ)
141	Osmometer	
142	Otoscope	សោតទស្សន៍
143	Oxygen concentrator (mobile)	ម៉ាស៊ីនផលិតអុកស៊ីហ្សែន (ប្រភេទចល័តបាន)
144	Oxygen cylinder cart and flow regulator with Humid	រទេះរុញបំពង់អុកស៊ីហ្សែន និង ឧបករណ៍បង្កើតសំណើមគ្រប់គ្រាន់

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No.	Name Equipment	Khmer Name
145	Oxygen monitor	អេក្រង់ពិនិត្យអុកស៊ីហ្សែន
146	Oxygen tent	
147	Paraffin Bath	ឧបករណ៍រក្សាកំដៅដោយប្រេងប៉ារ៉ាហ្វីន
148	Paraffin Oven	ឡចំរាញ់ប្រេងប៉ារ៉ាហ្វីន
149	Patient Monitor (Central)	ម៉ាស៊ីនតាមដានសភាពជីវិត (ប្រព័ន្ធ)
150	Patient Monitor (ECG, plus any vital singe)	ម៉ាស៊ីនតាមដានសភាពជីវិត (ចលនាបេះដូង និងសញ្ញាជីវិតផ្សេងៗទៀត)
151	Perimeter	តែរីម៉ែត្រ
152	pH Meter	ម៉ាស៊ីនវាស់ក្រូង
153	Phaco Surgical Ultrasound Suction Unit	
154	Phototherapy unit	ឧបករណ៍ព្យាបាលទារកដែលមានប៊ិលូប៊ីនខ្ពស់
155	Pulmonary function test	ឧបករណ៍តេស្តមុខងារសួត
156	Pulse oximeter(SaO2)	ម៉ាស៊ីនវាស់កម្រិតអុកស៊ីហ្សែនក្នុងឈាម
157	Radio Theraphy Unit	ឧបករណ៍ព្យាបាលប្រើវិទ្យុសាស្ត្រ
158	Refractometer	ប្រដាប់ស្ទង់ការស្ទង់ដែលរៀបចំ
159	Refrigerator (General)	ទូទឹកកកប្រើទូទៅ
160	Refrigerator blood bank	ទូទឹកកកសម្រាប់កន្លែងស្តុកឈាម
161	Refrigerator Drug & Pharmacy	ទូទឹកកកសម្រាប់កន្លែងឱសថ
162	Refrigerator Vaccine (Gas or Gas & Electric)	ទូទឹកកកប្រើសម្រាប់ក្លាសេផ្លាបង្ការ (ប្រើខ្សែស្រឡៅ ឬ ប្រើខ្សែស្រឡៅ និងអគ្គិសនី)
163	Refrigerator Vaccine (Solar power)	ទូទឹកកកប្រើសម្រាប់ក្លាសេផ្លាបង្ការ (ប្រើថាមពលព្រះអាទិត្យ)
164	Retinoscope	ចិត្របដទស្សន៍
165	Rotator	ម៉ាស៊ីនបង្វិលឈាម
166	Scrub unit	ឧបករណ៍លាងសំអាតដៃ
167	Shaker	ម៉ាស៊ីនក្រឡុកឈាម
168	Shock wave treatment system	
169	Short Wave Treatment Unit	
170	Sigmoidoscope (Fiber)	
171	Sigmoidoscop (Hard)	
172	Simulator	
173	Simulator (For Radiology)	

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No.	Name Equipment	Khmer Name
174	Slide Warmer	ឧបករណ៍ក្ស័យកំដៅកញ្ចក់ឈាម
175	Slitlamp Microscope	មីក្រូទស្សន៍ពិនិត្យភ្នែក
176	Spectrophotometer	ឧបករណ៍វិភាគប្រើបាច់ពន្លឺ
177	Spirometer Electric	
178	Staining equipment automatic	
179	Sterilizer (Autoclave) Electric	ឧបករណ៍រំងាប់មេរោគដោយចំហាយ (អូតូក្លាវ)
180	Sterilizer (Autoclave) Laboratory	ឧបករណ៍រំងាប់មេរោគ (អូតូក្លាវ) មន្ទីរពិសោធន៍
181	Sterilizer (Autoclave) Steam supply	ឧបករណ៍រំងាប់មេរោគដោយចំហាយទឹក (អូតូក្លាវ)
182	Sterilizer (Autoclave) Table top electric	ឧបករណ៍រំងាប់មេរោគដោយស្មៅ
183	Sterilizer Ethylene oxide gas (E.O.G)	
184	Stirrer (Hot plate Stirrer)	ម៉ាស៊ីនកំដៅឈាម
185	Suction unit electric (Suction pump, Aspirator)	ម៉ាស៊ីនបូមស្តេស្កដោយចរន្តអគ្គិសនី (ម៉ាស៊ីនបូម, ប្រដាប់ប៊ីត)
186	Suction unit manual(Aspirator foot operated)	ម៉ាស៊ីនបូមស្តេស្កដោយដៃ (ប្រដាប់ប៊ីតដែលដំណើរការដោយជើង)
187	Suction unit system (Vacuum system)	ម៉ាស៊ីនបូមស្តេស្ក (ប្រព័ន្ធប៊ីតស្តេស្ក)
188	Surgical Cutter & Drill electric	ម៉ាស៊ីនកាត់ និង ខ្ទងដោយចរន្តអគ្គិសនី
189	Surgical Light (for Operation Microscope)	
190	Synoptiscope	
191	Syringe pump	ស៊ីរីងបូម
192	Table boiler (Instrument Sterilizer) Electric	ឆ្នាំងចំហាយប្រើអគ្គិសនី (ឧបករណ៍រំងាប់មេរោគ)
193	Thermomerter Electric	ទែម៉ូម៉ែត្រ អេឡិចត្រូនិក
194	Tissue Floating Bath	ម៉ាស៊ីនបណ្តុះមេរោគ
195	Tissue Processor Aoutomatic	ម៉ាស៊ីនវិភាគកោសិកាដោយស្វ័យប្រវត្តិ
196	Tonometer	មីក្រូទស្សន៍ពិនិត្យភ្នែក
197	Tourniquet (Air, Pneumatic, Electric)	
198	Traction Unit	
199	Transcutaneous	
200	Tread Mill	
201	Tube dryer	បំពង់កំដៅ
202	TV Monitor	ទូរទស្សន៍

Medical Equipment Standard List

No.	Name Equipment	Khmer Name
203	Ultrasonic cleaner	ម៉ាស៊ីនសម្អាតធ្មេញប្រើអ៊ុលត្រាសោន
204	Ultrasonic Dental Scaler	អ៊ុលត្រាសូនិកដីនថលស្តេល័រ
205	Ultrasound diagnostic color doppler system	ម៉ាស៊ីនអេកូប្រភេទពណ៌ធម្មជាតិ
206	Ultrasound Scanner Black & White	ម៉ាស៊ីនអេកូប្រភេទសខ្មៅ
207	Ultrasound Scanner portable	ម៉ាស៊ីនអេកូប្រភេទអាចយូរបាន
208	Ultrasound Therapy Unit	ឧបករណ៍ព្យាបាលប្រើអ៊ុលត្រាសោន
209	Ultraviolet Lamp	អំពូលការស្និស្នយ័អ៊ុលត្រាសម្រាប់ព្យាបាល
210	Urine Analyzer	ម៉ាស៊ីនវិភាគទឹកនោម
211	Urine gravitometer	ម៉ាស៊ីនវិភាគក្រាវីតេទឹកនោម
212	Urology examination table electric	តុអគ្គិសនីសម្រាប់ពិនិត្យ ផ្នែកមូតសាស្ត្រ
213	UV Lamp	ឧបករណ៍សម្រាប់មេរោគប្រើការស្និស្នយ័អ៊ុលត្រា
214	Vacuum extractor OB/GYN	ម៉ាស៊ីនបូម ប្រើនៅផ្នែកសម្ភពនិងរោគស្ត្រី
215	Ventilator electric (Multifunction)	ឧបករណ៍សម្រួលដង្ហើម (ពហុមុខងារ)
216	Ventilator electric (simple)	ឧបករណ៍សម្រួលដង្ហើម (ធម្មតា)
217	Ventilator infant	ឧបករណ៍សម្រួលដង្ហើមសម្រាប់កុមារ
218	Vitrectomy (Instrumentation)	
219	Warming & Cooling Unit (Hypohypasermier)	
220	Washer for Lab	ម៉ាស៊ីនបោកឥតសម្រាប់មន្ទីរពិសោធន៍
221	Water Analyzer	ម៉ាស៊ីនវិភាគទឹក
222	Water Bath	ឧបករណ៍រក្សាកំដៅដោយទឹក
223	X-ray Angiographic System	
224	X-ray C-arm TV system(Image intensifier)	ម៉ាស៊ីនការស្និស្និច មានដៃកោង ឃើញរូបភាពតាមកញ្ចក់ទូរទស្សន៍
225	X-ray Computer Tomographic Scanner (CT)system	
226	X-ray Dental	ម៉ាស៊ីនថត-ឆ្លុះធ្មេញដោយការស្និស្និច
227	X-ray Dental Panoramic	ម៉ាស៊ីនការស្និស្និចប្រើនៅផ្នែកព្យាបាលធ្មេញ
228	X-ray diagnostic Unit Bucky Table	ម៉ាស៊ីនថតឆ្លុះប្រើការស្និស្និចមានតុអ្នកជំរុំ
229	X-ray Film Auto Processor (Film Developer)	ម៉ាស៊ីនលាងហ្វីលដោយការស្និស្និចដោយស្វ័យប្រវត្តិ
230	X-ray Film Auto Processor for Dental	ម៉ាស៊ីនលាងហ្វីលដោយការស្និស្និចដោយស្វ័យប្រវត្តិសម្រាប់ជំរុំធ្មេញ
231	X-ray Film Dryer	ម៉ាស៊ីនសម្ងួតហ្វីល

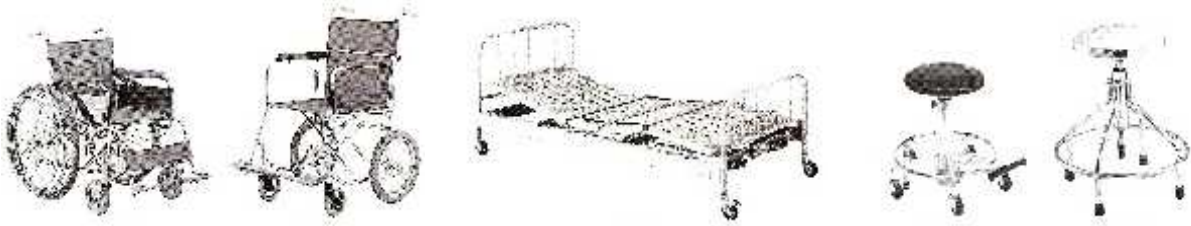
Medical Equipment Standard List

No.	Name Equipment	Khmer Name
232	X-ray Film Manual Processor	ម៉ាស៊ីនលាងហ្វីលដោយដៃ
233	X-ray Film Name Printer	ឧបករណ៍វាយឈ្មោះលើហ្វីល
234	X-ray Mamography	ម៉ាស៊ីនកាំរស្មីអ៊ិចសម្រាប់ថតដោះស្រាយ
235	X-ray Mobile	ម៉ាស៊ីនថត-ឆ្លុះកាំរស្មីអ៊ិចលត់
236	X-ray TV System (Fluoroscopy)	ម៉ាស៊ីនកាំរស្មីអ៊ិច មានប្រព័ន្ធចេញរូបភាពតាមកញ្ចក់ទូរទស្សន៍
237	X-ray Universal Diagnostic Table	តុសម្រាប់ដាក់អ្នកជំងឺថតកាំរស្មីអ៊ិច
238	Yag Laser Surgical Unit	

Medical Equipment could be divided Three Categories:



Medical Instrument



Medical Furniture



Medical Equipment