*Ministry of Health and Social Services*

# *National*
# *Health Care Technology*
# *Policy*

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# FOREWORD

An integrated element of the health delivery system of the public health sector of Namibia is the management of technology, embodied in medical equipment and instrumentation. Health care technology increasingly permeates all aspects of modern health care delivery and technological advancement has contributed to increased life expectancy, lower mortality rates and, generally, to better health outcomes.

This National Health Care Technology Policy (NHCTP) has been formulated in order to achieve more effective management and use of technological devices and procedures. The need for a comprehensive policy document became a matter of urgency, following the restructuring of the MOHSS in 1999, which resulted in the establishment of the Medical Equipment Management Sub-Division.

The management of medical technology comprises many aspects. These aspects include the selection process of devices from local, regional and international markets, followed by acquisition procedures. Acquisition is followed by installation and commissioning (where appropriate), after which the equipment is ready for use. Training of operators and maintenance staff are areas of great importance, as the lack of user skills and maintenance capacity invariably leads to poor performance of medical equipment. Writing-off and disposal of obsolete devices concludes the technology management cycle. The effectiveness of each managerial aspect has an impact on the overall performance of technology and for these reasons they have all been included in this policy.

This policy is written during a time of change and adjustment, where management responsibility is gradually being decentralised from the national level to the regions and districts. For this reason it is anticipated that the policy will have to be updated periodically, so as to reflect its dynamic nature.

The Ministry urges all stakeholders to actively support the principles and objectives contained in this policy and to ensure the effective implementation of the policy so as to achieve the wider goal of rendering sustainable quality health care to all Namibians. It is my wish that health managers, planners and indeed all health workers, who are dependent on technology, will familiarise themselves with this document and put the policy guidelines into action, with the ultimate goal of providing a better service to the clients.

Dr Libertina Amathila
Minister

# PREFACE

The National Health Care Technology Policy sets out the development objectives and a framework for action concerning the health care technology management services of the Ministry of Health and Social Services. This policy document is dynamic and therefore subject to periodic review. Furthermore, health care technology policy does not exist in a vacuum, but is situated within a context provided by broader policies, such as health policy and development policy. Any changes in broader policy frameworks, therefore, will have to be reflected in this policy.

The objective of the policy is to define long term goals and strategies as part of a comprehensive approach to improving the effectiveness of health care technology. This policy aims to take into account problems specific to Namibia, such as financial constraints and an acute shortage of skilled human resources.

The structure and format of this policy is in agreement both with ministerial guidelines, as well as with the relevant recommendations issued by the World Health Organization, in particular those that pertain to the development of health care technology policy. This also means that the term 'equipment' has been replaced by the broader term 'technology' which, besides equipment hardware, includes skills, knowledge, tools and procedures related to the acquisition and utilisation of medical equipment.

This policy document is structured as follows: Chapter 1 introduces the reader to the terminology associated with Health Care Technology Management. After a concise analysis of the current situation in Namibia in Chapter 2, Chapter 3 presents the framework for this policy. Chapter 4 sets out the institutional framework for the implementation of the policy, whereby responsibilities for implementation are attributed to stakeholders at the various levels of the health care system. Chapter 5 is concerned with required resources, while Chapter 6 outlines the tools for the monitoring and evaluation of policy implementation. Chapter 7 deals with issues pertaining to legislation and regulation in the field of health technology utilisation.

For the benefit of those readers who are not familiar with the technical jargon related to health care technology, an annex has been included giving a glossary of terms used in this policy document.

The National Health Care Technology Policy 2003 will be accompanied by a Health Care Technology Policy Implementation Plan, being a set of guidelines with strategies, objectives and inputs needed to implement identified policy components.

It is hoped that this document will guide the process of improving technology management at national, regional and institutional level and ultimately contribute to improving health care delivery to the people of Namibia.

Dr Kalumbi Shangula
Permanent Secretary

# LIST OF ABBREVIATIONS

| | |
|---|---|
| AFTH | African Federation for Technology in Health Care |
| CEW | Clinical Engineering Workshop |
| CMS | Central Medical Stores |
| CSS | Clinical Support Services |
| DD | Deputy Director |
| DOW | Department of Works |
| EAC | Equipment Advisory Committee |
| EHTP | Essential Health Technology Package |
| EMO | Equipment Management Officer |
| HCTA | Health Care Technology Assessment |
| HCTP | Health Care Technology Policy |
| HCTS | Health Care Technical Services |
| HMIS | Health Management Information System |
| HRD | Human Resource Development |
| HSSSP | Health and Social Sector Support Programme |
| ID | Identification |
| IEC | International Electro-Technical Commission |
| ISO | International Standards Organisation |
| MEM | Medical Equipment Management |
| MOF | Ministry of Finance |
| MOHSS | Ministry of Health and Social Services |
| MTI | Ministry of Trade and Industry |
| MOWTC | Ministry of Works, Transport, and Communication |
| MRC | Medical Research Council |
| NGO | Non-Government Organisations |
| NHCTP | National Health Care Technology Policy |
| NNCCI | Namibian National Chamber of Commerce and Industry |
| NPC | National Planning Commission |
| PHC | Primary Health Care |
| PMDRC | Policy and Management Development Review Committee |
| PP&HRD | Policy Planning and Human Resources Development |
| PPM | Planned Preventive Maintenance |
| R&D | Research and Development |
| THC&CSS | Tertiary Health Care and Clinical Support Services |
| TOR | Terms of Reference |
| UCT | University of Cape Town |
| WCH | Windhoek Central Hospital |
| WHO | World Health Organization |

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# CHAPTER 1 INTRODUCTION

## 1.1 Defining Health Care Technology

Health care technology management plays a significant role in the process of achieving Health for All. On this premise, the World Health Organization has played a leading role in the development of technology policy guidelines. The vision of rational use of technology in the service of health is universal. To achieve it, one requires, as an important first step, the formulation of an appropriate health care technology policy, as policy provides the tracks on which the health care technology management system runs.

The term *Health Care Technology* has been defined by the WHO as:

> *"The devices, drugs, medical and surgical procedures - and the knowledge associated with these – used in the prevention, diagnosis and treatment of disease as well as in rehabilitation and the organisational and supportive systems within which care is provided".*

It incorporates:

> Organisational/physical infrastructure, including health facilities/buildings, their installations and plant, energy sources and water and gas supplies; and
>
> Supportive/logistical systems, whose components are supply systems, information systems, communication and transport systems, and waste disposal systems.

This policy, however, *excludes* physical structures (buildings) as well as drugs/ pharmaceuticals as these are covered by separate policy initiatives and frameworks. Nevertheless, technology-related activities will be linked and coordinated, where possible and appropriate, so that optimised allocation and utilisation of the entire spectrum of health care technologies is ensured.

Health care technology pervades all aspects of modern health care and over the past decades has contributed to increased life expectancy, more rapid and improved diagnosis and treatment, faster rehabilitation and generally to better health outcomes.

The Alma-Ata Declaration (WHO, 1978) promotes the use of appropriate technologies, i.e. those technologies which are scientifically valid, socially acceptable and universally available to all individuals and families of the community at a cost that the community and the country can afford at all stages of the country's development in the implementation of primary health care. However, for varying reasons, certain countries are often unable to utilise and apply health care technologies to their fullest extent to improve the health of their peoples.

In an effort to address this issue, WHO has adopted resolutions (WHO/EMRO, 1997 and WHO/AFRO, 1994) related to health care technologies. These resolutions call upon Member States to:

- *Develop national programmes on health care technology through designating a national focal point for health care technology in the country;*
- *Develop suitable mechanisms for the assessment and acquisition of health technologies;*

- *Develop means of obtaining access to health care technology information systems and databases;*

- *Take necessary measures to ensure that donor support in the area of health care technology is given where it is most needed and likely to be most cost–effective;*

- *Raise awareness of health care technology related issues amongst decision-makers and health workers in general, and*

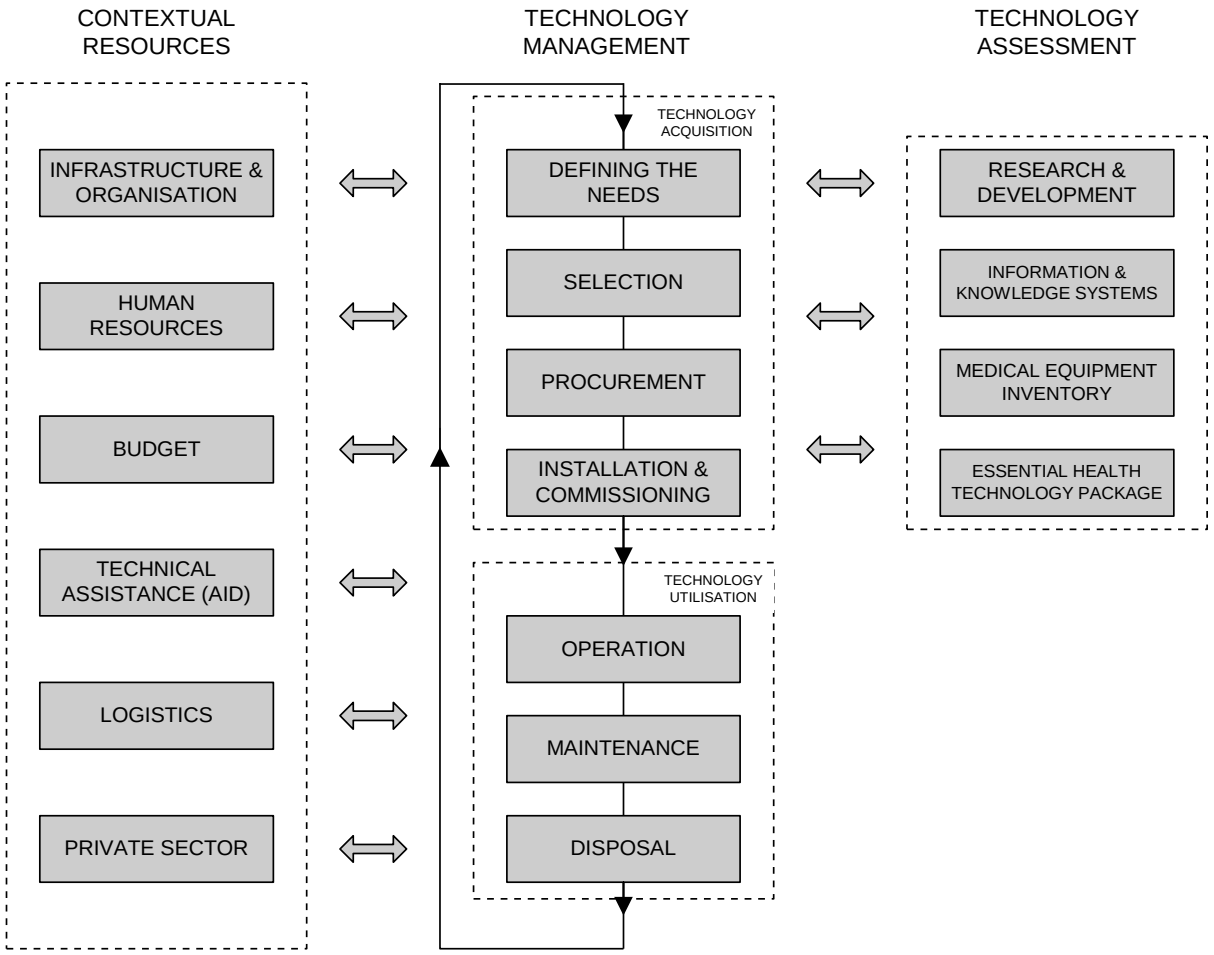
- *Introduce the concept of an Essential Health Technology Package (EHTP) as a management tool to facilitate delivery of appropriate, cost-effective and sustainable health services (Bobadilla, et al. 1994 and Heimann, 1998).*

Technology policy is the foundation on which successful utilisation and application of health care technologies reposes and as such all countries, including Namibia, need to have an explicit policy on health care technology, covering all levels of the national health system, as an integral part of their overall health policy. Regional diversity underlines the need for each country to formulate and implement policies consistent with the country's needs, priorities, resources and capabilities.

## 1.2 Health Care Technology Management

Health care technology management is a complex cyclical process, which takes place within a context (environment) of limited resources. The different elements of the management process draw on these resources, while there is a constant interaction between the process and the resources. Technology assessment provides information relevant to the acquisition stage of the management process. Management, assessment and context are dynamic entities. The following diagram visualises this interactive process:

*Diagram 1. Technology Management & Required Resources*




The remainder of this Section presents the characteristics of the various elements of the contextual resources, the technology management process and of technology assessment.

### A. Contextual Resources

*Infrastructure and Organisation*

This policy outlines the creation, operation and sustainability of adequate and appropriate organisational structures at all levels of the health system in support of health care technology needs assessment, acquisition and utilisation.

The core infrastructure for Health Care Technology Management consists of a referral system of Clinical Engineering Workshops. The Clinical Engineering Workshop in Windhoek acts as referral unit, in support of the technical units outside the capital.

*Human Resources*

Capacity building and human resources development refers to the development of institutional and individual abilities and expertise in support of policy formulation and implementation, health care technology needs assessment, acquisition and utilisation of technology. This objective will be achieved by strengthening the health care technology management system including promoting appropriate training initiatives. The primary objective in this regard will be the improvement and optimisation of technology cost-effectiveness.

*Budget*

The budget refers to the available financial resources from the Ministry for the acquisition of new technology, the replacement of obsolete technology and the maintenance and repair of existing technology items.

*Technical Assistance (Aid)*

Technical assistance provided through bi-lateral, multi-lateral and private aid agencies will primarily be used towards the development of essential technical and managerial competence. Technical assistance will be regarded as an integral part of a comprehensive and coherent management system.

*Logistics*

Logistical support refers to the means and procedures related to the transport of personnel, goods and information. Included in this are arrangements for the supply, storage and distribution of equipment, as well as service tools, test equipment and replacement parts for equipment.

*Private Sector*

This policy encourages public/private partnerships to maximise the benefits of the acquisition and utilisation of health care technology resources.

The provision of quality health services at affordable prices is a collective effort involving all sectors of society. “Smart” - mutually beneficial - partnerships between public and private sectors for cost-effective health care service delivery will be explored and, where appropriate, implemented. An important area of collaboration is the sharing of technical and management expertise between public and private sector employees.

Local innovation (research, development and production) of appropriate medical devices, which meet acceptable quality standards and good manufacturing practices, will be encouraged (Schmitt, 1989 and Free, 1992).

## B. The Technology Management Process

*Needs Definition*

The definition of needs for new or replacement medical equipment is the first stage of the management process. Requirements for equipment-embodied technology are to be based on, and in

agreement with, the intended medical functions at national, regional and district level, which in turn are to be in agreement with national policies on health care.

The computerised inventory of medical equipment (MEMS Database) will be consulted as a routine matter, since the inventory contains up-to-date information about installed equipment, including its operational status.

The output of this first stage of the management process, is a detailed list of requirements, which serves as the reference document for the selection and procurement stages that follow.

*Selection*

The selection process for new equipment, once funds have been identified, will follow the established procedures of the MOHSS related to the acquisition of medical equipment.

With the needs for new equipment clearly defined and justified, a selection from the available products from the local and/or international market can be made. Offers will be invited from suppliers by means of formal tendering procedures, after which the selection process follows a comparative evaluation of available products.

In order to arrive at an appropriate list of requirements, inputs are required from a number of disciplines. The inputs of health workers, technical staff, architects, physical planners, administrators and planners are all relevant in order to reach a decision. The specification of requirements involves the users of equipment as well as senior managerial staff.

The selection of equipment and suppliers is the most crucial stage in the acquisition process. The output of the selection process is a detailed list of equipment names and models, stipulating the preferred supplier. This list constitutes the link between the selection stage and the procurement stage.

*Procurement*

Following a systematic and transparent selection process, outlined above, the procurement process will be a predominantly administrative exercise, which includes obtaining the best possible deal from the various sources of supply and organising the transfer of the equipment from the supplier to its final destination.

The established procedures for equipment procurement will be followed whereby companies are invited to submit tenders. The tender committee will make final recommendations to the Tender Board with regard to awarding tenders.

*Installation and Commissioning*

Planned installation and commissioning procedures will be in place, stipulating a number of tests to be performed to new equipment, in order to ensure that it is functioning correctly. The type of tests will depend on the nature and complexity of the equipment.

*Operation*

In order for equipment to deliver its intended services, personnel operating the equipment will be adequately trained in using the devices confidently while observing appropriate safety procedures.

*Maintenance*

Maintenance serves the purpose of keeping equipment in good running order throughout its anticipated lifetime. A distinction is made between curative and preventive maintenance.

Based on an appropriate cost-benefit analysis, the MOHSS will develop in-house service capacity for the maintenance of basic and robust devices. The proportion of equipment serviced in-house and externally will vary according to the complexity of equipment and the availability and quality of external services.

*Disposal*

Writing-off and subsequent disposal of equipment that is no longer cost-effective, constitutes the final stage of the cyclical and continuous management process.

## C. Technology Assessment

*Research and Development (R&D)*

R&D in the area of health care technology assessment will contribute to a better understanding of the choice process related to technology acquisition.

*Information and Knowledge Systems*

The MOHSS will collect and analyse information related to the acquisition and use of health care technology.

*Medical Equipment Inventory*

A comprehensive computerised database of medical equipment in hospitals, health centres and clinics facilitates the proper planning and management of the equipment.

*Essential Heath Technology Package (EHTP)*

The EHTP concept, developed by the World Health Organisation, will be embraced as an integral part of the technology assessment process.

# CHAPTER 2 SITUATION ANALYSIS

The availability of safe and effective health care technology, embodied in *devices, drugs, medical and surgical procedures*, is an important condition for a well-functioning curative and preventive health service. The effective use of the hardware component of health care technology involves more than just the acquisition and use of medical devices. Rather, it requires a number of specific managerial, technical and administrative inputs.

In order to fully understand and be able to analyse the situation regarding health care technology in Namibia the MOHSS undertook a comprehensive study. Special emphasis was given to the situation regarding the state of medical equipment in hospitals, health centres and clinics. A national workshop was the forum used to debate the issues and produce recommendations for change which led directly to policy formulation.

The present situation in Namibia with regard to the state of medical devices is critical. Due to inadequate resources invested in medical equipment management the MOHSS is facing a situation whereby a large proportion of equipment in hospitals and health centers is either requiring immediate replacement or else in need of repair.

Of the total current stock value of medical equipment, no less than 55% is technically obsolete or for some other reason in need of replacement. In addition, health facilities and plant (kitchen, laundry equipment, etc.) are in urgent need of maintenance or renovation. However these fixed assets are covered by a separate policy.

The current response time by technical staff, to reported equipment malfunction, is unacceptably high. The total time for equipment repair, that is from the moment that the malfunction is reported to the return of the equipment in good working order, is often in excess of 2 months. This fact contributes to the poor level of satisfaction with the technical support services, on the part of equipment users.

This serious situation can only be remedied by the introduction of an effective asset management programme. The year 2000 saw the introduction of such a programme, with technical assistance through the Second Phase of the Finnish Health and Social Sector Support Programme (HSSSP II). Providing assistance for the development of a comprehensive equipment policy is an important element of this Programme.

A critical constraint, presently, is the acute shortage of national staff within this Programme. The MOHSS set out to develop in-house managerial and technical expertise, in a variety of innovative ways. Vacant staff positions need to be filled urgently.

In line with national public sector policy trends, use will be made of the private (equipment) sector, in particular in the following areas: (i) equipment maintenance and repair services, (ii) specialised training to public sector employees in the area of equipment maintenance, testing and calibration and (iii) sharing product information. It is envisaged that the MOHSS will ultimately perform a managerial and monitoring function towards the cost-effective use of private sector services for the management and maintenance of assets. At the same time, the primary responsibility for asset management is decentralised to the regions and districts and to individual health institutions.

More important, however, is that the overall status of medical equipment management is raised to a level that is required. It is envisaged that the development and adoption of this policy will contribute to this objective.

# CHAPTER 3 POLICY FRAMEWORK

## 3.1 Goal

This Health Care Technology Policy is an integral part of the general health sector policy. Its goal is to deliver improved health services, by giving health service providers the necessary health care technology resources to enable them to deliver a **high quality, safe**, and **cost-effective** service. This policy is an instrument to assist the MOHSS to achieve this goal.

## 3.2 Principles

The guiding principles are to:

- Ensure that constant **availability** of safe and appropriate health care technology is maintained in the health facilities of Namibia
- Ensure that **equitable access** of all citizens to essential health care technology is observed and sustained
- Ensure the provision of essential health care technology which is **appropriate**, and **affordable** to the Government
- Promote **safe operation** of health care technology through correct use by skilled and knowledgeable staff

## 3.3 Objectives

The objectives stated in this policy document will cover the period up to the year 2006. This is in line with the time frame for the objectives of the National Development Plan II.

- Increase the operational performance of medical equipment, so that by the year 2006, 75% of all medical equipment in hospitals, health centers and clinics is in excellent condition, in good working order and safe to use
- Decrease the response time of technical service staff, so that by the year 2006 the total average time for equipment repairs at any health institution does not exceed 30 working days
- Ensure that the acquisition of technology for health facilities is in agreement with existing norms and standards, thus ensuring appropriate and affordable acquisition of technology, while adhering to principles of equity
- Establish a programme of planned preventive maintenance (PPM), whereby all equipment in all health facilities is routinely checked at regular intervals, thus ensuring safe operation of technology
- Develop and institutionalise a programme for continuous training and upgrading of users and maintenance staff

### 3.4 Strategies

The strategies for achieving the objectives can be divided into three broad categories, namely those associated with the required resources to sustain the technology management process and those related to the improvement of components of the management process.

The strategies associated with the rationalisation of the *required resources* to sustain the technology management process are to:

- Establish an effective infrastructure and organisation at all levels of the health care system, in order to provide adequate technical support services to managers and users of technology
- Develop the required capacities and skills among users, managers and service staff, in order to enable them to acquire and utilise technology at a maximum cost-benefit ratio
- Ensure the availability of adequate financial resources for the acquisition, utilisation, maintenance and replacement of equipment
- Ensure the effective utilisation of technical assistance (aid), through national and international development agencies, in such a way that human and institutional capacity building in the area of technology management is maximised
- Ensure the effective development of a system of logistical support, related to the transport of personnel, goods and information
- Promote the development of public/private sector partnerships, so as to maximise the benefits of technology utilisation

The strategies associated with the improvement of aspects of the *technology management process* are to:

- Clarify the procedure of needs definition and provide the tools and information to managers and users, so as to enable them to take appropriate decisions related to the acquisition of technology
- Establish procedures for the effective selection of technology, taking into account the outcome of the needs definition process and the established procedures of the MOHSS
- Promote and strengthen the established procurement procedures so as to ensure that health care technology is acquired efficiently and effectively and at the optimum cost-benefit ratio
- Clarify and strengthen the procedures for the installation and commissioning of acquired technology items
- Strengthen and develop human skills and capacities for the safe operation (use) of technology
- Strengthen and develop human skills and capacities for the effective maintenance and repair of technological equipment
- Ensure the application of established procedures for equipment disposal

The strategies associated with the improvement of aspects of *technology assessment* are to:

- Promote research and development for the purpose of improving the acquisition and utilisation of health care technology
- Develop and sustain an integrated system for appropriate and effective data collection, storage, analysis and dissemination of information
- Develop and maintain an inventory of existing stock of medical equipment, as a tool for planning and management
- Apply the Essential Health Care Technology Package concept as integral part of the technology assessment process

# CHAPTER 4 INSTITUTIONAL FRAMEWORK FOR POLICY IMPLEMENTATION

The MOHSS will develop and maintain appropriate structures and expertise, required for all aspects of health care technology management. Members of staff involved in the management of technology will have clearly defined roles, responsibilities and relationships to each other. The current organisational structure related to technology management is shown in Figure 1:

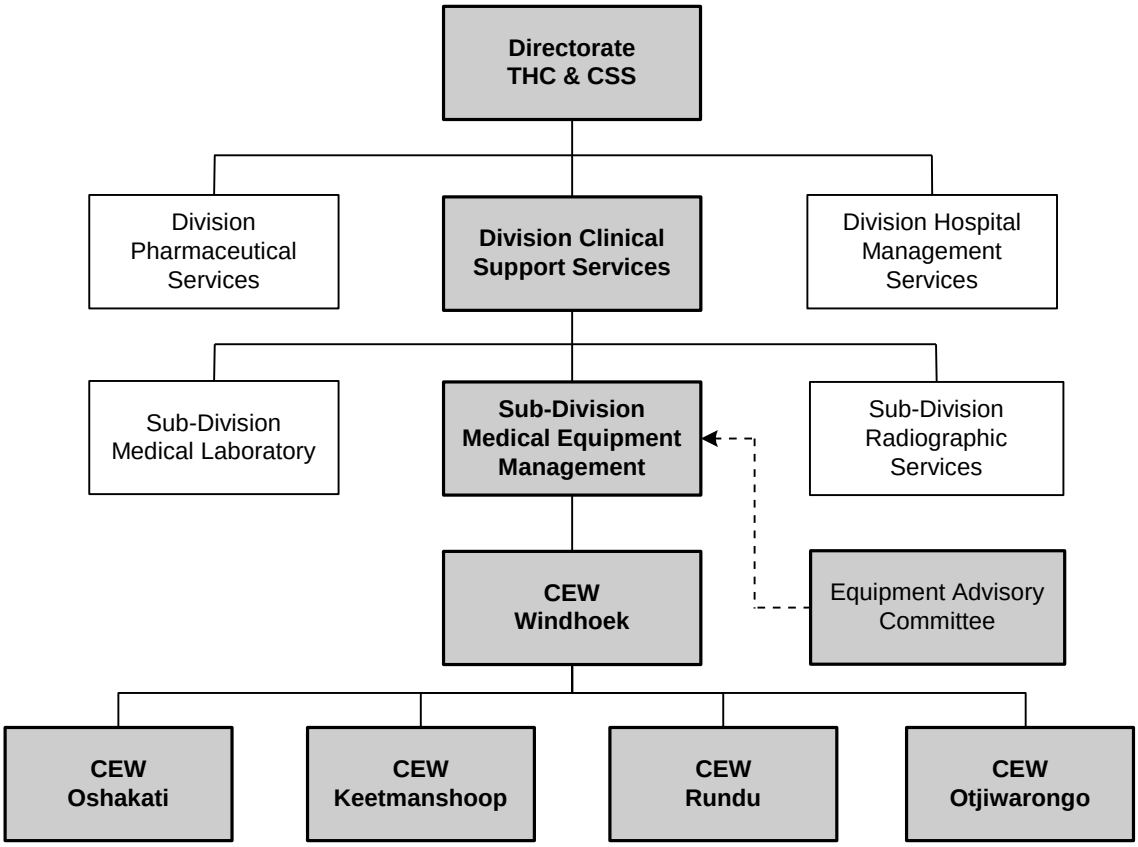



*Figure 1. Organisational Structure*

Key stakeholders of health care technology management include the Sub-Division Medical Equipment Management, the national network of Clinical Engineering Workshops and the Equipment Advisory Committee at the national level. Units responsible for health care technology management will liase with all other health service providers and maintenance organisations, so that all aspects of health care technology management are properly coordinated.

## 4.1 District and Facility Level

The District Co-ordinating Committee (DCC) will oversee the implementation of all technology management activities at district and facility level.

The management of health facilities will be responsible for the timely drafting of the list of annual requirements for medical equipment and the subsequent procurement of low-tech medical equipment. They will determine medical equipment requirements in a systematic way, according to accurate and up-to-date information available from the Sub-Division MEM, through the Equipment Management Officers.

The management of health facilities will ensure that equipment under their care is subjected to Planned Preventive Maintenance (PPM), in order to optimise the functionality and safety of the equipment.

Users of medical equipment will have first-line responsibility for the care of low-tech medical equipment. For this reason, they will be trained in basic maintenance and general care for equipment. They will have the responsibility to report equipment malfunction to the management of the health facility without delay.

## 4.2 Regional Level

### 4.2.1 Regional Management Team (RMT)

The Regional Management Teams (RMTs) will oversee the implementation of all technology management activities at regional level.

The RMTs will be responsible for budgeting for routine equipment replacement and maintenance. They will receive advice in this matter from the Sub-Division Medical Equipment Management through the regional Equipment Management Officers (EMOs).

In order to maximise the lifetime of equipment and its functionality, the RMTs will ensure that all medical equipment in their region is subjected to Planned Preventive Maintenance (PPM).

### 4.2.2 Equipment Management Officers (EMOs)

The key role of Equipment Management Officers (EMOs) is to assist the RMTs with the various aspects of technology management, particularly with (i) budgeting for maintenance and replacement, (ii) coordination of maintenance and repair activities, (iii) staff development and capacity building, (iv) updating equipment inventories, and (v) supervisory visits.

EMOs liase between the RMT, the CEW, the health facilities at regional and district level and the Sub-Division Medical Equipment Management at national level. Each region ensures that an EMO is appointed. He/she reports routinely to the RMT.

The EMO receives support from the Sub-Division MEM in terms of inventory information and periodic training. He/she will ensure that PPM takes place at facility level. To this extent the EMO will communicate and collaborate closely with the CEW.

### 4.2.3 Clinical Engineering Workshops (CEWs)

Health care technical services will be provided through a network of Clinical Engineering Workshops supervised by the Sub-Division Medical Equipment Management at national level. The regional CEWs are responsible for the repair and maintenance of medical equipment, upon request by the users of the equipment.

The national CEW in Windhoek serves as a referral unit for the regional CEWs and is equipped and staffed to carry out more complex maintenance and repair activities.

CEWs make use of the private sector when the complexity of the equipment is such that specialised expertise and tools are required.

CEWs will be equipped with Mobile Workshops. Mobile Workshops will be staffed and equipped to visit health facilities in order to carry out repairs and maintenance on medical equipment. In addition, Mobile Workshops will play a key role in the Planned Preventive Maintenance (PPM) Programme.

A CEW may delegate its responsibility for Planned Preventive Maintenance (PPM) to clinical engineering maintenance team(s) at district or hospital level, in cases where such teams exist and are operational. The CEW reports to the Sub-Division MEM on the progress of PPM implementation.

## 4.3 National Level

### 4.3.1 Division Clinical Support Services

The Division Clinical Support Services (CSS) within the Directorate THC&CSS will oversee the implementation of all technology management activities at all levels of the health service. This Division will liase closely with relevant units within the MOHSS, specifically with those responsible for health facility planning and management.

At the 19th National Management Meeting in 2002 a resolution was approved to the effect that the procurement of high-tech medical equipment should be coordinated at national level. Consequently, the preparation of specifications and procurement contracts will be coordinated and supervised by the Division CSS.

This Division will implement a programme for raising awareness amongst equipment users concerning the value of equipment and the importance of preventive care of the equipment. This will be done through training, workshops, and re-orientation. This Division will be responsible for the development and/or acquisition of training manuals which are relevant within the Namibian context.

### 4.3.2 Sub-Division Medical Equipment Management (MEM)

The Sub-Division MEM within the Division CSS will be responsible for the overall management of the operational aspects of the technology management programme. This Sub-Division has an advisory and monitoring role within the framework of technology management. In addition, it will provide technical support to users of medical equipment, regional and hospital based EMOs, as well as to the network of CEWs throughout the country. It will collaborate closely with all units within the MOHSS concerned with the management of technology.

This Sub-Division will assists regions, districts and hospitals with the preparation of equipment specifications and the compilation of lists of requirements. Assistance will be rendered with full involvement of the designated EMOs. It will maintain a computerised equipment inventory. EMOs and CEWs will be given access to the database, so as to assist them with planning and management activities.

Service, maintenance and repair contracts for medical equipment will be prepared bi-annually jointly by this Sub-Division and the national CEW, with recommendations from the regions.

### 4.3.3 National Clinical Engineering Workshop

The national Clinical Engineering Workshop (CEW) will act as the hub of a network of CEWs throughout the country. The services provided by the national CEW in Windhoek will include all services provided by the regional CEWs. In addition, this CEW will receive new medical equipment from suppliers, with the exception of stationary/fixed equipment. The national CEW will test the equipment in accordance with established procedures. The end-User will be responsible for collection of the equipment from the national CEW. Stationary/fixed equipment will be delivered directly to the final destination by the supplier, unless otherwise agreed in the purchase contract.

This CEW will be responsible for recording the technical and price details of all new equipment delivered by suppliers, or equipment otherwise entering the health service. It will ensure that the Sub-Division MEM is supplied with those details so as to enable the Sub-Division to enter the new items into the national inventory.

### 4.3.4 Equipment Advisory Committee (EAC)

The Equipment Advisory Committee (EAC) at the national level will assist and provide advice to all management functions and units associated with the acquisition and use of medical equipment. The Committee will conduct regular meetings and consist of representatives from the relevant Directorates and Programmes.

### 4.3.5 Ministerial Tender Section

The ministerial Tender Section is ultimately responsible for the selection and procurement of medical equipment, as well as for the choice of suppliers. Regarding the procurement of equipment it will ensure that the best possible deals with the suppliers are made, meaning that the most suitable equipment is procured from the most suitable supplier at the best possible price.

### 4.3.6 Ministerial Stock Taking Board

All stock-taking activities related to medical equipment resort under the framework of Treasury and are subject to Treasury Regulations. Taking the equipment inventory will, therefore, be synchronised with the annual stock-taking exercise carried out by the Stock Taking Board of the MOHSS. In order to assist the Stock Taking Board with this task, the Sub-Division MEM and the EMOs will provide timely input to the Stock Taking Board in the form of a printed listing of the national equipment stock derived from the computerised inventory at the Sub-Division MEM.

### 4.3.7 National Referral Hospitals and Intermediate Hospitals

The responsibilities of the management of health facilities at the national and referral levels are the same as those for the regional and district level (refer to Section 4.1). The duties of the EMOs at the referral hospitals are identical to those of the regional EMOs (refer to Section 4.2.2).

### 4.3.8 Other Line Ministries

The MOHSS will endeavour to communicate and collaborate with relevant Ministries and Offices, in particular with the MOF, NPC and the MOWTC, in order to raise awareness and increase levels of priority for the planning, management and funding of health care technology.

## 4.4 Academic Institutions

The MOHSS will establish collaboration with local academic institutions, in particular with the Polytechnic of Namibia, the University of Namibia and private educational institutions. For the development of specific technical and managerial skills, not catered for at Namibian institutions, the MOHSS will collaborate with academic institutions outside the country.

The MOHSS will encourage collaboration between the National and Regional Health Training Centres and the Directorate THC&CSS. The collaboration between these units will endeavour to incorporate training for nurse trainees in basic care and maintenance of medical equipment.

## 4.5 The Private (Equipment) Sector

The MOHSS will ensure the efficient and effective collaboration between the public and private sector. As such the MOHSS may employ the services of private companies to carry out maintenance and repairs on medical equipment. The Sub-Division MEM will determine for which categories of medical equipment external companies will be used and advise the CEWs accordingly.

The decision by the Sub-Division MEM to use either in-house staff or external companies for servicing of equipment will depend on (i) the level of complexity of the equipment, (ii) whether maintenance contracts already exists for specific items of equipment, and (iii) whether the equipment concerned is still under warranty.

The MOHSS will stimulate and promote local production of specific types of health care technology with the objective of gradually decreasing reliance on imports. This applies in particular to items of medical instrumentation which are appropriate to the Namibian context and which are not readily available from the international equipment market. The MOHSS will liase with the private sector in order to stimulate the local:

- assembly of health care equipment from imported parts;
- production of low technology health care equipment;
- production of spare parts for health care equipment; and
- production of consumables for health care equipment.

Liaison will be sought with the Investment Centre of the Ministry of Trade and Industry (MTI) and the Namibian National Chamber of Commerce and Industry (NNCCI), in order to support any

private sector initiatives regarding technical innovation and local production of technological devices, in this case medical equipment.

### 4.6 Professional Societies and Associations

The MOHSS will recognise the role of professional societies and associations, be they at national, regional or international level. The MOHSS will establish effective interfaces with these bodies.

### 4.7 Development Partners and NGOs

In order to enhance efficient and effective use of resources and to benefit from international bodies of knowledge, pertaining to health care technology management, the MOHSS will promote collaboration with and between national and international development partners, technical cooperation agencies and non-governmental organisations (NGO's).

External entities including the donor community and foreign expertise will continue to play an important role in the development of health care technical services. The MOHSS will collaborate with multi-lateral and bi-lateral technical co-operation assistance for the implementation of this policy.

With regard to donated medical equipment, the MOHSS will issue guidelines for both donors and recipients, for the purpose of ensuring the acquisition of appropriate technology with acceptable standards of quality and safety.

The MOHSS will liase with other health care providers (private sector, mission organisations, etc.) in order to share information on equipment management and planning, to mutual benefit.

### 4.8 Regional and International Collaboration

The MOHSS will promote collaboration between Namibia and other countries, especially with those in the SADC region. Besides the transfer of skills, specialised expertise and knowledge, the MOHSS will exchange information on good practice related to health care technology management, in order to maximise the efficient and effective use of technology and associated resources.

The MOHSS will establish and maintain ongoing technical co-operation with similar programmes in other countries and with international agencies and institutions. Areas of co-operation between relevant national, regional and international partners and institutions will be identified, especially in the preparation of appropriate policies and mechanisms for promoting health care technology assessment and operational research.

More specifically, the MOHSS will endeavour to advance local and international collaboration in technology-related areas, through sharing of information, experience and other health care technology resources, management systems and tools, promotion of joint initiatives in the establishment of resource centres and the development of human resource capacity development programmes.

# CHAPTER 5 RESOURCE IMPLICATIONS

The MOHSS will mobilise adequate financial resources needed for the implementation of all aspects of the Health Care Technology Management Programme.

## 5.1 Human and Institutional Resources

The MOHSS will employ suitably qualified cadres to effectively deliver all aspects of the Health Care Technology package.

The staff establishment for the Sub-Division Medical Equipment Management, the network of Clinical Engineering Workshops and the health institutions will take into consideration adequate and appropriate skill mixes for each level of expertise. The maintenance service will contain skill mixes within at least the following cadres: work hands, handymen, artisans, technicians, technologists, engineers and managers, as well as the relevant administrative support cadres.

The MOHSS will ensure that complimentary management staff (such as hospital administrators, safety inspectors, supplies officers, etc.) will be in place to provide the necessary assistance with implementing the National Health Care Technology Policy.

## 5.2 Capacity Building

The MOHSS will ensure that staff members are available at all times with the knowledge, skills and attitude to manage, operate and maintain equipment effectively.

The Sub-Division MEM will develop a comprehensive training programme and ensure that adequate funds are allocated for the training of users and maintenance staff. All types of in-service training will be included in the training programme: pre-service, on-the-job, attending external training institutes for long or short periods, refresher courses, and workshops/seminars. Collaboration with local and international training institutions will be encouraged.

The MOHSS will review the forms of in-service training currently given to maintenance staff in order to improve them. The MOHSS will liase with registration bodies such as the Trade Testing Authority and the Namibian Engineering Council and will ensure that in-service training is formalised and recognised as part of the staff's career progression.

The Sub-Division MEM will explore, develop and stimulate cooperation with private companies, both local and outside the country. Selected individuals or groups of individuals will be trained, by these companies, in specific technical and managerial skills pertaining to the various aspects of technology management.

### 5.3 Financial Resources

The MOHSS will ensure that sufficient financial resources are made available for health care technology acquisition, operation and maintenance.

The equipment inventory will be the primary basis for planning expenditure. Procurement of equipment and associated supplies will be rational and planned, while the procurement guidelines will be based on four areas of expenditure:

- Requirements for any future expansion of services to be delivered;
- High profile projects;
- Replacement of equipment (when equipment reaches the end of its life);
- Procuring the shortfall of equipment to make a basic provision based on the Standard Equipment Lists (this purchasing will be staggered according to priorities and criteria to be established).

The MOHSS will ensure the continuation of the services it delivers by replacing equipment when it reaches the end of its lifespan. It aims to follow international guidelines for budgeting for replacement, i.e. an average investment of 10 percent of the current equipment stock value each year.

Replacement and procurement budgeting will be undertaken nationally, regionally, or at facility level depending on the type of health care technology. Procedures and guidelines for replacement will be contained in the replacement guidelines, and will be used by both government and mission health facilities.

Increasing priority will be given to the maintenance of equipment. In order to facilitate this, the equipment management unit will set standards and norms for minimum budget levels. Maintenance budget allocations will follow the general principle of the 3-year rolling budget. MOHSS will aim to protect its investment in equipment by providing adequate maintenance budgets, which will not be transferable for other use. It will aim to adhere to international guidelines for budgeting for maintenance and repair, i.e. 6 percent of the equipment stock value each year.

The maintenance budget will be split between national, regional, and facility level according to the maintenance functions defined for each level. Procedures and guidelines for budgeting for maintenance and repair will be given in the maintenance and repair procedures.

Budget control will be decentralised to the 13 political regions. Regions will economise requests from districts for low-technology equipment maintenance and repair, using their maintenance budget appropriately. High technology equipment maintenance will be economised at national level.

Planned increases in capital expenditure on equipment under capital budgets will have corresponding increases in recurrent budgets. Therefore, information regarding new equipment procured under the capital budget will be provided to the users for budgeting for maintenance and running costs from their recurrent funds.

When new equipment is evaluated in the tender process, the lifetime cost will be taken into account. For existing equipment, lifetime cost information (expenditure on consumables) will be gathered regularly by facilities and suppliers. These records, together with the equipment inventory, will serve as the basis for recurrent budgeting.

## 5.4 Infrastructural Resources

The MOHSS will, in collaboration with other stakeholders and development partners endeavour to strengthen, consolidate and expand the provision of infrastructure needed for the efficient delivery of Health Care Technical Services.

Health Care Technical Services will be provided through a national network of engineering workshops, overseen by the equipment management unit at national level (refer to Chapter 4 of this policy document).

# CHAPTER 6 MONITORING AND EVALUATION

In accordance with national objectives and priorities, indicators for monitoring and evaluation of technology-related service provision will be developed. Periodic reports at the different levels of the service will be produced, based on the agreed indicators. The national level will ensure that monitoring and evaluation activities are also carried out at regional, district and facility level.

The equipment management programme will promote total quality assurance related to medical equipment in health facilities, ensuring that patients obtain the best possible care, given the local organisational and environmental constraints. For this reason, the programme will promote the development and/or implementation of performance indicators, hospital effectiveness parameters and technical efficiency to monitor technology utilisation. The programme will address directly the issue of user training and supporting mechanisms that will be put into place to ensure adequate competence and proper and safe application of all technologies at all levels of health care delivery.

## 6.1 Performance Indicators

Approved essential indicators for medical equipment management will be applied at regional and district level. They will be reported on periodically by the RMTs and presented to the National Management Meetings. In addition to the approved regional indicators, this policy recommends a number of indicators to be applied at the different levels of service, so as to measure performance and achievements at those levels. Reference is made to the Guideline 'Planning and Monitoring Tools', in which indicators are presented for the following levels of service: national level, regional/district level, facility level and CEW level.

## 6.2 Policy Implementation Plan

In order to facilitate an effective and efficient implementation of this policy, the MOHSS will prepare and periodically update relevant procedures and guidelines related to all aspects of equipment management, operation and maintenance. In addition, a series of training manuals will be developed to train end-users of medical equipment, in order to enable them to take responsibility for basic care of their equipment.

The Policy Implementation Plan will consist of a series of guidelines with the following titles:

1. Procurement of Medical Equipment
2. Replacement of Medical Equipment
3. Planned Preventive Maintenance of Medical Equipment
4. Maintenance and Repair of Medical Equipment
5. Donations of Medical Equipment
6. Planning and Monitoring Tools

The Policy Implementation Plan will define priority areas and translate them into concrete short term action plans with defined activities, budgets, timetables, responsible persons, expected outcomes and indicators.

# CHAPTER 7 LEGISLATION AND REGULATIONS

The legislation and regulation component of the National Health Care Technology Policy will support, guide and regulate aspects associated with the provision, acquisition and utilisation of health care technologies.

The MOHSS will ensure that the appropriate administrative and legal measures, organisational and support mechanisms and appropriate infrastructure, within the framework of the policy, will be adhered to and implemented. Issues of safety for health workers and risk management will be essential elements of such measures and mechanisms.

The MOHSS will undertake a situation analysis with respect to medical equipment utilisation in Namibia, in order to establish whether the appropriate legislation and regulations are being observed and implemented.

Safety issues (including hazards, notifiable incidences and technology induced fatalities) will be addressed to ensure effective management of health care technologies, in order to ensure minimal risk to health workers, patients and visitors in the clinical environment.

Formal risk and safety programmes, as appropriate to different levels of health care delivery and supported by relevant national and international standards, will be developed, implemented and supported. These programmes will be supported by appropriate information systems with access to international sources of relevant information. Safety and risk management activities will span the period from pre-market appraisal to post-market surveillance.

Regulatory and legislative instruments will be dynamic and responsive to changing circumstances. The Division CSS will liaise with the various Divisions within the MOHSS, such as Radiation Protection and Occupational Health, as well as with the private sector in order to develop and implement relevant legislation and regulations.

## ANNEX 1 Key Implementation Phases

| TARGET AREAS | SHORT TERM (by 2004) | MEDIUM TERM (by 2006) | LONG TERM (by 2010) |
|---|---|---|---|
| Policy, Guidelines, Management Systems | • Health Technology Policy in place<br>• MEM Guidelines in place<br>• MEMS inventory system fully operational<br>• PPM Pilot Projects | • CEWs in five key locations fully established and operational<br>• PPM Programme fully operational<br>• MEMS system deployed to all regions<br>• Reporting systems fully implemented at all levels | • Timely replacement of obsolete medical equipment<br>• All low-tech equipment maintained by in-house technicians<br>• Main hospitals own Clinical Engineering Section |
| Human Resources Development | • EMOs Trained<br>• Regular ToT[a] Seminars for Nurses | • Key vacant posts filled<br>• Training Programme for technicians and handymen in place | • All vacant posts filled<br>• Technicians appointed at District and Intermediate Hospitals |
| Maintenance Budget Allocated[b] | 2% | 4% | 6%[c] |
| Replacement Budget Allocated[d] | 2% | 5% | 10%[e] |
| Percentage of equipment maintenance budget committed[f] | 50% | 75% | 100% |
| Percentage of equipment replacement budget committed[g] | 50% | 75% | 100% |
| Medical Equipment Performance[h] | 60% | 75% | 85% |

[a] ToT = Training of Trainers (Basic Care of Equipment)
[b] As percentage of replacement value of total national stock of medical equipment
[c] As per international recommendation (WHO, GTZ et al.)
[d] As percentage of replacement value of total national stock of medical equipment
[e] As per international recommendation (WHO, GTZ et al.)
[f] Composite national total (13 regions and 4 referral hospitals)
[g] Composite national total (13 regions and 4 referral hospitals)
[h] Proportion of medical equipment in excellent condition and good working order (national)

# ANNEX 2 Glossary of Terms

**African Federation for Technology in Health Care:** organisation offering co-ordination and advice on technical issues for all persons working with health care technology on the African continent.

**Artisan**: skilled person with a technical trade such as car mechanics, electrics, plumbing, carpentry, etc. An Artisan has a higher level of education/qualification than a Workhand.

**Barcode Number:** means of physically labelling equipment so that each individual item can be identified as distinct from another similar machine; the barcode label will be applied when undertaking the equipment inventory. The barcode label will be used when recording details of work undertaken on specific equipment (service history).

**Best Cost Benefit Ratio:** choice of equipment based on the item that will be the most economically advantageous over its life-time and not simply the cheapest at time of the initial sale; criteria used to judge/compare products at the time of procurement.

**Calibration:** adjustments made to equipment to ensure the result/performance is true and correct, and to counteract the normal alterations in performance which occur due to the effect on technology of climate, time, wear and tear, etc.

**Catalogues:** a series of documents developed to assist users with the various aspects of managing equipment.

**Clinical Engineer:** a person who has passed an undergraduate degree course in an engineering field and subsequently trained post-graduate to apply their engineering skills to the problems of medical equipment; or has undertaken an undergraduate degree course specifically designed for the engineering aspects of medical equipment.

**Clinical Engineering Workshop:** current national medical equipment maintenance workshop based at WHC.

**Clinical Technologist:** a person who has passed a higher diploma course specifically designed for the engineering aspects of medical equipment; or has undertaken and ordinary diploma course in an engineering field and subsequently trained at higher diploma level to apply their engineering skills to the problems of medical equipment.

**Commissioning:** a series of tests performed, after new equipment in installed, to check and ensure that the equipment is functioning correctly at the start of its operational life.

**Core Equipment Service Expenditure Plan:** estimates the amount of money required to ensure that all facilities are provided with functioning equipment at the level defined by the Standard Equipment Lists by the end of a specified period, taking into account purchase, replacement, maintenance, and running requirements.

**Equipment Advisory Committee:** a body established to advise MOHSS top management, PMDRC, and the ministerial Tender Committee on general equipment issues, and comprised of members from the various divisions within the ministry that play a part in the management of equipment.

**Equipment Complexity:** In terms of complexity, medical equipment is divided into (i) low technology/complexity devices (e.g. manual centrifuge, baby scales), (ii) medium technology/complexity (e.g. suction pump, HB-meter) and (iii) high technology/complexity devices (e.g. X-ray apparatus, ECG monitor).

**Equipment Procedure Manual:** a document containing the MOHSS procedures and guidelines for all aspects of managing health care technology.

**Essential Service Packages:** details of activities which must occur at each level of the health service (e.g. clinics, district hospital, referral hospitals, etc).

**Handyman:** a labourer with some training/skills in basic maintenance in trade areas (plumbing, building, etc), but usually without formal qualifications.

**Essential Health Technology Package (EHTP):** the range of inputs which need to be addressed if technology is to be successfully transferred into the health care environment, including: management and planning, allocation of financial resources, selection of equipment, procurement, operation, maintenance, training, research and development, and local production.

**Health Care Technology:** within health facilities there are many types of equipment; the range which falls under the responsibility of ministries of health varies from country to country. In Namibia, the definition of health care technology comprises:

| | |
|---|---|
| Medical equipment: | X-ray units, diathermy units, suction pumps, scales, foetal dopplers, infant incubators, physiotherapy units, etc; |
| Hospital Furniture: | Hospital beds, trolleys, etc; |
| Service Supplies: | Electrical installations, water & sewage pipelines, gas supplies; |
| Hospital Plant: | Boilers, lifts, air-conditioners, cookers, washing machines, etc. |

**Health Management Information System:** computerised data-gathering system for management indicators throughout the health service.

**High Technology:** see Equipment Complexity

**Hospital Furniture:** see definition of Health Care Technology

**Installation:** tasks undertaken to fix equipment into place, and can range from building the equipment into the fabric of the room to simply connecting it to the electrical supply.

**Institutional Maintenance Team:** comprising 2 staff members at each health facility (such as the administrative officer and a nurse) who show an interest in equipment issues; they are responsible for equipment and maintenance matters; all problems are reported to them; they are responsible for sorting them out/contacting the correct person; and may undertake simple tasks themselves.

**International Electro-technical Commission (IEC):** international body which defines in detail the standards to which equipment must be manufactured if it is to be recognised as safe; IEC 601 (Parts 1 & 2) is their standard concerning the manufacture of medical equipment to which bona fide companies shall conform.

**International Standards Organisation (ISO):** international body which defines minimum standards for quality manufacturing, for which manufacturers can obtain accreditation.

**Inventory:** a detailed listing of all the health care equipment that the MOHSS owns, its location and state of repair; a record which is annually updated.

**Life-time:** all equipment has a normal "life" expectancy dependent on the type of equipment and its technology (ranging from 5 - 20 years); the life will be shortened if equipment is not cared for (i.e. maintained), and at the end of its life equipment must be replaced if the service it provides is to continue.

**Life-time Cost:** many items of equipment use consumable items (x-ray film, laboratory reagents, etc); the cost of providing these inputs must be met throughout the equipment's life if it is to continue to provide a service.

**Medical Equipment:** see definition of Health Care Technology

**Mobile workshop:** the tools and test equipment of a maintenance workshop mounted in a vehicle, so that the maintenance staff can travel to facilities and undertake repair work there.

**MOWTC 2000 Initiative:** a strategy of the Ministry of Works, Transport, and Communication to gradually hand over responsibility for financing and maintaining plant to client ministries by the year 2000, after which the clients can contract maintenance support from commercialised DOW agencies and the private sector.

**Multi-Disciplinary Maintenance Teams:** teams of maintenance staff made up of a variety of people with different skill mixes (electrical, mechanical, plumbing, electronic, carpentry, etc) to ensure that maintenance can be carried out in a hospital for all types of equipment (electrical and plumbing installations, plant, and medical equipment).

**National Equipment Management Meeting:** the annual meeting of the Equipment Advisory Committee together with one representative from each region, to review equipment issues.

**Planned Preventive Maintenance:** a specified schedule of activities carried out according to a timetable on equipment with the aim of preventing breakdowns and ensuring that equipment is operational and safe, thereby diminishing the amount if time equipment is out of service.

**Procurement Contracts:** after a tendering process, the MOHSS enters into contracts with various suppliers from whom they will procure certain types of equipment over a given time period (1 or 2 years).

**Purchasing Policy:** MOHSS agreed strategy for rational and planned procurement of equipment in accordance with four prioritised areas of expenditure.

**Replacement Policy:** MOHSS agreed strategy for rational and planned replacement of equipment in accordance with certain specified valid reasons which have to be fulfilled.

**Service Supplies:** see definition of Health Care Technology

**Site Preparation:** work required to ensure that the room or space where equipment will be installed is suitable (in terms of size, position, layout, and materials) and the environment is adequate for the particular purpose (e.g. air-conditioned, dust-free, away from running water), and can include construction work, and provision of services such as electricity, water, gas and waste pipelines.

**Specifications:** descriptions of equipment in sufficient detail to clearly detail the functions and criteria that the equipment must fulfil; used for procurement purposes to ensure the suppliers can identify exactly what the purchaser requires, and to ensure the purchaser receives the type of equipment they want.

**Standard Equipment Lists:** lists of the equipment required per room, per department, for different types of health facility (clinic, district hospital, etc), so that the health service planned for that facility can be delivered.

**Standardisation:** limiting the wide range of makes and models of equipment found in the health service; a strategy to ensure users and maintainers are familiar with the types of equipment they come into contact with, and to rationalise the large stocks of consumables and spare parts to be held.

**Sub-Division Medical Equipment Management:** a unit within the ministry of health with the capacity and authority to oversee all aspects of health care equipment management.

**Technician**: skilled person in possession of a diploma of a particular trade, such as mechanics, electrics, electronics, etc. A technician has a higher level of education/qualification than an Artisan.

**Technology Assessment:** a process of evaluating the efficiency and efficacy of existing equipment available on the market and the new and ever-evolving technologies arriving on the market.

**Training Plan:** the annually revised strategy for training equipment operator and maintenance staff in various equipment-related skills by different training organisations, together with the training timetable for the implementation of the plan.

**Users:** people who operate health care equipment

**Workhand:** a labourer in the maintenance workshops

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