Medical supplies and equipment for primary health care
A practical resource for procurement and management

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ECHO
International Health Services Limited
“It is not the knowing that is difficult, but the doing”

Chinese proverb
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The life cycle of a health technology (medical devices or drugs) consists of three main phases - provision, acquisition and utilization. Procurement is one of the key steps in the acquisition phase. As such it plays an important role in ensuring that the right health sector goods (equipment, drugs, supplies etc.) are available, in the appropriate places and in the required quantities. Good procurement practices do not only lead to savings in acquisition costs, they also facilitate downstream activities during the utilization phase, especially maintenance in the case of equipment.

This book is a welcome document in this vein, as it provides a comprehensive resource for acquisition of health sector supplies and equipment, covering the needs of facilities at the primary health care level. If properly used, it should help ameliorate the situation in developing counties, where procurement of goods (and services) is often fraught with ineffectiveness and inefficiency. The book is fairly exhaustive in the range of products it covers - from cotton swabs to syringes, and from microscopes to waste disposal systems. The identification of equipment and supplies with the procedures they support, reasserts the need for acquisitions to be driven by health care goals, not procurement objectives.

The practical tips and suggestions on routine inspection and preventive maintenance can extend the useful life of the items procured, especially in the developing world, where sometimes more than fifty per-cent of all health care equipment is unusable, for reasons ranging from operator misuse to lack of spare parts. The discussion on management again underscores the need for a holistic view of procurement as an activity in a broader context, whose object goes beyond simply procuring health sector goods, to improving health services.

We trust that the book will get the readership it richly deserves, and most important, that its use will contribute positively to improving the health of the people and communities envisaged.

S. Yunkap Kwankam, Scientist & Andrei Issakov, Coordinator, Service Outcome 
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Preface

Drugs, medical supplies and equipment account for a high proportion of health care costs. Health services in developing countries need to choose appropriate supplies, equipment and drugs, in order to meet priority health needs and to avoid wasting limited resources. Making sure that health facilities have adequate supplies, equipment and drugs is also essential if people are to have confidence in health services and health workers.

Model lists of basic low-cost products can help people responsible for procurement to make cost-effective decisions. A lot of useful information is available about essential drugs, and the World Health Organisation and other organisations have produced model lists of essential drugs. Until recently, less information was available about medical supplies and equipment, despite the fact that there is a much wider range of different brands and items to choose from and the specifications for supplies and equipment are much less standardised than for essential drugs. To address this situation, ECHO published Selecting medical supplies for basic health care, a model list of essential supplies and equipment, in 1995.

This revised edition, Medical supplies and equipment for primary health care, covers effective procurement, management and maintenance of basic supplies and equipment. The model list of essential supplies and equipment has been updated to reflect changes and developments since 1995 and expanded to include laboratory supplies, supplies and equipment for community care, and essential drugs. The presentation of the list has been reorganised to show what supplies and equipment are required for different primary health care activities. New information has been included about selection, ordering, storage, care and maintenance of medical supplies and equipment, and about waste disposal.

We hope that the revised edition will help readers to think about what supplies and equipment are needed and why, to decide how to obtain supplies and equipment, and to understand the basic principles of management and maintenance. Please use the feedback form at the end of the book to send your comments and suggestions, which will help us to improve future editions.
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The authors are indebted to Kathy Attawell for editing and support.

The manual was illustrated by David Woodroffe and designed by wave.
Glossary, acronyms, abbreviations and symbols

Glossary

Accessories – are complementary and add to the functions of an item of equipment, but are not always essential, e.g. a 20X objective is useful if you are using a microscope to examine plasma for parasites but is not required for other functions.

Cleaning – is the process of removing visible material, such as dirt, grease, blood and body fluids and reducing the number of infectious micro-organisms (bacteria, viruses, fungi, and spores).

Consumables – are essential for an item to perform its basic function, e.g. immersion oil is essential for microscopes. Consumables are also items that are used within a short time, e.g. cotton wool.

Disinfection – is the process of removing or reducing the number of micro-organisms to levels that are no longer harmful. Disinfection kills viruses, fungi and bacteria but not spores such as tetanus. Disinfection is, therefore, safe for items that are used for some purposes but not for those where all organisms must be destroyed.

Disposables – are items designed for single use. Disposables should only be used once and should not be re-used.

Equipment – is capital equipment and durable items that last for several years, e.g. beds, examination tables, sterilisers, microscopes, weighing scales, and bedpans.

Planned Preventive Maintenance (PPM) – is the regular maintenance service recommended by manufacturers and carried out by trained technicians, which should supplement maintenance carried out by health facility staff using the equipment.

Procurement – includes deciding what quantities to order, choosing a supplier if goods are purchased, and obtaining supplies and equipment through donations.

Reusables – are items designed to be used more than once. Reusables should only be used after proper cleaning and sterilisation and/or disinfection.

Spare parts – are required to maintain the basic function of an item of equipment, e.g. to replace damaged, worn or lost parts, or as part of PPM to prevent breakdown.

Standard List – is a model list of standardised medical supplies and equipment, based on the type of preventive care, diagnostic tests, and treatments a health facility is expected to carry out.

Sterilisation – is the process of destroying or removing all forms of living organisms, including bacteria, viruses, fungi and spores.

Supplies – are items that need replacing on a routine basis, including disposables, single use items, e.g. disposable syringes and needles; expendables (sometimes also called consumables), items that are used within a short time, e.g. cotton wool and laboratory stains; reusable items, e.g. catheters and sterilisable syringes; and other items with a short life span, e.g. thermometers.

User Maintenance – is day-to-day routine care and maintenance by users, including cleaning, inspection for damage and reporting any defects, which is essential to keep instruments and equipment in good working condition.

Acronyms and abbreviations

ANC Ante Natal Care
B/B Blunt/Blunt
BCG TB vaccine
CHW Community Health Worker
CMS Central Medical Store
CSSC Christian Social Services Commission
ECHO ECHO International Health Services Ltd
ED Essential Drugs
EDL Essential Drugs List
EPI Expanded Programme on Immunisation
Hb Haemoglobin
HIV Human Immunodeficiency Virus
HW Health Worker
IDA International Dispensary Association
JMS Joint Medical Store
LBW Low Birth Weight
MCH Mother and Child Health
MEDS Mission for Essential Drugs and Supplies
MOH Ministry of Health
MSF Medecins Sans Frontieres
NGO Non Government Organisation
ORS Oral Rehydration Solution
ORT Oral Rehydration Therapy
Paed Paediatric
PHC Primary Health Care
Pr Pair
PVC Poly Vinyl Chloride
SS Stainless Steel
S/S Sharp/Sharp
SSS Sugar Salt Solution
STI Sexually Transmitted Infection
TBA Traditional Birth Attendant
TH Traditional Healer
TT Tetanus Toxoid vaccine
UNICEF United Nations Children’s Fund
VEN Vital, Essential, Non-essential
WHO World Health Organisation
Abbreviations for drug formulations and routes of administration

Amp (Ampoule)
Cap(s) (Capsule(s))
Inj (Injection/Injectable)
IM (Intramuscular)
IV (Intravenous)
SC (Subcutaneous)
Tab(s) (Tablets)

Abbreviations for standards

BP (British Pharmacopoeia)
CE (European Committee for Standardisation)
EP (European Pharmacopoeia)
EN (European Norms)
IEC (International Electrotechnical Commission)
IP (WHO International Pharmacopoeia)
ISO (International Organisation for Standardisation)
USP (United States Pharmacopoeia)

Symbols

° degree
% per cent
& and
" inches
+ and/with
/ or/per
< less than
> more than
÷ divided by
x multiplied by
µ micro

Measures

AC alternating current
C centigrade (Celsius)
CH Charriere gauge for catheters, tubes, drains (same as FG e.g. CH5 = 5FG)
cm centimetre
DC direct current
F Fahrenheit
FG French gauge for catheters, tubes, drains (same as CH e.g. 5FG = CH5)
G gauge for IV catheters, needles (the lower the gauge the greater the diameter)
g gram
ht height
Hz Hertz (cycles per second)
kg kilogram
l litre
lb pound
l x w x h length x width x height
m metre
min minute
mcg microgram
mg milligram
ml millilitre
mm millimetre
MU mega units
no. number
oz ounce
tsp teaspoon (5mls)
V volts
W watts
wt weight

This book uses metric dimensions and sizes. If you use imperial measures, refer to the conversion table below.

Conversion table

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Temperature:

To convert °C to °F: multiply by 9, divide by 5 and add 32.
To convert °F to °C: subtract 32, multiply by 5 and divide by 9.

Measures and equivalents:

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<tr>
<td>1 m</td>
<td>100 cm</td>
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<tr>
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<tr>
<td>1 g</td>
<td>1000 mg</td>
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<tr>
<td>1 kg</td>
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Who is this book for?

This book is aimed at primary health care facilities. It is intended for health workers who are responsible for selecting and managing medical supplies and equipment for primary health care services provided by government facilities and by non-government organisations, including non-profit agencies and private companies such as mines and plantations.

The way that primary health care is organised varies from country to country and the services provided depend on the type of facility and staff, and on the resources available. Primary care facilities include health posts, dispensaries, clinics and health centres. Some facilities may have only one health worker, others may have a number of staff. Primary care staff include medical assistants, clinical officers, nurses, midwives, community-based workers or other professional and non-professional health workers.

In this book we have assumed that primary health care facilities offer the following services:

- **Diagnosis and treatment of common diseases and conditions** – including malaria, skin diseases, respiratory infections, anaemia and malnutrition.
- **Preventive child health** – including growth monitoring, immunisation and nutrition.
- **Reproductive and sexual health** – including antenatal, postnatal and delivery care, family planning and prevention, diagnosis and treatment of STIs.
- **Treatment of injuries** – dressing wounds and immobilising uncomplicated fractures, minor outpatient surgery under local anaesthetic and providing basic first aid in emergencies.
- **Eye care** – including checking vision, prevention of blindness and treatment of infections.
- **Health education and health promotion** – in the community and in health facilities.

Primary health care facilities usually provide **community care**, supporting and supervising community-based health workers (community health workers, traditional birth attendants and traditional healers), and home-care programmes for people with chronic or terminal illness and disabled people.

Some primary health care services may also have a small delivery room for births and a few short stay beds for very sick patients, and basic **laboratory facilities** for conducting simple diagnostic tests.

The information in this book will also be relevant for secondary level facilities, usually district hospitals, which deal with more complex cases and take referrals from primary level facilities. The more sophisticated needs of tertiary level facilities, which provide specialist services, are not discussed in this book. However, we hope that it will be useful to health planners, managers and trainers at national and district level in Ministries of Health, Finance and Planning, and to personnel responsible for purchase and supply and for managing medical stores.

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**Medical supplies and equipment**

The term medical supplies means different things to different people, and the distinction between supplies and equipment is not always clear. In this book, we have defined medical supplies and equipment as follows:

- **Supplies** – items that need to be replaced on a routine basis, including: disposables, single use items, e.g. disposable syringes and needles; expendables (sometimes also called consumables), items that are used within a short time, e.g. cotton wool, laboratory stains and tape; reusable items, e.g. catheters and sterilisable syringes; and other items with a short life span, e.g. thermometers.
- **Equipment** – capital equipment and durable items that last for several years, e.g. beds, examination tables, sterilisers, microscopes, weighing scales and bedpans.
What is the purpose of the book?
Choosing supplies and equipment is often given little thought or attention. This can result in procurement (the process of obtaining items through purchase and donation) of inappropriate supplies and equipment. Items can be inappropriate because they are technically unsuitable or incompatible with existing equipment, because accessories or spare parts are not available, or because staff have not been trained to use them. Too often, supplies and equipment are not effective or efficient because they are poorly managed and maintained.

This book aims to:
• Provide guidance for deciding what medical supplies and equipment are needed.
• Promote the use of standard lists of supplies and equipment, in order to encourage good procurement practice in primary level facilities.
• Encourage collaboration between those who use supplies and those who make decisions about the allocation of resources.
• Improve understanding of management and maintenance of supplies and equipment.

Why are standard lists useful?
A standard list is a model list of standardised medical supplies and equipment, based on the type of preventive care, diagnostic tests and treatments a health facility is expected to carry out.

Standard lists assist in making appropriate choices of medical supplies and equipment, which helps to improve patient treatment and care, use of resources and management.

Standard lists improve patient treatment and care by:
• Identifying the priority supplies and equipment needed to prevent and treat common health problems, and ensuring that these priority items are available in health facilities.
• Promoting standardised use of medical supplies and equipment in treatment, providing the basis for standard clinical procedures and training for health workers.

Standard lists improve use of resources by:
• Providing a framework for budgeting and for controlling procurement costs.
• Avoiding procurement of items that are rarely or never used.
• Reducing duplication of items used for the same purpose.
• Preventing expensive and wasteful over-ordering and over-stocking.
• Helping to prioritise new acquisitions.

Standard lists improve management of supplies by:
• Reducing the number of items that need to be supplied.
• Dividing supplies into ‘vital’, ‘essential’ and ‘not so essential’ categories (see Box), which helps to identify items that should always be in stock.
• Encouraging uniformity in health facilities, which simplifies stock control, ordering and maintenance.
• Providing the basis for standard maintenance training of users and technicians.
• Rationalising the range of spare parts, accessories and other consumables required, which simplifies sourcing, purchasing and storage.
• Helping to decide whether or not to accept donated supplies and equipment.
The VEN system

The VEN system helps to set priorities in procuring medical supplies and equipment and keeping stock. Items are categorised as:

- **Vital** – items that are crucial for providing basic health services.
- **Essential** – items that are important but not absolutely crucial for providing basic health services.
- **Not so essential** – items that are used for minor or self-limiting problems.

Vital and essential items should be given priority if funds are limited, and health facilities should always have these items in stock.

What information is included in this book?

This book is organised in the following sections:

- **Section 1** – provides a checklist of criteria to guide selection of supplies and equipment.
- **Section 2** – provides practical guidelines about procurement, including deciding what quantities to order, choosing a supplier, and dealing with donations of supplies and equipment. It also looks at management, including keeping records, maintaining supplies and equipment in good condition and disposing of waste.
- **Section 3** – includes information about essential supplies and equipment for primary health care services, with specific lists of the items required for activities carried out by most primary health care facilities. This section also describes new developments in the field of medical supplies and equipment.

Appendix 1 provides a resource list of useful materials and sources of additional information, and Appendix 2 includes a list of essential drugs for primary health care facilities and information about drug quantification methods.

How can you use this book?

Ideally you should use a standard list to help you select supplies and equipment. In many countries, Ministries of Health (MOH) have developed guidelines or standard lists of medical supplies and equipment for all levels of the health system.

If there is no standard list available, you will need to develop your own standard list of commonly used supplies and equipment. This book is intended to help you to do this. It is beyond the scope of this book to include everything you might need to know about equipping and furnishing a PHC facility, and so it does not provide information about non-medical and communications equipment, furnishings, stationery and so on.

- Think about the most common health problems in your area.
- Review patient needs and the services provided by your facility.
- Review the skills and competence of your health workers.
- Assess what resources you have available for procurement of supplies and equipment.
- Find out what supplies and equipment are used by other health facilities in your district and ask colleagues in these facilities about their experience.

Use this information and the criteria in Section 1, the guidelines in Section 2 and the lists in Section 3 to help you draw up a standard list of the supplies and equipment required to meet patient needs. Make sure that you involve health workers and maintenance staff in drawing up the list. Review and update the list on a regular basis. The prices given as examples are illustrative. You will need to obtain current prices from suppliers.

Readers are also encouraged to use the book as a practical resource for procurement, management and maintenance of supplies and equipment. You can photocopy or reproduce relevant sections as posters, wall charts or other practical tools to help you in your day-to-day work.

ECHO welcomes your comments on this manual. Please use the feedback form at the end to send us your suggestions about ways in which we can improve future editions.