

Instruments and consumables



Ingrid Mason
CBM Medical Advisor,
PO Box 58004, 00200 City
Square, Ring Road Parklands,
Nairobi, Kenya.



Catherine Cross
Formerly Manager,
International Programmes,
Sightsavers, Grosvenor Hall,
Bolnore Road, Haywards
Heath, West Sussex, RH16
4BX, United Kingdom.

Our recent issue on “Equipment for eye care” (number 73, September 2010) addressed the importance of equipment in the delivery of eye care and covered maintenance, repair, training, purchasing, and donations. This issue (number 76) addresses similar concerns around surgical instruments and consumables.

For an eye unit to function, instruments must be carefully managed so that they remain in good repair and can be replaced quickly if needed. Consumables, such as stationery, spare parts, surgical supplies, and medicines, are fast-moving and must be managed so that they are always available and do not go out of date. To make this possible, systems must be in place that support scheduled maintenance and repair activities, monitoring of stock levels, and co-ordinated purchasing of instruments and consumables.

Without usable instruments and an adequate supply of consumables, not only does equipment stand idle, but so also does the eye care team – while patients wait for treatment or are turned away.

Who is responsible?

The person in charge of an eye unit, usually the ophthalmologist or programme manager, is ultimately responsible to ensure that instruments and consumables are available when needed. Active oversight by the person in charge is vital, but in many eye units the day-to-day responsibility for purchasing and supplies management is delegated to another staff member,



Good management of instruments and consumables helps improve patient care.
IVORY COAST

Ferdinand Ama

receiving and unpacking deliveries, and physically arranging the stock in the stores area. Although the ordering and inventory management associated with instruments may also be dealt with by the stores manager, there may be a dedicated instruments person who will manage the necessary maintenance and repair protocols, including systems for reporting faulty instruments.

However, every member of the eye care team is responsible for instruments and consumables. Whatever your area of work, you must look after the items you use: identify low stocks or faulty items and communicate this to the stores manager, the instruments person, or the person in charge of your eye unit.

Whether you are an eye unit secretary who sees your supply of printed forms dwindling, or a nurse in a clinic where there

normally referred to as the stores manager.

The stores manager is responsible for keeping an inventory of all consumables, finding and dealing with suppliers, planning orders, making purchases,

are incomplete cataract sets, doing something about it is your responsibility – and we hope that this issue will show you how.

In this issue

- | | |
|---|---|
| <p>26 Instruments for cataract surgery: results from our survey
Daksha Patel and Phil Hoare</p> <p>30 Instrument care: everyone's responsibility
Renée du Toit, Konio Szetu, Wanta Aluta, and Alumita Ravona</p> <p>32 Managing your eye unit's supplies
RD Thulsiraj</p> <p>35 A simple paper-based system for stock management
Ferdinand Ama and Paddy Ricard</p> <p>36 Care of ophthalmic surgical instruments
Sue Stevens and Ingrid Mason</p> <p>38 Purchasing instruments and consumables
Ingrid Mason and Phil Hoare</p> <p>40 Donations of consumables and surgical instruments: how to ensure you really benefit Ismael Cordero</p> | <p>42 Optical products for refractive error and low vision
Kovin S Naidoo, Yashika I Maharaj, Vivasan Pillay, and Sebastian Fellhauer</p> <p>30 USEFUL RESOURCES</p> <p>44 EQUIPMENT CARE AND MAINTENANCE
Sharpening and tightening surgical scissors
Ismael Cordero</p> <p>45 PRACTICAL OPHTHALMIC PROCEDURES
Schirmer's test
Sue Stevens</p> <p>46 TRACHOMA UPDATE SERIES
New DVD supports trachoma surgery training
Saul N Rajak, Amir Bedri, and Matthew J Burton</p> <p>47 CPD: TEST YOURSELF</p> <p>48 NEWS AND NOTICES</p> |
|---|---|



Volume 24 | Issue 76 | December 2011

Editor

Elmien Wolvaardt Ellison editor@cehjournal.org

Editorial committee

Nick Astbury
Allen Foster
Clare Gilbert
Ian Murdoch
GVS Murthy
Daksha Patel
Richard Wormald
David Yorston

Consulting editor for Issue 76

Catherine Cross

Regional consultants

Sergey Branchevski (Russia)
Miriam Cano (Paraguay)
Professor Gordon Johnson (UK)
Susan Lewallen (Tanzania)
Wanjiku Mathenge (Kenya)
Joseph Enyegue Oye (Francophone Africa)
Babar Qureshi (Pakistan)
BR Shamanna (India)
Professor Hugh Taylor (Australia)
Min Wu (China)
Andrea Zin (Brazil)

Advisors

Catherine Cross (Infrastructure and Technology)
Pak Sang Lee (Ophthalmic Equipment)
Dianne Pickering (Ophthalmic Nursing)

Editorial assistant Anita Shah

Design Lance Bellers

Proofreading Mike Geraghty

Printing Newman Thomson

Online edition Sally Parsley

Email web@cehjournal.org

Exchange articles

Anita Shah exchange@cehjournal.org

Website

Back issues are available at:

www.cehjournal.org

Subscriptions and back issues

Community Eye Health Journal, International Centre for Eye Health, London School of Hygiene and Tropical Medicine, Keppel Street, London WC1E 7HT, UK.

Tel +44 207 612 7964/72

Fax +44 207 958 8317

Email admin@cehjournal.org

The *Community Eye Health Journal* is sent **free to applicants from low- and middle-income countries**. French, Spanish, Portuguese, and Chinese translations are available and a special supplement is produced for India (in English). Please send details of your name, occupation, and postal address to the *Community Eye Health Journal*, at the address above. Subscription rates for applicants elsewhere: one year UK £50; three years UK £100. Send credit card details or an international cheque/banker's order made payable to London School of Hygiene and Tropical Medicine to the address above.

© International Centre for Eye Health, London
Articles may be photocopied, reproduced or translated provided these are not used for commercial or personal profit. Acknowledgements should be made to the author(s) and to *Community Eye Health Journal*.
Woodcut-style graphics by Victoria Francis.

ISSN 0953-6833

The journal is produced in collaboration with the World Health Organization. Signed articles are the responsibility of the named authors alone and do not necessarily reflect the policies of the World Health Organization. The World Health Organization does not warrant that the information contained in this publication is complete and correct and shall not be liable for any damages incurred as a result of its use. The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by the World Health Organization in preference to others of a similar nature that are not mentioned.



SURVEY RESULTS

Instruments for cataract



Daksha Patel

MSc Course Director and Clinical Lecturer, International Centre for Eye Health (ICEH), London School of Hygiene and Tropical Medicine, Keppel Street, London WC1E 7HT, UK.



Phil Hoare

Procurement Manager, Sightsavers; IAPB Procurement Advisor and IAPB Standard List Administrator.

For any operation, including cataract surgery, the appropriate instruments must be available and in good working order. If instruments are not available, or are blunt, or do not function properly, it may be necessary to delay or postpone surgery. Using such instruments in an operation can result in a poor outcome, or even pose a risk to surgeons and their assistants.

The impact is therefore considerable, and can damage the reputation of the hospital in the community.

It may also mean that patients remain blind or have to travel further for treatment at an additional cost to them. They may even resort to using traditional methods, such as couching.

Making sure surgical instruments are in good working order requires the following:

- Purchasing high-quality instruments, as these are likely to be more robust and will last longer. The companies supplying them are also more likely to offer service warranties.
- Cleaning the instruments carefully after each operation, checking them to make sure they are still in good working order, packing them carefully, and sterilising them using appropriate methods.
- Checking that everyone working in the operating theatre and sterilisation areas knows how to handle instruments carefully. If sterilisation is centralised, those used to handling the large, robust instruments used in general surgery, orthopaedics, or obstetrics will have to be trained in handling ophthalmic instruments, which are small and delicate with fine points or very short blades.

Long-term maintenance of instruments requires an additional set of activities that must be carried out in

a systematic, scheduled, and routine manner. These activities include:

- **Regular preventive maintenance**, which comprises inspection (preferably with magnification), cleaning, lubrication, and replacement at regular intervals
- **Record-keeping for maintenance**, so eye units can record which instruments are broken and must be repaired, when they broke, when they were repaired, and so on
- **Repair of broken or unusable instruments**, carried out on defective instruments or parts of instruments
- **Withdrawal and disposal**, a protocol for discarding instruments, trading old instruments for new, or updating and salvaging old instrument parts as spares
- **Spares planning**, which consists of anticipating which instruments will require replacement and keeping spares in stock to replace instruments without delay.

Long-term maintenance activities can also be supported by negotiating annual maintenance contracts with instrument suppliers, although not all suppliers will provide this service.

Methods used

The survey discussed in this article was designed to find out:

- What instruments are used in different eye centres worldwide
- How they are cleaned and maintained
- Who is responsible for their care
- What effect poorly maintained, broken,



Ferdinand Ama

Regular preventive maintenance, such as cleaning and inspection, prolongs the life of instruments. IVORY COAST

surgery: results from our survey

or missing instruments had on the effectiveness of cataract services.

The survey focused on the equipment needed for cataract surgery, but many of the principles apply to all eye surgery. We designed the survey using the Bristol Online Surveys (BOS) service. The IAPB Standard List (see page 30) provided a guide to the instruments needed for cataract surgery.

The survey was circulated to Sightsavers and CBM regional offices and to alumni of the International Centre for Eye Health (ICEH) Community Eye Health/ Public Health for Eye Care MSc. It was also made available on the ICEH website. Only one entry per hospital was accepted and the data collection period was over three months, from 5 April to 3 July 2011. Data collected were cleaned and analysed using BOS and Microsoft Excel.

We asked eye units to provide information on the number of cataract operations performed in 2010 and on the number of ophthalmologists who worked there. Each unit was also asked to describe the roles and responsibilities of those handling surgical instruments and whether they had undergone any training.

Units were asked to report on a list of 41 instruments in four main groups: scissors, forceps, knives, and cannulae.

All the instruments required to perform a single operation are usually kept together as a complete 'cataract set'.

Ideally, to ensure efficiency, there should be three complete cataract sets for every theatre bed in use. This means that, while one set is being used for surgery, another can be set up for the next

Table 1. Breakdown of high- and low-volume units by region

	Africa	Southeast Asia	Other regions	Total
Low-volume units (<=2,000 operations in 2010)	27	17	7	51
High-volume units (>2,000 operations in 2010)	5	26	3	34

patient and the third can be sterilised.

We asked respondents whether any instruments were broken or unusable, the reasons why, and for how long they had not been usable.

We also asked how many units had incomplete cataract sets, and what the effect of this was on the services they were able to provide.

Findings

A total of 85 eye units responded to the survey. Most were in Southeast Asia (43) and Africa (32). A total of 83 were from low- and middle-income countries, and two were from high-income countries. The responding units were funded by government, by non-governmental organisations (NGOs), or had combined funding from two or more sources.

The populations served by all the eye units ranged from under 0.5 million to over 3 million.

Sixty per cent of the eye units carried out small-incision cataract surgery (SICS) and 24% reported extracapsular cataract surgery (ECCE) as their main method. All had a high percentage of surgery with intraocular lens (IOL) implantation. Phacoemulsification was

only performed in 5% of the eye units.

During analysis, we divided the eye units into two broad groups, based on the number of operations performed in a year. Those performing over 2,000 operations were classed as 'high-volume units' and those performing fewer than 2,000 operations in 2010 were classed as 'low-volume units'.

There were 51 low-volume units, most of which were from Africa, and 34 high-volume units, most of which were from Southeast Asia (see Table 1).

High-volume units were mainly funded from combined sources. Across all regions, 80% of those funded by government were low-volume units.

Procurement

The vast majority of the responding eye units (89%) reported having a person in charge of procurement who followed a specific protocol.

Instruments used

When the units' preferences were compared across the regions, it was clear that there was no one type of instrument that all units preferred.

However, capsulorrhexis forceps were used more commonly in the responding eye units in Southeast Asia (81%) than in Africa (51%).

Care of instruments

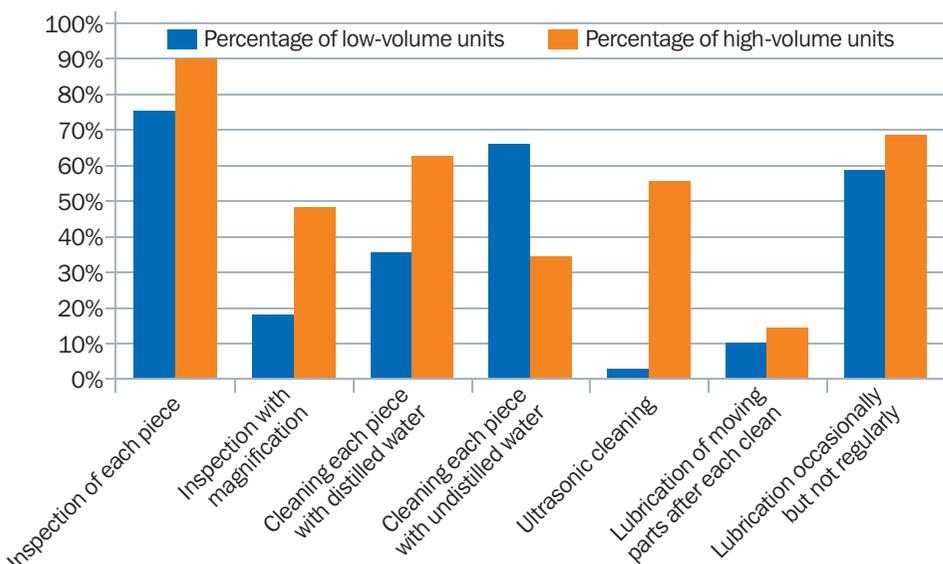
The day-to-day care of instruments varied across the responding eye units (Figure 1).

Whereas 62% of the high-volume units reported using distilled water to clean instruments, this was the case in only 35% of low-volume units. These units still cleaned their instruments, but using water that had not been distilled.

Although 80% of all responding eye units regularly inspected their instruments (75% of low-volume and 90% of high-volume units), only 29% inspected instruments using magnification (18% low-volume and 48% high-volume).

A total of 63% of eye units lubricated their instruments occasionally, and only 11% reported lubricating instruments after each clean.

Figure 1. Comparing day-to-day instrument care in low- and high-volume units



Continues overleaf ►

Long-term planning and maintenance

Overall, a greater proportion of the high-volume units who responded undertook long-term planning and maintenance activities (Figure 2).

In the questionnaire, these activities were described as ‘routine, periodic, pre-scheduled examination, repair, and replacement processes’:

- Preventive maintenance (cleaning, lubricating, and replacing broken parts at monthly intervals)
- Carrying out timely repairs
- Negotiating annual maintenance contracts with suppliers
- Withdrawing and disposing of instruments according to a set protocol
- Record-keeping for maintenance
- Spares planning.

Who was in charge of instrument care?

Most eye units surveyed (81%) had someone in charge of instruments and consumables (70% in low-volume units compared to 97% in high-volume units).

In both settings, only half of those responsible for the maintenance and care of instruments had received any specific training for this role. Those who did not have any training either followed a protocol or worked under the supervision of an ophthalmologist.

Among the ten teaching hospitals who responded only half had a dedicated person in charge of instruments who had also received training for the role.

Non-functioning instruments

Compared to the high-volume units, considerably more of the low-volume units reported having non-functioning or unusable instruments (Figure 3).

In some low-volume units, five or more of the same kind of instrument did not work.

The reasons given for instruments not working are summarised in Figure 4. Of those eye units who reported unusable forceps, the majority gave the reason as ‘broken’.

For cannulae, the most frequent reason was ‘faulty’; for knives, ‘blunt’. For scissors, both ‘blunt’ and ‘broken’ were reported very often.

Preventable causes (breakages due to poor handling, rust, being blunt) accounted for 73% of the unusable instruments.

In total, 40% of the eye units reported having instruments that had remained unusable for more than one year.

Figure 2. Comparing long-term planning and maintenance activities in low- and high-volume eye units

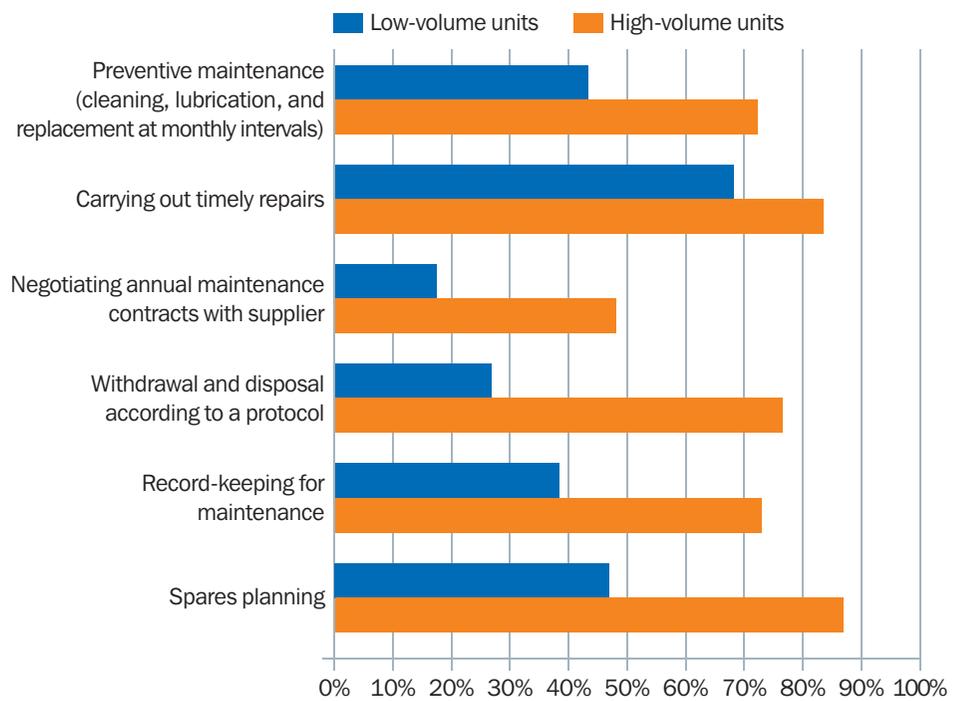
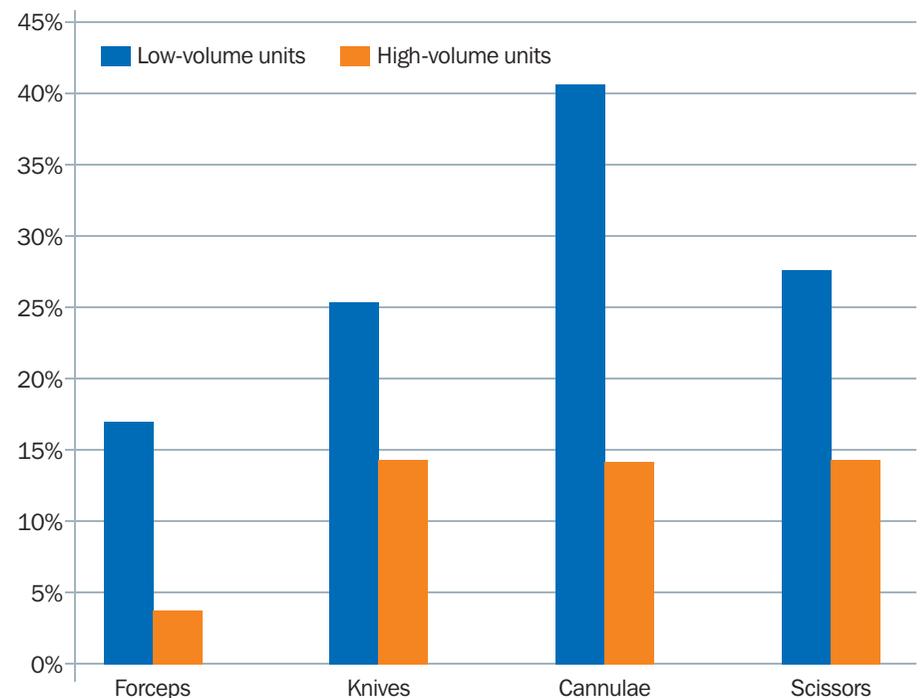


Figure 3. Percentage of eye units with non-functioning instruments, by surgical output



Impact of non-functioning instruments

Where repair was a challenge or re-ordering slow, eye units had to delay surgery, ‘make do’ without these instruments, or use disposable options instead.

Almost half of the units from Asia and Africa (48%) had at least one incomplete cataract set. Overall, more low-volume than high-volume units reported incomplete sets (59% vs 28%). Overall, of the eye units based in Africa, 75% reported incomplete cataract sets, compared with

just 21% of those in Asia.

The impact of having incomplete sets was considerable (Figure 5): 46% of the responding eye units had to extend surgical times as they had to wait longer between operations for cataract sets to be cleaned and sterilised; 12% had reduced the number of cataract operations they performed, and 7.3% had discontinued outreach services.

Overall, 69% of eye units without a person responsible for instrument care had incomplete cataract sets, compared to 41% of units with a person responsible.

Figure 4. Main reasons that instruments were non-functioning, by group of instrument

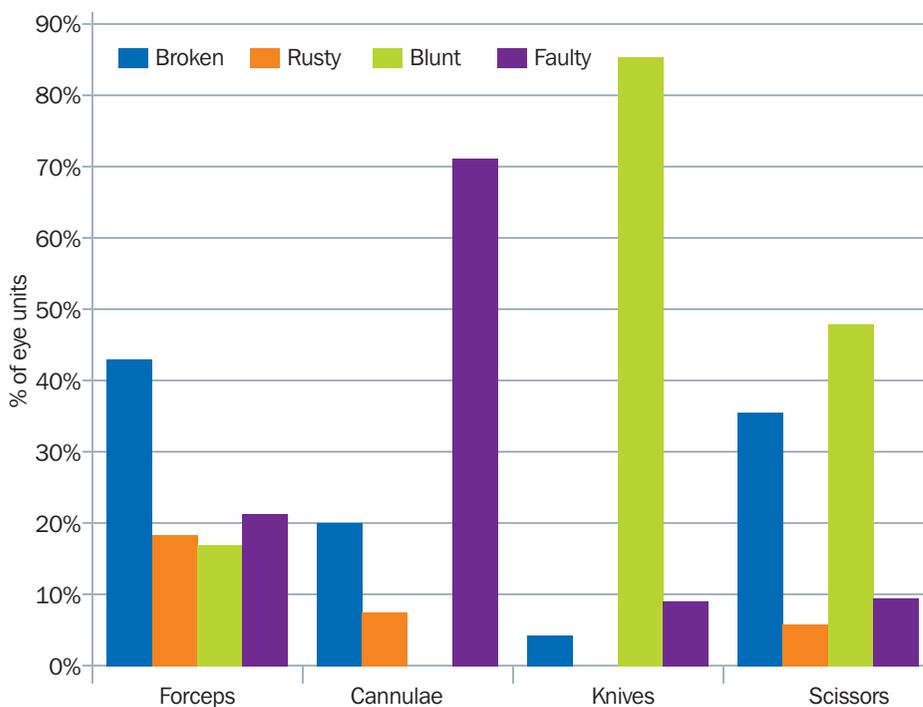
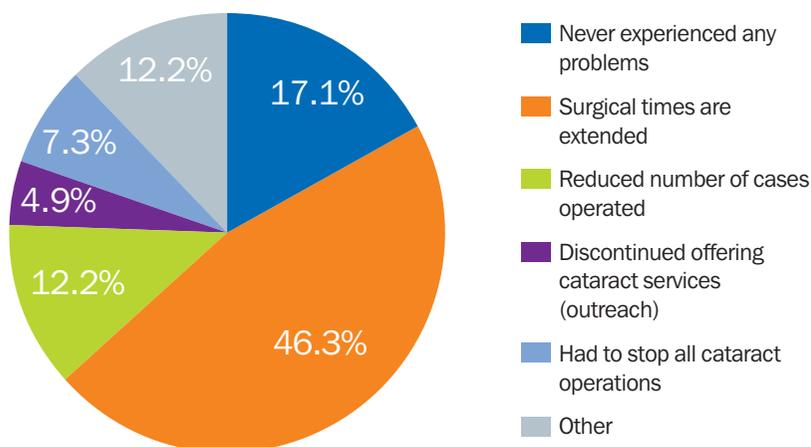


Figure 5. Impact of incomplete cataract sets



Conclusions

Ultrasound cleaning is expensive, which may explain why so few of the responding low-volume eye units used it.

A greater proportion of the responding high-volume units conducted long-term maintenance activities, giving the impression that eye units doing high-volume surgery have a proactive and anticipatory approach to maintaining their instruments.

The fact that only half of the teaching hospitals who responded had a trained person in charge could be cause for concern.

This raises questions about the teaching hospitals' ability to demonstrate the appropriate quality standards for instrument care to surgeons and ophthalmic nurses during their training.

Good repair and maintenance regimes and protocols can minimise preventable

causes such as rust, breakage due to poor handling (pages 36–37), and being blunt (see page 44).

Instruments that had remained unusable for a long time should have been replaced, repaired, or discarded. This can be addressed by putting in place both an instrument inventory where problems with instruments can be noted, and protocols to repair or withdraw these instruments.

Incomplete cataract sets affect surgical efficiency, as time is spent waiting to sterilise the available instruments between patients, or the unit is forced to reduce the overall number of operations done per surgical session.

In 5% of the responding eye units, outreach services were discontinued because of lack of instruments. This would have far-reaching consequences for people in remote settings.



Elmien Wolvaardt Ellison

A special bin for non-functioning instruments. SOUTH AFRICA

The survey responses suggest a link between having someone in charge of instruments and having fewer incomplete cataract sets, which is better for output and efficiency. Compared to low-volume units, a greater proportion of the high-volume units had such a person, which would boost their output even further.

Recommendations

- Assign responsibility to one person to manage the daily care and long-term maintenance of instruments. This can be on a part-time basis.
- The routine care of instruments after each operation should consist of cleaning and lubrication to prevent rust and prolong the life of the instrument (see pages 36–37).
- After washing instruments to remove debris, you must ideally rinse them with distilled (pH neutral) water. This reduces the risk of corrosion and chemical damage.
- Regular inspection, particularly with magnification, is important to detect instruments in need of urgent repair or replacement. These observations must be recorded and acted upon in a timely manner.
- Keeping records of all breakages and of instruments needing repair would make it possible to actively manage procurement and repair activities. A simple idea is to create a bin where staff can place non-functioning instruments as soon as they are noticed. These can then be recorded and dealt with in a systematic way.
- Timely procurement (page 38) is important to ensure that instruments are replaced as needed. If instrument replacement is planned and anticipated based on a repair log, then delays will be minimised.

References

- 1 Gilbert CE, Murthy GVS, Sivasubramaniam S, Kyari F, Imam A, Rabiu MM, Abdull M and Tafida A. Couching in Nigeria: prevalence, risk factors and visual acuity outcomes. *Ophthalmic Epidemiol* 2010 Oct;17(5):269-75.
- 2 Tafida Abubakar, Clare Gilbert. Reasons for the high uptake of couching in Jigawa State, Northern Nigeria.
- 3 The IAPB Standard List is available from TALC (see page 30) or online (<http://IAPB.standardlist.org>)

Useful resources: instruments and consumables

IAPB Standard List

The **IAPB Standard List** provides information for eye health providers on a carefully evaluated range of eye care technologies, supplies, and training resources suitable for use in settings with limited resources.

You can now register to use the new interactive, online IAPB standard list (<http://IAPB.standardlist.org>) which allows you to create a 'basket' of items that you can print out and use when drawing up an order.

Individuals working for IAPB member organisations, or working in partnership with these organisations, will have access to the full functionality of the site, which includes being able to see the prices of all items and, in the near future, to order directly from suppliers.

Registration may take one or more days to be approved.

Paper copies of the IAPB Standard List can be ordered from Teaching Aids at Low Cost (TALC).

TALC (Teaching Aids at Low Cost)

PO Box 49, St Albans, Hertfordshire, AL1 5TX, UK. Tel +44 (0) 1727 853869. Email info@talcuk.org

Teaching and learning resource
Prozesky D, Stevens S, Hubley J.
Effective Teaching and Learning for Eye Health Workers, International Centre for Eye Health, 2006. Free download (720 KB) on www.cehjournal.org/icehpubs.html or order free of charge from TALC. High-income countries pay £5.

Videos

Karen Watts. Handling and passing of surgical instruments; Instrument care during decontamination and sterilisation; Handling of sterile supplies (all part of the 'Nursing' package). Cost: Rs 500 per package + free postage (India only) or US \$40 per package for international orders. Order from LV Prasad Eye Institute. Write to Shobha Mocherla, A-V Producer, Central Audio-Visual Unit (CAVU) L V Prasad Eye Institute, L V Prasad Marg, Hyderabad 500 034, India. Email: video@lvpei.org

Procurement agencies in Africa
Joint Medical Stores, Uganda.
Plot 1828 Gongonya Rd, PO Box 4501

Kampala. Tel +256 (0)414510096 or toll free (Uganda only): 0800 123124. Email store@jms.co.ug or visit www.jms.co.ug

Missions for Essential Drugs, Kenya. PO Box 78040-00507, Viwandani, Nairobi
Tel +254 (0)203920102. Email customerservice@meds.or.ke or visit www.meds.or.ke

Action Medeor, Tanzania. PO Box 72305, Dar es Salaam, Tanzania.
Tel +255 (0)222863136.

Cameroon Baptist Convention Health Services, Cameroon.
Cameroon Baptist Convention Health Board, PO Box 1 Bamenda, North West Province, Cameroon.
Tel: +237 (0)77964683.
Email: info@cbchealthservices.org or visit www.cbchealthservices.org

Pre-shipment inspection companies

INTERTEK
<http://www.intertek.com/government/pre-shipment-inspection/>

COTECNA
<http://www.cotecna.com/COM/EN/psi.aspx>

SGS
http://www.sgs.com/pre_shipment_inspection_-_import_verification.htm?serviceld=6942&lobld=5549

Courses: care and maintenance of ophthalmic instruments
LAICO, Aravind Eye Care Systems (AECS) runs six-week training courses in Madurai for instrument technicians. These are repeated four times a year (US \$325). LAICO offers shorter courses on invitation at a range of different training centres. The LAICO team has also helped to establish instrument maintenance training centres at the National Eye Institute, Kaduna, Nigeria; the National Institute of Ophthalmology, Hanoi, Vietnam, and Kikuyu Eye Unit, Kenya. Write to Prof V Srinivasan, LAICO, 72, Kuruvikaran Salai, Gandhi Nagar, Madurai 625 020, Tamil Nadu, India. Email: v.srinivasan@aravind.org or visit www.aravind.org/education/coursedetails.asp



Instrument



Renée du Toit
Professional Development Director,
The Fred Hollows Foundation New Zealand.
Email: rdutoit@hollows.org.nz



Konio Szetu
Senior Nurse Manager, The Pacific Eye Institute,
The Fred Hollows Foundation New Zealand.
Email: kszetu@hollows.org.nz



Wanta Aluta
National Eye Care and Training Co-ordinator,
Solomon Islands Ministry of Health and Medical
Services, Solomon Islands.
Email: alutawanta@yahoo.com.au



Alumita Ravono
Nursing Clinical Supervisor, The Pacific Eye Institute,
The Fred Hollows Foundation New Zealand.
Email: alumitaravono@yahoo.com

Some eye units have technicians who are responsible for taking care of instruments. It is certainly important to have a specific person assigned to do tasks such as monthly checking and maintenance, even on a part-time basis.

However, everyone working in an ophthalmic operating theatre must be competent in the care, handling, storage, and maintenance of instruments. This will help to improve surgical outcomes, maintain an economic and affordable service for patients, and provide a safe environment for the wellbeing of patients and staff.

Including instrument care in theatre courses and in-service training is one way of ensuring staff competence. Table 1 opposite provides some guidance about the different skills each team member must be able to master.

To support in-service training, we suggest that you provide staff with lists of duties, protocols, and guidelines for instruments. This ensures that everyone will adhere to the same standards when they demonstrate instrument handling, care, and maintenance to learners. These documents can also serve as a reference for learners.

Support learners by encouraging staff to provide close supervision and give constructive (positive, supportive, and informative) feedback.

A supportive environment

Training by itself is not enough. Staff require an environment that supports them to take good care of instruments and provide high-quality care in the operating theatre. The different components of the health system (human resources, finance, equipment and supplies, leadership and governance, and health information systems) provide a useful framework

Human resources

- Plan for sufficient trained personnel to work in the operating theatre; this ensures that the standards of instrument care are maintained.
- Include a section on instrument care in the job descriptions of staff. Job descriptions document the roles and responsibilities of each person in the operating team and can be used as a basis

care: everyone's responsibility

Table 1: Roles of the eye care team members in looking after instruments

Instrument cleaning nurse/ technician	Circulating nurse (or equivalent)	Surgical assistant/scrub nurse (or equivalent)	Surgeon
To ensure safety			
<ul style="list-style-type: none"> careful passing and placement of instruments, e.g., onto cleaning dishes and instrument trays 	<ul style="list-style-type: none"> careful passing to the instrument cleaning nurse or technician 	<ul style="list-style-type: none"> careful handling to and from the surgeon 	<ul style="list-style-type: none"> careful handling to and from the surgical assistant/scrub nurse
To enhance efficiency and facilitate quality outcomes			
<ul style="list-style-type: none"> place instruments in order of use 	<ul style="list-style-type: none"> collect used instruments and take these to the cleaning area 	<ul style="list-style-type: none"> collect the used instruments immediately after surgery, take to the cleaning area 	<ul style="list-style-type: none"> use instruments for their intended purpose
To maintain sterility			
<ul style="list-style-type: none"> follow recommended temperatures and times for autoclaving and/or soaking 	<ul style="list-style-type: none"> check sterility indicators take care when opening the autoclave, placing instruments on sterile trolley ensure that sterile water is ready for rinsing instruments that have been soaked 	<ul style="list-style-type: none"> careful passing to surgeon, using aseptic non-touch technique ensure that instruments that have been sterilised in a sterilisation solution are thoroughly rinsed before use 	<ul style="list-style-type: none"> handle and use instruments properly for their intended purpose
To prevent loss and preserve functionality of instruments			
<ul style="list-style-type: none"> account for all instruments check instruments before putting them away: tips, sharpness, rust, functional springs, hinges, and damage, ideally with magnification dry instruments before storing on clean, closed shelves in a secure but ventilated environment 	<ul style="list-style-type: none"> keep a list of damaged instruments and inform the nurse/technician, so that these instruments can be repaired or replaced as soon as possible do not keep defective instruments in surgical sets ensure all instruments are accounted for 	<ul style="list-style-type: none"> ensure all instruments are accounted for, especially when removing drapes from the trolley ensure that instrument sets are correct, with the known number and type of instrument in place 	<ul style="list-style-type: none"> use instruments for their intended purpose report defective instruments
To maintain instruments and prevent damage			
<ul style="list-style-type: none"> clean instruments individually use correct solutions in appropriate concentrations and containers for soaking and cleaning place instruments carefully, without piling, in cleaning and rinsing dishes, the autoclave, and/or the sonic cleaner protect the tips of sharp instruments when packing or storing them 	<ul style="list-style-type: none"> careful handling and proper passing, especially when instruments are not packed in an instrument tray 	<ul style="list-style-type: none"> handle instruments properly during cleaning and surgery wipe instruments during surgery if required carefully place instruments next to each other on the trolley group different types of instruments together 	<ul style="list-style-type: none"> handle instruments as per protocol avoid throwing instruments down, hand them to the scrub nurse instead

for evaluating staff performance. You can then evaluate (and reward) staff competence in instrument care.

- Provide continuing professional development in instrument care. For example, ask staff to teach skills they know well to small groups of co-workers, or ask staff to reflect on their instrument care and come up with ways of improving what they do. You can also encourage staff to read and discuss articles on equipment care such as those in this journal (see page 44 of this issue, as well as previous issues).

Finance

- Purchase the best quality instruments that your eye centre can afford as these are likely to last longer and may contribute to better quality outcomes

- Purchase sufficient instruments for the number of patients seen in your unit
- Purchase appropriate instruments for different procedures
- Allocate funds for replacement of defective instruments.

Equipment and supplies

- Develop and implement protocols for instrument maintenance and care
- Schedule monthly maintenance procedures, including a check of the functionality of the instruments.

Leadership and governance

- Ensure that your eye unit complies with standards of occupational health and safety, theatre design and layout, materials, and infrastructure.
- Develop and implement checklists from best practice and evidence-based

standards, guidelines, or protocols to cover the following areas: equipment, instruments, infection control, documentation, administration, stock management, productivity, and the roles and responsibilities of staff.

Health information systems

- Report defective instruments to the person responsible on a regular basis, ideally at the end of the day or of the operating list.

Service delivery

- The quality of care during outreach visits should be maintained at similar standards to a permanent facility. This means taking the same level of care with instruments and adhering to the same high standards of disinfection. Ensure instruments are packed carefully for transport.



Managing your eye unit's supplies



RD Thulsiraj

Executive Director, LAICO, Aravind Eye Care System; President, VISION 2020: The Right to Sight: India, Lions Aravind Institute of Community Ophthalmology, Aravind Eye Care System, Annanagar, Madurai 625 020, Tamil Nadu, India.

Key learning points

- Monitor your stock usage by keeping accurate records – this allows you to predict future usage and plan orders.
- The number of different items you stock can be limited through standardisation. It is desirable to do so as it may reduce cost and improve quality.
- Ensure uninterrupted services: keep enough stock to last until the next order arrives.
- Don't buy more stock than you will use before it expires.
- It is generally cheaper to make bigger orders, less frequently.
- Even if you make frequent, small orders, take advantage of bulk discounts by negotiating a price based on your projected annual usage. The actual orders can be delivered monthly or as required.
- Stock equals money. Money you spend on stock is money you can't spend on anything else, so buy as little as you can without risking an interruption to services.
- Invest in your supplies management systems – this will help you to perform better.

In order to deliver eye care, many resources have to be in place at the right time: your patients, your staff, your facilities, your equipment, and your supplies. In this article, we focus on how you can manage your supplies to ensure that your eye service runs smoothly. These supplies, or consumables, include every little thing needed in the course of your daily work: IOLs, medicines, gloves, forms used for patient care, house-keeping supplies, and equipment spares. If any of these items become unavailable, your eye centre will be unable to provide the same high quality of services, and you may even have to turn patients away.

The aim of good supplies management is to ensure uninterrupted services. If you want to effectively manage consumables in your eye unit, you will have to monitor the number of each item available (the 'stock level'). To do this, you must keep an inventory.

Keeping an inventory

An inventory is a document that lists all the items in stock that are required for the eye unit to function. It is the place where you record the quantity of each item in stock on a daily or weekly basis, depending

on your needs. An inventory can be kept on paper or computer, or it can be kept using a combination of both. These days, several software systems are available for inventory management. They can also be integrated into computerised patient care or patient record systems.

At any one time, the inventory must show the quantities of each item in stock, the purchase price of each item, and the shelf life of any consumables or medicines.

A good inventory system should be in place in every eye unit. To ensure the inventory is used properly, make it as easy and convenient as possible to work with. For example, the person in charge of

managing the stores can keep a note of the stock levels of each product on an individual stock (or bin) card for each item, placed near the item in question. This can be used to update a general inventory register of all items, whether in a book or on computer (see the case study on page 35).

When items enter or leave the store, the stock card and inventory register must be amended accordingly. Ideally, staff should complete a form before taking any items, and hand a carbon copy of the form in to the stores manager.

Keeping an accurate inventory allows you to monitor how many of each item your clinic uses every week, or every month. This is very important to know, as it helps you to work out:

- What supplies to keep
- How much to keep
- How often to order new supplies
- How much to order each time.



Ferdinand Arma

Entering stock levels on computer. IVORY COAST

Stock cards

Figure 1: An example of a stock card

Item name:			Re-ordering level:		
Vendor information:					
Date	Document reference	Details (including expiry date)	Number of items received	Number of items issued (taken out)	Current stock level (total number of items in stock)

'Re-ordering level' refers to the minimum items you can safely have in stock before you order more (page 34). 'Date' refers to the date of the document related to the items leaving or entering the store, if available, or simply the date items entered or left the store. 'Document reference' is for the number, or any other

identifying reference, on the supplier's invoice or on the internal authorisation for stock issued, as applicable. 'Details' is for writing a brief narrative, such as "Received from (supplier's name)" or "Issued to...". Ideally, include the expiry date of any received stock in the 'Details' section.

Rej Kumar



Physical verification of stock on hand



Rajkumar

Shelves and racks can help organise your inventory. INDIA

What supplies to keep

Your clinical protocols and administrative procedures determine to a large extent how many different items you need. For example, if your eye unit handles a wide range of conditions and has complex administrative procedures, you will need a larger number of items.

Also, where there is more than one ophthalmologist and each surgeon wants to use a different brand of IOL, this will increase the types and range of powers you stock. Stocking a large number of items can be more expensive and will make supplies management more complex, which has cost implications.

The number of items you stock can be limited through standardisation, where everyone agrees to use a limited but appropriate range of equipment, instruments, and consumables.

For standardisation to work, it is critical to involve the ophthalmologists in your eye unit. Everyone must agree which surgical supplies, equipment, instruments, and medications to use, including those used in outpatient services or outreach. The IAPB Standard List can help.

Your inventory will show which products are used less often and may be reconsidered. Other good questions to ask include:

- Which products are approved by the national government body concerned?
- Which products are easily available in our country?
- Which products meet our quality standards?

How much to keep

Working out how much to keep is somewhat of a balancing act.

Too little can result in items being out of stock, leading to frequent disruption of work and emergency purchases, often

at high costs. At the same time, playing it too safe, and stocking large amounts of supplies, means that you will need a larger storage facility, that you may risk higher wastage if the items expire, and that more of your eye unit's available cash will have been invested in stock, leaving you with less cash for other essential expenses.

The **minimum** number of each item you can safely stock is driven by two things: the number of patients you see, and how long it takes for new supplies to arrive from the day they are ordered.

Changes in the number of patients have a direct impact on how quickly you will use up your supplies. For instance, if more patients tend to come at a certain time of year, or if a training course is to take place, a larger number of items will be required.

When items are not locally available, it makes sense to stock them in larger quantities, particularly if the effort involved in ordering or purchasing is high and the delivery time is unpredictable or slow.

'Working out how much to keep is a balancing act'

However, it is important to recognise that most medical supplies come with a specific shelf life and must be consumed before their respective expiry dates.

The **maximum** number of items you should sensibly stock is determined by:

- How much space you have to store supplies
- How quickly supplies will exceed their expiry date
- How much of your eye unit's cash you are willing to spend on stock.

How much to order – and how often

There are costs and effort involved every time you order supplies. As we

have seen, it also costs to hold stock by way of the money invested in the stock and the storage facilities required. The quantity of items ordered may also affect the price.

How often you order will determine how much you will order. For example, if the decision is to order an item every month, then the order quantity for that item would be equal to how much you use per month, on average.

It therefore makes sense to choose an optimum pattern of ordering that will balance all these costs.

There are two different approaches:

- 1 Monthly replacement.** To start with, keep enough of each item in stock to last for two or three months. Then place orders every month for whatever

Continues overleaf ▶

TOP TIPS Supplies management

- **Reduce the effort involved in making frequent orders.** Once you have fixed a price with your supplier, decide how much you want to keep in stock and negotiate with the supplier for weekly or monthly replacement. It will eliminate the whole ordering process and shift the responsibility to the supplier.
- **Employ a competent stores manager.** This person should have basic training in supplies management and should ideally be computer literate. The store manager can make a valuable contribution to the efficient and cost-effective running of the eye unit.
- **Go digital.** If you can afford it, a computerised supplies management system can work together with the manual stock entry system. This will show your stock balance, consumption, suppliers, prices, discounts, expiry dates, re-order levels, and re-order quantities.
- **Monitor other stocks.** Check **theatre stocks** before surgery begins and ensure that all needed items are delivered to the operating room to avoid interruptions during surgery. There may be some medicines held in the **pharmacy** or in an **outreach box**. Check these regularly to ensure that they are in date.
- **Arrange with the supplier to replace drugs with an early expiry date** with ones that have a later expiry date. This will reduce wastage.

Contributed by RD Thulsiraj, Demissie Tadesse, and Pierre Ngounou.

has been used since the last ordering date. The work load of monthly ordering can be distributed over several days: one week it could be printed materials, another week it could be medicines or sutures, another week it could be maintenance and housekeeping materials. This way, not only is the ordering work load spread out, but the work related to receiving, verifying, and accounting will also be spread out. This would work well for most secondary level, or district, eye units.

2 Set re-ordering levels for individual items. Calculate re-ordering levels (or minimum stock levels) for individual items. When stocks are reduced to that level or quantity, the item is re-ordered (see the worked example below). This approach relies on having good supplies management systems and can work well in larger hospitals. Smaller hospitals could also use this system for items that are not locally available and which may take longer than a month to arrive.

Bulk buying

The quantity of items bought can also affect the price: the larger the order, the cheaper the price of each item in the order (a 'bulk discount'). Even if you decide to order frequently, and hence have smaller orders, you can still take advantage of bulk discounts by negotiating with the supplier to fix the price based on your annual consumption estimate – this is known as a framework agreement. The actual orders can be delivered monthly or as required.

The quantity ordered also affects the price of printed items that are customised to your hospital or eye centre, like the

Rajkumar



Clear labelling of goods can ease retrieval and visual verification

forms and letterheads which bear the hospital's name. Printing them in small quantities is very expensive and may not be an attractive order for the supplier.

Arranging your stock

When new supplies of a particular product arrive, move those with the shortest shelf life to the front of the shelf and put those with the longest shelf life at the back. This is the 'first in, first out' approach. Some medicines have to be kept in cold storage. Check labels carefully and make the

appropriate cold storage arrangements.

Similar items, such as the same medicines purchased at different times, should be kept together, with a stock card showing the quantity in stock and relevant purchase and expiry dates.

Drugs can be stored in alphabetical order or according to their use. Arrange them according to their expiry dates, with the earliest expiry dates at the front.

Depending upon the number and types of items that has to be stocked, you will need adequate shelf and floor space. Consider the following:

- Are our supplies safe and secure? Is there easy access to fire fighting equipment?
- Are the supplies protected against damage from rodents, insects, etc.?
- Does the storage area protect our supplies from damp and heat?
- Do the shelves clearly show the names of the items stored on them?
- Are we able to keep delicate items in a safe place where access is limited?
- Are we able to store chemicals for cleaning, and dangerous substances, separately, according to legal requirements? Are they clearly marked?

Rajkumar



Issuing goods to user departments against a requisition form

The storage facility should ideally be in an area which can be secured properly. In very small eye centres, a few cupboards, which can be locked, would be enough. In larger eye centres, you will need separate storage rooms. The staff managing the inventory (including the stores manager) should be based either within, or close to, the storage area.

Inventory management

In order to manage your inventory effectively, do the following regularly:

- **Stock taking.** This ensures that the stock as per the record tallies with the physical count. Do this at least once a week. However, in a busy eye unit, it would be worth reconciling the stock every day, noting those items that have been received or issued during the day. This is also a good opportunity to note items nearing their expiry date.

Worked example: re-ordering level of 10-0 sutures

The hospital's monthly consumption of 10-0 sutures varies between 75 and 150 units a month, with an average monthly consumption of 100 units. When an order is placed, it takes two to six weeks to receive the supply with an average delivery time of 3 weeks.

At what stock level should the hospital order 10-0 sutures?

Since it could take as long as six weeks to get the sutures, the hospital should have adequate stocks at the time of ordering to last the six weeks it could take to receive them from the supplier. Since the hospital uses between 75 and 150 sutures a month, the consumption during the six-week period (1.5 months) could be as high as 225 (150 times 1.5). So this (225)

becomes the minimum stock level, or 're-ordering level,' of 10-0 sutures.

How many 10-0 sutures should the hospital order?

If the decision is to order a month's supplies at a time, then the order quantity would be the average monthly consumption, which is 100 sutures. Every time the stock of 10-0 sutures reaches a level of 225, an order will therefore be placed for 100 sutures. An exception would be when you know that something special will take place in the coming month, such as a big outreach event which will result in 250 more operations. In this instance, the number of sutures required to perform the additional 250 operations should be added to the routine order quantity of 100.

- **Stock valuation.** Add up the monetary value of the stock so you know how much of your eye unit's cash is invested in stock. If you are trying to minimise costs, you can calculate the cost of consumables per patient, which is helpful to know.
- **Review of non-moving and slow-moving items.** These are any items that have not been issued for two months, or stock levels above what is needed for two months. You must determine whether these items are not required and decide what to do. Do this in consultation with the ophthalmologists and management team, perhaps when standardising your supplies. Not doing so means that items will take up valuable space and tie up funds required for other items.

Although it is vital to avoid running out of stock, we have seen that having more stock is not always the answer, since it requires more space, more investment, and more time to manage. There is also a greater chance of wastage.

It can be difficult to strike the right balance, but good record keeping, careful planning, and honest evaluation of your successes and failures will help you to work out the right stock management plan for your eye unit's needs.

Equipment spares

For each piece of equipment in use in your eye unit, determine which components you must replace periodically, and how often.

Take into account the time and cost involved in importing spare parts, and plan to stock adequate quantities of each item to avoid delays, should you have to replace a part.

It makes sense to purchase essential spare parts while purchasing the equipment, as the manufacturers' support, and certainly their interest, will diminish with time. It is also worth negotiating with them to provide a certain quantity of spares free of charge.

Manufacturers may try to make the spares specific to the equipment by some minor alterations or by simply renaming a generic equivalent – and charging up to four times more for it! This is particularly true of bulbs for operating microscopes and slit lamps: their generic equivalents can often be found in the automobile industry. A good knowledge of where to source generic equivalents can help you to reduce costs and establish a local source of supply.



EXCHANGE

A simple paper-based system for stock management

Ferdinand Ama

Ophthalmologist, senior physician, Methodist Eye Centre, BP 81 Dabou, Ivory Coast.
Email: amaferdinand@yahoo.fr

Paddy Ricard

Consultant editor for the *Revue de Santé Oculaire Communautaire*, London, UK

The best systems create little extra work for staff and can be implemented almost without thinking in the course of a busy day. The system used in the stock room of our eye clinic in Ivory Coast illustrates this well.

All medicines, instruments, and consumables are held in the stock room. Each item has a specific code, which is displayed near that item on the shelf and is also kept on our accountant's computer.

Stock levels are monitored both by our accountant and by the person in charge of the stock room.

The accountant, who is in charge of ordering stock throughout the year, keeps a record on the computer of the stock levels of each item. Ordering is based on current stock levels and on our centre's statistics (e.g., there has to be enough consumables for our average of 20 cataract operations a week).

To keep accurate records on the computer, the accountant relies on the up-to-date records kept by the person in charge of the stock room. This is done by means of a simple system of individual stock cards.

A pink card is placed on the shelf next to each item. An open, compartmentalised shelving system – in which no more than

two types of medication are held in the same compartment – ensures that products and stock cards are easy to find.

The stock cards are divided into two columns. The left-hand column states what was brought in or taken out, as well as the date. The right-hand column shows the number of items now in stock (the current stock level).

For example, when the person in charge of the stock room takes out two bottles of eye drops, she adds a new line to the card. In the left-hand column, she writes the date and that she has taken out two bottles of eye drops. She then updates the number in the right-hand column: the previous total minus two. Similarly, if twenty new bottles are brought in, she adds another new line and updates the number in the right-hand column: previous total plus twenty.

The person in charge uses this system in all circumstances: when a patient buys medication, or when the centre's head nurse comes to collect consumables for the week's work.

The accountant can quickly check each item's stock level by glancing at the relevant card in the stock room. Once a week, stock cards are collected and the data entered into the computer.

This system of placing a single stock card right next to an item in the stock room can also be used when there is no member of staff specifically in charge of distributing stock, provided that everyone who is permitted to take items out of the stock room updates the relevant stock card.

'Ordering is based on current stock levels and on our centre's statistics'

No more than two types of medicines are kept in the same compartment. IVORY COAST



Care of ophthalmic surgical instruments



Sue Stevens

Former Nurse Advisor, Community Eye Health Journal, International Centre for Eye Health, London School of Hygiene and Tropical Medicine, Keppel Street, London WC1E 7HT, UK.



Ingrid Mason

CBMI Medical Advisor, PO Box 58004, 00200 City Square, Ring Road Parklands, Nairobi, Kenya.

Handling and safety



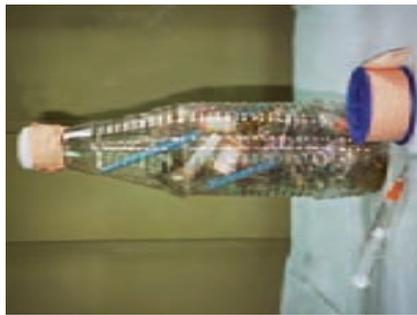
Sharps

Protect the tips of all sharp instruments with silicone or rubber tubing.

Intravenous infusion tubing or tubing from 'butterfly' intravenous needles may be used.

Remember!

- Never re-sheath a disposable needle
- Always use artery forceps to remove a blade from a Bard Parker handle
- Provide a gallipot on the theatre trolley to collect used needles and blades
- Do not touch the tips of any instrument
- Never throw an instrument down



Needles

Discard used needles immediately after use.

Place in a receptacle used only for this purpose.

Do not over-fill.

Preferably use small receptacles and dispose of them daily.

Seal and incinerate the receptacle when almost full.

Maintenance

Cleaning

Ideally, instruments must be cleaned immediately after surgery (within 20 minutes). If this is not possible, place them in a pH neutral enzymatic solution or at the very least cover them with a moistened towel to prevent blood, tissue, and saline from drying and caking on the instruments.

Use a soft toothbrush and warm soapy water to thoroughly clean each instrument individually and in its **open** position.

Remember! All of these maintenance tasks must be done before you sterilise the instruments.

Lubricating hinged instruments after cleaning

Use a lubricant immediately after cleaning hinged instruments to prevent rust and stiff joints.

Ideally, use water-based synthetic lubricants as these are designed to be compatible with sterilisation. Oil-based lubricants (mineral or silicone) can coat micro-organisms and prevent penetration of steam, preventing adequate sterilisation.

If water-based lubricants are not available, ordinary sewing machine oil is acceptable.



If you are using water-based lubricants, dip instruments and allow the lubricant to drain off (pictured). **Do not leave to soak, and never put cannulae in lubricant.**

If you are using sewing-machine oil, use a 2 ml syringe and a 21-gauge needle to draw up the oil and a 25-gauge needle to apply oil to the joints. Use a piece of gauze to carefully wipe away any surplus oil.

If any hinged instruments are stored, you must lubricate them at least once a week.

Inspecting instruments



Inspect cannulae to ensure they are not obstructed by flushing through with clean, warm water.



Inspect instruments for alignment and sharpness under a good light and magnification.



Thoroughly dry instruments before storing or sterilising them. Dry gauze (used cautiously) or a hairdryer may be used.

Drying

Water should be warm, not hot. Hot water causes blood to clot (coagulate) faster, making it harder to remove.

Distilled water is preferable since regular water can leave mineral deposits.



Storage, transport, and security

Remember! Silicone or rubber protectors must be used on sharp instruments when in storage or transit.

Shelves

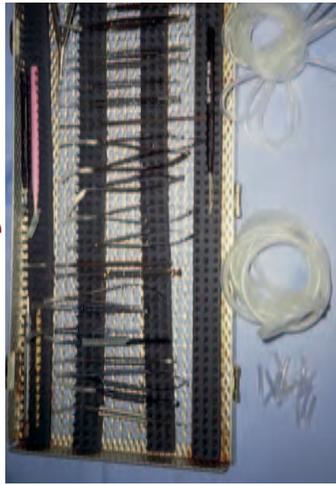


Glass shelves in a lockable cupboard provide for secure storage and easy checking.

Never pile instruments on top of each other.

A well-ventilated room is recommended.

Trays



Each individual slot in the tray holds a single instrument.

Instruments must not touch each other.

The tray can be used for storage, transportation, and during some sterilisation procedures.

Cases



Cases may be of metal or plastic and contain a protective silicone mat.

Cases can be used for storage, transportation, and during some sterilisation procedures.

Rolls



Rolls, made of strong fabric, are inexpensive. Each pocket holds a single instrument.

Secure the roll with ribbon or cord, not elastic, as elastic can degrade in heat.

Use rolls only for storage and transportation of instruments, not for any other purpose.



Purchasing instruments and consumables



Ingrid Mason
CBM Medical Advisor,
PO Box 58004, 00200
City Square, Ring Road
Parklands, Nairobi, Kenya.



Phil Hoare
Procurement Manager,
Sightsavers; IAPB
Procurement Advisor and IAPB
Standard List Administrator.

Key learning points

- Obtain competitive quotes from several reputable suppliers
- When drawing up an order, use the IAPB Standard List for advice on items required, reliable suppliers, and approximate costs
- Where purchasing from outside the country, become familiar with import requirements and which costs must be included in your budget
- Check items carefully on arrival and promptly submit any claims for deficiencies found.



Ferdinand Anna

Consumables require frequent replacement. IVORY COAST

products, keep a good relationship with them through prompt payment and good communication.

Using a local agency

In some countries, there are procurement agencies that purchase, stock, and supply government and non-governmental institutions. Working with these agencies, where they are efficient and reputable, can help you maintain quality and ensure that your eye unit always has the necessary items in stock.

The agencies will already have in place the procedures needed to import and clear items through customs. They will also be aware of what can be imported with or without tax exemption, and the national requirements for pharmaceutical products.

Once a good relationship has been built between the procurement agency and

The procedures for purchasing surgical instruments and consumables are similar to those for purchasing equipment, which were addressed in our “Equipment for eye care” issue (number 73, September 2010).

The major difference with consumables is that the number of items in stock (the ‘stock level’) must be monitored constantly. Consumables are generally fast moving and require frequent replacement, which means they must be carefully managed. This is addressed in the article on page 32.

Drawing up an order

Determine what items are running low, and which you need to re-order. The IAPB Standard List (page 30) provides information on a carefully evaluated range of eye care technologies, supplies, and training materials suitable for use in settings with limited resources. Once the items have been identified, the next stage is to find suitable suppliers and request a quotation.

Direct local purchase

The first consideration is, are any of the products available locally? If so, do the

local suppliers or manufacturers have a good reputation? There may be staff in another eye unit who you could ask; what they have to say about the supplier

or manufacturer could save you from an unwise purchase. Has there been a prompt and reliable service, with items priced reasonably? Were the items received of good quality?

Once you are satisfied that some of the products can be bought locally, you can send a list to the suppliers asking for quotations. It is best to approach more than one supplier to get competitive prices, and to avoid dealing with individual businesspeople.

If you are being offered an instrument or a new brand of consumable, ask for a sample to test to be sure that the quality is of a high standard and appropriate for your needs.

If you have found reliable suppliers and you are happy with the quality of their

your eye unit, provide the agency with a list of the items you use most commonly, and consult the IAPB Standard List for the names of reputable overseas suppliers.

‘If you are being offered an instrument or a new brand of consumable, ask for a sample to test to be sure that the quality is of a high standard’

This will enable the agency to source your required items on the local market or overseas, and to stock them so that they are always available to your eye unit.

Generally, the agency will prefer bulk purchasing as this reduces their costs and they can also negotiate a lower price for the eye unit. Better

still, if several eye units can agree to use the same agency, orders can be combined to further lower the price.

Buying from outside the country

It may be necessary to purchase some of your instruments and consumables from sources outside the country.

Before doing so, you must check what the regulations are for importation. Some

countries have websites with information about the regulations but generally it is advisable to appoint a reliable import agent who can guide you through the regulations. There will be a cost to this, so you need to obtain a quotation and allow for these costs in your budget.

Things to consider:

- What are the import duties?
- Are there any restrictions on the products you wish to import?
- Is the manufacturer or country of origin approved by your government?
- Is the manufacturer already registered in your country or does this still need to be completed?
- Do any of the items require a special import licence?
- Does your country stipulate that imported goods have to be inspected before shipment?
- If importing pharmaceuticals, are any of the products deemed controlled substances, such as Ketamine?

There are particular issues around the procurement of pharmaceuticals from out of the country, and many countries have strict regulations. There will be a mandatory registration procedure for the overseas manufacturer and this can be costly. However, not following the procedure will result in penalties. It is therefore important that you check with your ministry of health, particularly if you are considering a new item or a manufacturer you have not used before. A limited selection of eye medicines which have been approved by World Health Organization (WHO) is published in the WHO Model List of Essential Medicines.¹ The list gives guidance on the basic pharmaceuticals which a country should consider for duty-free import.

When placing an order abroad, you must be familiar with the terms exporters use as part of their contracts. These are known as Incoterms[®] and were developed by the International Chamber of Commerce.² Incoterms are internationally recognised standards used all over the

Table 1. Incoterms[®], the terms commonly used by exporters

FOB (Free on board)	This term signifies that the seller is responsible for placing the goods on the ship or plane and that the goods are cleared for export. All other charges, including freight, insurance, and clearance charges on arrival, are the buyer's responsibility.
CPT (Carriage paid to)	The seller is responsible for clearing the goods for export, delivering them to the carrier, and onward shipment to the country of destination. The buyer is responsible for insurance and clearance charges.
CFR (Carriage and freight)	As for CPT.
CIP (Carriage, insurance and paid to)	The seller is responsible for clearing the goods for export, delivering them to the carrier, onward shipment to the country of destination and marine cargo insurance. The buyer is responsible for clearance charges.
CIF (Carriage, insurance and freight)	As for CIP.

world. Table 1 shows some of the common terms, together with a brief explanation.

A few countries require a physical inspection of the goods before shipment, called a pre-shipment inspection (PSI). This must be done by an independent inspection company which checks the goods and verifies the prices, quantities, and quality, as well as the terms of the contract, before permission to import can be granted. If you are placing a large order, it is worth commissioning a PSI as it could well speed up clearance on arrival, but it will increase the cost by about 2–3% of the order. See page 30 for a list of the three largest PSI companies.

Once you have identified your overseas supplier, request a quotation for the items you require. Ask them to include shipment to your country by the most cost-effective method and request marine cargo insurance. The Incoterms[®] the supplier will use could look as follows: "Total CIF or CIP Nairobi, Kenya: US \$5,000."

If the consignment is small, the supplier may recommend that the products are couriered. This may be ideal, as the consignment will be delivered straight to you, subject to normal import clearance. If the consignment is air freighted or sea freighted, it is the buyer's responsibility to clear the consignment and collect it from the harbour or airport.

To obtain the **total cost** of importing the goods, you must add the following costs to the cost of CIF or CIP shipment to the destination country:

- Import duties
- Import agent's costs
- Inland transportation (from the port of entry to the eye unit)

- Documentation
- Pre-shipment inspection (if required)

If you decide that the price quoted is acceptable, and you have checked each of the items and quantities against your original request, place a confirmed order with the supplier. Ensure that the delivery terms are spelt out, and that you are happy with the shelf life offered for pharmaceuticals (check the shelf life offered before placing the order).

The supplier will either expect payment with the confirmed order or payment prior to despatch. Delays in payment will cause delays in shipment. Monitor the progress of the order with the supplier through regular communication. Ask for full shipping details in advance so that you can put the procedures in place to receive the consignment.

If the consignment is arriving by air you will need the flight and airway bill number and date of arrival. If the consignment arrives by ship, you will need details of the ship, where it is expected to dock, and on what date.

Once received, check the items carefully against your original order. Report immediately any breakages, shortages, or missing items to the manufacturer. If an insurance claim is necessary, there is only a short window of time to submit the claim.

Safety of medicines and quality of instruments

Counterfeit medicines can be found all over the world. The problem is particularly apparent where governments' regulatory controls are weak, as in some African, Asian, and Latin American countries. Other

Continues overleaf ►

Henry Nkumbe



Eye centre staff check goods on arrival. MADAGASCAR

consumables, such as IOLs, have also been copied illegally. It is therefore important not to accept products unless you are convinced of the reliability of the source.

If purchasing locally, check with the manufacturer or supplier what quality control mechanisms are in place before submitting the order.

The following marks indicate that the products on which they appear are of an acceptable standard: CE Mark, ICO:9001, FDA, and the WHO Good Manufacturing Practices (GMP) certificate.

Cheap instruments of poor quality are not cost-effective, are not appreciated by eye unit staff, and can lead to a poor surgical outcome for the patient.

It is better to procure the highest quality instruments that you can afford. The

suppliers and manufacturers listed in the IAPB Standard List have all been tried and tested for the quality of their products, and their prices are affordable.

Bulk purchasing

Bulk purchasing is about procuring products in larger quantities and transporting them together as one lot. Doing so reduces the cost of transport and therefore the individual cost of each item.

For imported instruments and consumables, bulk purchasing items in frequent use will significantly reduce costs.

A supplier may well be prepared to offer large discounts, so consider placing an order covering a period of three or six months at a time. Hospitals managed by the same religious institution or

supported by the same NGO in a country or region could consider combining their orders. A discussion within the National Prevention of Blindness or VISION 2020 Committee could lead to a joint order, which will be cost-saving for all those involved, and also reduce the amount of time and effort spent on clearing customs.

In competitive markets, or where there are local suppliers, it may not be necessary to bulk buy as you could negotiate a discount based on your projected requirements over a year or six months (see page 34).

Additional online resources

- 1 World Health Organisation (WHO) Model List of Essential Medicines – 17th Edition (updated) March 2011, www.who.int/medicines/publications/essentialmedicines/en/
- 2 Incoterms 2010, <http://www.iccwbo.org/incoterms/>

FROM THE FIELD

Setting up and managing a depot for instruments and consumables

Paul Caswell

CBM Country
Co-ordinator, Nigeria

In countries where foreign exchange or importation are difficult and where there is low but constant demand from a number of small eye units, a depot for instruments and consumables can make the difference between the success or failure of a VISION 2020 programme.

In Nigeria, there are many small eye care programmes, often in remote areas. The CBM country co-ordination office identified the need for a depot to provide a constant supply of essential instruments and consumables. It was started with a grant from CBM, but now all running costs are generated by the sales of the items stocked.

Ideally, a depot should be a one-stop shop. We try to carry everything that an eye care programme needs: consumables (eye drops, IOLs, viscoelastic, sutures etc); instruments, and equipment, such as operating microscopes. The depot also carries popular textbooks, public awareness materials, and information about training.

Although our depot is not expected to make a profit, the selling price of each item must not only cover the cost price, insurance and freight, clearance

charges, and local transport, but must be high enough to contribute to the running costs of the depot. Running costs include staff salaries, maintenance, utilities, administration, and auditing. There should even be a little left to cover inflation.

When starting the depot, we were visited by 'businessmen' coming disguised as eye care centre representatives. They would buy our goods at our lower prices and then sell them on at inflated prices to eye care programmes that did not know of our existence. However, as our reputation grew, this problem has disappeared.

If you plan to start an eye care depot, it is good to situate it near a large town,

such as the capital city. Eye care personnel are likely to visit the capital a few times each year, so that the visit to the depot will be just one extra task. We also

agree to despatch goods to our customers by courier service, after receiving a deposit in our account.

One of the most critical factors in starting a depot

in Nigeria was identifying an appropriate person to manage it. We felt that an experienced sales manager was needed rather than a specialist in eye care. This has proved to be a good decision. The manager quickly learnt about eye care equipment and consumables by reading catalogues and talking to customers about their needs. He attended a short course about procurement but

otherwise had no formal, specialist training. If customers have questions he cannot answer, he is always willing to ask advice from his ophthalmologist colleagues in the unit to which the depot is attached.

To run a depot is not easy. It requires a lot of administration: ordering, banking, auditing, and so on. However, I am convinced it has an important part to play in making VISION 2020 a reality.

CBM Resource Centre

Maryland-Gwagwalada, Abuja
Tel: +234 (0) 805 232-2411
Email: cbm_rc@yahoo.com



Emmanuel Audu



Some of the eye care equipment offered for sale in the depot. NIGERIA



DONATED SUPPLIES

Donations of consumables and surgical instruments: how to ensure you really benefit



Ismael Cordero

Clinical Engineer.

Email: ismaelcordero@me.com

Our “Equipment for eye care” issue (number 73, September 2010) described how donations of equipment can help achieve the goals of VISION 2020 when both donors and recipients follow some general essential guidelines. By following the additional suggestions in this issue, you can help to ensure that your unit benefits the most from donated medicines, medical consumables, and surgical instruments.

General principles

- Ask the donor to provide a list of the medicines, instruments, and consumables they intend to donate so that you can select only those that you really need and which are appropriate to your practice.
- Before accepting any donations of instruments or consumables, make sure that your eye care unit has the appropriate methods, tools, chemical solutions, and equipment in place which are required to clean, sterilise, package, store, and transport these items. Some medicines may have to be refrigerated.
- Do not accept used devices and consumables that are labeled “for single use” since they may not clean and re-sterilise properly. The mechanical integrity and functionality of some single-use devices may suffer when they are cleaned and sterilised.
- Only accept medicines or consumables if you know what the expiry date is and you are sure you will be able to use them before they expire. Ideally, accept only consumables with an expiry date of over one year. This is the standard recommended by the World Health Organization (WHO). In all cases, the date of arrival, the quantities involved, and any expiry dates should be communicated to you well in advance.
- Ask the donor to provide a list of the instruments, consumables, and medicines they intend to donate so that you can select only those that are needed and appropriate to your practice. Refer to the IAPB Standard List for additional guidance (see page 30).
- Only accept donations of items that conform to your country’s regulations.

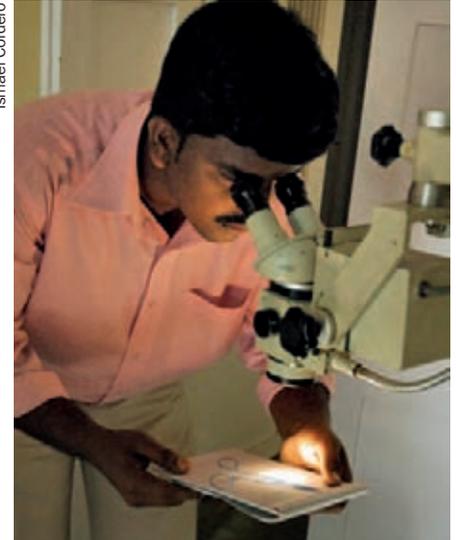
Medicines

- The presentation, strength, and formulation of donated medicines should be similar to those of the medicines commonly used in your country and unit.
- All donated medicines should be obtained from reliable sources and comply with quality standards in both the donor country and your country.
- You should not accept medicines that have been issued to patients and then returned to a pharmacy or elsewhere, or that were given to health professionals as free samples.
- All medicines should be labeled in a language that is easily understood in your country; the label on each individual container should contain, at minimum, the International Nonproprietary Name (INN) or generic name, the batch number, dosage form, strength, name of manufacturer, quantity in the container, storage conditions, and expiration date.
- Donated pharmaceuticals should be presented in unit sizes and packaging that conform to local regulations.

Consumables

- For consumables that are intended for use with specific medical devices, such as tubing and cassettes, provide the donor with the specific brand and models of your equipment to ensure that the consumables are a correct match.
- Since the storage and transport conditions of donated consumables may be unknown, it is a good idea for you to inspect the packaging of sterile items to make sure that it is still sealed. It may be difficult for you to know whether the consumable packages have been subject to changes in temperature and humidity outside the storage and transport ranges stated on the package labels. If you have any doubts about an item’s sterility, you should discard the item or sterilise it, if it is meant to be sterilised.
- As with medicines, only accept consumables that have a remaining shelf life of at least one year.
- Avoid accepting donations of used implantable devices, such as intra-ocular lenses (IOLs). These devices require re-sterilisation and special preparations for reuse, which may compromise the device.

Ismael Cordero



Inspection of instruments should ideally be done with magnification. INDIA

Surgical instruments

- If you are receiving new types of instruments, make sure that your surgical team is trained in their correct handling and use.
- Single-use instruments should only be accepted if you intend to use them once.
- The quality of surgical instruments varies greatly from manufacturer to manufacturer. Before accepting any instruments, ask for information about the place of origin, manufacturer, standards certifications, and materials used.
- Ask for pictures of the instruments prior to accepting them. This may help you to identify them better since identical instruments can sometimes be known by several different names.
- Ask the donors to pack the instruments for transport so that they do not move around and damage each other.
- Ask the donor to include the manufacturer’s instructions for handling, cleaning, and sterilisation.
- Used instruments may be worn to the point where they are misaligned or not sufficiently sharp. If you are accepting a donation of used instruments, make sure that they have been properly maintained prior to donation and that your eye care unit can re-align or sharpen them.
- Donated instruments should always be inspected closely upon receipt. The inspection should ideally be done with magnification and good illumination. If a magnifying glass or a good microscope is not available, a surgical microscope could be used.



Optical products for refractive error and low vision



Kovin S Naidoo
Global Programmes Director,
International Centre for
Eyecare Education (ICEE);
Africa Chair, International
Agency for the Prevention
of Blindness (IAPB),
Director: African Vision
Research Institute (AVRI).
Email: k.naidoo@icee.org



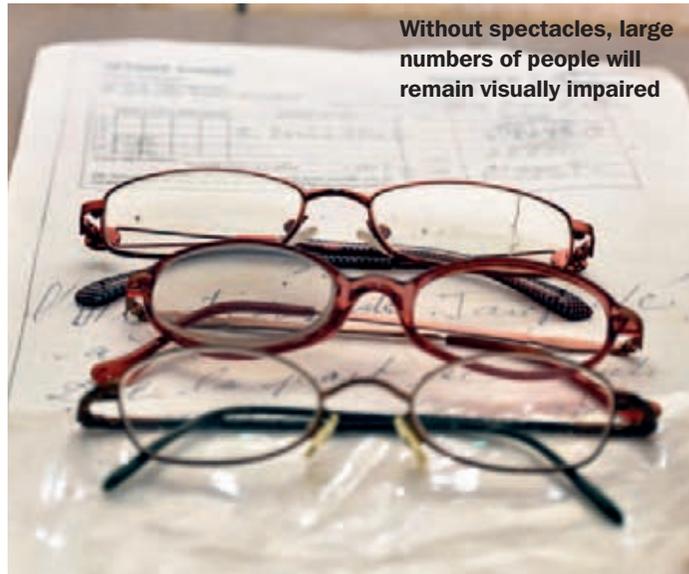
Yashika I Maharaj
Global Programmes Officer,
ICEE; Postgraduate
Student, AVRI



Vivasan Pillay
Business Development
Manager, ICEE



Sebastian Fellhauer
Social Enterprise
Co-ordinator, ICEE



Without spectacles, large numbers of people will remain visually impaired

Laura Crow/Sightsavers

conduct commercial transactions, they have a vested interest in assisting community-based and public health organisations to fulfil their objectives.

The most widely known social enterprises that supply optical products are the Global Resource Centre and the Hong Kong Society for the Blind (see opposite). Alternatively, if you are part of a non-profit organisation providing refractive error and low vision services, you can invite your optical suppliers to support your work by supplying products at a discount.

Large numbers of people, mostly in low- and middle-income countries, continue to be blind or visually impaired due to uncorrected refractive error or cannot function because they lack access to appropriate low vision aids. Numerous challenges have been cited as the reason for the lack of efficient refractive error and low vision services. These include a lack of appropriate human resources, inadequate infrastructure, and lack of optical products such as spectacles and low vision devices.

This article will focus on the optical products required for the efficient delivery of refractive error and low vision services, and provide insight into how they can be managed effectively to ensure a quality service. You can consult the IAPB Standard List (see page 30) for suggestions regarding the optical products you may require at your facility as well as recommended suppliers.

This article will focus on the optical products required for the efficient delivery of refractive error and low vision services, and provide insight into how they can be managed effectively to ensure a quality service. You can consult the IAPB Standard List (see page 30) for suggestions regarding the optical products you may require at your facility as well as recommended suppliers.

Finding the right supplier

To have an efficient operation and be effective requires finding the right supplier. Price and location are two key

criteria when choosing suppliers.

Whilst it may be tempting to use the supplier with the cheapest prices, make sure that products are of an appropriate quality. Obtain recommendations from others who have purchased from the supplier and ask for help from someone who is able to assess the product samples.

Carefully consider the effect the location of your supplier will have on costs. Imported products can be cheaper, but the total cost may be more than that of local products once costs for freight, customs, and duties are included.

It is also important to get to know more than one supplier. This means that other suppliers can deliver when your preferred supplier

is out of stock or unable to supply, for whatever reason.

In the public sector, it is important to find a supplier who understands the philosophy and objectives of your organisation. Social enterprises who conduct operations in the optical industry are usually best positioned to meet such needs as their motive for existing is to make a social impact. Although they

‘Price and availability are two key criteria when choosing suppliers’

Figure 1. Key optical products for refractive error & low vision

Refractive error	Low vision
<ul style="list-style-type: none"> • Lenses (single vision, cylindrical, bifocal) • Frames (metal and plastic) • Ready-made spectacles (metal and plastic) 	<ul style="list-style-type: none"> • Telescopes • Stand and hand-held magnifiers • Filters • Spectacle magnifiers • Closed-circuit televisions (CCTVs)

Planning what to stock

Know your customers

The number of potential customers in your local population should be an indicator of the quantities of stock you will need. Consider the size of the population who will have access to your services. How many people are likely to need spectacles? You can look at data from neighbouring districts, countries, or regions if none are available for your area.

Also consider the different age groups in the population. The needs of an ageing population differ significantly from those of a younger population. Also consider any facial characteristics that are more prevalent in your area so that you can stock the appropriate shapes and sizes of spectacle frames.

Know what your customers need

Stock levels of optical products should take account of the prevalence of specific eye conditions and the needs of the customers. For example, the sales figures for the Global Resource Centre indicate that ready-made reading spectacles account for approximately 18% of all sales to several public sector hospitals and clinics in Kwazulu-Natal, South Africa. In all likelihood, this is because the ready-made spectacles respond to customer needs on several levels: it is appropriate for a common eye condition in that population (presbyopia), it is immediately available (no waiting times or repeat appointments required), and the price is affordable.

Know what your customers can afford

The ability of the targeted population to pay for spectacles and low vision devices

should determine the particular category of frames, lenses, ready-made spectacles, and low vision devices you stock. If the population consists mainly of people with little money to spend, then it is best to keep a large volume of budget products. If there is a mix, also stock more expensive products for those who have more to spend. In a programme that aims to be financially sustainable by providing products at a cost to the customer, the profits made on middle- to high-end products can be used to subsidise the cost of spectacles or devices for the very poor.

Know what your customers like

This is probably the most ignored factor as the prevailing thinking is that people with less money are not conscious of their appearance. If you do not take this into consideration, patients may buy a pair of spectacles but decide to not to wear them because they are not fashionable or because they fear being ridiculed.

Know what sells

To successfully be able to observe and respond to sales trends, you will need systems that track the sale of products. There are many computer software packages that can provide these trends in the form of schedules and graphs based on your daily sales. Even if these are not available to you, the rate at which some frames are depleted and the frequency with which they are ordered will give an indication of what is sold most often. Should the trends show high sales for particular styles, this should be reflected in what you buy: order the most of what you sell the most.

Having focused discussions with small groups of patients about their preferences is another popular method of understanding current and potential sales trends. Try to find out what frame styles, if included, could potentially be popular.

Ordering optical products

Ordering must be planned well in advance, else you could run out of stock and potentially lose sales. However, ordering and keeping too much stock should also be avoided because money will be tied up in stock that could otherwise have been used in other parts of your operations.

Be aware of public holidays and other periods that your supplier may be unavailable, and factor these into your ordering strategy.

High-powered lenses fall out of the range that is available off-the-shelf and must be made on demand by optical laboratories. These lenses can cost a lot more, particularly in low- and middle-income countries; partly because there

are so few of these laboratories.

To keep costs down, identify a manufacturing laboratory in your country or region, negotiate a price based on your projected demand, and choose a cost-effective means of delivery.

Sources of optical products

The Global Resource Centre (www.iceegrc.org)

The Global Resource Centre was set up by ICEE to procure refractive error and low vision products for non-governmental organisations and governments. The main aim of this initiative is to reduce the costs of optical products to create greater affordability. The GRC operates an online ordering system and provides the following products:

- Frames (plastic and metal)
- Lenses (spherical, spherocylindrical, and bifocal)
- Reading glasses (plastic and metal)
- Refraction equipment
- Low vision aids, in collaboration with the Hong Kong Society for the Blind. To increase access in Africa, the GRC procures these in bulk from the Hong Kong Society for the Blind and is able to supply products at affordable prices.

The GRC is in the process of setting up regional distribution centres to ensure a faster delivery time.

In addition, a partnership is being established with a major logistics company. This will ensure that delivery costs are kept to a minimum and that small orders will be possible.

Hong Kong Society for the Blind (www.hksb.org.hk)

The Hong Kong Society for the Blind operates the VISION 2020 Low Vision Resource Centre which was set up by IAPB in the 1990s.

The centre's purpose is to centralise the purchase and distribution of quality low vision resources to low- and middle-income countries.

A wide range of visual assessment charts, refraction equipment, training materials, and low vision devices, are available, including:

- Telescopes
- Spectacle magnifiers
- Magnifiers (stand, handheld, bar)
- Closed-circuit televisions (CCTVs)

Further information about the resource centre and its comprehensive product range is available on the website.

FROM THE FIELD

Supplying spectacles in Papua New Guinea

As Papua New Guinea's national spectacles supply system co-ordinator, Moses oversees the spectacle supply chain that serves six eye care vision centres and eight spectacle supply units around the country.

Supplying spectacles to fourteen locations can create logistical challenges. To overcome barriers and ensure that each location has spectacles required to provide patients with the most efficient care, Moses completes monthly reports, talks to everyone involved about what they need and how things are going, and makes certain that ordering and shipping procedures are followed at all times.

"The best thing about my job is that I'm able to meet people at all levels in

'I'm able to meet people at all levels in the hospitals I visit'



the hospitals I visit," said Moses.

The Papua New Guinea eye care vision centres are addressing the lack of eye care services in the country by

providing free eye examinations and affordable spectacles. The eye centres are an initiative by International Centre for Eye Care Education (ICEE).

Sharpening and tightening surgical scissors



Ismael Cordero
Clinical Engineer. Email:
ismaelcordero@me.com

Surgical scissors consist of a pair of metal blades, pivoted so that the sharpened edges of each blade slide against each other when the handles opposite to the joint or pivot are closed.

The cutting edge of each blade is where the inner surface and the cutting surface meet (Figure 1). The two cutting edges cut as they slide over each other. The angle of the cutting surface is usually between 0 and 15 degrees from the horizontal. Scissors with a very steep angle (nearer 15 degrees) are extremely sharp and are meant for cutting soft tissues such as conjunctiva. Scissors with a less steep angle are meant for cutting harder tissues.

With repeated use, the sharp cutting edges become rounded and pits or gaps can appear, making the scissors blunt. These pits will be visible as changes in the reflection when you examine the cutting surfaces in bright light.

The sharper the cutting edge, the quicker the scissors will become blunt. You should never use scissors to cut material that the scissors are not suitable for, or they will become blunt very quickly. If blunt scissors are used, the tissue will be clasped instead of cut, resulting in contusion of the tissue and ineffectual wound healing.

Testing the scissors

- 1 Stretch a piece of cotton wool so that a small, straight piece is formed, with the width equal to the length of the scissor blades.
- 2 Cut this piece using the whole length of the scissors.
- 3 Gently pull the cotton wool out while the scissors are still in the closed position. If the scissors are working well, there should be a nice, straight cut in the cotton wool. If not, and the scissors clasp the cotton wool, this may be because the scissor blades are blunt or because the joint is too loose.

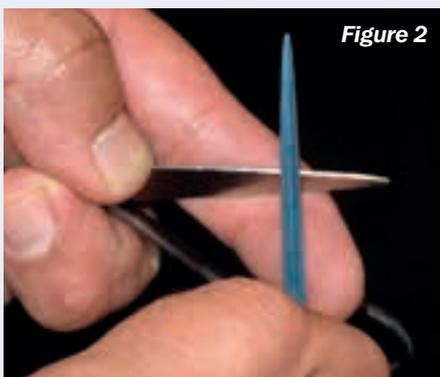
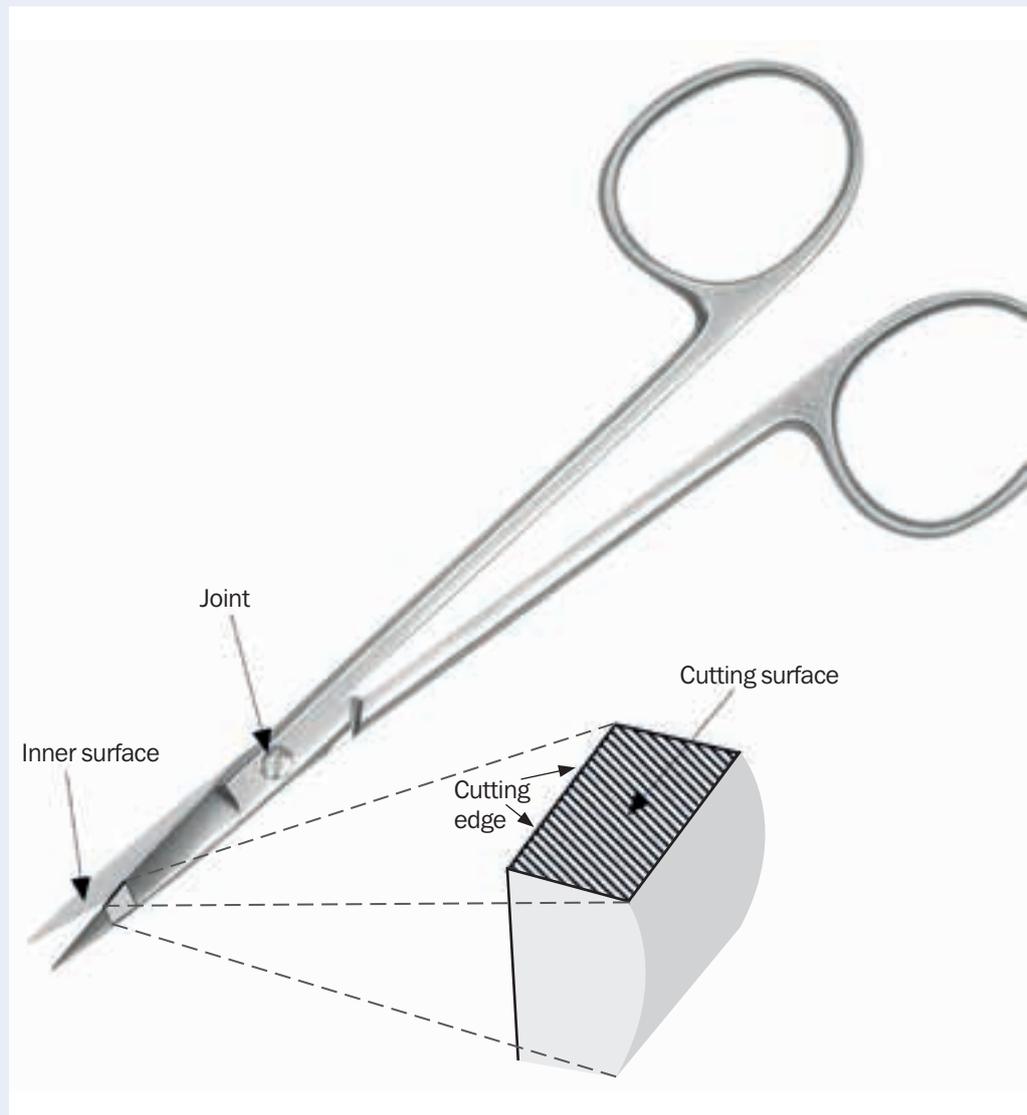


Figure 2



Sharpening the scissors

A pair of scissors is sharpened by filing off a very thin layer of the cutting surface to create a new cutting edge.

You may use a small, fine triangular file; however, if you have access to a triangular sharpening stone (800–1,200 grit) you will achieve even better results.

To obtain the smoothest surface possible, place a few drops of sewing machine oil on the sharpening stone.

Note: Always sharpen scissors by filing along the cutting surface, never on the inner surface.

- 1 Hold the scissors firmly in one hand (your left hand if you are right-handed, and vice versa), with the back of one blade resting on the end of your index

finger and the cutting surface visible (Figure 2). Keep the joint open by pressing your thumb against the hand-piece of the scissors.

- 2 Place a bright desk lamp at the same height as your eyes. Let the light

reflect on the cutting surface. Rotate the scissors slowly in both directions. When the reflection is at its brightest, the surface is horizontal. If you keep the sharpening stone horizontal as well,

you will preserve the original angle.

- 3 Always start sharpening at the tip of the instrument, to prevent rounding off the tip. Make a gentle stroke in a forwards direction (away from you) and simultaneously towards the joint. Make sure to cover the whole surface with each stroke so that you do not create different levels along the length of the

'Using blunt scissors can result in contusion of tissues and ineffectual wound healing'

Schirmer's test



Sue Stevens
Former Nurse Advisor, Community Eye Health Journal, International Centre for Eye Health, London School of Hygiene and Tropical Medicine, Keppel Street, London WC1E 7HT, UK.

Before performing any eye procedure

- Wash your hands (and afterwards too).
- Position the patient comfortably with head supported.
- Avoid distraction for yourself and the patient.
- Ensure good lighting.
- Always explain to the patient what you are going to do.

Reasons for Schirmer's test

To record measurement of tear secretion in patients with suspected 'dry eyes'.



Figure 1

You will need (Figure 1):

- Schirmer's test strips
- Watch or clock
- Clear adhesive tape
- Pen.

Preparation

- Explain to the patient that although this procedure may be uncomfortable, it is not painful.

Remember: Do not instil any anaesthetic drops or other eye medication before the test. This would give a false result.

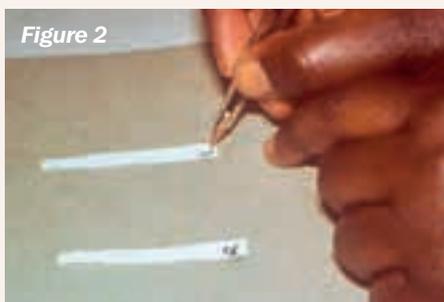


Figure 2

Method

- Remove two strips from the sterile packet and label them 'R' (right) and 'L' (left) (Figure 2).
- Bend each strip, at the notch, to a 90 degree angle (Figure 3).
- Ask the patient to look up and, with an index finger, gently pull down the lower eyelid.

Figure 3



Figure 4



Figure 5

- Hook the bent end of the strip over the centre of the lower eyelid and allow it to 'sit' inside (Figure 4).
- Repeat the procedure for the other eye.
- Note the time (Figure 5).
- Ask the patient **not to squeeze**, but just to keep the eyes gently closed.
- After five minutes, ask the patient to open both eyes and look upwards.
- Carefully remove both strips.
- Using the package scale, measure the length of the moistened area on the strip, from the notch, and indicate this with a pen mark (Figure 6).
- Stick the strips into the patient's documentation and record the measurements below each strip, e.g., "10 mm in 5 minutes". If the strips are completely moistened before five minutes, record appropriately, e.g., "30 mm in 3 minutes".

Figure 6



blade. Do not apply too much force. The repetition of the movement is what sharpens the scissors.

- 4 Repeat until most of the pit reflections are gone. If the pits are too deep, the amount that has to be filed off to get rid of them may be too large and you run the risk that the cutting surfaces of the scissor blades no longer touch each other. It may be necessary to remove such scissors from circulation.
- 5 After sharpening, a burr (an accumulation of filed metal) may be formed on the inner surface. This burr has to be removed. If not, it will damage the cutting edge on the opposite side during cutting. You can remove any burrs by scratching them off with your fingernail.
- 6 Repeat the procedure for the other scissor blade. Always sharpen both blades.
- 7 Clean the scissors thoroughly after sharpening. Any remnants of oil and metal on the instrument can cause inflammation in the eye.

Tightening a loose joint

Another reason why scissors may not cut properly is a loose joint. If the screw or rivet is not tight, the distance between the two inner surfaces will be too large, causing the cutting surfaces to not touch each other. As a result, tissues will be clamped instead of cut.

- 1 Place the scissors on a flat, hard surface.
- 2 Close the scissors so that the blades are top of each other.
- 3 If the joint has a screw, then tighten it. If it has a rivet, then proceed to the next step.
- 4 Place the tip of a pin punch on top of the rivet head, keeping the pin punch perpendicular to the scissors.
- 5 While holding the scissors down, have someone else hit the top of the pin punch with a small hammer.
- 6 Test the scissors after every hit, to prevent them from becoming too tight.

Adapted from Haddad D and Worst JGF. Standard Operating Procedure Manual for the Maintenance and Repair of Microsurgical Instruments. 1992. www.infratechonline.net/wp-attachments/MaintenanceOfSurgicalInstruments.pdf

New DVD supports trachoma surgery training

Saul Rajak



Filming a trichiasis operation for the training DVD. ETHIOPIA

Saul N Rajak

International Centre for Eye Health, London School of Hygiene and Tropical Medicine, Keppel Street, WC1E 7HT, UK

Amir Bedri

Light For The World, Addis Ababa, Ethiopia

Matthew J Burton

International Centre for Eye Health

Trichomatous trichiasis (TT) is the blinding consequence of infective trachoma. It occurs when in-turned eyelashes scrape the cornea, and it affects over eight million people worldwide. It is painful and has been likened to thorns scraping your eyes every time you blink. Lid rotation surgery, which restores the in-turned eyelashes to the proper position, is the mainstay of treatment for TT. Unfortunately, the results of surgery can be poor with many patients developing recurrent trichiasis. There is evidence to suggest that poor surgical technique is responsible for a significant proportion of the recurrent cases. There is a pressing need to strengthen surgical training.

To help strengthen trichiasis surgery programmes, the International Centre for Eye Health (ICEH) has produced a comprehensive TT surgery training DVD, which was filmed in Ethiopia.

Currently, trainee trichiasis surgeons undertake a course of about two weeks, containing both theoretical and practical components. Training programmes usually teach one of the WHO approved

lid rotation procedures: bilamellar tarsal rotation (BLTR) or posterior lamellar tarsal rotation (PLTR). These are described in the WHO trichiasis surgery training and certification manuals. A frequent limitation of training is the lack of exposure to surgical cases. Moreover, many trained surgeons do not operate frequently and most do not receive regular supervision.

The ICEH DVD contains step-by-step teaching videos of both BLTR and PLTR procedures. In addition, there is extensive supporting material, such as the assessment and counselling of patients, setting up an operating theatre, sterilising instruments and post-operative care.

The DVD will be distributed **free of charge**, in bulk, to National Trachoma Control programmes and non-governmental organisations for free distribution in training programmes. In addition, it can be obtained free of charge from TALC (Email info@talcuk.org or see page 30).

It is available in English and French, and was made possible thanks to the support of Band Aid via Fight For Sight, the Carter Center, the International Trachoma Initiative, and Stanton Media.

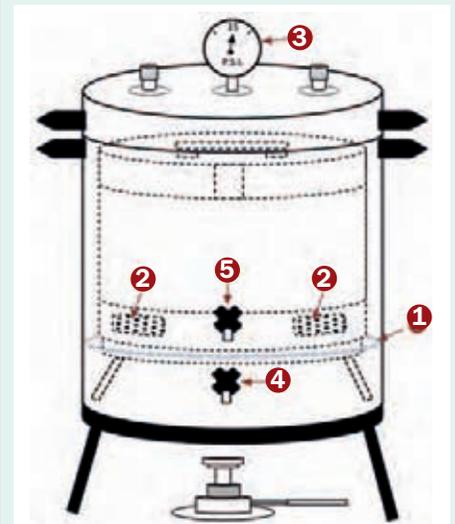
For this issue on instruments and consumables, we have specially adapted the following extract from the DVD. It covers using a steam autoclave to sterilise the instruments used in trachoma surgery.

Using a steam autoclave



The kerosene-burning steam-pressure autoclave (Figure 1) is widely available in trachoma endemic regions. If you use a different model of autoclave you **must** read and carefully follow the instructions.

Figure 1: Diagram of a kerosene-burning steam-pressure autoclave



- You should use the autoclave in a clear area. Place the items to be sterilised on a clean table or shelf nearby.
- Pour water (ideally, distilled or demineralised water) into the autoclave up to the level of the top of the tripod stand inside (1).
- Load the drum with the items to be sterilised:
 - All jointed instruments should be placed in the opened or unlocked position.
 - Sharp edges must be protected by gauze or tubing to prevent dulling.
 - The drum should not be packed tightly.



- You must check the drum to ensure that the vents are open. Close the drum lid and lock the vent collar in the open position (2).
- Place the drum in the autoclave and close the autoclave lid by rotating it

clockwise, until it locks into position. You **must** ensure the autoclave lid is correctly closed. If this is not done properly, the autoclave is extremely dangerous when being heated.

- Check both taps are closed and place the autoclave on a kerosene burner. Some autoclaves are designed to be heated using an electrical supply.



ICEH/LS/HTM

- After several minutes, the steam produced causes the pressure to rise in the autoclave. You can see this on the pressure gauge (3).
- When the pressure reaches 15 +/- 1 psi, steam will come out of the pressure valve. You must record the time at which this happens.
- Continue heating for a further 20–25 minutes. Turn off the heat source.
- Open the lower tap, which is the vacuum release tap. All the steam and water will then drain from the autoclave (4). As soon as the water stops draining, close the tap again and leave the autoclave for 5–10 minutes. A further vacuum develops in the autoclave, which will now dry the sterile contents.
- Then open the upper tap (5), which is the steam release tap, allowing all remaining steam to come out. The pressure gauge should now drop to zero psi.
- Only open the autoclave when the pressure is zero. Then remove the drum and immediately close the vents.

Safety

There are some crucial safety points that you must always follow when using an autoclave.

- You should be well trained in autoclave usage and you should be trained and tested periodically for proficiency in the operation of an autoclave. There is a danger of transmitting HIV, hepatitis viruses, or other infectious diseases if the surgical materials are not properly sterilised. There is also a danger of causing serious injury if the autoclave is not used correctly.
- Always ensure there is the correct amount of water in the autoclave before every use.
- You must **not** open the autoclave until the pressure reaches zero.
- Do **not** use an autoclave if parts are malfunctioning; for example, if the pressure does not rise and there is continual escape of steam.
- Do **not** use if you notice wear and tear on the lid gasket or notice leaky taps and valves.



CONTINUING PROFESSIONAL DEVELOPMENT

CPD: Test yourself

These continuing professional development (CPD) Test Yourself questions are based on the contents of this issue. You can use the questions to test your own understanding; we hope that you will also discuss them with your colleagues and other members of the eye care team. The questions have been developed in association with the International Council of Ophthalmology (ICO) and are based on the style of the ICO Advanced Examination: www.icoexams.org/exams/advanced

1. Think about purchasing instruments and consumables. Which of the following statements are true, and which are false?		True	False
a	Pre-shipment inspections are expensive, but they are worth the cost.	<input type="checkbox"/>	<input type="checkbox"/>
b	Your supplier is usually responsible for inland transportation.	<input type="checkbox"/>	<input type="checkbox"/>
c	When obtaining a quote, always approach more than one supplier.	<input type="checkbox"/>	<input type="checkbox"/>
d	The Incoterm® CIP means that you are responsible for insurance and clearance charges.	<input type="checkbox"/>	<input type="checkbox"/>
2. Think about instrument care and maintenance. Which of the following statements are true, and which are false?		True	False
a	Instruments must be cleaned after each use and lubricated once a week.	<input type="checkbox"/>	<input type="checkbox"/>
b	Using distilled water to clean instruments reduces the risk of corrosion and chemical damage.	<input type="checkbox"/>	<input type="checkbox"/>
c	Regular inspection is important, but it is not necessary to do so under magnification.	<input type="checkbox"/>	<input type="checkbox"/>
d	It is important to keep records of any instruments requiring repair or replacement.	<input type="checkbox"/>	<input type="checkbox"/>
3. Think about supplies management. Which of the following statements are true, and which are false?		True	False
a	You don't have to make a large order to take advantage of bulk discounts.	<input type="checkbox"/>	<input type="checkbox"/>
b	The people who manage supplies are usually specially trained and enjoy working with complex inventory systems.	<input type="checkbox"/>	<input type="checkbox"/>
c	If an eye unit uses between 20 and 30 sutures a month, and they take between 6 and 8 weeks to arrive, you should keep a minimum 40 sutures in stock (and order more whenever the stock reaches 40).	<input type="checkbox"/>	<input type="checkbox"/>
d	The 'first in, first out' approach means that you must use the items with the shortest shelf life first.	<input type="checkbox"/>	<input type="checkbox"/>
4. Think about performing Schirmer's test and about sharpening and adjusting surgical scissors. Which of the following are true and which are false?		True	False
a	When performing Schirmer's test, patients must close their eyes as tightly as possible.	<input type="checkbox"/>	<input type="checkbox"/>
b	Performing Schirmer's test soon after instilling any eyedrops will give a false result.	<input type="checkbox"/>	<input type="checkbox"/>
c	When sharpening surgical scissors, don't be afraid to apply pressure with the sharpening stone.	<input type="checkbox"/>	<input type="checkbox"/>
d	When sharpening surgical scissors, cover the full length of the cutting surface with each stroke.	<input type="checkbox"/>	<input type="checkbox"/>

ANSWERS

1. a. False. If your country does not require one, only consider a pre-shipment inspection (PSI) if you are making a large order. A PSI may speed up clearance on arrival, but will increase the price by 2-3%. You should decide whether the cost is worth it. b. False. You are responsible, unless you have chosen for the items to be couriered to you (i.e., door-to-door delivery). c. True. d. False. You are responsible for clearance, but marine insurance is the seller's responsibility.
2. a. False. Instruments should be cleaned and lubricated after each use. b. True. c. False. Use magnification whenever possible to help you identify instruments that must be repaired or serviced. d. True. This allows you to plan ahead so you can negotiate a discount based on projected demand. b. False. Make sure your inventory systems are easy and convenient to use. c. False. Stock may take as long as 8 weeks to arrive (around 2 months), and you may use as much as 30 sutures a month, so keep enough to last until then (2 x 30 = 60). d. True.
3. a. True. You can negotiate a discount based on projected demand. b. False. Make sure your inventory systems are easy and convenient to use. c. False. Stock may take as long as 8 weeks to arrive (around 2 months), and you may use as much as 30 sutures a month, so keep enough to last until then (2 x 30 = 60). d. True.
4. a. False. Patients must close their eyes as tightly as possible. b. True. c. False. Do not apply too much force. The repetition of the movement is what sharpens the scissors. d. True.

News



Sad news

The much-admired ophthalmologist Dr Dennis Williams died earlier this year. Dr Williams was born in Nigeria but educated in

Sierra Leone, and was the only ophthalmologist to remain in the country during the war. He worked for Sightsavers for much of his life, and was appointed Vice President of Sightsavers on his retirement in 2008; the only staff member ever to receive this honour. He will be remembered for this courage, his leadership, his humour, and his humility. Dr Williams, who was suffering from cancer, is survived by his wife, Pamela, and four children.

Have your say

Our September 2012 issue is about glaucoma and visual fields. Have you had a useful or interesting experience you would like to share with other readers? Do you have any questions you would like to ask our experts? Write to: The Editor, International Centre for Eye Health, London School of Hygiene and Tropical Medicine, London WC1E 7HT, UK.

Email: editor@cehjournal.org

Deadline: 15 March 2012.



Community Eye Health Update CD

Look out for your free copy of the Community Eye Health Update CD in this issue of the journal. It contains

back issues of the journal in English, French, Spanish, Portuguese, and Chinese, as well as photographs, books,

software, and many other helpful resources. If you have not received your copy, please contact TALC (see page 30) to request a replacement.

Get your own copy

Do you get your own copy of the *Community Eye Health Journal*? Do you know anyone else who would like their own, free copy? Or have you moved or changed jobs? Send your up-to-date details to Anita Shah, International Centre for Eye Health, London School of Hygiene and Tropical Medicine, London WC1E 7HT, UK.

Email: admin@cehjournal.org

Courses

Community Eye Health Institute, University of Cape Town, South Africa

For information about VISION 2020 certificate courses in 2012, a postgraduate diploma in community eye health (PGDip) in 2013, or a Masters in Public Health (community eye health) in 2013, contact Zanele Magwa, Community Eye Health Institute, University of Cape Town, Private Bag 3, Rondebosch 7700, South Africa. Tel: +27 21 404 7735.

Email: ntombizanele.magwa@uct.ac.za

International Centre for Eye Health MSc in Public Health for Eye Care.

From September 2012 to September 2013 or part-time over two years. Apply before April 2012. For scholarships and details of application, write to: Registry, LSTHM, Keppel Street, London WC1E 7HT, UK. Tel: +44 207 299 4646 or visit www.lshtm.ac.uk/prospectus/masters/mscphc.html

New short course: Understanding an eye health system in order to achieve VISION 2020. A five-day course to

familiarise participants with a health systems approach to eye care in developing countries, through using practical interactive examples and case studies. Start date: June 25th 2012. Duration: 5 days. Cost: £915. Place: London. This course is ideal for eye care professionals who wish to work or are working in low- and middle-income countries.

Kilimanjaro Centre for Community Ophthalmology (KCCO), Tanzania

For information on courses, contact Genes Mng'anya, KCCO, Good Samaritan Foundation, PO Box 2254 Moshi, Tanzania. Tel: +255 27 275 3547.

Email: genes@kcco.net

or visit www.kcco.net

Lions SightFirst Eye Hospital, Nairobi, Kenya

Small incision cataract surgery for ophthalmologists wishing to upgrade from ECCE.

Duration: 1 month. Courses run every month. Cost: US \$1,000 for tuition and US \$500–700 for accommodation and meals. Write to: The Training Co-ordinator, Lions Medical Training Centre, Lions SightFirst Eye Hospital, PO Box 66576-00800, Nairobi, Kenya, call +254 20 418 32 39, or email

training@lionsloresho.org

Lions Aravind Institute of Community Ophthalmology

Instrument maintenance courses

with a trainee: trainer ratio of 1:1. Courses start on 1 Feb, 1 Apr, 1 June, 1 Aug, 1 Oct and 1 Dec 2012. Duration: Four weeks. Cost: US \$400 (including tools). Visit

www.aravind.org/education/course-details.asp or write to: Prof V Srinivasan,

LAICO, 72, Kuruvikaran Salai, Gandhi Nagar, Madurai 625 020, Tamil Nadu, India. Email: v.srinivasan@aravind.org

Community Eye Health JOURNAL Supported by:

Next issue

The next issue of the *Community Eye Health Journal* will be on **Low vision**