



Endoscope Cleaning & Maintenance Workshop

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Welcome to Olympus

Thank you for attending the Olympus Australia Endoscope Cleaning and Maintenance Workshop. We trust that you will enjoy this opportunity to learn more about all aspects of care and maintenance of endoscopic equipment.

Our aim is to keep these sessions as informal as possible and your interaction will be actively encouraged.

If you have any questions or concerns throughout today, please do not hesitate to raise them with the facilitator of your session.

Again, thank you for your attendance, and welcome to Olympus Australia.

Chapter 1

Programme

Registration

Introduction

History of endoscopy

Structure and function of endoscopes

Morning tea

Cleaning and disinfection of endoscopes

Includes: Pre-cleaning

Leak testing

Brushing

Manual flushing

Disinfection / sterilisation

Alcohol flushing

Storage

Lunch

Care and maintenance of endoscopic accessories

Discussion / presentation of certificates

Hands on demonstrations

Close

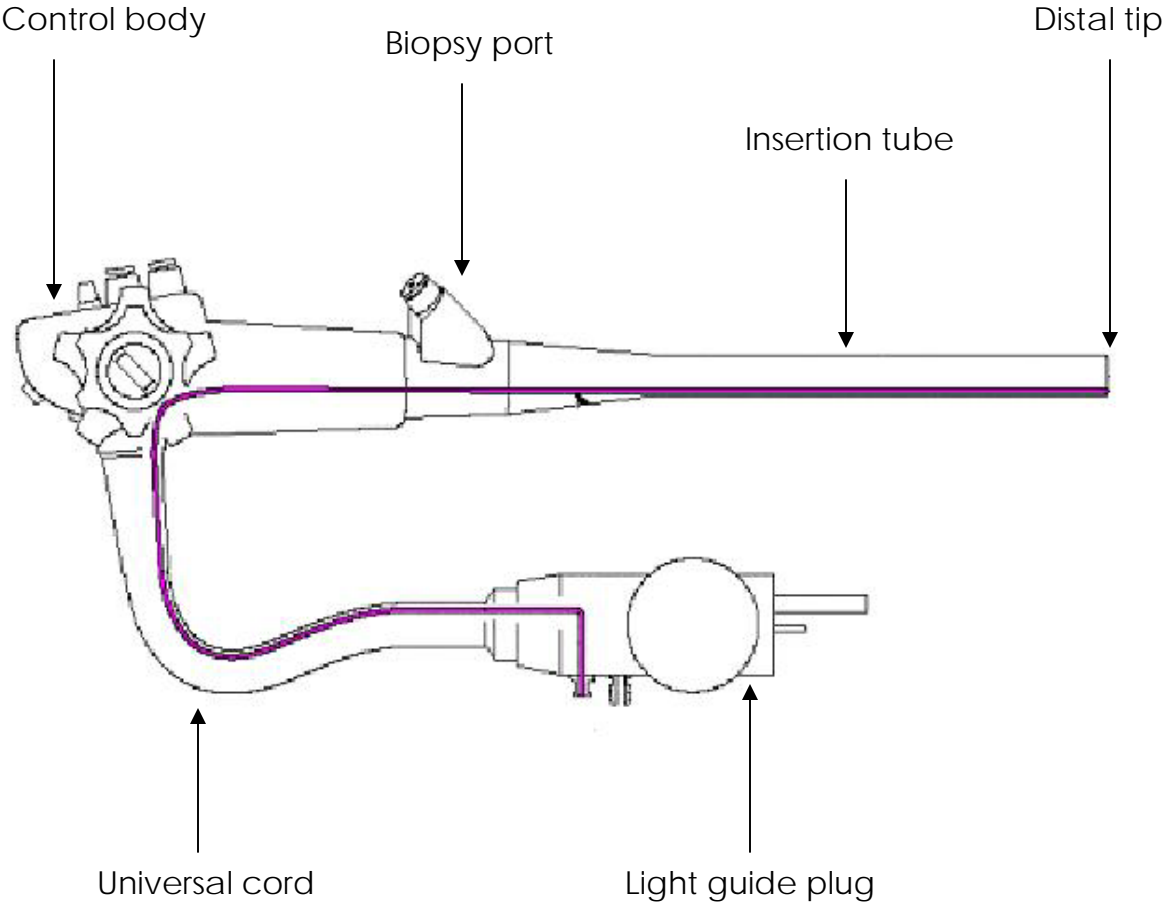
Chapter 2

History of Olympus Endoscopy

1910	Oesophageal tube
1919	Olympus established in Tokyo as Takachihi Seisakuho
1921	"Olympus" registered as trademark
1932	Schindler semi flexible gastroscope
1948	Development of Gastrocamera commence
1949	Company renamed Olympus Optical Co., Ltd
1950	First Gastrocamera (GT-1) introduced at Japan Surgical Conference
1963	Gastrocamera with fiberscope introduced
1983	OES immersible endoscopes introduced
1985	EVIS-1 first generation video endoscopy system released
1989	EVIS100 series video endoscopy system released
1997	EVIS 140 series video endoscopy system released
1997	Olympus Australia established
2000	EVIS EXERA 160 and 145 series video endoscopy systems released
2002	Olympus Australia relocates to new head office in Mount Waverley, Victoria

Chapter 3

Nomenclature of Endoscopes



Chapter 4

Internal Structure & Function of Endoscopes

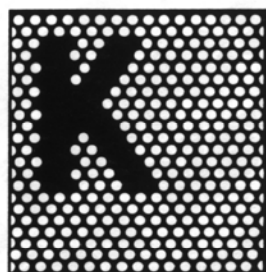
Both fiberoptic and video endoscopes share the same basic design principles and, to a large extent, the same mechanical construction. The main difference between the two endoscopes is the system that transmits the image. The fiberoptic endoscope utilises optical fibres and the video endoscope, advanced CCD (charged coupled device) technology. Both systems require a light guide and a complex objective lens system at the distal end to focus the image.

Fiberscope Optical System

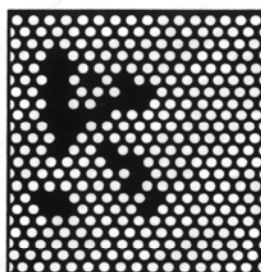
Many thousand (often in excess of 45,000) optical fibres are arranged into an ordered pattern to form a coherent image guide fibre bundle.

The fibres in coherent bundles are arranged at each end in a common matrix, i.e., each single fibre is held in the same place at either end but is free to flex in the middle section. Thus a complete image can be transferred over a long distance, with each individual fibre carrying a small component part of the image.

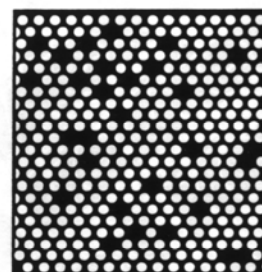
The degree of ordering of a coherent optical fiber bundle is vital to the quality of the image it transmits - the more perfect the ordering, the better the image quality. Also, of course, broken fibers in the bundle will mean the loss of one component part of the final image, although in practice a relatively small number of broken fibers (less than 25) will give a negligible effect on the image resolution (quality) of a modern fiber scope.



WELL ORDERED
COHERENT IMAGE
GUIDE



POORLY ORDERED
COHERENT IMAGE
GUIDE

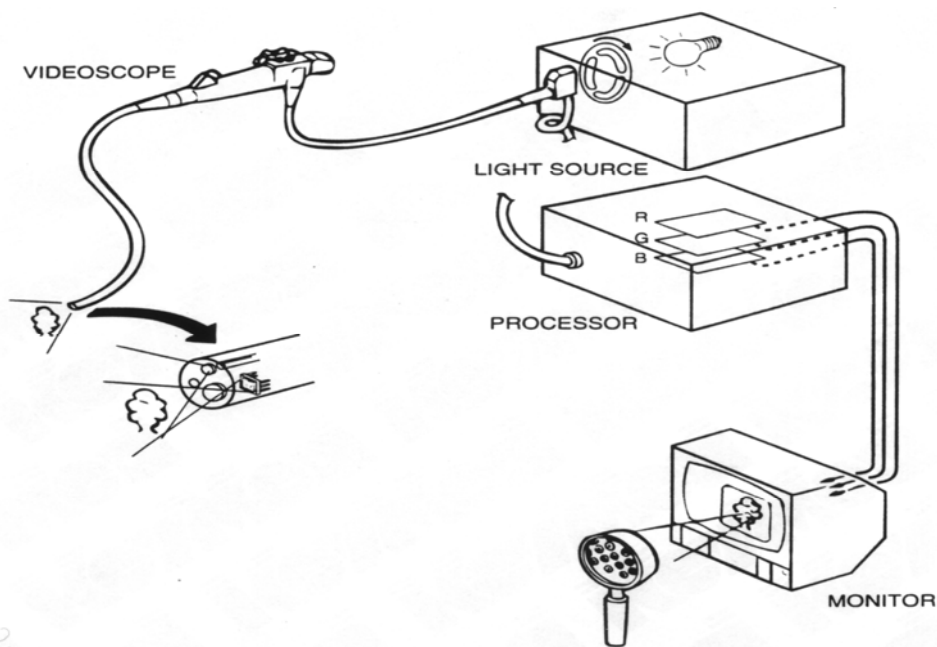


NO ORDERING
INCOHERENT LIGHT
GUIDE

Video Scope Imaging System

The CCD (charged coupled device) used in the video endoscope, is a solid-state microchip used for image sensing. The photo-sensitive surface of the chip is divided into an array (rows and columns) of cells, each able to directly convert the light focused upon it into electrical charges (electrons). These cells are more commonly called 'pixels', a name derived from 'picture element'. A pixel represents the limit of image resolution and is the basic building block used to re-create an electronic image. The electrical charge produced at each pixel corresponds to the intensity of the light falling on that particular pixel. By 'reading' the charge developed at each pixel sequentially, the image focused on the CCD surface is turned into an electronic signal which can, after sophisticated processing, be accurately reproduced on a TV (video) monitor.

The CCD in the video endoscope produces coded, electronic data which must be decoded before it can be viewed. The electronic signal is passed down wires within the endoscope to an image processor where it is decoded and transmitted to a TV monitor for viewing as shown below:



Endoscope Inspection

All instruments should be inspected as frequently as possible and ideally, before each use.

Should faults or abnormalities be suspected, the instrument should not be used and the Technical Service Centre contacted on 1300 132 992.

a) Inspection of the Insertion Tube

Inspect the surface of the insertion tube, both visually and by running your fingertips over the whole length. Check for dents, protruding objects or other irregularities.

b) Inspection of the Bending Mechanism

Check that the angulation locks stabilise the tips of the scope when engaged and allow free movement of the control knobs when released ('F' or free position). Operate the angulation controls slowly to their limit in each direction, checking for smooth operation. Check the degree of angulation against the standard taken when the instrument was new.

Check the bending section rubber for signs of wear and physical damage. **(Never bend or twist the bending section by hand).**

c) Inspection of the Optical System

Using clean gauze moistened in 70% alcohol, clean the lens surface at the distal tip of the insertion tube (for fiberoptic scopes, also clean the eyepiece). Do not use abrasive cleaners as damage to the lens coating may occur.

Attach your scope to the light source and switch on. For video scopes, attach to the video processor and switch on. Check the image for clarity using an object approximately 15mm from the distal tip. With fiberscopes, record the number of broken fibres (black dots) on the image. A sudden increase in these may indicate damage to the instrument.

d) General Inspection

Check the light output from the tip of the scope to ensure the light guides are functioning.

For fiberscopes used with cameras or video converters, check the contact pins surrounding the eyepiece lens. Any deposits should be cleaned using a cotton bud moistened in 70% alcohol.

All other parts of the instrument should be visually checked for signs of wear or damage.

A leak test on your endoscope should be performed prior to pre-soaking (at the beginning of your list) and prior to cleaning your scope once a procedure is complete.

This is one of the most vital preventative measures to ensure major damage does not occur to an endoscope.

Fluid ingress into the optical bundle of a fiberscope or a CCD chip of a video scope will cause major damage, resulting in high cost repairs.

Correct leakage testing will detect points on the endoscope where fluid could enter and must therefore, be performed as frequently as possible, and certainly before and after each session.

The leak test procedure is described in detail on page 15 of this manual.

Chapter 5

Cleaning and Disinfection of Endoscopes

Cleaning and disinfection of endoscopes can be broken down into the following stages:

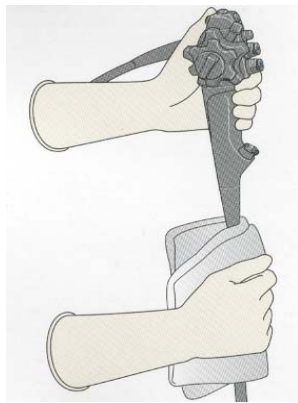
1. Pre-cleaning page 12
2. Leak testing page 15
3. Brushing page 18
4. Manual flushing page 21
5. Rinsing page 22
6. High level disinfection / sterilisation page 24
7. Rinse after disinfection page 26
8. Alcohol flush page 27

(Olympus has produced a cleaning video & poster that details the entire cleaning process of your scope, please enquire after the workshop).

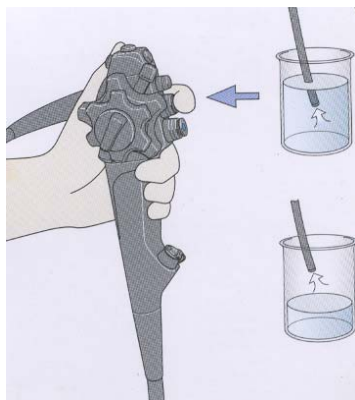
Pre-cleaning

Performed at the bedside immediately after each examination.

- (1) Prepare a container of detergent solution.
- (2) Wipe the entire insertion tube with a clean, lint-free cloth soaked in detergent solution.



- (3) Place the distal end of the insertion tube in the detergent solution and aspirate detergent solution until clear return is seen in suction tubing. Then aspirate air for 10 seconds.



CAUTION: Monitor the suction bottle carefully to be sure that it does not overflow, as this could result in damage to the suction pump.

(4) Remove the air/water button and replace with the AW channel cleaning button (MH-948).

(5) Feed water using the AW channel cleaning button by depressing the silver button, feed air by releasing the silver button.



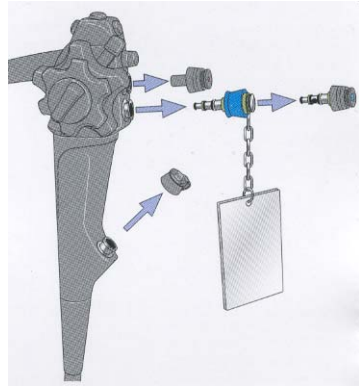
WARNING:

Do not use the AW channel cleaning adaptor for patient examinations as it will cause continuous insufflation and result in patient injury.

The MH-948 AW channel cleaning adapter does not require lubrication. Lubricants (e.g. water soluble brands and silicone oil) can cause swelling of the valve rubber parts that will affect valve performance or damage the valve.

To prevent blocking the air/water nozzle, always use the AW channel cleaning adapter when cleaning the air/water channel after each case.

- (6) Turn OFF the light source. Turn OFF the video processor. (If further cases follow immediately after, the light source CAN be left running).
- (7) Detach the AW channel cleaning adapter, suction valve and biopsy valve from the endoscope and reprocess as described in chapter 6, Procedures for Cleaning, Disinfection and Sterilisation of Removable Parts.



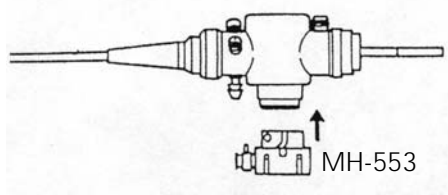
- (8) Disconnect the water bottle from the endoscope.
- (9) Disconnect the suction tube from the suction connector.
- (10) Disconnect the video scope cable from the endoscope. Remove the endoscope from the light source. Replace the waterproof cap (MH-553).
- (11) Transport endoscope and accessories carefully to your clean up area.

Leak Testing

This should be performed PRIOR to pre-soaking your scopes (at the beginning of a list) and PRIOR to cleaning your scope after procedure.

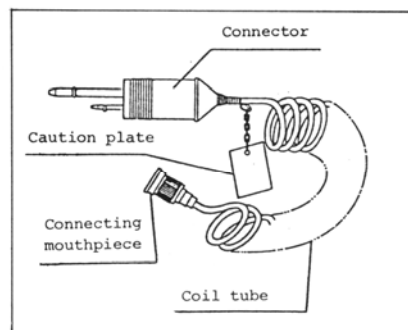
The sequence for performing a leak test is as follows.

1. Attach the water resistant cap MH-553 to the endoscope.



2. Set the Maintenance unit (MU-1) or light source to ON and air setting to HIGH.

Attach the leak test cable (MB-155) to the air source.

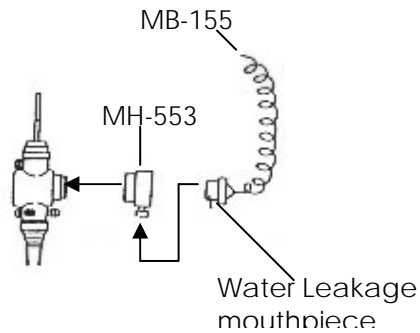


Olympus MB-155 Leak-tester

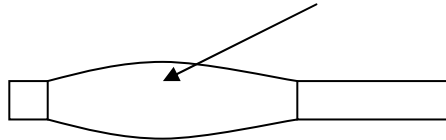
Check that sufficient air emits from the leak tester mouthpiece by inserting a dry finger into the pin.

Verify that the air emitted contains no moisture.

3. Attach the leak test cable to the ETO valve of the endoscope.



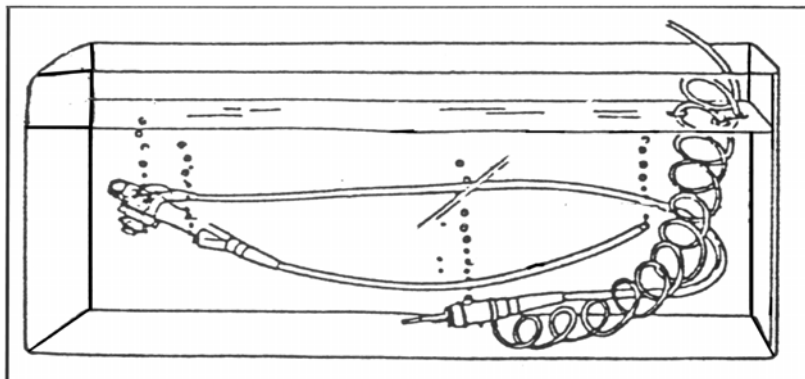
4. Confirm that the bending section of the endoscope is swollen.



5. Immerse the entire scope into a basin of water.

Observe for bubbling consistent with leaks – keeping in mind some settling of trapped air will occur.

Angulate distal tip in all directions to check rubberised section is free of small holes.



6. Remove the endoscope from the basin.

Remove the leak test cable from the air source and wait 30 seconds for the bending section to deflate.

7. Disconnect the leak tester from the endoscope.

NB: Do not detach the leak test cable from the endoscope under water.

Failed Leak Tests

Continuous bubbling from the endoscope may indicate the presence of a leak. If a leak is suspected, the following procedure applies;

Keep the leak test cable (MB-155) attached to the running air source.

Perform all steps as described on the following pages for manual cleaning and flushing.

If possible, disinfect the endoscope, with the leak tester attached and running, in disinfectant solution.

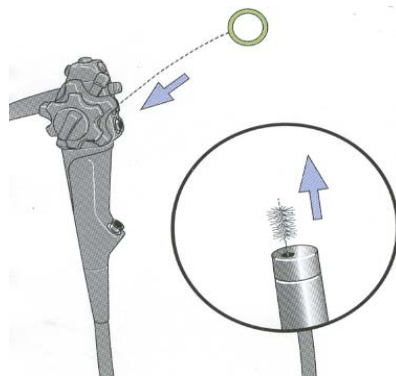
If manual disinfection is not possible – contact the Olympus Service Centre on 1300 132 992 for further instructions.

Brushing of Internal Channels

1. Fill a basin with water and low foaming detergent solution to the temperature and concentration recommended by the detergent manufacturer. Use a basin which is deep enough to allow the endoscope to be completely immersed.
2. Immerse the endoscope and transfer the AW channel cleaning adapter, air/water and suction valves, and biopsy valve into the basin with detergent solution.
3. With the endoscope immersed, use a soft brush or lint-free cloth to thoroughly brush and wipe all outside surfaces of the endoscope. Pay particular attention to the air/water nozzle opening and ensure that all surfaces of the distal end are cleaned thoroughly.
4. Brush the instrument/suction channel, suction cylinder and instrument channel opening according to the following procedure:

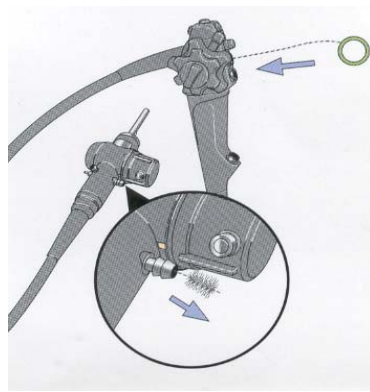
Grip the Channel Cleaning Brush BW-20T 3cm from the bristles. (NB: Please refer to your scopes manual for the cleaning brush best suited to your model).

Insert it at a 45° angle into the opening located in the base of the suction valve housing.



Using short strokes, feed the brush through the insertion tube until it emerges from the distal end of the endoscope. Clean off the bristles with your fingertips. Carefully pull the brush back through the channel. Clean off the bristles again. If debris remains after brushing repeat until all debris is removed.

Insert the channel cleaning brush straight into the suction valve housing into the opening located in the back of the housing.



Using short strokes, feed the brush through the universal cord until it emerges from the suction connector on the light guide connector. Clean off the bristles with your fingertips. Carefully pull the brush back through the channel. Clean off the bristles again. If debris remains after brushing repeat until all debris is removed.

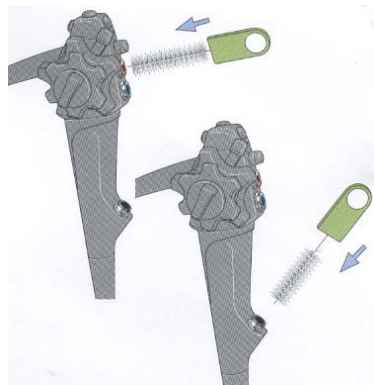
Insert the channel cleaning brush into the biopsy valve housing.

Using short strokes, feed the brush through the insertion tube until it emerges from the distal end of the endoscope. Clean off the bristles with your fingertips. Carefully pull the brush back through the channel. Clean off the bristles again.

If debris remains after brushing repeat until all debris is removed.

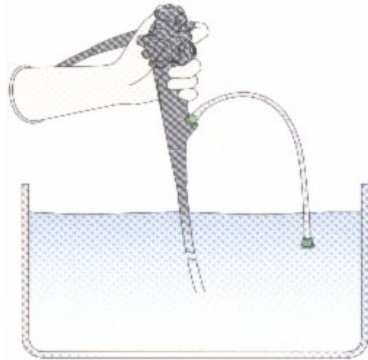
Insert the channel opening cleaning brush (MH-507) into the suction valve cylinder until approximately half of the brush head is inside the opening.

Rotate the brush once and then pull it out. Wash the bristles. Repeat for the air/water valve housing and the biopsy port.



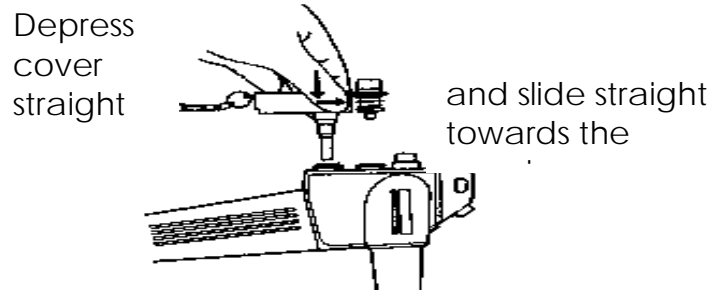
Manual Flushing of Internal Channels

1. Attach the suction cleaning adapter (MH-856) to the instrument channel port. Reattach the suction tubing to the suction outlet of the endoscope.
2. Attach the suction cleaning adapter to the instrument biopsy channel port on the Endoscope.
3. Immerse both the endoscope's distal end and the weighted end of the suction cleaning adapter in the detergent solution.
4. Cover the suction valve cylinder with your finger and aspirate detergent solution for approximately 30 seconds.

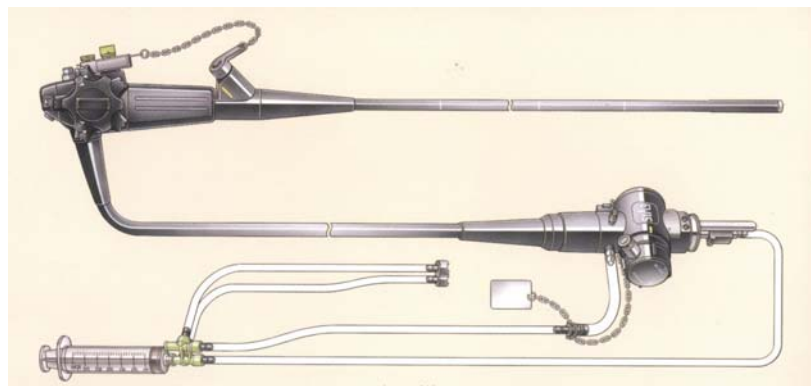


5. Turn OFF the suction pump.
6. Disconnect the suction tube and the suction cleaning adapter. Leave to soak in the detergent solution, then reprocess as described in Chapter 6: "Manual Cleaning of Removable Parts".

7. Attach the Channel Plug (MH-944).



8. Attach Injection Tube (MH-946) and 30cc syringe to flush the air/water channels with detergent solution.

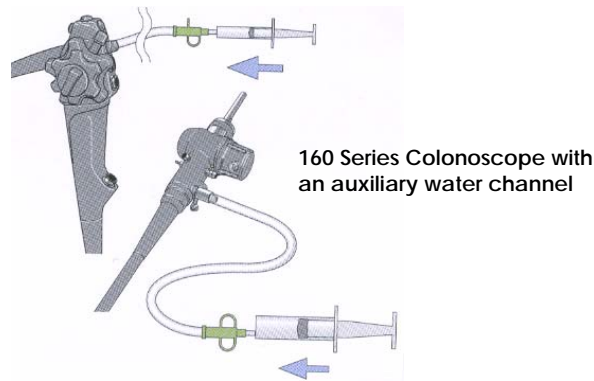


NOTE: The All-Channel Irrigator (CW-3) cannot be used on 140 / 145 / 160 series scopes. Adaptors for the MH-946 are available for older models – please enquire with Olympus.

9. Attach 30 cc “Luer Lock” syringe to the injection tube’s air/water channel port. Inject 90mls of detergent solution into the air/water channel to flush the channels.
10. Move syringe from Air/Water port to suction channel and inject 90mls of detergent solution.
11. Repeat the entire flushing process using 90 mls of filtered water in both channels.

12. Repeat the entire flushing process again with 90 mls of air in both channels.
13. If you have a CF-100 / 130 series colonoscope with an auxiliary water channel, attach the corresponding cleaning tube to the channel opening and inject detergent 30 mls of detergent solution, then 30 mls water, then 30 mls air into the channel.
14. If you have a 160 series colonoscope with an auxiliary water channel, attach the corresponding cleaning tube to the channel opening and inject detergent 90 mls of detergent solution, then 90 mls water, then 90 mls air into the channel.
15. If injecting into a duodenoscope forceps raising channel, use a 2 or 5 ml syringe only and inject slowly with 15 mls of detergent solution, 5 mls water and 10 mls air.

Duodenoscope Forceps Raiser



15. Disconnect the channel plug and injection tube from the endoscope.
16. Finally inspect the surface of the scope for remaining debris – if debris is present, we recommend repeating manual cleaning cycle.
17. Rinse the entire endoscope by immersing in a basin of fresh filtered water.

The endoscope is now ready for reprocessing via washing machine or manual procedures as detailed on page 24.

Manual Disinfection

Refer to this section if no Washing Machine is used in your suite. If the Endoscope was not reprocessed immediately following the last examination, it may be necessary to soak the instrument in detergent for up to a maximum of 10 hours. Following this, manual cleaning should be repeated prior to disinfection to ensure that all debris is removed. Please refer to the "Manual Cleaning" section in this handbook.

All disinfection steps should be done with the endoscope and all equipment completely immersed. If the equipment is connected or disconnected while not immersed disinfectant solution may not adequately contact all surfaces of the equipment. The effectiveness of disinfection may be reduced.

1. Fill a basin with disinfectant solution at a temperature and concentration according to the instructions on the manufacturer's label. Use a basin that is at least 40cm by 40cm (16" by 16") in size and deep enough to allow the endoscope to be completely immersed.
2. Attach the channel plug and the injection tube to the endoscope, and immerse completely in the basin with disinfectant solution.
3. With the injection tube's intake in the disinfectant solution, use the 30cc syringe to flush the air/water channel with 90mls of disinfectant solution, and the suction channel with 90mls disinfectant solution to all channels and expel all air.
4. If auxiliary water channels or forceps raising channels are present, attach the appropriate cleaning tube and inject disinfectant solution into this channel also. Refer to pages 23 & 23 for volumes.

5. With the endoscope and the channel plug and injection tube completely immersed in the disinfectant solution, disconnect the channel plug and injection tube from the endoscope. Leave all three to soak in the disinfectant solution.

* Disconnect the channel plug and injection tube from the endoscope only while they are completely immersed. Disconnecting when not immersed may allow air to be drawn into the channels and will reduce the effectiveness of the disinfection.

* Should air bubbles adhere to the surfaces of the endoscope, channel plug, or injection tube, remove these using a clean, soft lint-free cloth.

* Cover the disinfectant basin with a tight fitting lid to minimize the release of disinfectant vapour.

* Soak the equipment for the amount of time and at the temperature recommended by the disinfectant manufacturer. It is recommended to use a timer to check the correct soaking time.

6. Re-attach channel plug and injection tube.

Flushing with Air:

Using the channel plug and the injection tube, flush air through the air/water and suction channels as follows:

1. Before removing the endoscope from the disinfectant solution, connect the channel plug and injection tube to the endoscope.
2. Remove the injection tube intake from the disinfectant solution.
3. Attach the 30cc syringe to the injection tube's air/water channel port and flush the air/water channel with 90mls of air.
4. Attach the 30cc syringe to the injection tube's suction channel port and flush the suction channel with 90mls of air.

5. Inject air into any auxiliary channels / forceps raiser channels if present. Refer to pages 23 & 23 for volumes.
6. Remove the endoscope from disinfection solution.

Rinsing with Water:

1. Immerse the endoscope, channel plug, and injection tube in water (refer your hospital guidelines for water specifications required). Use sterile lint-free cloth to thoroughly rinse all external surfaces.
2. Connect the injection tube to the endoscope. With the injection tube intake immersed in sterile water and using the 30 cc syringe, flush the air/water channel and the suction channel with 90mls of sterile water respectively.

Flush any auxiliary channels / forceps raiser channels if present with sterile water. Refer to pages 23 & 23 for volumes.
3. With the channel plug and injection tube connected to the endoscope, remove the equipment from the sterile water.
4. Flush with air to expel sterile water from the air/water and suction channels.
5. Use lint-free cloth to thoroughly wipe dry the external surfaces of the endoscope, channel plug and injection tube.
6. Inject air into any auxiliary channels / forceps raiser channels if present. Refer to pages 23 & 23 for volumes.

Terminal Cleaning / Flushing:

Immediately before storing your endoscope at the completion of your list flush channels with alcohol as follows:

1. Immerse the injection tube intake in 70% isopropyl alcohol or 70% ethyl alcohol. Using the 30 cc syringe, flush the air/water channel and the suction channel with 60 mls and 90 mls respectively.
2. Remove the injection tube intake from the alcohol. Flush the air/water channel and the suction channel with 60 mls & 90 mls of air respectively.

Use a lint free cloth moistened with 70% isopropyl alcohol or 70% ethyl alcohol to thoroughly wipe the external surfaces of the endoscope, channel plug and injection tube.

Storage of Endoscopes:

Your storage cabinet should be:

- Clean
- Dry
- Well ventilated and maintained at room temperature

Do not store your endoscope:

- In direct sunlight
- At high temperatures / humidity
- Where exposed to X-rays
- In the carrying case. Use the carrying case only for shipping. Routinely storing the endoscope in an unventilated case may encourage the growth of microorganisms.

These factors can damage your endoscope or present an infection control risk.

Detach all removable parts of the endoscope. By removing the air/water valve, biopsy valve and suction valve, air will circulate through the internal lumens of the endoscope and assist in drying.

Before storage:

- Thoroughly dry all parts of the endoscope (especially all internal lumens, distal ends and electrical contacts) and accessories.
- Use a cotton swab moistened with 70% ethyl or isopropyl alcohol to carefully remove any film covering the surface of the objective lens and light guide glass on distal end.
- Place the endoscopes angulation locks in the "F" (or free) position.
- Hang the endoscope in your storage cabinet with the distal tip hanging freely. Please ensure that insertion tube hangs as straight as possible.

Chapter 6

Manual Cleaning of Removable Parts

1. Immerse the removable parts in a basin of detergent solution, prepared according to the manufacturer's instructions. Uncap the semi-disposable biopsy valve before immersing

CAUTION: Please ensure items immersed in detergent solution do not contact each other, which can lead to scratched seals on the air/water valve and AW channel cleaning adapter from the brushes etc.

Valves and Buttons

2. Using a soft clean brush, sponge or lint-free cloth, meticulously clean the outer surfaces in the detergent solution. Depress and release the pistons of the air/water valve, suction valve and AW Cleaning adapter to ensure the detergent solution contacts all crevices and surfaces of the valves.
3. Using the channel cleaning brush, thoroughly brush the openings of the suction valves and the air/water valves until no debris can be seen. Again, clean the bristles and crevices of the brush while immersed in the detergent solution.
4. Using a 30 cc syringe, flush the interior and recessed parts of the biopsy valve while immersed.
5. Soak all components for the amount of time and at the temperature recommended by the manufacturer (or your hospital).

6. Remove the parts from the detergent solution and place in Ultrasonic cleaner.
7. Ultrasonically clean the valves and buttons at 40 kHz for 5 minutes.
8. Rinse the valves and buttons in clean water.

Cleaning Attachments

1. Immerse the removable parts in a basin of detergent solution, prepared according to the manufacturer's instructions.
2. Using a soft clean brush, sponge or lint-free cloth, meticulously clean the outer surfaces in the detergent solution. Clean the bristle sections of the cleaning brushes thoroughly while immersed.
3. To clean the suction cleaning adapter, attach the 30 cc syringe to the biopsy valve connector and flush the tube thoroughly with detergent solution.
4. Soak all components for the amount of time and at the temperature recommended by the manufacturer (or your hospital).
5. Ultrasonically clean the channel cleaning brushes for 5 minutes at 40 MHz.
6. Remove the parts from the detergent solution and place in clean water.
7. Attach the syringe to the suction cleaning adapter and flush the tube with clean water.
8. Remove all accessories from the water.
9. Attach the 30 cc syringe to the suction cleaning adapter and flush air to thoroughly dry the inside of the tube.
10. Use a clean, lint-free cloth to thoroughly dry the parts.

Disinfection of Removable Parts

1. Prepare a basin of disinfection solution according to the manufacturer's instructions.
2. Immerse accessories into basin.
3. While immersed, depress and release the pistons of the valves and the AW channel cleaning adapter to ensure the disinfectant solution contacts all internal surfaces of the valves. Use the 30cc syringe to flush the openings and crevices with disinfection solution to remove all air bubbles.
4. Rub the bristles of the cleaning brushes to ensure all air bubbles are removed.
5. Using a 30 cc syringe, flush the interior and recessed parts of the biopsy valve while immersed.
6. Attach the 30 cc syringe to the suction cleaning adapter and flush the tube with the disinfectant solution to ensure that all air bubbles are expelled.
7. Using a clean, lint-free cloth, wipe away any air bubble adhering to surfaces.
8. Soak the parts for the amount of time, and at the temperature recommended by the disinfectant manufacturer.

Note: Accessories with the colour GREEN are autoclavable. If autoclaving facilities are available, these items can be reprocessed in this manner.

Rinse after Disinfection

Once removed from the disinfectant solution, the parts must be thoroughly rinsed with sterile water to remove any disinfectant residue. If sterile water is not available, fresh tap water, or water which has been processed (e.g. filtered) to improve its microbiological quality may be used instead.

Please consult your hospital's infection control committee for further information.

If non-sterile water is used for rinsing, the parts must be wiped and flushed with 70% ethyl alcohol or 70% isopropyl alcohol as follows:

Rinse with Sterile Water

1. Remove the suction cleaning adapter from the basin of disinfectant solution and attach the 30 cc syringe. Flush with air to expel all disinfectant solution.
2. Remove parts from the disinfectant solution and immerse in a basin of sterile water.
3. While immersed in the sterile water, depress and release the pistons of the valves and AW channel cleaning adapter.
4. Attach the 30 cc syringe to the suction cleaning adapter and flush sterile water through the tube.
5. Gently agitate the parts to thoroughly rinse.
6. Remove the parts from the sterile water.
7. Attach the 30 cc syringe to the suction cleaning adapter and flush air to dry the inside of the tube.
8. Thoroughly dry the parts with a lint-free cloth.

Flush with Alcohol

1. Prepare a small container of 70% isopropyl or ethyl alcohol.
2. Attach the 30 cc syringe to the suction cleaning adapter and flush 70% isopropyl or ethyl alcohol through the tube.
3. Immerse all parts in the alcohol. While immersed, depress and release the pistons of the valves and AW channel cleaning adapter.
4. Remove the parts from the alcohol.
5. Attach the 30 cc syringe to the suction cleaning adapter and flush air to thoroughly expel all alcohol from inside the tube.
6. Using a clean lint-free cloth, thoroughly dry the parts.

Chapter 7

Endoscope Washing Machines

Please refer to your manufacturers instruction manual for any further information regarding endoscope washers.

Chapter 8

Service Department Protocols

- (i) Your Supplies department should be made aware that the equipment needs to be returned for repair and an official order will need to be raised. (if applicable)

- (ii) To Book your repair, call the Toll free Olympus Customer Service hotline on **1300 132 992**.

Have the following information available when you call:

- Your Organisation and department.
- Your contact details including phone, fax and email address.
- The product model and serial number.
- A detailed description of the reported fault with the equipment.
- Any special requests, if required.

Our friendly Customer Service staff will immediately enter your repair requirements into the Service Centre system and issue you with a SERVICE REQUEST FORM.

Keep your service request form as a reference. You will be required to quote the information on this form when making a query with the service centre. Quoting this reference number will expedite your query as it allows immediate access to your repair records.

Enclose a copy of your SERVICE REQUEST FORM, with the equipment being returned to the Service Centre.

Please minimise any accessories that are being sent back to the Service Centre, unless it is essential or defective.

Why?

A Quotation will be completed and delivered promptly to your organisation.

Olympus is able to track and provide feedback at all times on your repair.

Most importantly, your equipment will be back with you sooner!

- (iii) Ensure equipment is properly packed – use the original manufactures case, as it is the best method of storage when despatching.
- (iv) A declaration of contamination status should always be enclosed. The form mentioned above can also be used to declare this.
- (v) It is a requirement of Australian Standard AS/NZS 4187:2003 that disinfection protocols are carried out on all medical equipment sent in fro repair. If this is not possible, the items must be returned in an appropriate biohazard bag.
Olympus Australia has the facilities of correctly disinfect these items upon receipt. (Charges for disinfecting equipment apply)

IMPORTANT

No repair work can proceed until we receive your confirmation, with a valid purchase order no. and signed "Service Quotation" (N/A to customers with valid service contracts)

- (vi) Upon receipt of the hospital's signed authorisation, the repair will commence and we will endeavour to return the equipment within our turnaround target time.
- (vii) At the time of authorisation we will, if so requested, (subject to availability) endeavour to supply you with a loan instrument.

- (viii) On completion of repair, the equipment will be dispatched back to you and the loan equipment will need to be returned to your local Olympus agent as soon as possible.

Our Policy of Quality Service

Olympus' policy has always been to return instruments after repair without any operating faults to ensure that our customers achieve maximum up-time.

This is why, when you send an instrument for repair specifying 'air blockage' you will sometimes receive a report detailing that we have adjusted the angulation system, replaced a worn bending section rubber, etc.

We hope you will agree that this is a sensible policy, operated in the best interests of our customers.

If you ever have any questions regarding your repair, please contact our Customer Service Hotline on 1300 132 992 and we will assist you with your enquiry.

Routine Servicing - Flexible Endoscopes

We strongly recommend that flexible endoscopes be returned for routine servicing at least once a year, ideally, every six months or quarterly if the scopes usage is particularly high.

What Does a Routine Service Cover?

Service requirements differ depending on the model of instrument. Typically, a routine service covers:

- (i) Incoming fault diagnosis inspection
- (ii) Angle wire tension adjustment
- (iii) Angle radius adjustment
- (iv) Bending section rubber replacement
- (v) Lubrication and replacement of perishable components
- (vi) Full functional check
- (vii) Full leak test

Comprehensive Service Agreements

Olympus offers a competitively priced service agreement designed to help protect your Olympus equipment investment. Each plan can be customised to meet specific needs and budgets.

Performance Reporting & Analysis

Cover your equipment with our premium options and receive onsite performance reports and analysis of your Olympus equipment on a regular basis.

Make informed decisions on capital purchases and maintenance options based on operational data on your equipment fleets performance to date within its product life cycle.

Peace of mind is critical.

Having an effective service agreement in place for your Olympus equipment provides you with true peace of mind. Each agreement is designed to eliminate the risk of excessive service expenses and even costlier downtime.

- Maximise repair savings and control service costs
- Maximise uptime
- Improve efficiency

Your Support Network

When you employ the power of Olympus Service, you employ the strength of a full-service support network staffed by highly experience Olympus equipment specialists. Whenever you need them, the following professionals are available on a local and regional level:

- Customer Service Representatives
- Sales Specialists
- Olympus Repair Technicians
- National Service Management
- Field Service Engineers
- Application Specialists

You've made a substantial investment in Olympus. Make sure it stays protected with Olympus Service. For more information please call your local Olympus Representative, alternatively contact our customer service team on **1300 132 992** or info@olympus.com.au.

Chapter 9

Endoscopic Accessories

How to Read Names of Flexible Accessories

All Olympus flexible accessories are given code references from which they can be identified.

Example: **FB - 25 K - 1**
 (1) (2) (3) (4)

1. The first two letters in the code indicate the Endotherapy accessory's model name.

FB	Biopsy Forceps
BC	Cytology Brush
FG	Grasping Forceps / Retrieval Basket
FS	Surgical Scissors / Suture Cutting Forceps
IE	Magnetic Extractor
PW	Washing Pipe
SD	Electrosurgical Snare / Polypectomy Snare
CD	Coagulation Electrode / Heat Probe
FD	Hot Biopsy Forceps
KD	Sphincterotome / Diathermic Cutter
NM	Injection Needle
BW	Brush For Channel Cleaning
HX	Clip Fixing Device / Ligating Device
PR	ERCP Cannulae
SB	Suction Biopsy Unit
CC	Curette
PBD	Biliary Stent
B	Balloon Catheter
BML	Mechanical Lithotripter
M	Measuring Device
NA	Aspiration Biopsy Needle

2. The digit(s) in the middle indicates the serial number of the Endo-therapy accessory type.
3. The final letter in the code indicates the working length of the insertion portion.

B = 950 mm	Q = 1,950 mm
C = 1,050 mm	R = 2,050 mm
D = 1,150 mm	S = 2,150 mm
E = 1,200 mm	T = 2,200 mm
F = 1,250 mm	U = 2,300 mm
G = 1,300 mm	V = 2,400 mm
H = 1,400 mm	W = 2,500 mm
J = 1,450 mm	Z = 3,000 mm
K = 1,500 mm	ST = 500 mm
L = 1,650 mm	SW = 650 mm
M = 1,700 mm	SX = 700 mm
N = 1,800 mm	LB = 4,000 mm
P = 1,900 mm	LD = 5,000 mm

For products with a rotating function "R" is added following the working length code. "I" indicates the instruments compatibility with the refined reprocessing protocol.

So, for example, FB-25K-1 is a Biopsy Forceps 1,550 mm long, and the FG-44NR is a rotatable grasping forceps with the working length of 1,800 mm.

Endoscope Compatibility (Colour Coding)

As the design of endoscopes and their accessories becomes more sophisticated, it is increasingly important that all accessories are checked for compatibility with Endoscope before use.

Olympus Endo-Therapy products have colour coded handles matching the channel openings of Olympus endoscopes. This colour coding is a visual reference to the endoscope's instrument channel diameter. Therefore, by matching an accessory's colour coded handle to the channel opening colour coding, the correct accessory can be quickly and easily identified.

The following table demonstrates colour-to-channel size compatibility:

White	1.2 mm
Violet	1.7 mm
Blue	2.0 / 2.2 mm
Green	2.6 mm
Yellow	2.8 / 3.2 mm
Orange	3.7 / 4.2 mm
Pink	5.0 / 5.5 mm

Electro-Surgical Accessories

Electro-surgery which can be performed using an Endoscope includes polypectomy, sphincterotomy, hot biopsy, haemostasis and others.

Before each operation, the electro-surgical system should be tested according to the instruction manual supplied with the diathermy unit. Should the slightest irregularity or abnormality be suspected, do not use the equipment.

Snares

Before use, make sure snares open/close smoothly and easily and that there are no frays or breaks in the wire. Ensure the snare wire can be retracted in the snare tube completely. Visually inspect the entire snare tube for cracks, breaks, crushed areas etc.

The life of the snare differs widely depending upon use and maintenance.

Hot Biopsy Forceps

Before using hot biopsy forceps, check the distal portion for a curled or swollen sheath, if the electrode shaft is exposed, use a new pair of forceps.

Sphincterotomy Knives

Prior to a sphincterotomy procedure, it is important to pre-form the distal end of the Sphincterotome into a smooth curve by gently running it between thumb and forefinger, taking care not to deform the knife wire. Pre-curved Sphincterotomes are also available and do not require pre-forming.

Several precautions must be observed when using electro-surgical accessories in conjunction with flexible endoscopes:

- (i) Only use endoscopes designed for use with electro-surgical accessories and only use electro-surgical accessories designed for use in conjunction with flexible endoscopes.
- (ii) Only use compatible electro-surgical machines with patient plate, scope lead and leakage current monitor circuits (for example, Olympus PSD-30).
- (iii) Inspect and test the full electro-surgical circuit prior to use. (The Olympus PSD-30 performs this function automatically).
- (iv) When using electro-surgery in conjunction with two-channel endoscopes, ensure any grasping forceps used through the second channel are of the insulated type, and that the active electrode is not brought into contact with the secondary accessory.

- (v) During use, take care not to let the active part of the accessory contact the metal endoscope parts. This is a major cause of damage to sphincterotomy knives in particular.

Inspection

Before each use, always inspect the accessory to ensure it is in good condition. Check for kinks, surface irregularities, spikes protruding from cups and where applicable, smooth operation or that the lumen is patent. If any problem is found, do not use - replace with a new one.

Identification of a fault in endo-therapy equipment either prior to or during use, will preclude treatment. It is, therefore necessary to always provide sufficient stand-by or replacement equipment.

REMEMBER: Damaged accessories can cause expensive endoscope repairs - always keep spares.

Proper Use of Accessories

Most damage to accessories is caused during insertion and use. Always insert only short portions of the instrument - no more than 50mm - at one time. Attempting to insert longer sections will inevitably result in kinks being formed.

If the scope has a forceps raiser, ensure this is raised during initial insertion to stop the accessory extending beyond the distal tip and out of the field of view. Introduce the accessory slowly and when movement is halted by the forceps raiser, lower it, then advance the accessory a little, elevate the raiser until the accessory can be seen through the scope, then advance it carefully to the target. With forward viewing scopes, advance the accessory gradually into the field of view.

REMEMBER: Take care not to let the accessory emerge from the scope too fast or too far, as injury to the patient may result.

Once in position, do not apply excessive force to the operating handle, where fitted. Forceps should require only gentle movement of the slider to operate the jaws. If in any doubt on an accessory's operation, familiarise yourself with the response of the operating mechanism before inserting into the Endoscope.

Due to different tolerances, angulation specifications and details of design, it is strongly recommended that only accessories manufactured by the Endoscope manufacturer should be used in conjunction with that Endoscope. For instance, Olympus biopsy forceps have flexible shafts with two-stage flexibility - the distal portion being significantly more flexible than the proximal portion - to enable correct operation, even when the scope's bending section is tightly angled.

Single Use or Re-Useable?

Olympus Endo-Therapy products have been designed as either single use or re-useable items.

Those which are re-useable should be autoclaved between each use and before the first use when new.

Re-useable endotherapy products have been carefully designed and most accessories can be used extensively if maintained carefully.

Single use products in the Olympus Endo-Therapy System are generally supplied in a sterile condition. These products are **not** designed to withstand being disassembled, cleaned, sterilised, reassembled and re-used, and under no circumstances should this be attempted - dispose of them after the first use.

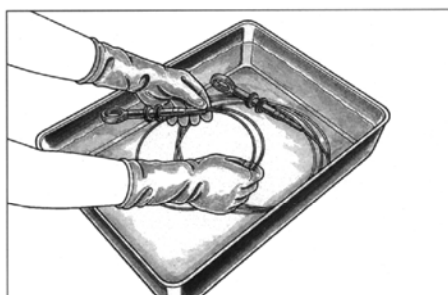
Some types of products are available in both single use and re-useable form, i.e., snares, cytology brushes and injection needles. In these cases, the endoscopist should decide which accessory to use on the basis of the procedure to be performed and from a professional medical viewpoint.

Reprocessing Protocol

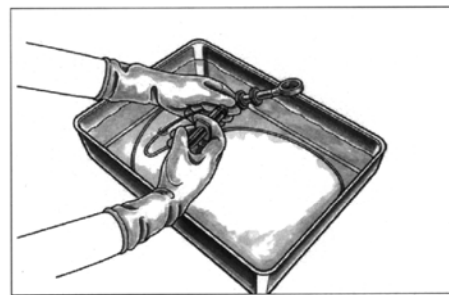
Olympus is the first company to address the issue of Endotherapy Sterilisation. The new Olympus Endotherapy products when reprocessed by the "Refined Reprocessing" procedure are guaranteed to be sterile for the next use.

The Olympus "Refined Reprocessing" protocol includes the following six steps:

Step 1: Immersion

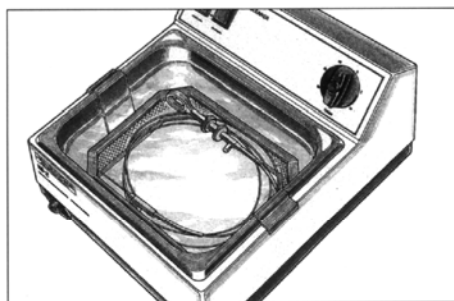


Immerse the instrument in detergent solution immediately after use.

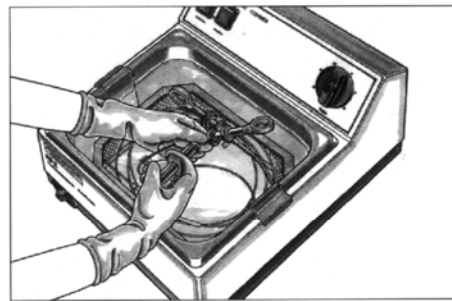


Inject detergent solution (10 ml) through flushing port.
(If equipped with a flushing port)

Step 2: Ultrasonic Cleaning

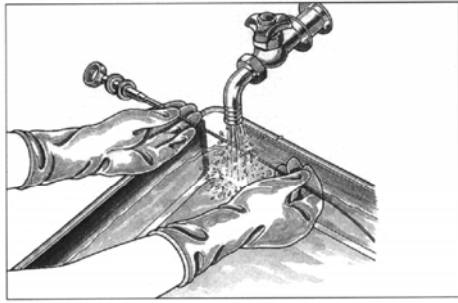


Immerse the instrument in detergent solution.

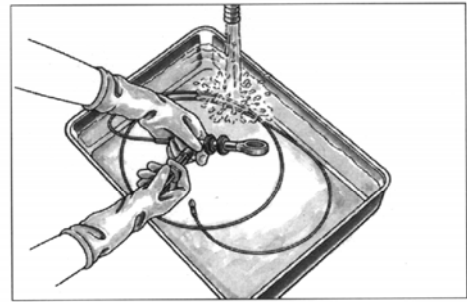


- Inject detergent solution (10 ml) through flushing port.
(If equipped with a flushing port)
- Clean ultrasonically for 30 minutes.

Step 3: Rinsing



Rinse the instrument under clean running water.

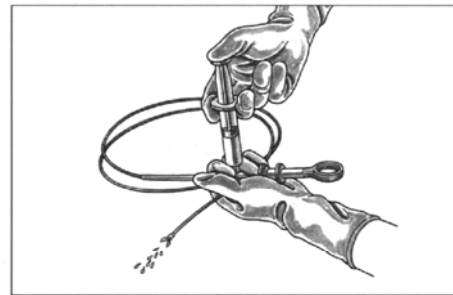


Inject water (10 ml) through flushing port twice.

Step 4: Lubrication

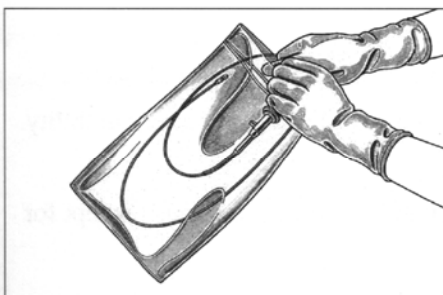


- Immerse the insertion portion in lubricant.
- Inject lubricant until it flows from the distal end of insertion portion. (If equipped with a flushing port)



- Inject air until no liquid appears from the distal end of insertion portion. (If equipped with a flushing port)
- Wipe the exterior of the instrument with a clean lint-free cloth and allow the instrument to air dry.

Step 5: Autoclave



- After coiling the insertion portion, place the instrument in the sterile packaging and seal.
- Place the sealed sterile packaging with the instruments in the autoclave, and autoclave in accordance with the following conditions.

[Recommended Autoclave Cycles (Most common cycle)]

Sterilizer	Temperature	Exposure time
Prevacuum	132°C (270°F) to 134°C (274°F)	5 minutes

This outlined process is a guide for all Endotherapy products. For a detailed protocol of individual products such as snares, sphincterotomy knives etc., ask your local Olympus Representative for a copy of the Refined Reprocessing Nurse Training Guide, or refer to the Cleaning and Sterilising Instructions supplied with all Olympus Accessories.

Storage

Flexible accessories should be stored in their sterile packages and not coiled with a diameter of less than 150mm.

Management of Accessories

Identification of a fault in endo-therapy equipment, either prior to or during use, will preclude treatment. This is especially true in the case of endo-therapy products such as papillotomy knives or high frequency electro-surgical snares. It is therefore, necessary to always stock sufficient stand-by or replacement equipment when using any endo-therapy products.

Identify those accessories which you most commonly use and consume. As your stock levels decrease, re-order a sufficient quantity to ensure you always have stock.

Never wait until you have exhausted your supplies before re-ordering, as you may find yourself without a particular accessory.

Guarantee

All Olympus Endo-Therapy accessories are carefully inspected and tested before shipment, but because of the risk of damage by misuse, we regret they cannot be covered by a guarantee. Please

therefore, always examine your accessories upon receipt and return them immediately, should they not reach you in a satisfactory condition.

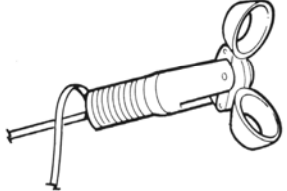
Repair Policy

Olympus Endo-Therapy products are designed and manufactured to exacting standards. Special equipment is necessary to ensure that each accessory is to the required quality and this can only be achieved in a controlled manufacturing environment. It is therefore, Olympus' policy not to attempt repair of flexible accessories or valves, etc, as it would generally not be possible to return them to their

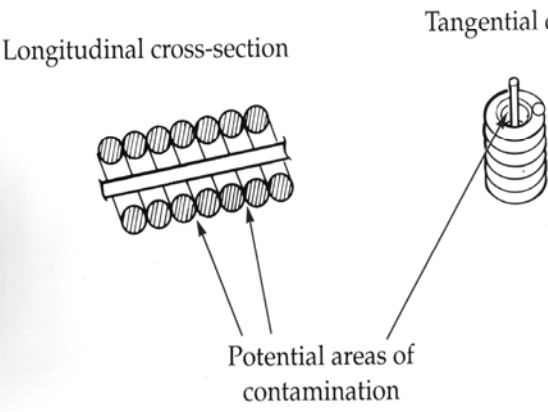
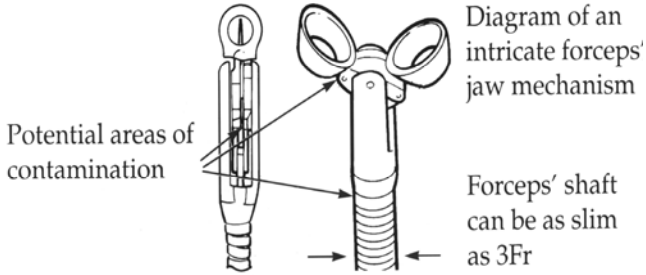
original specification. This would not be in the best interests of patient safety and could be potentially damaging for the endoscope.

For detailed instructions about cleaning, disinfecting and sterilisation of Endotherapy products always refer to the Instruction Booklets supplied with every Olympus product.

Forceps' Construction



Construction of a spiral sheath of a flexible accessory



ANCILLARY ITEMS

Ultrasonic cleaning is also effective on ancillary items such as scope valves, mouthguards and dilator flexible tips.

Chapter 10

Cleaning and Disinfection of Bronchoscopes

Cleaning and disinfection of bronchoscopes can be broken down into the following stages:

1. Pre-cleaning
2. Leak testing
3. Brushing
4. Manual flushing
5. Rinsing
6. High level disinfection / sterilisation
7. Rinse after disinfection
8. Alcohol flush

Pre-cleaning

***P**erformed at the bedside immediately after each examination.*

- (1) Prepare a container of detergent solution.
- (2) Wipe the entire insertion tube with a clean, lint-free cloth soaked in detergent solution.
- (3) Place the distal end of the insertion tube in detergent solution and aspirate detergent solution for 30 seconds (approximately 200mls suctioned through). Then aspirate air for 10 seconds.

CAUTION: Monitor the suction bottle carefully to be sure that it does not overflow, as this could result in damage to the suction pump.

- (4) Turn OFF the light source. Turn OFF the video processor. (If further cases follow immediately after, the light source CAN be left running).
- (5) Disconnect the suction tube from the suction connector.
- (6) Disconnect the video scope cable from the bronchoscope. Remove the endoscope from the light source. Replace the waterproof cap (MH-553).
- (7) Remove the suction button and biopsy cap from the scope.
- (8) Transport bronchoscope and accessories carefully to your clean up area.

Leak Testing

The full leak testing protocol is described on page 15 of this manual. Follow the same process to leak test the bronchoscope.

Brushing of Internal Channels

1. Fill a basin with water and low foaming detergent solution to the temperature and concentration recommended by the manufacturer. Use a basin that is deep enough to allow the bronchoscope to be completely immersed.
2. Immerse the bronchoscope, suction valve and biopsy valve into the basin with detergent solution.
3. With the bronchoscope immersed, use a soft brush or lint-free cloth to thoroughly brush and wipe all outside surfaces of the scope. Ensure that all surfaces of the distal end are cleaned thoroughly.
4. Brush the instrument/suction channel, suction cylinder and instrument channel opening according to the following procedure:

Grip the Channel Cleaning Brush 3cm from the bristles. (NB: Please refer to your scopes manual for the cleaning brush best suited to your model).

Insert it at a 45° angle into the opening of the suction valve housing.

Using short strokes, feed the brush through the insertion tube until it emerges from the distal end of the scope. Clean off the bristles with your fingertips. Carefully pull the brush back through the channel. Clean off the bristles again. If debris remains after brushing repeat until all debris is removed.

Insert the channel cleaning brush into the biopsy valve housing.

Using short strokes, feed the brush through the insertion tube until it emerges from the distal end of the scope. Clean off the bristles with your fingertips. Carefully pull the brush back through the channel. Clean off the bristles again.

If debris remains after brushing repeat until all debris is removed.

Insert the channel opening cleaning brush (MH-507) into the suction valve cylinder until approximately half of the brush head is inside the opening. Rotate the brush once and then pull it out. Wash the bristles. Repeat for the biopsy port.

Flushing of Internal Channels

1. Attach the Cleaning Adaptor (MAJ-222) to the bronchoscope.
2. Attach 30cc "Luer Lock" syringe to the injection tube's port. Inject 100mls of detergent solution to flush the channels. (If suction is available – attach suction to the MAJ-222 and suction detergent solution through the scope for 30 seconds).
3. Inject air through the scopes channels to remove the detergent solution. (Or use suction to aspirate air through the channels).
4. Remove the scope from the detergent solution and immerse in a basin of fresh water.
5. Attach 30cc "Luer Lock" syringe to the injection tube's port. Inject 200mls of water to flush the channels. (If suction is available – attach suction to the MAJ-222 and suction water through the scope for 60 seconds).
6. Inject air through the scopes channels to remove the water. (Or use suction to aspirate air through the channels).

Terminal Cleaning / Flushing:

Immediately before storing your endoscope at the completion of your list flush channels with alcohol as follows:

1. Fill a 30ml syringe with 70% isopropyl alcohol or 70% ethyl alcohol. Using the 30 ml syringe attached to the MAJ-222 cleaning adapter, flush the scopes channels with 30 mls of alcohol.
2. Flush the scopes channels with 60 mls of air.

Use a lint free cloth moistened with 70% isopropyl alcohol or 70% ethyl alcohol to thoroughly wipe the external surfaces of the bronchoscope.

OLYMPUS®

REPAIR EXPEDITION FORM

Please complete this form and enclose it with the instrument you are sending for repair.
Upon receipt, our Service Centre will contact you with details concerning the repair,
an estimated turn-around time and quotation.

**ALL INSTRUMENTS MUST BE CLEANED AND PROPERLY DISINFECTED
PRIOR TO SHIPMENT TO OUR SERVICE CENTRE.**

Hospital Name: _____

Contact Name: _____ Department: _____

Telephone No: _____ Fax No: _____

Hospital Address: _____

Delivery Address (if different from above): _____

Model No: _____ Serial No: _____

Problem description: _____

This form authorises Olympus to complete any repair up to and including your
amount indicated below:

Up to \$500 Up to \$1,500 Up to \$3,000 Up to \$5,000 _____
Pre-approved amount

Order No: _____

Please tick the appropriate box:



THIS INSTRUMENT WAS Cleaned Disinfected

Signed: _____ Date: ____/____/____

Name: (Please print): _____

Notes: