Equipment for genitourinary medicine

Choosing equipment for colposcopy in genitourinary medicine

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Colposcopy is the examination of the lower genital tract in women using a low power microscope and was first described by Hinselmann in Germany in 1925. Hinselmann's thinking when he developed the technique was that cervical cancer must start as "mini-cancer": a lesion not visible to the naked eye but which could be seen with suitable magnification and illumination. This hypothesis proved not to be true, but the changes that he did see were found to indicate a precancerous state (cervical intraepithelial neoplasia or CIN). Although originally described as a screening procedure, the introduction of cytological techniques by Papanicolau in the 1940s led to colposcopy being developed mainly as a secondary investigation, used as the principle technique in the investigation of the abnormal or unsatisfactory cervical smear.

The order and details of the parts of the colposcopic examination have been described by Souther.1 The genitourinary physician must be aware that this technique is designed for the diagnosis of premalignant disease, and will need modification and additions if tests for sexually transmitted infection are undertaken at the same time.

EQUIPMENT FOR COLPOSCOPY

(1) The colposcopy couch or chair (fig 1)

The requirements for colposcopic examination are broadly the same as for an examination for sexually transmitted disease, but correct positioning of the patient is vital. The essential features are therefore:

(a) A couch or chair in which the woman sits or lies with her buttocks on the edge and her legs supported with hips abducted. Leg supports can be under-knee crutches (Lloyd-Davies pattern) or heel supports: the author finds that most women prefer the latter. Lithotomy poles with ankle straps should never be used with the conscious patient.

(b) Adjustable height and angle. This is essential to obtain a good view in all cases, unless the colposcopist is also a contortionist! Although manual control may suffice, electric adjustment is quicker and more accurate.

(c) Adjustable angle of back support for patients. Although few choose to lie flat for examination the preferred angle of inclination varies from person to person.

(d) A tray below the buttocks to hold discarded swabs and instruments.

(e) The option to lie the patient flat or in a head-down position. Occasionally women experience synopal attacks during examination, especially on cervical biopsy. A couch that can be quickly flattened or tilted head down, with a cushioned section that can be attached to support the legs makes it unnecessary to transfer such patients to a conventional couch in a semiconscious state. Because of this risk of syncope, access should always be available to oxygen and a basic resuscitation pack containing drugs and other equipment.

(2) The Colposcope (figs 1, 2)

The essential features of the coloscope are:

(a) A binocular low powered microscope, giving an effective magnification of between × 6 and × 40. The instrument should have a number of steps between these limits, or have a zoom lens.

(b) An integral light source. This may be situated in the body of the microscope, in which case the whole instrument can become hot during use. It is probably better for the light source to be in the base, with a fibre-optic connection.

(c) A green filter that can be moved in and out of the visual field.

(d) A heavy mobile base, on which the microscope is adjustable for height and angle. Generally instruments permanently clamped on to chairs or couches are less satisfactory.

Not essential but desirable features include:

(e) A reasonably long focal length. For cleaning the cervix, smear-taking, retraction and especially for biopsy the colposcopist needs to be able to work with instruments in front of the microscope without crowding it. To create this distance a minimum focal length of 300 mm is desirable: some may prefer 350 mm or longer.

(f) A camera attachment, to allow permanent recording of appearances. This is best through the coloscope's own optical system, using a beam splitter.

(g) A teaching attachment. Fixed monocular teach-
ing tubes have now been largely superceded by light video cameras.

(3) Vaginal specula
Standard bivalve instruments are used, usually inserted with the handle downwards and locked open during the examination.

(4) Instruments for cervical smear taking
There is no single ideal instrument to take a cervical smear. Although for use in the general population the Aylesbury pattern gives more reliable results, for the genitourinary medicine clinic population this is not so. Women attending such clinics are on average younger, more likely to be using oral contraception, more likely to have cervical columnar cell ectopy (an erosion) and more likely to have cervical infection. For such cases the Ayre spatula has been shown to give equally accurate smears with a lower risk of the smear being unreliable because of the presence of blood or pus. For the older woman in whom the squamocolumnar junction has receded into the endocervical canal a smear should be taken with an endocervical brush as well as one with a spatula. All three instruments should be available on the instrument tray.

(5) Swabs for cleaning
Three types should be available:
(a) Small cotton tipped swabs of the pattern used for bacterial culture, to enable cleaning of very small areas and within the endocervical canal.
(b) Medium sized swabs, each of which will absorb about 3 ml of fluid. These can be used for cleaning, painting and pressure application and are the most commonly used swab.
(c) Small surgical swabs on sponge-holders (Rampleys pattern). These are used for cleaning out large volumes of fluid (blood or acetic acid) from the vagina and for firm pressure on bleeding points and biopsy sites.

(6) Solutions
Three standard solutions should be available for diagnostic purposes:
(a) normal saline, to clean and "freshen" normally moist surfaces. This enables the vascular pattern to be observed.
(b) acetic acid at either 3% or 5% of glacial strength. Application of this affects mature normal tissue only minimally, but causes abnormal tissue to turn white. The denseness of the white change usually reflects the degree of abnormality. The solution can be dabbed on to the cervix with swabs or sprayed on to
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the surface from a laboratory wash-bottle. Stinging may occur, and surplus fluid should be mopped out of the vagina immediately. At least 30 seconds should be allowed for the effect of the acetic acid to appear.

(c) iodine, as standard Lugol's solution (the original solution as described by Schiller is too weak for usefulness). Many colposcopists do not use this preparation routinely, but some find it useful in checking the outer extent of the abnormality demonstrated by acetic acid. Iodine stains only the mature glycogen-containing epithelium; as well as CIN, immature squamous epithelium, inflamed squamous epithelium and columnar epithelium will be left unstained. Thus Schiller's test will not identify abnormal epithelium or the degree of CIN: it simply shows the extent of the fully mature, un-inflamed squamous epithelium. Iodine must be painted on carefully and sparingly: severe reactions can occur in some women if it is spilt on the skin.

(7) Instruments for retraction
It may be necessary to push or pull the cervix into different positions to inspect its whole surface and that of the vagina. This may be done with a swab or a small hook such as is used for eye or ear, nose and throat surgery. If the cervix is difficult to manipulate, it can be grasped with a single-toothed vulsellum or a tissue-holding forceps (Littlewoods pattern) and pulled more firmly. However, the puncture marks thus created will almost certainly bleed.

For adequate colposcopy the whole of the present squamo-columnar junction must be seen and identified. If this border is high up inside the endocervical canal it may be brought into view by the use of an

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Figure 2 Most modern colposcopes have distant light sources with fibre optic relay. This allows for proper bulb cooling, and a brighter light without the colposcope head becoming hot.

Figure 3 The Eppendorff forceps is the general favourite for biopsy. The head can be removed for sharpening.
(a) Eppendorfer forceps (fig 3). Probably the favourite of colposcopists, taking a clean bite from most tissues. It is a fragile instrument, easily blunted and strained; it is also expensive to buy and maintain, although the heads can be bought separately. The cutting edge can be circular or oval.
(b) Tischler forceps. A strong instrument, with teeth to grasp the tissue prior to cutting it. Usefull for vaginal biopsy but generally too brutal for the cervix.
(c) Kevorkian–Younge forceps. This forceps also has teeth, but these are smaller than those of the Tischler forceps. This general purpose forceps is much less expensive than the Eppendorfer, but not as popular.
(d) Sharpe forceps. This instrument is different in that it has a replaceable cutting edge, and therefore there are no problems from bluntness. It is comparatively new and untried.
(e) Kevorkian endocervical curette (fig 5).

Figure 4  (a) Kogans forceps. (b) These may be used to inspect the endocervical canal to a depth of about 1 cm.

endocervical speculum. Kogans pattern (fig 4) will lock open, allowing tests to be taken from the canal under direct vision.

(8) Biopsy instruments
These fall into two categories: cutting biopsy forceps and endocervical curettes. Biopsy forceps need to be capable of removing an adequate specimen for histological assessment, with dimensions of 2–3 mm in all directions, and for routine use there is no place for the miniature instruments described by Dunlop et al.4 CIN is delicate tissue and easily crushed: the forceps must protect the biopsy as well as remove it. Suitable instruments are:

Figure 5  Kevorkian endocervical curette. The cross-bars catch the material removed making it available for a pathologist’s examination.

(9) Haemostasis
Haemostasis is secured largely by pressure on the bleeding points, the main factor being the length of time applied. However, styptic preparations probably do have a beneficial effect, and will of themselves stop small bleeding points. Amongst those used are Monsells solution (ferric sulphate), silver nitrate and such old favourites as witch hazel.

When bleeding has stopped it is worthwhile to insert a tampon in the vagina to continue the pressure on the cervix and to be removed 3–4 hours later. In many clinics women who have undergone colposcopic cervical biopsy are asked not to leave the premises for 30 minutes, after which time a nurse checks that blood has not soaked through the tampon. If blood is seen then the cervix must be re-examined and any recurrent bleeding staunched.

(10) Documentation
Very careful documentation is needed after colposcopy, especially so that clinical appearances can be correlated with histopathological findings and so that treatment can be undertaken at the second visit on the basis of findings at the first examination. For this a good diagram is essential, identifying affected areas on the cervix and the vagina, and if needs be, on the vulva and perineum. Many colposcopists favour a full size recording sheet, a fresh one to be used at each visit; this does make the notes very thick and
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“stamped on” diagrams within the normal notes may be preferred. On the diagram of the cervix it is essential to make clear:
The line of the present squamo-columnar junction
Nabothian follicles and gland openings
Areas of keratin (white before the application of acetic acid)
Areas of mosaic and punctation, and the type (for example, fine, coarse, corkscrew or hairpin vessels etc.)
Obvious condylomata, polyps, etc.
Overall suggestive patterns (as for example of trichomoniasis or atrophic vaginitis)
The effect of acetic acid (degree of whiteness, accurate lines of acetowhite effect etc.)
The effect and extent of iodine staining (if applied)
Biopsy sites
It is easiest to treat the cervix as a clock-face for recording purposes, breaking it up into twelve easily recognised segments.

Treatment
Having diagnosed CIN or warty lesions on the cervix many genitourinary physicians will wish to proceed to treat them, and certainly effective locally destructive treatments, such as cryotherapy and “cold” coagulation are painless and easily applied in the clinic setting. Recently, however, the initial euphoria over the success of local destruction of such lesions has been dampened by reports of recurrence in a significant number of cases and in a few the development of invasive cancer after treatment. The techniques of locally destructive therapy are outside the scope of this article, but the basic requirements for suitability for such treatment can be stated as follows:
The lesion must be fully visible on colposcopy.
Cytology, colposcopy and the results of colposcopically-directed biopsy of the worse areas must agree, and all tests should have excluded the presence of invasive carcinoma.

Diagnostic colposcopy and treatment should be performed by an experienced colposcopist, ideally the same person for both visits. Under normal circumstances to be regarded as experienced a doctor should have had two years minimum training on a weekly basis under adequate supervision. A theoretical course should have been attended, and practical experience should have been acquired ideally in both gynaecological and genitourinary clinics.


Useful addresses

Suppliers of equipment
Akron Products Ltd, 1 Farthing Road, Ipswich IP1 5AP. (Couches and Chairs).
Euro surgical Ltd, The Common, Cranleigh GU6 8LU. (Biopsy Instruments, Colposcopes).
Rocket of London Ltd, Imperial Way, Watford WD2 4XX. (Biopsy Instruments).
Cory Bros Ltd, 4 Dollis Park, London N3 1HG. (Biopsy Instruments, Colposcopes).
Carl Zeiss (Oberkochen) Ltd, PO Box 78, Woodfield Road, Welwyn Garden City, Herts AL7 1LU (Colposcopes).
Codman Ltd, 110 High Street, Maidenhead, Berks SL6 1QX (Colposcopes).
Olympus Ltd, 2 Honduras Street, London EC1Y 0TX. (Colposcopes).

Learned Societies
British Society for Colposcopy and Cervical Pathology.
Secretary: Dr James Cordiner, Queen Mothers Hospital, Glasgow G3 8SH.
Genitourinary Medicine Colposcopy Society.
Secretary: Dr Brian Evans, West London Hospital, Hammersmith Road, London W6 7DQ.

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