Current Practice

Asepsis in General Practice

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Aseptic techniques in hospitals have been changing over the past few years and the influence of these changes on techniques in general practice will be considered in this article. A report on sterilizing practices in six hospitals published by the Nuffield Provincial Hospitals Trust¹ indicated many deficiencies in traditional sterilizing methods. Following this and other publications, many central sterile supply departments have become established in hospitals. These departments pack and sterilize syringes, dressings, and other equipment, and distribute as required to wards and operating theatres. The main advantages of this system are that sterilizing processes are carried out in one central department and are safer and more easily controlled; boiling of equipment in the wards is almost or entirely eliminated and there is a saving of nurses' time. Disposable equipment has also become more readily available and where necessary can be obtained in pre-sterilized packs from commercial sources. Although the use of disposables is sometimes expensive when compared with similar non-disposable equipment, costs will probably become less with increased demands. It is impossible to prove that the establishment of central sterile supply departments and the increased use of disposables has reduced hospital cross-infection, although some reports suggest that a reduction has occurred.

Although wound sepsis is not a major problem in general practice, it is obviously preferable to use efficiently sterilized materials and equipment for all aseptic techniques, whether in hospital or in a patient's home. A recent report by the Queen's Institute of District Nursing² indicates that standards of asepsis in domiciliary practice could be improved by the adoption of these new methods.

Sterilization

Sterilization means the killing of all micro-organisms, whereas disinfection (e.g., by boiling) means the killing of all vegetative organisms but not necessarily of spores; as most infections are due to vegetative organisms, disinfection by boiling in water is still a useful procedure. The report of the Queen's Institute of District Nursing recommends that syringes and instruments should be boiled for 10 minutes; the equipment should be completely immersed and free of air bubbles, and component parts of syringes should be separated during the boiling process. Thorough cleaning is essential, as some vegetative forms of bacteria and possibly the virus of serum hepatitis may survive the treatment if protected by dried serum or other organic matter. The immersion of instruments in disinfectants is less reliable and the common practice of immersing syringes in methylated spirits cannot be recommended.

Steam Sterilization

Steam at high pressure is an effective method of sterilization—e.g., 121° C. for 15 minutes, 126° C. for 10 minutes, 134° C. for 3 minutes. Small portable autoclaves heated by gas or

electricity can be obtained for sterilizing instruments and dressings. A thermometer should be fitted to these autoclaves in addition to a pressure gauge, and if used for dressings it should be possible to obtain a vacuum for drying after sterilization. A domestic pressure cooker may be a useful and less expensive alternative to an autoclave.³ Small automatic high vacuum sterilizers are also available for rapidly sterilizing instruments, but are rather expensive.

Dry Heat Sterilization

Dressings are commonly "sterilized" in domiciliary practice by baking in a domestic oven, but there is always the risk of inadequate sterilization or overheating unless an accurate thermostat and thermometer are fitted. Even with these instruments the method may not be reliable, as there is often considerable temperature variation in different parts of an oven. In the absence of more suitable methods (e.g., autoclaving) it is preferable to treat dressings in a domestic oven rather than to use untreated dressings. Nevertheless, dry heat (160° C. for 60 minutes) is an effective method of sterilization, and is particularly useful for syringes, which may be assembled ready for use and sterilized in a sealed metal or glass container. Small hot-air ovens are used by some general practitioners for sterilizing syringes and dressings, and a small high-speed dry heat sterilizer is available.⁴ Autoclaves and hot-air ovens should be regularly tested for efficiency, and one of the simplest methods of testing is by the use of Browne's tubes.[†] These tubes contain a chemical indicator which changes colour in response to certain combinations of temperature and time.

Sterilization by means of an autoclave or hot-air oven is possibly too expensive and time-consuming for practitioners with limited facilities and may be unreliable unless adequately controlled and supervised. A satisfactory alternative would be to obtain supplies of pre-sterilized materials, thereby eliminating the necessity of sterilizing equipment in small units.

Pre-sterilized Equipment

Syringes

An injection is the commonest aseptic procedure in domiciliary practice. Although infection of an injection site is rare, there is always the risk of transmitting the virus of serum hepatitis by the use of inadequately sterilized syringes and needles. Sterilized syringes and needles should therefore be used for all injections and venepunctures.

Hospital central supply departments can at present supply sterile syringes to general practitioners for taking blood, and most of these departments or the commercial sterile syringe services could increase their output, given extra staff and materials. Disposable plastic syringes sterilized by gamma radiation or ethylene oxide are being increasingly used, particularly for emergencies and night calls. Disposable syringes have the advantage of not being returnable for cleaning and

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† Obtainable from Albert Browne Ltd., Chancery Street, Leicester.

sterilizing, although disposal of large numbers of syringes and needles may create further problems. Disposable needles are particularly valuable, as they are invariably sharp as well as sterile and cheap, and can be used with glass or disposable syringes.

Dressings and Instruments

Traditional dressing materials may be prescribed and a district nurse may arrange for the patient to "sterilize" these in a domestic oven, but often non-sterile materials are used. Public health authorities usually supply maternity packs containing sterile materials, but rarely other types of sterile pack. A wide range of sterilized dressing packs can be obtained commercially—e.g., post-operative, post-operative (gynaecological), inoculation, casualty, etc.—but these are at present expensive and do not usually contain instruments. A general practitioner must either sterilize his own dressings and instruments or arrange for these to be sterilized unofficially at a local hospital. This arrangement is unsatisfactory, and the issue of sterilized packs for all aseptic techniques would be invaluable. A few standard packs would meet most requirements—e.g., a suture pack might contain a paper dressing towel, gauze swabs, dressings, cotton wool balls, a disposable gallipot, dressing forceps, artery forceps, scissors, needle holder, sutures, and needles. If preferred, instruments could be supplied in a separate pack, depending on requirements, and used in conjunction with standard dressing packs. A small selection of sterilized packs, each containing a separate item—e.g., a dressing towel or scalpel, could also be supplied if required.

A "no touch" technique should be used with all aseptic procedures, and methods of using dressings and instrument packs could be demonstrated at central sterile supply departments; if necessary, instruction sheets describing the techniques could be issued with the packs. Sterilized packs could be supplied to practitioners by large hospital central sterile supply departments⁵ or by the usual commercial sources. It is probable that both methods of supply would be necessary, depending on local facilities.

Other Types of Disposable Equipment

Gloves

Disposable gloves are already widely used in general practice for various clinical examinations and minor surgery. These are cheap and time-saving, and they should reduce the hazard of cross-infection, particularly with gynaecological examinations. Convenient sterile packs containing strong yet sensitive disposable plastic gloves can be obtained in several sizes for sterile procedures.

Disposable Instruments

A number of disposable instruments are now available—e.g., dressing forceps (metal or plastic), scissors, scalpels, suture needles, blood lancets, umbilical clamps, vaginal specula,

and mucus extractors for the newborn. Catheters are difficult to sterilize, and only pre-sterilized disposable catheters should now be used in domiciliary practice. Contamination of the injured cornea by non-sterile eye-drops or droppers may be followed by serious eye infection; individually sterilized plastic droppers can be obtained which would reduce this hazard. Sterilized sets of disposable equipment can be obtained commercially for most aseptic procedures (e.g., catheterization, bladder irrigation, urine and blood collection, and lumbar puncture). Many of these sets and some of the instruments are at present rather expensive.

Paper Products

A wide range of paper materials are produced by many manufacturers. These products are variable in quality and must be selected according to requirements—e.g., paper hand towels need to be soft, absorbent, and to have high wet-strength, whereas outer coverings of dressing-packs should allow penetration of steam and air but not bacteria and have a high tensile strength. Paper products of particular value are hand and dressing towels, masks, operating caps, sheets for covering examination couches, bags for disposal of soiled dressings, tissues for a wide variety of uses, and pads for incontinent patients. Paper bedding and gowns can also be obtained, but are expensive and are unlikely to be of much general value.

Plastic Products

A wide range of plastic equipment is available, much of which is not necessarily disposable after single usage—e.g., draw-sheets, mattress and pillow covers, aprons, pants for incontinent patients, bowls, gallipots, receivers, and instrument trays. Many plastic materials are heat sensitive and require sterilization by gamma radiation or ethylene oxide.

Other Materials

Although most disposable articles are made of paper or plastic, other materials may be used—e.g., disposable bowls, gallipots, and receivers are often made of aluminium foil.

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