

The weakest link?

Specimen collection for clinical microbiology

Recent years have seen wonderful advances in the technology available within the clinical microbiology laboratory. Traditional methods have been improved with the availability of chromogenic media and spiral platers, while automated systems are used for blood culture, urine handling and analysis, immunoassay, bacterial identification and antibiotic susceptibility testing. Difficult cases will yield their answers to advanced molecular techniques such as ELISA and PCR.

These methods, combined with the technical expertise of dedicated clinical microbiologists enable laboratories to quickly provide accurate results, often on-line, so that patients can be treated appropriately and effectively.

The one area that is often overlooked is that of specimen collection and transport. Centralised laboratory services often mean microbiology specimens being sent to laboratories many miles away. And although some laboratories provide 24 hour service, this is not universal and specimens often have to wait until the next day for processing.

The problem is that a clinical specimen is a piece of biological material, with living cells, some bodily fluids and possibly a community of bacteria, some of which will thrive in their new environment, while others will tend to perish. Within a few hours the make up of this community may have completely changed. For example, a sterile specimen of urine may have been contaminated with a few *E. coli* and in a few hours is transformed into an apparent case of bacteriuria. What is even more dangerous is if such burgeoning growth were to mask the presence of other slower growing pathogens.

The physical process of transport presents its own challenges to the specimen. Vacuum tube transport systems within hospitals are excellent, but any transport device has to be rigid and sturdy enough, and properly closed if it is to arrive intact in the laboratory. Specimens coming by dedicated courier or by post need to be capable of withstanding rigorous handling. Leaking or damaged specimens are not only unpleasant, and hazardous for the receiving staff, but will often be rejected as unusable, which can be disastrous for the patient. Some specimens are distressing and painful to provide, some may require invasive procedures, and to have them rejected means that the procedure has been wasted, no progress can be made in determining treatment, and the patient has been let down with potentially serious consequences.

If all the advanced technology and highly trained staff are to be of any assistance to the patient, it is vital that specimens are properly collected and transported. In these times when healthcare budgets are under so much pressure and scrutiny, it can be tempting to treat transport devices as a commodity, and buy the cheapest available. The result can be, however, that

instead of saving a few pence or cents, the whole test is compromised, valuable staff time is wasted, and the patient's illness prolonged.

A specimen transport device faces three main challenges. Firstly it has to collect an adequate sample, secondly it must withstand the rigours of transport, and thirdly it should maintain the sample material in a condition which represents as closely as possible the original specimen, including the relative populations of infectious microorganisms. These challenges are addressed in the CLSI (formerly NCCLS) standard M40-A, published in 2003. This document provides device manufacturers and device users with guidelines to assess the suitability of these devices for the transport of microbiological specimens.

Medical Wire has long been a leader in the manufacture of devices for the safe collection and transport of clinical microbiology specimens. In 1975 it introduced Transwab[®], a self-contained transport swab system for the safe collection and transport of bacteriological specimens. The swab tube contains a gel transport system, based on the media of Amies (1967) and of Stuart (1946). This was followed by Transtube[®], a liquid transport system, and in 1979 by Virocult[®] providing a similar safe and effective transport device for viral specimens.

Over the years Transwabs[®] have developed to provide specimen collection solutions for many different tasks. The standard Transwab[®] has a plastic shaft with standard rayon bud suitable for many specimens including respiratory, wound, and vaginal. For ear and urethral specimens Transwab[®] is available with either a straight aluminium shaft or a stiff twisted nichrome wire shaft, both with narrow mini-tip buds to enable sampling from narrow orifices. A pernasal version of Transwab[®] has a very fine twisted nichrome wire shaft with tiny rayon bud. This version is very flexible to allow sampling from the nasopharyngeal region, for example when testing for *Bordetella pertussis*. The different versions of Transwab[®] are distinguished by colour coded caps making it easy for clinical personnel to select the correct swab.

All Transwabs[®] have rayon fibre buds. In the development of the M40 standard it emerged that rayon will normally give the best performance for the recovery of viable bacteria. Transwabs[®] also all feature a bell-cap holder for the swab which gives a degree of protection to the user, and also ensures an effective double seal on the tube containing the potentially hazardous specimen. Transwab[®] medium, modified from Amies formulation, has been developed to ensure good recovery of all microorganisms, maintaining them in a viable condition without allowing overgrowth of contaminants.

Transwabs[®] are all CE-marked and are Class IIa sterile medical devices (European Medical Devices Directive 1993) meaning they can be safely used for sampling from surgical wounds.

Full details of Transwabs[®], and many other specimen collection devices can be found at Medical Wire's website, www.mwe.co.uk.

References

1. CLSI. Quality Control of Microbiological Transport Systems; Approved Standard, CLSI document M40-A [ISBN 1-56238-520-8].
2. European Medical Devices Directive 93/42/EEC