A swab is a swab?

We don’t think so!!
Says who?

Say the microbes!
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Swabs may look similar, and you might save a little by buying cheap, but if the bacteria and other passengers don’t arrive safely at the lab, what have you saved.

A transport swab is essentially a kit, and has a vital role to play in the accurate and timely diagnosis of infectious disease.

What about the bud? Isn’t it just a piece of cotton wool? Well from some sources it might well be. But did you know cotton can be toxic for bacteria? Cotton wool contains various fatty acids, some of which are toxic to bacteria if in contact for an extended period. The irradiation which is used to sterilise swabs actually makes this worse as it causes these fatty acids to leach from the material. When swabs are used immediately, as with cotton applicator swabs for sensitivity testing in the lab, this will not have a serious effect, but when used in transport devices there can be a dramatic loss in recovery.

But the matter doesn’t end there. Even with the correct material, some buds can be wound too tightly which results in bacteria being trapped and unable to be released for testing in the laboratory. Recent studies have shown this to be a significant issue. There has recently been interest in “flocked swabs” where the bud is formed by small nylon fibres glued to a shaped plastic stick. These have the advantage of providing a large surface area for bacterial attachment, and can be shown to give excellent release of coloured dyes taken on to the bud in demonstrations. But bacteria are not coloured dyes! Unfortunately some are rather more sticky and actual release can be less than predicted. There have also been reports of lung disease attributed to flock fibres.
And the stick? Wood, wire, plastic? What's the difference? Well wood has the same problem as cotton, leaching fatty acids, particularly after irradiation. There is also the risk of breaking and splintering. Plastic such as polystyrene and polypropylene are ideal as they are inert in the transport medium, although it is important that the plastic sticks are not too brittle as this can represent a hazard to patient and clinician.

Medical Wire does not use wood sticks or cotton buds for any of its transport swabs. Shafts are made from polystyrene, aluminium or nichrome according to intended application. Buds on our transport swabs (Transwab®, Transtube® & Virocult®) are rayon which has been shown to give the best results for live microorganisms. In addition, Medical Wire's transport swabs feature a “bell cap” holder which provides protection for both user and specimen, and gives a double seal (inside and outside) to the transport tube.

What about the medium? Stuart’s, Amies, Cary Blair ...does that matter?
Well, yes. Stuart’s medium was a great step forward in 1946, but was eventually found to have limitations due to the nutrient properties of the calcium glycerophosphate incorporated as the buffer. Some bacteria will metabolise this and grow rapidly, and distort the population of microorganisms in the specimen, leading to false diagnosis. Stuart’s medium also needs a charcoal coated swab bud, which is not popular with patients. In 1967 Amies moved the science forward with his medium using inorganic phosphate as the buffer, and incorporating charcoal into the medium, rather than leaving it on the swab. He also included agar to give the now familiar semi-solid gel that slows down oxygen diffusion giving improved conditions for hard-to-recover anaerobes. Amies’ is now recognised as the medium of choice for the majority of specimen collection situations. The medium of Cary and Blair is also particularly good for fecal specimens. The high pH and low nutrient content inhibit overgrowth of common enteric bacteria, while allowing extended survival of Salmonella and Shigella.

These are the published formulations, but other factors are also important in determining the effectiveness of a particular medium. Reagents come in different grades, and impurities can have a deleterious effect on performance, particularly with fastidious bacteria. Some agars have a high bioburden which after manufacture is translated into high levels of non-viable organisms, and causes havoc with the interpretation of Gram films. Some charcoal materials are “lumpy” also interfering with microscopy. Medical Wire uses agar from trusted sources, tested for low bioburden. Together with carefully selected
analytical grade reagents this gives our medium the lowest possible (and industry leading) level of non-viable organisms.

So if a swab is not just a swab, how do you choose?

Firstly, use only swabs which are compliant with CLSI’s M40-A standard. In 2003, CLSI (at that time called NCCLS) published its new standard for microbiological transport systems setting out criteria that both manufacturers and users can use to assess the suitability of a product for a particular application. It includes designated classes of microorganism, and requires products to be tested for the different transport conditions which may be encountered in practice. At present only a few manufacturers offer such products, although in some cases the M40-designated products are offered at a higher price. All Medical Wire’s transport swabs (including Transwab®, Transtube® and Virocult®) are M40-compliant.

Secondly, select a swab which is suitable for your application. A standard plastic shaft will be suitable for most purposes, but for nasopharyngeal specimens the swab shaft needs to be both fine and flexible (as with Medical Wire’s pernasal shaft), while for ENT and urethral the shaft should also be narrow, but more rigid (as with our ENT products). Medical Wire’s different swab shafts are identified by colour coded caps.

Thirdly, do consider the ability of the swab bud to release organisms. Medical Wire’s open weave bud allows good specimen collection, but also superior organism release, allowing optimum recovery and identification of pathogens in the specimen.

For further information visit our website at www.mwe.co.uk

Reference
CLSI Quality Control of Microbiological Transport Systems; Approved Standard M40-A [ISBN 1-56238-520-8]