

Letters to the Editor

Comments on Oxoid Signal blood culture system

We were interested to read the description of the Oxoid Signal blood culture system.¹ We have had the opportunity to evaluate about 400 bottles in clinical trials, and these showed some inadequacies and unfavourable features.

Two trials were conducted. The first, on febrile neutropenic haematology patients, compared the Oxoid system with the Roche Septi-check bottles and our own (MRI) method. The second trial was on unselected patients, comparing the MRI bottles with the Oxoid Signal system. The MRI bottles comprise a Casteneda slope of Columbia agar with Difco bacto-tryptose broth, trisodium citrate, and Difco penase, together with a second bottle containing 80 ml Oxoid thioglycollate USP (CM 173).

During our work with 100 haematology patients many false positive signals were noted at 37°C, which showed reversal after 10-15 minutes at room temperature. Although many theories for this phenomenon were postulated and tested, the reason was never ascertained. A general tendency to slower isolation and failure to grow some organisms were noticed. These occurrences prompted the second trial of blood cultures on unselected patients when 135 blood culture sets (MRI and Oxoid Signal) were returned to the laboratory. Thirteen of 135 bottles grew organisms in the MRI system that were considered to be clinically important.

Seven of these organisms were not isolated at all in the Oxoid bottles (two *Klebsiella* spp two *Candida albicans*, one *Pseudomonas* sp, one *Staphylococcus aureus*, and one *Acinetobacter anitratus*). Of the remaining six; two gave no signal but showed visible growth in the bottle (coagulase negative staphylococci), two gave "late signals" (one and six days after growth in the MRI bottles for *Escherichia coli* and coagulase negative staphylococci, respectively), and two gave equal results (both *Staphylococcus aureus*). It is also worth noting that the latter isolates required subculturing for further laboratory tests, whereas growth on the Casteneda slope was available immediately in the MRI system. There were no instances of clinically important isolates in the Oxoid bottles which did not grow in our own.

Our final concern is that of laboratory safety. The system is far from being "user-friendly" as quoted, with the handling of 70 mm needles representing a particular hazard. One medical laboratory scientific officer sustained a needle stick injury during insertion of the needle, and dismantling of the autoclaved bottles is made difficult by the buckling of the plastic signal component.

With all these points in mind we would conclude by saying that while Oxoid have the basis of a good idea, individual laboratories should conduct their own clinical evaluations before accepting it in preference to their own or other commercial systems.

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References

- 1 Sawhney D, Hinder S, Swaine D, Bridson EY. Novel method for detecting micro-organisms in blood cultures. *J Clin Pathol* 1986;39:1259-63.

Drs Bridson, Hinder, Sawhney, and Swaine comment:

"The authors' poor results in their trial suggest that the importance of early insertion of the Signal chamber into the bottle after adding blood and adequate agitation during the first day of incubation were insufficiently emphasised. This would be particularly relevant for the *C albicans*, *Pseudomonas* sp, and *Acinetobacter* sp, which the authors failed to isolate.

All the comments made in the early clinical trials were noted and action taken. Following initial studies with prototype Signal chambers, they are now fabricated in polycarbonate to prevent buckling in the autoclave, and the design of the chamber has been changed twice.

False positive reactions with the Signal system are rare; where they have arisen the cause would seem to be some transitory effect in the laboratory or incubator, which invariably disappeared.

The term "user friendly" is overworked computer jargon but it succinctly describes the enthusiasm displayed by most laboratory staff towards the system. The insertion of the 50 mm needle (not 70 mm) obviously requires care, particularly to avoid contaminating the needle shaft. The potential danger from this operation, however, is much less than the injection of blood into any blood culture system, when using hypodermic needles and syringes.

The authors are right to recommend prudence to laboratories contemplating changing their blood culture systems. Large scale trials and routine use in both UK and overseas laboratories show, however, that the signal system compares favourably with other blood culture systems.

It is to be hoped that the authors will re-examine the Signal device, using the amended protocol, as they seem to like the basic concept of the system.

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Corynebacterium CDC group D2 bacteraemia

Coryne bacterium CDC D2 is a pathogen of the urinary tract¹ (Soriano F, *et al.* Abstract presented at 26th Interscience Conference on Antimicrobial Agents and Chemotherapy 1986) but has not been reported as causing bacteraemia or sepsis.¹ We report the isolation of this organism on three occasions from the blood of a renal transplant recipient.

A 24 year old woman was receiving chronic haemodialysis for renal failure secondary to hypertension. She received a cadaver kidney in March 1984 after which she developed a chest infection that was treated with ampicillin, with good clinical results. There was poor urine output, and the donor kidney was surgically explored five days postoperatively, showing signs of acute rejection. Haemodialysis was restarted via an arterio-ventricular fistula. In April a subclavian line was inserted for further haemodialysis at a time when the patient was receiving azathioprine, her white cell count being $1.5 \times 10^9/l$. The following day she developed a fever. Blood cultures taken on three occasions over the subsequent seven days grew *Corynebacterium* CDC D2. Blind antibiotic treatment with cefotaxime 1g, twice daily, intravenously, and oral metronidazole 400 mg, thrice daily, was given at the onset of fever, and a transplant nephrectomy of the "necrotic, septic-looking" donor kidney was subsequently performed. Postoperatively her temperature returned to normal and she remained well. She was subsequently started on continuous ambulatory peritoneal dialysis.

The positive blood cultures were not taken via the subclavian line but by periph-