Optimising Specimen Collection and Transportation for Isolation of Anaerobic Bacteria / Guidance for Clinicians

Selina Scotford BSc, MIBMS
Specialist Biomedical Scientist UK Anaerobe Reference Unit

Infections caused by anaerobic bacteria can occur at any bodily site. The bacteria can be resistant to antimicrobials and the diseases caused can be life threatening. Well known conditions caused by anaerobic bacteria include Botulism (*Clostridium botulinum*), Tetanus (*Clostridum tetani*) and Lemierres syndrome (*Fusobacterium necrophorum*). Clinicians are usually responsible for specimen collection and delivery to the laboratory. Proper collection and transportation of patient specimens will ensure that microbiologists can isolate and identify anaerobic bacteria and determine their antibiotic susceptibility.

Samples must be taken before the use of sanitising solutions or any locally administered antibiotics. Anaerobic bacteria are easily damaged or killed during specimen collection and transport. Dehydration and exposure to oxygen must be minimised. Oxygen exposure will kill some strict anaerobes within 20 minutes.

The preferred specimen types for successful isolation of anaerobes are:

- Aspirate or tissue - Biopsies and other tissue samples should be placed in a dry, sterile container. No sterile water or saline should be added since this introduces dissolved oxygen.
- Pus or exudate – Collect a full syringe of pus. Pus is self-reducing and maintains a good level of anaerobiosis. Where larger quantities of sample are available, fill a small, sterile, screwcapped container and cap tightly to exclude oxygen.
- Bladder urine (SPA)
- Blood sample
- Swab samples (less preferable; see Table 1 below) – If used, swabs must be placed immediately into a transport medium such as Amies with charcoal, which absorbs toxic metabolites.

Specimens not routinely cultured for anaerobes include:

- Nasal / throat / intra-oral swabs (except *F.necrophorum* from persistent/recurrent sore throats)
- Sputum
- Vaginal / cervical
- Skin or superficial wounds
- Voided or catheterised urine
- GI tract / faeces (except for Clostridial cultures)

Specimens from these locations may be contaminated with normal flora. Such specimens may be collected based on clinical details or at the clinician's request.

Table 1: Relative isolation of anaerobes from pus and swab samples

No. isolates	Pus	Swabs
Bacteroides spp	8	6
Prev/Porph spp	20	10
Fusobacterium spp	6	1
Anaerobic cocci	8	4
Clostridium spp	3	3
NSGPB*	6	3
Total	51	27

**NSGPB = non-spore-forming gram-positive bacilli. Adapted from Anaerobes in Human Disease, 1991 Duerden & Drasar. Used by permission*

Specimens must be transported to the laboratory as quickly as possible.

Do not leave specimens in direct sunlight or near heat sources.

In the microbiology laboratory, specimens will be inoculated onto appropriate culture media and transferred to an anaerobic atmosphere without delay.

Any significant bacterial growth will be identified, tested for antibiotic susceptibility and the results reported to the clinician.

The UK Anaerobe Reference Unit (UKARU) is located within Public Health Wales Microbiology at the University Hospital of Wales in Cardiff.

Core services comprise identification and susceptibility testing of anaerobic bacteria, PCR-ribotyping of Clostridium difficile and clinical anaerobic bacteriology consultation services. The UKARU is also actively involved with other anaerobic microbiology initiatives including surveillance schemes, practical training, individual and collaborative research projects, evaluation of novel laboratory techniques and curation and maintenance of an extensive culture collection.

For contact details and further information refer to:

www.publichealthwales.org/anaerobe-reference-unit

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