Chapter 12

CASE STUDY 12.1 Postoperative infection

- What samples would you take and from which healthcare worker? What investigations would you request?

Wound swabs from patients to confirm the cause of the infection. Nasal swabs from surgical staff involved in the operation and post-op care.

- Who would you involve in this process?

Control of Infection teams and the microbiology laboratory.

- What media would you use in sample processing?

Blood agar plus aztreonam or chromogenic media for *S.aureus* and MRSA. Culture also for organisms such as *P.aeruginosa.*

- What nursing procedures would be implemented?

Strict hand hygiene and good aseptic technique when changing dressings.

- What are your conclusions about the organism involved?

The infecting organism is an MRSA.

- What further tests would you perform on the isolate?

Additional sensitivity tests and Mupirocin which will be useful to treat carriers if detected.

- What further tests would you perform on the isolate?

Cefoxitin and mupirocin sensitivity tests. MALDI-TOF confirmation.

- What control of infection procedures would be implemented?

Barrier nursing.

- Would any therapeutic regimes be considered?

Topical mupirocin to infected individuals.

CASE STUDY 12.2 Outbreak of a Gram-negative pathogen

- What would you suggest is the cause of the sepsis and why?

Gram-negative sepsis could be caused by a wide range of organisms. The leaking roof/tap is a suspicion the cause could be an environmental organism such as a pseudomonas.

- What samples would be taken and how would they be processed?

Environmental samples from the roof and dripping tap. Culture for Gram-negative organisms on blood agar and/or chromogenic media for pseudomonads.

- What would you recommend happens on the unit next?

Emergency estates intervention to repair the roof and taps. If not forthcoming patients may need to be moved to ensure others are not affected.

- What organism is the likely cause of the sepsis?

Probably *P.aeruginosa*.

- What is your action plan and report into the outbreak?

Likely caused from contamination from roof or taps. Urgent repair and review of facilities on the unit. Inform Chief Executive as there may be adverse media attention.

- What methods could be used to determine if the organisms are identical?

Refer to reference laboratory for typing, can be by antisera or WGS.

CASE STUDY 12.3 Outbreak on a neonatal unit

- What screening samples would you suggest on admission?

Nasal samples for MRSA carriage, wound swabs for conventional culture.

- On what media would you process these samples on?

Aztreonam blood agar or chromogenic media for *S.aureus*. Blood agar for Gram-negative pathogens. MRSA selective agar for nasal swabs. Anaerobic cultures also.

- What nursing procedures would be implemented and why?

Isolation and barrier nursing as high likelihood of an MDR organism colonizing or affecting the wounds.

- What are your indications of the patients MRSA status?

Negative for MRSA as no green colonies detected on chromogenic agar.

- Suggest some possible identities for the non-lactose fermenting Gram-negative rod/coccobacillus.

Most likely an *Acinetobacter spp*.

- How would you proceed to identify the Gram-negative organism and what further investigations would you perform on it?

MALDI-TOF ideally or API 20NE. Full susceptibility testing as high suspicion at this point of *Acinetobacter sp.*

- What further antibiotics would you suggest are tested?

All available antibiotics as obviously a MDR strain based on first line susceptibility testing.

- You are required to prepare some selective media to allow screening swabs etc. to be sent from all patients on the unit. What would your suggestions be as to the selective agents to include and your reasons for this?

Acinetobacter sp are intrinsically resistant to numerous antibiotics therefore incorporate cefotaxime or ertapenem if proven to be highly resistant. Consider addition of vancomycin as a selective agent for Gram-positive stains and antifungals to make the medium highly selective for Acinetobacter.

- What nursing procedures need to be in place?

Barrier nursing and possible isolation. Strict hand hygiene and thorough ward cleaning.

- Should the public be informed? If so how and why?

No as no need. Control of infection team should be able to deal with this problem. It is possible that no further admissions to the unit would occur until the problem is under control. If the hospital had to make a statement it would be from the Chief Executive.

Case Study 12.4 **Faecal Transplantation**

- What could be the causes of the above symptoms?

A variety of causes but suspicious of *C.difficile* infection based on clinical symptoms and use of cephalexin.

- What are the Control of Infection issues with this patient? How would they be dealt with?

With possible infective diarrhea patient should be isolated until it subsides.

- What samples would you take and how would these be processed?

Faeces sample for culture and *C.difficile* testing.

- What is your diagnosis?

Patient has infection with *C.difficile* and the strain is a hypertoxin producing variant (027 strain).

- Why was the strain tested for 027 and why would a positive finding have been more significant?

027 strains produce more toxin than other *C.difficile* types so symptoms can be more severe and more problematic to the hospital if cross infection were to occur.

- What treatment regimes would you suggest for the patient?

Vancomycin and/or metronidazole.

- Based on the isolate being determined as an 027 strain what enhanced nursing procedures would be required.

Isolation of the patient and barrier nursing to prevent transmission.

- What Control of Infection advice would you give to the care home?

Deep clean of the patient's area and monitor to ensure other patients do not develop diarrhea.

- What other antimicrobials could you suggest may help the patient's condition?

Metronidazole or fidaxomycin which is a new treatment.

- What other non-antibiotic interventions could be beneficial?

Trying to replace flora killed by cephalexin such as lactobacillus rich food. Recently some doubt has been expressed as to how many lactobacilli would actually reach the GI tract.

- What tests would have been performed on the donor prior to the donated stool sample being taken?

Serology screening pre-op as well as stool samples for culture and *C.difficle.*

- What would be the purpose of this faecal transplant? What microbes would be administered from the donor sample which could be of benefit?

To replace the flora of the patient's GI tract. Most commonly high numbers of lactobacilli, *E.coli* and anaerobes so the "normal flora" is restored at the expense of *C.difficile*.

- What are the situations where an FMT might be considered?

Severe GI infection caused by *C.difficile*, especially if type 027 is involved.

- What are the risks of this procedure?

That the procedure does not resolve the patient's condition or introduces other infecting organisms.

- How would the patients' environment be cleaned upon discharge from the unit?

Disinfectants which are sporicidal. Alternately Hydrogen peroxide vapor.