

## Case 1

**A 78 year old gentleman presented to Leicester ED in the early hours of the morning with profuse diarrhoea. He is seen by an SHO and admitted up to the Acute Medical Unit (AMU) for review. The SHO who saw the patient was very busy. His brief clerking is below.**

Presenting Complaint: 2 day history of diarrhoea (6 times a day) and associated abdominal discomfort.

No recent holidays

Had take -away for dinner 2 days ago

Past medical History; Osteoarthritis, hypertension, gall stones

Drug History; Paracetamol, dihydrocodeine, bendroflumethiazide

No known allergies

Family History; nil

Social History; Lives with wife, retired teacher, smokes 10 cigarettes daily

On examination

RR: 14 Heart sounds normal

Pulse 88 Chest Clear

Sats: 100% on air Abdomen: soft but generalised tenderness

BP 100/58

Temp: 38.3

Plan: IV fluids

Admit Medics

Paracetamol

?may need side room

**Imagine that you are one of the junior doctors working on AMU and you are asked to go and see this patient.**

**1. What person protection methods will you employ when you go to see this patient?**

**2. In addition to the information from the clerking what other questions would you like to ask in your history to establish the likely cause of his symptoms?**

**On further questioning it is apparent that the patient recently had a course of amoxicillin for a community acquired pneumonia infection. As far as he knows he has not been in contact with anyone else with diarrhoea or vomiting. He and his wife eat the same food and she has not developed any symptoms. He has not been abroad in 8 years.**

**3. Using the clerking notes and the additional history above please complete the 'D&V Patient Assessment Emergency Department &AMU' Pathway. What advice is recommended for this patient?**

**4. Having clerked this patient what investigations would you like to request to aid your assessment of his condition? For each explain what you are looking for.**

**5. Stool investigations come back positive for *Clostridium difficile*. What type of bacteria is *C difficile*?**

**6. *Clostridium difficile* is a minor component of the normal flora of the large intestine. What elements of the Innate Immune system normally prevent an infection occurring with regard to bacteria in the large bowel?**

**Use the information gained from the lecture last week on the Innate Immune system. Try to remember the headings that were used (or look up the lecture)**

**7. Use of some antibiotics is linked to increase susceptibility to *Clostridium difficile* infections. What is the mechanism behind this?**

**8. Apart from amoxicillin what other antibiotics are frequently associated with a *Clostridium difficile* infection?**

**9. *Clostridium difficile* exerts its pathological effects by producing toxins. What are these toxins and how do they work?**

**10. *Clostridium difficile* is part of a group of clostridium bacteria. Can you name the other bacteria in this group and diseases that they might cause?**

**11. Self-Study: Something to consider**

In an earlier question you outlined the role of the Innate Immune system in the GI tract. In a subsequent lecture you will learn about the 'Adaptive Immune System' which is also very active in the GI tract and has some specialised functions. In last week's session on acute sepsis we discussed that a large part of the problem with acute sepsis is the over-reaction of the immune system and damage to body systems. QUESTION: Since the GI tract is so full of micro-organisms and since there is a frequent exposure to ingested pathogen why is there not a constant state of immune reaction with inflammation in the bowel? You will need the knowledge of the adaptive immune system and some extra reading to answer this. But it illustrates the remarkable nature of the immune system.

**12. Self-Study: Using the UHL microbial website please look at the treatment advice for *Clostridium difficile* (found under abdominal infections).**

**How is the severity of the infection assessed?**

**What different antibiotics are advised for treatment?**

## **Case 2**

**A 70 year old lady from Leicester, Mrs Kumar, goes to visit relatives in Mumbai, India. Whilst there she suffers a myocardial infarction for which requires hospitalisation including a short stay on ITU. During her stay she develops pneumonia and is treated with antibiotics. Once stabilised she is repatriated to Leicester Royal Infirmary for on-going treatment.**

**3 days after arriving in Leicester Mrs Kumar becomes generally unwell and develops a high fever. Examination is unremarkable aside from the note of a urinary catheter in situ. A range of investigations are requested including blood cultures and the patient is started empirically on co-amoxiclav. The next day she continues to deteriorate and on the advice of the microbiology consultant is changed to meropenem instead of co-amoxiclav.**

**A day later the patient deteriorates and dies. Blood culture results reveal gram negative rods resistant to all known antibiotics.**

**The next day the lady who was in the bed next to Mrs Kumar starts to feel unwell and develops dysuria and a fever. Urine cultures are positive for gram negative rods.**

**1. The Infectious diseases team are anxious that the second patient has contracted the multi-drug resistant bacteria from Mrs Kumar. What steps should have been taken to reduce the chances of this happening?**

**2. Mrs Kumar had been visiting relatives in India. India is associated with high rates of antibiotic resistance, why might this be?**

**3. Antibiotic resistance is a global concern. What problems does it create?**

**4. In order to become antibiotic resistant a bacterium needs to acquire new genes that confer resistance in some form. By what mechanisms can these new genes be acquired?**

**5. Have you heard of any drug resistant infections? In your group discuss what you know.**

### **Case 3**

**Last January an 85 year old lady presented to the LRI with a 48 hour history of vomiting and diarrhoea. She appeared to be dehydrated and was admitted up to a 6 patient bay on the ward for IV fluids.**

**The following day 3 patients and one member of staff seem to develop similar symptoms and things only get worse when the day after 9 patients appear to have developed gastroenteritis and 5 members of staff call in sick.**

**1. What is the likely infectious agent at work here?**

**2. What is the transmission route of this pathogen?**

**3. What precautions should have been considered to avoid this situation developing?**

**4. What are the complications associated with this infection?**

**5. Using the 4 P's model of infection control consider Norovirus and what measures could help prevent its spread.**