

**Paper Reference(s) 4BI1/2BR**  
**Pearson Edexcel International GCSE (9-1)**

**Biology**  
**UNIT: 4BI1**  
**PAPER: 2BR**

**Text Booklet**

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**Question 1**

**HUMAN KIDNEY DISEASE**

**Human kidney disease can be caused by infection, high blood pressure, high blood cholesterol levels or diabetes. There is no cure for kidney disease, but suitable treatment can reduce the symptoms and stop the disease getting worse.**

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**The treatments include lifestyle and dietary changes to help you remain as healthy as possible. Medicine is also used to control associated problems such as high blood pressure and high cholesterol levels. Other treatments need to be used for severe kidney disease when the kidneys stop working. These are dialysis and kidney transplants.**

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**Dialysis carries out the excretory function of the kidney. There are two types of dialysis that are commonly used, haemodialysis and peritoneal dialysis. Haemodialysis involves diverting blood into an external machine, where it is filtered before being returned to the body. Peritoneal dialysis (PD) involves pumping dialysis fluid into a space inside your abdomen. Haemodialysis is usually done about three times a week, either at hospital or at home. PD is normally done at home, several times a day or overnight. If the patient does not have a kidney transplant, treatment with dialysis will usually need to continue for life.**

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**PD became an alternative to haemodialysis a few years ago. Many patients prefer the independence PD lets them have. In PD, a soft tube called a catheter is used to fill the abdomen with a dialysis solution. The composition of the dialysis solution is water, glucose, and mineral ions at the same concentration that occurs naturally in the blood. The dialysis solution is prepared according to the individual patient's needs to help regulate their ion balance and remove metabolic waste products.**

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Inside the abdominal cavity is a natural membrane lining called the peritoneum. This membrane is partially permeable. The waste products and extra fluid and salts pass from the blood through the peritoneum into the dialysis solution. They then leave the body when the dialysis solution is drained. This used solution is thrown away. The process of draining and filling is called an exchange and takes about 30 to 40 minutes. The period that the dialysis solution is in your abdomen is called the dwell time. A typical schedule is four exchanges a day, each separated by a dwell time of four hours. 40 45

One form of PD, continuous ambulatory peritoneal dialysis (CAPD), does not require a machine and it is possible to walk around with the dialysis solution in your abdomen. Another form of PD, automated peritoneal dialysis (APD), requires a machine to fill and drain your abdomen. Three to five exchanges are performed during the night while you sleep. The whole process lasts a total of nine hours each night. 50 55