APPENDIX B

B.1 Kidney transplantation surgery

Kidney is one of the two bean-shaped organs located on both sides of the spine, just above the waist and they rid the body waste materials and maintain fluid balance through the production of urine. Dialysis is the process of cleansing and achieving chemical balance in the blood of patients whose kidneys have failed. A kidney transplant is performed on patients in kidney failure who are usually on dialysis. A donated kidney is transplanted from a living or cadaver donor and a kidney is donated from a blood relative or non-related living donor to reduce the chances of organ rejection. Before a patient is accepted as a transplant candidate, they must undergo several evaluations and tests and before the donor kidney is accepted for transplant it is thoroughly evaluated. This evaluation of the living or cadaver includes examination of the donor’s medical history, social history, and lab tests and donors are carefully tested to be sure as possible that they have no transmissible diseases, such as HIV, hepatitis, or cancer. Cross match is a test in which donor and patient blood samples are mixed together and a "positive" cross match shows the donor and recipient are incompatible. A "negative" cross match shows there is no reaction between the donor and the recipient and this means that the donor and recipient are compatible and the transplant may proceed.

An extensive evaluation must be completed before patient is placed for transplant surgery. Testing includes: blood tests and diagnostic tests. Tests are done to gather information that helps to determine how urgent it is that patient is placed for the transplant surgery, as well as ensure the patient receives a donor organ that is a good match. These tests include those to analyse the general health of the body,
including the patient's heart, lung, and kidney function, the patients nutritional status, and the presence of infection. Blood tests help to improve the chances that the donor organ will not be rejected. These tests may include: blood chemistries - these may include serum creatinine, electrolytes (such as sodium and potassium), cholesterol, and liver function tests and clotting studies, such as Prothrombin Time (PT) and Partial Thromboplastin Time (PTT) - tests that measure the time it takes for blood to clot. Other blood tests will help to improve the chances that the donor organ will not be rejected.

Each person has a specific blood type: type A+, A-, B+, B-, AB+, AB-, O+, or O-. When receiving a transfusion, the blood received must be a compatible type with patient's own, or an allergic reaction will occur. The same allergic reaction will occur if the blood contained within a donor organ enters patient's body during a transplant. Allergic reactions can be avoided by matching the blood types of patient and the donor as the following: © Human Leukocyte Antigens (HLA) and Panel Reactive Antibody (PRA) tests help to determine the likelihood of success of an organ transplant by checking for antibodies in patient's blood. Antibodies are made by the body's immune system in reaction to a foreign substance, such as a blood transfusion or a virus, ® kidney, liver, and other vital organ function tests, ◆ viral tests and ◆ IntraVenous Pyelogram (IVP)-a series of x-rays of the kidney, ureters, and bladder with the injection of a contrast dye into the vein; to detect tumors, abnormalities, kidney stones, or any obstructions, and to assess renal blood flow.

Before surgery, special x-rays will be taken of the donor's kidneys, including an intra-venous pyelogram, and/or renal arteriogram, or spinal CT scan testing to check the anatomy of the kidney. Additional blood testing will determine the quality
of matching between the donor and the recipient (HLA typing or tissue typing). Prior to surgery, patient and the donor are called to have final medical examination. Preoperative testing will include a chest X-ray, ECG, blood work, and a health history and physical exam to make sure neither patient nor donor have developed any new medical problems. At this time, patient and donor must undergo final cross match test. This test makes sure patient does not have any antibody sensitivities against donor that could cause immediate rejection of the kidney.

After admission, the patient receives a physical examination and additional testing. Preoperative procedures may include: an enema to clean out the intestines and prevent constipation after surgery, shaving the chest and abdomen, inserting an intravenous (IV) line to administer fluids and medications and a sedative to help the patient relax before the operation. The surgical procedure ultimately depends on donor and recipient anatomic considerations particularly related to the renal artery, renal vein, and ureter. There are 3 approaches to surgical placement of a renal allograft: ① extraperitoneal, ② transperitoneal, and ③ intraperitoneal. The kidney transplant procedure usually takes approximately 8 hours. The new kidney is placed in the lower abdomen, and then the renal artery and vein are connected to the blood vessels in the pelvic area. The ureter is usually connected directly to the patient’s bladder. In most cases, the patient’s own kidneys and ureter are not disturbed. Urine production can start within five minutes after blood flow to the kidney begins. If the kidney is transplanted from a living donor, the kidney must first be harvested. An incision is made in the side of the abdomen and then the kidney is taken out, and the incision is closed. If the kidney is a cadaver kidney, the organ is harvested before the kidney transplantation starts. A curved incision is made in the recipient’s pelvic
region. The kidney is implanted, and the vessels of the kidneys are connected to the iliac vessels. The ureter is attached to the bladder and then the incision is closed.

The quality of a kidney from a living donor is often better because the kidney is evaluated carefully before the transplant. The donor is often a family member, resulting in a better match than is usually achieved with a cadaver donor. With a better match, the chance of rejection is lower. A living-donor transplant is really the only reliable way to get a kidney transplant before beginning dialysis, and sometimes, this avoids dialysis altogether. Patients need not have to be on the waiting list for an unknown period of time. On average, recipients of living-donor kidney kidneys require less of the anti-rejection medications and fewer hospitalisations after the transplant. The majority of the patients, whose kidney transplants have continued to function for more than 15 years, received a living-donor transplant.
Figure B.1 Schedule generation agent screen for the case study
Figure B.2 Scheduling agent screen for the case study