

International Institute of Health Management Research (IIHMR)
NEW DELHI
HIT 703 Requirement Management
Batch- 2017-2019
Term Exam

TOTAL TIME: 3.0 HOURS

MAXIMUM MARKS: 70

Read the following case and answer the questions provided.

1. Background

Brazilian Kidney Transplantation

Kidney transplantation is considered to be the best treatment for people with chronic kidney failure, because it improves the patients' quality of life and increases their length of survival compared with patients undergoing dialysis. The main result from this study was construction of a representation of the kidney transplantation process. This representation took into account the entire kidney transplantation process in Brazil, with the addition of the particular features attributed to the state of São Paulo. A grid representing the entities involved and the different stages of the process was created.

In this diagram, there are 3 integrated hierarchic levels. The national, state, and local levels are represented by the National Central Organization for Transplantation (CNT), the State Central Organizations for Transplantation (CETs), and hospital establishments, respectively. The CNT is responsible for organ allocation between the states. It undertakes management and distribution of organs between the different Brazilian states at the time that an organ is offered from one state to another. The CETs have the responsibility of coordinating the transplantation process in their own states. They manage activities such as enrollment and ranking of recipients, receive notifications of potential donors, and coordinate the whole donation process, which includes confirmation of the diagnosis of brain death, interviewing family members to obtain the family's consent for organ removal, and allocation of the organs. The local level (hospital establishments) is responsible for notifying the existence of a possible donor and for providing support for the whole process that is needed for the transplantation to be accomplished.

The kidney transplantation process in Brazil, from the inclusion of potential recipients in the single technical kidney registry to follow-up of patients who have received transplants, was

divided into 2 subprocesses in this representation. In fact, the inclusion of new potential recipients takes place at the time when the need to perform transplantation is identified. On the other hand, the transplantation process itself starts from the confirmation of the diagnosis of brain death. These 2 stages are independent and generate different subsequent activities and events.

Each stage in the process was represented according to a grouping of activities, namely: registration of a new potential recipient in the single technical kidney registry; occurrence and notification of brain death; management of the allocation of the organ to be transplanted; transportation of the organ to be transplanted; performing the transplantation; and notification and follow-up of the transplantations accomplished. Below, the main events and activities of each stage in the above-mentioned processes are described.

1. Registration of a new potential recipient in the single technical kidney registry: In this stage, state transplantation teams receive patients who have been referred from health care establishments with a suspected need for transplantation of a new kidney. If the patient really needs a new kidney, they are registered as a new potential recipient in the state's single technical kidney register. If not, the patient is referred for another type of treatment.

2. Occurrence and notification of brain death: In this stage, patients in health care establishments are identified as possible donors (individuals in a non-perceptive coma; neurologic status 3 on the Glasgow coma scale). In this establishment, an Organ Procurement Organization (OPO) or a Intra-Hospital Committee for Donation of Organs and Tissues for Transplant (CIHDOTT) may be in operation, and both of these should manage the organ harvesting process. Initially, the doctor, nurse, or other qualified professional should inform the central organization for organ harvesting and distribution regarding the existence of a potential organ and tissue donor. After the OPO has been put into action, tests to confirm the occurrence of brain death are conducted under its supervision. Once this has been confirmed, in accordance with the criteria established by the Conselho Federal de Medicina in Brazil, the OPO conducts an interview with the family of the potential organ donor with the aim of obtaining authorization to remove organs for donation. If the family authorizes the donation, a variety of tests are performed on the possible donor to ascertain whether they are suitable for the donation.

3. Management of the allocation of the organ to be transplanted: In this stage, if the possible donor is suitable for the donation, the organs to be transplanted are removed from the donor, including the kidneys, and a samples of serologic and ganglionic materials are taken to perform specific histocompatibility tests. The serologic material collected from the donor is used to determine HLA type. From the result of this test, a list of potentially compatible recipients is generated. These individuals' HLA types will previously have been registered in the computerized system. At this time, the central organization for transplantations makes the initial contact with the state transplantation teams to find an effective recipient. If one of the state teams accepts the organ that is offered, it will be transplanted in the recipient's state. If not, the state's central organization contacts the national central organization for transplantations to offer the organ. Through the single technical kidney registry, the CNT then starts to search for potential recipients for the organ that has been offered, taking into consideration the factor of organ transportation logistics and any emergency cases in the various Brazilian states.

4. Transportation of the organ to be transplanted: The transplantation team of the state of São Paulo or the CNT provides all of the documentation needed for transporting the kidney to be transplanted, and thus the kidney is sent to the place where the transplantation is to be performed.

5. Performing the transplantation.

6. Notification and follow-up of the transplantations accomplished: In this stage, the CET or CNT receives data regarding transplantations that have been concluded and follow-up data on the recipients from the teams that performed the transplantations.

Based on the above answer the following questions:

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| 1. Identify the major stakeholders of the information system | 5 marks |
| 2. Identify 10 functional requirements of the system considering all stakeholders | 20 marks |
| 3. Draw three use case diagrams for one functional requirement each for clinicians, medical record staff and receptionist individually based on question no 2. | 15 marks |
| 4. Take one use case diagram from question 3 and write use case description | 10 marks |
| 5. Draw an activity diagram with swim lanes based on the case. | 20 marks |