



University Health Network

Toronto General Hospital Toronto Western Hospital Princess Margaret Hospital

# Abdominal Organ Transplantation

## Rotation-Specific Educational Goals & Objectives for Residents in General Surgery

Revised April, 2012



Department of Surgery  
Faculty of Medicine  
University of Toronto

Abdominal Organ Transplantation

## Rotation Specific Educational Objectives

### Introduction:

The GI Transplant Programme at the University Health Network and the University of Toronto is based at the Toronto General Hospital. The in-patient ward is located on 7<sup>th</sup> floor of the New Clinical Services Bldg (7-NCSB). The Transplant Acute Care Unit is on 10-NCSB, The administrative area is on 11-NCSB, (including the Fellows' and Residents' Room 11-1242). Transplant clinics are held on 12-NCSB. Out-patients are also seen in General Surgery Clinics on 10<sup>th</sup> floor of the Norman Urquhart Bldg, and on 4<sup>th</sup> floor of the Princess Margaret Hospital.

There are 6 Surgeons (Drs. Cattral, Grant, Greig, McGilvary, Ghanekar & Selzner) and Physicians (Drs. Levy, Lilly, Renner and Selzner) on the Transplant Team: Residents will gain experience with all aspects of the care of patients undergoing liver, pancreas, and kidney transplantation, including the management of patients on the transplant waiting list with end-stage liver disease, the perioperative management (donor and recipient procedures, ICU and ACU care) as well as the postoperative management, both early and late. Surgical Residents have the opportunity to attend out-patient clinics in Transplantation and related clinics in HBP Surgery.

The formal education opportunities are:

Mondays:	Transplant Hepatology Rounds	9:00am
	Monthly Hepatology/HBP Rounds (Faculty Club)	6:30pm
Tuesdays:	Core Junior Resident Seminars	7:30 – 12:00
	Living Donor Assessment Conference	8:00 am
	Monthly Transplant Journal Club	6:30pm
Wednesday	M.O.T. Rounds	9:00am
Thursday	GI Transplant Seminar Series	7:00am
	Transplant Pathology Review	4:00pm
Friday	Liver Transplant Listing Rounds	8:30am
	MOT / G.I.Tx Seminar Series	9:30
	HBP Tx Surgery Rounds	11 – 13:00

Educational objectives are presented in CanMeds format as described in the RCPSC General Standards of Accreditation. Cognitive and technical skills are presented by organ donation & transplant-related topic, and by level of training.

All residents receive a copy of “EDUCATIONAL OBJECTIVES FOR THE GENERAL SURGERY RESIDENT ON THE ABDOMINAL ORGAN TRANSPLANT SERVICE, UNIVERSITY HEALTH NETWORK” at the beginning of their UHN rotation. These goals & objectives as well as the wide range of educational opportunities are reviewed with the Resident upon arrival on the service.

### Resident Evaluation:

All Surgeons on the Transplant Service evaluate Residents throughout their rotation, with input from the staff Transplant Physicians and Fellows. Residents meet with the Programme Head at the beginning, middle and end of their Transplant rotation. At the end of every Resident's rotation all Faculty members, Fellows, and the Nurse Manager, provide input into the evaluation. These discussions are used to form a final in-training evaluation for each resident through the Department of Surgery's on line resident evaluation system “POWER”. Residents meet with the Programme Head on an individual basis for an exit interview and to receive and review their in training evaluation.

**EDUCATIONAL GOALS & OBJECTIVES  
FOR  
THE GENERAL SURGERY RESIDENT  
ON THE ABDOMINAL ORGAN TRANSPLANT SERVICE  
UNIVERSITY HEALTH NETWORK**

**General Aims (PGY1-7)**

1. To become familiar with the recognition, natural history, complications and general and specific treatment of end-stage disease of the liver, pancreas (Diabetes Mellitus) and kidney, and the indications for transplantation of these organs.
2. To understand the pathophysiology and diagnosis of brain death, the management of the organ donor and the principles of the assessment of the liver, pancreas and kidney for the purposes of organ donation.
3. To understand the principles of clinical immunosuppression (including the basic immunology of rejection) and become familiar with the use of immunosuppressive drugs.
4. To learn to provide care, including the resuscitation and emergency treatment for the transplant patient with complex medical and surgical problems.
5. To become technically proficient with the components of the organ donation and transplant operations that are relevant to general surgical procedures.
6. To achieve the range of other CANMeds competencies within the context of a transplant and general surgical environment.

## **A. Medical Expert**

### **1. Cognitive Knowledge**

The resident will be expected to demonstrate a fundamental knowledge and understanding of the following domains as listed in the attachments on

1. Immunology & Immunosuppression
2. Brain Death, Donor Management, Assessment of organ suitability for transplantation, Multi-organ procurement
3. Abdominal Surgery in General
4. Transplantation of the Liver
5. Transplantation of the Pancreas and Kidney
6. Living donor transplantation.

The specific Goals & Objectives for cognitive knowledge and clinical & technical skills for each of these domains is detailed below.

### **2. General Clinical Skills**

Given a patient with advanced disease of the liver, pancreas or kidney, the resident will be able to do the following to the satisfaction of his/her supervisor(s):

- a) Take a relevant history (PG1-2)
- b) Perform an acceptable physical exam concentrating on the relevant areas (PGY1-2).
- c) Arrive at an appropriate differential diagnosis (PGY1-2).
- d) Order appropriate laboratory, radiological and other diagnostic procedures, demonstrating knowledge in the interpretation of these investigations (PGY1-3).
- e) Arrive at an acceptable plan of management, demonstrating knowledge in operative and non-operative treatment of the disease process (PGY4-7).
- f) Manage patients in the ambulatory setting, demonstrating knowledge of common office techniques and procedures (PGY1-2).
- g) Manage the patient throughout the entire in-hospital course, demonstrating knowledge of common office techniques and procedures (PGY4-5).
- h) Provide a plan for patient discharge and follow-up (PGY1-2).

### **3. General Technical Skills**

During the rotation, the resident will assist, and operate under supervision or independently, depending on case complexity, level of training, patient comorbidity, as well as confounding issues such as resource availability.

Residents at all levels (PGY1-7) must master:

ASSISTING (both first and second) in the operating room, developing a facility for anticipation of surgical maneuvers, gentle traction on tissues, an ability to take direction well, to make reasonable suggestions and enquiry, and to contribute to a positive operating room atmosphere.

#### **PGY1**

Given a patient requiring a surgical procedure, the PGY1 resident will participate in the patient's care as a member of the operating team. It is expected that the PGY1 resident will initiate the process of technical skill development by assisting in both simple and complex operations, and by performing, under supervision, simple procedures. It is expected that the PGY1 resident will be familiar with surgical instruments and suture materials. It is expected that the PGY1 resident will be able to position and drape patients for organ donation and transplant operations. It is expected that the PGY1 resident will be able to open and close surgical wounds, control bleeding, and demonstrate a knowledge of fundamental principles of tissue handling.

### **PGY3**

Given a patient requiring a surgical procedure, the PGY3 resident will participate in the patient's care as a member of the operating team. It is expected that the PGY3 resident will be a competent assistant for both simple and complex operations, and be able to perform, under supervision, the components of donor and transplant operations that are common to general surgical procedures, based on an understanding of fundamental surgical principles

In the operating room, the trainee is expected to develop the following abilities:

- a) to anticipate surgical maneuvers and assist appropriately
- b) to handle tissues gently,
- c) to make reasonable suggestions and ask relevant questions, and
- d) to contribute to a positive operating room atmosphere
- e) respond appropriately to emergency situations

### **PGY5**

Given a patient requiring one of the surgical procedures listed below, the PGY5 resident will participate in the patient's care as a member of the operating team. It is expected that the PGY5 resident will be competent in performing independently most general surgical procedures. It is expected that the PGY5 resident will be able to lead an operating team and operatively treat surgical problems, safely, effectively and efficiently. It is expected that the PGY5 resident will be able to deal with operative circumstances that are unusual or unexpected.

In addition, by the end of the rotation, the resident will be expected to develop technical competence in performing the procedures as outlined in the attachment, to the satisfaction of his/her supervisors(s).

### **B. Communicator / Collaborator**

- a) Obtain and synthesize relevant history from patients, their families, colleagues and the community(PGY1-3)
- b) Demonstrate an appreciation of the unique relationship between transplant patients and their families and be able to deal effectively and compassionately with patients and family members by establishing therapeutic relationships(PGY1-7).
- c) Demonstrate an appreciation of the psychological needs of transplant patients (PGY3-7).
- d) Listen effectively (PGY1-7)
- e) Demonstrate effective communication skills including oral presentations at rounds and conferences (PGY1-7).
- f) Writes or dictates timely meaningful notes and reports on all patients (PGY1-7)
- g) Can summarize a patient's condition quickly and accurately (PGY1-7)
- h) Presents consult verbally in an understandable way (PGY1-2).
- i) Communicates effectively and empathetically with his/her patients and their families (PGY1-2).
- j) Can conduct a family meeting effectively (PGY4-7).
- k) Can and does discuss treatment plans with the charge nurse on the team (PGY2-7).
- l) Communicates treatment plans to all members of the team so that they understand (PGY3-7).
- m) Demonstrates skill in working with others who present significant communication challenges such as ethno-cultural background different from the physician's own, anger or confusion (PGY1-7).
- n) Consult effectively with other physicians and health care professionals (PGY1-7).
- o) Contribute effectively to other interdisciplinary team activities (PGY1-7).
- p) Effectively use the team approach in the management of complex patients (PGY3-7).
- q) Demonstrates respects for all members of the health care team (PGY1-7)
- r) Participate in discharge planning rounds (PGY1-7)

### **C. Manager**

- a) Utilize resources effectively to balance patient care, personal learning needs, and outside activities (PGY1-7).
- b) Completes notes and dictations appropriately and in a timely fashion (1-7).
- c) Generate schedules in a fair and timely manner. (PGY3-7)
- d) Allocate juniors and students to the OR and clinics appropriately (PGY3-7).
- e) Attends morning rounds, clinic, teaching sessions and academic events on schedule (PGY1-7).
- f) Books tests, procedures and OR appropriately and efficiently (PGY1-7).
- g) Multitasks appropriately and effectively, prioritize tasks appropriately and understands the principles of effective delegation (PGY2-7)
- h) Delegate responsibilities appropriately and/or accepts delegated tasks appropriately (PGY1-7). Demonstrates knowledge of population-based approaches to health care services and their implication for medical practice and preordination to access (PGY1-7).
- i) Maintain and demonstrate an up to date log of procedures (PGY1-7)

### **D. Health Advocate**

- a) Identify the important determinants of health affecting patients (PGY1-7).
- b) Demonstrate an understanding of injury prevention (PGY1-7).
- c) Demonstrates advocacy for patients, colleagues and the profession as appropriate (PGY1-7)
- d) Contributes to health-maintenance advocacy for patients, by educating patients and others about travel safety, helmet use, operating machinery or motorized vehicles, smoking cessation, use of alcohol in moderation, weight loss and cancer screening and accessibility to firearms (PGY1-7).
- e) Demonstrates through actions the importance of organ donation to individual and societal health (PGY1-7).

### **E. Scholar**

- a) Develop, implements and monitors a personal continuing education strategy (PGY1-7).
- b) Demonstrates critical appraisal skills related to sources of medical information (PGY2-7).
- c) Facilitate learning of patients, housestaff / students and other health care professionals through formal and informal teaching opportunities. Present at rounds at a level relevant to year of training (PGY1-7).
- d) Attends and participates in academic activities including Seminar, Rounds, Conferences and Journal Club (PGY1-7).
- e) Contributes to development of new knowledge to foster the academic growth of the specialty of transplantation by participating in scholarly work (PGY4-7).

### **F. Professional**

- a) Deliver highest quality care with integrity, honesty and compassion (PGY1-7).
- b) Exhibit appropriate personal and interpersonal professional behaviours (PGY1-7).
- c) Have an ethical relationship with colleagues, patients, and relatives (PGY1-7).
- d) Demonstrate sensitivity to age, gender, culture and ethnicity in dealing with patients and their families (PGY1-7).
- e) Have a complete knowledge of the principles of biomedical ethics and medical jurisprudence (PGY1-7).
- f) Have knowledge and understanding of the professional legal and ethical codes to which all physicians are bound (PGY1-7).
- g) Recognize and respect his/her own limitations of professional competence (PGY1-7).
- h) Recognize the importance of maintenance of competence and evaluation of outcomes (PGY4-7).
- i) Understand the legal issues related to surgical consent, confidentiality, and refusal of treatment (PGY1-7).
- j) Demonstrate the ability to recognize, analyze and know how to deal with unprofessional behaviours in clinical practice, taking into account hospital, university and provincial regulations (PGY1-7).
- k) Dress appropriately and cleanly, arrive promptly (PGY1-7).
- l) Display teamwork and respect for all members of the health care team (PGY1-7).
- m) Answer pages and responds in a timely fashion (PGY1-7).
- n) Maintain patient privacy and dignity and act with personal integrity (PGY1-7).

# **Specific Educational Goals & Objectives for Abdominal Organ Transplantation**

## **1. Immunology, Rejection & Immunosuppression**

### **Cognitive Knowledge**

To understand and apply clinical immunosuppression that allows transplantation, the resident (PGY1-2) must demonstrate an understanding of

1. Basic immunology
  - a. antigen presentation/recognition, immune cell type and their function, cytokine responses, regulation of the immune response
2. The immunologic mechanisms of acute and chronic rejection
  - a. cell-mediated and humoral
  - b. Class I and II antigens
  - c. Presensitization
  - d. Graft vs host disease
  - e. Basic pathologic features of acute rejection
3. The mechanisms of actions of the major immunosuppressive drugs, and their toxicities (PGY1-2)
4. A practical, working knowledge of the use of these drugs individually and in combinations, and their long term relevance in general surgical patients (PGY3-7)

### **Clinical Skills**

1. Applies an understanding of presensitization and tissue typing to allocate organs (PGY1-2)
2. Applies an understanding of the risks of acute rejection to individualize immunosuppression (PGY3-7)
3. Can investigate biochemical abnormalities of transplanted organ (PGY1-7)
4. Can adjust immunosuppression to balance the toxicities of the drugs in a specific patient (PGY4-7)

## **2. Brain Death, Donor Management, Assessment of organ suitability for transplantation, Multi-organ procurement, organ allocation**

## Cognitive Knowledge

Given a critically-ill patient with a severe neurologic injury, the resident must be able to perform the clinical skills listed and be able to demonstrate to the satisfaction of his/her supervisor(s) a fundamental knowledge and understanding of the general areas and a practical working knowledge of

1. The determination of neurologic death (“brain death”)
  - a. Clinical determination and confirmatory tests (PGY1-2)
  - b. Medicolegal issues (PGY4-7)
2. The process of organ donation
  - a. Identification of the potential deceased organ donor (PGY1-2)
  - b. counseling the family, and the policies and standards regarding discussion of organ donation and consent PGY4-7)
  - c. notification of the Organ Procurement Agency (Trillium Gift of Life) (PGY1-2)
3. Management of organ donor
  - a. Pathophysiology of brain death (PGY1-2)
  - b. Inotrope and hormonal maintenance & resuscitation (PGY3-7)
4. The special issues of Donation after Cardiac Death (DCD) (PGY1-7)
5. Assessment of the suitability of potential organs for transplantation,
  - a. General assessment and previous disease (PGY4-7)
  - b. Individual organ assessment of injury and function (PGY4-7)
  - c. Contraindications to organ donation (PGY4-7)
6. Principles of graft preservation (PGY4-7)
7. Multiple organ procurement
  - a. Liver, pancreas & kidney (see technical skills below)
8. The ethical issues surrounding organ donation and transplantation (GY1-7).
9. Organ allocation (PGY1-7)

## Clinical Skills

1. demonstrate the ability to clinically assess the deceased donor for:
  1. confirmation of NDD or DCD (PGY4-7)
  2. risk of communicable disease (PGY 4-7)
2. demonstrate the ability to advise on appropriate management of a deceased donor prior to donation (PGY4-7)
3. demonstrate the ability to assess the suitability of the liver, pancreas and or kidney for donation (PGY4-7)

## Technical Skills

At the end of a rotation in Transplantation, the resident must be able to show technical competence in the following aspects of a donor operation to the satisfaction of his/her supervisor(s). Designation is listed as to expectation of *Surgeon* or *Assistant* for each operation and each level.

	<u>PGY1</u>	<u>PGY3</u>
<b>Donor procurement</b>		
Laparotomy	S	S
Median sternotomy	A/S	S
Mobilization of the liver & GI tract	A/S	S
Mobilization of the pancreas	A	A
Dissection & canulation of the IMV/splenic/portal vein	A	S
Dissection & canulation of the aorta	A/S	S
Post perfusion extraction of the liver	A	A
Post perfusion extraction of the pancreas	A	A
Post perfusion extraction of the kidneys	A	A
Post perfusion extraction of the iliacs	A	S
Postoperative care of the deceased patient	S	S



### **3. Abdominal Surgery in General**

#### **Cognitive Knowledge**

Given a patient who requires an abdominal surgical procedure, the resident must be able to perform the clinical skills listed and be able to demonstrate to the satisfaction of his/her supervisor(s) a fundamental knowledge and understanding of the general areas and a practical working knowledge of the specific disease processes listed; the expectations of depth of knowledge will vary with the level of training as articulated at the end of the list.

#### **Metabolic**

Fluid and electrolyte disorders  
Acid base disturbances

#### **Shock**

Septic shock

#### **Response to surgery**

Wound infection, dehiscence, and evisceration  
Thromboembolic disorders, PE  
Atelectasis and pneumonia  
Pressure palsy and pressure ulceration  
Bladder retention  
Delirium  
Organ failure  
Stress ulceration

#### **Surgical Nutrition**

Malnutrition  
Obesity  
Specific nutritional deficiencies

#### **Coagulation**

Specific coagulation disorders  
General coagulopathies

#### **Blood Products**

Transfusion reaction

#### **Surgical Infections**

Erysipelas  
Necrotizing fasciitis  
Streptococcal myonecrosis  
Progressive synergistic gangrene

#### **Venous and Lymphatics**

Superficial thrombophlebitis  
Subclavian vein thrombosis  
Visceral venous thrombosis

**Small Intestine**

Bowel obstruction  
Crohn's enteritis  
Neoplasms  
    Benign, malignant  
Small bowel fistula  
Blind loop syndrome  
Short bowel syndrome  
Small bowel obstruction

**Colon, Rectum and Anus**

Ulcerative colitis	Crohn's disease of colon and anus
Ischemic colitis	Infectious colitis
Radiation enterocolitis	Pseudomembranous enterocolitis
Diverticular disease	Colonic volvulus
Angiodysplasia	Carcinoma of colon and rectum
Anal neoplasms –Benign/Malignant	Hemorrhoids
Fissure in ano	condyloma
Anorectal abscess	Fistula in ano
Pruritis ani	Anal incontinence

**Appendix**

Appendicitis  
Appendicial tumours

**Peritoneum**

subphrenic abscess  
intra-abdominal abscess  
pelvic abscess

**Abdominal Wall, Omentum, Mesentary, Retroperitoneum**

Rectus sheath hematoma  
Torsion of the omentum  
Mesenteric artery and vein occlusion/ischemia  
Retroperitoneal fibrosis & tumors

**Abdominal Wall Hernias**

Inguinal hernia  
Umbilical hernia

## Technical Skills

	<u>PGY1</u>	<u>PGY3</u>	<u>PGY5</u>
<b>General Diagnostic &amp; Therapeutic Procedures</b>			
Arterial puncture	S	S	S
Venipuncture	S	S	S
Foley catheter insertion	S	S	S
<b>Integumentary System</b>			
Incision & drainage subcutaneous abscess	S	S	S
<b>Intestinal</b>			
Laparotomy	S	S	S
Ileostomy	SA	S	S
Insertion feeding enterostomy	SA	S	S
Colostomy	SA	S	S
Entero-enterostomy	SA	S	S
Roux-loop entero-enterostomy	SA	S	S
Resection and anastomosis of small bowel	A	S	S
Resection and anastomosis of large bowel	A	S	S
Lysis of adhesions	A	S	S
<b>Abdominal Sepsis</b>			
Drainage intra-abdominal abscess			
• abdominal	A	S	S
• subphrenic	A	S	S
• pelvic	A	S	S
<b>Hernia &amp; Abdominal Wall</b>			
Repair inguinal hernia	S	S	S
Repair femoral hernia	S	S	S
Repair umbilical or ventral hernia	SA	S	S
Closure evisceration	A	S	S

## 4. Transplantation of the Liver

### Cognitive Knowledge

Given a patient with advanced liver disease, the resident must be able to perform the clinical skills listed and be able to demonstrate to the satisfaction of his/her supervisor(s) a fundamental knowledge and understanding of the general areas and a practical working knowledge of

1. Fulminant Hepatic Failure (PGY1-7)
  - a. Etiology, pathophysiology, complications & management
2. Chronic liver failure
  - a. Natural history, complications of, and treatment options for:
    - i. Viral hepatitis, esp. B & C
    - ii. Autoimmune liver diseases including PBC, PSC
    - iii. Alcoholic liver disease
    - iv. Non-alcoholic steato-hepatitis (NASH)
    - v. Hemochromatosis, and other metabolic diseases
    - vi. Other liver diseases
3. Portal hypertension (PGY1-7)
  - a. Sequellae and management options
  - b. Hepatic encephalopathy
4. Hepatocellular carcinoma and other tumors of the liver (PGY1-7)
5. Indications & contraindications for liver transplantation (PGY1-7)
6. Postoperative management of the liver transplant patient
  - a. Immunosuppression (PGY1-7)
  - b. Complications (investigation & management) (PGY4-7)
7. Acute rejection
  - a. Diagnosis & management (PGY4-7)
8. Long-term issues / surveillance (PGY4-7)

### Clinical Skills

1. demonstrate the ability investigate and manage a patient with advanced liver disease for encephalopathy (PGY1-2)
2. demonstrate the ability to manage a critically ill transplant patient
  - a. fluid & electrolytes (PGY2-7)
  - b. ventilation & vasopressors (PGY3-7)
  - c. need for dialysis (PGY2-7)
3. recognize the need for re-operation in a transplanted patient (PGY4-7)
4. demonstrate the appropriate suspicion for acute rejection and its investigation and initial management (PGY3-7)
5. demonstrate a working knowledge of immunosuppressive drugs, their different mechanisms of action and toxicities and discuss combination options (PGY4-7)

## Technical Skills

At the end of a rotation in Transplantation, the resident must be able to show technical competence in the following procedures to the satisfaction of his/her supervisor(s). Designation is listed as to expectation of *Surgeon* or *Assistant* for each operation and each level.

	<u>PGY1</u>	<u>PGY3</u>	<u>PGY5</u>
<b>General Diagnostic &amp; Therapeutic Procedures</b>			
Central Venous line insertion	S	S	S
Liver biopsy	S	S	S
Paracentesis	S	S	S
<b>Liver</b>			
“Back bench” dissection	A	A	A
Laparotomy	S	S	S
Incisional liver biopsy	S	S	S
Local excision liver lesion	S	S	S
Mobilization of the liver	A	SA	S
Dissection of the porta	A	A	SA
Mobilization of the IVC	A	A	SA
Management of the anhepatic state	A	A	SA
Venous anastomosis	A	A	SA
Arterial anastomosis	A	A	SA
<b>Biliary Tract</b>			
Cholecystostomy	S	S	S
Choledochotomy	A	S	S
Choledochoenterostomy	A	A	S
Cholecystectomy, open	S	S	S
Bile duct reconstruction	A	A	SA

## 5. Transplantation of the Pancreas and Kidney

### Cognitive Knowledge

Given a patient with Diabetes Mellitus and/or Chronic Renal Failure, the resident must be able to perform the clinical skills listed and be able to demonstrate to the satisfaction of his/her supervisor(s) a fundamental knowledge and understanding of the general areas and a practical working knowledge of

1. Complications of Diabetes mellitus (PGY1-7)
  - a. Nephropathy, neuropathy, retinopathy, hypoglycemic unawareness
2. Rationale for pancreas transplantation (PGY1-7)
  - a. Risks, benefits
3. Organ allocation (PGY4-7)
4. Assessment of immunologic risk (PGY4-7)
  - a. HLA typing and presensitization (PRA) assessment
5. Intraoperative surgical options (PGY4-7)
9. Postoperative management of the K/P transplant patient
  - a. Fluid/electrolyte balance (PGY1-2)
  - b. Immunosuppression (PGY4-7)
  - c. Complications (investigation & management) (PGY4-7)
10. Acute rejection
  - a. Diagnosis & management (PGY4-7)
11. Long-term issues / surveillance (PGY4-7)

### Clinical Skills

1. demonstrate the ability to manage a critically ill transplant patient (as above)
  - a. fluid & electrolytes
  - b. ventilation & vasopressors
  - c. need for dialysis
2. recognize the need for re-operation
3. demonstrate the appropriate suspicion for acute rejection and its investigation and initial management
4. demonstrate a working knowledge of immunosuppressive drugs, their different mechanisms of action and toxicities and discuss combination options

### Technical Skills

At the end of a rotation in Transplantation, the resident must be able to show technical competence in the following procedures to the satisfaction of his/her supervisor(s). Designation is listed as to expectation of *Surgeon* or *Assistant* for each operation and each level.

	<b><u>PGY1</u></b>	<b><u>PGY3</u></b>	<b><u>PGY5</u></b>
<b>Pancreas</b>			
“Back bench” dissection	A	A	A
Mobilization of the iliac A & V	A	A	SA
Venous anastomosis	A	A	SA
Arterial anastomosis	A	A	SA
Roux loop	SA	S	S
Duodenal-jejunostomy	A	SA	S
<b>Kidney</b>			
“Back bench” dissection	A	A	SA
Mobilization of the iliac A & V	A	A	SA
Venous anastomosis	A	A	SA
Arterial anastomosis	A	A	SA
Ureteric anastomosis	A	SA	S

## 6. Living Donor Transplantation

### Cognitive Knowledge

Given a patient who has been listed for transplantation, and for whom a potential living donor has volunteered, the resident must be able to perform the clinical skills listed and be able to demonstrate to the satisfaction of his/her supervisor(s) a fundamental knowledge and understanding of the general areas and a practical working knowledge of

1. Risks/benefits of living donor transplantation (liver or kidney) (PGY4-7)
  - a. Recipient
  - b. Donor
2. Recipient suitability for LD transplantation (PGY4-7)
3. Donor suitability for Living Donation (PGY4-7)
4. Technical issues in LD transplantation (PGY4-7)
  - a. Donor
  - b. Recipient
5. Postoperative management of donors & recipients (PGY1-7)
6. Ethical issues in LD transplantation (PGY4-7)

### Technical Skills

At the end of a rotation in Transplantation, the resident must be able to show technical competence in the following procedures to the satisfaction of his/her supervisor(s). Designation is listed as to expectation of *Surgeon* or *Assistant* for each operation and each level.

	<u>PGY1</u>	<u>PGY3</u>	<u>PGY5</u>
Donor hepatectomy or nephrectomy	A	A	A
Living Donor Liver transplant	A	A	A
Living Donor Kidney Transplant	A	A	A