



Treatment of End-Stage Organ Failure in Canada,
Canadian Organ Replacement Register, 2005 to 2014:
Methodological Notes and Supplementary Information

March 2016

Types of Care



Canadian Institute
for Health Information

Institut canadien
d'information sur la santé



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Section 1: Canadian Organ Replacement Register board of directors

CORR board of directors (December 1, 2014)

- Dr. Joseph Kim, Canadian Society of Transplantation — President
- Dr. Scott Klarenbach, Canadian Society of Nephrology — Vice President
- Dr. Louise Moist, Canadian Society of Nephrology — Past President
- Dr. Joanne Kappel, Canadian Society of Nephrology
- Dr. Daniel H. Kim
- Dr. Jean-Philippe Lafrance, Quebec Society of Nephrology
- Dr. Susan M. Samuel
- Dr. Lianne Singer
- Dr. Manish M. Sood
- Dr. Jean Tchervenkov, Quebec Society of Transplant
- Ms. Alison Thomas
- Ms. Kim Young, Canadian Blood Services
- Ms. Elisabeth Fowler, Kidney Foundation of Canada

Section 2: Canadian transplant hospitals, renal programs and independent health facilities providing dialysis to chronic renal failure patients as reported to CORR

Hospital/facility	Types of transplants performed in 2014							Dialysis programs in 2014				
	Kidney	Liver	Heart	Heart/ lung	Lung	Intestine/ multi- visceral	Pancreas/ kidney- pancreas	Islet cell	HD	Home HD training [†]	PD	Home PD training
Northwest Territories												
Stanton Territorial Health Authority*									X			
Hay River Health Authority*									X			
British Columbia[†]												
Abbotsford Regional									X		X	X
B.C. Children's	X								X		X	X
Kelowna General									X	X	X	X
Nanaimo Regional									X		X	X
Kootenay-Boundary Regional									X	X	X	X
Penticton Regional									X		X	X
University of Northern B.C.									X	X	X	X
Royal Columbian									X	X	X	X
Royal Inland									X	X	X	X
Royal Jubilee									X	X	X	X
St. Paul's	X		X						X	X	X	X
Surrey Memorial									X			
Vancouver General	X	X			X		X	X	X		X	X
Alberta												
SARP, Foothills Medical	X						X		X	X	X	X
NARP, University of Alberta	X	X	X	X	X	X	X	X	X	X	X	X
Alberta Children's Hospital	X								X		X	X
Saskatchewan												
Regina General									X	X	X	X
St. Paul's	X								X	X	X	X
Manitoba												
Brandon Regional									X			
Children's Hospital of Winnipeg	X								X		X	X
Health Sciences Centre	X			X	X				X	X		
Seven Oaks General									X	X	X	X
St. Boniface General									X		X	X

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	Kidney	Liver	Heart	Heart/ lung	Lung	Intestine/ multi- visceral	Pancreas/ kidney- pancreas	Islet cell	HD	Home HD training [†]	PD	Home PD training
Ontario												
Bayshore Centre Dialysis Brockville*									X			
Bayshore Centre Dialysis Stoney Creek*									X			
Brantford General*									X			
Children's Hospital of Eastern Ontario									X		X	X
Cornwall Dialysis Clinic*									X			
Credit Valley									X	X	X	X
Dialysis Management Clinics Inc. — Pickering*									X			
Dialysis Management Clinics Inc. — Markham*									X			
Dialysis Management Clinics Inc. — Peterborough*									X			
Grand River									X	X	X	X
Halton Healthcare Services									X			
McMaster Children's									X		X	X
Hospital for Sick Children	X	X	X		X				X	X	X	X
Niagara Health System									X	X	X	X
Hôtel-Dieu Grace									X	X	X	X
Humber River Regional									X	X	X	X
Kingston General	X								X	X	X	X
Lake of the Woods*									X			
Lakeridge Health									X	X	X	X
LHSC — University	X	X	X				X		X			
LHSC — Victoria									X	X	X	X
North Bay General									X		X	
Orillia Soldiers' Memorial									X	X	X	X
Ottawa–Carleton Dialysis Clinic*									X			
Ottawa Hospital	X								X	X	X	X
Peterborough Regional Health									X		X	X
Renfrew Victoria									X		X	
Sault Area Hospitals — Plummer Memorial									X		X	X
Scarborough — General Division									X		X	X
Sheppard Centre*									X			
St. Joseph's (Hamilton)	X								X	X	X	X
St. Joseph's (Toronto)									X		X	X
St. Michael's	X								X	X	X	X
Health Sciences North									X	X	X	X
Sunnybrook Health Centre									X	X	X	X
Sussex Centre*									X			
Thunder Bay Regional — McKellar Site									X	X	X	X
Timmins and District									X		X	X

Hospital/facility	Types of transplants performed in 2014								Dialysis programs in 2014			
	Kidney	Liver	Heart	Heart/ lung	Lung	Intestine/ multi- visceral	Pancreas/ kidney- pancreas	Islet cell	HD	Home HD training [†]	PD	Home PD training
Ontario (cont'd)												
Toronto East General									X	X		
Toronto General — University Health Network	X	X	X		X	X	X		X	X	X	X
University of Ottawa Heart Institute			X									
William Osler									X			
Mckenzie Richmond Hill									X		X	X
Quebec												
Aurores boréales									X		X	
Charles-LeMoynes									X		X	X
CHUS — Fleurimont	X								X		X	X
C.H. de Granby									X			
C.H. de Verdun									X		X	X
Chicoutimi									X		X	
C.H. de la région de l'Amiante*									X			
CHUM — Notre-Dame	X				X		X		X	X	X	X
CHUM — Saint-Luc		X							X		X	X
C.H. régional de Trois-Rivières									X		X	X
Cité de la Santé de Laval									X	X	X	X
CHUQ — Hôtel-Dieu	X								X	X	X	X
C.H. régional de Lanaudière									X		X	
CSSS de Gatineau-Hull									X		X	X
CSSS de Rimouski-Neigette									X		X	X
CSSS du lac Témiscamisque									X			
CSSS du Suroît									X		X	X
CSSS de la Vallée-de-l'Or									X		X	X
CSSS Haut-Richelieu- Rouville									X		X	X
CSSS de Rouyn-Noranda									X			
CSSS de Saint-Jérôme									X		X	X
CSSS de Sorel-Tracy									X		X	X
Hôtel-Dieu d'Arthabaska*									X			
Hôtel-Dieu de Lévis									X		X	X
Institut de cardiologie de Montréal			X									
IUCPQ			X									
Lakeshore									X			
Maisonneuve-Rosemont	X								X	X	X	X
Montréal Children's, McGill	X								X		X	X
Montréal General, McGill									X	X	X	X
Pierre-Le Gardeur									X			
Rivière-Rouge*									X			
Royal Victoria, McGill	X	X	X				X					
Sacré-Cœur de Montréal									X		X	X
Sainte-Croix*									X		X	

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	Kidney	Liver	Heart	Heart/ lung	Lung	Intestine/ multi- visceral	Pancreas/ kidney- pancreas	Islet cell	HD	Home HD training [†]	PD	Home PD training
Quebec (cont'd)												
Sainte-Justine	X	X	X						X		X	X
Sir Mortimer B. Davis — Jewish General Hospital									X		X	X
St. Mary's									X		X	X
New Brunswick												
Chaleur Regional									X		X	
Edmundston									X	X	X	X
Dr.-Georges-L.-Dumont									X	X	X	X
Saint John Regional									X	X	X	X
St. Joseph's*									X			
Nova Scotia												
Cape Breton Regional									X		X	X
IWK Grace Health	X								X		X	X
Queen Elizabeth II	X	X	X				X		X	X	X	X
Yarmouth Regional									X			
Newfoundland and Labrador												
Central Newfoundland Regional									X			
Eastern Health									X	X	X	X
Western Memorial Regional									X		X	

Notes

* Independent health facilities.

† Home HD training is provided at the main dialysis facility or affiliated community dialysis centres.

HD: Hemodialysis; PD: Peritoneal dialysis.

Section 3: Canadian organ procurement organizations

British Columbia

BC Transplant Society
West Tower, 3rd Floor
555 12th Avenue West
Vancouver, British Columbia V5Z 3X7
www.transplant.bc.ca

Alberta

Southern Alberta Organ and Tissue Donation Program — Calgary
(SAOTDP)

Foothills Medical Centre Site
1403 29th Street North West
Calgary, Alberta T2N 2T9

HOPE Program — Edmonton
University of Alberta Hospital
Transplant Services
Walter C. Mackenzie Centre
8440 112th Street
Edmonton, Alberta T6G 2B7

Saskatchewan

Saskatchewan Transplant Program
Provincial Office
St. Paul's Hospital
1702 20th Street West
Saskatoon, Saskatchewan S7M 0Z9

Saskatchewan Transplant Program
Regina Office
Regina General Hospital
1440 14th Avenue
Regina, Saskatchewan S4P 0W5

Manitoba

Transplant Manitoba — Gift of Life Program
Health Sciences Centre
820 Sherbrook Street, Room GE441
Winnipeg, Manitoba R3A 1R9

Ontario

Trillium Gift of Life Network
522 University Avenue, Suite 900
Toronto, Ontario M5G 1W7
www.giftoflife.on.ca

Quebec

Transplant Québec
Head Office
4100 Molson Street, Suite 200
Montréal, Quebec H1Y 3N1
www.quebec-transplant.qc.ca

Transplant Québec
Québec Office
2700 Jean-Pierre Street, Suite 170
Québec, Quebec G2C 1S9

New Brunswick

New Brunswick Organ and Tissue Procurement Program
Department of Health, Hospital Services Branch
P.O. Box 5100
Fredericton, New Brunswick E3B 5G8
www.qnb.ca/0051/0217/organ/index-e.asp

Nova Scotia

Multi-Organ Transplant Program
Queen Elizabeth II Health Sciences Centre
1278 Tower Road, P.O. Box 9000
6 South, Room 291
Victoria Building
Halifax, Nova Scotia B3H 2Y9
www.motphalifax.net

Newfoundland and Labrador

Organ Procurement and Exchange of Newfoundland and Labrador (OPEN)
Health Sciences Centre
300 Prince Phillip Parkway
St. John's, Newfoundland and Labrador A1B 3V6

Section 4: Glossary and acronyms

Acronyms

APD:	automated peritoneal dialysis
CAPD:	continuous ambulatory peritoneal dialysis
COPD:	chronic obstructive pulmonary disease
CORR:	Canadian Organ Replacement Register
ESKD:	end-stage kidney disease
HD:	hemodialysis
ICU:	intensive care unit
OPO:	organ procurement organization
PAK:	pancreas after kidney transplantation
PD:	peritoneal dialysis
PMP:	per million population
PTA:	pancreas transplant alone (isolated pancreas transplantation)
RRT:	renal replacement therapy
SD:	standard deviation
SKP:	simultaneous kidney–pancreas transplantation

body mass index (BMI): Body mass index is a relationship between weight and height that is associated with body fat and health risk. The equation for BMI is body weight in kilograms divided by the square of height in metres. In the Canadian weight classification system, 4 categories of BMI ranges are defined:

- Underweight (BMI less than 18.5)
- Normal weight (BMI 18.5 to 24.9)
- Overweight (BMI 25 to 29.9)
- Obese (BMI 30 and higher)

diabetes: A disease caused by the lack of insulin in the body or the body's inability to properly use normal amounts of insulin.

- **type 1:** Occurs when the pancreas no longer produces any or produces very little insulin. The body needs insulin to use sugar for energy. Approximately 10% of people with diabetes have type 1 diabetes.
- **type 2:** Occurs when the pancreas does not produce enough insulin or when the body does not use the insulin that is produced effectively. Approximately 90% of people with diabetes have type 2 diabetes.

dialysis: A type of renal replacement therapy, whereby the blood is cleaned and wastes and excess water are removed from the body. Sometimes dialysis is a temporary treatment. However, when the loss of kidney function is permanent, as in end-stage kidney disease, dialysis must be continued on a regular basis. The only other treatment for kidney failure is kidney transplantation. There are 2 kinds of dialysis: hemodialysis and peritoneal dialysis.

- **hemodialysis:** The blood is cleaned by being passed through a machine that contains a dialyser. The dialyser has 2 spaces separated by a thin membrane. Blood passes on one side of the membrane and dialysis fluid passes on the other. The wastes and excess water pass from the blood through the membrane into the dialysis fluid, which is then discarded. The cleaned blood is returned to the bloodstream.
- **peritoneal dialysis:** The peritoneal cavity inside the abdomen is filled with dialysis fluid, which enters the body through a permanently implanted catheter. Excess water and wastes pass from the blood through the lining of the peritoneal cavity (the peritoneum) into the dialysis fluid. This fluid is then drained from the body and discarded. In most cases, this treatment can be performed without assistance from hospital personnel.

end-stage kidney disease: A condition in which the kidneys are permanently impaired and can no longer function normally to maintain life.

estimated glomerular filtration rate (eGFR): Estimated rate in mL/min/1.73 m² of the volume of plasma filtered by the kidney. Rates of filtration have been calculated from serum creatinine using the Modification of Diet in Renal Disease (MDRD) Study equation. eGFR is used to determine renal function.

graft survival: Graft survival refers to whether an organ is still functioning at a certain time after transplantation.

median waiting time: This statistic reports the middle waiting time value for recipients of an extra-renal transplant. It means that half the recipients waited less than this value and the remaining half waited more than the value. CORR does not have patient-level data for patients who were listed for a transplant but did not receive a transplant. Thus, these waiting times provide only a partial picture. For kidney transplant patients, time between first dialysis and first kidney transplant is used.

medical urgency status code: Liver, heart and lung patients are assigned a status code at the time of their listing for a transplant. This status code corresponds to their medical condition and how urgently they require transplantation. The status codes are updated regularly until a patient receives a transplant. CORR collects the initial listing status and the status at the time of transplant.

new patient: A patient with end-stage kidney disease who began renal replacement therapy for the first time (either dialysis or renal transplantation) in the calendar year. Also known as an incident patient.

organ donor: A person who donates 1 or more organs that are used for transplantation. Organ donors may be deceased or living.

- **deceased donor:** A person for whom neurological death has been determined, consent has been obtained and organs are offered for transplantation. Neurological determination of death means that there is an irreversible absence of clinical neurological function as determined by definite clinical and/or neuro-imaging evidence. Within CORR, deceased donors are defined as those donors who originated in Canada and who had at least 1 solid organ used for transplantation. Solid organs that can be donated after death include the heart, liver, kidneys, pancreas, lungs, intestine and stomach.
- **living donor:** A donor with a biological (related) and/or emotional (unrelated) relationship to the transplant recipient. Living donors most commonly donate 1 of their kidneys. A lobe of the liver, a lobe of the lung or a segment of the pancreas or the intestine may also be donated by a living donor. At the time of this report, living pancreas and intestine transplants have not been performed in Canada.

organ procurement organization: An organization responsible for coordinating the recovery and distribution of organs from deceased donors in its province or region. Since not all provinces in Canada perform extra-renal transplants, OPOs from across the country coordinate their activities to ensure that those patients on the extra-renal organ transplant waiting lists who most urgently require a transplant are offered a suitable organ first.

organ transplant waiting list: A list of patients awaiting organ transplantation. Lists are maintained by the OPOs. Information on urgent liver and heart patients is shared across provinces. Each list identifies active and on-hold patients.

- **active patient:** A patient on the organ transplant waiting list who can receive a transplant at any time.
- **on-hold patient:** A patient on the organ transplant waiting list who cannot receive a transplant for medical or other reasons for a short period of time.

organ transplantation: Surgical procedure that involves transplantation of organs or parts of organs recovered from deceased or living donors to recipients with end-stage organ failure. Organs that can be transplanted include the heart, liver, kidneys, pancreas, lungs, intestine and stomach. The single-organ kidney transplant is the most commonly performed transplant procedure. In rare cases, 2 or more organs may be transplanted. Organs used in these transplants may be from 1 or more donors.

- **combination organ transplantation:** Surgical procedure that involves transplantation of organs or parts of organs to recipients who have more than 1 organ with end-stage organ failure. The most frequent examples of combination transplants in Canada are kidney–liver and kidney–heart transplants, where patients have end-stage kidney failure along with liver or heart failure. Organs used in these transplants are usually from the same donor.
- **islet cell transplantation:** A medical procedure that involves replacing the insulin-producing cells of the pancreas (islet cells), which are destroyed in people with type 1 diabetes. In Canada, islet cells are retrieved from the pancreas of deceased organ donors, although they may be preserved for a period of time prior to being used for transplantation. Islet cell transplants are captured within CORR.

- **kidney transplantation:** A procedure during which 1 or 2 kidneys from a deceased organ donor or 1 kidney from a living organ donor are surgically recovered and implanted into a person with end-stage kidney disease. Not all persons with end-stage kidney disease are candidates for kidney transplantation. Most people with end-stage kidney disease receive dialysis prior to a kidney transplant.
- **multi-visceral transplantation:** A rare surgical procedure that involves transplantation of the liver, small intestine, pancreas, stomach and duodenum (also known as a cluster transplant).
- **pre-emptive kidney transplant:** An organ transplant that includes a kidney, where the patient has not been treated with dialysis prior to the transplant.

patient survival: Patient survival refers to whether a transplant recipient is still alive at a certain time after transplantation.

prevalent patient: A patient who is alive and receiving renal replacement therapy for end-stage kidney disease on December 31 of a given year, regardless of date of initiation of treatment. Counts of prevalent patients are obtained from treatment hospitals providing patient status change data and facilities on the year-end hemodialysis facility profile and peritoneal facility profile.

registered patient: A patient who began renal replacement therapy for end-stage kidney disease for the first time in 1981 or thereafter and is registered in CORR. The progress of registered patients is monitored each year.

renal replacement therapy: Procedures of hemodialysis, peritoneal dialysis and kidney transplantation, which in part temporarily or permanently replace a person's failed kidneys.

Section 5: Analytical methods

Age calculation

The computation of patient age is based on a count of months between birthdate and treatment date, which is then divided by 12. This calculation yields a whole number in years. For donors, age is collected in terms of a code (e.g., *newborn, days, months, years*) and unit (e.g., 2, 12, 35), as birthdate is not part of the donor data set. For the purposes of this report, donor age is converted to a year-based whole number.

Incident ESKD renal replacement therapy patients

Counts and rates are based on patients registered during a given calendar year (January 1 to December 31). An incident patient must start renal replacement therapy for ESKD in a Canadian facility. Patients who began renal replacement therapy for ESKD outside of Canada but are subsequently treated in Canada are included in registered and prevalent, but not incident, counts.

Organ recovery rates

Organ recovery rates (deceased) are based on organs recovered and transplanted from deceased donors identified in Canadian hospitals.

Patient and graft survival

Unadjusted survival probabilities (expressed as percentages from 0 to 100) are calculated using the Kaplan–Meier method. The cohorts are dialysis and transplant patients who started dialysis or received a first graft between 2005 and 2014. For dialysis survival, patients were censored at first kidney transplant, lost to follow-up, left the country or recovered function. For transplant graft survival, patients were censored if they withdrew, were lost to follow-up or left the country.

Population estimates used in rate calculations

Rates presented are either crude or age specific and are not age standardized.

$$\text{Crude rate} = (\text{number of cases} \div \text{population}) \times 1,000,000$$

$$\text{Age-specific rate} = (\text{number of cases in age group} \div \text{population of age group}) \times 1,000,000$$

All Canadian population estimates are from the Statistics Canada CANSIM Table 051-0001 and are based on total population figures for July 1.

Province	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
B.C.*	4,285,510	4,341,681	4,342,039	4,417,017	4,488,860	4,564,233	4,607,987	4,658,674	4,618,678	4,675,405
Alta.†	3,329,790	3,448,406	3,587,925	3,671,210	3,763,284	3,797,591	3,856,350	3,950,791	4,104,202	4,200,960
Sask.	994,126	985,386	1,000,139	1,013,620	1,030,129	1,044,028	1,057,884	1,079,958	1,108,303	1,122,283
Man.	1,177,556	1,177,765	1,193,932	1,206,100	1,221,964	1,234,535	1,250,574	1,267,003	1,265,015	1,280,242
Ont.	12,541,410	12,686,952	12,794,689	12,936,296	13,069,182	13,227,791	13,372,996	13,505,900	13,537,994	13,677,687
Que.	7,598,146	7,651,531	7,687,125	7,753,470	7,828,879	7,905,679	7,979,663	8,054,756	8,155,334	8,214,885
Atlantic‡	2,343,969	2,331,769	2,326,107	2,329,624	2,337,561	2,352,324	2,357,325	2,363,409	2,368,778	2,372,196
Canada	32,270,507	32,623,490	32,931,956	33,327,337	33,739,859	34,126,181	34,482,779	34,880,491	35,158,304	35,543,658

Notes

* Includes Yukon.

† Includes the Northwest Territories and Nunavut.

‡ Includes New Brunswick, Nova Scotia, Prince Edward Island and Newfoundland and Labrador (see breakdown below).

Source

Statistics Canada.

Atlantic provinces	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
N.B.	752,006	749,168	745,561	747,147	749,468	752,838	755,455	755,950	756,050	754,578
N.S./P.E.I.	1,076,002	1,072,924	1,074,016	1,076,036	1,079,168	1,088,205	1,091,292	1,094,800	1,086,026	1,088,549
N.L.	515,961	509,677	506,530	506,441	508,925	511,281	510,578	512,659	526,702	529,069
Total	2,343,969	2,331,769	2,326,107	2,329,624	2,337,561	2,352,324	2,357,325	2,363,409	2,368,778	2,372,196

Source

Statistics Canada.

Prevalent patients

Prevalent patient numbers at year-end are based on the patient-level data, which includes registered patients with CORR. These are called prevalent registered patients, while prevalent ESKD patients present facility numbers, which are obtained on year-end when the facility profiles are provided by Canadian renal programs. Within these questionnaires, centres are asked to record the number of patients by their modality at year-end. These counts are compared against registered patients within CORR. Over time, the numbers yielded from the facility profiles and patient-level data within CORR have become nearly identical to the dialysis counts. Although converging over time, the counts of patients with a functioning kidney transplant from the facility profile and the patient-level data are still divergent. As such, the facility profiles might continue to provide the most comprehensive picture of the burden of ESKD on Canada's health care systems.

Primary diagnosis

For extra-renal transplant recipients, primary diagnosis is based on the diagnosis made at the time of the patient's first transplant. In some cases, most usually for liver transplant recipients, more than 1 diagnosis may be recorded. For kidney transplant recipients, primary diagnosis is based on the diagnosis provided at the time of incident dialysis treatment, as well as diagnosis at the time of kidney transplant for non-pre-emptive kidney transplants.

Registered patients

Registered patients are patients for whom CORR has patient-level information; the term includes patients who are being treated at a Canadian renal program with dialysis at year-end or who have a functioning kidney transplant at year-end. The prevalent number of registered patients in CORR may vary from prevalent counts provided in the annual facility profiles for the following reasons: not all patients will be registered in CORR because they may have started treatment prior to January 1, 1981; incident patients have been under-reported by some reporting centres; and deaths are suspected to be under-reported to CORR, potentially inflating numbers of living patients.

Transplant recipients

Information presented on transplant recipients in this report looks at recipients of first grafts of a specific organ where transplants occurred at a Canadian transplant facility. The tables and figures refer to either transplant procedures or recipients, with the latter counting patients only 1 time for their first organ-specific graft. Recipient characteristics and province-specific rates are based on transplant recipients.

Waiting list

Data reported on patients waiting for transplants comes from counts provided by provincial and regional OPOs. Patient-level data is not available. For patients waiting for a kidney transplant, the definition of a pediatric patient was changed in 2002 from younger than 15 to younger than 18. This definition is now in line with the definition of pediatric patient used for extra-renal transplants.

Waiting times

Waiting times are calculated for patients who received extra-renal transplants and do not include patients who died while waiting or who withdrew from the list because they became too sick to undergo a transplant. There is currently no national source of information on wait times for all patients listed for transplantation.

For patients who received a kidney transplant, a proxy measure of waiting time (i.e., time spent on dialysis pre-transplant) is used. While this approach avoids the problem of incomplete data on waiting list start dates for prospective kidney transplant recipients within CORR, it does not factor in the waiting time for patients who were listed for a kidney transplant but for whom no transplant occurred. A wait time of 0 is allocated to patients who received a pre-emptive kidney transplant.

Section 6: Primary diagnoses captured by CORR

The tables below list the diagnostic categories that are captured by CORR for primary diagnosis. The tables are organized by organ.

End-stage kidney disease

Primary diagnosis codes — End-stage kidney disease	
Generic	
00	Chronic renal failure — etiology uncertain
Glomerulonephritis/autoimmune diseases	
05	Mesangial proliferative glomerulonephritis
06	Minimal lesion glomerulonephritis
07	Post-strep glomerulonephritis
08	Rapidly progressive glomerulonephritis
09	Focal glomerulosclerosis — adults
10	Glomerulonephritis, histologically not examined
11	Severe nephrotic syndrome with focal sclerosis (pediatric patients)
12	IgA nephropathy — proven by immunofluorescence (not code 85)
13	Dense deposit disease — proven by immunofluorescence and/or electron microscopy (MPGN type II)
14	Membranous nephropathy
15	Membranoproliferative mesangiocapillary glomerulonephritis (MPGN type I)
16	Idiopathic crescentic glomerulonephritis (diffuse proliferative)
17	Congenital nephrosis or congenital nephrotic syndrome (pediatric only)
19	Glomerulonephritis, histologically examined — specify
73	Polyarteritis
74	Wegener's granulomatosis
84	Lupus erythematosus
85	Henoch–Schönlein purpura
86	Goodpasture syndrome
87	Scleroderma
88	Hemolytic uremic syndrome (Moscowitz syndrome)
Nephropathy, drug induced	
30	Nephropathy caused by drugs or nephrotoxic agents, cause not specified
31	Nephropathy due to analgesic drugs
32	Nephropathy due to cisplatin
33	Nephropathy due to cyclosporin A
39	Nephropathy caused by other specific drug — specify

Primary diagnosis codes — End-stage kidney disease	
Polycystic kidney	
41	Polycystic kidneys, adult type (dominant)
42	Polycystic kidneys, infantile and juvenile types (recessive)
Congenital/hereditary renal diseases	
21	Pyelonephritis/interstitial nephritis associated with neurogenic bladder
22	Pyelonephritis/interstitial nephritis due to congenital obstructive uropathy with or without vesicoureteric reflux
24	Pyelonephritis/interstitial nephritis due to vesicoureteric reflux without obstruction
40	Cystic kidney disease, type unspecified
41	Polycystic kidneys, adult type (dominant)
42	Polycystic kidneys, infantile and juvenile types (recessive)
43	Medullary cystic disease, including nephronophthisis
49	Cystic kidney disease, other type — specify
50	Hereditary familial nephropathy, type unspecified
51	Hereditary nephritis with nerve deafness (Alport syndrome)
52	Cystinosis
53	Oxalosis
54	Fabry disease
55	DRASH syndrome
58	Posterior urethral valves
59	Hereditary nephropathy, other — specify
60	Congenital renal hypoplasia — specify
61	Oligomeganephronic hypoplasia
62	Segmental renal hypoplasia (Ask-Upmark kidney)
63	Congenital renal dysplasia with or without urinary tract malformation
66	Syndrome of agenesis of abdominal muscles (prune belly syndrome)
Diabetes	
80	Diabetic nephropathy associated with type 1
81	Diabetic nephropathy associated with type 2
Renal vascular disease	
70	Renal vascular disease, type unspecified
71	Malignant hypertension (no primary renal disease)
72	Renal vascular disease due to hypertension (no primary renal disease)
73	Polyarteritis nodosa
78	Atheroembolic renal disease
79	Renal vascular disease, classified (nephrosclerosis, renal vascular thrombosis)
Other	
20	Pyelonephritis/interstitial nephritis, cause not specified
23	Pyelonephritis/interstitial nephritis due to acquired obstructive uropathy — specify
25	Pyelonephritis/interstitial nephritis due to urolithiasis

Primary diagnosis codes — End-stage kidney disease	
Other (cont'd)	
29	Pyelonephritis, other causes
56	Sickle cell nephropathy
57	Wilms' tumour
82	Multiple myeloma
83	Amyloid
89	Multi-system disease, other — specify
90	Cortical or acute tubular necrosis
91	Tuberculosis
92	Gout
93	Nephrocalcinosis and hypercalcemic nephropathy
94	Balkan nephropathy
95	Kidney tumour
96	Traumatic or surgical loss of kidney
97	HIV nephropathy
99	Other identified renal disorders — specify

Liver transplant

Primary diagnosis codes — Liver transplant	
Acute hepatic failure (fulminant)	
01	Hepatitis, type A
02	Hepatitis, type B
61	Hepatitis, type C
58	Hepatitis, type non-A, -B, -C
35	Hepatitis with delta
05	Toxics
04	Drug induced, other
56	Drug induced, acetaminophen
47	Other/fulminant hepatic failure (including Budd–Chiari syndrome and Wilson disease)
Chronic hepatic failure	
12	Budd–Chiari syndrome
36	Byler disease (intra-hepatic cholestasis)
09	Cirrhosis, alcoholic
10	Cirrhosis, other
08	Cryptogenic cirrhosis
49	Post-necrotic cirrhosis
07	Primary biliary cirrhosis
14	Secondary biliary cirrhosis
45	Drug induced, other

Primary diagnosis codes — Liver transplant	
Chronic hepatic failure (cont'd)	
42	Hepatitis, type A
43	Hepatitis, type B
60	Hepatitis, type C
59	Hepatitis, type non-A, -B, -C
51	Neonatal hepatitis
06	Autoimmune chronic active hepatitis
13	Primary biliary atresia
11	Sclerosing cholangitis
46	Toxic
15	Watson–Alagille disease (arterio-hepatic dysplasia)
62	Polycystic liver disease
64	Non-alcoholic steatohepatitis (NASH)
Hepatic tumours	
50	Angiosarcoma
17	Cholangiocarcinoma
18	Fibrolamellar hepatoma
16	Hepatocellular carcinoma
19	Metastatic tumour
53	Hepatic tumour, other
Metabolic disorders	
20	Alpha-1-antitrypsin deficiency
28	Crigler–Najjar syndrome
21	Glycogen storage disease
23	Hemochromatosis
27	Hyperlipoproteinemia type 2
24	Niemann–Pick
26	Phenylketonuria
25	Protoporphyrinemia
29	Tyrosinemia
22	Wilson disease
34	Metabolic disorder, other
Other primary diagnosis	
30	Congenital hepatic fibrosis
31	Caroli disease
32	Cystic disorders
52	Thrombosed hepatic artery
98	Unknown/missing
99	Other

Heart transplant

Primary diagnosis codes — Heart transplant	
32	Cardiomyopathy
29	Dilated cardiomyopathy
01	Idiopathic cardiomyopathy
30	Other dilated cardiomyopathy — specify
33	Metabolic/genetic cardiomyopathy
34	Cardiomyopathy related to muscular dystrophy
35	Drug-induced cardiomyopathy (chemotherapy)
12	Restrictive cardiomyopathy
31	Hypertrophic cardiomyopathy
24	Myocarditis
07	Coronary artery disease (ischemic cardiomyopathy)
04	Valvular heart disease
23	Acute myocardial infarction
15	Congenital heart disease — specify
16	Congenital heart disease — acyanotic lesions
17	Congenital heart disease — cyanotic lesions
36	Metabolic disorder
37	Cardiac tumour
38	Refractive arrhythmia
39	Muscular dystrophy
98	Unknown
99	Other — specify

Lung, heart–lung transplant

Primary diagnosis codes — Lung, heart–lung transplant	
08	Eisenmenger syndrome
11	Idiopathic pulmonary fibrosis
13	Emphysema
15	Lung failure due to congenital disease
17	Primary pulmonary hypertension
18	Chronic obstructive lung disease
19	Alpha-1-antitrypsin deficiency
20	Cystic fibrosis
22	Bronchiectasis
26	Sarcoidosis
27	Asbestosis
28	Bronchiolitis obliterans
32	Cardiomyopathy — not specified
98	Unknown
99	Other — specify

Pancreas transplant

Primary diagnosis codes — Pancreas transplant	
01	Chronic pancreatitis
02	Diabetes type 1
03	Pancreatectomy
04	Cystic fibrosis
05	Trauma
06	Diabetes type 2
07	Pancreatic cancer
08	Bile duct cancer
98	Unknown
99	Other — specify

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