



Transplantation at a Glance

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Christopher Watson
Michael Allison
John Dark**

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Preface

The early attempts at transplantation in the first half of the 20th century were limited by technical challenges and ignorance of the immune response. Half a century later, with an appreciation of some aspects of human immunology, the first successful renal transplant was performed between identical twins. From these beginnings transplantation has progressed from being an experimental treatment available to a few, to a thriving discipline providing life-changing treatment for many. Its power to dramatically transform the quality and quantity of life continues to capture and inspire those involved at all levels of care. Transplantation is a truly multidisciplinary specialty where input from physicians, surgeons, tissue-typists, nurses, coordinators and many others is required in the provision of optimal care. It is also a rapidly moving discipline in which advances in surgical technique and immunological knowledge are constantly being used to improve outcomes. As a newcomer to the field, the breadth of knowledge required can appear bewildering, and it is with this in mind that we have written *Transplantation at a Glance*. We hope that in this short, illustrated text we have provided the reader with a succinct, yet comprehensive overview of the most important aspects of

transplantation. The book is designed to be easily read and to rapidly illuminate this exciting subject. We have long felt that many aspects of transplantation are best conveyed by diagrammatic or pictorial representation, and it was this conviction that led to the creation of *Transplantation at a Glance*. In particular, the two fundamentals of transplantation, basic immunology and surgical technique, are best learned through pictures. For those approaching transplantation without a significant background in immunology or the manifestations of organ failure, we have provided an up-to-date, crash course that allows the understanding of concepts important in transplantation so that subsequent chapters can be easily mastered. For those without a surgical background, the essential operative principles are simply summarised. Most importantly, throughout the text we have aimed to provide a practical and clinically relevant guide to transplantation which we hope will assist those wishing to rapidly familiarise themselves with the field, regardless of background knowledge.

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List of abbreviations

6-MP	6-mercaptopurine	ECMO	extra-corporeal membrane oxygenator
ACR	acute cellular rejection; albumin–creatinine ratio	EEG	electroencephalogram
ADCC	antibody-dependent cellular cytotoxicity	ELISA	enzyme-linked immunosorbent assay
ADH	antidiuretic hormone	EPO	erythropoietin
AKI	acute kidney injury	EPS	encapsulating peritoneal sclerosis
ALD	alcohol-related liver disease	ERCP	endoscopic retrograde cholangio-pancreatography
ALG	anti-lymphocyte globulin	ESRF	end-stage renal failure
ALP	alkaline phosphatase	EVLV	ex vivo lung perfusion
ALT	alanine transaminase	FcγR	Fc-gamma receptor
AMR	antibody-mediated rejection	FEV₁	forced expiratory volume in 1 second
ANCA	antineutrophil cytoplasmic antibody	FFP	fresh frozen plasma
APC	antigen-presenting cell	FGF	fibroblast growth factor
APD	automated peritoneal dialysis	FP	fusion protein
APKD	adult polycystic kidney disease	FSGS	focal segmental glomerulosclerosis
ARB	angiotensin receptor blocker	FVC	forced vital capacity
AST	aspartate transaminase	GDM	gestational diabetes mellitus
ATG	anti-thymocyte globulin	GERD	gastro-oesophageal reflux disease
ATN	acute tubular necrosis	GFR	glomerular filtration rate
AV	atrioventricular	GN	glomerulonephritis
AVF	arteriovenous fistula	HAI	healthcare-associated infection
BAL	bronchoalveolar lavage	HAS	human albumin solution
BCR	B cell receptor	HBIG	hepatitis B immune globulin
BMI	body mass index	HBV	hepatitis B virus
BOS	bronchiolitis obliterans syndrome	HCV	hepatitis C virus
BP	blood pressure	HD	haemodialysis
CABG	coronary artery bypass graft	HLA	human leucocyte antigen
CAPD	continuous ambulatory peritoneal dialysis	HSP	heat shock protein
CAV	cardiac allograft vasculopathy	HSV	herpes simplex virus
CD	cluster of differentiation	IAK	islet after kidney
CDC	complement-dependent cytotoxicity	ICP	intracranial pressure
CDR	complementarity-determining region	IF	interstitial fibrosis
CF	cystic fibrosis	IFALD	intestinal failure-associated liver disease
CKD	chronic kidney disease	IFN	interferon
CMV	cytomegalovirus	IL	interleukin
CNI	calcineurin inhibitor	IMPDH	inosine monophosphate dehydrogenase
CO	carbon monoxide; cardiac output	IMV	inferior mesenteric vein
COPD	chronic obstructive pulmonary disease	INR	international normalised ratio
CPET	cardiopulmonary exercise testing	IPF	idiopathic pulmonary fibrosis
CPP	cerebral perfusion pressure	ITA	islet transplantation alone
cRF	calculated reaction frequency	ITU	intensive therapy unit
CRP	C-reactive protein	IVC	inferior vena cava
CSF	cerebrospinal fluid	JVP	jugular venous pressure
CT	computed tomography	KIR	killer-cell immunoglobulin-like receptor
CTA	composite tissue allotransplantation	KS	Kaposi's sarcoma
CXR	chest X-ray	LV	left ventricular
DAMP	danger/damage-associated molecular pattern	LVAD	left ventricular assist device
DBD	donation after brain death	LVEDP	left ventricular end diastolic pressure
DC	dendritic cell	LVH	left ventricular hypertrophy
DCD	donation after circulatory death	mAb	monoclonal antibody
DGF	delayed graft function	MAC	membrane attack complex
DLCO	diffusing capacity of the lung for carbon monoxide	MAP	mean arterial pressure
DSA	donor-specific antibodies	MELD	model for end-stage liver disease
DTT	dithiothreitol	MHC	major histocompatibility complex
EBV	Epstein-Barr virus	MI	myocardial infarction
ECG	electrocardiogram	MMF	mycophenolate mofetil

MODY	maturity onset diabetes of the young	RFA	radiofrequency ablation
MPA	mycophenolic acid	RRT	renal replacement therapy
MPAP	mean pulmonary arterial pressure	SAP	serum amyloid protein
MPS	mycophenolate sodium	SMA	superior mesenteric artery
MR	magnetic resonance	SMV	superior mesenteric vein
MRSA	methicillin-resistant <i>Staphylococcus aureus</i>	SPK	simultaneous pancreas and kidney
NAFLD	non-alcoholic fatty liver disease	T3	triiodothyronine
NK	natural killer	TA	tubular atrophy
NODAT	new onset diabetes after transplant	TACE	trans-arterial chemo-embolisation
NSAID	non-steroidal anti-inflammatory drug	TCR	T cell receptor
ODR	organ donor register	TGF	transforming growth factor
PA	pulmonary artery	TIA	transient ischaemic attack
PAK	pancreas after kidney	TIN	tubulointerstitial nephritis
PAMP	pathogen-associated molecular pattern	TLR	toll-like receptor
PCR	polymerase chain reaction; protein-creatinine ratio	TMR	T cell-mediated rejection
PD	peritoneal dialysis	TNF	tumour necrosis factor
PN	parenteral nutrition	TPG	transpulmonary pressure gradient
PRA	panel reactive antibodies	TPMT	thiopurine S-methyltransferase
PTA	pancreas transplant alone	TPR	total peripheral resistance
PTC	peritubular capillary	US	ultrasound
PTH	parathyroid hormone	VAD	ventricular assist device
PTLD	post-transplant lymphoproliferative disease	VRE	vancomycin-resistant enterococci
PVD	peripheral vascular disease	VZV	varicella zoster virus
PVR	pulmonary vascular resistance		