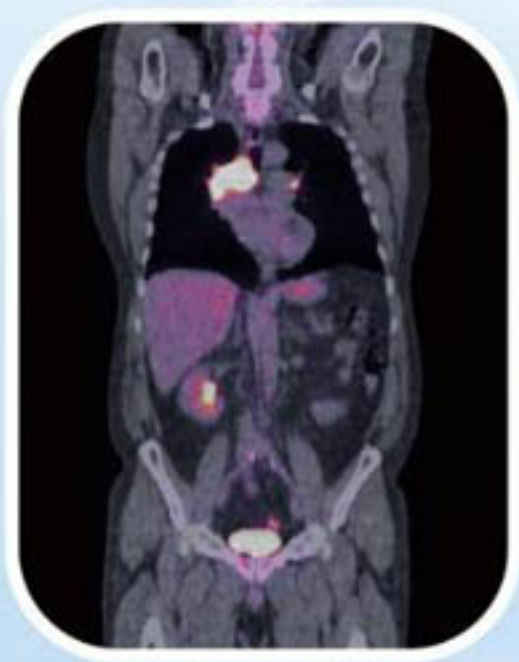


CLINICAL NUCLEAR MEDICINE

FOURTH EDITION



Edited by
**Gary JR Cook, Michael N Maisey,
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Clinical Nuclear Medicine

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Clinical Nuclear Medicine

Fourth edition

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To all those around the world who have contributed and continue to contribute to educating the medical professionals and the public on the beneficial uses of radioactive materials in medicine and for society.

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Preface

Clinical nuclear medicine continues to flourish as a result of the implementation of new techniques into the clinical evaluation of patients that impact on management and therapeutic decisions.

Since the previous edition, PET has become firmly established as a key clinical imaging modality and there is an emphasis on combined anatomical and functional imaging modality with PET/CT and SPECT/CT scanners as well as image registration techniques. These methods have become established in oncology, and cardiac, neurological and other applications are increasing. New SPECT and PET tracers continue to be developed to explore varied aspects of human physiology and biology and the discipline of targeted radionuclide therapy techniques continues to evolve and expand.

These new developments are of importance, not only for nuclear medicine, but also for a wide variety of other disciplines, including the study of physiology and pathophysiology at a molecular level in both humans and animals. The ubiquity of these methods is a testament to the robustness of

the radiotracer principle stimulating continuing advancement of radiotracers, techniques and instrumentation.

The text is structured in a similar manner to previous editions in an effort to describe relevant topics of current clinical importance rather than attempting to deal with all of the basic science. An initial section covers the broad principles and scope of important areas that are considered to impact more significantly on current and future clinical practice since the last edition. The second section covers the clinical systems where nuclear medicine influences clinical practice and a third section reviews a number of relevant technical topics.

In the drawing era of molecular medicine, established and novel nuclear medicine techniques are firmly placed to ensure that this discipline remains at the heart of mainstream medical practice.

G.J.R.C., M.N.M., K.E.B. (London, UK)
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Abbreviations

ACAT	acyl-CoA:cholesterol acyl transferase	cps	counts per second
ACD	annihilation coincidence detection	CRH	corticotropin-releasing hormone
ACE	angiotensin-converting enzyme inhibitor	CRMO	chronic recurrent multifocal osteomyelitis
ACL	anterior cruciate ligament	CSF	colony stimulating factor
ACS	acute coronary syndrome	CT	computed tomography
ACTH	adrenocorticotrophic hormone	CTPA	computed tomography pulmonary angiography
ADAM	2-((2-((dimethylamino)methyl)phenyl)thio)-5-iodophenylamine	CVR	cerebrovascular reserve
AFP	alpha-fetoprotein	CZT	cadmium zinc telluride
APA	aldosterone-producing adenoma	DCIS	ductal carcinoma <i>in situ</i>
APC	activated protein C	DHEA	dehydroepiandrosterone
APD	avalanche photodiode	DIC	disseminated intravascular coagulation
ARPKD	autosomal recessive polycystic kidney disease	DISIDA	diisopropylphenyl-carboxymethyl iminodiacetic acid
ATN	acute tubular necrosis	DLB	dementia of the Lewy body type
ATSM	$^{62}\text{Cu}(\text{II})$ -diacetyl-bis[<i>N</i> (4)-methylthiosemicarbazone]	DLBCL	diffuse large B-cell NHL (q.v.)
(^{62}Cu -ATSM)		DMSA	dimercaptosuccinic acid
BAH	bilateral adrenal hyperplasia	DOTATOC	1,4,7,10-tetra-azacyclododecan-4,7,10-tricarboxy-methyl-1-yl-acetyl-D-Phe ¹ -Tyr ³ -octreotide
BBB	blood-brain barrier	DRF	differential renal function
BCPA	bidirectional cavo-pulmonary anastomosis	DTBZ	dihydrotetrabenazine
BGO	bismuth germanate	DTPA	diethylenetriaminepentaacetic acid
BMD	bone mineral density	DVT	deep vein thrombosis
BNP	B-type natriuretic peptide	DXA	dual-energy X-ray absorptiometry
BRASS	brain registration and analysis of SPECT studies	ECD	L,L-ethyl cysteinyl dimer
BSA	body surface area	ECFV	extra-cellular fluid volume
C5a	complement factor 5a	Echo (or ECHO)	echocardiography
CABBS	computer assisted blood background subtraction	EDE	effective dose equivalent
CABG	coronary artery bypass graft	EDTA	ethylenediaminetetraacetic acid
CAD	coronary artery disease	EDV	end diastolic volume
CAPD	chronic ambulatory peritoneal dialysis	EECP	enhanced external counter pulsation
CBF	cerebral blood flow	EF	ejection fraction
CCD	charged coupled device	ELND	elective lymph node dissection
CCK	cholecystokinin	EORTC	European Organisation for Research and Treatment of Cancer
CEA	carcino-embryonic antigen	ERPF	effective renal plasma flow
CEA	cost-effectiveness analysis	f-Met-Leu-Phe	formyl-methionyl-leucyl-phenylalanine
CHD	congenital heart disease	FCH	fluorocholine (can have [^{18}F] fluorocholine, ^{18}F -FCH)
CMR	complete metabolic response		
CNH	cortical nodular hyperplasia		
CNS	central nervous system		