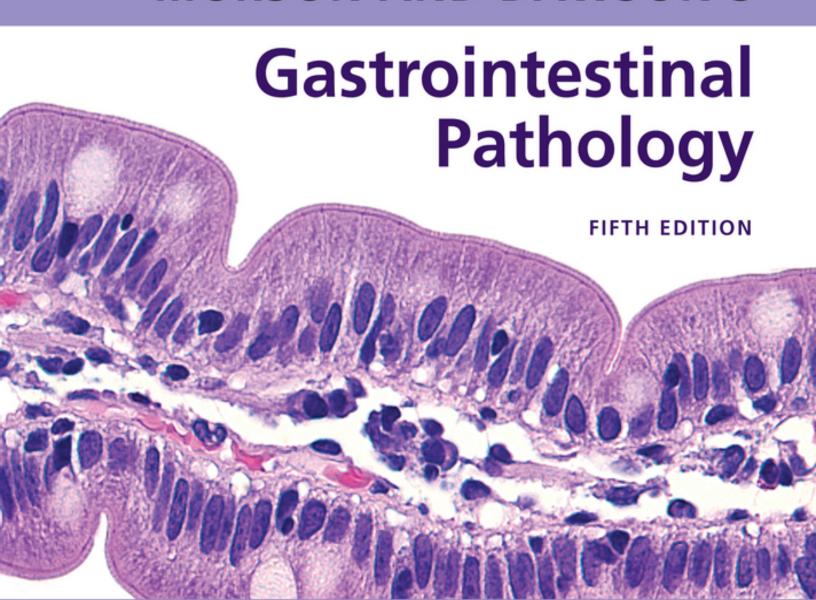
MORSON AND DAWSON'S



EDITED BY

Neil A. Shepherd, Bryan F. Warren, Geraint T. Williams, Joel K. Greenson, Gregory Y. Lauwers and Marco R. Novelli





Table of Contents

Cover

Dedication

Title page

Copyright page

Contributors

Foreword

Preface

About the companion website

PART 1: Oesophagus

CHAPTER 1 The normal oesophagus: anatomy, specimen dissection and histology relevant to pathological practice

<u>Anatomy</u>

<u>Histology</u>

Handling of endoscopic and resection oesophageal specimens

<u>CHAPTER 2 Normal embryology, fetal</u> <u>development and developmental</u> <u>abnormalities</u>

Embryology and fetal development

Anomalies of development

Atresia, stenosis and tracheo-oesophageal fistula

<u>CHAPTER 3 Neuromuscular and</u> <u>mechanical disorders of the oesophagus</u>

Classification

Progressive systemic sclerosis (scleroderma)

Primary muscle disorders

<u>Diffuse oesophageal spasm and other motility</u> <u>disorders of the oesophagus</u>

Achalasia

Diverticula, rings and webs

Acquired hiatus hernia

Muscular and connective tissue changes associated with eosinophilic oesophagitis

<u>CHAPTER 4 Inflammatory disorders of the oesophagus</u>

Classification

Reflux oesophagitis

Infective oesophagitis

Eosinophilic oesophagitis

Other forms of oesophagitis

CHAPTER 5 Barrett's oesophagus

Introduction

Definition, diagnosis and histological

<u>appearances</u>

SSCLO

USSCLO

Effects of treatment

Dysplasia in Barrett's oesophagus

<u>CHAPTER 6 Polyps and tumour-like lesions</u> <u>of the oesophagus</u>

Inflammatory/hyperplastic polyp

Giant fibrovascular polyp

Glycogenic acanthosis

<u>Diffuse leiomyomatosis</u>

CHAPTER 7 Tumours of the oesophagus

Benign epithelial tumours

Malignant epithelial tumours

Well differentiated endocrine (carcinoid) tumour

Malignant melanoma

Mesenchymal tumours

Secondary tumours

Leukaemia and lymphoma

<u>CHAPTER 8 Miscellaneous conditions of the oesophagus</u>

Trauma

Oesophageal casts

<u>Varices</u>
<u>Webs and rings</u>
<u>Barium sulphate in the oesophagus</u>

PART 2: Stomach

<u>CHAPTER 9 The normal stomach:</u> <u>anatomy, specimen dissection and</u> <u>histology relevant to pathological practice</u>

Anatomy and specimen dissection Histology

<u>CHAPTER 10 Congenital abnormalities of</u> the stomach

Normal development

Developmental abnormalities

CHAPTER 11 Inflammatory disorders of the stomach

Classification of 'gastritis' and 'gastropathies'

Gastropathies

Gastritides

Peptic ulcer disease

Atrophic gastritis and gastric atrophy

<u>Autoimmune gastritis</u>

Acute gastritis

Uraemic gastropathy

Other forms of gastritis

CHAPTER 12 Polyps and tumour-like lesions of the stomach

Epidemiology

Classification of gastric polyps

Fundic gland polyps

Hyperplastic polyps

Adenoma

Polyps developing in the setting of polyposis

Non-epithelial and malformative polypoid lesions

Ménétrier's disease

Polyp-like lesions

CHAPTER 13 Epithelial tumours of the stomach

Benign epithelial tumours

Malignant epithelial tumours

Staging gastric cancer

Hereditary gastric cancer syndromes

Molecular aspects of gastric carcinoma

Endocrine cell tumours

Secondary carcinoma in the stomach

CHAPTER 14 Stromal tumours of the stomach

Gastrointestinal stromal tumours

<u>Tumours of neural origin</u>

Tumours of smooth muscle origin

Vascular tumours

<u>Tumours of adipose tissue</u> <u>Other mesenchymal tumours</u>

CHAPTER 15 Lymphoid tumours of the stomach

Introduction

Primary gastric lymphomas

Extra-nodal marginal zone lymphoma of MALT type (MALT lymphoma)

Primary gastric diffuse large B-cell lymphoma

Other primary gastric lymphomas

Secondary lymphomatous involvement

Miscellaneous haematological malignancies

CHAPTER 16 Miscellaneous conditions

Acute gastric dilatation

Motility disorders

Amyloidosis

Gastric bezoars

Gastric hyalinisation

Pseudo-lipomatosis

Pseudo-xanthoma elasticum

Graft-versus-host disease

Vascular disorders

PART 3: Small Intestine

<u>CHAPTER 17 Normal small intestine:</u> anatomy, specimen dissection and

histology relevant to pathological practice

Gross anatomy

Physiology

Microscopic anatomy

Distinctive regional characteristics

<u>CHAPTER 18 Congenital abnormalities of</u> the small intestine

Normal development

Small intestinal development

Malformations

Maldevelopment

CHAPTER 19 Muscular and mechanical disorders of the small intestine

<u>Intussusception</u>

Internal (intra-abdominal) hernia

Volvulus

Perforation and rupture

Small intestinal obstruction

Intestinal pseudo-obstruction

<u>CHAPTER 20 Inflammatory disorders of the small intestine</u>

<u>Inflammation due to identifiable micro-organisms</u>

Bacterial infection

Fungal infection

Protozoal infection

Helminthic infection

Crohn's disease

Drug-induced enteropathy

<u>Miscellaneous inflammatory conditions of the</u> small intestine

Radiation enteritis

Behcet's disease

<u>Ileal reservoirs and pouchitis</u>

<u>Ulcerative colitis in the small intestine</u>

<u>Ileostomy pathology and ileal conduits</u>

Obstructive ileitis

Non-specific jejunitis

Chronic 'non-specific' duodenitis

<u>CHAPTER 21 The pathology of malnutrition</u> and malabsorption

Introduction

<u>Histopathological diagnosis of malabsorptive</u> <u>states</u>

Malnutrition due to unsatisfactory diet

Malnutrition due to defects in absorption and metabolism

Food intolerance

Miscellaneous causes of malnutrition

<u>CHAPTER 22 Vascular disorders of the small intestine</u>

Vascular anatomy of the small intestine
Vascular physiology of the small intestine

Pathogenesis	of	vascu	ar	disorders	of	the	<u>smal</u>	
intestine								

Occlusive ischaemia

Non-occlusive ischaemia

Nomenclature of vascular pathology in the small intestine

<u>Histopathology of intestinal ischaemia</u>

Vasculitis and other primary vascular lesions in the small intestine

CHAPTER 23 Polyps and tumour-like lesions of the small intestine

Brunner's gland

hyperplasia/hamartoma/adenoma

Peri-ampullary myo-epithelial

hamartoma/adenomyoma

Peutz-Jeghers polyps

<u>Juvenile polyps</u>

Cronkhite-Canada syndrome

Pyogenic granuloma

<u>CHAPTER 24 Epithelial tumours of the small intestine</u>

Introduction

Molecular genetics of small intestinal neoplasia

Adenomas

Adenocarcinoma

Endocrine tumours

Metastatic epithelial tumours

Acknowledgement

<u>CHAPTER 25 Stromal tumours of the small</u> intestine

Gastrointestinal stromal tumours

Smooth muscle tumours of the small intestine

Inflammatory myofibroblastic

tumour/inflammatory fibrosarcoma

<u>Tumours of adipose tissue</u>

Vascular tumours

Neural tumours of the small intestine

<u>Translocation sarcomas involving the small</u> intestine

<u>CHAPTER 26 Lymphoid and other tumours</u> of the small intestine

Benign lymphoid proliferations

<u>Primary malignant lymphoma of the small</u> intestine

Leukaemic and secondary lymphomatous

involvement of the small intestine

Metastatic disease to the small intestine

<u>CHAPTER 27 Miscellaneous disorders of the small intestine</u>

<u>Amyloidosis</u>

Bypass operations

Cholesterol ester storage disease

Endometriosis

Pneumatosis cystoides intestinalis

<u>Malakoplakia</u>

Systemic mastocytosis

Melanosis and pseudo-melanosis

Zinc deficiency

Pseudo-lipomatosis

Graft-versus-host disease

Small intestinal transplantation

PART 4: Appendix

<u>CHAPTER 28 Normal appendix: anatomy,</u> <u>specimen dissection and histology</u> <u>relevant to pathological practice</u>

<u>Anatomy</u>

<u>Histology</u>

Specimen dissection

<u>CHAPTER 29 Inflammatory disorders of the appendix</u>

Acute non-specific appendicitis
Other forms of appendicitis

CHAPTER 30 Tumours of the appendix

Low grade appendiceal mucinous neoplasms

Adenocarcinoma

Pseudomyxoma peritonei

<u>Hyperplastic polyp, diffuse mucosal hyperplasia</u> <u>and sessile serrated adenoma</u>

<u>Traditional serrated adenoma</u>

Colonic-type tubular adenomas

Endocrine (carcinoid) tumours

Goblet cell carcinoid

Mesenchymal tumours

Malignant lymphoma

Secondary tumours (other than lymphoma)

<u>CHAPTER 31 Miscellaneous conditions of the appendix</u>

Normal embryology and fetal development

Developmental abnormalities

Diverticular disease

Intussusception

Torsion

Endometriosis and conditions related to

<u>pregnancy</u>

Cystic fibrosis

Foreign bodies

Melanosis

PART 5: Large Intestine

CHAPTER 32 Normal large intestine: anatomy, specimen dissection and histology relevant to pathological practice Anatomy Specimen handling Histology

<u>CHAPTER 33 Embryogenesis and</u> <u>developmental abnormalities (including</u> <u>the anal region)</u>

Normal development

Malpositions

Vestigial remnants

Maldevelopments

Disturbances of innervation

<u>CHAPTER 34 Neuromuscular and</u> <u>mechanical disorders of the large intestine</u>

Diverticular disease of the colon

Diverticulosis of the right colon

The irritable bowel syndrome

<u>Idiopathic constipation, megacolon, megarectum</u> <u>and pseudo-obstruction</u>

Volvulus

<u>Mucosal prolapse and the solitary ulcer syndrome</u> <u>Intussusception and complete rectal prolapse</u>

Trauma

Foreign bodies

<u>CHAPTER 35 Inflammatory disorders of the large intestine</u>

Inflammation due to viruses
Bacterial infection

<u>Inflammation due to fungi</u>
Protozoal infection
Helminthic infection
Inflammatory bowel diseases
Ulcerative colitis
Crohn's disease of the large intestine
Diverticular disease and CIBD of the large
<u>intestine</u>
Other granulomatous pathology in the large
<u>intestine</u>
Biopsy in the differential diagnosis of CIBD and
<u>infective procto-colitis</u>
<u>Drug-induced procto-colitis</u>
Pseudo-membranous colitis and antibiotic-
associated diarrhoea and colitis
Brainerd diarrhoea
Focal active colitis
Radiation procto-colitis
<u>Diversion procto-colitis</u>
Necrotising colitis
Neutropaenic colitis
Neonatal necrotising enterocolitis
Microscopic colitis
<u>Mastocytic enterocolitis</u>
Phlegmonous colitis
Transient colitis and acute self-limiting (acute
<u>infectious type) colitis</u>

Obstructive colitis

Behçet's disease

<u>CHAPTER 36 Vascular disorders of the large intestine</u>

Anatomy

Nomenclature

Causes of ischaemic colitis

Ischaemic lesions

Endoscopic features and biopsy

Angiodysplasia

Portal (hypertensive) colopathy

<u>Vasculitides</u>

<u>Idiopathic myointimal hyperplasia of mesenteric veins</u>

<u>CHAPTER 37 Polyps and tumour-like</u> <u>lesions of the large intestine</u>

Conventional adenoma

Serrated polyps

Serrated polyposis

Familial adenomatous polyposis

MUTYH-associated polyposis

Juvenile polyp

<u>Autosomal dominant inherited hamartomatous</u>

polyposis syndromes

Cronkhite-Canada syndrome

Inflammatory polyps

Other polyps

<u>CHAPTER 38 Malignant epithelial</u> <u>neoplasms of the large bowel</u>

1	1				44	: _	
ın	١TI	rn	а	u	ct	ın	n
			u	u			

Epidemiology

<u>Aetiology</u>

Pathogenesis of colorectal neoplasia

The clinical pathology of colorectal

adenocarcinoma

Endocrine tumours

Rare forms of colorectal cancer

Datasets and reporting standards

Screening for colorectal cancer

<u>CHAPTER 39 Non-epithelial tumours of the large intestine</u>

Tumours of lymphoid tissue

Connective tissue tumours

<u>Miscellaneous tumours of the colorectum and retrorectal space</u>

<u>CHAPTER 40 Miscellaneous disorders of the large intestine</u>

Amyloid

Endometriosis

Melanosis coli

<u>Muciphages</u>

Pneumatosis coli

Pseudo-lipomatosis

Stercoral ulceration

<u>Graft-versus-host disease</u>

Cord colitis syndrome

Effects of bowel preparation
Torsion of appendices epiploicae
Barium granuloma
Malakoplakia
Squamous metaplasia of the colorectum

PART 6: The Anal Region

<u>CHAPTER 41 Normal anal region: anatomy, histology relevant to pathological practice and specimen handling</u>

Normal anal region: anatomy, histology relevant to pathological practice and specimen handling

<u>CHAPTER 42 Inflammatory disorders of the anal region</u>

Miscellaneous inflammatory conditions
Infectious disease of the anorectum
Inflammatory bowel disease involving the
anorectum

<u>CHAPTER 43 Tumours and tumour-like</u> <u>conditions of the anorectal region</u>

Benign epithelial tumours and pre-cancerous
lesions of the anorectal region
Malignant epithelial tumours of the anal canal
Malignant epithelial tumours of the anal margin
Miscellaneous tumours

<u>CHAPTER 44 Miscellaneous conditions of the anal region</u>

Haemorrhoids

Oleogranuloma

Ectopic tissue

Anal incontinence

PART 7: Peritoneum

CHAPTER 45 The normal peritoneum

<u>Anatomy</u>

Microscopic appearances

<u>CHAPTER 46 Inflammatory disorders of the peritoneum</u>

Acute diffuse peritonitis

Localised peritonitis

Special forms of peritonitis

Sclerosing mesenteritis

<u>Fat necrosis after pancreatitis</u>

CHAPTER 47 Tumours and tumour-like lesions of the peritoneum

Introduction

Mesothelial hyperplasia and mesothelial tumours

<u>Epithelial tumours and metaplastic tumour-like</u>

lesions of the peritoneum

<u>Primary tumours arising from the subserosal</u> <u>mesenchyme</u>

<u>Tumours of uncommitted stem cells or uncertain</u> <u>histogenesis</u>

Tumour-like conditions of the peritoneum

Secondary tumours

Pseudomyxoma peritonei

<u>CHAPTER 48 Miscellaneous conditions of the peritoneum</u>

Ascites

Pneumo-peritoneum

Intra-peritoneal loose bodies

<u>Torsion and segmental infarction of the greater</u> <u>omentum</u>

Peritoneal pigmentation

Splenosis

Trophoblastic implants

Cartilaginous metaplasia

Index

This book is dedicated to the memory of two outstanding gastrointestinal pathologists,
Professor Jeremy Jass and Professor Bryan Warren.

Morson and Dawson's Gastrointestinal Pathology

Edited by

Neil A. Shepherd, DM, FRCPath

Professor of Gastrointestinal Pathology and Consultant Histopathologist Gloucestershire Cellular Pathology Laboratory Cheltenham, UK

Bryan F. Warren, MB ChB, FRCP(London), FRCPath[†]

Professor of Gastrointestinal Pathology John Radcliffe Hospital Oxford, UK

Geraint T. Williams, OBE, BSc, MD, MRCR, FRCP(London), FRCPath, FMedSci

Professor of Pathology Cardiff University Cardiff, UK

Joel K. Greenson, MD

Professor of Pathology University of Michigan Medical School Ann Arbor, MI, USA

Gregory Y. Lauwers, MD

Vice Chair of Pathology, Massachusetts General Hospital Professor of Pathology, Harvard Medical School Boston, MA, USA

Marco R. Novelli, MB ChB, PhD, FRCPath

Professor of Gastrointestinal Pathology and Consultant Histopathologist University College Hospital London, UK

FIFTH EDITION

†Deceased



A John Wiley & Sons, Ltd., Publication

This edition first published 2013 © 2013 by Blackwell Publishing Ltd.

Blackwell Publishing was acquired by John Wiley & Sons in February 2007. Blackwell's publishing program has been merged with Wiley's global Scientific, Technical and Medical business to form Wiley-Blackwell.

Registered office: John Wiley & Sons, Ltd, The Atrium, Southern Gate, Chichester, West Sussex, PO19 8SQ, UK

Editorial offices: 9600 Garsington Road, Oxford, OX4 2DQ, UK

The Atrium, Southern Gate, Chichester, West Sussex, PO19 8SQ, UK

111 River Street, Hoboken, NJ 07030-5774, USA

For details of our global editorial offices, for customer services and for information about how to apply for permission to reuse the copyright material in this book please see our website at www.wiley.com/wiley-blackwell

The right of the author to be identified as the author of this work has been asserted in accordance with the UK Copyright, Designs and Patents Act 1988.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, except as permitted by the UK Copyright, Designs and Patents Act 1988, without the prior permission of the publisher.

Designations used by companies to distinguish their products are often claimed as trademarks. All brand names and product names used in this book are trade names, service marks, trademarks or registered trademarks of their respective owners. The publisher is not associated with any product or vendor mentioned in this book. This publication is

designed to provide accurate and authoritative information in regard to the subject matter covered. It is sold on the understanding that the publisher is not engaged in rendering professional services. If professional advice or other expert assistance is required, the services of a competent professional should be sought.

The contents of this work are intended to further general scientific research, understanding, and discussion only and are not intended and should not be relied upon as recommending or promoting a specific method, diagnosis, or treatment by physicians for any particular patient. The publisher and the author make no representations or warranties with respect to the accuracy or completeness of the contents of this work and specifically disclaim all warranties, including without limitation any implied warranties of fitness for a particular purpose. In view of ongoing research, equipment modifications, changes in governmental regulations, and the constant flow of information relating to the use of medicines, equipment, and devices, the reader is urged to review and evaluate the information provided in the package insert or instructions for each medicine, equipment, or device for, among other things, any changes in the instructions or indication of usage and for added warnings and precautions. Readers should consult with a specialist where appropriate. The fact that an organization or Website is referred to in this work as a citation and/or a potential source of further information does not mean that the author or the publisher endorses the information the organization or Website may provide or recommendations it may make. Further, readers should be aware that Internet Websites listed in this work may have changed or disappeared between when this work was written and when it is read. No warranty may be created or extended by any promotional statements for this work.

Neither the publisher nor the author shall be liable for any damages arising herefrom.

Library of Congress Cataloging-in-Publication Data

Morson and Dawson's gastrointestinal pathology. – 5th ed. /
edited by Neil A. Shepherd . . . [et al.].

p.; cm.

Gastrointestinal pathology

Includes bibliographical references and index.

ISBN 978-1-4051-9943-8 (hardcover : alk. paper)

I. Shepherd, Neil A. II. Morson, Basil C. (Basil Clifford). Gastrointestinal pathology. III. Title: Gastrointestinal pathology.

[DNLM: 1. Gastrointestinal Diseases-pathology. WI 140] 616.3'3071-dc23

2012009760

A catalogue record for this book is available from the British Library.

Wiley also publishes its books in a variety of electronic formats. Some content that appears in print may not be available in electronic books.

Cover images: Main image – Courtesy of Robert E. Petras and back image – Courtesy of Neil A. Shepherd Cover design by Sarah Dickinson

Contributors

Richard L. Attanoos, BSc, MB BS, FRCPath

Consultant Histopathologist Department of Histopathology University Hospital Llandough Penarth, UK

Shinichi Ban, MD, PhD

Head, Department of Pathology Saiseikai Kawaguchi General Hospital Saitama, Japan

Adrian C. Bateman, BSc, MD, FRCPath

Consultant Histopathologist and Honorary Senior Lecturer in Pathology

Southampton General Hospital Southampton, UK

Lodewijk A.A. Brosens, MD, PhD

Chief Resident in Pathology Department of Pathology University Medical Centre Utrecht Utrecht, The Netherlands

Ian Brown, FRCPA

Visiting Senior Specialist Royal Brisbane and Women's Hospital; Specialist Pathologist Envoi Specialist Pathologists Brisbane, QLD, Australia

Fiona Campbell, BSc, MD, FRCPath

Honorary Professor and Consultant Gastrointestinal Pathologist
Department of Pathology
Royal Liverpool University Hospital
Liverpool, UK

Frank A. Carey, BSc, MD, FRCPath

Consultant Pathologist and Honorary Professor in Pathology Department of Pathology Ninewells Hospital and Medical School

Ninewells Hospital and Medical School

Dundee, UK

Fátima Carneiro, MD, PhD

Professor of Pathology and Head of Department of Pathology Faculty of Medicine of the University of Porto Centro Hospitalar de São João and IPATIMUP Porto, Portugal

Andrew D. Clouston, MBBS, PhD, FRCPA

Associate Professor, Molecular and Cellular Pathology University of Queensland;

Visiting Senior Specialist, Royal Brisbane and Women's Hospital;

Specialist Pathologist

Envoi Specialist Pathologists

Brisbane, QLD, Australia

Claude Cuvelier, MD, PhD

Head, Academic Department of Pathology Ghent University

Ghent, Belgium

Paola Domizio, BSc, MB BS, FRCPath

Professor of Pathology Education

Barts and The London School of Medicine and Dentistry

Queen Mary University of London;

Department of Cellular Pathology

The Royal London Hospital

London, UK

Erinn Downs-Kelly, DO, MS

Staff Pathologist

Department of Anatomic Pathology

Cleveland Clinic

Cleveland, OH, USA

David K. Driman, MBChB, FRCPC

Professor of Pathology Department of Pathology Schulich School of Medicine and Dentistry Western University and London Health Sciences Centre

Robert P. Eckstein, MB, BS, FRCPA

Associate Professor of Pathology Department of Anatomical Pathology Pacific Laboratory Medicine Services Royal North Shore Hospital St Leonards, NSW, Australia

Nadine Ectors, MD, PhD

London, ON, Canada

Professor in Histopathology and Coordinator Translational Cell and Tissue Research AC Biobanking University Hospitals and University Leuven Leuven, Belgium

Hala El-Zimaity, MD, FRCPC, MSc

Associate Professor Department of Laboratory Medicine and Pathobiology University of Toronto Toronto, ON, Canada

Jean-François Fléjou, MD, PhD

Professor of Pathology Department of Pathology Hôpital Saint-Antoine, AP-HP; Faculté de Médecine Pierre et Marie Curie Paris, France

Karel Geboes, MD, PhD, AGAF

Professor of Pathology Department of Pathology University Hospital and Medical School KU Leuven Leuven, Belgium

Muriel Genevay, MD

Consultant Gastrointestinal Pathologist Service of Clinical Pathology University Hospitals of Geneva Geneva, Switzerland

John R. Goldblum, MD

Chairman, Department of Anatomic Pathology Cleveland Clinic; Professor of Pathology Cleveland Clinic Lerner College of Medicine Cleveland, OH, USA

Joel K. Greenson, MD

Professor of Pathology University of Michigan Medical School Ann Arbor, MI, USA

Thomas Guenther, MD, PhD, FRCPath

Honorary Consultant Histopathologist St Mark's Hospital North West London Hospitals NHS Trust London, UK;

Professor of Pathology and Consultant Histopathologist Otto-von-Guericke University

Magdeburg, Germany

Gordon Hutchins, BMedSci(Hons), MB BS

Academic SpR in Histopathology & Honorary Clinical Lecturer

Pathology and Tumour Biology Leeds Institute of Molecular Medicine University of Leeds Leeds. UK

Dhanpat Jain, MBBS, MD

Associate Professor of Pathology and Medicine (Digestive Diseases)

Director, Program in Gastrointestinal and Liver Pathology Department of Anatomic Pathology Yale University School of Medicine New Haven, CT, USA

Marnix Jansen, MD, MSc, PhD

Chief Resident, Pathology Department of Pathology Academic Medical Centre Amsterdam, The Netherlands

Laura W. Lamps, MD

Professor and Vice-Chair Department of Pathology University of Arkansas for Medical Sciences Little Rock, AZ, USA

Gregory Y. Lauwers, MD

Vice Chair of Pathology, Massachusetts General Hospital; Professor of Pathology Harvard Medical School Boston, MA, USA

Laurence de Leval, MD, PhD

Professor of Pathology Clinical Director, Institute of Pathology Centre Hospitalier Universitaire Vaudois Lausanne, Switzerland

Maurice B. Loughrey, BSc, MRCP, MD, FRCPath

Consultant Histopathologist and Honorary Lecturer Royal Victoria Hospital Queen's University Belfast Belfast, UK

Joanne E. Martin, MA, MB BS, PhD, FRCPath

Professor of Pathology
Barts and the London School of Medicine and Dentistry
Queen Mary University of London;
Department of Cellular Pathology
The Royal London Hospital
London, UK