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Encyclopedia of Gastroenterology Basic Theory

胃肠病百科全书 ②

胃肠病学基础知识

Leonard R. Johnson



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科学出版社

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Encyclopedia of Gastroenterology

胃肠病百科全书②

Basic Theory

胃肠病学基础知识

Editor-in-Chief

Leonard R. Johnson

University of Tennessee

科学出版社

北京

图字:01-2008-0431 号

This is an annotated version of
Encyclopedia of Gastroenterology(Volume 1-3) by Leonard R. Johnson.

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ISBN 10: 0-12-386860-2(set)

ISBN 10: 0-12-386861-0(Volume1)

ISBN 10: 0-12-386862-9(Volume2)

ISBN 10: 0-12-386863-7(Volume3)

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AUTHORIZED EDITION FOR SALE IN P. R. CHINA ONLY

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图书在版编目(CIP)数据

胃肠病学基础知识=Basic Theory:英文/(美)约翰逊(Johnson, L. R.)主编. —影印本. —北京:科学出版社,2008

(胃肠病百科全书;2)

ISBN 978-7-03-021033-3

I. 胃… II. 约… III. 胃肠病学-英文 IV. R57

中国版本图书馆 CIP 数据核字(2008)第 015711 号

责任编辑:田慎鹏 李小汀 乐俊河/责任印制:钱玉芬

封面设计:耕者设计工作室

科学出版社出版

北京东黄城根北街16号

邮政编码:100717

<http://www.sciencep.com>

双青印刷厂印刷

科学出版社发行 各地新华书店经销

*

2008年3月第一版 开本:787×1092 1/16

2008年3月第一次印刷 印张:19 1/4

印数:1—1 500 字数:457 000

定价:88.00元

(如有印装质量问题,我社负责调换〈双青〉)

《胃肠病百科全书》译者名单

参译人员(按姓名汉语拼音顺序排列)

何必立 黄柏强 李长青 李俊强 李学先 聂 飏
司遂海 孙欣欣 王文虎 王 星 吴汉平 吴嗣泽
尤 捷 曾其强 张殿彩 郑明华 周 毅 周祖木



感谢丁香园生物医药网

对本书翻译工作的鼎力支持和积极协调,感谢所有参译人员付出的不懈努力。

一部案头必备的胃肠病学大全

——胃肠病学百科全书导读

随着胃肠病学基础理论和实用技术的迅猛发展,临床胃肠病学发生了翻天覆地的变化。数十年前,消化性溃疡曾被认为是一种难于治愈又极易复发的顽症。尽管人们早已认识到“无酸便无溃疡”,但也只是在上个世纪七、八十年代发现了 H_2 受体阻滞剂和质子泵抑制剂(PPD)以后,消化性溃疡才得以快速治愈;当研究者发现幽门螺旋杆菌(HP)在消化性溃疡发病中的作用,建立了“没有 HP 便没有溃疡复发”的学说以后,才解决了溃疡病的复发问题。当人们认识到 HP 感染与胃(肠)黏膜相关淋巴瘤的关系极为密切时,抗 HP 治疗便成为成功治愈早期胃黏膜相关淋巴瘤的有效方法。“脑肠肽”和脑肠肽瘤的发现,使既往某些不明原因的分泌性腹泻的病因得以明确,患者也因此获得治愈的希望。分子遗传学理论的发展,使我们发现了许多发病原因不明的遗传性疾病的病因。利用现代分子生物学技术,克隆了常见的“遗传性大肠癌综合征”的致病基因,并成功地预测了未患病家族成员的患病风险。相关学科的发展更为我们提供了许多诊断和治疗的新手段。例如,消化道内镜的开发和应用,使过去无法看到的病理形态学变化在今天“一目了然”。当代的消化道内镜已经达到“无孔不入”,放大内镜、超声内镜和共聚焦内镜可以侦察到消化管壁深层和消化管以外的病变,为多种恶性肿瘤的诊断和治疗提供了强有力的工具。内镜下的微创治疗技术在许多情况下代替了剖腹手术,大大提高了治疗效率,降低了治疗费用和患者的痛苦。大量物理学、化学、生物学技术被应用到临床医学。CT(包括模拟结肠镜)、MRCP(核磁共振胆管水成像)扩大了我们的视觉效果,使深藏在人体实质脏器内的病灶显露无遗。放免技术、酶标技术、发光技术已可检测到人体内纳米级的微量物质,现代 PCR 技术更将生命的基本物质结构——核苷酸的信息呈现出来,使我们可以更深入的了解生命的本质。基因工程技术不仅仅是制备生物制剂的手段,也被用于改造有缺陷的组织和器官,引导患病机体恢复健康。

凡此种种,学术知识的爆炸式增长和海量信息的迅猛增加,使得跨学科专家甚至同行专家,都很难全面了解自己研究范围以外的知识和进展。医学生、年轻的医师和各研究领域的专家,都迫切需要一本可快速查阅、能全面反映胃肠专科进展的著作。为适应这种需求,2004年由美国著名胃肠病学家、优秀教育学家 LR Johnson 博士领衔,15位资深专家共同编纂,Elsevier 出版的《胃肠病学百科全书》便应运而生。这是一部由近 600 位专家撰写的大型综合性著作。全书共有 477 项词条,几乎囊括了当代胃肠病学和肝病学的所有分支。各词条均是从专业角度,系统阐述了各种胃肠疾病和肝脏疾病的病理过程、临床特点、诊断标准和治疗模式,详细介绍了各种综合征和专项学术进展。在一些必要的地方,还针对儿童和成人患者分别论述其异同。每个词条均包含一个经典的核心知识和进展性前沿材料。作者们在各词条中,巧妙地将基础理论和临床知识有机地结合在一起,使读者在学习基本理论的同时,自然而然地掌握了相应的临床技能。全书 477 项词条虽然

自成系统,独立成文,但各词条间又有交叉重叠,使不同背景、不同领域的读者可以从自己感兴趣的侧面,获得完整的知识。一些未能以词条形式独立收录的课题,必然会在其它篇章论及,读者可以通过第三卷最后的索引查到要了解的内容。《胃肠病学百科全书》虽然由数百位作者撰写而成,但他们在写作风格上,都尽可能突出实用性和可读性。全书语言简练,清晰易懂,在介绍概念和论述重点的地方配以图表,使母语为非英语的读者也容易理解所述内容。

《胃肠病学百科全书》原著采用专业性工具书的体例,全部词条均以英文字母顺序编排,其中第一卷从A到E,第二卷从F到N,第三卷从O到Z。为方便读者查阅,全书有三套检索系统:各卷之首列出目录总表,读者可按关键词英文字母顺序查阅;论文主体前,还提供了一个主题目录,便于读者按不同主题范围查找关键词;在第三卷最后列出全书索引,为读者指引相关信息的出处,发挥了迅即查询、快速答疑的作用。

《胃肠病学百科全书》原著中,各词条均按以下统一的标准格式排列:词条和作者、术语词汇、内容概要、论文主体、相关文章、参考文献。

各词条多以关键词或提示内容的短语列出,并在其后缀以定语,例如,“结肠炎,溃疡性”(Colitis, Ulcerative),这种标引方法使该词条内涵更加丰富,既包括了各种结肠炎,也包扩了溃疡性结肠炎。

众所周知,临床医生在阅读专业书籍时会遇到来自其它学科的知识,面对这些交叉学科的渗透,常常由于不明白它们的含义而感到困惑。显然,读懂这些术语的意义,对于了解本词条的主旨内容非常重要。为此,该书在各词条论述主体内容之前,首先列出本词条所涉及的术语词汇解释,它们都是该词条主体部分使用的关键词。例如,在词条“结直肠腺瘤”(Colorectal Adenomas)中,列出“结直肠腺癌”(colorectal adenocarcinoma)、“结直肠腺瘤”(colorectal adenoma)、“结直肠息肉”(colorectal polyp)、“输尿管乙状结肠吻合术”(ureterosigmoidostomy)等术语词汇的解释。为方便阅览,该书还将所有词条涉及的2000个左右术语词汇集中在一起,列于第三卷最后(索引之前),供读者快速查询。

术语词汇之后,均先以黑体字对全文作一综合性介绍(即内容概要),并与论文主体分开。例如,词条“小肠吸收不良”(Celiac Disease)的内容概要为:“小肠吸收不良是一种因谷胶(麦麸)致敏,小肠黏膜受损,引起小肠慢性炎症,继而出现多种营养素吸收不良的疾病。患者也会出现肠道以外的其它临床表现。本病的诊断有赖于小肠活检的特异发现。无麦麸饮食可使患者很快康复。患者须终生进食无麦麸饮食,以防止症状复发和其它不良后果”。

内容概要之后,便是各词条的论文主体。作者们用简明、扼要的方式对所论述的相关背景知识、基础理论和实践技能进行了全面阐述。

论文主体之后是共计2700多条相关文章的推介。例如,词条“腹泻”(Diarrhea)的相关文章中,提供了“抗生素相关性腹泻”(Antibiotic-Associated Diarrhea)、“抗腹泻药”(Anti-Diarrhea drugs)、“细菌毒素”(Bacterial Toxins)、“碳水化合物和乳糖吸收不良”(Carbohydrate and Lactose Malabsorption)、“腹泻,感染性”(Diarrhea, infectious)、“腹泻,儿科”(Diarrhea, Pediatric)、“胃肠炎”(Gastroenteritis)、“吸收不良”(Malabsorption)、“营养不良”(Malnutrition)、“胰腺功能试验”(Pancreatic Function Tests)、“旅行者腹泻”(Traveler's Diarrhea)等关键词。读者可以通过相关文章中的关键词,查阅其它词

条,从不同角度更深入地掌握与腹泻相关的知识。

词条的最后是参考文献。《胃肠病学百科全书》类似一部专业词典,总体上要求内容包罗万象——大而全,因而作者在每一词条中不可能象专著那样全面展开论述,只能以精要的语言概述与主题相关的内容。为弥补各词条内容相对单薄的缺憾,作者们在词条之后列出参考文献,以协助读者寻找更详细、更深入的专业信息。例如,词条“胃食管反流病”(Gastroesophageal Reflux Disease)在全文结尾处,列出作者推荐的如下参考文献:

*Achem, S R. , Kolts, B. E. , MacMath, T. , Richter, J. , Mohr, D. , Burton, L. , and Castell, D. O. (1997). Effects of omeprazole versus placebo in treatment of noncardiac chest pain and gastroesophageal reflux. *Digest. Dis. Sci.* 42, 2138-2145.

*Bammer, T. , Hinder, R. A. , Klaus, A. , and Klingler, P. J. (2001). Five-to eight-year outcome of the first laparoscopic Nissen fundoplication. *J. Gastrointest. Surg.* 5, 42-48.

*Carlson, M. A. , and Frantzides, C. T. (2001). Complications and results of primary minimally invasive antireflux procedures: A review of 10,735 reported cases. *J. Am. Coll. Surg.* 193, 428-439.

这一部分并不是作者写作时参阅的全部文献,只是专家对某一条目为读者推荐的更多信息。

为了便于中国读者快速查阅,又能保留原著风格,导读本将原书中的目录、词条和作者、各词条的术语词汇和内容概要一一译出,保留了原书中论文主体、相关文章和参考文献等主体内容的英文原文。为方便读者阅读和携带,导读本参照原书主题目录,按词条论述类别,分10卷分册出版:第一分册,消化系统解剖与生理(吸收与分泌,解剖与发育);第二分册,胃肠病学基础知识(细胞生物学,激素和介质,免疫);第三分册,胃肠病学概论(概论,一般症状);第四分册,上胃肠疾病(食管,胃,小肠);第五分册,下消化道疾病、胃肠动力与神经胃肠病学(肠炎-溃疡-腹泻,动力,神经胃肠病学);第六分册,肝胆与胰腺疾病(肝,胆,胰);第七分册,肿瘤与外科(癌,外科);第八分册,全身性疾病与影像学检查(全身性疾病,影像学检查);第九分册,儿科与寄生虫病(儿科,寄生虫);第十分册,药理、营养与心理学(药理,营养,心理学)。在编辑体例上仍维持原书风格,依次按:词条和作者、术语词汇、内容概要、论文主体、相关文章、参考文献的顺序编排。

《胃肠病学百科全书》是一部介于教科书和学术专著之间,类似于专业词典的著作。该书给基础研究和临床实践架起了一座桥梁,有助于专家们了解各自学术领域以外的课题,也适合医学生和临床胃肠病医师翻阅参读。我相信,有这样一部专业性工具书放在案头,协助我们解惑、答疑,对职业生涯会有莫大帮助。

李世荣

北京军区总医院 专家组组长, 肠病中心主任

前 言

与我同龄的人对百科全书通常有种复杂的感情，大约是因为它们唤起了高中时代写学期报告以及在图书馆翻阅 26 卷百科全书的记忆。电脑时代的年轻人或许无法全然了解我所说的这些。随着年龄的增大，我重新发现了它们的用处，特别是那些只有一两卷或者 3 卷的百科全书。我最喜爱的常识性百科全书是《哥伦比亚百科全书》，第一版是 1935 年，现在已经出到了第五版。在很多场合我都用到过这部书。例如有次我在准备关于乳糜泻的大查房讲座时发现，这种疾病早在公元二世纪就被卡帕多西亚的阿勒特奥斯 (Aretaeus the Cappadocian) 确切地描述过。卡帕多西亚 (Cappadocia) 在哪里？是古希腊的一个城市吗？猜到可能有人会问这个问题，于是我查阅了《哥伦比亚百科全书》，发现卡帕多西亚是古赫梯王国 (ancient Hittite state)，位于今土耳其中部。最近我参加了医学人文研究院一位博士生的论文答辩委员会，他论文开题报告涉及到的哲学我从未听说过（比如诠释学和现象学）。而在《哥伦比亚百科全书》中这些问题得到了简洁的描述，并且没有超出我这个外行的理解能力。因此，我成了小部头百科全书的拥趸。它们的确很有用。

那为什么没有出版社为医学和生物学专业出一部这样的百科全书呢？实际上是的。Elsevier 出版社已经出版了好几种这样的百科全书，包括《癌症百科全书》（目前已是第二版）、《激素百科全书》以及《毒理学百科全书》。在总编 Leonard R. Johnson 博士的领导下，Elsevier 现在又出版了《胃肠病学百科全书》。Johnson 博士还是一位令人尊敬的胃肠道疾病专家、教育家、编辑和作家，他组建了一个包括 15 名副主编的团队，每一位都是在某个或多个领域令人尊敬的专家。他们又召集了 700 多位作者撰写了 477 篇文章，分为三卷。

这部全书以专业的视角，力求涵盖胃肠病学和肝脏病学的各个方面，包括胃肠道和肝脏疾病的症状、诊断与疗法，以及生理和病理过程。必要时，某些疾病针对小儿和成人分别进行讨论。四百多篇文章易读又全面，通常囊括了所述疾病的基础科学和临床方面的内容。每篇文章都以一个词汇表开始，以缩小初学者理解上的差距；随后简短的摘要可以让人对相应文章有简明扼要的整体印象。

现代胃肠病学和胃肠道学极需一本百科全书形式的专著。胃肠病学是临床医学上一个非常广泛的领域，包括人类行为和心理学，以及其他被用来研究功能性胃肠道疾病的分支领域，比如消化不良和肠易激综合征，还有技术含量较高的学科，比如作为诊断和治疗手段的内镜，再有就是外科手术，通常作为根治的手段。与胃肠道和肝脏直接相关的内容，则归到传统的消化内科学。此外，上述的诸如行为、药物、内镜及手术，在儿童和成年人之间又有很大差异。

对于基础胃肠病学来说，胃肠道并不仅仅是通过消化酶、分泌和吸收过程，对水分与营养进行处理的简单程序。胃肠病学还包括多个学科的内容，比如内分泌学、免疫学

和神经科学。如果将胃肠道所有的内分泌细胞都放到一个器官里，那将是人体最大的一个内分泌器官。同样，胃肠道粘膜免疫细胞和相关淋巴组织，可以构成人体免疫系统中最大的器官。此外，这个完整且复杂的包含上皮、分泌、吸收、内分泌和免疫的器官，又有自己的大脑和神经系统，即肠神经系统。

胃肠系统疾病的发病率以及与其它学科之间的关系，使胃肠病学变得更加复杂。胃肠道肿瘤是目前人类第二大肿瘤。营养学的大部分内容与胃肠病学密不可分。胃肠道内还定植着大量与健康息息相关的共生微生物。尽管我们对这些微生物知之甚少，但随着益生菌在疾病预防和治疗中的应用，对它们的了解也逐步展开。

胃肠病学和胃肠道学的宽广领域，使得选择这部百科全书的内容组成非常之难。但我发现这部全书所列的目录相当完整，并且糅合了基础理论和临床信息。如果某个特殊问题没有专门的文章，那么它会被合理的安排在其它文章提及，并且可在第三卷末的索引中查找。

哪些人会使用《胃肠病学百科全书》？他们为什么要用？我相信读者的范围会非常广泛。比如医学生经常在阅读教科书时遇到困难。或者教科书中的内容过于尖端，或者很多单词没有解释，又或者教材被压缩到“迷你书”的篇幅而缺少实质性内容，这些都使学生很难理解课本内容。我相信这部百科全书中的很多词条对临床医学的初学者非常适用。文章前面的词汇表和摘要对医学专业的初学者也很有帮助。同时，这些文章又是基础理论和临床医学完美结合的工艺品，对医学生用处很大。

其他专业的医生无疑也会发现，《胃肠病学百科全书》是一部很有价值的参考书。医学知识的爆炸式增长使得紧跟其他分支学科的进展成为难事甚至无法实现。这部百科全书对各种胃肠道疾病都作了易读、完整和最新的描述。这对需要了解特定胃肠道疾病的全科医生和其他专科医生非常有用。

基础学科和桥梁学科的研究人员也会从这部百科全书中获益。比如说，基础学科的人员在撰写论文的引言或讨论部分，以及申请补助书写背景内容时，都需要将基础科学和临床科学精确的结合在一起。这部书的价值还在于，它可以使研究人员对某种胃肠道疾病的最新进展有所了解。在转基因时代，科学家通常是对某个专门的领域进行研究，比如免疫学和风湿病学，有时研究者会创造出胃肠道亚型的基因敲除小鼠，而不是风湿病亚型。因此，风湿病的研究人员必须快速掌握克罗恩氏病（Crohn's disease）和溃疡性结肠炎的基本概念。

最后，胃肠病学和胃肠道学的专业人员当然会使用这部百科全书。与时俱进的跟上胃肠病学和胃肠道学所有领域的最新发展是不太可能的，但是胃肠病学内部各个领域的交叉重叠，又要求我们更为详细地掌握其他专业的知识。因此，我希望在我的书架上拥有这三卷百科全书。对于临床实践它们会有很大帮助，同时，作为科学研究者，我和实验室其他人员也能够从这部百科全书中获得帮助。

总之，这部全书的编者定位在了一个前人未曾涉足的领域，他们应该为自己对胃肠病学所做的贡献感到自豪。我们仍然会需要更多的基础性专业词典、内容详尽的高级教科书与专著。而《胃肠病学百科全书》在两者的中间地带发挥了重要作用，并且一定会

得到广大读者的青睐。我相信这三卷百科全书会出现在多数医学院图书馆的书架上，以及临床医师和胃肠病研究者的书架上。《胃肠病学百科全书》对消化领域而言，是一个非常有益的补充。

Don W. Powell
Professor, Internal Medicine
Professor, Cellular Physiology and Molecular Biophysics
Associate Dean for Research
Program Director, General Clinical Research Center
University of Texas Medical Branch at Galveston, Texas

序

对于研究自己专业外课题的专家，以及学生和科普教育而言，《胃肠病学百科全书》的形式是受欢迎的，它在基础科学和胃肠病学临床之间建起了一座桥梁。尽管很多基础医学的文章是独立的，但多数和临床医学整合在一起。现如今，人们对于胃肠道越发的感兴趣，相关的知识也在快速积累，而这部百科全书正是在这样一个时候出现了。众多的研究成果使胃肠道疾病的治疗方法越来越多，药库里也增加了大量新药。过去几年间诊断技术也得到了极大发展，使我们对疾病的理解进一步加深，更有能力发现疾病。

读者可以发现，这部书涵盖了胃肠病学的所有领域，包括基础的生理学、药理学、解剖学、免疫学和微生物学。还有许多内容与特殊疾病的基础领域有关。很多文章是以疾病或者病理状态作为标题。临床营养学也被适当强调，有几篇专门针对营养方面问题的文章。本书还涉及了寄生虫学方面对胃肠道极为重要的内容。有些独立的文章专门讨论儿童胃肠病学，大量条目与放射、内镜和手术有关。

本书文章的撰写和组织即全面又方便阅读，是一个很好的信息库。477个词条都有交叉索引，后面紧跟一个简短的摘要。大量主标题和副标题的应用使读者很容易查找内容。重要的知识点和概念辅以表格图标进行强调。每篇文章都提供了核心的、经过时间检验已成为共识的知识，对这些词条没有专门的索引。文章之后还有参考文献，很多都是带有大量参考文献的综述性文章，便于读者进一步阅读。

启动这项工作首先要对所有相关的问题进行选择。15名副主编被先后招募进来，每一位都是至少一个领域的专家。整个小组和 Elsevier 出版集团的成员在圣地亚哥进行了为期两天的会议，经讨论确定了全书的内容范围、文章及候选作者。我们相信这部书涵盖了胃肠病学基础和临床的所有重要题目。任何一篇文章都可以成为独立的主题，因此肯定有很多重叠的地方。但这样读者可以更容易地查找到特定信息。

这个巨大的工程展现了很多人的知识和努力。超过 600 位作者为本书贡献了自己的专业知识。我尤其要感谢那些短时间内即完成文章的作者，是他们确保我们可以及时截稿。15名优秀的副主编是这项工程的奠基者。文章题目的提议与作者的推荐都应归于他们渊博的学识。招募作者和完成整部书的编辑也要归功于他们。

最后，我还要感谢 Elsevier 的工作人员所作的贡献。《胃肠病学百科全书》是由 Elsevier 科技副总裁 Jasna Markovac 发起并支持的。高级发展编辑 Nick Panissidi 负责联系作者和稿件投递，他的工作是不可或缺的。生产经理 Pat Gonzalez，发行编辑 Tari Paschall，以及副发行编辑 Judy Meyer 为这项工程提供了总体规划。在此一并致谢！

LEONARD R. JOHNSON

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FOREWORD

People of my age often have mixed emotions about encyclopedias, probably because they conjure up memories of writing high-school term papers and reading from 26-volume encyclopedias in the library. Those individuals who came of age in the computer era may not fully understand to what I am referring. As I have grown older, I have rediscovered the usefulness of encyclopedias, especially those comprising only 1, 2, or 3 volumes. My favorite for general knowledge is the *Columbia Encyclopedia*, which was first published in 1935 and is now in its fifth edition. I have used this encyclopedia on many occasions. For example, while developing a Grand Rounds lecture on celiac disease, I discovered that the disease was described exceedingly well in the second century A.D. by Aretaeus the Cappadocian. Where is Cappadocia? Is it an ancient city of Greece? Knowing that someone would ask me these questions, I consulted the *Columbia Encyclopedia* and learned that Cappadocia was the ancient Hittite state located in what is now central Turkey. Recently, I was asked to be on the thesis committee of a young doctoral candidate in our Institute for Medical Humanities. His dissertation proposal referred to philosophies (e.g., hermeneutics and phenomenology) that I had never heard of. These topics were described in the *Columbia Encyclopedia* in a brief capsule format that did not overwhelm my untrained and uneducated mind. Therefore, I have become a fan of small-volume encyclopedias. They are quite useful.

Why, then, has a publisher not produced such encyclopedias for the fields of medicine and the biological sciences? In fact, indeed one has. Elsevier has published several such encyclopedias, including *The Encyclopedia of Cancer* (now in its second edition), *The Encyclopedia of Hormones*, and *The Encyclopedia of Toxicology*. Now, under the leadership of Editor-in-Chief Leonard R. Johnson, Ph.D., a respected gastrointestinal scientist, educator, editor, and author, Elsevier has published *The Encyclopedia of Gastroenterology*. Dr. Johnson has assembled a cadre of 15 Associate Editors, each a highly respected expert in one or more of the topics featured in the book. They have brought together over 700 authors to write 477 articles, divided into three volumes.

These articles go a long way toward covering the entire gamut of gastroenterology and hepatology and do so in an expert fashion. They cover gastrointestinal and hepatic diseases, as well as syndromes, diagnostic and treatment modalities, and physiological and pathological processes. Where necessary, discussions of some of the diseases are divided into separate articles describing the condition in pediatric patients and adult patients. The articles are easy to read, yet comprehensive, and usually encompass both the basic science and the clinical aspects of that disease or process. Each article begins with a glossary of terms that allows the uninitiated to read the article by filling in gaps in understanding; a brief abstract that gives a concise, but comprehensive, overview of the subject matter follows the glossary.

Modern gastroenterology and gastrointestinal science lend themselves well to an encyclopedia format. Gastroenterology is a broad clinical field comprising issues that concern human behavior and psychology, other disciplines that are useful for understanding functional gastrointestinal diseases, such as dyspepsia and irritable bowel syndrome, and very technical sciences that encompass endoscopy as a diagnostic and therapeutic tool and often surgery as definitive treatment. In the middle of the spectrum is classical internal medicine as it relates to the gastrointestinal tract and liver. Furthermore, the behavioral, medical, endoscopic, and surgical approaches may differ considerably for pediatric patients versus adult patients.

As regards basic gastrointestinal science, the gastrointestinal tract does more than simply process and assimilate nutrients and water through the action of its digestive enzymes and secretory and absorptive processes. Gastrointestinal science also encompasses diverse fields such as endocrinology, immunology, and the neurosciences. If all the endocrine cells of the gastrointestinal tract were combined into one organ, it would be the largest endocrine organ in the human body. Similarly, the mucosal immune cells and the gastrointestinal-associated lymphatic tissue together constitute perhaps the largest organ of the immune system in the body. Furthermore, this entire, complex epithelial, secretory, absorptive, endocrine,

and immunological organ is controlled by its own intrinsic brain and nervous system, the enteric nervous system.

Gastroenterology is made even more complicated by the frequency with which diseases of this system occur and by its close relationship to other disciplines. Gastrointestinal cancer is the second most common type of cancer, if men and women are considered together. The broad field of nutrition borders closely on and is intertwined with gastroenterology. Finally, the intestinal tract is colonized by commensal microbiota that are crucial for optimal health. Little is known about these microorganisms, but it is beginning to be understood that they may be a vehicle for the treatment or prevention of disease through probiotics.

This broad view of gastroenterology and gastrointestinal science must have made it difficult for the Editors to choose the individual articles that make up these three volumes. However, I find the list to be fairly complete and each article to be a good mixture of basic knowledge and clinical information. If certain subject areas are not represented as specific articles, they are reasonably well covered in other articles that are in the three volumes and can be located in the subject index at the end of the third volume.

Who will use *The Encyclopedia of Gastroenterology* and why? I believe that the range of potential users is wide. For example, medical students often have difficulty with medical textbooks. Either the textbooks are too advanced and the various words and terms are not explained, making it difficult for the student to comprehend the text, or else the content has been reduced to a "mini" textbook version that often lacks substance. I believe that many of the entries in this encyclopedia are geared perfectly for medical students new to clinical medicine. The glossary of terms at the beginning of each article and the abstracts should be extremely helpful for those who are medically naive. Furthermore, the articles are well-crafted combinations of basic science and clinical science and this is useful at the medical student level.

Physicians from other disciplines will undoubtedly find *The Encyclopedia of Gastroenterology* to be a valuable reference work. The explosion of medical knowledge has made it difficult, if not impossible, to keep up with advancements in other areas of medicine. This encyclopedia provides concise descriptions of the various gastrointestinal diseases that are easily readable, complete, and up-to-date. This should be quite useful for the primary care physician or a specialist in another discipline who needs to know about some specific gastrointestinal disease or process.

Basic scientists and nonphysician translational research scientists would certainly benefit from this encyclopedia also. For instance, the mixture of basic science and clinical science information in each article is precisely what the basic scientist needs as he or she writes the Introduction or Discussion sections of publications or the Background section of grant applications. In addition, the encyclopedia would prove quite valuable in rapidly bringing scientists up to date in a specific area of gastrointestinal disease. In this era of transgenic animals, it is not uncommon for the scientist who has been conducting research in a specific field, for example, immunology or rheumatology, to create a new knockout mouse that presents with a gastrointestinal phenotype rather than a rheumatological phenotype. Thus, the scientist who has spent his or her career gaining an understanding of rheumatologic disease will need to quickly acquire a basic understanding of Crohn's disease and ulcerative colitis.

Finally, the gastroenterologist or gastrointestinal scientist can certainly utilize this encyclopedia as well. It is impossible to stay abreast of all areas of gastroenterology and gastrointestinal science and yet the overlapping disciplines within gastroenterology may demand a more detailed knowledge of an otherwise distant field of expertise. Thus, I look forward to having these three volumes on my bookshelf. They will be helpful in my clinical practice of gastroenterology and also helpful to me as a scientist and to other research scientists in my laboratory.

In summary, the Editors should be proud of their contribution to the knowledge base of gastroenterology. They have found a niche in our field that has hitherto not been occupied. There will continue to be a need for more elementary dictionaries and for highly detailed, advanced textbooks and monographs. *The Encyclopedia of Gastroenterology* will play a role in the middle of this spectrum and should be extremely valuable to a wide range of users. I believe that the three volumes will find their way onto the bookshelves of most medical libraries, as well as those of individual practitioners of medicine and active gastrointestinal investigators. *The Encyclopedia of Gastroenterology* is an extremely useful addition to our field.

DON W. POWELL

Professor, Internal Medicine
Professor, Cellular Physiology and Molecular Biophysics
Associate Dean for Research
Program Director, General Clinical Research Center
University of Texas Medical Branch at Galveston, Texas

PREFACE

The *Encyclopedia of Gastroenterology* bridges basic science and clinical gastroenterology in a way that should appeal to the expert researching a topic outside his or her field of expertise as well as to students and the educated public. Although some articles on the basic medical sciences stand alone, most integrate these topics with areas of clinical medicine. These volumes appear at a time when general interest in, and knowledge of, the gastrointestinal tract is expanding at a rapid rate. Research has led to new approaches in the treatment of many gastrointestinal diseases and a plethora of new drugs have been added to the pharmaceutical armamentarium. Diagnostic procedures have advanced remarkably over the past few years, leading to an increased understanding of how diseases develop and an improved ability to detect them.

The reader will find articles related to all areas of gastroenterology. There are articles covering basic physiology, pharmacology, anatomy, immunology, and microbiology. Others relate these basic fields to specific diseases. Many of these articles are entitled with the name of a disease or pathological condition. When appropriate, nutritional aspects of clinical conditions are emphasized and several articles feature aspects of nutrition. Areas of parasitology of special importance in relation to the gastrointestinal tract are also covered. Separate articles treat topics relating primarily to pediatric gastroenterology and numerous entries are concerned with radiology, endoscopy, and surgery.

The articles are written and organized to serve as convenient, yet comprehensive sources of information. Each of the 477 entries begins with a glossary of cross-referenced terms followed by a brief abstract. Generous use of primary and secondary headings allows the reader to locate material rapidly. Tables and figures emphasize important points and concepts. Each article presents core knowledge, time-tested and generally accepted within the field. As a result, there are no specific references with the entries. Each contribution, however, concludes with a list of references for further reading.

Many of these are review articles with comprehensive bibliographies.

This work began with the selection of a number of general areas of coverage. A group of 15 Associate Editors, each of whom is an expert in at least one of these areas, was subsequently recruited. The entire group, along with members of the Elsevier staff, then met for two days in San Diego. That meeting resulted in the refinement of the areas of coverage, selection of individual article topics within those areas, and identification of potential authors. The Associate Editors and I believe that we have covered the important topics of basic and clinical gastroenterology. Each article is written to stand alone as a complete subject, so there is, no doubt, a certain amount of overlap. This, however, should make it easier for the reader to locate a specific piece of information.

A product of this magnitude represents the knowledge and efforts of a large number of individuals. More than 600 authors contributed their expertise to the individual articles. I am especially grateful to those who produced articles on short notice, so that our deadline could be met. An outstanding group of 15 Associate Editors was the foundation for this project. Due to their great breadth of knowledge, they were able to propose topics for articles and recommend the authors to write them. They then recruited the authors and edited the completed articles.

Finally, I acknowledge the contributions of the staff at Elsevier. The *Encyclopedia of Gastroenterology* was initiated and supported by Jasna Markovac, Sr. Vice President, Elsevier, Science and Technology. Nick Panissidi, Senior Developmental Editor, was indispensable as he contacted authors and kept up with all article submissions. Pat Gonzalez served as Production Manager, and Tari Paschall, Sr. Publishing Editor, and Judy Meyer, Associate Publishing Editor, provided overall management of the project.

LEONARD R. JOHNSON

GUIDE TO USING THE ENCYCLOPEDIA

The *Encyclopedia of Gastroenterology* is a comprehensive yet accessible resource describing all significant aspects of the discipline of gastroenterology. This reference work consists of three separate volumes and includes 477 articles written by leading experts in the field. Each entry in the encyclopedia provides a focused description of the given topic, intended to inform a broad spectrum of readers, ranging from academic and clinical gastroenterologists to students and to the interested general public.

In order that you, the reader, will derive the greatest possible benefit from your use of the *Encyclopedia of Gastroenterology*, we have provided this Guide. It explains how the encyclopedia is organized and how the information within it can be located.

Organization

All of the articles in the *Encyclopedia of Gastroenterology* are arranged in a single alphabetical sequence by title. Articles whose titles begin with the letters A to E are in Volume 1, articles with titles from F to N are in Volume 2, and articles from O to Z are in Volume 3, along with the Subject Index.

So that they can be easily located, article titles generally begin with the key word or phrase indicating the topic, with any generic terms following. Thus, for example, "Colitis, Ulcerative" is the article title rather than "Ulcerative Colitis," and is grouped with the other "Colitis" entries. Similarly, "Nutrient Transport, Regulation of" is the title rather than "Regulation of Nutrient Transport."

Table of Contents

A complete table of contents for the *Encyclopedia of Gastroenterology* appears at the front of each volume. This alphabetical list of article titles (see page v) is followed by a second contents list (see page xix) in which the titles are listed according to their subject area. The articles have been classified into 25 different subject areas listed below:

Absorption and Secretion
Anatomy and Development

Biliary System
Cancer
Cell Biology
Colitis/Ulcer/Diarrhea
Esophagus
General Symptoms
Hormones and Transmitters
Immunology
Intestines
Liver
Motility
Neurogastroenterology
Nutrition
Overviews
Pancreas
Parasitology
Pediatrics
Pharmacology
Psychology and Behavior
Radiology and Endoscopy
Stomach
Surgery
Systemic Diseases

Index

A Subject Index is located at the end of Volume 3. This index is the most convenient way to locate a desired topic within the encyclopedia and thus it should be the starting point for any reader seeking to find a topic. The entries in the index are listed alphabetically and indicate the volume and page number where information on this topic can be found.

Article Format

Articles in the *Encyclopedia of Gastroenterology* are arranged in a standard format, as follows:

Title and Author
Glossary
Defining Statement
Body of Article
Cross-References
Further Reading

Glossary

The Glossary contains terms that are important to an understanding of the article and that may be unfamiliar to the reader. Each term is defined in the context of the particular article in which it is used. The encyclopedia includes approximately 2,000 glossary terms. For example, the article "Glycogen Storage Disease" includes the following glossary entries (among others):

gluconeogenesis Formation of new glucose from noncarbohydrate substrates, including various amino acids, lactate, pyruvate, and glycerol.

glycogenolysis Intracellular breakdown of glycogen to glucose.

Defining Statement

The text of each article begins with an introductory paragraph that is displayed in boldface and set off from the rest of the article. This introduction defines the topic under discussion and summarizes the content of the article. For example, the entry "Celiac Disease" begins with the following defining paragraph:

Celiac disease, a chronic inflammatory condition associated with small intestinal injury induced by gluten exposure, results in malabsorption of different nutrients. It is associated with multiple other medical conditions. The diagnosis relies on characteristic findings of small intestinal biopsy. Patients with celiac disease usually respond quickly to a gluten-free diet. The disease requires a life-long commitment to a gluten-free diet to prevent recurrence of symptoms and other potential consequences.

Cross-References

All of the articles in the Encyclopedia have cross-references to other articles. These appear at the conclusion of the article text, preceding the Further Reading section. The Encyclopedia contains over 2,700 cross-references in all. The cross-references indicate related articles that can be consulted for further information on the same topic, or for information on a related topic. For example, the article "Diarrhea" provides

the following cross-references:

Antibiotic-Associated Diarrhea • Anti-Diarrheal Drugs • Bacterial Toxins • Carbohydrate and Lactose Malabsorption • Diarrhea, Infectious • Diarrhea, Pediatric • Gastroenteritis • Malabsorption • Malnutrition • Pancreatic Function Tests • Traveler's Diarrhea

Further Reading

The Further Reading section appears as the last element in an article. It lists recent secondary sources to aid the reader in locating more detailed or technical information. Review articles and research papers that are important to an understanding of the topic are also listed. For example, the article "Gastroesophageal Reflux Disease (GERD)" has the following references (among others):

- Achem, S. R., Kolts, B. E., MacMath, T., Richter, J., Mohr, D., Burton, L., and Castell, D. O. (1997). Effects of omeprazole versus placebo in treatment of noncardiac chest pain and gastroesophageal reflux. *Digest. Dis. Sci.* 42, 2138–2145.
- DeVault, K. R., and Castell, D. O. (1999). Updated guidelines for the diagnosis and treatment of gastroesophageal reflux disease. *Am. J. Gastroenterol.* 94, 1434–1442.
- Hunter, J. G., Trus, T. L., Branum, G. D., Waring, J. P., and Wood, W. C. (1996). A physiologic approach to laparoscopic fundoplication for gastroesophageal reflux disease. *Ann. Surg.* 223, 673–685.
- Ours, T. M., Kavuru, M. S., Schilz, R. J., and Richter, J. E. (1999). A prospective evaluation of esophageal testing and a double-blind, randomized study of omeprazole in a diagnostic and therapeutic algorithm for chronic cough. *Am. J. Gastroenterol.* 94, 3131–3138.
- Spechler, S. J., Lee, E., Ahnen, D., et al. (2001). Long-term outcome of medical and surgical therapies for gastroesophageal reflux disease: Follow-up of a randomized controlled trial. *J. Am. Med. Assoc.* 285, 2331–2338.
- Waring, J. P. (2001). Surgical and endoscopic treatment of gastroesophageal reflux disease. *Gastrointest. Clin. North Am.* 31, S89–S109.

The Further Reading references are for the benefit of the reader; they provide the author's recommendations for more information on the given topic. Thus they consist of a limited number of entries. They do not represent a complete listing of all the sources consulted by the author in preparing the paper.