

Erwin Kuntz · Hans-Dieter Kuntz †

HEPATOLOGY

TEXTBOOK AND ATLAS

History · Morphology
Biochemistry · Diagnostics
Clinic · Therapy

With 530 Coloured Illustrations and 321 Coloured Tables

 Springer

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Dedication

In 1978, my son and I began with the planning and preparation of a joint textbook on hepatology. In 1997, one year before completion of this work, Hans-Dieter died of a malignant disease. It was his wish that I should realize our mutual aim.

I have dedicated the **German edition** of the book “Praktische Hepatologie” (1998) to:

my unforgettable son *Hans-Dieter*

whose knowledge and manual skill I have always admired,
whose critical as well as creative ideas for our joint book were
so valuable,

who did not live to see the completion of this work as a
co-author

dedicated in love and gratitude

Dedications

The 1st **English edition** of the book “Hepatology · Principles and Practice” (2002) is dedicated — also at my son’s request — to:

Dr. med. Dr. rer. nat. *Herbert Falk* (Freiburg)
the most generous patron of hepatological research
and further education,
the initiator of worldwide, international hepatology
dedicated in admiration and friendship



The 2nd **English edition** of the book “Hepatology · Principles and Practice” (2006) is dedicated to:

Prof. Dr. med. *Heribert Thaler* (Vienna)
who has united the histopathologic and clinical aspects
of hepatology in such an excellent manner,
from whom I have learned so much in many years of friendship
dedicated in esteem and cordiality



The 3rd **English edition** of the book “Hepatology · Textbook and Atlas” (2008) is dedicated to:

Prof. Dr. med. Dr. h.c. mult. *Hubert E. Blum* (Freiburg)
who has enriched hepatology as a scientist, teacher
and clinician in such an exemplary manner,
he remains a physician with a strong sense of vocation
dedicated in appreciation and respect



Authors



Prof. Dr. med. Dr. med. h. c. Erwin Kuntz

The author spent the first 16 years of his clinical career at the Medical University Hospital in Giessen (6 years as senior physician). Then followed 20 years as head physician at the Internal Department of the Academic Hospital in Schwäbisch Hall and at the Internal Department of the Academic Hospital in Wetzlar. For 45 years, he has taken an active part in the postgraduate education of physicians; he has been an organizer of numerous scientific congresses. Erwin Kuntz has received more than 25 national and international awards and honorary memberships. He has been presented the Honorary Doctorate of the University of Debrecen (Hungary) and is an Honorary Citizen of the region of Waldsolms. He is holder of the “Great Merit Cross of the Federal Republic of Germany”, the “Great Merit Cross of the Republic of Italy” and the “Paracelsus Medal”, which is the highest award given by the medical profession in Germany.



Prof. Dr. med. Hans-Dieter Kuntz

The co-author was certified as a specialist in internal medicine at the Academic Hospital in Duisburg. In 1980, he obtained his qualification as a gastroenterologist and became senior physician at the Department of Gastroenterology/Hepatology of the University Hospital in Bochum. As from 1989, he was head physician at the Department of Internal Medicine and Gastroenterology at Augusta Academic Hospital in Bochum. His many activities included the postgraduate education of physicians for 17 years. He was granted honorary membership of the Society of Gastroenterology of Uruguay (1993) and became a Fellow of the European Board of Gastroenterology (EUMS) (1996). Before the introduction of the German textbook “Praktische Hepatologie” (1998) together with his father he died due to a malignant disease at the age of 48.

Preface to the third Edition

Like the first edition, the second edition was sold out within one year, as was a special reprint available exclusively in the Far East. The extremely positive response from different countries around the world made it easy for both publisher and author to consider a third edition in the near future. We wished to create a textbook with an integrated hepatological atlas based on a form, colour design and scope that had not existed before. Nevertheless, we decided to keep the tried and tested concept of the original version: to serve as a teaching manual, textbook and reference work. Like its predecessor, the new edition has 40 self-contained chapters, each with its own detailed list of contents (using up to three decimal points). Once again, a big black dot is inserted whenever the following sentence represents a semantic leap from the preceding statement. The same fonts and letter sizes have been used. Each chapter finishes with an extensive bibliography. All authors are listed in full in semi-bold type and ordered alphabetically. About 7,000 references have been cited. I have retained historical papers which appeared to me to be in some way remarkable, but literature up to 2008 has also been included.

Due to the updating of the individual chapters, a revised index was required with about 3,000 terms and 12,000 page references. Using this index and the detailed table of contents at the beginning of each chapter, the reader is able to find everything easily and quickly. Furthermore, in the text itself, there are numerous cross-references to related descriptions, figures and tables in other chapters. This makes it possible to interconnect the extensive information contained in the 935-page textbook like a network.

There are more citations of first-time authors (with year) regarding syndromes, diagnostic methods, therapeutic measures, medicotechnical developments, surgical procedures, etc. Some 1,500 initial descriptions are mentioned (whereby numerous corrections had to be made in this respect). Such creative or innovative ideas have often led directly to significant progress or served as a new starting point for subsequent path-breaking developments. The notable achievements of earlier physicians or clinicians deserve great respect! Regrettably, such important scientists of the past tend to be forgotten in our fast-moving times. In this context, we would

do well to remember the 2,000-year-old tradition of hepatology.

For that reason, I took great care in revising the chapter on “History of Hepatology”. With its 20 historical figures, which have never before been published together, this chapter represents a special feature for all interested readers.

The comprehensive selection of colour illustrations has been extended to 530, so that the textbook has become a real atlas of hepatology. The 320 tables have been designed in different shades and colours. All figures and tables have been integrated in the textflow, making this edition especially attractive. So the book itself is designed to lead from “seeing” to “understanding” and, ultimately, to diagnostic and therapeutic “doing”.

I should like to express my special gratitude for all the friendly assistance and helpful advice to the pathologist Prof. Dr. H.P. Fischer (Bonn), the radiologist Prof. Dr. K. Rauber (Wetzlar) as well as the gastroenterologists Prof. Dr. R. Jakobs (Wetzlar) and Dr. G. Schmidt (Kreuztal). In addition, I wish to thank the numerous colleagues who offered their support in preparing the first and second editions and whose names appear in the respective prefaces (see pp X and XII). The abbreviations or symbols frequently used are listed in the preface to the first edition together with all other information regarding dictionary and technical terms.

All my personal thoughts and emotions, which are written down in the first and second edition, have constantly been with my beloved son Hans-Dieter. This comprehensive volume must be seen as our joint life's work.

My special thanks go to the company Pagina Media (Hemsbach) for their excellent setting of all three editions and for their most friendly collaboration over many years. Finally, I thank the employees at Springer Publishing House (Heidelberg) for completing this book, with special mention of Hinrich Küster, senior editor, and Meike Seeker, project manager, for their encouragement and kind support at all times.

Wetzlar, May 2008

Erwin Kuntz

Foreword to the third edition

“...because the liver is a source of many diseases, and is a noble organ that serves many organs, almost all of them: so it suffers, it is not a small suffering, but a great and manifold one” (Paracelsus, 1493–1541). • This quotation already appears as a motto for the German edition “Praktische Hepatologie” (1998) written by Erwin Kuntz and his deceased son Hans-Dieter (1997 †). Even with our present-day level of knowledge, it is not possible to give a better definition of the key role played by the liver and of the various clinical pictures involved, which require a holistic approach.

Despite the fact that “empirical liver research” can boast of a long and cult-related tradition dating back to Babylonian and ancient Egyptian times and although the liver and/or its components have always been an important subject of basic research, clinical hepatology is a relatively recent discipline. A large number of biochemical, cell-biological and metabolic respondent mechanisms were studied and developed in connection with the liver; however, it took time for the results to be applied to clinical practice. Clinical hepatology became more widespread mainly due to the social relevance of liver diseases, which resulted from the significance of the liver as the central metabolic organ and the fact that the liver is the principal target and modulator of environmental influences on the human organism (e.g. toxic substances, alcohol, infections, diet), including drug therapy. The need for experts in clinical hepatology has evolved due to recent developments, such as discovery and characterization of hepatitis viruses, more specific treatment of viral liver diseases, liver transplantation, adverse effects of obesity with associated nonalcoholic fatty liver disease and frequency of complications in chronic liver diseases rising with age of the affected patients. Drug-induced liver damage is the price for medical progress in today’s world. In spite of modern concepts used in the design of medicines, the liver remains particularly sensitive to side effects due to its biotransformational function and the pharmacogenetic characteristics of each individual person.

In his foreword to the first English edition of “Hepatology. Principles and Practice”, Charles S. Lieber praises it as an international landmark in the field of clinical hepatology. And rightly so! The concept was, and still is, innovative in many respects. This is confirmed by the worldwide success of the book and the fact that the first two editions were completely sold out. The third edition entitled “Hepatology. Textbook and Atlas” with its numerous figures and coloured tables is a further extension of the original concept. In order to understand liver diseases in more depth, it is essential to have a basic knowledge of morphology, pathology, physiology and molecular biology in a clinical context. This book does justice to present-day liver research (also known as “biomolecular hepatology”) without losing sight of the patient as the main focus of all efforts.

The new edition comprises 40 chapters, each with its own detailed table of contents for easy reference. The individual chapters deal in a lucid manner with historical aspects, modern diagnostic methods (not forgetting the classical form of bedside examination: “One good feel of the liver is worth any two liver function tests” – F.M. Hanger jr.,

1971), symptomatology and general as well as specific effects of liver disease. The fluent and uniform style of presentation underlines the special value of a “one-author” book as opposed to “collective-author” books, which are more common today! Clearly structured information about aetiology, pathogenesis, clinical-pathological correlations, therapy and prognostic assessment helps the reader to gain a complete understanding of the material. A total of more than 500 figures turn the book into a true “atlas”. All figures are excellently integrated into the textflow and literally illustrate the content. With the help of the high-quality laparoscopy- and histology-related figures, reading becomes a real pleasure, even for the pathologist. But it is not only the figures which give the book its “completeness”. Another special feature are the historical aspects, which describe the development of hepatology up to the present day, and the general evolution of knowledge concerning the liver. This is achieved by stating the first-time authors of the respective clinical pictures, syndromes and advances in diagnostics, technology or therapy. The originators of relevant scientific theories are also mentioned.

The didactic approach which runs through the whole book is a clear indication of the author’s immense practical experience in the field of hepatology as well as his understanding of the results of basic research, including the biological and pathological aspects which determine the given disease. Like Paracelsus, the author also looks beyond the liver in his deliberations. The reader also senses the long-term engagement of the author (and his son) in postgraduate education and the lessons learned from this. According to Papyrus Ebers (ca. 1550 BC), the liver is the “seat of emotions”. And indeed, it is the emotions with which father and son began their undertaking that are clearly palpable and, at the same time, the key to success. It is only possible to impart knowledge and to convey enthusiasm if one has great personal involvement. This certainly applies to the authors, Erwin and Hans-Dieter Kuntz.

The current edition contains up-to-date information, but also stands for tradition and progress in hepatology. The reader is carefully introduced into the subject matter and learns to experience and understand everything to the full extent. Consequently, the book is not only a source of knowledge for the relatively small circle of hepatologists; due to the chosen form in which the material is presented, the book will surely arouse the interest of less specialized readers, including those involved in research. Thus this work serves as a starting point for new “liver enthusiasts”. It is food for thought and a trigger for continued research. Our thirst for knowledge is unquenchable. This book lays out in an admirable fashion what is state of the art, but it makes no dogmatic statements. Therefore we have every reason to look forward to the next edition.

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Preface to the second edition

Originally, it was the intention of both my son and me that the German edition of “Praktische Hepatologie” should be followed by an English translation. After Hans-Dieter’s premature death due to a serious illness, I made it my aim to complete an English-language version of the textbook by myself, knowing that this would have been his great wish. The memory of my dear son was an inspiration to me in my efforts at all times.

It was a great sense of achievement for both author and publisher that the first edition (2002) was sold out within such a short period and that a reprint was necessary. This fact, supported by the positive response shown directly by readers and reviewers, was the main motivation to prepare a second edition.

A decision was made to keep the well-established division of hepatology into six specialist areas; once again, forty chapters were used. Each chapter has been revised and updated with regard to content and language. At the beginning, there is a detailed table of contents and, at the end, a list of references. Like its predecessor, the second edition contains a visually comprehensive arrangement of the text into sections, incorporating various script sizes and types as well as 306 tables in half-tone colouring; significant conclusions are set in coloured boxes. A big, black dot is inserted whenever the following sentence represents a semantic leap from the preceding statement. (For further details regarding the structural concept of the chapters, see preface to 1st edition, page VII, paragraph 2.)

Altogether, about 7,000 references have been cited, of which some 1,500 have been replaced by more recent papers, including many from 2005. The Vancouver-style layout has been used again, since it proved to be clear and easy to read. (For further details regarding the extensive bibliography, see preface to 1st edition, page VII, paragraph 3.)

Every effort has been made to maintain and improve the concept of citing, whenever possible, the first-time authors of syndromes, clinical entities, morphological or clinical findings, imaging or endoscopic techniques and conservative or surgical measures. (For further details, see preface to 1st edition, page VII, paragraph 4.)

The number of coloured figures has been increased by 97 to a total of 477; developments in printing

techniques make possible an even more colourful presentation with brilliant reproduction. All the figures are integrated in the text-flow. In this way, a hepatological atlas has been created, leading from “seeing” to “understanding”, thereby facilitating diagnostic and therapeutic “acting”.

My special thanks for their friendly assistance and helpful advice go to the pathologists Prof. Dr. H.-P. Fischer (Bonn) and Prof. Dr. G. Korb (Weiden), the radiologist Prof. Dr. K. Rauber (Wetzlar), the hepatologist Prof. Dr. J. Eisenburg (Munich), the virologist Prof. Dr. G. Berencsi (Budapest), the immunologist Prof. Dr. W. Storch (Weinheim) and the gastroenterologist Dr. G. Schmidt (Kreuztal). (In addition, numerous colleagues offered their support in preparing the first edition; they are named in the preface to 1st edition – see page VII, paragraphs 5 and 6.)

The abbreviations or symbols frequently used in the text are listed in the preface to the first edition (see page VIII).

All my personal thoughts and emotional feelings, which were written down in the first edition, are unchanged. This applies also to the two quotations from PARACELSUS at the beginning and end of the book. But, above all, how extremely happy and proud I would have been if my son Hans-Dieter could have joined me as co-author in achieving our common aim.

It is my sincere wish that this textbook will not only promote interest in the field of hepatology, but also deepen understanding of pathophysiological and morphological changes regarding liver as well as supporting successful application of the various diagnostic and therapeutic possibilities.

Finally, I should like to express my gratitude to the employees at Springer Publishing House (Heidelberg) for their professional help in completing this book, especially to Hinrich Küster, senior editor, and Meike Seeker, project manager, who gave their encouragement and kind support at all times.

Wetzlar, October 2005

Erwin Kuntz

Foreword to the second edition

The first edition of “Hepatology: Principles and Practice” by Erwin Kuntz, which appeared in 2002, was rapidly sold out. This was not astonishing since the textbook offered a comprehensive, lucid and scholarly presentation of liver disease. Informative figures and tables made reading a pleasure. The second edition has now been revised and updated to 2005 by Erwin Kuntz. Once again, the author, a distinguished hepatologist, has produced an encyclopedic masterpiece of hepatology. The book combines a complete scientific and historical discussion of the many aspects of hepatology together with the wise insight of a physician who has enormous practical experience in caring for patients with liver disease.

The second edition has been enlarged to more than 900 pages, a change necessitated by the enormous increase in our understanding of liver disease. The number of references that are cited now stands at 7,000; references are given in full and in alphabetical order, a feature that will prove most helpful to physicians engaged in teaching and research. The judicious use of color for figures and tables made the first edition extremely attractive to the reader. This practice is continued in the second edition which contains a further 97 figures and 30 tables, making a total of 477 figures and 306 tables. A special feature is the quality of the superb laparoscopic and histological pictures. Indeed, the colored figures are of such superior quality that they can be scanned directly for computer-based presentations. The histological illustrations are especially valuable as the number of autopsies and liver biopsies continues to decline worldwide. Moreover, these illustrations have been integrated perfectly into the text. The publishers, true to their long tradition, have done justice to the quality of this work in every way. The book is not only a true handbook of liver disease, but also a hepatological atlas.

Like its predecessor, the second edition also comprises 40 chapters. At the beginning of each chapter, there is a complete table of contents, which, together with the general index, makes it possible for the reader to find specific topics easily. The first chapter “History of Hepatology” is an indication of the depth and breadth of the knowledge which the author brings to the current edition. This chapter contains a richness of historical illustrations depicting

the birth of knowledge of this multifaceted organ. The following chapters of the book show the profound knowledge and interest of Erwin Kuntz in the multiple spectra of hepatology. Each topic shows the evolution of our knowledge and acknowledges by name the individuals who contributed to our present knowledge. In this way, hepatology is not only discussed as a contemporary branch of internal medicine, but also related to the pioneering achievements of our ancestors, who deserve our full respect and recognition. The historical emphasis is global, rather than European. Throughout the book, detailed histological depictions of hepatic pathology have been fused with scientific aspects and clinical procedures. All forms of treatment have been updated, so that this work can be used as a manual of therapy which will be highly useful to both practitioners and teachers.

As Charles S. Lieber, New York, wrote three years ago in his foreword to the first edition, such a textbook could not have appeared at a better time. This statement applies to the second edition in the year 2005. Great progress has been made in hepatology with regard to diagnostics and therapy, and consequently, the number of publications dealing with, for example, the treatment of viral hepatitis has grown immensely. Likewise, there is much new information on the pathogenesis of autoimmune liver diseases and so-called overlap syndromes. Thus it is essential that the current body of knowledge is presented in an intensive and accurate form.

It is a pleasure to know Prof. Dr. Erwin Kuntz personally. His enthusiasm for hepatology is contagious and can be sensed in every chapter. To be shown his enormous private library and pictorial archive is a moving experience. This impressive collection contains important papers and original monographs of authors from past and present and provides the data base for this fascinating textbook.

We would like to wish this new edition from Erwin Kuntz the same resounding success which was enjoyed by the first edition. We are convinced that the book will not only find its place in every medical library, but also be consulted repeatedly by scientists and physicians who seek to understand how we can use its contents to improve the care of our patients with liver disease.

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Preface to the first edition

It is a wonderful experience for a father to work with his son on an enormous number of lectures, seminars, courses, congresses and publications over a period of many years. For a total of 35 (overlapping) years we were both active as clinicians in the field of hepatology. From this experience arose our wish to co-author a book on this fascinating subject. We were greatly encouraged in this project by friends and colleagues. • The joint work, supported by an extensive personal archive, a large number of clinical, endoscopic and morphological illustrations, and documentation of imaging technique findings, is intended to serve as a *teaching manual*, a *textbook*, and a *reference book* – for use in the doctor's surgery, in daily clinical practice, and in the specialist fields associated with hepatology.

After weighing up the various approaches and objectives of the book, the *concept* of subdividing the subject matter into 40 self-contained chapters presented itself. We set value on: – a systematic structure of the chapters, – a coherent presentation of facts and evidence, – a visually comprehensible arrangement of the text into sections, incorporating various script sizes and types, – half-tone colouring of tables and conclusions considered to be of exceptional importance, – consistent cross-referencing of figures, tables and text between different chapters, and the incorporation within the text of 276 tables, 380 figures, and numerous boxed texts (all in colour). • A big, black dot is inserted whenever the following sentence represents a mental leap from the preceding statement, which enables a more structured approach. • Our constant aim was to improve the readability and clarity of the book.

Each chapter has an extensive *bibliography*. We used a modified Vancouver-style layout, which we consider clear and easy to read. Authors' names (all authors are listed in full in the chapter bibliography) appear in semi-bold type and are ordered alphabetically for easy reference. As far as possible, we subdivided more extensive chapter bibliographies thematically. A total of 7,300 *publications* up to 2001 are cited. This detailed bibliography is intended to assist the interested reader in exploring specific areas in more depth. • We have therefore included both historical references and those older publications which we consider of particular significance or interest – there is always the danger, in hepatology as well as in other fields, that such works might regrettably become victims of our fast-moving times. There is certainly a subjective influence in this selection, and in this context any additions or corrections to the bibliography will be gratefully received.

A further conceptual concern was to cite, whenever possible, the *first authors* of publications on syndromes, clinical research, laboratory parameters, imaging or endoscopic techniques, morphological findings of special interest, and conservative, invasive and surgical procedures (and to correct previous information given in the literature). In the past, the creative or innovative ideas of these inaugurators have often led directly to significant progress or have served as a new starting point for subsequent, ground-breaking developments. Despite arduous research, it has not always been possible to attribute work correctly to the first author(s). Yet, the notable achievements of earlier physicians, clinicians and scientists deserve to be remembered with respect! In this connection, further information or corrections will be welcomed.

The extensive selection of *colour illustrations* incorporated into the text covers a wide range of clinical and morphological findings in hepatology: it is designed to lead from “*seeing*” to “*understanding*”, thereby facilitating diagnostic and therapeutic “*acting*”. Although we had collected an extensive picture archive of our own over a period of more than 30 years of clinical practice, we were nevertheless able to complement this and close any gaps thanks to numerous illustrations and impressive findings generously made available to us by colleagues. My special thanks for their friendly assistance go to the pathologists Prof. Dr. H.-P. Fischer (Bonn) and Prof. Dr. O. Klinge (Kassel), and to the radiologists Prof. Dr. K. Rauber (Wetzlar) and Prof. Dr. R. Heckemann (Bochum). Some very valuable documentations of findings could be used by courtesy of Prof. Dr. J. Eisenburg (Munich), Prof. Dr. K.-M. Müller (Bochum), Prof. Dr. G. Piekarski (Bonn), Prof. Dr. H. Thaler (Vienna), Prof. Dr. G. Volkheimer (Berlin), Prof. Dr. O. Vorländer (Berlin), and Prof. Dr. W. Wermke (Berlin).

We repeatedly enlisted the *helpful advice* of friends and colleagues to supplement or confirm our own interpretations. Our opinions not infrequently diverged (and in the field of hepatology, this can only be an advantage) and personal opinions were modified or confirmed. The contacts arising from these discussions have been immensely rewarding to me. Here I should like to express my special thanks to: Prof. Dr. G. Berencsi (Budapest), Prof. Dr. R. Klein (Tuebingen), Prof. Dr. H. K. Seitz (Heidelberg) and Prof. Dr. W. Storch (Weinheim). • Very many thanks for advisory support also go to: Prof. Dr. H.-R. Duncker (Institute of Anatomy, Univ. of Giessen), Priv. Doz. Dr. Marietta Horster (Institute of Classics and Ancient History, Univ. of Cologne) and Prof. Dr.

N. Katz (Institute of Biochemistry, Univ. of Giessen).
• Receiving such varied and kind assistance and advice has filled me with gratitude and encouragement during the years spent compiling this book.

In preparing the book my thoughts and my loving gratitude have constantly been with *my son, Hans-Dieter*, whose death was so sudden and incomprehensible to us all. I have tried to represent his inspirations and detailed ideas as well as incorporating his particular clinical insights. This volume is thus our joint life's work. He will always be remembered as an example to us all.

At the beginning and end of the book I have purposely cited two quotations from PARACELUS which have always made a deep impression on me. • In the course of such intensive engagement with the history of hepatology, one is repeatedly filled with respect and admiration for how our forebears, solely through sight, hearing and touch, and an ingenuity of methods – and through logical deduction – drew medical conclusions, recognized correlations and established

an astounding body of theoretical and practical knowledge. Many of these empirical findings were subsequently confirmed – some (still) remain “empirical”, without, however, having been disproved. “*Empiricism, Intuition and Logic*” (R. Gross, Cologne, 1988) will always be the leitmotif of the physician! • The considerable and fascinating developments in hepatology, especially those of the last ten years, remain a central theme. • The current stage of this development may well become known as the 4th (biomolecular) epoch of hepatology, as I have proposed in the first chapter of our book.

Finally, my thanks to the employees at *Springer* for the speedy completion of this book and especially to Jörg Engelbrecht and Dr. Dorothee Guth for their encouragement and kind support at all times.

Wetzlar, July 2001

Erwin Kuntz

Frequently used *abbreviations* and *symbols* in the textbook are listed in alphabetical order below:

s. fig.	see figure	ca.	circa	a.-v.	arterio-venous
s. figs.	see figures	e. g.	exempli gratia, for example	N.B.	nota bene, important
s. p.	see page	etc.	et cetera, and so on	i. m.	intramuscular
s. pp	see pages	i. e.	id est, that is	i. v.	intravenous
s. tab.	see table	quot.	quoted, quotation	s. c.	subcutaneous
s. tabs.	see tables	vs	versus	v. v.	vice versa, conversely

As regards the *half-tone colouring* and colour intensity, blue is used – as far as possible – for normal findings, classification, causes, indications, therapy regimen, etc., red applies to pathological findings, contraindications, complications, side effects, etc., yellow to methods, test procedures, etc., and grey to historical details.

Medical and technical terms, orthography and hyphenation in this textbook are based on: (1.) P. PROCTER (editor): Cambridge International Dictionary of English (Cambridge Univ. Press) 1999, 3rd edition; (2.) J. CROWTHER (editor): Oxford Advanced Learner's Dictionary (Oxford Univ. Press), 1999, 5th edition; (3.) J. DORLAND, W. A. NEWMAN (editors): Illustrated Medical Dictionary (W. B. Saunders, Philadelphia, et al.), 2000, 29th edition; (4.) F. J. NÖHRING (editor): Langenscheidt's Fachwörterbuch Medizin (Langenscheidt, Berlin, et al.), 1996, 3rd edition; (5.) W. E. BUNJES (editor): Medical and Pharmaceutical Dictionary (Thieme, Stuttgart, et al.), 1985, 4th edition; (6.) S. DRESSLER (editor): Dictionary of Clinical Medicine (Chapman & Hall, London, et al.), 1996.

Foreword to the first edition

The textbook “Hepatology. Principles and Practice” by Erwin Kuntz and Hans-Dieter Kuntz will undoubtedly become an international landmark. It reflects the scholarship, encyclopedic knowledge of the authors and the outstanding craftsmanship of the publishers. Professor Erwin Kuntz’s stature was not only well established in Germany and the rest of Europe but his fame had crossed the Atlantic and I have known of him for many years. I also had the privilege of getting acquainted with him personally at an international meeting on phospholipids in Cologne in 1989 where I had the pleasure of enjoying both his intellectual and his broad humanistic qualities.

The book is not only an unusual combination of an extremely thorough textbook of all aspects of hepatology, including important pathogenic mechanisms and their clinical application, but it also has a very didactic approach which effectively highlights most points while not neglecting those details the academician or practitioner may want to find for needed clarification. It synthesizes more than 30 years of practical experience in clinical hepatology. Accordingly, it can be used as a teaching manual for students, post-graduate clinicians and practitioners, as a textbook for internists, gastroenterologists and hepatologists, as well as a reference book for teachers, scientists and authors. The original text has been revised and updated to 2000/2001. The bibliography now consists of about 7,300 papers and the number of colored figures has been increased to 380. It is a distillate of hundreds of personal publications and presentations and thousands of literature references of classic and contemporary scholars. The information is presented

in such a way that it makes the facts very accessible and the chore of retrieval becomes a pleasure. The very vivid display of information gives unique insights providing a very rational approach to the practice of hepatology. This volume brilliantly achieves the basic aim of its authors, which is to guide the user from “seeing” to “understanding” and finally to “acting”.

The book could have come at no better time. There is real blossoming of hepatology worldwide and its importance has increased logarithmically with the availability of transplantation and the pandemic of hepatitis C, with effective treatments finally evolving. Diagnostic procedures have also gained much greater sophistication and “interventional” hepatology is now finally on the rise. Being familiar with German, I had the pleasure of enjoying the original textbook but felt envious that this opus was limited to those fluent in that language. I am delighted to see that this work will now be shared worldwide in an English edition which has been thoroughly updated, with the most recent concepts and therapies reported and carefully assessed. Its comprehensive yet crisp and clear presentation will open the gates of hepatology to all health professionals. Last but not least, this work represents the highly humanistic qualities of its authors and is obviously an act of life time love, with abundant citations not only to our modern masters, but also giving proper credit to those who preceded them. Hippocrates already stated that the liver was the site of the soul; it is obvious that both Erwin Kuntz and his son, Hans-Dieter, have put their souls in this opus.

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Abbreviations

Abbreviation: Meaning:

A

AA	Amino acid
AAA	Acitiactin antibody
AAA	Aromatic amino acid
AAT	α_1 -antitrypsin
ABT	Aminopyrine breath test
AcCoA	Acetyl coenzyme A
ACE	Angiotensin-converting enzyme
ACTH	Adrenocorticotrophic hormone
ADF	Adenofir
ADH	Antidiuretic hormone
ADH	Alcohol dehydrogenase
ADP	Adenosine diphosphate
ADR	Adverse drug reaction
ADT	Placebo (any – what you desire – thing)
AE	Anion exchanger
AFP	α_1 -foetoprotein
Ag	Antigen
AHA	Antibody histone (2B)-A
AIC	Autoimmune cholangitis
AIH	Autoimmune hepatitis
AIP	Acute intermittent porphyria
ALA	δ -aminolaevulinic acid
ALAD	δ -aminolaevulinic acid-dehydratase
ALD	Aldolase
ALD	Alcohol liver disease
ALDH	Aldehyde dehydrogenase
ALF	Acute liver failure
ALG	Antilymphocytic globulin
ALL	Acute lymphatic leukaemia
ALT	Alanine aminotransferase (= GPT)
AMA	Antimitochondrial antibody
AML	Acute myelogenous leukaemia
AMP	Adenosine monophosphate
ANA	Antinuclear antibody
ANCA	Antineutrophil cytoplasmic antibody
ANF	Atrial natriuretic factor
AP	Alkaline phosphatase
APOLT	Auxiliary partial orthotopic liver transplantation
APTT	Activated partial thromboplastin time
APUD	Amine precursor uptake and decarboxylation
ARA-AMP	Adenine arabinoside monophosphate
ARP	Anti-ribosomal P antibody
ASA	Acetylsalicylic acid
ASGPR	Asialoglycoprotein receptor
ASH	Alcoholic steatohepatitis
AST	Aspartate aminotransferase (= GOT)
AT III	Antithrombin III
ATP	Adenosine triphosphate
ATPase	Adenosine triphosphatase
AVP	Arteriovenous pressure
AWS	Alcohol withdrawal syndrome

B

BAC	Blood alcohol concentration
BAL	Bioartificial liver device
BBB	Blood-brain barrier
BCAA	Branched-chain amino acid
BCS	Budd-Chiari syndrome
BELS	Berlin extracorporeal liver support
BICAP	Bipolar circumactive probe

Abbreviation: Meaning:

C

BLSS	Bioartificial liver support system
BMI	Body mass index
BMP	Bone morphogenetic factor
BRIC	Benign recurrent intrahepatic cholestasis
BSEP	Bile salt export pump
BSR	Blood sedimentation rate (= ESR)
BUN	Blood urea nitrogen
BW	Body weight
CAGE	Alcoholism test
CAH	Chronic active hepatitis
CAM	Cell adhesion molecule
cAMP	Cyclic adenosine monophosphate
CBAT	Canalicular bile acid transporter
CBG	Corticosteroid-binding globulin
CC	Cystadenocarcinoma
CCC	Cholangiocellular carcinoma
CDCA	Chenodeoxycholic acid
CDK	Cyclin-dependent kinase
CDT	Carbohydrate-deficient transferrin
CEA	Carcinoembryonic antigen
CEDS	Colour-encoded Doppler sonography
CEP	Congenital erythropoietic porphyria
CESD	Cholesterol storage disease
CET	Caffeine elimination test
CETP	Cholesterol transfer protein
CEUS	Contrast-enhanced ultrasonography
CF	Cystic fibrosis
CFR	Complement fixation reaction
CFT	Complement fixation test
CFTR	Cystic fibrosis transmembrane regulator
cGMP	Cyclic guanosine-3', 5'-monophosphate
CH	Cavernous haemangioma
ChE	Cholinesterase
CHBV	Crane hepatitis B virus
CHP	Chronic hepatic porphyria
CIBD	Chronic inflammatory bowel disease
CLH	Chronic lobular hepatitis
CLL	Chronic lymphatic leukaemia
CM	Contrast medium
CML	Chronic myeloid leukaemia
CMV	Cytomegalovirus
CNDC	Chronic non-suppurative destructive cholangitis
CNS	Central nervous system
CO	Cardiac output (vol./min)
CPH	Chronic persistent hepatitis
CREST	Calcinosis-Raynaud-esophagus-sclerodactyly-telangiectasia syndrome
CRP	C-reactive protein
CSF	Cerebrospinal fluid
CSH	Chronic septal hepatitis
CSI	Cholesterol saturation index
CT	Computer tomography
CTAP	CT arteriography
CTL	Cytotoxic T lymphocyte
CVP	Central venous pressure
CYP	Cytochrome P-450

D

DBP	Vitamin D-binding protein
-----	---------------------------

DCP	Des-gamma-carboxy prothrombin
DCP	Divalent cation transporter
DDT	Dichlorodiphenyltrichloroethane
DHBV	Duck hepatitis virus
DIC	Disseminated intravascular coagulation
DLPC	Dilinoleoylphosphatidylcholine
DNA	Deoxyribonucleic acid
DOD	Degree of disability
DRQ	DeRitis quotient
DSA	Digital subtraction angiography

E

EBV	Epstein-Barr virus
EC	Elimination capacity
ECLP	Extracorporeal liver perfusion
ECM	Extracellular matrix
ECP	Erythropoietic coproporphyrin
ECS	Extracellular space
EDRF	Endothelium-derived relaxing factor
EDTA	Ethylenediaminetetraacetic acid
EEG	Electroencephalography
EEP	Endogenous evoked potentials
EGF	Epidermal growth factor
EHP	Erythrohepatic porphyria
EHT	Electrohydrothermic probe
EIA	Enzyme immunoassay
ELAD	Extracorporeal liver assist device
ELISA	Enzyme-linked immunosorbent assay
EPL	Essential phospholipids
EPP	Erythropoietic protoporphyria
ER	Endoplasmic reticulum
ERC	Endoscopic retrograde cholangiography
ET	Endothelin
EUS	Endoscopic ultrasound
EvG	Elastica van Gieson
EVR	Early viral response

F

FA	Fatty acid
FBP	Folate-binding protein
FENa	Fractional sodium excretion
FFA	Free fatty acid
FFP	Fresh frozen plasma
FGF	Fibroblast growth factor
FHCC	Fibrolamellar hepatocellular carcinoma
FHF	Fulminant hepatic failure (= ALF)
FHVP	Free hepatic venous pressure
FIA	Fluorescence immunoassay
FM	Fibrin monomer
FNB	Fine needle biopsy
FNH	Focal nodular hyperplasia

G

GABA	Gamma-aminobutyric acid
GBV	GB-Virus
GDH	Glutamate dehydrogenase
GEC	Galactose elimination capacity
GFR	Glomerular filtration rate
GGT	Gamma-glutamyl transpeptidase
GHRF	Growth hormone-releasing factor
GMCSF	Granulocyte macrophage colonic stimulat. factor
GOT	Glutamic oxaloacetic transaminase (= AST)
GPT	Glutamic pyruvic transaminase (= ALT)
GSH	Reduced glutathione
GSHV	Ground squirrel hepatitis virus
GSSG	Oxidized glutathione
GST	Glutathione-S-transferase
GVHD	Graft-versus-host disease

H

HAI	Hepatitis activity index
HAV	Hepatitis-A virus
HBDH	α -Hydroxybutyrate dehydrogenase
HBIG	Hepatitis-B immunoglobulin
HBp	Hepatic binding protein
HBSS	Hepatobiliary sequence scintigraphy
HBV	Hepatitis-B virus
HCC	Hepatocellular carcinoma
HCP	Hereditary coproporphyrin
HCV	Hepatitis-C virus
HDL	High-density lipoprotein
HDV	Hepatitis-D virus
HE	Haemotoxylin eosin
HE	Hepatic encephalopathy
HEP	Hepatoerythropoietic porphyria
HES	Hydroethyl starch
HEV	Hepatitis-E virus
hFABP	Hepatic fatty acid-binding protein
HGBV	Hepatitis-GB virus
HGF	Hepatocyte growth factor
HGV	Hepatitis-G virus
HHBV	Heron hepatitis B virus
HHc	Hereditary haemochromatosis
HHT	Hereditary hepatic telangiectasia
HHV	Human herpes virus
HIDA	Hepatic iminodiacetic acid
HIV	Human immunodeficiency virus
HL	Half-life
HLA	Human leucocyte antigen
HLT	Heterotopic liver transplantation
HMG-CoA	Hydroxymethylglutaryl-CoA
HMV	Heart minute volume
HNF	Hepatocyte nuclear factor
HPI	Hepatic proliferation inhibitor
HPLC	High-pressure liquid chromatography
HPS	Hepatopulmonary syndrome
HRGP	Histidine-rich glycoprotein
HRQL	Health-related quality of life
HRS	Hepatorenal syndrome
HSS	Hepatic stimulatory substance
HSV	Herpes simplex virus
HTL	Hepatic triglyceride lipase
HVF	Hepatocyte volume fraction
HVPG	Hepatic vein pressure gradient

I

IBC	Iron-binding capacity
IBP	Iron-binding protein
ICAM	Intercellular adhesion molecule
ICDH	Isocitrate dehydrogenase
ICG	Indocyanine green
ICP	Intracranial pressure
ICS	Intracellular space
ICU	Intensive care unit
IDL	Intermediate density lipoprotein
IDUS	Intraductal ultrasound
IFN	Interferon
IFT	Immunofluorescence test
IGF	Insulin-like growth factor
IHAT	Indirect haemagglutination test
IL	Interleukin
INR	International normalization ratio
IOUS	Intraoperative ultrasound
IRF	Iron regulation factor
ISAGA	Immunosorbent agglutination assay
ISC	Iron saturation capacity
IU	International unit

K		N	
KB	Ketone bodies	NAD	Nicotinamide adenine dinucleotide
kDa	Kilo-Dalton	NADP	Nicotinamide adenine dinucleotide phosphate
KKS	Kallikrein-kinin system	NAFLD	Non-alcoholic fatty liver disease
L		NALD	Non-alcoholic liver disease
LAM	Lamivudine	NASH	Non-alcoholic steatohepatitis
LAP	Laparoscopy	NCT	Number-connection test
LAP	Liver active protein	nDNA	Nuclear DNA
LAP	Leucine aminopeptidase	NHL	Non-Hodgkin lymphoma
LASER	Light amplification by stimulated emission of radiation	NLCT	Number-letter combination test
LB	Liver biopsy	NO	Nitrous oxide
LC1	Liver cytosol typ 1 antibody	NRH	Nodular regenerative hyperplasia
LCAT	Lecithin-cholesterol acyl transferase	NSAR	Non-steroidal antirheumatics
LCT	Lipiodol-computer tomography	NU	5'-Nucleotidase
LD	Lethal dose	O	
LDH	Lactate dehydrogenase	OA	Ornithine aspartate
LDL	Low-density lipoprotein	OATP	Sodium-independent transport system for organic anions
LDLT	Living donor liver transplantation	OCT	Ornithine carbamoyltransferase
LE	Lupus erythematosus	OGTT	Oral glucose tolerance test
LFA	Lymphocyte function antigen	OLS	Overlap syndrome
LFT	Liver function test	OLT	Orthotopic liver transplantation
LIP	Liver inhibitor protein	ORF	Open reading frame
LITT	Laser-induced thermotherapy	P	
LKM	Liver-kidney microsomal antigen	PAF	Platelet-activating factor
LMA	Liver membrane autoantibody	PAH	Para-aminohippuric acid
LPA	Liver-pancreas antibody	PAI	Percutaneous acetic acid injection
LPL	Lipoprotein lipase	PAI	Plasminogen activator inhibitor
LP X	Lipoprotein-X	PAIR	Puncture/Aspiration/Injection/Re-Aspiration
LR	Liver resection	pANCA	Perinuclear antineutrophilic cytoplasmic antibody
LSP	Liver-specific protein	PAP	Pulmonary artery pressure
LT	Liver transplantation	PAS	Para-aminosalicylic acid
LTC	Laparoscopic transhepatic cholangiography	PAS	Periodic acid-Schiff reaction
LTT	Line-tracing test	PBC	Primary biliary cholangitis/cirrhosis
LTT	Lymphocyte transformation test	PBG	Porphobilinogen
LWW	Liver wet weight	PCB	Polychlorinated biphenyl
M		PCNA	Proliferating cell nuclear antigen
MALT	Munich alcoholism test	PCO ₂	Partial pressure carbon dioxide
MALT	Mucous membrane associated lymphoid tissue	PCP	Pentachlorophenol
MAO	Monoamine oxidase	PCR	Polymerase chain reaction
MARS	Molecular adsorbent recirculatory system	PCT	Porphyria cutanea tarda
MAST	Michigan alcoholism screening test	PCWP	Pulmonary capillary wedge pressure
mAST	Mitochondrial aspartate aminotransferase	PDGF	Platelet-derived growth factor
MBq	Megabecquerel	PDR	Plasma disappearance rate
MCL	Midclavicular line	PEEP	Positive end-expiratory pressure
MCT	Medium-chain triglyceride	PELAM	Platelet endothelial cell adhesion molecule
MCV	Mean corpuscular volume	PEI	Percutaneous ethanol injection
MEGX	Monoethylglycinexylidide test	PEM	Protein-energy malnutrition
MELD	Model for endstage liver disease	PET	Positron emission tomography
MELS	Modular extracorporeal liver support	PG	Prostaglandin
MEOS	Microsomal ethanol-oxidizing system	PHI	Phosphohexose isomerase
MFH	Malignant fibrous histiocytoma	Pi	Protease inhibitor
mGOT	Mitochondrial glutamic-oxalacetic transaminase	P III-P	Procollagen-III-peptide
MHC	Major histocompatibility complex	PMN	Polymorphonuclear neutrophilic leucocytes
MIGET	Multiple inert gas elimination technique	PPC	Polyenylphosphatidylcholine
MMF	Mycophenolate mofetil	PPH	Primary pulmonary hypertension
MMP	Matrix metalloproteinase	PPSB	Prothrombin complex (prothrombin, proconvertin, Stuart factor, antithrombin factor B)
MOAT	Multi-organic anion transporter	PSC	Primary sclerosing cholangitis
MPS	Mononuclear phagocyte system	PSE	Portosystemic encephalopathy
MRC	Magnetic resonance cholangiography	PT	Prothrombin time (= Quick)
MRI	Magnetic resonance imaging (= MRT)	PTC	Percutaneous transhepatic cholangiography
mRNA	Messenger RNA	PTH	Parathormone
MRP	Multi-drug resistance protein	PTP	Percutaneous transhepatic portography
MT	Metallothionein	PTT	Partial thromboplastin time
MTP	Microsomal triglyceride transfer protein		

PVC	Polyvinyl chloride	TACE	Transarterial chemoembolization
PVS	Peritoneovenous shunt	TAE	Transarterial embolization
Q		TBG	Thyroxine-binding globulin
QOL	Quality of life	TCDD	Dioxin
R		TGF	Transforming growth factor
RAAS	Renin-angiotensin-aldosterone system	TIBC	Total iron-binding capacity
RAST	Radio-allergo-sorbent test	TIMP	Tissue inhibitor metalloproteinase
RBP	Retinol-binding protein	TIPS	Transjugular intrahepatic portosystemic shunt
RCE	Reduction in earning capacity	TNF	Tumour necrosis factor
REE	Resting energy expenditure	TNM	Malignant tumour classification system (tumour, node, metastasis)
RER	Rough endoplasmic reticulum	tPA	Tissue plasminogen activator
RES	Reticuloendothelial system	TPT	Thromboplastin time
RFA	Radio frequency ablation	TRH	Thyrotropin-releasing hormone
RFTA	Radiofrequency thermal ablation	tRNA	Transfer RNA
RHS	Reticulohistiocytic system	TSH	Thyroid-stimulating hormone
RIA	Radioimmunoassay	TT	Thrombin time
RIBA	Recombinant immunoblot assay	TTR	Transthyretin
RNA	Ribonucleic acid	TUDCA	Tauro-ursodeoxycholic acid
RNF	Renal natriuretic factor	TVC	Transvenous cholangiography
ROI	Reactive oxygen intermediates	U	
rRNA	Ribosomal RNA	UDCA	Ursodeoxycholic acid
RT-PCR	Reverse transcription-polymerase chain reaction	UDP	Uridine diphosphate
S		UES	Undifferentiated embryonal sarcoma
SAMe	S-adenosylmethionine	uPA	Urokinase plasminogen activator
SBP	Spontaneous bacterial peritonitis	US	Ultrasound
SDH	Sorbitol dehydrogenase	UTP	Uridine triphosphate
SeHCAT	Selenohomotaurocholic acid test	UV	Ultraviolet
SEP	Somatosensory evoked potentials	UW	University of Wisconsin solution
SER	Smooth endoplasmic reticulum	V	
SLA	Soluble liver antigen	VBDS	Vanishing bile duct syndrome
SLT	Split liver transplantation	VC	Vinyl chloride
SMA	Smooth muscle antibody	VCAM	Vascular cell adhesion molecule
SOD	Superoxide dismutase	VEGF	Vascular endothelial growth factor
SOL	Space-occupying lesion	VEP	Visually evoked potentials
SPECT	Single-photon emission computer tomography	VIP	Vasoactive intestinal polypeptide
SPIO	Superparamagnetic particles of iron oxide	VLDL	Very low-density lipoprotein
SQUID	Superconducting quantum-interference device	VOD	Veno-occlusive disease
SSC	Secondary sclerosing cholangitis	VZV	Varicella-zoster virus
STD	Sexually transmitted disease	W	
STH	Somatotropic hormone	WAIS	Wechsler adult intelligence scale
STP	Standard temperature (0°C) and pressure (760 mg Hg)	WHV	Woodchuck hepatitis virus
SVR	Sustained viral response	WHVP	Wedge hepatic venous pressure
T		WNV	West Nile virus
TAC	Transarterial chemotherapy	Y	
		YF	Yellow fever

**“... because the liver is a source of many diseases,
and is a noble organ that serves many organs,
almost all of them: so it suffers, it is not a small
suffering, but a great and manifold one”**

**Theophrastus Bombastus von Hohenheim,
known as PARACELSUS (1493–1541)**

(Liber tertius paramiri, de morbis ex Tartaro.
St. Gallen, 1531)

The first and the last page of this book on hepatology (1st German edition 1998; 1st, 2nd and 3rd English edition 2002, 2004, 2008) are devoted to *Theophrastus Bombastus von Hohenheim*, called **Paracelsus**. The life and work of this great man have fascinated me since my youth.

Therefore, it was an indescribable feeling for me when, in 2006, I was awarded the **Paracelsus Medal** as the greatest distinction of the German Medical Profession. It bears the inscription (see last page in all editions!) “*the highest ground is love*”, which is part of a well-known quotation of Paracelsus himself concerning the benefit of remedies.

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Hepatology

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