

LUPUS NEPHRITIS

A Comprehensive Guide for Clinicians



Wonngarm Kittanamongkolchai

LUPUS NEPHRITIS

Wonngarm Kittanamongkolchai

LUPUS NEPHRITIS

© 2024 by Wonngarm Kittanamongkolchai

Published by:

Wonngarm Kittanamongkolchai, MD
Chula Clinical Research Center (Chula CRC)
Faculty of Medicine, Chulalongkorn University.
Aor Por Ror Building, 7th Floor, Rama 4 Rd.
Pathumwan, Bangkok, 10330
www.chulacrc.org
Tel: (+66) 2 251 6704
Fax: (+66) 2 251 6706

First Edition

Number of prints: 500 copies

ISBN: 978-616-612-634-1

Price: 280 Baht

Printed at:

Bangkok Medical Publisher, Ltd, Part.
3/3 Sukhumvit 49, Klong Ton Nua, Vadhana, Bangkok 10110
Thailand
E-mail: bkkmed@gmail.com

Publication:

20/05/2024

ALL RIGHTS RESERVED

No part of this book may be reproduced, distributed, or transmitted in any form or by any means without the prior written permission of the publisher, except in the case of brief quotations embodied in critical reviews and certain other noncommercial uses permitted by copyright law

ACKNOWLEDGEMENT

The creation of this textbook was facilitated by a free book template from UsedToTech, which provided a solid foundation for its design. I am thankful to OpenAI's ChatGPT for its remarkable assistance with English editing, which greatly enhanced the quality of this publication. The inclusion of visual illustrations from BioRender.com has added clarity and depth, enriching the learning experience. Moreover, the renal pathology images on the cover, provided by Dr. Kroonpong Lampenkhoe, have significantly enhanced the book's visual appeal. I am also deeply grateful to the reviewers from various institutions for their meticulous and insightful feedback, and to Professors Kriang Tunsanga, Keerkiat Praditpornsilpa, Yingyos Avihingsanon and Talerngsak Kanjanabuch for their invaluable contribution of a foreword.

TABLE OF CONTENT

CHAPTER 1: EPIDEMIOLOGY AND NATURAL COURSE OF SLE AND LUPUS NEPHRITIS	1
Epidemiology of SLE	1
Epidemiology of lupus nephritis	2
Natural course of SLE and lupus nephritis	2
CHAPTER 2: PATHOGENESIS OF SLE AND LUPUS NEPHRITIS	5
Pathogenesis of SLE	7
Pathogenesis of lupus nephritis	7
Risk factors of SLE and lupus nephritis	14
CHAPTER 3: CLINICAL ASSESSMENT OF LUPUS NEPHRITIS	22
The critical role of early diagnosis in lupus nephritis	22
Risk factors for lupus nephritis development	23
Assessing clinical parameters for lupus nephritis diagnosis	24
The role of novel biomarkers in lupus nephritis	30
CHAPTER 4: INTERPRETING RENAL PATHOLOGY IN LUPUS NEPHRITIS	40
Indications for renal biopsy in lupus nephritis	41
Interpreting renal pathology findings	43
Basic overview	47
Glomerular lesions	49
Tubulointerstitial lesions	54
Vascular lesions	55
CHAPTER 5: INDUCTION THERAPY	63
STEP 1: Glucocorticoids	65
STEP 2: Induction therapy	67

Cyclophosphamide	67
Mycophenolate mofetil	70
Calcineurin inhibitors	72
Belimumab	76
Azathioprine	78
Selecting induction therapy for active lupus nephritis	79
STEP 3: Adjuvative therapy	88
Hydroxychloroquine	88
STEP 4: Adverse event prevention	89
Infection prevention	89
Gastric protection	90
Bone protection	90
STEP 5: Monitoring treatment response	90
STEP 6: Modifying treatment for suboptimal response	93
CHAPTER 6: MAINTENANCE THERAPY	100
Maintenance therapy.....	101
Standard maintenance therapy: MMF and AZA	101
Add-on therapy: CNIs and Belimumab	102
Glucocorticoids	103
Hydroxychloroquine	105
Duration of maintenance therapy	105
Preemptive immunosuppressive treatment	106
Recommended approaches to extend remission	108
Health maintenance	110
CHAPTER 7: NOVEL THERAPY	119
Type 1 interferon	120
Co-stimulation pathway	121
B-cell	122

CD20	122
BAFF and APRIL	123
Chimeric antigen receptor T-cell	124
Plasma cell.....	125
Complement system	126
Janus kinases	127
Precision medicine in lupus nephritis	128
APPENDIX	131
INDEX	133

PREFACE

In the realm of nephrology, lupus nephritis stands out as a significant contributor to chronic kidney disease and end-stage renal disease on a global scale, predominantly affecting individuals at a young age. The journey towards understanding and managing Systemic Lupus Erythematosus (SLE) and lupus nephritis has been marked by considerable progress, steering us towards the possibility of cure or at least sustained remission. Such advancements not only enhance the quality of life for patients but also extend their life expectancy, signaling a beacon of hope for those affected by these conditions.

Through this work, I aim to share the insights gained from my experiences in treating patients with lupus nephritis, complemented by the integration of the most current clinical data to elevate the standard of patient care. My conviction lies in the personalized approach to treatment; recognizing that SLE and lupus nephritis manifest uniquely in each individual necessitates a tailored therapeutic strategy. With this philosophy in mind, I have endeavored to provide practical tips and guidance on selecting the optimum treatment regimen. This advice takes into account the patient's clinical presentations, immunological activity, renal pathology, and personal context, aspects that may not always be covered by existing guidelines.

This work could not have been realized without the steadfast support of many. I am deeply grateful to my family for their foundational encouragement, to my teachers and colleagues for their invaluable contributions to my professional development, and most importantly, to my patients. Their resilience, trust, and feedback have not only inspired but also critically shaped the insights shared in this narrative.

It is with great hope that the insights presented herein will contribute to the ongoing efforts to improve the lives of those affected by lupus nephritis, paving the way for more individualized and effective treatments.

Wonngarm Kittanamongkolchai, MD

Nephrology Division, Faculty of Medicine, Chulalongkorn University
Bangkok, Thailand

FOREWORD

Systemic lupus erythematosus (SLE) is not an uncommon disease, especially in the Asia-Pacific region. More alarmingly, renal involvement is more common and, perhaps, more serious than that among other ethnic groups. Despite much improvement in therapeutic innovation for the disease, there are quite a few barriers to good clinical care in this region: accessibility to proper care, inadequate awareness among the patients and families, and insufficient funding support to cover the medical costs. This book "Lupus Nephritis: A comprehensive guide for clinician" is dedicated for use by practitioners at all levels. The Book covers comprehensively many areas such as epidemiological, pathophysiological, as well as therapeutic aspects. Truly, the Book is invaluable for both medical practitioners and allied personnel to read and apply for their clinical practices.

Kriang Tungsanga, MD

Emeritus Professor of Medicine

Nephrology Division, Faculty of Medicine, Chulalongkorn University

Bangkok, Thailand

FOREWORD

In the realm of nephrology, where understanding complex diseases is paramount, Dr. Wongarm Kittanamongkolchai has achieved a remarkable feat with "Lupus Nephritis." This book guides readers through the transformative journey of understanding lupus nephritis, akin to the metamorphosis of a butterfly from egg to pupa to small worm and finally to an adult butterfly spreading their wings, all while maintaining simplicity and clarity.

Dr. Kittanamongkolchai's dedication to excellence is evident on every page of this work. Through meticulous research, insightful analysis, and a profound understanding of the subject matter, she has crafted a masterpiece that serves as a cornerstone in the education of aspiring nephrologists.

What sets "Lupus Nephritis" apart is its comprehensive coverage of every aspect relevant to the understanding and management of this complex disease. From pathophysiology to treatment strategies, Dr. Kittanamongkolchai leaves no stone unturned. Medical students find solace in its lucid explanations, residents find guidance in its practical insights, and fellows find inspiration in its scholarly depth.

Beyond its academic merit, "Lupus Nephritis" is a testament to Dr. Kittanamongkolchai's unwavering commitment to advancing the field of nephrology. Her passion for teaching and dedication to her patients shine through its pages, inspiring a new generation of nephrologists to strive for excellence in their practice.

As we express our deepest gratitude for the invaluable contribution of "Lupus Nephritis" to the medical community, we also extend our heartfelt appreciation to Dr. Wongarm Kittanamongkolchai for her vision, expertise, and tireless efforts in creating this seminal work.

Kearkiat Praditpornsilpa, MD

Professor of Medicine

Nephrology Division, Faculty of Medicine, Chulalongkorn University
Bangkok, Thailand

FOREWORD

I met Dr Jay, Wonngarm, years ago during her internship. She is the unique physician combining researcher and clinician together. We became members of a research team establishing one of the largest lupus nephritis cohort in Thailand. In this cohort, we learned that lupus nephritis patients were never the same one. Given that fact, personalized medicine is one of our favorite research topics. We published our experience of therapeutic drug monitoring of an immunosuppressant. Of which, the results are useful for treating lupus patients and improving compliance of the medication.

In this book, Dr. Wonngarm has reviewed an update on basic knowledge of SLE and applied it to current clinical studies and landmark trials. She then explains the disease in simple diagrams and clearly illustrated graphics. Furthermore, she uses her clinical experience to elaborate more which is very useful for the readers particularly medical students and internal medicine residents.

This is a “must-read” book of the year 2024 for medical students, residents and fellows. The readers can enjoy the snapshot of basic knowledge while understanding mechanisms of current treatments. To date, this is one of the rare pieces of information about lupus nephritis and I wish it would ultimately benefit our patients.

Yingyos Avihingsanon, MD

Professor of Medicine

Nephrology Division, Faculty of Medicine, Chulalongkorn University

Bangkok, Thailand

FOREWORD

In the ever-changing landscape of medicine, Lupus Nephritis presents itself as a formidable challenge, necessitating unmatched precision and expertise throughout the processes of pathogenesis and treatment. This textbook, meticulously crafted and detailed, is designed to fulfill dual purposes: it serves as an indispensable introduction for newcomers to the realm of lupus nephritis, guiding them through the complexities of this disease, and as a comprehensive reference for seasoned practitioners aiming to enhance their treatment methodologies and deepen their understanding. The integration of the latest research findings with experienced clinical insights ensures that the content remains cutting-edge, firmly grounded in practical patient care, thereby reflecting deep empathy towards patients' experiences.

Structured to promote a thorough understanding of lupus nephritis, the book commences with a detailed overview of the disease, covering its epidemiology, pathophysiology, and the spectrum of clinical manifestations. It progresses to illuminate the pathogenesis and the most effective diagnostic strategies, highlighting the importance of early detection for optimal intervention. Treatment modalities are examined with rigor, dedicating chapters to both established therapies and emerging innovations in the field. The discussion provides a balanced view on the efficacy of different treatments, equipping practitioners with a comprehensive perspective on the advantages and limitations of each approach. Significantly, the text also delves into the nuances of long-term patient management, offering strategies to mitigate complications and enhance the quality of life for those afflicted.

In essence, this textbook marks a significant milestone in the world of lupus nephritis, effectively narrowing the gap between academic research and clinical application. It stands as a testament to the authors' unwavering commitment to improving patient outcomes through the pillars of education, innovation, and compassion. Readers, as they delve into the book, will emerge better equipped to tackle the challenges of Lupus Nephritis, armed with the knowledge and tools necessary to deliver superior patient care. I sincerely salute the efforts of the editor, Dr. Wonngarm Kittanamongkolchai, for her contribution, sacrifice, and endeavor in creating this masterpiece for nephrologists, residents, and medical students. This comprehensive resource will undoubtedly improve the quality of life and save lives of patients suffering from Lupus Nephritis.

Talerngsak Kanjanabuch, M.D.

Secretary General and Executive Member, The Nephrology Society of Thailand
ISN-OSEA Deputy Chair and ISN Council

International Society for Peritoneal Dialysis (ISPD)-APC Coordinator | ISPD Council

Asia-Pacific Society Nephrology Councilor

Professor of Medicine, Division of Nephrology | Department of Medicine

Director of the Center of Excellence in Kidney Metabolic Disorders

Faculty of Medicine | Chulalongkorn University

lupus nephritis

by

Wonngarm Kittanamongkolchai

