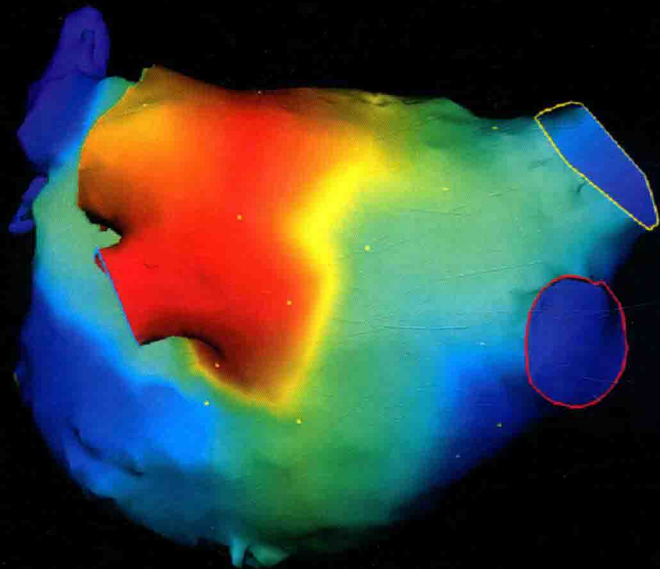
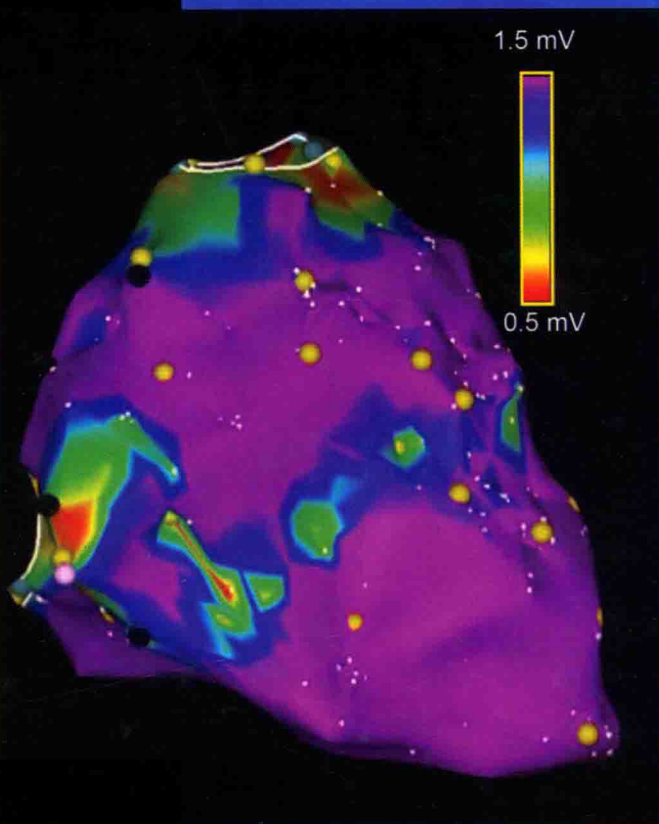




消融实践操作 培训教程

**Hands-On
Ablation:
The Experts'
Approach**



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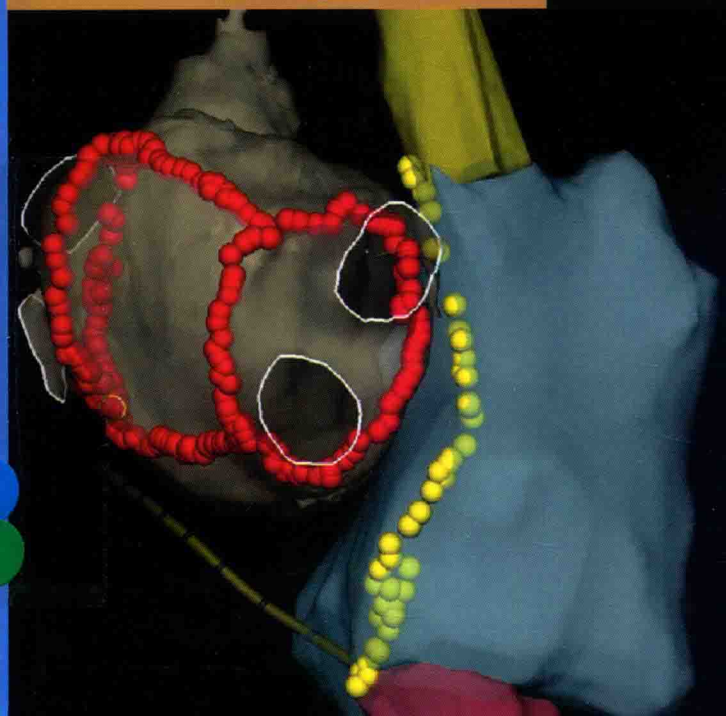
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注 意

本领域的医学知识和最佳临床实践不断进步。随着新的研究成果的问世、临床经验的积累，我们的认识不断拓展，研究方法、临床实践或药物治疗可能也要随之变化。

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译者前言

作为真正临床意义上的精准医学治疗，经导管射频消融进入中国已 20 余年。在这期间，标测手段从最初的单纯二维标测发展到三维标测，直至目前刚兴起的心内三维超声标测，使得消融适应证也由原来的单纯室上性心动过速，逐步拓展到房性心动过速、心房扑动、心房颤动和顽固性室性期前收缩（早搏）、室性心动过速等。消融成功率和安全性也在不断地提高。支撑这一切的除了对心律失常机制的认识逐步加深外，主要还有标测系统和导管技术的巨大进步。

对每一次理论或技术上的进步，国内外业界都会及时加以总结和推广。因此有关导管消融的图书近年来出版了许多，对普及推广这项技术做出了巨大贡献。常言道，知识不等于本领，知识转化为本领需经千百次的临床实践。尽管别人的本领也不等于自己的本领，但如果通过学习一些经过别人转化过的、已经将理论蕴含在内的实践性知识，就可以实实在在地缩短这个转化过程。《消融实践操作培训教程》就是一本呈现实践性知识的书。

《消融实践操作培训教程》是由国际上（主要为美国）著名的 107 位心脏电生理专家精心编撰的一本有关心律失常消融的专著。从体例上，该书分 50 章，每章几乎均以“如何做……”开头，简洁明了。从写作风格上，著者将理论性的内容全部压缩在实操中，由于这些都是各位专家多年来自己或自己中心的宝贵经验，有很强的实操指导性，理论性内容则主要在参考文献中罗列，读之有如读者亲自到该中心访学一般。从具体内容上，完全覆盖了

目前心律失常消融治疗的所有范畴，除了常规的心内膜、心外膜消融外，还详细介绍了外科心内膜联合消融、外科心外膜手术和导管心内膜消融杂交技术等前沿内容；从技术层面上，该书也几乎覆盖了目前这个领域的所有新技术，包括三维标测系统（Carto 和 Ensite）、腔内超声标测技术（二维和三维超声导管）、冷冻消融、激光消融和化学消融等，是一本简洁且完备的心律失常消融操作手册。

负责此书翻译任务的近 40 位专家都来自国内大型医院的心内科或心律失常诊治中心，每位从事心律失常消融工作时间都超过 10 年，是一直活跃在国内消融一线的骨干专家。尽管大家平时临床任务艰巨、教学工作繁重、科研学术活动异常繁忙，但出于对本书的喜爱、与本人的友情和团队协作的热情，都极其爽快地接受了各自的任务，并在规定时间内保质保量地完成了任务。在此向各位可敬的同行们表示感谢。

此书翻译体例完全遵从原著，包括插图位置编排和视频内容的讲解。内容上，从译者交稿到小范围的交互审稿，到出版社专业编辑审稿、完善，先后经过了 4~5 遍审阅。尽管如此，预计仍会有许多细节有待改进，一些译法还需商榷，偶尔可能还存在错误，希望各位专家读者在参考时能发现并不吝赐教。

此书的出版有幸遇到北京大学医学出版社的编辑团队，他们深厚的专业素养、严谨的工作态度、高效的工作作风都是此书得以顺利出版的有力保证，在此向整个编辑团队致以敬意。

主译 贾玉和

如何不“在转化中迷失”

在 20 世纪 50 年代末，当心脏内的信号第一次通过导管被记录下来时，心脏电生理学便创立了，并在过去的半个世纪成长为一个国际公认的心血管病学亚专业。虽然有时还不能明确某个患者的心律失常确切机制，但是我们如今已经可以诊断大部分的心律失常。诊断能力的进步和与之同步的手术技术的进步为心律失常的治疗铺平了道路。明确最终诊断后再通过导管释放能量（以消融病灶）的过程是一个自然的延伸，我们因此进入了 20 世纪 80 年代的导管消融术时代。

目前已经存在大量描述某种心律失常该如何诊断及射频治疗的文献。心电生理的诊断依赖于对腔内心电图的观察和其所示的对电刺激干预的反应，有时需使用药物。全世界都为之努力研究并且将继续取得更多进展。心电生理导管室需要将这些进展转化成安全、实际、有效的诊断及治疗策略。比如，新的电生理方法可用于区别各种间隔型心律失常：Parahisian 起搏的应用，观察拖带后房室之间关系，起搏后间期-心动过速周长（PPI-TCL）间期及室-房关系。要实现安全、充分、高效治疗的第一步是准确鉴别各种心律失常机制，这一点可以用左束支传导阻滞-电轴向下型室性心动过速逐渐被大家所了解的过程来说明。最初，这类室性心动过速被认为仅起源于右室流出道。随着知识和经验的积累，人们渐渐了解到这种室性心动过速会出现在左心室及右

心室流出道、主动脉-二尖瓣交界区、主动脉瓣窦、主动脉、肺动脉以及心外膜表面。在术前初步明确室性心动过速的起源点有助于和患者讨论手术风险、手术设计及手术可能的结果。

值得祝贺的是，《消融实践操作培训教程》的编者们完成了一本全面涵盖各类可消融治疗心律失常内容的著作。这本书分为三部分：室上性心动过速、心房颤动、室性心动过速。每一部分都将现存的文献著作转化为如何确诊及如何消融的实用步骤。

对于难于鉴别的心律失常，本书也可提供辅助诊断策略。这一点对于心电生理的培训人员及有经验的电生理专家来说，都可谓极具价值。同样，当诊断起来举棋不定时也可以参考本书。“如何操作”可以避免临床医生在现存文献所言和对临床有用的诊断及消融方法之间“在转化中迷失”。

这本书采用“如何操作”的人性化写作形式使其所讲内容都与临床密切相关。这本书图文并茂，正所谓“一幅图胜过千言万语”。每一位编者都是在相关电生理领域一言九鼎的专家，能够为每个问题提供权威意见。

总之，这本书将现存的文献知识转化成对临床决策有用的方法。这本书专门写给那些在心电生理实验室中亲自处理实际临床问题的电生理学家，为他们提供如何处理常见临床情况的专家意见，而不至于“在转化中迷失”。

—Ranjan K. Thakur

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原著前言

伴随着技术的进步及对心律失常病理生理学更深入的理解，导管射频消融领域不断发展。医生们只有跟得上这些前进的脚步，才能为患者提供最先进的治疗。期刊出版物能提供第一手的新观点和创见点，但常常缺乏能将新鲜事物运用到实践中的实用性细节。

本书每一章节都聚焦于更加实用的消融程序，为读者透彻解析世界顶尖电生理实验室是如何完成这些环节的。对于“如何完成”室上性心动过速、

心房颤动及室性心动过速的消融术，本书均给出了独一无二的解答。专家作者们描述了详细的操作步骤，突出了每章节知识的实用性。此外，每章节还附上图片和（或）视频以辅助对概念进行详解。

我们的目的是为读者提供以往只有通过观看专家操作才能学会的实用性知识和技巧。

希望此书能成为临床电生理学家、电生理培训生及相关分支专业甚至产业专家的有益资源和教学工具。

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缩略词表

A-A-V	atrial-atrial-ventricular 心房-心房-心室激动顺序
ACT	activated clotting time 活化凝血时间
AF	atrial fibrillation 心房颤动
AFCL	atrial fibrillation cycle length 心房颤动波周长
AFL	atrial flutter 心房扑动
AIVV	anterior interventricular vein 前室间静脉
AMC	aorto-mitral continuity 主动脉瓣-二尖瓣结合体
AP	accessory pathway 旁路
APC	atrial premature contraction 房性期前收缩
ARVC/D	arrhythmogenic right ventricular cardiomyopathy/dysplasia 致心律失常性右室心肌病/发育不良
ASC	aortic sinus cusp 主动脉窦
ASD	atrial septal defect 房间隔缺损
AT	atrial tachycardia 房性心动过速
ATP	antitachycardia pacing 抗心动过速起搏
AV	atrial-ventricular or atrioventricular 房室
AVN	atrioventricular node 房室结
AVNRT	atrioventricular nodal reentry tachycardia 房室结折返性心动过速
AVRT	atrioventricular reciprocating tachycardia 房室折返性心动过速
BBB	bundle branch block 束支传导阻滞
BBRV	bundle branch reentrant ventricular tachycardia 束支折返性室性心动过速
bpm	beats per minute 每分钟心跳次数
CAD	coronary artery disease 冠状动脉疾病
CFAE	complex fractionated atrial electrograms 复杂碎裂心房电图
CL	cycle length 周长
CS	coronary sinus 冠状窦
CT	computed tomography 计算机化断层显像
CTI	cavotricuspid isthmus 下腔静脉三尖瓣峡部
ECG	electrocardiogram 心电图
EGM	electrogram 电描记图 (电图)
E-IDC	electrograms with isolated delayed components 伴孤立延迟成分心电图
EP	electrophysiology 电生理学
ERP	effective refractory period 有效不应期
EUS	electrical unexcitable scar 电不兴奋性瘢痕
GCV	great cardiac vein 心大静脉
HA	His-atrial 希氏束-心房
HB	His bundle 希氏束
HB-RB	His bundle-right bundle branch 希氏束-右束支