

a LANGE clinical manual

Medical Perioperative Management '89/'90

Edited by
Susan D. Wolfsthal



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To Bill, Rebecca, and Jennifer for your love and support.



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Preface

PURPOSE

This manual provides a practical, portable guide to perioperative medical assessment and management of the surgical patient. Written by internists and specialists in internal medicine, it is intended to be a convenient quick reference for consulting internists but will also prove useful to house officers, medical students, surgeons, and anesthesiologists.

ORGANIZATION AND SCOPE

The manual is organized in 2 major sections: Perioperative Assessment and Management, and Special Problems in Perioperative Management. The first section includes chapters on general risk assessment, pharmacologic and nutritional assessment and management, prevention and management of postoperative infection, followed by assessment and management of individual body systems.

Chapters in the second section discuss the special assessment and management considerations for patients with multi-system problems such as the older adult, the pregnant woman, the obese person, the person who abuses alcohol and other drugs, and the patient with rheumatologic disease. In addition, separate chapters consider patients undergoing particular surgeries: gynecologic, orthopedic, vascular, neurosurgical, and ophthalmological.

The convenient outline format and selective use of boldface type afford quick, easy access to key aspects of patient assessment and management. Implications of a particular problem in the perioperative setting—such as insulin regimens for the diabetic undergoing surgery, management of antihypertensive medications, and approach to the patient with electrolyte disturbances—are highlighted.

Each chapter details preoperative risk assessment, prevention and treatment of postoperative complications, and evaluation of patients undergoing particular procedures.

OTHER USEFUL FEATURES

- Extensive, practical tables provide readily accessible information on endocarditis and wound prophylaxis; drug options in chronic obstructive pulmonary disease, hypertension, and diabetes; infection control and management of perioperative infection; choice of prophylaxis for thromboembolism; and options for nutritional supplementation.
- Practical, precise guidelines delineate indications for drug therapy, dosages, and administration.
- Appropriate screening tests in the healthy individual are recommended, as well as more extensive evaluations required in the risk assessment of patients with medical problems, for example, indications for pulmonary function tests, exercise stress tests, etc.
- Prophylaxis for common postoperative problems is provided.
- Indications for postponement of surgery are included.
- The medical consultation process, including specific consultative procedures, medicolegal aspects, and special outpatient considerations, is described in the introduction.
- Numerous references include recent clinical studies and reviews on the risk assessment and management of patients undergoing surgery.

Although the authors are solely responsible for the content of this manual, we are greatly indebted to the following consultants, who provided helpful advice: Meyer Heyman, MD, Assistant Professor, University of Maryland School of Medicine, Baltimore; Marc C. Hochberg, MD, MPH, Associate Professor of Medicine, Johns Hopkins University School of Medicine, Baltimore; Robert Knodell, MD, Head, Division of Gastroenterology, University of Maryland School of Medicine, Baltimore; David Nagey, MD, Director, Division of Maternal-Fetal Medicine, University of Maryland School of Medicine, Baltimore; Gail Rosen, MD, PharmD Assistant Professor, School of Pharmacy, Director of Nutritional Support Services, Pharmacy Department University of Maryland Medical System; Paul J. Weidle, MD, PharmD, Clinical Specialist/Adult Medicine, University of Maryland Medical System, Clinical Assistant Professor, School of Pharmacy, University of Maryland, Baltimore.

We also owe special thanks to Dolores Stewart for her enthusiasm and dedication in preparing the manuscript. No matter how many or how complex the changes, her response was the same: "No problem." We needed that. We would also like to thank Kathy O'Brien for her helpful criticisms and tireless support during the development of the book.

The editor welcomes suggestions and comments about any aspects of this manual. Letters should be addressed to:

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OTHER USEFUL FEATURES

- Extensive practical tables provide readily accessible information on endocarditis and wound prophylaxis, drug options in chronic obstructive pulmonary disease, typhoid fever, and bacterial meningitis, and management of cholelithiasis.
- Practical, precise guidelines delineate indications for drug therapy, dosage, and administration.
- Appropriate scoring leads to the best drug choice for the individual patient, as well as more extensive evaluation options in the risk assessment of patients with medical problems for elective anesthesia, particularly in patients with cardiac disease, etc.
- Prophylaxis for common postoperative problems is provided.
- Indications for postoperative care are included.
- The medical consultation process, including specific anesthetic consultation procedures, medical aspects, and special outpatient considerations is described in the introductory section.
- Numerous references include recent clinical studies and reviews on the risk assessment and management of patients undergoing surgery.

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Introduction

The Consultative Process

Susan D. Wolfsthal, MD

Medical consultation integrates the knowledge and skills acquired in medical practice and modifies them to the perioperative setting. Because a surgical procedure is involved, the medical problems of the patient must be viewed with a perspective different from that observed in a nonoperative setting. Analysis of the patient's preoperative risk along with prevention and management of perioperative medical complications is the primary goal of the consultant. Often the severity of the disease and the spectrum of the illness encountered in the practice of surgery vary considerably from those encountered in a general medical practice. For example, the clinical presentation of a myocardial infarction may be different in the postoperative period from that encountered in an ambulatory setting. Similarly, the risk due to certain medical conditions such as hyperthyroidism may be heightened in the perioperative period.

In addition, the consultant is faced with the need for effective communication with referring physicians to maximize their compliance with recommendations and to optimize the patient's outcome. In the perioperative setting, the consultant functions as part of a team along with the surgeon, the anesthesiologist, and other health care professionals to bring the patient to the operating room in the best possible condition. In addition to playing a key role in the preoperative assessment and management of clinical risk factors, the consultant aids in the institution of prophylaxis to lessen the risk of endocarditis or thromboemboli, in the management of postoperative medical problems and in the discharge planning of patients.

A successful consultation depends on several factors, including the specificity of the referring physician's inquiry; the consultant's completeness, timeliness, and availability; the appropriateness and clarity of the recommendations; and the team approach to the patient's problems.

I. The question. The referring physician should specify the problems to be addressed by the consultant. Merely asking for "preoperative medical clearance" may not provide the referring physician with the desired answer and may well lead to mutual dissatisfaction. The immediacy of the consultation should also be specified in relation to surgery to allow the consultant adequate time for evaluation.

II. The consultant's responsibilities. To ensure effective patient evaluation and good patient outcome, the consultant should adhere to the following principles.

A. Establish the question. If the question has not been specifically stated, ascertain the urgency for surgery and the concerns of the referring physician. Prompt response to consultation requests ensures better compliance by the referring physician with the consultant's recommendations.

B. Document the patient's health status. A consultation should not repeat what has already been documented in the chart, but it should emphasize what is essential to the preoperative evaluation (see **C**, below). If not already stated in the chart, a precise history of the present illness and pertinent prior medical history should be detailed (see Chap 1, **III. A**). Any recent changes in symptoms or the development of new symptoms should be documented. No more than one-third of the consultation report should be used for this purpose.

C. Assess the risk. One-third of the written consultation should be dedicated to a discussion of the patient's medical problems and how they relate to the

surgical disease and upcoming surgery. The preoperative assessment should contain 3 main components.

- 1. Medical illnesses.** A clear delineation of the chronic and acute medical problems should be made with specific attention to the severity, duration, and potential complications of each problem as it relates to the surgical procedure.
- 2. Risk factors.** Conditions that increase the risk of postoperative morbidity and mortality should be defined and quantified. In addition, medical conditions that do *not* confer added risk should be listed, such as stable angina or diastolic hypertension under 110 mm Hg. The Physical Status Classification of the American Society of Anesthesiologists (ASA) can be used by the anesthesiologist, and the Cardiac Risk Index can be used by the consulting internist (see Chap 1, II). In the event of elective surgery, reversible risk factors, eg, hypokalemia, congestive heart failure, moderate hypertension, or hyperthyroidism, should be corrected prior to surgical intervention. If the risk of delaying a surgical procedure outweighs the benefit of correcting a clinical risk factor, the consultant must work with the surgeon and the anesthesiologist to prepare the patient for surgery in the most stable condition possible, given the medical condition and the time available.
- 3. Final assessment.** A definitive statement regarding any relative or absolute medical contraindications to surgery should conclude the risk assessment. If the patient is in the best condition possible, the consultant should state that there are no acute or absolute medical contraindications to surgery.

D. Make recommendations. The remaining one-third of the consultation report should consist of recommendations for the preoperative and postoperative periods. These recommendations should clearly address the questions asked by the referring physician. If the consultant can limit the number of recommendations to fewer than 5, definitively state them, and adhere to the most important issues, the rate of compliance with these recommendations by the referring physician should be markedly improved. Precise drug dosages, routes, and intervals should be specified. Monitoring schedules and potential adverse outcomes should be stated clearly. Prophylaxis for endocarditis or thromboembolic disease should be precisely listed.

III. The team approach. Each physician on the team (internist, anesthesiologist, and surgeon) plays a vital role in the perioperative management of the patient. The internist is responsible for addressing general medical illnesses, the anesthesiologist for maintaining optimum anesthesia and vital signs, and the surgeon for actual surgical procedures and potential complications. Their smooth interaction is particularly important in the preoperative process, when the patient is being assessed for overall surgical risk. Major decisions regarding the patient's ability or inability to face surgery are usually made by all 3 physicians. Unilateral decisions are generally inadvisable. The decision to postpone nonelective surgery is often difficult, since the benefit of delaying surgery may not clearly outweigh the risks of proceeding with the operation. However, open communication among all 3 physicians can lead to an effective and positive patient outcome.

IV. Medicolegal aspects of the perioperative period. Once a physician-patient relationship or duty of care is established, the possibility exists that negligence or errors of commission or omission may give rise to an action for medical malpractice. The primary surgeon, the consultant, and the anesthesiologist are potentially exposed to malpractice liability during the perioperative period. The laws regarding malpractice may vary from state to state, but the following concepts are generally accepted everywhere.

A. Definition. A malpractice action is based on 4 conditions:

- 1. Duty of care.** The physician-patient relationship imposes a duty of care on the surgeon, the anesthesiologist, the internist, and the consultant.

2. **Breach of duty.** The physician's duty as established by the standard of care in that hospital, specialty, or situation has been breached.
 3. **Damages.** The patient must sustain some degree of injury as a consequence of the breach of duty.
 4. **Causation.** It must be shown that the injury was directly caused by the breach of duty.
- B. Informed consent.** Most hospitals supply standard consent forms for patients undergoing surgical procedures. It is usually the surgeon's responsibility to obtain the patient's informed consent.
1. **The basic elements** of informed consent are as follows:
 - a. Diagnosis
 - b. Nature and purpose of the procedure
 - c. Risks of the procedure
 - d. Alternatives to the procedure
 - e. Benefits of the procedure
 - f. Consequences of accepting or rejecting the procedure
 2. **Competency.** The patient must be of legal age and able to understand *all* elements of the informed consent to be deemed competent. If deemed competent, the patient has the right to refuse surgery up to the time sedative drugs are given. Questions of competency are frequently addressed by a consulting psychiatrist, the hospital administration, or the civil court system in the hospital's jurisdiction. In emergency situations, physicians may act in the patient's best interest if informed consent cannot be obtained.
 3. **Witness.** The witness to consent merely attests that the patient signed the document. No certification of the patient's competency or understanding is made by the witness signing the form.
- C. Pitfalls for the surgeon.** In the consultative process and in obtaining consent, the surgeon is potentially liable for any of the following.
1. **Not obtaining a consultation** or not obtaining one from a qualified expert when the medical problems significantly affect risk.
 2. **Not following the advice of the consultant** and thus falling below the standard of care.
 3. **Not obtaining informed consent.**
 4. **Lack of documentation.**
- D. Pitfalls for the consultant.** The consultant is held to the standard of care just as any other physician. The following situations may lead to litigation.
1. **Lack of documentation.** Informal consultations without written documentation, eg, "off-the-cuff" recommendations or verbal interactions with the surgeon, may leave the consultant liable for the statements made if the advice is taken by the surgeon.
 2. **Failure to adequately or accurately assess risk or establish diagnoses.**
 3. **Not providing adequate follow-up.** Signing off a consultation prematurely, not being personally available, or not providing backup coverage during absences may make the physician liable for abandonment.
 4. **Not obtaining additional consultations** if indicated by the medical problems or the standard of care.
- V. Outpatient consultation.** With the advent of restricted length-of-stay allowances, the consultant may not have the luxury of even one inpatient preoperative day in which to evaluate the patient for surgery. In addition, the increasing number of procedures being done in ambulatory surgery centers has created a situation in which patients must receive preoperative care and postoperative management in the outpatient setting. Because fewer postoperative complications occur in patients with well-controlled medical illnesses, such patients should be seen by the primary care physician or the consultant as soon as surgery is contemplated. Although screening tests rarely detect asymptomatic abnormalities, a few carefully selected tests performed prior to admission may be less costly than admitting a

patient to the hospital and discovering that elective surgery cannot be performed owing to the presence of an abnormality (eg, a myocardial infarction of unknown age as detected on the ECG).

A. Guidelines for early consultation

1. The following patients should be referred for an early outpatient preoperative medical evaluation.
 - a. Patients with chronic medical illnesses (eg, hypertension, cardiovascular disease, diabetes, thyroid disease).
 - b. Patients of advanced age (eg, over 65–70 years).
2. If a preoperative medical evaluation is not deemed necessary by the surgeon, a minimal number of laboratory tests should be performed, particularly in patients over age 40 years, before admission, eg, hematocrit, glucose, ECG, and urinalysis. If these tests are done within 5–7 days of surgery, many anesthesiologists will accept the results for surgery. Thus, the patient is not charged for 2 sets of studies, and there is adequate time to investigate any abnormalities before admission.

B. Ambulatory surgery. Patients undergoing outpatient surgery by definition are provided preoperative and postoperative care in an ambulatory setting. The team approach is crucial here in the management of patients with multiple medical problems.

1. **Preoperative care.** Early risk assessment by the consultant or the primary care physician should be done as noted above.
2. **Postoperative care.** Management of the patient after outpatient surgery depends on the medical problems. In addition to providing routine recovery room care (eg, monitoring of vital signs or urine output, administration of routine medications for hypertension or cardiac disease, or provision of insulin coverage for diabetes), the consultant may need to see the patient in the office daily for 1–2 days postoperatively to monitor the medical condition. The consultant and the surgeon are responsible for close follow-up of the patient's medical and surgical condition. The consultant can either see the patient personally or ensure appropriate follow-up with the primary care physician.

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SECTION I. Perioperative Assessment and Management

1 General Risk Assessment

Susan D. Wolfsthal, MD

One of the main responsibilities of the consultant in the preoperative period is to define and classify the patient's risk factors for surgery. Any surgical procedure, even a minor one in a healthy individual, carries some degree of risk for morbidity or mortality, albeit small. A variety of medical conditions increase that risk. Therefore, a comprehensive review of the patient's medical history and a thorough physical examination, including review of screening laboratory studies, are critical components of preoperative risk determination. Further inquiry and diagnostic studies may be warranted if illnesses such as diabetes mellitus, hypertension, or emphysema exist. The following sections outline the approach to a patient who is to undergo surgery. Should any abnormality be revealed in the history, on physical examination, or in laboratory studies, the consultant should refer to the chapter in this manual that discusses the perioperative management of that problem.

I. Definition of risk. Three areas of concern must be addressed before a final determination of the potential morbidity and mortality of a surgical procedure can be made.

A. Patient risk factors. The physician must first define what risk factors, if any, are present and analyze their significance. Both disease- and habit-related problems must be considered. The duration and severity of these conditions should be documented by history or diagnostic studies.

1. Does the patient have a known chronic systemic illness (eg, diabetes mellitus, hypertension, cancer)?
2. Is there an underlying condition that has not been diagnosed (eg, coronary artery disease, hyperthyroidism, liver disease)?
3. Is there any genetic predisposition to complications (eg, family history of bleeding or adverse reactions to anesthesia)?
4. Is there a history of drug allergy, particularly to antibiotics that may be used in the perioperative period?
5. Are there any habits that increase risk (eg, smoking, drug abuse, alcoholism)?

B. Reversibility of risk. After assessing the type and severity of disease present, the consultant must determine which risk factors are reversible prior to surgery. Reduction of risk preoperatively can decrease the postoperative complication rate and potential mortality. However, the ability of the team of internist, surgeon, and anesthesiologist to initiate risk reduction management is limited by the amount of time available before surgery must be performed. If elective surgery is scheduled, there usually is ample time to optimize the patient's condition. Treatment of hypertension, congestive heart failure, or hyperthyroidism before surgery will result in a more beneficial outcome for the patient. Obviously, certain risk factors cannot be reversed, eg, poor liver function or advanced age (>70 years). Often a reversible risk factor exists, but because emergency surgery is mandatory, there is not enough time to correct it. The team must weigh the benefits and risks of performing the surgical procedure immediately versus postponing it until the patient's condition is optimized.

C. Surgical risk factors. The indications for surgery, in addition to the timing and type of procedure, affect the patient's risk status. Certain procedures (eg, aortic, intrathoracic, or abdominal surgery) carry a higher risk than do more