

## Preface

Misery and suffering have always lingered in humankind's deepening shadows, a sordid background on the stage of human drama, shifting in intensity across *Homo sapiens* time. Disease is never quite out of sight for anyone, always edging the fringe of experience. Few individuals even in the modern era travel through their lives without at least once stumbling into injury or contracting an infectious illness.

Unexpectedly disease may leak joy from one's existence, alter the course of one's intimate relationships. This is the stuff of real life. It also ought to form a portion of the foundation of characterization as well as offer plot (mis)direction.

Throughout history, illness, like its fellow tormentor, war, has defined humankind's folly. The hopeful protégé of this painful history, our species remains a tortured learner. Limping through varied and uncertain existences, we seem confused by the thorn in our heel.

Today disease often brings with it a trip to the hospital. The young suffer outrageous ravages of trauma, often self-inflicted, while the elderly slip insidiously into the awaiting arms of age-related deterioration and chronic illness. While highway trauma and inter-city violence wound and maim youngsters, over 75% of our elderly suffer at least one chronic disease and often several, with heart disease, cancer and stroke leading the hit parade of causes of elder death. The very aged are admitted to the hospital twice as often as youngsters and stay twice as long. When discharged they often require further institutionalization.

Regardless of their age, it seems hospitalized patients are treated with equal aggressiveness and are discharged before healing is complete. More and more beds in the modern hospital are dedicated to medical and surgical intensive care units, intermediate care areas as well as floors which offer complex specialty care, and house complex technology and their specially trained staff.

Some hospitals specialize in only one type of medical problem such as cancer treatment. Some hospitals emphasize research and teaching; others on the periphery of populated geography provide only the most basic type of acute care with systems of referral for complex patients.

More than any other feature of modern hospitals is the dedication to doing things to patients, performing diagnostic and therapeutic interventions, complex surgical procedures. These intense treatments include radiation therapy, chemotherapy, hyperbaric oxygen therapy, dialysis and other organ-specific treatments. Physicians who practice in the hospital setting may also be active in community practice, or they may run hospital-based clinics or limit themselves to in-house (hospital) care.

A few doctors have elected (or have been directed) to no longer work in the hospital at all.

Procedures which require catheters, needles and other hardware to be inserted into body cavities carry well-defined risks. Some doctors are better at specific procedures than others. Many surgeons limit themselves to a few operations while others, particularly in smaller hospitals, must perform a wider range of surgical procedures.

In this environment where risky and intense care is delivered to a carefully selected number of sick patients, the stakes are high. Bad things may happen to good people. Excellent doctors may have horrible complications befall their patients. All of these statistics are now available to patients, but, as with all statistics the numbers don't tell the whole story.

And the question which no one wants to ask today is always there for the writer to grab and wrestle to the ground: *who should be treated?* In a society racked by impossible health costs, the issue of rationing of precious but scarce medical resources will not go away. And if the American populace and the Federal Government quietly turn their backs on the disaster lurking for Americans in the twenty-first century, surely writers will not.

### **The Writer's View**

Few stories have been written without at least one character suffering an element of illness or disability. Most of your characters will

have been in the hospital at one time or another in their back story, or may find themselves hospitalized during your current story. Fiction and non-fiction writers alike must understand how the high tech hospital works, know the changes which have occurred over the last three decades and be able to seamlessly integrate this understanding into their prose.

Wonderful opportunities to create conflict and deepen characterization lie in the modern hospital and in the unpredictable, irrational progression of disease. The popularity of television programs such as *ER*, *Scrubs*, and *House* as well as movies like *Malice* emphasize the public's interest in medical issues. But, get it wrong and they will not forgive you.

This book is written for writers. Rather than assembling a compendium of data, we have attempted to cull from the exponentially growing mass of medically related literature those interesting facts which will not only inform your prose, but provoke you to search for new relationships in your material. We believe there is 'behind the scenes' information in this book not available elsewhere which you may expand in your own fictive world.

Just as important, we feel, as the factual data is the information which does not appear in lists and sidebars, but represents the intimate narrative of the book. It is the hidden taproot of the hospital. This truly unique approach to 'telling it the way it is' provides you with material not published elsewhere and not commonly discussed by doctors. Amid the

facts and photos there also lies a minefield of information distilled from untold observed querulous physician interactions and overheard hospital dialogue.

It's the brandy in the 'hospital' eggnog.

Is there a point in your character's life where illness becomes a sheer wall of impedance past which your story must progress? Can you get your hero into trouble in the hospital? Do you know how to get him out of trouble? Or in deeper?

Recently one of us served briefly as a consultant on a major movie (*"In Dreams"*) where a scene involved a woman waking up from a coma in an intensive care unit. The initial script dialogue for the physician seemed woody, unreal. When changed slightly the scene flowed smoothly, emphasizing the awakening woman and not the doctor. A small adjustment in dialogue based on an understanding of how doctors really talk to patients in the hospital setting and a few suggestions about the doctor's demeanor made the scene more believable.

The history of the hospital's origins is really the story of the evolution of medical care. Every writer should understand the basic elements of this often sordid tale. As a backdrop to the detailed information provided in the remainder of the book, the historical sketch in the first chapter will enrich your understanding of medicine's recent successes. It provides a starting point for your research for an historical novel or may expand your basic understanding of a character who lived in a different era.

From there you will learn details of hospital function which will authenticate your own nonfiction, novel, stage or screenplay.

Doctor Richard Selzer once said every patient is a short story. Thus, the modern hospital very much is a many volume collection of plot material. In the acrid-smelling corridors and behind closed doors and *Restricted Access* signs, terrible things may be happening.

Story conflict lies awaiting. But, you've got to get it right.

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## CHAPTER ONE

### The Origins of the Modern Hospital

- **Evolution of hospitals and society**
- **Earliest hospitals**
- **Evolution of modern medicine**
- **Barber surgeons**

- **Hospitals in Colonial America**
- **19<sup>th</sup> Century hospitals**
- **20<sup>th</sup> Century hospitals**
- **Modern teaching hospitals**
- **Categories of modern hospitals**

Humankind learned early in its belligerent history how to dress wounds. Unpredictable traumatic events were commonplace in a hostile world where survival depended more on ingenuity than strength. Man preyed on all life forms, and death and mutilation were the by-products of the struggle for existence in Early Pleistocene life. When early man began to develop the concept of possessions, boundaries and ownership of land, he ruthlessly descended upon his own kind to defend them and began the expansive history of warfare, a brutal activity of swords and hatchets which set the stage for the evolution of surgical practice.

Injuries and wounds led humans to experiment with herbal poultices, mud packs and bark bandages and to eventually discover the basic principles of primitive medical care. All manner of practitioner populated the convoluted nascent history of medicine and thus contributed to the story of the modern hospital's evolution. It is the history of medicine which informs the story of the hospital. As political, social and economic factors changed in various locals in the world so did the face of the institution eventually known as the hospital.

Enlightened writers will appreciate the vital steps in the development of modern health care and the role the hospital played in this magnificent epic. For the hospital – as we understand it approaching the

twenty-first century – is not the same institution which served as the modern era's forerunner.

It's difficult to appreciate the notion of a hospital with neither doctors nor nurses and certainly nothing resembling a business-oriented administrator. However, in the beginning of civilization priests served as doctors and temples as hospitals; faith in a compassionate God healed poor multitudes and the rich alike before science bore restorative fruit for a truly effectual medical profession.

The hospital has always mirrored the foibles of society at large, the shortcomings of the healing arts and the forceful presence of the ruling political party. In a real sense, everyday hospital drama is humankind's story played out on a small stage. The hospital is a reflection – on a diminutive scale with remarkable intensity – of mankind's history

By contrast, the modern hospital will be seen as a crucible -- if not a marginally controlled cauldron -- where medical professionals, bureaucrats and sick patients interact in heroic and, at times, demonic ways. The hospital thus has always mirrored the foibles of society at large, the shortcomings of the healing arts and the forceful presence of the



ruling political party. In a real sense, everyday hospital drama is humankind's story played out on a small stage. The hospital is a reflection -- on a diminutive scale with remarkable intensity -- of humankind's history. Yet as recently as the 1800s in America, no citizen of note or with any degree of personal wealth, would enter a hospital for medical care.

Medical science -- and thus society at large -- has witnessed dramatic change since the days of the Greek temples of Saturn, Aesculapius and Hygeia and Hippocrates's original contributions to medical education and patient care. Throughout the ages, poverty, bad luck and illogical behavior made hospital care a necessity. In response, hospitals tepidly evolved to meet the shifting challenges of a more urban life, eventually incorporating new sciences essential for intelligent medical practice. Larger hospitals became the only place where modern medical treatment and diagnosis could be provided, the only place where all of the new technology was available. In the computerized world of lasers, magnetic resonance scanners, SPECT isotope scanners, advanced surgical with specialized surgical teams, the larger hospital setting was the only place where it all came together.

The origin of the modern hospital is rooted in the beginning of medical care in prehistoric times. Descriptions of pathologic findings in early man reflect a variety of injuries as well as the impact of parasitic diseases, arthritis, bone cancer and bone infections. One may assume that similar illnesses of soft parts (intestines, muscles, major internal organs, etc.) occurred but are not part of the fossil record. Care in the cave preceded, and no doubt anticipated, most primitive hospital treatments.

We also know from primitive and folk medicine that numerous illnesses were treated in a quite specific and effective manner. That is, the *external* diseases which afflicted early mankind received attention from ancient times. We know less about how internal diseases were handled but it seems certain that magic and witchcraft played a role in their treatment. And through it all early humans struggled to feed and shelter themselves, suffering the ravages of famine and exposure to the hostile forces of Nature.

### **Early Hospitals**

Cure wasn't always the mission of the hospital.

By 600 BC hospitals in India employed the principles of basic sanitation and surgery and were built with a regional plan to serve the destitute and the infirmed. Arab hospitals also served as teaching centers where pharmacy and chemistry originated and where classic Islamic learning was preserved. Not only did the Arabs establish asylums for the insane centuries before the Europeans, their hospitals were characterized by such modern concept as separate wards for different diseases as well as different locations for convalescent patients who were less ill and more ambulatory than others.

The cyclic nature and rhythm of human knowledge is reflected in the Middle Ages when all intellectual pursuits, including those already applied to the practice of medicine -- as well as any notion of progress -- were eradicated. Nursing care, ignorance of sanitation and the absence of reasoned treatment brought medical care between the fourth and fourteenth centuries to a shuddering halt. Medieval houses for the sick

provided shelter for pilgrims and other destitute citizens as well as marginal medical care for the poor.

The famous thirteenth century Hotel Dieu in Paris offered succor to the poor with only occasional physician coverage and was staffed by members of the religious community. It was common before the twelfth century for hospitals to have minimal physician input as doctors seldom included the hospital in their practices. And even the Hotel Dieu often assigned two or three patients to a single bed; meals were also less than nutritious and heating often non-existent! It must be said that a few medieval hospitals provided physician and surgeon services and aimed at cure for certain diseases rather than mere comfort care until death, the 'hospital's' mission at that time.

### **Hospitals in Colonial America**

American medicine, borrowing from English, German and French influences, vaulted from primitive bleedings, bandages and purges to the sophisticated interventions which now characterize the modern era. The history of the American hospital marks the development of notable medical careers, the nourishment of improved scientific principles with which to practice and the expansion of medical knowledge and technology. It also includes a rancorous vein of disagreement and bickering among doctors and significant distrust by the public. From the beginning American hospitals were founded and supported by private citizens, at first by contributions of merchants and farmers and only later by the affluent.

American medicine in general and hospitals in particular lagged behind European accomplishments, despite the trend for Americans to seek medical knowledge in Germany, France, England and Scotland. American doctors eschewed the stethoscope and clinical thermometer when these clinical accouterments first became available and resisted new medical knowledge from overseas for quite some time in the nineteenth century.

Doctors were exclusively men until 1853, when Elizabeth Blackwell became the first woman to earn a medical degree. Men who possessed a college degree, read what medical literature was available and gained some experience with patients was as close to a physician as was to be found in the Colonies before the 1760s. Magistrates and clergymen read and practiced the healing arts, such as they were, and competed with 'doctors' trained by apprenticeship. These two groups undoubtedly represent the beginnings of the 'town versus gown' conundrum of modern times, the confrontation of practical, experienced physicians with their academic, research-based colleagues. The dilemma is reflected in Richard Harrison Shryock's observation in his book, *Medicine and Society in America: 1660-1860*, that Oliver Wendell Holmes wrote essays where in one he praises the practical practitioners and in another he ridicules them. Overall, colonial medicine between the early 1600s and 1730 was primitive and disorganized.

Early medical practitioners in America would have been considered ignorant in Europe. Shrylock states that before the Revolutionary war, "It has been estimated that on the eve of that conflict there were about 3,500 established practitioners in the colonies and that not more than 40 of

these had received any formal training. Of the latter, only about half -- or barely more than five per cent of the total -- held degrees.“ Lay people often wrote medical guides focused on hygiene and quackery. And in 1721 in Boston there was only one practitioner who held an MD degree!

The early American hospital shared in the ignominy of the slave trade. In 1707, a “pest house” or *lazaretto* was built on Sullivan’s Island in South Carolina where the newly-arriving Africans were required to remain for ten days, or as much as three weeks until a health inspector had examined them. According to Edward Ball in his book, *Slaves in the Family*, “Those who had survived the Middle Passage – the second leg of the triangular travel for British ships, which sailed from England to West Africa to America, and finally back to England – stayed under guard in the pest house. People who died during the quarantine were evidently buried in mass graves.” The idea was to let any illness contracted at sea run its course before the slave was allowed to set foot in America., unseen in a crude brick building set near the marshes of Sullivan’s Island, a despicable hospital forerunner.

As American cities grew and prosperity increased, so did the wish for improved education. Young men were returning from abroad with degrees and these practitioners began to insist on improved standards of care by the 1760s. From then onward in both British and American medical practice serious attempts were being made to admit only those possessing an MD degree to the legitimate practice of medicine. It was at this time that the first true hospital appeared in America.

A succession of foreign-trained American doctors formed the spine of quality in early American medicine. A sequence of distinguished

American physicians included Doctors Benjamin Rush, John Morgan and Thomas Bond who contributed to the parallel development of the Pennsylvania Hospital in 1751. The New York Hospital was erected later in 1771. Modeled on the British voluntary hospitals, Pennsylvania Hospital was designed to care for the poor and indigent. Some private patients were admitted and charged fees, but most practitioners cared for their charges without compensation. Shryock states the mortality rate at the Pennsylvania Hospital was a remarkable ten per cent, but the so-called 'hospitals' sprinkled about the colonies at this time were anything but death-free.

These original 'true' hospitals became engaged in medical education and instruction in gross anatomy began for the first time in America in Philadelphia and New York. Midwives were encouraged to attend lectures along with medical students and thus a sliver of science insinuated itself into early American medicine. Pushed by John Morgan the College of Philadelphia established a medical faculty and the tradition of fusing the university with the hospital began at that time and persists -- with only a few exceptions along the historical way -- today. Joining the two medical schools mentioned above, Harvard College moved its fledgling medical school to Massachusetts General Hospital in 1821 and thus established the third major teaching center in the colonies. Hospitals and medical schools were beginning to become juxtaposed, a relationship fought for and won in the 1890s as *the* paradigm of the future for medical education in America.

At the beginning of the Nineteenth Century, American almshouses cared for the destitute, the poor, the blind and crippled, the alcoholics and

prostitutes and anyone else suffering from venereal diseases. These impoverished houses also cared for the working class who suffered from pleurisy, pneumonia and arthritic illness. They existed in over-crowded conditions, in filth and with inadequate ventilation, food and plumbing. Often more than one patient shared a bed and foraging for food was a constant activity. But, America's first 'true' hospitals, those just described -- New York Hospital (1771), Pennsylvania /hospital in Philadelphia (1752) and Massachusetts General Hospital (1821) -- admitted only those citizens of known respectable character and moral worth.

Charles E. Rosenberg states in his book, *The Care of Strangers: the rise of America's hospital system*, "The origins of the American hospital began as much with ideas of dependence and class as with the unavoidable incidence of sickness and accident." Physicians of that era believed that a direct connection existed between personal responsibility and disease; you became sick because of something you did or failed to avoid. Thus, as Rosenberg points out, great care was taken to discriminate between those who deserved hospital care and those who ought to be shipped off to an almshouse. He describes philanthropists as haunted by the prospect of too much medical care creating "the specter of pauperization" -- the idea that medical aid might remove any will or moral capacity of those receiving help. This attitude appears to have emerged along with a conviction that suffering was somehow good.

Admission to a nineteenth century American hospital was based upon one's social standing and often a recommendation from a prominent community member (including religious leaders and physicians

themselves) was needed before hospital admission was allowed. And, in contrast to our modern high tech institutions, patients in the ante-bellum hospital were not terribly sick. Truly critically ill patients were not encouraged to enter the hospital and most surgery was limited to setting broken bones or dressing wounds. Those suffering from the ravages of alcoholism or venereal disease were not permitted the luxuries offered to other hospitalized patients as punishment was inexorably weaved into the fabric of the medical care provided for these irresponsible victims.

In the almshouses, on the other hand, there seemed little concern for the “presumed blunted sensibilities of working class life,” according to Rosenberg.

Even curtains between patient beds was deemed an unnecessary luxury and dead bodies were often left on the wards until placed into coffins while the family looked on in horror. Putrid smells permeated the almshouses, over-crowding was common, beds were shared and some patients slept on the floor. The medical staff visited the almshouses infrequently and house physicians often viewed their patients with condescension. And when doctors attempted to charge their patients for some services, the trustees of the institution balked. At the Pennsylvania Hospital the famous John Morgan resigned. This conflict between physicians and administrators gained momentum in subsequent decades and is alive and well today.

This was the beginning of the medical care system of an emerging democratic country proud of its devotion to equality!

## **Nineteenth Century American Hospitals**



The practice of medicine in American in the 19th Century did the profession little credit, characterized as it was with recrimination among its members, failure to accept growing scientific evidence as the basis for practice and the predominant role of money in physician's education and professional activities. Between the end of the Revolutionary War and about 1820 the number of medical schools in America exploded. In the vacuum expanding from a rapidly growing population, the so-called 'proprietary' medical schools emerged in large numbers, each school sponsored by a handful of enthusiastic young doctors, many of whom had little or no formal education. Although motivated to teach, these neophytes had served only an apprenticeship for two or three years themselves.

Laboratory investigation and the availability of a medical library was usually considered unimportant in the early medical schools as only practical knowledge was considered of useful to the early American doctor. Attempts to develop anatomy courses based on human dissection caused public resentment and resulted in the burning down of more than one medical school building. Grave robbing by the 'ressurrectionists' or 'sac-em-up men' as they were called in newspaper reports of the time, further discredited early American medical education. In fact, in 1830 Massachusetts became the first state to legalize the granting of bodies to medical schools. Nonetheless, more and more proprietary schools appeared.

According to John Duffy, author of *From Humors to Medical Science: A history of American medicine*, "While medical schools had been slow in appearing during the first thirty years of the new nation's history,

their numbers increased rapidly after 1810. No less than twenty-six schools were founded between 1810 and 1840, and another forty-seven between 1840 and 1875.”

The school year for these various medical schools -- which consisted of little more than a practitioner base of six or fewer individuals and a lecture hall -- lasted for two *four month* terms, and when attempts were made by the more prestigious schools to lengthen each term to six months, enrollment dropped precipitously, forcing the schools to return to two four month programs. Little or no actual hospital teaching was involved in these early medical school curricula and few patients were actually examined. Patients, women in particular, did not as yet accept a physician’s hands and fingers prodding what was otherwise personal and concealed body anatomy. Again Duffy states, “The ease with which medical colleges could be established and the fact that many professors were more concerned with collecting fees than with providing a medical education led to keen competition for students.”

An exception was the New Orleans School of Medicine which in 1856 emphasized clinical teaching, insisting students evaluate hospitalized patients and record their findings. This was, in fact, the very first clerkship. Clinical clerkships would only become established later in the century when Johns Hopkins School of Medicine became established and William Osler would take credit for beginning this effective method of teaching medicine. Overall, the medical curriculum remained lean and unscientific for many more years. Duffy states, “Whether or not the level of medical education declined in the anti-bellum years, clearly the move to reform medical schools came to naught.”

Another contentious matter embroiling the medical profession in the 19th Century was the issue of licensure. Various states legislatures and medical societies attempted to establish themselves as the primary body involved in the examination of candidates for licensure. Conflict with medical schools and the lack of any real power to enforce penalties left the system impotent. By the end of the Civil War, notes Duffy, not a single state was making any serious attempts at regulating the practice of medicine. Little wonder Abraham Flexner's renowned report of 1910 severely criticized proprietary medical schools and their lack of affiliation with universities.

In the late 19th Century, three classes of physicians practiced in America: the top group held medical degrees from reputable American schools; the second group were those who held degrees from second rate schools or were awarded them after apprenticing with a doctor; and finally, the virtually illiterate doctors with minimal training who practiced in rural areas and often supplemented their incomes with farming. Repeated blood-letting, the use of dangerous drugs and a paucity of medical knowledge -- all overlaid by the constant bickering and in-fighting among the various doctors groups and often in print -- left the populace skeptical of the medical profession and leery of entering a hospital.

In Charles Frazier's novel, *Cold Mountain*, the Confederate soldier Inman describes his healing neck wound thus: "Before it started scabbing, it spit out a number of things: a collar button and a piece of wool collar from the shirt he had been wearing when he was hit..." Testimony to the treating doctor's failure to properly debris and dress the wound initially. Antiseptic surgery was at least two decades away and bandages were used

with little regard for separating clean dressings from pus-laden bandages freshly removed from a wounded soldier.

### **Entering the Twentieth Century**

Most medical care was administered in the private home in the late 19th Century and this trend of avoiding hospitals carried into the 20th Century. Hospitals served the poor and the destitute. American doctors paid little attention, for example, to developments in Europe in the field of bacteriology led by Louis Pasteur and Koch. Frightening is the revelation that *twenty-five years after* Pasteur demonstrated conclusively that no bacteria ever arose spontaneously -- a formerly cherished theory of ignorant practitioners -- a medical graduate from Tulane Medical School based his thesis on a series of diphtheria and typhoid cases which were said to have developed in isolation! This 'doctor' as well as those who entered proprietary medical schools with the sole requirement being the ability to read and write continued to employ bleedings, severe emetics to induce vomiting, purges and a variety of formulations based on opium and alcohol.

According to Kenneth M. Ludmerer in, *Learning To Heal: the development of American medical education*, "When a brave Union surgeon general, William Alexander Hammond, banned the use of two toxic drugs, calomel and tartar emetic, because of their severe side-effects (profuse salivation and putrid gangrene of the gums, mouth and face) he was court-martialed and condemned by the AMA."

But, these pockets of ignorance were about to be dissipated. By the end of the nineteenth century, steam sterilization, bacteria as the cause of

disease and anesthesia were about to be coupled with Wilhelm Konrad Roentgen's discovery of x-rays. All four were available to form the scientific basis of hospital care.

We now come to the most significant change in American medicine.

In 1893, Johns Hopkins School of Medicine came into existence and science and research became irrevocably enmeshed in the culture of American medicine. Johns Hopkins became the first medical school to require an undergraduate degree as a condition of admission. Laboratory studies in chemistry, physics and biology necessitated more than a passing knowledge of grammar. And by 1900, chemistry had been moved to the undergraduate curriculum for good, permitting more advanced courses to be added to the medical school program. Inexorably, an elitist flavor entered medical education and left a bad taste in the mouths of many practitioners.

Johns Hopkins Medical School required two rigorous years of basic sciences followed, as every medical school does today, by two clinical years spent in the hospital. Bedside teaching and hands-on learning from real patients became of paramount importance. The physical plant consisted of a new hospital as well as buildings for research and for teaching the bulk of the medical school curriculum. The new school combined the best traditions from Europe with the finest American medical educators.

During the first half of the 19th century France was the medical Mecca for the world, advancing physical diagnosis and the field of pathology, as well as employing statistics in the assessment of clinical problems. Clinical observation at the bedside in the hospital dominated the French approach to patient care and influenced the many Americans

who studied in Paris in the first half of the century. But, French doctors distrusted laboratory investigations and did little to study disease. They were primarily observers and as such lost their international edge to the Germans who moved into laboratory research, making it an essential part of medical education in Germany.

The list of German investigators who gave the world a sound grasp of cell biology, bacteriology and a host of experimental approaches to physiology, biochemistry, etc. runs long and deep. Americans flooded German medical schools after the Civil War, bringing to America a new appreciation for the role laboratory investigation in diagnosis and treatment. The names of these American medical giants subsequently populated Johns Hopkins, Harvard, Cornell, Michigan and other rising American medical school.

For example, William Stewart Halsted, the famous original surgical leader at Johns Hopkins, expressed his concerns about the state of American medicine in an address quoted in, *Medicine: a treasury of art and literature* edited by Ann Carmichael and Richard Ratzan, "It may be that the rise and multiplication of proprietary schools of medicine without organic connection with a university was a necessary incident in the rapid growth of a new country, but it is absurd to expect them to yield results in the education of physicians and in the advancement of knowledge comparable with those of the well-supported medical departments of European universities."

Yet, all was not well. The majority of practitioners remained troubled by the aristocratic posturing of these new medical schools. These pioneering schools were accused of becoming unegalitarian, restricting

opportunities for young men who were seen as likely to succeed by sheer willpower if given a chance, a chance now taken away by the severe premedical requirements of a broad education.

The new curriculum, elitism aside for the moment, demanded more topics and thus a much more demanding academic load. Also, medical students were required to spend more time at the bedside in the hospital. Rounds with students and residents became common and the flavor of the hospital now was clearly educational.

### **The Twentieth Century Teaching Hospital**

As we progress through the history of medicine in the twentieth century we will note that hospitals became more numerous, growing in size and complexity. In academic circles an unresolved argument centered on whether or not the modern hospital followed an industrial model of organization as it emerged in the twentieth century. The end product nevertheless was inexorable medical specialization with a horizontal division of clinical areas by organ system diseases and populations, as well as by vertical division of labor by procedures which according to Barbara Bridgman Perkins are, "...assigned to a hierarchy of institutional-bases personnel." Perkins goes on to note the medical profession's leadership as recognizing this horizontal organization as representing a monopoly in the same sense as trademarks and name brands. This fragmentation was the beginning of competition of specialties for recognition as full departments.

Before specialty departments became well established patient care areas were shifting in size and configuration. The concept of open wards with multiple beds in rows slowly gives way to the concept of hospital

floors with semi-private and private rooms. Medical and surgical floors with nurses trained in the nuances of specialty care become commonplace as does a shift toward more private care. Reimbursement squabbles and an explosion of new knowledge exist together in a much more complex medical environment. Small hospital laboratories eventually give way to huge collections of chemistry, bacteriology and pathology labs as well as burgeoning blood banks. Novel surgical procedures necessitate more operating rooms at the same time medical care becomes increasingly complicated and invasive as well.

Hospital space proves to be a growing priority.

New hospitals were built. More interesting was the expansion of existing facilities. The space problem was often solved by adding wings. A cursory examination of most modern hospitals reveals a succession of old, new and yet newer wings, jutting out in all directions. It becomes clear with inspection of many hospital's floor plans that strategic planning for the most recent additions amounted to aligning new additions with old buildings or building completely new hospitals next to the old which often became the site of administrative offices or a rehabilitation facility.

Not all hospitals grew at the same rate. Not all hospitals served the same mission. And not all hospitals survived the reforms dictated by the Flexner Report in the early part of the century. Hospital closures have punctuated modern medicine's march toward technological complexity and economic streamlining. In many hospitals in the late 1990s, emergency departments have closed because of inadequate re-imburement and hospitals have merged with other larger institutions in order to remain



solvent. One neglected aspect of modern hospital care was the attention paid to intimate patient concerns.

In the 1980s several studies were done to assess how patients felt about being *inside* a modern hospital. One such report demonstrated a significant preference by many patients for rooms with windows where contact with nature -- visual contact with trees, flowers, etc. -- was possible. In an article in *Literature and Medicine* (Spring, 1996), David B. Morris reviews many of these reports and quotes one, "...patients whose windows faced a natural setting fared much better than patients whose windows faced a brick wall: they had shorter postoperative hospital stays, received fewer negative evaluations from nurses, and took fewer potent analgesics." Morris refers to the great biologist Edward O. Wilson's hypothesis of *biophilia* or the intense connection humankind makes with nature, presumably due to our genetic and cultural 'co-evolution'.

There may be a built-in genetic preference for certain settings and particularly those associated with what we affectionately call 'the great outdoors', the component missing from early hospitals as well as from our modern specialized care units. Morris quotes writer-surgeon Richard Selzer who stated if he were to build a hospital, Selzer would include a large fountain. Selzer writes in his autobiography, *Down from Troy: A Doctor comes of Age*, "There can be nothing so consolatory to the sick as a fountain."

**Florence Nightingale**

Perhaps no one knew as much about the ideal hospital environment as Florence Nightingale. Her experiences in the Crimea and elsewhere helped to convince Nightingale that the hospital environment might as well contribute to disease as much as assist in regaining health. These notions are elucidated in her *Notes on Hospitals*, presented to the National Association for the Promotion of Social Science at Liverpool, England in 1858 regarding sanitary conditions of hospitals and defects in hospital construction. In the same publication she addresses the Royal Commissioners on the state of the Army in 1857, and her remarks to both groups were published in 1859.

Florence Nightingale was perhaps the first person to make a distinction among different hospital's mortality rates, addressing the issue of different disease mixes and thus the misleading nature of these statistics. In her case, Nightingale was looking at the effect of sanitary conditions while today mortality rates for various surgical procedures have replaced grime as the statistician's grist. Of paramount importance to creating a healthy hospital environment as outlined in 1857 by Nightingale were:

- an appropriate number of sick patients within a given hospital
- adequate space for each patient -- e.g. avoid overcrowding
- adequate ventilation with fresh air
- adequate light

Nightingale was convinced the absence of any of these factors represented a major deficiency in hospital construction. But, she went on

to deny the existence of a 'contagion', a possible organism which would cause an illness. Nightingale opines, "There is no end to the absurdities connected with this doctrine. Suffice it to say, that in the ordinary sense of the word, there is no proof, such as would be admitted in any scientific inquiry, that there is any such thing as 'contagion'." And yet she agreed that infections occurred, particularly in crowded conditions and that large groups of patients could 'infect' each other. By what mechanism? By fouling the air.

Nightingale continues, "...if they be shut up without sufficient space and sufficient fresh air, there will be produced not only fever, but erysipelas, paemia, and the usual tribe of hospital-generated epidemic diseases." Indeed, later the next decade such organisms would be proven to exist. Nightingale did predict and identify what we now call nosocomial infections -- infections occurring in the hospital from hospital sources. What she attributed to purely sanitary conditions -- the spread of disease within the hospital from one patient or attendant to another -- was correct, but the agents were bacteria and viruses, a concept she rejected.

Nightingale nonetheless made many other recommendations for hospital construction, including references to patient location and windows, anticipating the twentieth century studies previously quoted. Modern hospitals have addressed a majority of Nightingale's concerns, but there was a time at the turn of the century when conditions remained marginal in many facilities. Education again led to reform.

### **Developing the Modern Hospital**

The reorganization of American hospitals during the first two decades of the twentieth century wasn't new, but rather a return to the principles of sanitation learned and relearned over the centuries. Still, the scramble to survive in a chaotic environment of cost containment today seems tame as compared to the revolution in hospital management experienced immediately after Abraham Flexner dropped his critical 'bomb' in 1910 regarding the inadequacy of many existing medical schools and their associated hospitals. No doubt a significant deficiency existed in basic patient care as well as in the educational inadequacies Flexner documented.

Kenneth Ludmerer describes the seminal fusion of three medical schools with nearby hospitals in or just after 1910 as a reflection of the national trend toward a tighter affiliation between hospitals and medical schools. Today, we assume they are one. It wasn't always that way. Leading the movement were Harvard Medical School bonding with the new Peter Bent Brigham Hospital, the College of Physicians and Surgeons (Columbia) with Presbyterian Hospital and Washington University Medical School with Barnes Hospital. The three unions were modeled after the Johns Hopkins program which had redefined academic medicine in America. The boards of trustees for each of these institutions (medical school and hospital) overlapped to a considerable extent permitting a relatively smooth merger. As momentum grew and more medical schools joined the movement toward steadfast hospital associations, conflict expanded exponentially between the schools and the hospital staffs.

Three duties eventually became recognized as the reason for these mergers: improved patient care, improved medical student and resident

teaching and expanding research. To accomplish these goals specialized faculty were needed. Scientifically trained clinicians were hired and a new paradigm for the modern teaching hospital fell into place. Replacing the era of solitary private practitioners examining their patients in the company of respectful nurses who dutifully carried charts and promptly answered the physician's queries, walking respectfully behind the doctor as he made rounds, was a new breed. Boisterous and energetic, the young doctors and students rounded on their patients in clusters.

Thus, the teaching hospital began to develop all of the characteristics to which the private doctors had originally objected. Noise and inconvenience from successive waves of students examining patients at mealtime and at night annoyed patients and the hospital staff alike. Rounds became an endless procession of white coats accompanied by noisy bursts of questions and answers. And through it all the assumption, never proven or discarded, was that patient care had improved in the intense, learning environment of the teaching hospital.

On the heels of improved patient care in the U.S. there arrived the issue of creating great teaching centers. Board of trustee members, medical school deans and clinicians all agreed that carefully selected faculty members, doctors known for their expertise in a specific field, all drawn together under one roof with common goals, would redefine excellence in American medical schools. Indeed, this has occurred. But, it was the third piece of the equation which threw a perfectly good educational system into disarray, a condition which persists today.

New medical knowledge required research.

Thus, another reason for medical schools to affiliate with specific hospitals was to encourage basic research which could be translated into clinical problem-solving, the creation of immediate, dramatic cures. The trustees saw international fame as another by-product of medical school association, reputations built in laboratories nearby in close proximity to the clinical facility on the medical school campus. Complex patients would be referred to predominantly urban medical centers where expertise with specific diseases was entrenched and where there was assembled an awesome array of basic scientists and clinicians focused on the identification and treatment one or more illnesses.

Finally, the merger of hospitals and medical schools made economic sense. The elimination of duplication permitted more funds to be poured into specific programs focused on solving a particularly mysterious clinical conundrum. Ludmerer adds, "In each case, hospitals made available to the universities superb teaching facilities that the university could not have afforded on their own. In return, the universities equipped and maintained the hospital's laboratories and provided the hospitals with scientifically distinguished staffs." These initial mergers were driven by the fact that they were well financed and the hospitals possessed sizable patient populations.

Eventually other medical schools joined with local hospitals. The public seemed to like the idea of medical specialization as science infused more and more aspects of American life. Voters and local legislative bodies followed suit and approved similar public institutions, and so around the country funds were appropriated for the joining of medical schools with new hospital teaching facilities. But, not all cities went along

with the modern order. Some forced the universities to build their own hospitals. And the schools which were marginal to begin with often closed, this the final stake in their agonized hearts. Scientific teaching had arrived for good and those schools unable to provide the 'new' curriculum which included quality, hospital-based clerkships went out of business. Because most of the larger medical schools were to be found in the city medical education as consequence became more and more urban.

### **The Modern Hospital**

Within a test tube throw away – or at least within the city limits – is most often found the mother institution. Behind the historical trail of white coats there exists a story of discovery, medical evangelism and no small degree of strife. The evolution of the American medical school still isn't over. We are stuck in the thick educational batter consisting of an unequal measure of teaching, patient care and research. And as it is stirred and nurtured we discover the overpowering odor of research.

Foremost in the minds of today's medical educators is the crusade for ever more funding. Expertise in writing grants for pet research projects far outweighs the energy spent on teaching tomorrow's doctors. No one would argue with the contributions made by twentieth century research, only a foolish person would suggest we rediscover the nineteenth century French penchant for clinical medicine to the exclusion of new science. No one would venture to suggest the complete unveiling of the human genome is worthless, not even to suggest its only tangentially valuable to clinical medicine. Apple pie and all of that.

But as you view the ramparts of the modern hospital and enter into its sacred halls, brushing past hurried young men and women in white, you must realize the extent of the system's deficiencies. Just as apprenticeship-trained practitioners in the late nineteenth century gave way to more scientifically oriented physicians trained in academically sophisticated medical schools, now those very clinicians are stepping back from the teaching podium, replaced by PhDs, laboratory-trained specialists in any science with a remote bearing on medical practice. Now teaching the first two years of medical schools are these research-obsessed professors who view teaching as an annoyance and who, anyway, do not understand what a clinician needs to know in order to care for patients. To a large degree we have lost our way in the maize of evolving scientific data. The task of selecting what is clinically relevant has fallen on the medical school deans who have manipulated the curriculum with varying amounts of self-interest and reason.

From a century of medical practice characterized by virtually no science, where ancient treatments carried forth from previous centuries and myth and astrology served as the profession's high water mark, we arrive today at a teaching menu stuffed with bits and pieces of high tech research. Succulent morsels by themselves, curious if not intriguing, these hors d'oeuvres have little to do with curing patients and nothing at all with caring. The medical school curriculum is in danger of becoming modeled after an advertisement with out-of-context sound bites flashing forth as real information. Curriculum committees struggle like intellectual chefs, constantly rearranging their plateful of goodies, unsure



which to feed to the dog and which to save for their 'culinary' curricular presentation.

And while the academic deans create ever new menus for tomorrow's doctors to master, still more novel interventions and procedures arrive on the scene, created and refined by hospital specialists who are not permitted to set the agenda for the curricular table. Everyone has something they want in the program. "Leave this stuff out and our students will suffer grievously", is the implication.

At one time the medical professors fought with the surgeons to get more of their own material in the curriculum. Then, among the medical experts a new divisiveness arose; pulmonary medicine was slighted in the third year by too much endocrine material. Now the dean must listen to the endocrinologists argue among themselves. Why so much on diabetes? Why not more on thyroid disease? We are no longer cutting up the pie; we've begun picking out apple slices.

How much of this is actually learned by the modern medical student? What is truly important? Consider that the primary care physician who is now the gate-keeper -- the doctor who assesses each and every disease to determine if referral to a specialist is necessary -- never sets foot on a surgical service after ten or twelve *weeks* exposure to surgery as a third year medical student. How can a doctor evaluate a disease he's never seen?

Of course with fiscal restraints on hospitals and individual doctors these decisions have become even more critical. It is curious that the snowballing scientific revolution which began at the turn of the century, the impetus for improved patient care now seems to be melting. The very

specialization which draws patients to America from all over the world is being subjugated by limited resources and an army of primary care doctors who cannot possibly know enough to direct patients to all of the proper experts. Americans seem to have lost sight of an over-arching query: if it takes a doctor four or five years to become expert in a specific area of medical care, how can the primary care physician judge the need for *that* care if he or she has little comprehension of the complex clinical issues involved?

### Categories of Hospitals

#### **CATEGORIES OF HOSPITALS**

(By Increasing Size and Complexity)

- Rural clinics
- Free-standing day-stay surgical units
- community medical centers
- large city hospitals / medical centers
- University medical centers

### **Rural Clinics**

Rural clinics are little more than first aid stations with basic equipment such as bandages, antiseptics, basic instruments for diagnosis and treatment, including a minimum of surgical instruments for suturing, cast materials for fracture treatments and basic drugs for the treatment of insect sting reactions (anaphylactic shock), antibiotics, cardiac drugs, and those for the treatment of acute asthmatic attacks and so forth. An examination table, instrument cabinets, a small sterilizer in a single examination / treatment room constitutes the majority of rural clinic set-ups and may be expanded to two or more exam rooms with a small office for a traveling physician.

### **Free-Standing Daystay Surgical Units**

These are small or large specialized clinics that provide same day surgical service to a variety of specialties including: general surgery (hernia repair, lumpectomy, proctologic procedures, etc.), gynecology (D & C, laparoscopic procedures, exams under anesthesia, etc.), plastic surgery (various tissue transfers, cosmetic surgery, uncomplicated grafts, etc.), pediatric surgery (hernias, lumps and bumps, etc.) ENT surgery, urological surgery (cystostomy, bladder fulguration, hydrocoele excision, minor excisions, etc.) to mention common procedures.

### **Small Community Hospital**

The community hospital serves a defined local population and offers many of the services and procedures mentioned under the day-stay heading above, as well as uncomplicated but major surgery such as colon removal, hysterectomy, thyroid and other head and neck operations. Also, some basic radiological interventions and tests such as CT scans may be offered as well as uncomplicated medical treatments for acute cardiac, pulmonary and kidney disorders. Complex care is referred to larger institutions. These hospitals offer Level III trauma care which is limited to the treatment of simple injuries and the referral of all other multiple trauma victims to a larger institution.

### **Community Medical Centers**

These medical centers vary in sophistication from extended community hospitals with more staff and services with small residency training programs to complex medical centers. The latter offer open heart surgery, transplant surgery, complex radiological interventions including biopsy of internal organs, interventional cardiology such as coronary angioplasty, specialized pediatric and adult intensive care services, Level I trauma care, large multiple specialty residency training programs and clinical research.

### **University Medical Centers**

These larger hospitals include all of the services offered by the large community medical center plus: specialty care in specific diseases (the best of the best clinicians and basic researchers in one

building or unit) as well as specialty surgical services for the treatment of common illnesses such as breast cancer where the doctors only treat a single disease and are recognized as world experts. An example is Duke University Medical Center which is a 200 acre complex with many separate buildings which include hospitals, specialty clinics, research labs, a nursing school, a cancer center and a children's center.

### **Money and Mergers**

As we reach the end of the 20th century a new phenomenon has once again threatened to change the hospital landscape: *merger mania*. The once mighty medical centers affiliated with prestigious medical schools now find themselves in need of fusing their names and identity in order to survive in the heated battle for shrinking health care dollars. It's all bottom line. Yet, one hears the incessant echo of meek voices in the background, emanating from the leadership of managed care, insisting they are still offering quality care. Perhaps we are; let's hope so.

In the foreground the battle bloodies and washes over the landscape to the bugle blasts of *vanishing medical resources, rationing and clout*. The reality is that Americans are having their health care traded on Wall Street by insensitive capitalists who's sole interest is profit. Referring to a recent splash of community hospital acquisitions by large corporate entities, Robert Kuttner in an article in *The New England Journal of Medicine* (August 8, 1996) stated, referring to these deals, "...are notable for the speed, secrecy and legal ingenuity with which they are

accomplished. The company has flying squads of acquisition specialists backed by financial analysts, accountants, lawyers and consultants and can negotiate a binding letter of intent with a hospital's board of trustees in a matter of weeks."

Are we back to the motivating medical bugle blast of the unscientific 19th Century, the allure of filthy lucre in the care of the sick? Is there a shred of difference between the preoccupied, marginally trained post-Civil War doctors intent on upping their fees and the granite-hearted capitalists squeezing HMOs for one more drop of profit today?

It seems the end of the century is bringing with it unhappiness for hospitals, patients and doctors alike. Health insurance premiums remain high as services shrink. Access to physicians and other health care providers is blocked by a system where those with little or no training in the nuances of specific illnesses are positioned to permit or deny consultation with specialists. And whether the managers of care like it or not rationing *is* occurring. Fortunately, the U.S. Congress is stepping up its consideration of bills to protect consumers of health care. A patient 'bill of rights' will provide patients with recourse to restrictive managed care policies.

In the end, two chores seem to remain for medical educators who ultimately determine what will occur in the modern hospital where so much of the learning and practice of medicine takes place. The first task is clearly to define the medical school's role: is it primarily for research or teaching? If the education of doctors is the singular goal of medical schools, then teachers must be sought and rewarded as teachers with no hidden agenda regarding research output.

Most medical students today are taught in the first two scientifically-oriented years by post-doctoral candidates focused on their own research, PhDs who have little or no teaching experience or interest. In the clinical years a major portion of the student's instruction comes from residents who are students themselves. This begs the question: what are all of the highly esteemed, highly paid professors doing?

Research?

One need only query a few disgruntled patients to discover the loopholes in the knowledge of some of today's physicians. How many diagnoses are missed? How many antibiotic and other prescriptions are scribbled with no apparent connection to the patient's chief complaint? Why are these fundamental clinical problems insoluble by our medical graduates?

Could it be the great ideals of Johns Hopkins University and the goals set for undergraduate and graduate medical education, lofty ideals which are as valid today as they were in 1893, are simply being ignored?

In the hospital-based practice of medicine as well as in the clinics where educational efforts are being shifted, teachers are attempting to meet the needs of students as well as cure the illnesses of the sick. Technology permitted the bar to be raised to a higher level. There can be no question patient care has reached a new level of expertise overall. Still, there seems to be a dissonance between the character of high tech specialty practice and primary care medicine. This is seen in such crucibles as the emergency department where treatment and teaching often reach extremes in disharmony and disrespect, reflected, for example,

in the instance of a physician assistant student glibly disagreeing with the opinion of a board-certified surgeon.

Yet, in the end the modern hospital serves the sick in ways never anticipated even as late as the mid-twentieth century. Kidney dialysis, transplantation of vital as well as supportive organs and tissues, has become commonplace. Organs failing in the face of overwhelming disease are supported in the intensive care setting with steely certainty by knowledgeable doctors dedicated to curing and often untrained in the art of letting go. Hearts regularly receive new plumbing, sagging skin is removed, repaired in the name of beauty and the American denial of aging. Cancers are cured, infectious diseases wiped out -- with the spectacular exception of AIDS. Arthritis has been tamed along with asthma, diabetes, and an historical host of childhood illnesses.

Money is thrown at these illnesses until there seems to be little left. A significant number of people admitted to the hospital have no insurance, many children cannot receive appropriate medical care. Personal responsibility lags as an issue in medical economics and automobile trauma, cigarette, drug and alcohol abuse and domestic violence continue to thrive in a culture distracted by an all-devouring media.

And through it all our hospitals persist, a testimony to man's creativity, his industriousness and triumph over disease. Left to solve are the multitude of social and ethical dilemmas spreading across the hospital's floor, painting us into a corner. In the final -- and as yet unwritten chapter of the hospital -- we will undoubtedly discover the fallout of our reluctance to face our human natures. We must resolve to



allow a measure of true freedom in choosing how we will die and how much care we will give and receive.

We must face our religions, our politics and our conflicted souls.

In the following chapters you will learn more about the modern hospital and why this intense healing environment deserves your creative attention. The medical staff, nursing personnel, students and ancillary workers all contribute to the functioning of the hospital.

## **CHAPTER TWO**

### **The Emergency Center**

- **emergency center**
- **Saturday night in the ER**
- **triage in the ER**
- **patient identification**
- **the critically ill patient**
- **rating trauma centers**
- **security**
- **VIPs**
- **isolation**
- **mass casualties**
- **levels of readiness**

Sudden illness or unexpected body trauma propel patients to the modern hospital's emergency room. The drama played out in the subsequent one-on-one, acute care encounter with the ER professionals sets the stage for our examination of the twentieth century hospital. Life-threatening catastrophes bring patients to the ER via ambulance with red lights ricocheting off of the hospital's ER double doors, or by helicopter with prop wash distorting crouching figures in white coats and blue scrubs.

The Emergency Center receives people whose lives are in serious jeopardy. Each victim, barely alive, may die. It all depends on the severity of the illness or injury and the skills of the nurses and doctors.

From gang warriors with chest wounds to gasping grandmothers choking with phlegm-riddled lungs, from adrift and depressed mid-lifers to croupy kids, the emergency room rings with the sounds of anguish and the odor of incontinence and damage. In ones, twos and threes, victims limp or drag themselves through the admitting doors, some wheeled into treatment stalls and rooms on stretchers and in wheelchairs. All bleat for attention.

### **The Emergency Room**

Before the 1960's, most community and mid-sized hospitals had emergency rooms that were in fact made up of rooms for basically advanced first-aid treatment. Suturing lacerations, x-raying injured limbs, dispersing medications, and casting broken bones constituted most of the care given in the ER. Anything more serious was admitted. Staffing was provided by the entire medical staff on a rotational basis, usually without special training in emergency medicine. A pediatrician would do a great job with the babies he saw during his rotation in the ER, but would very limited in dealing with trauma, adult myocardial infarctions, or stroke patients.

During the 1960's, new ways were developed to help people survive their first heart attack with CPR, cardiac defibrillators, pacemakers and new medications. At the same time, MAST trauma suits, rapid-response surgical teams and medical-evac helicopters also began to save lives. All of this medical advancement and technological development gave rise to

the modern large, sophisticated Emergency Centers, complete with their own trauma rooms, and physicians trained and skilled in emergency medicine.

These large, complex areas are far advanced from the early “emergency rooms.” In larger hospitals, they are now called either the *Emergency Department* or the *Emergency Center*, which reflect the sophistication and complexity of the modern emergency care centers. However, the modern Emergency Department or Emergency Center is still referred to simply as the “*ER*” by doctors and nurses alike.

For the rest of this book, we will use either the term *Emergency Center* or the abbreviated “*ER*” to mean the same thing.

### **The Emergency Center**

Just as the operating room changes in character between elective and emergency surgery, the ER is a chameleon, shifting its colors between the blood red of Saturday night and the subdued pastels of early light on Sunday morning.

On a busy Saturday night, EMS personnel, sirens and lights, police, sick or injured patients in wheelchairs and gurneys, nurses, doctors, and concerned family members demanding immediate attention create a war zone like atmosphere of chaos. Mixed with the sounds of overhead pages, pagers and monitors are the sounds of coughing, screaming, moaning and often yelling.

During the lull of a Sunday morning, the quite and subdued ER can take on an aura more suited to a library than the war zone it was.

### What you would see on a Saturday night “war zone” in the ER

- *at the ER unloading dock (ambulance entrance)* -- a row of parked ambulances, others leaving, more arriving with their crimson lights bouncing off ER doors as they back in, people straggling about outside waiting for their significant others who are being treated; ambulance stretchers enter through a sliding double door directly into the ER; others walk into a reception area
- *at the reception area* -- secretaries behind (bullet-proof) glass windows, take information...name, problem, urgency, insurance, etc.
- *the waiting room* -- is growling with injured, sick and unhappy folks in varying degrees of discomfort; blood-soaked bandages on arms and legs, people bent over in pain, folks walking and muttering, many languages used to express fear, annoyance and anger at the patients and the hospital, kids screaming in real or imagined pain
- *the main Emergency Center* -- represented by a large central room and smaller rooms off of the main room, as well as cubicles formed by U-shaped tracks on the ceiling and hanging curtains, as in other hospital areas; the size of the hospital determines the size of the ER; the components of the main ER which are **seen** include:
  1. a huge central desk with multiple stations with computers, phones, chart racks, shelves, etc. where doctors and nurses review labs, write in charts, call

- other consultants, call hospital floors about new admissions, call the admitting office, etc.
2. equipment ready for use such as IV poles loaded with bags of fluid, blood pressure cuffs on wheels, stretchers, open cubicles ready for use with monitors on back shelves, oxygen source, suction, etc.
  3. big erasure board with patient's name, room or cubicle location, diagnosis, time of arrival, nurse's name
  4. ER charts on desks, on stretchers in doctor's grasp in varying stages of being assembled with information and being read by consultants
  5. crash carts for sudden code blue calls in ER
  6. equipment bins on wheels much like the OR with instruments, tubes, laundry hampers, hazardous wastes hampers, etc.
  7. special rooms -- trauma room with central operating room table and other surgical equipment and resuscitation equipment making it a true OR for procedures which cannot wait for the patient to be taken to the OR because of a life-threatening event such as bleeding or a bullet hole in the heart; endoscopy performed as an emergency for patients with massive upper or lower intestine hemorrhage, using endoscopy cart with scopes, light source, suction, etc.

8. the elements of an examining room include combinations of the following equipment, some permanently in the room, some brought in from other departments: sutures, gauze, basic surgical instruments, various tubes, drains, IVs, cast material, oxygen source and masks, plastic airway; physical exam equipment including ophthalmoscope, otoscope, tongue depressors, Q-tips, GYN vaginal speculum, reflex hammer, flashlight, anoscope, sigmoidoscope, stethoscope;
9. personnel include ER physicians, ER residents, PA students, nurses, nursing students, medical students, technical assistants, orderlies, clergy, police, firemen, paramedics, house-keeping, patient's relatives

### **ER Sounds**

- an ambulance's siren in the distance, closing on the hospital
- excited voices in the waiting room, angry voices, weeping or screams of anguish
- different languages used in the waiting room and attempts by others at interpretation
- in the treatment area the sounds of sickness prevail with moans and groans and pleas for medication or attention; also the verbiage of anger, rage, irritation, fear and outrage ring out at unpredictable intervals from behind drawn curtains

- machines add to the background sound procession including ventilators, suction machines, EKG monitors with beeps and alarms, computers ‘clacking’ as information is entered, x-ray machine in use, intercom squawking, a paging operator’s omniscient voice, pleading for, ”Respiratory therapy, ER stat!” or Doctor Grim, East five...”

### **ER Smells**

- ‘unwashed’ body odor is more common among homeless and other disadvantaged people.
- uncontrolled bowels as related to diarrheal disease rather than (as in the OR) gangrenous tissue.
- gangrenous extremities (usually legs) from ischemic or diabetic vascular disease.
- the smell of ‘rot’ from nursing home patients with large decubitus (sacral or ‘fanny’) ulcers; may be several inches wide and two or three inches deep...literally, to the bone.
- the stench of fresh vomitus including a mixture of booze and food; in patients with bowel obstruction feculent (‘bowel movement’) vomiting is seen.
- the stench of cigarette smoke on clothing.
- foul-smelling sputum in patients with bronchitis or pneumonia, including uncouth folks who spit on the floor.
- the ‘meat-locker’ smell of a massive upper or lower gastrointestinal bleeder; the combination of feces and



blood creates an objectionable odor which cannot easily be described.

- the 'good scents' of perfume and deodorant.

### **The ER Scene**

But you would not see the separate components mentioned above. What you would see is the combined effect of everything mentioned, mixed together into sickening smells, loud noises, and a sea of people.

A ruptured abdominal aortic aneurysm is rushed to the OR with no blood pressure, no pulse, the wailing family trailing the flying stretcher leaving the ER. Two kids scream with infected ears, their mothers demand care for their charges, now! Five hunched over people, three with arm slings, sit outside x-ray which is backed-up with an obstructed bowel case who just vomited on the x-ray table.

In Cubicle Seven a seventeen year old is having a spontaneous abortion and the paging operator screams overhead for the OB resident for the umpteenth time. The mother of the kid with a facial dog bite refuses to let the ER doctor sew up her child, demands a plastic surgeon. A surgical resident threatens to chew the phone and screams at someone in the lab. Paramedics called in with a four car accident on Route 91, the triage nurse just went home with the flu and no one's shown up to remove the DOA from the trauma room...

Sunday morning.

An ambivalent sun peeks out from behind a row of maples behind the Emergency Center, uncertain if its time to start all over again. The waiting room is empty, except for Mrs. Finn whose cab hasn't arrived yet.

The shifts change, new faces grin at the warriors leaving the battle zone, knowing they'll be back on the night shift next month. Only two patients to sign out to the fresh team. The aroma of coffee drifts like incense through the big room where hushed conversations are punctuated with occasional cackles of hilarity. Yes, it's all so absurd.

IV poles with new bags of fluid and tubing hang in expectation, monitors are ready, floors clean, mopped, no sign of last night's ambush. Soft music fills the cubicles and rooms and slides out to the waiting room. The guarded double doors of the ER are uncharacteristically open this Sunday morning. Mrs. Finn's taxi races her from the ambulance zone and disappears into the city.

### **The ER and the Hospital**

The Emergency Center is described in detail in Doctor Wilson's book, *Cause of Death*, and Doctor Page's *Body Trauma* in the Writer's Digest Books Howdunit Series. We will present only the essentials here and instead expand the discussion of emergency care to the hospital's overall role. The broader concerns regarding security, disaster management and caring and protecting celebrities such as the President will be covered in some detail.

The essential difference between patients admitted to the hospital electively and those evaluated in the Emergency Center is that the latter have potentially unknown and life-threatening illness. Acute asthma attacks, internal or external bleeding, heart attacks, coma, convulsions and uncontrolled infections are reasons the Emergency Room bustles with

an electric atmosphere of uncertainty and despair. Most will survive. But, a definite number will die.

ER doctors and nurses are trained to triage patients into those in dire need of care (in the act of dying), those who need treatment quickly (will die within thirty to sixty minutes) and those who may wait until the smoke clears from the first two groups. Hospital size determines who treats what diseases. In a large urban medical center ER doctors, Physician Assistants, residents of various specialties all interact, sorting out 'big crunches' from those who can wait, surgical residents caring for trauma victims, pediatric residents and Attendings treating severe infections, asthmatics, etc. Medical teams swarm in and begin sorting out massive myocardial infarctions and congestive heart failure patients. Everyone determines who must be admitted and to what specialty unit. And, of course, this includes patients transferred by ambulance or helicopter from smaller out-lying hospitals.

Smaller hospitals must have emergency room coverage but the level of expertise varies tremendously. One doctor and a team of nurses may see all of the above, triage the worst cases and decide who they can safely treat and who must be transferred to 'St. Elsewhere'. Really small rural clinics are little more than first aid stations, offering splints, bandages, IV fluid and a trip to a larger town for major trauma or illness. Somewhere in-between are community hospitals which provide a considerable amount of quality care in all areas.

Shock can't wait. Hemorrhage must be halted. Babies insist on being born at weird times. Kids need patent airways, stat.

Writers often want to set up an Emergency Center scene in which chaos rules, not unlike many of the episodes in the successful TV show, *ER*. To craft such a scene, one must understand the elements which underlie the surface disorder so that *order* (the basic elements of dramatic structure) nonetheless forms the spine of the scene. Thus, when writing a scene in which someone is dying, severely traumatized or experiencing an exacerbation of an existing illness (e.g., an acute asthma attack), keep in mind the following *life-threatening body function disruptions*:

- **cardiac (heart) failure** -- from damage to the heart muscle from a blocked coronary, direct trauma to the heart muscle (blunt chest trauma), laceration of the heart muscle or coronary from penetrating trauma (chest stab wound), failure of the heart muscle from diffuse coronary disease or damage to the heart muscle from specific causes (cardiomyopathy)
- **pulmonary (lung) failure** -- lungs fill with fluid from pneumonia (infected fluid), congestive heart failure (uninfected fluid), secondary to non-lung causes such as overwhelming infection anywhere in the body (called Adult Respiratory Distress Syndrome) or from direct blunt trauma; or from airway disease such as asthma, allergic bronchitis, smoking, causing spasm and blockage of small airways which results in wheezing and difficult breathing
- **massive bleeding** -- from any major blood vessel or from the heart itself from penetrating trauma or a 'blow-out' after a massive heart attack (myocardial infarction)

- **shock** -- from heart failure or bleeding as above or from diffuse loss of tone in the vascular system resulting in too little blood for the volume; this results from anaphylactic reactions to insect stings, allergic reactions to drugs, high spinal cord injuries
- **“brain failure”** -- various states of unconsciousness, lethargy, coma, or behavior disruption from true organic brain disorders or psychiatric causes; these threaten the patient in many ways including dangerous behavior or the risk of stopping breathing, choking, etc.
- **traumatic injuries** -- which may produce any of the above catastrophes but which usually involve a severe head injury, major chest trauma, massive abdominal injury with hemorrhage or a complex pelvic fracture with massive bleeding and disruption of major organs

## Triage Challenges in the Emergency Center

The location in the ER or in the hospital in general where acute care is provided doesn't shift the awesome responsibility burdening each medical professional who becomes involved.

Let's see how the system works by examining what might go **wrong**. For the most part this discussion assumes we're working in a large

hospital with significant resources. However, with the increasing mobility of the American public anything can happen anywhere.

### **Patient Identification and In-Hospital Tracking**

Patients who are admitted to the hospital through the Emergency Room are provided with a specific identification number. Of course, this system is used for elective admissions as well (see Chapter Three). In the latter instance the patient registers at the admitting office where information is gathered and entered into the new hospital record via a computer. Because the setting is unrushed, the secretary in the admitting office is usually able to receive and record all pertinent information simply by asking the patient appropriate questions. Family members or significant others are permitted to be present during the registering (admissions) process and may assist in providing information. In Chapter Three more information on the admitting process will be covered.

Often no one knows the victim's name when he arrives *in extremis* in the hospital's ER. Family, friends and significant others are not permitted through the double doors which swallow the patient on arrival. For those in shock, or whose lives are similarly threatened and in need of swift treatment, there is no time to ask questions. The traditional order of evaluating an elective patient by first taking a medical history, then performing a complete physical examination, is reversed in the acute evaluation process.

Treat now, ask questions later!

What if two dozen casualties arrive at the ER simultaneously with no identification? Or Two hundred? How do you track these patients as they are treated and discharged or sent out of the ER to other areas of the hospital? What if they all need different IVs and medications? How do you avoid confusion and error?

The biggest mistake made by personnel in the acute care setting (as well as with elective work-ups and therapy) is giving the wrong medication to the wrong patient or doing the wrong thing to a patient. An entire chapter (Chap. 11) has been devoted to mistakes and complications within the hospital.

### **Avoiding Mistakes**

Recently, a nurse attached an intestinal feeding solution to a patient's intravenous catheter, resulting in liquid food instantaneously flushing into the woman's circulation, killing her within minutes.

Before moving on it is necessary to defend nurses in what sounds like a parade of inexcusable mistakes. The errors used as examples are real enough, but the nurses who make these errors are often new and inexperienced. And, quite frankly, they are less expensive to cash-strapped hospitals determined to survive with fewer and less skilled RNs if that's what it takes to balance the bottom line. Overworked, frustrated and bound by their sense of duty to provide the best care possible, nurses plow ahead and on occasion miss things, make mistakes. Not unlike doctors. What about the more complicated issue of mass casualties with no names.

Most hospitals use a two number system for patient identification. One number is the patient's unique identifier number. The second number is different for each admission and serves to track the patient through a particular hospitalization or series of sequential admissions. Thus, both numbers are registered on the patient's information sheet in the front of the hospital chart. When a procedure is performed -- a surgical operation for example -- the surgeon refers to the unique identifier number when dictating the operative report. When transcribed the Op note finds its way into the appropriate chart via the special patient number. The patient wears a wrist band which records his or her name, age, the hospital numbers just mentioned, as well as the name of the physician of record.

The simple identification protocol the nurse or other health care personnel are supposed to follow when administering to a patient include:

- ask the patient their name
- confirm it is the same name on their wrist band
- confirm the patient's name and unique identifier number on the wrist band matches the name and number on the bag containing blood, antibiotics or digitalis
- administer the drug, blood product, IV or draw a blood sample or other body fluid specimen

These steps should be followed whether drawing a blood, giving medications, starting dialysis, providing respiratory therapy treatment or physical therapy. The connection must be made. Avoid clerical errors! It is the litany tossed at nurses and house officers all the time. And yet,



there they are: shattered bodies piling up in the ER after a mass injury situation, a terrorist bombing of a city building. How is identification handled?

Pre-packaged *John and Jane Doe* kits are ready to be used when unidentified single or multiple casualties arrive in the ER. Each kit has admission paper work ready with wrist bands labeled with a unique patient identifier number. Even for single unidentified victims these packages are used until the proper identification can be made. A significant number of patients arrive in the ER with altered mental states or frankly unresponsive. The differential diagnosis of coma is well-known to ER physicians and includes drug overdose, head trauma, metabolic disorders such as diabetic ketoacidosis, psychiatric illness, stroke and shock. But the proper documentation of each John or Jane Doe -- the traditional name used to signify a patient whose identity has not as yet been established -- must occur on admission to the emergency Room in order to assure a clean lineage of care.

Tracking patients in the modern hospital may be straightforward or remarkably complex. The common denominator which bonds a patient to all aspects of his or her care is the written or printed medical record which also has its electronic shadow in the hospital's information system. When a patient travels about the hospital during elective or even a semi-emergent work-up, the (physical) medical record must accompany the patient. It contains a distillation of the care provided and the doctor's diagnostic and treatment plans, to mention just a few aspects of immediate importance. A three ring binder is used in most cases for the physical or paper record. Computer terminals (when used by doctors and

nurses are they providing terminal care...) are present on all floors and in all treatment areas.

Access to patient information begins when the physician or nurse uses his or her special code number to enter the system and use the patient's unique provider number to access the patient's orders. Some hospitals have special tracking software to determine where in, for example a separate surgical or endoscopy unit, the patient may be located. A floor plan of the unit or separate building permits the doctor to click on a room, whereupon more information about who is in that room comes up on the screen. The nurse or doctor may thus search to see if their patient is in pre-anesthesia holding, in the OR or in the post-anesthesia recovery area.

### **Assessing Patients**

Now let's return to our critically ill patients in the ER. We have an acute problem in Room Five. The immediate dilemma is how sick is this patient? Someone must decide. That individual is usually a triage nurse who is trained to sort out the unending stream of victims of trauma and disease. Who needs to see a doctor immediately? Who can wait?

**Steps in the Assessment of a Critically Ill Patient**

Once the victim has been sorted out as someone in dire need of medical intervention the Emergency Center physician enters the picture. The ER doctor follows a time-honored sequence of steps (see sidebar above) in order to determine what life-saving intervention may be needed. Three or more of these assessment tools are employed and the patient is stabilized. That means any malfunctions such as shock, blood loss, heart attack, cardiac rhythms abnormalities, etc. are addressed before any attempt is made to sort out the exact diagnosis.

When the patient is stable and the major medical problem has been identified the ER physician either begins treatment or calls the appropriate specialist to come to the department to further evaluate and treat the patient. Both major and minor trauma figure in the daily bread and butter cases seen in the ER. But, it is multi-organ trauma and the threat of sudden death in one or more victims that really lights the burners in the Emergency Center.

The size of the hospital determines the extent of the services available to victims of extensive body trauma. *Three levels of trauma care* are recognized by the American College of Surgeons in an effort to coordinate the provision of services in various states. While most violent attacks on humans as well as accidental injury occurs in the urban setting, the system must also account for the care of victims of rural trauma.

### **Level Three Trauma Center**

This community hospital level of care is the *least* comprehensive, if one ignores the 'outpost' clinics and small hospitals in the rural setting which are mere first aid stations. the latter 'level four' center provides splints, bandages, IVs and immediate transport for any trauma case of consequence. A Level Three center also provides uncomplicated surgical care for single system trauma or simple two or three system trauma. If a victim of a fractured leg also demonstrates evidence of an intra-abdominal injury, the general surgeon in the community hospital will explore the abdomen and correct the problem.

Surgeons practicing in smaller communities routinely care for single or two system trauma, including non-operative neurosurgical and chest trauma, uncomplicated fractures and abdominal trauma. For patients requiring extensive monitoring, even if a neurosurgeon is available in the community, the patient may be transferred to a Level Two facility for more advanced monitoring post-operatively.

### **Level Two Trauma Center**

Trauma care provided in this institution includes a diverse team of surgical specialists and intensive care specialists. Most two or three system trauma and all single system trauma is kept local and managed appropriately. Specialists in orthopedic, plastic, urologic, maxillofacial and thoracic surgery work as a team to manage multi-system trauma. What they lack is a cardiac (open heart) surgical team and members of the above specialties who perform very complex procedures in their specialty, e.g. complex orthopedic total joint replacements, plastic procedures such as rotation flaps and the care of large injuries such as massive burns.

### **Level One Trauma Center**

At the top of the expertise heap is the Level One trauma Center which provides all aspects of trauma care. Not only are the specialties mentioned well-represented, but the hospital has a cardiac surgery service capable of providing bypass capabilities for disrupted hearts (penetrating cardiac trauma), torn aortas with massive hemorrhage and peripheral vascular surgical care (torn leg arteries after fractures or penetrating trauma). Complex neurosurgical surgery and neurosurgical ICU follow-up with intracerebral pressure monitoring is available in a Level Three facility.

A Burn Service is available in a Level One trauma center and requires numerous personnel including dedicated surgeons, rehabilitation services (including tank facilities) and specially trained nurses. A special Wound Care Service including the provision of hyperbaric medicine is needed in a large medical center as many of these trauma victims have poorly healing wounds. Complex trauma patients often must be operated on several times to clean wounds and replace or remove hardware.

Full-time surgical personnel characterize the difference between a large urban medical center Level One Trauma Center and the smaller centers providing basic trauma care. Surgeons in private practice can not care for these multi-organ patients and run a separate practice. Too much time is needed to care for victims who are often indigent. The urban medical center serves the purpose of caring for all victims of trauma and violence.

### **The Three levels of trauma care**

#### **Level Three Trauma Center:**

- the least comprehensive
- performs uncomplicated surgery
- patients requiring more extensive monitoring or specialized surgery must be transferred

#### **Level Two Trauma Center**

- extensive monitoring of trauma patient provided
- diverse team of surgical specialists and intensive care specialists
- lack cardiac (open heart) surgical team

#### **Level One Trauma Center**

- this provides the most extensive trauma care
- full-time surgical personnel for trauma surgery available 24 hours a day
- cardiac surgery is available
- a Burn Service is available

### **Hospital Security**

Hospitals are not prisons and for the most part are open and friendly to the public. The difficulty is to find the balance between security and need of accessibility for the public. The size of the hospital has a lot to do with how much security is needed. Obviously, the large urban medical centers mentioned above, often located in or near ghetto conditions, must protect not only their patients but also the personnel employed by the hospital. Smaller facilities may get away with a security guard in the ER at night and random visits by the local police who cruise

in for a cup of coffee in the wee hours. But in the urban hospital security has become an expensive part of providing safe medical care.

We will discuss several aspects of hospital safety and what is involved in planning and executing a comprehensive security program .

Included are:

- control of access to the hospital
- workplace violence
- the use of weapons by security guards
- the use of metal detectors
- methods of physical security
- handling VIPs
- the role of different cultures in hospital
- issues of restraint

A number of tragedies in Emergency Rooms around the country in the last several years focused attention on the need for increased security. Most outbursts of violence and episodes of patient emotional crisis occur in the ER. Thus, security directors focus their attention and personnel in the Emergency Center, and, in fact, smaller hospitals may have their only visible security presence in the ER. This cross-section of concerns ranges from a concern for a 'hard' physical presence to the softer educational and cultural sensitivity issues which make the ER a complex social arena.

Of paramount importance to hospital security personnel are the many issues of access. What entrances are left unguarded? Which doors must be locked at all times? Who has access and when? Which doors are

open twenty-four hours a day? What system of identification and card access is best for doctors, nurses and other personnel who arrive and depart at odd hours?

Incidents of violent assault in the Emergency Room have been documented over the last ten years and new national OSHA guidelines are designed to address these tragedies. Several years ago a disgruntled patient in Los Angeles fired a pistol at three doctors. In Springfield, Massachusetts about ten years ago a deranged man grabbed a boy and held the waiting room hostage, eventually cutting the youngster's throat and killing him. In January 1989, a female physician, Dr. Kathryn Hinnant, was raped and murdered in her hospital office by a man who had been "cooping" (living) in a vacant space in the hospital without being detected. He wore a scrub suit and a stethoscope and a stolen hospital ID without being challenged. The hospital was found not liable in the subsequent \$25 million dollar lawsuit. But, it subsequently added security personnel, additional patrols for out of the way places, increased access control measures and implemented tighter controls over who received scrub suits.

Fights still occur sporadically in the ER and other hospital waiting areas where dysfunctional families wrestle with the possible demise of critically ill loved ones. But the staff also bring their own problems to work. For security personnel the task includes not only controlling violent behavior but also doing so in a manner which doesn't terrorize other patients and staff. The possible sources of workplace violence include:

- violent patients attacking staff
- a patient's family attacking staff



- families fighting with each other
- staff with personal issue who mistreat patients

Obviously, the solutions to the multiple faces of workplace violence must be creative and vary in intensity with each situation. Sexual harassment is addressed with information -- meetings and discussions with follow-up memos on appropriate behavior -- and disciplinary actions if needed, including loss of job. Staff members who abuse patients or other staff may be more difficult to ferret out and identify. Subtle elder abuse, for example, may occur through delayed provision of basic needs and concealed physical abuse such as pinching and 'roughing up' patients unable to defend themselves. The ultimate 'abuse' of killing patients with intravenous injections repeatedly raises its ugly head.

When families, patients and/or staff indulge in physical attacks on one another, the job goes directly to the security staff of the hospital. If a major crisis occurs, for example, a distraught, dysfunctional family who decide to start a knife fight with each other in the ICU waiting room, local police may be asked to intervene as well. A violent event such as a fight raises the issue of how much firepower security personnel need.

The use of weapons by hospital security officers has been debated for years. Large urban teaching hospitals do permit armed officers on the premises and these private, multi-building facilities include Massachusetts General Hospital in Boston, Henry Ford Hospital in Detroit and Johns Hopkins Hospital in Baltimore. Also, sprawling state and federal institutions such as large Veterans Administration facilities may have armed guards as do city hospitals like Bellevue in New York.

For the most part, private hospitals use armed city police and keep their own guards unarmed, while in the federal system it's a matter of what rank the assigned officer holds and what the perceived threat seems to be.

Tom Lynch, Director of Security at Baystate Medical Center, feels weapons are not needed in the provision of adequate security in most hospitals. He fears the consequences of a firefight in the ER waiting area or in treatment rooms. Lynch quotes an ill-fated experience at Yale-New Haven where a restrained patient took a weapon from an officer and fled in a stolen car. According to Lynch, struggles between armed corrections officers guarding patients have resulted in shots fired during the ensuing struggle with bullets piercing the walls of adjoining treatment areas of the hospital.

To assure weapons aren't being smuggled into the hospital, metal detectors of the airport model are being used more and more in the ER. Problems arise with this additional layer of security as more staff are needed to man the station; besides, stretchers cannot easily pass through the blockade created by the metal detector. Perhaps of even more concern is what to do if a weapon is indeed discovered. Lynch states the only hospital security officer killed in his eleven years working in New York occurred at the VA hospital in the Bronx when a metal detector was set off

by a man carrying a gun who subsequently shot the officer before fleeing. One alternative is to use hand held metal detectors, for example in the psychiatric holding areas and on high risk persons identified by the staff, to screen new admissions.

## Typical Security Measures for Access Areas

The recommendations made by OSHA to 'harden' the Emergency Room include:

- **bullet proof glass at the registration area**
- **bullet proof glass at the triage area**
- **closed circuit TV in the ER waiting room**
- **closed circuit TV in the ER parking garage**
- **universal use of access control systems**
- **the provision of a 'safe room' within the treatment area where staff may retreat to in the event of a major violent incident**

The key to providing good security is the prevention of a violent person from gaining access to the hospital in the first place. Once inside the treatment area the disturbed individual compounds all of the issues of how to provide safe care. The Emergency Center therefore presents the security people with the biggest challenge and specific planning is needed to keep the ER under control. Security directors concentrate their energies on the following kinds of emergency plans:

- **the protection and supervision of VIPs**
- **how to properly restrain patients (as well as others)**
- **how to intervene in a major crime event in the hospital**

Because of the inherent threat of physical injury to all parties in the scenarios mentioned above a paramilitary flavor exists in most hospital security services and the larger, the more urban the medical center, the more entrenched the system. In the last twenty years security personnel have become younger and better trained. In some hospitals the security guards are armed, in others they carry only 'sticks' or batons, some use 'stun guns' as an intermediate level of preparedness and *aerosol weapons* -- pepper sprays in particular -- are becoming more popular.

Pepper sprays provide a number of advantages over handguns, stun guns and even batons. The downside of any aerosol weapon includes spraying unsuspecting people in the vicinity, particularly outside at hospital entrances in windy conditions. Also, in the hospital the spray may enter the ventilation system and create problems at a distance from the zone of initial attack.

*Pepper sprays* have the following advantages:

- they are relatively inexpensive
- can be effective at distances of up to ten feet
- the effect is over in less than ten minutes and is not life-threatening
- deters violent behavior -- the bad guys know its around
- it gives the officer a choice: use, don't use; show it as a deterrent

- the hospital is less liable (no severe injuries to bad guys)
- results in fewer injuries to security personnel

### **How to handle VIPs**

In some urban areas such as Los Angeles and New York where celebrities require hospitalization, the issue of security becomes heightened. Many VIPs have their own security personnel and these young bucks may or may not see the hospital's security force as colleagues. Conflict arises when the paparazzi flood a hospital seeking, for example, the very first *exclusive* photograph of Demi Moore's baby. The media must be corralled off to one area to permit mother and child privacy.

Religious leaders, movie stars and international dignitaries all must be protected from the mindless marauding of the media. At the top of the list of VIPs is the President of the United States. When the President visits a lot of preliminary leg work is done.

Memorial has been selected as a stopover on the President's trip through the midwest. You are the Director of Security at the Memorial Community Hospital and suits from the state department arrive and walk through your facility. What do they want to know? Here are some of the major issues the President's security team wants to know before arrival:

- what are the major access routes to the hospital?
- is there a helicopter landing zone; if not make one
- where are all of the entrances to the hospital?
- which entrances are secured and which are not?
- who are the security forces and who will be here?

- what are the Emergency Center resources, e.g. doctors, nurse, equipment, access, equipment, etc.?
- where is the operating room and what are its capabilities, e.g. trauma care, cardiac surgery, etc. (the President will have his/her own blood 'brought in' for transfusion if needed)
- where are the intensive care units and what are their capabilities?

The President will have his/her own security force which will form the inner 'circle of protection' regardless of where the President goes -- including the hospital's ER, OR etc. American presidents have a extensive history of getting themselves shot and information is available on the resuscitation efforts which saved Reagan's life as well as the nature of the fatal bullet which claimed John Kennedy. To appreciate the speed and selfless abandon with which the President's security forces react you need only revisit the film of Reagan's assault.

Imagine the same circumstances occurring inside a hospital.

The final security issue used outside of the hospital are *emergency telephone towers* which also are used on some college campuses. About ten feet tall, emblazoned with the word "help" and blue in color, they have emergency phone buttons. When pushed a strobe light goes on and the security personnel monitoring the system receive a signal which tells them which tower is calling and its location. The high-powered light will not go off until the security command center turns it off.

**Closed Circuit TV t**

Two critical areas in the hospital's emergency room where the added vigilance of closed circuit TV provides improved patient care are the trauma room and the acute psychiatric care rooms. In this regard the system isn't only a part of security. It's also a matter of watching and recording treatments and patient's responses and, in the case of suicidal psych patients, looking for behavior which must be stopped or used to justify admission and more aggressive treatment.

But, who watches the monitors? Who is trained well enough to know when a teenager is about to use his belt to end his life? And where do these observers sit? Where are the cameras and where are the monitors?

Does the hospital have two systems? One for security monitored by that staff? As well as a smaller local system to watch the ER?

Security measures often include video monitoring of the ER as well as other high risk areas, including the newborn nursery, critical care areas and the psychiatric units. This added precaution permits not only identifying undesirable behaviors as they occur but also recording them for future use. Not all hospitals use closed circuit TV and you may set up your fictional ER anyway you wish.

These closed circuit TVs are also used to monitor parking garages and the ER loading dock.

### **Lethal Infections**

The worldwide AIDS epidemic has changed the way health care workers view body fluids. No longer are bare hands seen in the hospital, not even in the boxing ring for that matter. The ascendancy of drug abuse

and multi-partner recreational sex make everyone suspect and if an injury (needle stick, blade cut, spilled blood on a hospital worker) occurs in the hospital the doctor of record must request the patient involved undergo an HIV and hepatitis blood test. Nobody knows who's carrying what these days. The lethality of HIV infection makes the safe handling of body fluids critical.

Certainly, the problem goes far beyond aggressive retroviral infections. So-called 'flesh-eating' bacteria have made the scene as well as individual virulent E. coli, staph and strep infections. Not to mention the old standbys such as salmonella and staph food poisoning and botulism.

Supposedly sophisticated health care consumers stumble badly on the issue of infections, pressuring doctors to provide more and more prescriptions for antibiotics, often when the problem is clearly viral. What happens? The antibiotics become resistant, develop enzymes to combat new (ever more expensive) drugs.

The public assumes that the pharmaceutical industry is ready with yet another 'generation' of 'gorilla-mycin', a new chemical cure to be used when moms try to force pediatricians to order drugs for Billie's sniffles.

In the hospital the lesson has been learned and is struggled with daily. Such impossible bugs such as VRE (vancomycin-resistant enterococcus, MRSA, methicillin-resistant staphylococcus, PRSR, penicillin-resistant Staph pneumonia -- all terrorize intensive care units. Critically ill patients with devastated immune systems, a secondary consequence of a variety of diseases, become infected and die of what is called a nosocomial or *hospital-acquired infection*.



## Isolation

How are these patients isolated in the ER and elsewhere in the hospital? How are hospitalized patients with these terrible infections isolated from other patients? The following principles apply to patients already in the hospital when the infection was identified or patients returning to the hospital who have already been labeled with one of these hospital-acquired infections:

- all patients identified with VRE, MRSA or PRSP (we'll call them 'bad bugs' from now on) must be placed in a private room or in a room with another patient with the same infection
- the patient can only be removed from the room after a full course of (intravenous) antibiotic treatment and all repeat cultures of appropriate fluids are negative -- specific cultures are sampled according to the hospital's infectious disease protocol
- only a member of the Infection Control Team can remove a patient from isolation
- if the patient is re-admitted to the hospital, he must be placed into isolation unless the above-mentioned follow-up cultures are on record as being negative
- outside of the patient's isolation room door a special *Alert* sign must be posted
- the patient should wear a *special colored wrist band containing no information* by which the staff will identify the patient

Specific rules of conduct must be followed for these infected patients during their care and this applies for the medical staff, nurses, family and visitors. Obviously, the number of visitors is severely restricted and family members must adhere to the infectious disease rules employed for any patient with the 'bad bugs'.

The guidelines for managing a patient in isolation with bad bugs (VRE, MRSA, or PRSP) include:

- gloves must be worn by everyone entering the room and removed before leaving
- hand washing is mandatory after glove removal using antimicrobial soap and a waterless alcohol product
- gowns and masks may be indicated as well (masks when suctioning a patient, intubation or with a patient with severe pulmonary secretions; gowns when working close to the patient, bathing, lifting, transferring, etc.)
- dedicated instruments which remain in the room must be identified, such as stethoscopes, reflex hammer, blood pressure cuffs, thermometers, etc.; no doctor should use personal equipment; the dedicated instruments are disinfected weekly and at the time of the patient's discharge
- wheelchairs stretchers and anything else which leaves the room must be disinfected

Although the issue of serious infections is not unique to the ER, it is worth reviewing these principles here. The associated concerns regarding HIV and hepatitis infections highlight the need for health care workers to

constantly be vigilant about who may harbor 'bad bugs' or virulent viruses. Thus, *universal precautions* must be followed.

The concept of considering all patients at all times as potentially sources of lethal infections is captured by the term, *body substance isolation (BSI)*.

These terms mandate the following precautions:

- gloves must be worn whenever contact with body fluids (e.g. urine, feces, pus, serum, blood, sputum) is anticipated
- a gown should be worn whenever one's cloths might come in contact with or be contaminated by a patient's body fluids
- masks and glasses or goggles must be worn if the patient has fluids which may be splashed on the health care provider
- for patients with tuberculosis respiratory isolation with a special tight-fitting mask is required

### **Psychiatric Emergencies and Lockdown Units**

What happens when a wild, emotionally deranged patient arrives at the Emergency Center? Where is the patient placed? How is such a patient restrained? How much force is permitted?

These psychiatric patients are a threat to themselves and to the people around them. this includes their own acquaintances and the medical team charged with their care.

What is the defining line between a psychiatric assault and a criminal assault?

Where is the interface between appropriate medical care by the treating team in terms of medical and physical restraints and the patient's rights?

If inadequate restraints are used and the patient harms himself does it mean the medication was inadequate? Should physical restraints have been used? In a northeast hospital some years ago three patients committed suicide, the first was a teenager who hanged himself. A lawsuit for wrongful death ensued as did two more suicides. How vigilant must the hospital be?

### **Mass Casualties**

9/11, the Oklahoma City bombing before it and the original flubbed New York Trade Center bombing reminded us that our world has changed remarkably in the last three decades. And while gang wars continue to challenge trauma teams, there is a new threat which seems unlikely to disappear in the near future: international terrorism. What ghastly numbers of blast and burn victims will next reach an unsuspecting hospital? Are we prepared? Is any hospital truly ready to handle fifty, a hundred, three hundred casualties?

Some years ago at Memorial Hospital in Martinsville, Virginia, a hostage drill took place at 4 A.M. which served to prove two points: it's difficult to actually train for this once-in-a-lifetime catastrophe and, secondly, even the hospital personnel weren't cooperative as some of those involved complained, the exercise was too intrusive. Local police refused to participate in the exercise. That alone should have tipped off a warning in the organizer's minds. Is it possible to handle a real situation with terrorists without local and state law enforcement officers?

The conclusions from this drill were that better communication among the principles was needed and that these exercises must not be

abandoned as the threat of assault in the ER especially is a real part of our violent modern world.

In this regard mass transportation and crowd events such as professional sports present local hospitals with a possible mass casualty situation. Can there be a life-threatening situation more tenuous than multiple casualties? More rift with potential disaster for loss of life?

Can it get any worse?

There's always the time-honored litmus test for any city hospital: what happens when the President of the United States comes to town? Inquiring about a presidential visit shows how hospital administrators, medical staff and federal officials interact in the (potential) heat of battle. American presidents seem to have a way of getting themselves shot in public and thus there is a real record of how life-threatening injuries to the President have been handled. And because anticipatory planning always precedes the President's visit we can use this theoretical happening to look at the modern hospital's emergency services in all of their complexity.

### **How Are Mass Casualties Handled?**

Hospitals have an inherent responsibility to be prepared for *mass casualties*, disasters involving large numbers of injured victims, some of whom will require major resuscitative and treatment efforts. The unanticipated catastrophe may occur in the community, in the immediate geographic area or at a distance where a given hospital must accept overflow patients from a primary hospital closer to the scene. Victims

may arrive by ambulance or by helicopter, in large numbers, simultaneously.

Also the hospital must be prepared to handle any multiple casualty event which occurs within the hospital's walls, an *internal disaster*. This might involve fire, explosions of various types or acts of terrorism such as a bombing. Disruption of electrical power with failure of the auxiliary system would create life-threatening scenarios throughout the hospital when electrically powered medical equipment shut down. Major hospital food contamination and the subsequent gastrointestinal illness would flood the ER with dozens of victims, burdening the system and leaving the hospital unable to feed its patients.

The third category of disaster which can result in mass casualties is that of *natural catastrophes*, particularly those related to severe weather. Some geographic areas suffer from repetitive hurricanes in the late summer, others from tornadoes, floods, and earthquakes. In the Northeast in winter major snow storms are a constant threat. Two problems arise from each of these scenarios: first, the need to treat injuries specifically related to the weather event, such as hypothermia, frostbite and other cold injuries during blizzards; and secondly, to deal with hospital staffing difficulties with isolation and lack of access to the hospital because of the weather.

Baystate Medical Center in Springfield, Massachusetts sits at the crossroads of two major highways, several large and small airports and is surrounded by a variety of industrial plants, including Smith and Wesson, gun manufacturers, and many colleges. Civil disobedience, spills of transported materials, aircraft crashes, multiple car crashes, industrial

explosions and fires all pose potential mass casualty threats to the medical center.

The following material is excerpted from BMC's disaster plan. It typifies the identification of levels of preparedness, the need for a chain of command and a method for mobilizing hospital personnel. The elements of this plan are intended to be flexible and to serve as guidelines.

It is the Medical Center's CEO who has sole responsibility for instituting the Disaster Preparedness Plan, or in his absence, the Administrator on-call. Each department head will remain in charge of his or her unit until someone higher up in the chain of command relieves them of their duties. **Three levels of readiness** are outlined below:

- **Plan D -- standby** -- this means the hospital has received unconfirmed reports that a mass casualty situation may have occurred and an influx of a large number of victims may follow; the response to this level of alertness is to organize and prepare staff and to assess availability of supplies and personnel
- **Level One Alert** -- a predetermined call sequence is executed to notify departments that a number of casualties are expected but which *should not exceed the hospital's capacity to manage them*; or that a major weather event or natural disaster is anticipated; the response at this heightened level of preparedness is to establish a Disaster Command Center which is then responsible for further responses; also, appropriate adjustments for staffing and the provision of added supplies must be set in motion

- **Plan D Now in Progress** – this is Baystate’s highest level of disaster preparedness and is immediately set in motion if any of the following is proven: a nuclear disaster, radiation spill, commercial or military plane crash or any catastrophe resulting in greater than thirty casualties; the response is the immediate implementation of the Disaster Preparedness Plan including alerting all staff and ascertaining appropriate equipment and supplies availability

As soon as the hospital has been notified of a possible disaster, the CEO or administrator on call must obtain the following information:

- name and telephone number of caller
- location of disaster
- type of disaster
- number of casualties

Next, the following sequence is followed by the CEO:

- call the emergency room and provide above information
- verify disaster by return phone call or the arrival of casualties
- if unable to verify, remain on “Standby” for two hours, then cancel
- if disaster verified and the number of casualties does not exceed usual capacity (in BMC’s case, 30), proceed to “Alert Level 1” and implement Level 1 call list
- if disaster confirmed and number of casualties exceeds usual capacity, announce “Plan D Now in Progress” and implement Plan D call list to set in motion a full disaster response



- when Plan D is placed in motion at BMC, the CEO/administrator on call must personally call the following people: CEO, senior VP, VP for medical/professional services, chief of security, Chairman, ER, VP, nursing, Director of Communications, Chairman, disaster committee
- establish command center, activate phone system and maintain contact with the ER
- verify all special areas are prepared
- monitor events related to disaster management

The Command Center continues a liaison with other regional hospitals while assuring adequate personnel are available to provide the hospital's services. These include a physician pool, personnel pool and a nursing pool. Other specialized areas controlled by the Command Center are:

- **triage**
- **major trauma**
- **fractures**
- **ambulatory care**
- **medical emergencies**
- **security**
- **a family center**
- **a Press and Information center**

Finally, all casualties should be wearing a colored tag which was placed in the field by an emergency medical technician using an international coding system. Each victim will be triaged at the emergency

center according to the tags as well as any changes in the casualty's condition or a perception by the triage doctor that the injury is either more salvageable or worse than labeled.

## **International Coding System for Patient Identification**

### **CHAPTER 3**

#### **Admission to the Hospital**

- **Admission to a hospital**
- **Dumping**
- **Types of admission**
- **Pre-certification**
- **Face sheet**
- **Living will / Advanced directive**
- **Emergency admission**
- **Who pays the bill?**
- **HMOs**
- **Length of hospitalization**

- **Dying in the hospital**

Being admitted to a hospital may seem like a relatively simple process to the patient, but getting admitted is actually a complex procedure that involves a series of medical, financial and legal issues. This chapter will sort out those various issues and take you step by step through several different scenarios as patients are admitted.

The first question to understand is whether or not a hospital has to admit you as a patient? The answer is no. A hospital is not required to admit you and may choose not to for a variety of reasons, most commonly because of restrictions placed by insurers.

What about emergencies? Can a woman in labor, or a man with an acute heart attack be sent away without treatment? Are hospitals required to treat them? Emergencies cannot be sent away; they must be treated and at least stabilized. Hospitals are required by law to treat any emergency that arrives.

Hospitals have to treat any emergency that is seen in the emergency department. However, since they are not required to admit everyone, a hospital's emergency center may treat someone to stabilize them, but instead of hospitalizing them for long term expensive testing and treatment, they will transport the patient to another hospital for admission.

Sending patients to another hospital for admission is a daily occurrence among hospitals in most cities and happens for a variety of reasons. The most common reason patients are transferred is because the patient's insurance carrier or the patient's HMO plan determines which

hospital the patient must be admitted to, and they usually refuse to pay for admission to an unapproved hospital.

In some cities, transferring patients may be because of “dumping.”

### **Dumping**

“Dumping” occurs when one hospital sends indigent or uninsured patients to another hospital for admission, requiring the second hospital to absorb the high cost of the patient’s hospitalization. Dumping usually occurs because most for-profit hospitals have no way of recovering the cost of admitting these patients. Health and Human Services (HHS) passed a law preventing hospitals from delaying care while awaiting insurance company approval or even denying treatment if a patient’s coverage is in doubt.

The once frequent occurrence of transferring patients because of being uninsured now happens only rarely. Today, most modern hospitals have a “charity fund” and also receive some aid from the city, county and state to help defray the cost of treating indigent or uninsured patients. Almost all hospital-to-hospital transfers now happen because HMOs will only authorize payment to a particular hospital, requiring patients to be moved.

There’s a more subtle form of dumping. Rather than blatantly transferring a patient to another hospital, a maneuver that is now illegal, the doctor at the ‘subtle dumping hospital’ decides he doesn’t want to have to take care of the patient for any of a number of reasons, including:

- the patient has no insurance

- the patient is on welfare
- the patient has a disease which will require tedious medical or surgical care over a protracted time frame

Recognizing the long profile of anticipated treatment for nominal monetary return the, 'dumping' doctor claims the patient would be better served at a (usually) larger, often urban medical center. He may tell the patient he hasn't done many of the procedures the patient needs performed. He's not comfortable with it. Unfortunately, these dubious and ethically repugnant behaviors do occur all the time and the flow is almost always from smaller hospitals to bigger institutions.

### **Types of Admissions:**

Admission to a hospital can be for a variety of reasons and circumstances. There are three broad categories of admissions:

#### **Types of Admissions**

- Standard Admission (more than 24 hours)
  - Medical evaluation / treatment
  - Obstetrics (labor and delivery)
  - Elective Pre-Operative Admissions
- Short Term (Less than 24 hours)
  - Referred to as "23:59" admits

### Standard Admission

There is nothing routine about being admitted to a hospital, but *routine admission* refers to patients staying longer than 24 hours who are processed through Admitting rather than through the Emergency Department. These patients are admitted for the following:

- scheduled surgery (pre op evaluation, testing and preparation)
- labor and delivery
- medical / surgical problems of adult and pediatric patients requiring treatment and extensive diagnostic testing

The term standard or ‘routine’ is used to differentiate it from acute, life-threatening emergency admissions that are automatically admitted through the ED, or from “short” admissions (or “23:59’s”) that are hospitalizations of less than 24 hours. Routine full admissions are for 24 hours or more and may extend for several days or weeks.

Admission to most hospitals follows a standard procedure. The Admitting Department fills out a form when interviewing the patient that provides very valuable and specific information. This is called the *face sheet* (or admission sheet) and constitutes the first page of the every chart.

The face sheet is often the first thing a consulting physician or resident reviews to get a quick overview of the patient prior to going into the room to see the patient for the first time. For instance, a new doctor

reading the face sheet would learn that Sophie is an 80 year-old moderately overweight woman with a history of diabetes and recurrent congestive heart failure, recently widowed who lives alone. The consulting doctor now has a general profile of the patient before he even enters the room to meet her. It's the same information the primary care doctor who admitted the patient has in his office records.

### **Short Term Admission**

These are admissions that are anything less than 24 hours in duration. These admissions are sometimes referred to as “twenty-three fifty-nines,” meaning 23 hours 59 minutes or less in duration. They have the same admitting process, with a face sheet, a history and a limited physical examination on the chart, and a discharge at the end of the treatment period.

The 23:59 rule was put into effect mainly for reimbursement purposes. Under the 23:59 rule, hospitals charge for the patient's room by the hour, rather than by the day. This is the only way they can recover some of the cost of rapid turnover of patients in any given room.

23:59's, or “short admits” are also called “observations” (or “obs”) by hospital personnel. Short admits are for observation following many procedures such as coronary angiograms, some elective surgery such as laparoscopic gallbladder operations, mastectomies, biopsies or complex treatments. This allows the patient to be observed closely in a hospital setting to assure that they are stable before discharging home.

These 23:59 hour admissions involve one night in the hospital or daystay surgical unit. Daystay surgery means just that: the patient has

surgery and returns home the same day. The term ‘short stay’ surgery means minor excisions under local anesthesia with no sedation. These excursions are truly ‘in-and-out’ experiences.

### **Pre-Certification**

HMOs and some insurance companies require that patients be “pre-certified” prior to any testing, procedure, or hospitalization – meaning that the insurer has authorized it and has agreed to pay for it. With any anticipated hospitalization, pre-certification actually states how many days have been authorized for the patient to stay in the hospital. If complications require a longer than expected stay, the patient must be re-certified to cover the extra days in the hospital. To minimize their costs, HMOs often deny extended hospitalization to treat unforeseen complications. Because of this, doctors sometimes “fudge” the records to allow sick patients to stay longer when the doctors know the HMOs would otherwise not approve it.

Some hospitals are beginning to pre-certify patients by telephone. Those who are otherwise healthy with no significant health conditions may be cleared without a paper trail. It’s fast and efficient.

When a patient has been pre-certified by the doctor’s office, the hospital admitting department has the patient’s name listed on a “*booking sheet*.” This sheet contains the name of all pre-certified patients to be admitted, has their doctor’s name, the working diagnosis, and a copy of the insurance card. This greatly speeds up the admitting process.



## **Living Will**

A Living Will is a declaration of a patient's wishes about extended medical care and allows someone to speak for them if terminal illness or a state of permanent unconsciousness renders you incapable of speech. This "advanced directive" allows a competent adult to state their wishes regarding what resuscitative efforts should or should not be performed on them during the hospitalization ( see Chapter Twelve). A living will is a written statement of personal desires regarding future health care, and is a declaration of the patient's wishes regarding life-support. A living will can speak for you when you can no longer speak for yourself. Without a living will, a patient could end up on a life support system contrary to their wishes. Living wills allow the patient to make decisions on vital issues of their treatment. It involves both the treatment they do or do not want, and the conditions under which these might apply.

Who is authorized to make a living will? The law permits anyone to make a living will if they are of sound mind, at least 18 years of age, or if they are married.

When considering a living will or advanced directive, the person should consider which treatments they would accept or reject, and under what clinical conditions those choices would apply.

The patient can indicate if they wish to receive or reject any of the following:

- cardiac resuscitation
- mechanical respiration
- tube feeding or hydration
- blood or blood products

- any surgery or invasive diagnostic test
- kidney dialysis
- antibiotics

**Different clinical conditions that should be considered:**

**Life Sustaining Treatment:**

a medical procedure which will only prolong the process of dying or maintain the patient in a state of permanent unconsciousness.

**Permanently Unconscious:**

a medical condition of total and irreversible loss of consciousness.

Example: irreversible coma or vegetative state.

**Terminal Condition:**

an advanced incurable and irreversible medical condition which will result in death.

What about a patient who has a living will and presents in an emergency room? What happens then? It is presumed that the patient is there for all necessary medical care. Patients who are conscious and able to make their wishes known may refuse unwanted medical care. But a living will should **not** be taken to forbid resuscitation in the emergency room on an unconscious patient. Without prior knowledge of the patient, the physician should not assume that the document belongs to that patient or that it reflects the patient's wishes in that situation.

If there is a reasonable probability that lifesaving care will be successful, then it should not be withheld on an unconscious person. For example, an elderly patient in currently good health may have signed a

living will out of fear of a lingering cancer death. However, the patient might very well want to be given emergency treatment after an automobile accident. Also, failure to honor a *do not resuscitate* or *do not treat* clause of a living will has resulted in at least one doctor being sued for doing too much.

The Florida Commission on Aging with Dignity created Five Wishes, a “living will with heart.” Five Wishes is a living will that address medical issues, such as whether a dying person wants a feeding tube or should be kept alive by artificial means. But it goes further than typical living wills by trying to meet the other needs of dying people such as family relationships and details of care. It makes it easier for families to know what their loved ones want.

### **“Five Wishes” Living Will**

- The person I want to make care decisions for me when I can’t
- The kind of medical treatment I want or don’t want
- How comfortable I want to be
- How I want people to treat me
- What I want my loved ones to know

Following the completion of the face sheet, the patient is banded with a plastic wrist band for proper identification and taken by wheelchair to their assigned room.

But there are other ways patients can be admitted to the hospital.

## **SUMMARY OF THE ADMITTING PROCESS:**

### **I. Routine Admission and “23:59” Short Admits**

(This also includes Pre-Op, and Labor & Delivery admissions)

- pre-certification
- face sheet filled out
- signed consent for treatment form
- signed living will / advanced directive
- patient banded with I.D. bracelet
- taken by wheelchair to floor
- nurses admission sheet added to chart
- history and physical performed

### **II. Emergency Admission**

- emergency resuscitation or stabilization in the ED
- make diagnosis and institute emergency treatment
- seek identification information for face sheet
- inform family or significant other(s) of the admission and treatment plan

## **Who Pays the Medical Bill?**

The construction and upkeep of hospitals includes the cost of utilities, expensive state-of-the-art equipment, funding for research, medical education, salaries of nurses, technologists, support personnel, food services and community programs and it all take money. Lots of money. Presidents, kings, and dictators from countries around the world come to the U.S. to receive medical treatment because, under the current system, it is in fact the best in the world.

What about the uninsured in America? Who will pay for them? According to Census bureau data, the number of uninsured in this country continues to rise. An estimated 44 million Americans (15% of the population in the United States) lack health insurance, some by choice. Unemployed welfare recipients receive Medicaid. The problem is that when they finally get employment, they lose Medicaid and move into low wage jobs that carry no insurance for workers. Low-income workers who aren't offered health insurance can't afford it on their own. Congress is still debating how to handle this, since the cost to insure these people would be staggering.

### **WHO PAYS THE MEDICAL BILLS?**

- self insured (uninsured)
- traditional fee for service insurance
- HMOs
- POSs
- Medicare / Medicaid

There are several methods of reimbursement for medical care. Traditional health insurance has been “fee-for-service,” where the doctor calls the shots and the patient’s insurance company pays the bill. Some patients choose to be “self-insured,” meaning they carry no insurance, but rather pay the doctor directly for office visits, treatments and exams. The government provides Medicaid for those on welfare, and Medicare to those receiving Social Security benefits.

**Self Insured**

The patient carried no health insurance, but instead, pays out of pocket all medical expenses incurred.

**Fee for Service Insurance**

This is the traditional method of payment, where the doctor calls all the shots, makes all the decisions regarding the patient, and the insurance pays the bill.

**Medicaid / Medicare**

HCFA (Health Care Financial Administration) controls Medicare, the nation’s largest health insurance program. **Medicaid** pays the health costs of non-working, low-income, and uninsured indigent or welfare patients. **Medicare** pays the health costs of everyone over 65 years-old and for anyone who is disabled. Since Medicare does not pay all the costs of medicines or medical treatment,

many people also carry their own supplementary insurance which covers any co-payment that may be required with Medicare.

### **Managed Care Programs**

Another method that has made its way on the American medical scene is the HMO (health maintenance organization). Basically, an HMO is a group that contracts with employers, hospitals, clinics, and physicians to provide medical care for a group of individuals, usually the employees of a company contracting with an HMO. The HMO guarantees a reduced cost of medical care to the employer contracting with them, and the amount allocated per person is determined. That means that if the medical bills of the patient is less than the amount allocated, the HMO has a profit (the company employer has already paid the HMO the allocation up front). Conversely, any amount that exceeds the patient-allocation is a loss. The HMO covers most charges for care received within the narrow network of providers. Patients usually have no “out-of-pocket” expenses.

Because medical costs have sky-rocketed as technology grows and as more expensive testing and treatments have become available, companies are turning to HMOs to provide cheaper health care coverage for their employees.

A POS (point of service) plan is generally similar to an HMO except that the plan pays a large share of the cost of out-of-network care. This is usually more expensive than HMOs.

### **HMOs (Health Maintenance Organizations)**

HMOs are organizations that provide health insurance to employees of companies, at a fixed allocation per person, regardless of whether any bills are paid or not. If less is spent, the HMO has a profit. If bills exceed the allocation, the HMO has a loss for that patient. The term used to describe the money allotted for each covered person is *per member per month (PMPM)* and is called capitation -- the doctor gets this amount of money whether she sees a patient or not. The motivation? See as few patients as possible. For specialists who will not play this game a *carve out* or reimbursement for special services such as dialysis is covered separately. Young healthy members reduce the risk to the HMO.

### **Length of Hospitalization:**

The average length of hospitalization in the U.S. is becoming shorter and shorter. Under many circumstances, this is both cheaper for the insurer (HMO or insurance company) and better for the patient. The patient is required to be up and about, often with better results and fewer complications than if they had stayed in bed longer. And almost all elective testing no matter how complicated is performed as an outpatient.

For example, four hours after a shoulder operation, the patient is sent home for rest and recuperation. It would have required at least a four day hospital stay just a few years earlier. Even mastectomies and laparoscopic gallbladder surgery require but one overnight stay in the hospital or special daystay unit.

However, early discharge is not always beneficial, and this approach to save money is abusive and done at the patient's expense. It is the



practice of many HMOs to not allow hospitalization more than one day after delivery. Both mother and baby with a normal, uncomplicated birth are sent home the same day, even though studies show that babies discharged within a day of birth face increased risk of developing jaundice, dehydration and infections.

Patients suffer when HMOs set arbitrary limits on medical care. HMOs do not adjust their guidelines for a patient's health complications, and they deny payment for care falling outside the guidelines they have set. The guidelines, including those for length of hospitalization, are a tool for controlling costs and returning a profit; unfortunately, they are not usually made with regard to patient care.

#### **Current HMO Guidelines for Length of Hospitalization**

<b><u>Procedure</u></b>	<b><u>Length of hospitalization (after surgery)</u></b>
Hiatal hernia repair	3 days
Below-knee amputation	1 - 2 days
Mastectomy	outpatient
Removal of kidney	3 days
Vaginal childbirth	6 - 18 hours following delivery
Hysterectomy	2 days
Coronary artery bypass	3 days

#### **Dying in the Hospital**

A recent study found that 70% of patients died in the hospital, 20% died at home and 10% died in hospices and elsewhere. The percentage of people dying in the hospital has gone up in recent years; in 1960, less than

50% died in the hospital, compared to 70% now. It is harder for families to cope with care for the dying at home, even though it is generally where most people wish to die, in a familiar surrounding. Bringing dying people home assures them they're wanted and won't be deserted. Dying people fear losing control over their lives. Everyone should be afforded dignity and comfort at the time of death. They should be able to expect optimal pain relief, physical comfort and psychological support.

It is generally accepted that in the past, nurses and doctors viewed death as a failure of their skills, and rejected the dying person as a reminder of their ability to sustain life. Recently, attitudes have dramatically improved as health care professionals begin to understand and improve hospital care for the dying. However, doctors and nurses still find it difficult to get close to the dying patient in the hospital, and tend to distance themselves from them. They withdraw because they feel they have little to offer.

Modern hospitals are not soulless machines; doctors and nurses are not ogres. They are a part of our society's 'alienation from death.' It has been said that 'we die alone' but there are degrees of loneliness, and the feeling of being unwanted at the end of life may be the most poignant of all human emotions.

*The Anxiety of the Unknown* by Beckman states that the kind of death one would hope for today – to die in one's sleep, ignorant of the event, was in the Middle Ages, only wished upon one's enemies. An orderly kind of death was part of an orderly life, and a number of ceremonies were an intrinsic part of dying. A will was written and psalms were chosen long before death actually occurs.



## CHAPTER 4

### Inside the Operating Room

Perhaps no other area of the modern hospital congers up an image of heroic and at times desperate treatment like the operating room. Even elective operations carry risk and uncertainty. Lay articles on medical topics frequently use photos of the operating room to highlight or dramatize the importance of a medical topic -- even if the topic is unrelated to surgery.

But, what actually goes on in the OR?

Is it really a private world of sexy surgeons and nubile scrub techs? Is every EKG heartbeat a measure of the tenuous distance between life and death? Do surgeons scream and shout? Is the typical OR awash with Beethoven or Wagner or the Rolling Stones? Do surgeons joke as they remove diseased organs and masses of cancer? Is levity tossed out in the face of despair?

Or is every moment solemn, measured? Is the operating room an oasis of riveting silence? What does this world of disease, damage, (potentially) lethal body fluids and sick body parts do to a doctor, particularly after twenty or thirty years of practice?

As you might anticipate, the operating room is not a homogenous place, not all OR rooms are alike, nor do surgeons perform their procedures in the same way -- even within the same specialty. Surgeons

have pet instruments, pet peeves, pet scrub techs. The intrusion of managed care into medicine has also reached the operating room. Cost-cutting includes the quality of gloves, sutures and the rate of replacement of equipment. If you think the OR is a bastion of individualism protected from the insanity of cost-containment then celebrate again.

### **Basic Principles In Surgery – What Do Surgeons Do?**

First we'll look at the basic elements of what a surgeon actually does and then look at the way an OR is set up. We'll evaluate the variations in room plans and types of equipment needed by various surgical subspecialists to show how the physical plant serves the demands of the techniques employed.

All surgeons follow basic tenants of surgical science. In their early years of residency, surgeons learn elements of technique which apply to all areas regardless of whether the specialty has specific maneuvers such as the placement of orthopedic hardware, or 'reaming' out a prostate, or 'lifting' a face. The most basic principles of surgery by which competent surgeons practice are:

- adequate exposure of the organ of concern
- a knowledge of the specific anatomy of the region
- careful hemostasis or control of bleeding
- gentleness with tissues

All of these principles belong in the armamentarium of the individual surgeon, but they also necessitate good lighting, high quality instruments and proper assistance during surgery. It is worthwhile

recalling some issues from the early days of laparoscopic surgery in relation to these principles. Board-certified surgeons with extensive experience with open gallbladder operations suddenly saw the procedure from a different perspective. The first target of minimally invasive surgery, the gallbladder could no longer be touched, could not be assessed by tactile discrimination. Instead, the surgeon used new technology which distanced him from the patient. Some of it didn't work that well.

For example, the cameras often broke or the instruments themselves were faulty. Surgeons struggled until the technology caught up with their skills. Now, the issues surrounding laparoscopic surgery have shifted. But it's still tied into what happens in the operating room.

The vital role of the surgeon's motor skills and personality will become apparent. Clearly, these two issues form the heart of what most people want to know about the mysterious place called the OR. Later, we will attempt to provide an honest evaluation of surgeon's attitudes and how personality effects everyone working in surgery.

## **How a Patient is Positioned During Surgery**

Surgery holds the intrigue enjoyed by professional sports events with the addition of warnings instead of scores, neon numbers listing death and disability on the scoreboard. In the OR there are no time-outs, no substitutes and no instant replays. As with sport, you never know quite what you're getting into; no one can define the risks completely.

### **The Operating Room Layout**

Before considering surgeon performance, what's the physical layout of the hospital with respect to where the operating rooms are located?

Three issues regarding the OR and the hospital as a physical plant are:

- the location of the operating rooms in relation to the Emergency Center
- the floor plan of the operating room
- the configuration of individual (specialty) operating rooms

The matter of locating the operating room in some sort of proximity to the ER applies only to the primary (not daystay) operating rooms, the place where major cases are performed. Daystay surgery and short stay (minor) surgery are often located at a distance from the ER as they serve no immediate tie-in role in acute patient care. But, major trauma and acute surgical illnesses such as a ruptured aortic aneurysm, must be transferred to the OR with the least waste of time as these patients are often in profound shock and surgery is an essential part of the resuscitation process.

In a well-designed urban hospital, the operating rooms are either around the corner from the ER, down one floor or up one floor with dedicated elevators for emergency transport. Patients are quickly transferred to the OR after assessment and stabilization in the ER and this often includes a team of nurses and doctors who must breathe (ventilate) for the patient, pump in IV fluid and/or blood and propel the stretcher down the corridor with dispatch.

**Figure: The Basic Components of an Operating Room**

- a centrally located operating room table
- several stainless steel tables on wheels and draped with sterile sheets
- an anesthesia machine, connected to hoses for oxygen and inhalation agents
- suction equipment (hoses from the wall or ceiling and a receptacle)
- a unit dose pharmacy machine accessed by code
- laundry bins or receptacles for soiled sheets, towels, etc.
- a cautery machine
- shelves and drawers in the walls for equipment
- a telephone
- intercom connections to the front desk and the pathology department
- IV poles, stools, storage carts on wheels
- a desk
- x-ray view boxes on wall with 'whiteboard' and pens (to record sponge, needle and instrument counts)



- storage cabinets on wheels for sutures, mesh, etc.

For elective surgery and some less urgent acute operations, the patient is taken to a holding area near the OR with corridor connections. Here the patient is prepped for surgery. This includes meeting the anesthesiologist, signing informed consent, inserting an IV if not already done, receiving sedation, antibiotics, and a kiss good-bye from loved ones who head for a nearby waiting room.

The operating room itself may take several forms, not unlike the critical care areas where open floor plans and separate isolation rooms vary in configuration. Each operating room is a self-contained unit with a single mechanical or electrical table. The room is functionally connected (messengers bring to the room and take away needed objects, specimens, etc.) to pharmacy, sterilization and instrument storage areas. A central desk represents the control center where one or more nurses (usually) and an anesthesiologist direct traffic and answer phones. Corridors lead from the holding area to the various surgery suites where stretchers are parked outside the OR room as elective and emergency surgical patients undergo their operations. Elective patients may walk or be transported by wheelchair or stretcher (gurney) to the holding area.

In most hospitals, operating rooms are designed to handle specific kinds of cases. But the key elements (Figure\_\_\_\_) in each room are basically the same. Extra equipment and special modifications of the OR table or other equipment are added to the basic furniture in designated rooms.

This additional equipment includes such items as:

- laparoscopic equipment with TV monitors, carbon dioxide insufflation devices with pressure monitors, etc.
- specific types of lasers for ophthalmology, dermatology, thoracic surgery, etc.
- special machines to freeze tumors (cryosurgery)
- special dissection equipment such as the harmonic (blunt, vibrating) scalpel
- special asepsis devices in orthopedics with hoods, helmets and associated ventilation systems
- heart bypass machine
- da Vinci robot

Many hospitals now have separate daystay operating rooms and some have separate hospitals dedicated to same-day operations. These units are organized around the principle of getting the patient in and out with the least commotion. Patients follow the same basic sequence of events followed by any elective surgery patient regardless of the magnitude of the operation (Figure \_\_\_\_).

Daystay operations usually involve a form of conscious sedation, short-acting drugs which permit the surgeon to complete procedures such as hernias with local anesthesia which could not be comfortably done with the injection of local medication alone. It's quite remarkable how much dissection can be performed with these novel chemicals blunting the patient's sensibilities. Most folks awake after their operation wondering when it's going to start!

The least complicated surgical unit is called *short stay*. Used for minor ‘lumps and bumps’ removals, only local anesthesia is required and this is administered by the surgeon himself. No sedation is given. The patient typically walks in and undergoes a thirty or forty minutes operation and walks out. No recovery room time is needed as no sedation was employed.

The short stay unit is usually located in a place in the hospital which allows easy access. Some hospitals use valet parking. This is similar to the method of handling large volumes of patients undergoing radiation therapy who must be processed for a rather short time in the radiation department. Parking sometimes takes longer than the treatment! Short stay surgery is similar.

## The Process of Elective Surgery

### Surgical Instruments

Surgical instruments are familiar to most people because of the ubiquitous hemostat (does it mean *hemo*, as in blood and bleeding, and *stat*, as in “Hand the damn thing to me *now!*”) which may be found in a modified form anywhere from the family garage to a trout stream. Actually, a majority of commonly used surgical instruments are based on the hemostat ‘scissors’ principle of two hinged, connected metal arms of

various lengths and with sundry tips, edges and shapes. They are used for grabbing tissue, blood vessels and organs (occasionally the assistant's glove to get his attention).

Instruments are often not used by surgeons in the manner most lay persons might imagine. A specific surgical instrument in competent hands becomes an extension of the surgeon's fingers, a projection of his nervous system. Touch and feel form the foundation of delicate dissection. Different skills are needed for laparoscopic surgery for this reason and not all surgeons possess them.

In open surgery the surgeon relies on his experience with normal tissue as well as disease processes such as inflammation and the alteration caused by it on tissue. For example:

- the ever-mentioned scalpel plays a minor role in most operations (used to open or cut the skin and soft tissues, now done more often with cautery to avoid sharp instrument use (threat of HIV and hepatitis infection))
- the surgeon's finger performs as much of most procedures as almost any other 'instrument' (so-called blunt dissection is safer than sharp cutting of tissues and sets up the use of scissors, cautery, etc. by exposing structures)
- many instruments are used in a manner for which they were not designed (blunt dissection with the end of the forceps, blunt dissection with non-blade end of scalpel, dissecting with a hemostat rather than

using it to grab tissue, 'picking' at tissue with the scissors blades closed)

Also, contrary to a commonly held concept of surgery, procedures are not entirely performed by a surgeon while the assistant passively positions instruments and retracts for exposure. Properly performed surgery requires two or more people working in concert, aware of each other's role, each individual cognizant of his or her well-defined responsibilities and each person paying attention to detail -- not just to the assigned task.

## **Operating Room Personnel**

### **The Surgical Assistant**

Surgery is a team sport.

Smaller operations don't require this level of cooperation and, in fact, the surgeon may elect to not have an assistant for such procedures as hernia repair, breast biopsy, D & C, various hardware placement and removal. But, major surgery can't be done single-handedly. Sure, surgeons differ in how they employ their help. Some surgeons say, "Here...hold this," and proceed to ignore the assistant until the retractor is shifted to a new location where the order is repeated.

Good surgeons engage their assistants.

To give you a sense of where conflict may arise in the process of performing an operation, we will consider a few basic ideas which serve as the most crucial aspects of what a surgeon must be thinking as he completes a dissection. To highlight the cooperative nature of surgery we will look at it from the assistant's point of view. For example, regardless of specialty assistant surgeons must adhere to the following maneuvers in order to perform safe surgery:

- tissue must be placed on traction by the assistant and the surgeon before being cut to avoid excess damage or avoid cutting the wrong structure
- exposure requires the assistant to retract body cavity walls, position overhead lights and stay out of the surgeon's way
- the assistant must anticipate the surgeon's next move in order to make the procedure a seamless event
- the assistant must perform certain parts of the procedure because it is easier from the assistant's position
- several skills must be done at the same time by the surgeon and the assistant with sharp instruments without injuring each other
- the assistant must know when not to move so as to not jeopardize the maneuver or get cut
- the assistant must know which instruments to ask for and when
- the assistant must learn when to keep his mouth shut when things are going badly
- the assistant must know when to speak up if he sees that something is not right, knowing the surgeon doesn't see it and realizing the surgeon isn't going to be happy to be informed of the problem

We will address the psychological and emotional aspects of the operating room and the sort of conflict some of the issues mentioned above may create. The interactions go beyond the surgeon and his assistant.

### **The Physical Design of an Operating Room**

Operating rooms are designed for safety and efficiency. Tile and linoleum cover walls and floors and permit swift cleansing with antiseptic solutions between cases. The center piece of the OR is a narrow table. It may be mechanically or electrically operated and is capable of adopting to the positions required for different operations.

Large electrical outlets are available on walls or as part of special columns which drop down from the ceiling and also contain anesthetic gases, oxygen and suction. Wall cabinets are built-in and contain all of the needed equipment not included in the case cart. The case cart is rolled into the room for a specific case and contains the needed instrument and sutures for a specific type of case. The usual generic equipment such as razors, tape, gauze, etc. are kept in the wall cabinets. Most of the specific equipment arrives with the case cart.

An anesthesia machine sits at the head of the OR table and is connected to the overhead gas sources by color-coded hoses as well as to a (separate from surgery) suction source. At least two huge overhead, multi-bulbed operating lights hover over the table. Stainless steel tables remain in the room and serve the scrub tech's needs when covered with sterile towels.

Outside the operating room are scrub sinks and sterilization equipment (the major sterilization machines are in a central processing area away from but connected to the main OR).

### **Specialty Operating Rooms**

Each surgical specialty has slightly different needs.

For example, urologists use a lot of water to irrigate the bladder and visualize the inside of the bladder with fiberoptic cystoscopes. Urologic surgeons wear rubber aprons in an attempt to remain dry during surgery. They also need immediate access to fluroscopy to take x-rays and thus have a fixed fluroscopy unit set up with the operating room table. And they often operate sitting down.

Orthopedic surgeons who perform total joint replacement procedures wear huge helmets and special gowns to eliminate any chance of infection. If a joint becomes infected the hardware must be removed and the procedure repeated at a later date. Air exchange occurs on average fifteen times an hour in most operating rooms, but this occurs more often in the orthopedic rooms.

Ophthalmologic surgeons and some other specialists use the laser and need well-trained nurses and special equipment to perform their operations. In fact, the laser has only a few applications in surgery. Cryosurgery is also used in cancer surgery and these special units must be wheeled into the OR for each case. Harmonic scalpels require a special unit and all laparoscopic surgery necessitates cameras, TV screens, insufflation equipment and extra personnel to hold the camera for the surgeons.



Neurosurgeons use an operating microscope which is bulky and again requires special personnel and attention to detail during delicate operations. Some oncology surgeons will employ intraoperative radiation treatments and the equipment must be rolled into an operating room large enough to accommodate it, or be set up with a permanent fixture.

Finally, minimally invasive surgery has transformed abdominal surgery by making access less traumatic with tiny incisions for trocars through which are placed instruments and a telescope with a camera. Visualization of organs thus is a matter of indirectly viewing them on a TV screen. TV screens mounted on all brackets or on rollaway carts fill the OR room even further. Chest and vascular surgery also may be done employing minimally invasive techniques.

### **Surgical Bookings**

Before anyone is rolled to the operating room the case must be booked ahead of time. This is done in a number of ways depending on the acuteness of the case. *Elective cases* require the surgeon's secretary to book the case -- and many others like it -- days or weeks before surgery. The hospital's booking agent and the surgeon's secretary scan their books while they talk on the phone and set up a complete operating schedule for a given day weeks in advance.

Between now and then the secretary may have to arrange for an assistant (another surgeon with his own schedule and booking problems), cancel the case because the patient needs a formal cardiac, pulmonary or renal clearance, rearrange the whole day so the biggest case is first or last.

Or fit in a professional hockey player's hernia repair before the Stanley Cup playoffs.

Hell *is* the details of an OR schedule.

Next in urgency are *add-on* cases, surgery that must be done that day or the next at the very latest. These cases may be fractures which must be set and casted or pinned, lacerations of the face or hands involving tendons, laparoscopic gallbladder surgery for someone who's pain recurs and won't go away or wait until the booked time. These cases are typically fit into the daily surgery schedule when a room is done or if cases are canceled at the last moment.

### **Levels of Urgency in Booking Surgery**

- *elective surgery* booked days or weeks in advance
- *add-on* cases to be done within twenty-four hours
- *emergencies* to be done within two to four hours if possible
- emergencies to be done when *next available OR room* opens
- *dire emergencies* to be done as soon as the patient arrives in the OR

*Emergency* cases vary with the degree of urgency and thus the time it takes to get to the operating room. Acute appendicitis -- without perforation, shock or wildly out-of-control infection(sepsis) -- must be done within about two to four hours if possible. A perforated ulcer goes to the

next available room. A ruptured aortic aneurysm or severe trauma such as a stab wound to the heart -- if not operated on in the Emergency Center -- often arrives in the OR following a curt phone call during which the surgeon announces, "We're coming down with a \_\_\_!"

In extreme cases time is not negotiable.

### **Bumping Booked Surgical Cases**

You have a case of acute appendicitis booked. They say you'll go at about six P.M. I call the OR with a perforated intestine. In shock. Got to go now! What happens when the hysterectomy in Room Four closes?

I bump you.

It means my patient is sicker than yours and is in danger of becoming even more unstable. The procedure is for the nurse at the desk to inform you you're being bumped. "You can't bump me!" you scream. And you make up some malarkey about how your patient is becoming septic, things have changed since you booked the case. No, you certainly cannot be bumped. Not tonight.

After all, you've got executive box tickets to a basketball game which starts at seven-thirty and the Knicks are playing the Celtics. But, you get bumped anyway.

More gray area? You bet. And at this point the anesthesiologist assigned to run the OR schedule for the day steps in and referees. He asks questions, defines who's patient is really in trouble. And, of course, a patient in the ER in shock with a perforated viscus goes first. You miss dinner and the first period of Boston versus New York.

Bumping. Getting the sickest patient under the knife the quickest. Personalities flare and eventually simmer. Most of the time the order of surgery is the correct one. Occasionally, lying takes over as sad it is to admit. Surgeons know how to bend, mold, squash, elongate, taper, flatten, and cudgel the truth.

Most surgeons accept the reality of the bumping process and realize it will all balance out over the course of twenty-five or thirty years. you watch the second half of the game on the TV in the surgeon's lounge.

### **The Rituals of Surgery**

The operating room is a magical place where no one works unless they have paid their dues. And their dues include mastering a lot of rituals, many of which make sense. Once a member of the clan OR people cherish their uniqueness, as well they should. They are in a position to help a lot of sick people through a difficult treatment, surgery. To get to this professional position they have no doubt suffer many fools, some of whom would be more effectively employed in the laundry.

Each separate surgical ritual must be learned and followed precisely because – it's impossible to argue this reality – repeating the same drill over and over and making certain everyone does it the same way results in the best outcomes. Even so, some of the people following these rules are unable to function outside of the checklist 'box'. Recently, the following remarkable scenario occurred to one of the authors (DWP) and will challenge your sense of credulity: after an abdominal operation, a clip applicator (a large scissors-like instrument about eight inches long) was missing when the instrument count was performed, even though *it*

*was never used* on the case and never (theoretically) left the scrub tech's table or wasn't there in the first place. Policy mandated that an abdominal x-ray be taken while the patient was still on the OR table to search for this non-existent instrument.

An equally absurd request for a post-op x-ray occurs when three of a particular instrument are counted at the end of a case when, at the time the case started, there were only *two*. Where did the third instrument come from? The x-ray was ordered to look for a fourth instrument. Why? Do they always come in two? Were we again seeking an instrument that never existed?

### **Instrument, Sponge, and Needle Counts in the OR**

Are these rituals ridiculous? Not at all.

To provide the most good for the largest number of people certain rules and procedures must be followed to avoid repetitive errors. However, a situation often arises when the check-up procedures seem absurd and someone must intervene with common sense.

Important rituals direct the operating room team's behavior and we'll examine more of them now. But, procedures directed at the care and counting of equipment are vital and adhered to religiously.

First, let's trace the steps of the individual members of the surgical team as they move through a typical case. Procedures and unwritten rules of conduct will be mentioned from various points of view. Each person experiences the operating room from a different vantage and from a specific position of authority (or lack of it).

The surgeon isn't the only important member of the operating room team.

### **The Real 'Captain Of The Ship' – The Anesthesiologist**

Presumably because surgery evolved over many years without the need – or should we say, availability – of proper anesthesia, surgeons have always labored under the delusion that they were in charge of the operating room. And, in fact, for many years surgeons administered anesthesia as well as perform operations. But, once the doctor (anesthesiologist) at the head of the table commanded better anesthetic agents and improved monitoring equipment, the surgeon was left with no reasonable choice but to cooperate. After all, the anesthesiologist is a superb clinical pharmacologist.

Not all surgeons saw it that way.

To this day, ego-encumbered surgeons still don't get it and miss the point that the anesthesiologist has total control of the patient and to a very large degree determines the success of the operation. No doubt many anesthesiologists nod their agreement when the surgeon glances up at the EKG monitor and says something incredibly stupid such as, "Is she getting enough oxygen?" This, to a physician who knows more about oxygen transport than the surgeon understands about tying square knots.

Of course, most surgeons work in harmony with their anesthesia brethren and the patient benefits from this synergy. Still, there are times when things go badly and everyone lashes out at someone else. In surgery, there is always someone to blame. For example, it is not unheard of to observe a surgeon who's gown is dripping crimson who insists, "No, we're not losing much blood down here. What's the problem up there?"

'Up there' behind the screen of sterile sheets which separates the surgeon from the anesthesiologist, the anesthesiologist is counting sponges with the circulator and noting the amount of bloody suction fluid. Indeed, the patient has lost significant blood despite the surgeon's denials.

The anesthesiologist's day often begins even earlier than that of the surgeon. In his assigned OR room, he checks out the drugs he will use, the anesthesia machine with its intricate piping, valves, dials and monitors, the pre-hung IV lines and bags of fluid (photo). He prepares his intubation instruments and his other supplies and then goes to the holding area and meets his patient.

In the pre-anesthesia holding area the anesthesiologist reads the patient's history and asks about the upcoming surgery to test the patient's understanding of what is to occur. He may order a sedative for the patient at this point (and wish he could slip one to the surgeon). When the surgeon has talked with his patient – assuming the surgeon does this, they're all different – the anesthesiologist wheels the stretcher to the room and with the help of the circulating nurse and an orderly (now often called an OR assistant), transfers the patient onto the OR table.

### **The Operating Room Assistant's (Orderly) Job**

- help to set up cases with regard to cleaning the room, getting equipment, etc.
- help bring the patient in the room and transfer onto the OR table
- hold the patient for a spinal or epidural
- shave the surgical area or hold arms or legs for surgical preps while assistant washes and paints extremity with antiseptic solution
- serve as a runner for emergency supplies for surgeon and anesthesiologist
- clean and restock anesthesia machine (often a designated individual)
- scrub and hold camera for laparoscopic cases
- at the end of the case transport patient to PACU making sure safety strap, side rails and blankets are in place
- mop floor and wash walls for next case

As the anesthesiologist places a mask on the patient's face and administers oxygen and more sedative, the scrub tech arranges instruments on her back table. Earlier, she stood at the scrub sink, tore open a pre-packaged scrub brush and peered through the OR window, wondering what sort of mood the surgeon would be in today.

An OR assistant may be required to hold the patient for a spinal anesthetic. This means the OR assistant (orderly) stands beside the OR table, holding the patient and helping to keep the patient curled up in a



ball in order to ‘open’ the intervertebral space the anesthesiologist is seeking with a needle from the opposite side of the patient.

### **The Scrub Technician’s World**

Beginning with her fingers, the scrub tech swirls soap up her knuckles, wrist forearms and stops at her elbows. The brush has a sponge side filled with antiseptic soap and a brush side for ‘scrubbing’ the skin. She works her way up the other arm, shifting the brush to the opposite hand, circling down to her hand again, rinsing, then scrubbing some more. This ritual lasts at least five minutes and is repeated for each subsequent case.

The old scrub sinks – and no doubt those still in operation in small community hospitals – use arm bars on the faucets or a knee bar or automatic kick pad below the sink, all of which are designed to turn on the water. No hands, Ma. Got to keep’ em sterile. In a modern operating room the water switches on as soon as an electronic eye senses the scrub tech or surgeon’s hands under the faucet.

Consider: the water used by the operating team comes from the city water supply and isn’t sterile...and the surgeon uses an antiseptic...when does the scrubbed skin *become* sterile? It doesn’t. It’s just really clean. It’s one of many dilemmas with what we call sterile technique.

Dripping soap and water, the scrub tech enters the operating room through a side door, fanny first, hands held up and crosses the OR to her tables and removes a sterile towel waiting there for her. The circulating nurse helped her set it up beforehand. With her hands dry, the tech picks up her folded gown, shakes it loose and dons it, followed by her gloves.

The tech knows how to pick up, open and don sticky gloves without help, an impressive little ritual.

### **The Scrub Technician's Job**

From the beginning to the end of the case *the scrub tech's job during surgery includes:*

- handing instruments to the surgeon and the assistant who are looking into body cavity, not at her, and with open hands expect the right instrument at the right time – even if they only mumble something which approximates the instrument's name
- asking the circulating nurse for suture material, devices to be used, additional instruments, more sponges, saline, etc. before the surgeon realizes he wants or needs it
- retract for the surgeon when an extra hand is needed, as well as still loading handles with scalpel blades, mounting sutures on needle holders, passing the surgeons sponges, doing it all with one hand...
- accepting tissue specimens for pathology, placing them in proper containers or handing them off to the circulator, while still retracting...
- working 'in close' with the surgeon without protective equipment

- standing tall when things go badly and the surgeon is finished abusing the anesthesiologist and his assistant

When the case is over the scrub tech removes soiled sheets, suction tubing and cautery wires from the patient and places them in the trash or in a hamper in the corner while the worn out surgical team stretches and checks the bandages. Moments earlier, she joined the circulating nurse and completed the last instrument, sponge and needle count. The surgeons depart to relieve themselves and enjoy a cup of coffee, but the circulating nurse and scrub tech continue to clean up, joined now by the OR assistants (orderlies).

When the surgeon exits to talk to the family the scrub tech, circulating nurse, anesthesiologist and OR assistants begin the ritual of preparing the room for the next case. The doors are closed now, and, as the odor of disinfectant fills the air they talk about the case and the surgeon.

Some surgeons hire a private scrub tech. The reasons are obvious. Because the interaction between the tech and the surgeon is crucial to the success of the case, some surgeons prefer to solidify this part of their day. Others are lucky enough to have a tech who scrubs with them on a regular basis, a tech who knows the surgeon's every move and requests before the surgeon asks for something!

### **The Circulating Nurse's Domain**

The circulating nurse coordinates the flow of instruments, equipment and personnel in the OR. A registered nurse, who no doubt

belongs to the Association of Operating Room Nurses, she is the ambulatory equivalent of the scrub technologist. Anything that must be done in the room or retrieved from elsewhere in the OR, falls to the circulator. She must understand sutures, instruments, asepsis, procedures, techniques, terminology and the fine art of juggling egos.

The circulating nurse may have to keep three or four inflated egos in the air at any one moment. At the same time she must observe literally *everything* that goes on, including watching for potential breaks in sterile technique, retrieving fallen instruments (which must be re-sterilized), note the need for more IV fluid, blood, drugs, and anything else the anesthesiologist may demand. At her very best, the circulating nurse may be seen getting things for *both* the surgeon and the anesthesiologist while juggling a conversation with PACU with the phone cord stretched and the receiver tucked into her neck.

When all of these duties are completed -- actually between running for equipment and counting sponges and changing the setting on the cautery and changing the suction canister and adjusting the laser setting and other chores -- the circulating nurse must record all of this information in the patient's chart. In many cases this occurs casually while surgery is performed in relative quiet; in big cases these duties overlap and intersect, creating a matrix of havoc.

### **The Circulating Nurse's Job**

- admit the patient in preop holding, review the chart, the proposed

- surgery, the side, the expected anesthetic and obtain permission for the surgery and anesthesia (make certain the signed permits are on the chart); make sure the history, physical exam, labs, EKG, etc. are on the chart
- assist in transporting the patient to the OR room, transfer to OR table arrange sheets, preserve the patient's privacy, assist the anesthesiologist in intubating patient
  - expose area of concern, often insert Foley catheter into bladder, prep the skin, place cautery pad on patient's thigh, place compression 'boots' (full leg sleeves to intermittently squeeze stagnant blood from legs to central circulation) and attach to machine, make certain suction is working, attach cautery wires and suction tubing to appropriate machines after accepting sterile ends from scrub tech
  - Snap back of surgeon and assistant's gowns, check for hair coverage with caps, appropriate masks and help with attaching sterile drapes to IV poles at head of table, adjust cautery setting to surgeon's preference, review scrub tech's back table
  - start getting last minute instruments, sutures and new scalpel blades, adjust radio, insert surgeon's favorite CD
  - record time of starting case, later end of case and all pertinent data, e.g. names of surgeons, assistants, students, name of procedure, handle specimen when removed, and all needs of the anesthesiologist for drugs, tubing, etc.
  - replace scrub tech is time or circumstances necessitate tech leaving the case
  - knows all potential disaster drills such as a cardiac arrest, malignant hyperthermia(MH) treatment and location of special crash cart for MH, calling for special vascular clamps in cases of unexpected hemorrhage, and handling of frozen section specimens for immediate pathological

evaluation during case

- at end of case removes soiled drapes with tech, moves patient onto stretcher, transports patient to Post-Anesthesia Recovery Unit (PACU)
- during the case handles all communications coming into and leaving the room
- returned to preop holding and introduces herself to the next patient with a smile, no matter how the previous case went

The circulator wears gloves, mask, gown and protective eye gear and handles bloody sponges, towels, dead legs, smelly colon specimens, containers of all manner of body fluids and also must occasionally mop up excessive floor puddles before the end of the case (before the orderlies arrive).

In a real sense the circulating nurse -- in tandem with her scrub tech associate -- engineers the success of the day in the operating room.

### **Rules of Conduct in the Operating Room**

Many written and unwritten rules govern behavior in the operating room. Procedural issues which are carefully spelled out include how to scrub, handle body fluids and parts, all aspects of antisepsis (reducing bacteria and other infectious agents) and asepsis (eliminating bacteria, etc.). With the advent of the era of frequent HIV and hepatitis infections in the patient population being served, *universal precautions* have been

instituted and serve as absolute dogma. No one breaks these rules and remains employed.

What are some of the unwritten understandings which grease the wheels of respect, interaction and efficiency -- or lack of them -- in the operating room? Perhaps this is the softest and most contentious information in this chapter -- and for that reason the most interesting. These suggestions about how people are suppose to behave and how they sometimes do interact should give you considerable insight into the OR culture.

And while ritual rules the operating room environment, behavior is less predictable. Understand our intent in discussing surgeon demeanor in the OR: while most are proper in their interactions with the staff, a significant number of surgeons behave poorly at regular intervals.

Some operating room rituals are amusing. They don't have to make sense. However, the dictates of professional conduct have to be followed without question in order to keep the OR team functioning smoothly -- unless you're the surgeon. And the more junior you are, e.g. a medical student, the more accountable you will be held. The ironclad manifesto, "Because that's how we do it..." was no doubt birthed in the operating room. It confirms the unspoken reality in medicine in general that, "Poop flows downhill."

A surgeon who accidentally touches something unsterile and doesn't recognize his error might not be noticed, but let a medical student bring her hand to within six inches of her face and the scrub tech will scream, "You contaminated yourself! Go out and re-scrub!"

**The real substance of unwritten OR guidelines involves a lack of substantial challenge of the surgeon's conduct. While the activities of the operating room are coordinated by the anesthesiologist, the actual operation is the surgeon's sole focus. Once skin is cut, the show is on. And what a show it can be!**

What confronts a surgeon each time he walks into the operating room? Why is the confrontational nature of this performance so stressful? Why doesn't extensive experience eliminate worry about how the case will proceed *today*? Consider the following aspects of the surgeon's world:

- no two operations are same, because...
- every patient's anatomy varies slightly from the previous case
- the pathological process is never exactly the same
- these two features combine to produce uncertainty
- the surgeon must attempt to exclude all distractions from the day including angst from his personal life
- other emergencies may arise during the course of the operation necessitating the surgeon to provide a plan of treatment while continuing the operation at hand
- unexpected bleeding or unexpected additional pathology may require the operation to be prolonged
- the surgeon has commitments which immediately follow the case, e.g. a full office which was suppose to start thirty minutes ago



- the surgeon may be ill (a mere cold or sprained ankle won't slow down a surgeon who survived five or more years of hellish training)
- the surgeon may have a personality conflict with the assistant (often assigned to him without choice, if it's a resident)
- the scrub tech and the surgeon may have a history of not getting along and every instrument may be delivered a fraction of a second too slowly

A small but persistent segment of the surgical population have earned their reputations as prima donnas because of the arrogance which is often expressed during the good times, at the end of operations that went well. Pleased the stress is over, standing proudly as the conqueror of all of the sundry threats confronting him that day, the surgeon's treatment of the personnel surrounding him implies he did it all himself. Failing to thank the team, he strides out of the OR without detecting that everyone in the room was ever so slightly nauseous.

Still, when things go well, everyone sighs a maskful of relief. And when the self-indulgent surgeon leaves the OR to speak to the family, as the anesthesiologist -- who made the surgeon's display of magnificence possible -- wakes up the patient, the radio goes back on or the station is changed to rock. Now alone, the tech and nurse really say what they're thinking in the closed room and the orderlies come in and join the cacophony of pent-up annoyance.

The good guys are more tuned into the people who make their professional lives pleasurable. At the end of a successful case, the scrub

tech and circulator may bubble happily because the surgeon was in a good mood and treated them well. Most surgeons are good people. Most operations go smoothly.

Operating room conversations are usually politically correct. At the very least, they are civil. But, not always. If you doubt the angst suffered by scrub techs and circulating nurses, you may be interested to know the *very first* thing they do each day is check the 'big board' to discover which surgeon they'll be working with for the next eight to twelve hours. A lot of begging for room changes goes on at seven A.M.

What happens when a surgeon becomes abusive?

**The issue of abusive surgeons is a Great Plains of gray. A huge behavioral no-man's land spans the extremes between cordial OR demeanor and clearly unacceptable behavior. Even unacceptable behavior is difficult to define. Who is qualified to judge a person fighting for another's life? Especially when something goes abruptly wrong?**

Here are a few comments from one of the authors (DWP) who has performed well and badly over twenty-five years of surgical practice. Personal experience with a multitude of difficult cases and observations of one's own mistakes and eventual growth informs this delicate discussion.

Seasoned scrub techs and circulating nurses have seen it all. They know what can happen in a big case where tissue unexpectedly falls apart and won't hold sutures, or when contamination from spilled feces occurs or blood pours out of a huge hole in an artery or vein and the patient's blood pressure suddenly plunges. Or, after a nine hour vascular bypass graft

operation, when the drapes are removed, the patient's foot is cold and pulseless, and the surgeons go out to re-scrub and start all over again, and the rest of the OR team scrambles for instruments as the anesthesiologist puts the patient back to sleep.

When a competent surgeon is performing an elective (things are suppose to go well) or in an emergency operation (a high level of stress already exists because the patient is sick to begin with), when something isn't right, even the 'good guy' surgeon may become a little unhinged. The people in the room adjust. Everyone tries to do their job just a little faster, a little better.

Even the good guys get rattled at times. It's interesting the circulator and scrub tech protect this surgeon, even though for those hairy moments he yelled and trampled them a little. At that stressful moment he didn't notice. But, at the end of the case he realizes what he's done, what he put the team through and he apologizes.

The team understands what's involved in those frozen, terrible moments when the surgeon loses control. They forgive him. There is no idle talk about the case. This is the conduct of professional at their best.

Then, there's the insensitive, self-indulgent surgeon with poor impulse control when things go badly. Along comes bad luck, and his case turns into a disaster...

The surgeon begins to demand instruments. "I need a curved vascular clamp! Now, dammit!"

Some of the requested instruments aren't in the kit. He acts as though he doesn't know this. After thirty years of practice the surgeon is abruptly having a brain cramp. "Just get it!"

The circulator opens the door to leave the room for the requested instrument bundle when the surgeon barks for a suture that's in the cabinet on wheels in the corner.

She moves toward the cabinet. "What size..."

"No, no! Go get the damn vascular clamps!" To the anesthesiologist the surgeon yells, "Art, get me a five 0 prolene!"

"Got my hands full," grunts the anesthesiologist from behind the sterile drapes.

"Awe shit! Can't you just get me a friggin suture?"

"She's in shock," insists the anesthesiologist. "Gotta keep pumping in this blood or we're gonna lose her."

"Son-of-a-bitch!" howls the surgeon, swinging arms. "I'm surrounded by a bunch of idiots! Call for help, then! S-O-M-E-B-O-D-Y!"

The scrub tech leans away from the surgeon's flailing arms. His assistant finds something on the drapes to examine.

The circulator returns, panting. She tears open the kit and dumps a nest of sterile instruments onto the tech's back table. "They're straight and curved," she says.

"Not those clamps, for Christ's sake! I have my own. They got yellow bands on them!"

And on and on.

The verbal abuse explodes, over and over, a one-way diatribe of uninterrupted bile. Everyone else keeps quiet. The patient comes first

and these unsung heroes -- the thousands of scrub techs and circulating nurses in hospitals everywhere -- keep this unwritten principle alive.

Until the case is solved. But, the surgeon in this instance continues to make unreasonable demands of the OR personnel, yelling and criticizing them even though the danger is over.

After he leaves the OR there is no levity. Only silence and perhaps the soft sound of weeping. This may be followed by a parade to the supervisor's office to fill out incident reports on the surgeon's behavior. And, he will do it again.

And, he'll get away with it again.

Were those instruments suppose to be on his kit or at least in the room? Did the circulator forget to have them available? Why wasn't he assigned a higher level surgical resident with more experience? Didn't the circulator know where his special sutures are kept? Can you blame him for becoming just a little upset?

How do you separate the slippery elements of this complex interaction when the end point may be removing the surgeon's operating privileges? When attempted in the past, in general most hospitals don't get very far when they tamper with a doctor's privileges.

On the other hand, there is a truly gray area in all of this.

Some surgeons make *every* case a difficult operation, no matter how smoothly it may go. In other words, the surgeon develops a method of absolute control by always being in a state of fury and that keeps the room unsettled, off balance. The surgeon then calls the shots, as if catastrophe is just around the corner.

With other surgeons the set-up for a miserable day in the operating room comes in the form of always finding something wrong. These surgeons aren't as miserable as those insecure souls who sulk and sour the operating room atmosphere with terror. The surgeon who *always finds something wrong* -- a fogged laparoscopic camera, the wrong-sized needle handed to him, a dull scalpel, shredded sponge -- is more annoying than abrasive.

These surgeons fit Eric Hoffer's adage: *rudeness is the weak man's imitation of strength*. This behavior approaches whining.

The operating room may be a crucible for heating up personalities and challenging proper conduct. Any thing can happen in the compressed time of major surgery.

**The imperative to repeatedly perform flawlessly under the stress in this restricted, but public place, highlights the demands imposed on a surgeon.**

### **Distractions During Surgery**

The telephone may become a source of annoyance for the surgeon who doesn't establish ground rules about calling into his room. The front desk can't make judgment decisions about what call is important and which can be logged and ignored. Some surgeons let anyone call in.

Imagine the surgeon and his assistant up to their elbows in intestine when the wall phone rings. The circulator answers it. "Sir, it's your wife...your dog is having puppies. She would like to know what to do?"

Or: “Doctor, there’s a patient in the Emergency Center asking for you.”

Or: “Doctor, this is East Six. Your gallbladder from yesterday just spiked to one o’ three...”

Or: “Doctor, your office wants to know how late you’re going to be today?”

It is up to the individual physician to determine what sort of interruptions he will tolerate. Some accept only true emergencies. Others actually talk with their stock brokers during complex surgery.

Different people may wander into the room during surgery.

### **Communication Interruptions During Surgery**

- *beepers* -- some surgeons keep their beepers on and when they scream (the beeper), the circulator must fish around under the surgeon’s gown at belt level to turn it off...right! Often residents are required to leave their beepers at the front desk
- *telephone* -- calls into the room are handled according to the surgeon’s wishes; some accept all calls, some a selective
- *overhead paging system* -- although not actually in the room, the speakers in the hall outside may carry into the room; not part of the system, although the paging operator will put nurses and doctor’s calls directly through

- *intercom* -- connected to the front desk and to pathology; permit communication between the desk and the surgeon about bookings for the day, emergencies, cancellations, as well as direct communication between surgeon and pathologist regarding frozen (immediate diagnosis) sections

Another nurse may be looking for an instrument for the surgeon next door. Or she may want to ask the circulator about lunch. A surgeon may waltz in to see what's going on, especially if he's somehow involved in the case. Maybe he's just interested. Most folks in the OR survey the 'big board' next to the main desk where all of the day's operations are listed.

Everyone who works in the operating room knows what's going on, when the mayor's wife is having her hysterectomy and when the Chairman of Psychiatry's daughter is undergoing a breast augmentation. These rooms will have their windows covered by sheets taped to the inside wall by the circulating nurse to prove privacy.

Still, someone's bound to peek in the room.

### **The Main Operating Room Case Board**

- room number
- surgeon's name
- assistant's name
- type of operation
- type of anesthesia



- anesthesiologist's name (plus resident's name or CRNA)
- a code indicating the readiness of the case, e.g. next to the name on the board, red dot for 'in the room', yellow dot for 'in pre-op holding'

What happens to specimens when they leave the operating room? How are they wrapped, transported and handled? What are the common types of specimens? Here's a list of tissues and other samples which are harvested during surgery and sent for further evaluation and processing:

- blood samples drawn by anesthesia for the usual labs, e.g. cross and type for blood transfusion, chemistries, etc. placed in standard (color coded caps) glass vials
- cultures of body fluids or pathological collections such as pus, transported in sterile test tubes labeled with date, source, patient's name
- tissue specimens for frozen section sent 'fresh' (without preservatives) in sealed plastic cups for immediate analysis; usually looking for cancer
- entire surgical specimens such as a resected colon, kidney, uterus, tubes ovaries, etc. sent in formalin for analysis; these specimens are the result of complete cancer operations and must be assessed for clear margins (around the cancer), number of lymph nodes containing cancer, blood vessel or lymphatic invasion, etc.; sent in large, sealed plastic containers

- amputated legs, arms, jaws, genitals, etc. placed in large sealed plastic containers as with surgical specimens or in special red plastic bags used to identify biological specimens as compared to routine OR trash; sent to surgical pathology
- hardware from orthopedic cases, e.g. rods, screws, plates, etc. or material such as body fluids containing illicit drugs, bullets, knives and other impalement objects which may have forensic importance bagged and sent to pathology lab

### **Teaching the Skills of Surgery**

All of the rituals we have discussed in this chapter must be learned by the surgical resident during five arduous years of training. How to scrub, gown and prep the patient precede the learning of how to tie knots, handle instruments as an assistant, sponge at the appropriate time and suction without getting in the way. Some of these skills are learned as a medical student.

For the most part these important maneuvers are not complicated. Still, they must be mastered in order to progress to the stage of actually learning how to perform surgery. But, how do you let someone operate for the first time?

Each year of training has set goals and objectives, recognizing that not all residents progress at the same rates. Some second year residents are able to perform a major part of an operation with good assistance from the Attending, while others have difficulty tying a secure knot. The dilemma for the teaching surgeon is how to permit a resident to progress in the mastery of surgical skills; the answer is to provide *graduated*

*responsibility*. How this is done varies from institution to institution as well as among Attendings.

**One of the romantic yet flawed ideas about learning procedural medicine, how to perform interventions requiring motor skills, is summarized in the oft-quoted expression, “See one, do one, teach one.” Implied is a narrow window of opportunity which presumably underlies medical education. Also, this quote denies the reality of the need for repeated performance of a motor skill in order to get it right.**

There is a marked difference in most surgical training programs between the private surgical services and the so-called ‘resident’ services, because the latter only treat unreferred patients who do not have a private doctor. Board-certified surgeons are ultimately responsible for the patients on both services. But, the residents on the private service are supervised more closely than on the ‘unreferred’ service. Whereas the residents who run their own service are allowed more liberty to conduct their service, private patients are more closely monitored by the Attendings.

### **The Elements of Teaching Surgical Technique**

- the resident must first learn how to assist, to hold retractors and instruments in the proper position without moving and to move smoothly with the surgeon as directed; part of assisting is tying knots, a difficult skill where every

potential bleeder grasped by a hemostat must be secured with a well-tied knot

- the resident must learn to make a clean incision and continue the dissection as directed by the surgeon; to use each instrument safely including dissecting scissors (Metzenbaums), scalpel, hemostat, probes, etc. to identify and outline normal anatomy and the specific pathology; this is begun on simple cases at first; the resident learns how to suture, including layered closure of body cavities
- the resident progresses to more complex dissection in areas with more detailed and crucial anatomy and must follow directions explicitly; also, the use of more complicated suturing techniques on bowel, blood vessels and other organs is learned; the use of sophisticated stapling devices and other high technology instruments, including laparoscopic instrumentation and the demands of non-tactile dissection are added in later years
- finally, the resident learns to operate independently with supervision, but as the surgeon, making his\her own decisions, performing the procedure with junior residents and completing the case without direct Attending input, unless needed
- the progression of responsibility given the training surgeon should follow the dictates of providing *graduated responsibility*, sequential addition of more complex cases as the resident demonstrates a growing competency
- after five years of basic surgical training the surgeon may practice or go on to a fellowship in a special area such as trauma or oncologic surgery; specialties require varying number of years in general surgery before acceptance to their programs in pediatric, orthopedic, plastic urologic surgery, etc..

Of course, residents rotate on both the private and the so-called residents service several times during their training. So they are exposed to both types of training. With time and repeated opportunities to evaluate, diagnosis and operate on patients, to perform the same operation over and over under careful supervision, residents become proficient. At the end of five years the chief resident is *board-eligible* when s\he graduates from the medical center's program. By then, the resident will have performed hundreds of operative cases and evaluated and treated, as well as followed up in clinic for postoperative care, a large number of surgical cases.

The growth of a young surgical resident from an intern to a competent chief resident requires countless hours of hard work by the resident, including thousands of pages of reading. Also, Attendings dedicated to teaching surgical residents invest energy and time as well as accept the responsibility of permitting residents to operate on their patients under strict supervision. The principle followed by the private surgeons is that their patient gets the operation they would have done themselves if alone, but some or all of the procedure is performed by the resident.

No free-lancing is permitted on the private service. On the resident's service the Attendings permit for freedom as it is here that the young surgeons must demonstrate their organizational skills, judgment on individual cases and maturity in dealing with patients and families.

To complete the discussion of what happens in the operating room we will present a number of unrelated but important topics.

### **Blood Loss in the Operating Room**

No surgery is completed without the team experiencing real or threatened exposure to blood products. For this reason the circulating nurse and anyone else who may come in contact with the patient's body fluids must wear:

- an impervious gown
- non-sterile gloves
- eye protection (goggles or special glasses)
- a mask

To measure blood loss during surgery the following maneuvers are carried out:

- measure volume of bloody fluid in suction canister minus irrigant volume
- count soaked, bloody sponges (weigh sponges on pediatric surgical cases for small differences)
- grossly assess blood in stainless steel bowls which contain huge blood clots in certain cases (e.g. an upper GI bleed where clots are scooped out of the stomach)
- grossly assess blood on drapes and the floor, if indicated

Some cases involve major hemorrhage. These operations may be identified ahead of time so that certain techniques may be employed to avoid excessive transfusions. Also, some patients such as Jehovah Witnesses refuse blood products. In any case, requiring conservation of blood the following techniques may be considered:

- have patient pre-donate blood days before surgery to be administered on the day of the operation if needed
- remove some of the patient's blood at the beginning of the case and replace it with intravenous salt solutions; transfuse blood back as needed at the end of the case; this is known as hemodilution
- retrieve the shed blood as it is lost during the case with a special device known as a 'cell saver'; this is a suction device with a special filter and conserves the patient's own blood

### **A Cardiac Arrest in the Operating Room**

For patients who are intubated under general anesthesia -- which represents most cases where an anticipated or completely unexpected cardiac arrest occurs -- control of breathing is already accomplished. the patient's intubated and on a ventilator, the anesthesia machine with oxygen and an EKG. Left to complete the resuscitative process is cardiac massage.

The surgeon often begins with a chest thump (we're considering a common abdominal operation where the lower chest is draped and part of the field). If this doesn't reverse the arhythmia, then external chest

compressions are begun. Rarely in extremely difficult situations is it necessary for the surgeon to open the chest. If done, a scalpel is used to swiftly divide the tissue between the ribs on the left lateral chest (thoracotomy) after which the surgeon inserts his hand and massages the heart.

If the patient is in a different position it may be necessary to turn the body into the supine (face up) position and institute cardiac massage. In any instance, the anesthesiologist also has at hand the numerous drugs used to convert cardiac rhythm problems and to boost cardiac function.

If the 'code' is brief, the patient may do well. If prolonged in a patient with multiple medical problems, a cardiac arrest 'on the table' is a harbinger of bad things.

Often these latter patients don't survive the arrest.

### **Death in the Operating Room**

When a patient dies on the operating table the case becomes a *medical examiner's case* until the body is released. It is the surgeon's duty to contact the Medical Examiner (ME) – or 'Coroner,' depending on state laws – and describe the case and why the patient died. If there is no questionable reason why the patient expired -- the victim was in shock from bleeding or sepsis and the chances of surviving surgery were slim to begin with -- the ME will release the body. That means the ME has no further interest in the case.

Now the surgeon is free to contact the family and request an autopsy (this is seldom done as the surgeon has, in effect, just performed one) or release the body to a funeral home.



Before the ME releases the body no tubes or other hardware are touched. If the Medical Examiner decides he wants to autopsy the body, all incisions, tubes and other drains etc. are left in the body when it is transported to the morgue. Sutures are used to close the abdomen while the body is still in the OR in order to keep the abdominal contents inside the body cavity as the body is moved. The surgeon or his assistant will notify the family followed by the hostess desk, the telephone operator and the nursing supervisor for that shift. The death certificate must be filled out by the surgeon or his assistant and all personal belongings are returned in a plastic bag to the Admitting Office where the family may retrieve them.

If the deceased's religion requires 'last rites,' the face sheet of the hospital record should have noted if this has occurred. If it has not happened, a priest is notified.

The body is transferred from the OR table to a special morgue stretcher which conceals the body. In the morgue the body is placed on a refrigerator stretcher with the head propped up on a wooden block. The body is placed in a body bag and picked up by the funeral home requested by the family.

### **The Post-Anesthesia Recovery Room (PACU)**

Successful surgery is celebrated in the PACU where the awakening patient is greeted by specially-trained nurses and plugged into the careful routine of this monitoring area (photo). Immediately after the anesthesiologist extubates the patient and replaces the breathing (endotracheal) tube with a face mask (and oxygen) is the most dangerous

time for the patient. Connected to an EKG monitor, oxygen saturation is checked with a pulse oximeter, and blood pressure, pulse rate, respiratory rate and level of consciousness are noted and recorded.

In addition to these routine vital sign checks, the patient is evaluated for stability of the surgical area. For example, a patient who underwent reconstruction of a leg artery (femoral-popliteal bypass graft) would have pulses frequently examined with the help of a doppler instrument (gives an audible signal) in the PACU, as the first few hours are the most likely time when the graft might clot off. Patients who have undergone tissue flap rotations from plastic reconstruction will have the color of the flap assessed frequently, as failure due to inadequate blood supply once again will occur early -- in the PACU. All bandages are checked at regular intervals in the PACU for bleeding, as are surgical drains (for volume of output).

If a chest tube, for example, keeps producing a couple of hundred cc's of blood per hour in the PACU after a thoracotomy for a lung resection, the PACU nurse would call the thoracic surgeon who almost certainly would take his patient back to the operating room and search for the uncontrolled bleeding. If a patient underwent a craniotomy (exploration of the brain) for tumor, aneurysm, etc. and developed a dilated pupil on one side after surgery, the neurosurgeon would be notified and would assume excessive intracranial pressure from swelling or bleeding was the culprit. If medication (steroids) didn't solve the problem, the patient would return to the OR for a re-exploration.

For the more fortunate -- who travel the route from surgery to the hospital's surgical floor much more frequently -- the next step (after

PACU) is the surgical floor, or a 'step-down' unit, also known as an 'intermediate care' area. On the floor the patient is seen by a nurse and her assistants a few times a day as all activities of daily living are resumed. In intermediate care, monitoring of many of the same vital functions followed in the PACU (EKG, oxygen saturation, BP, pulse, respiratory rate) is continued until the patient is deemed stable enough to be sent to a regular floor, or an unmonitored bed on the same floor. The next step is home.

Over twenty million surgical procedures are performed in the U.S. each year. A majority of well-trained surgeons carry out this workload efficiently and in cooperation with the other members of the operating room team. *Primma donnas* will always punctuate the ranks of surgical specialties, favoring cardiac, thoracic and neurosurgery.

Surgeons rank high among professionals who must perform before their 'public' every day without failing. The culture of the operating room is unique because it is not an exaggeration that death rides the shoulders of the participants and complications remain an insoluble problem. Besides, nobody is perfect.

But, unlike their professional sports alter egos, surgeons don't have 'next year' to correct their mishaps. Everything counts and the score can't be taken off the scoreboard.