

A Guide To Designing The
Elegant Dental Or Medical Office...
THE LARGEST MARKETING TOOL
OF YOUR CAREER

By MARK THOLEN, DDS, MBA

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Introduction

WHAT, ME WORRY?

Why should you be concerned with the design of your office and the ergonomics of the clinical treatment room or operator? Ergonomics is a great buzzword, but not many doctors are energized by it.

Too bad.

Because paying attention to *designing a functional and esthetic office while establishing an ergonomic environment in the clinical treatment room or operator can dramatically enhance your productivity and physical well-being, making you feel much more relaxed and refreshed at the end of the work day.* So, how do you create this ideal office?

Read on.

The objective of this book is to assist you in defining the magnitude and character of your office project. What is the optimal size of the office to meet the objectives of your practice? How many clinical treatment rooms or operatories does your practice require? How will you manage the integration of technology into the design while planning for future technological developments? How do you create an esthetic design effect that has specific purposes? That is, how is the esthetic statement of your office design conveyed to the patient so that the patient associates your physical office with their quality of care? What are the major common mistakes in designing a medical or dental office? How do you analyze the quality and functionality of a floor plan? These are all questions that help define your project and they will be answered in the following pages. As the ultimate manager of your project, because you are paying for it, the key to completing a successful office project is: 1) know the questions which must be addressed and, 2) ask them in a timely manner. Note that *you* do not need to supply the answers...that is the function of the team of designers and contractors that you assemble.

Major principles of design are applicable to all dental and medical practitioners whether you are in general practice or a specialty. There are obviously some differences in office design for a general dental practice as opposed to a medical specialty such as ophthalmology, but the principles of office design and planning are a common denominator.

The actual initiation of the project and its financing are often the two most prominent obstacles facing the doctor. However, in determining the cost of the project, you must be able to describe the magnitude and character of the project, and that is the objective of this text. That said, a defined practice management style should be in place in your practice prior to the design of the office. If you are in general practice, is there a focus such as a wellness medical practice or a cosmetic dental practice? If you have a specialty, is there an area of interest or subspecialty? How many patients do you see each day? What is the turnover rate of the clinical treatment rooms or operatories? Do you want to increase or decrease these numbers in your new office? Do you want greater production, i.e. revenue? How many front desk staff do you have? Is this number sufficient or excessive? Ask the same questions about your clinical staff. Is your information system paper based, i.e. appointing, accounting, recall system, lab results, radiology, and other diagnostics?

The answers to these questions will characterize your management style and methods. *These methods and style, otherwise known as management principles, will drive the design of your office to enhance productivity and reduce stress.* Rather than waiting until the last picture is hung to communicate with the practice management consultant, it is recommended that you work with a consultant from the onset of the project. Management principles should drive the design of the office, and because of this fact the practice management consultant should be present at the nascent stages of the project. One of the most egregious errors that you can commit is to first design your business area and then try to maximize your management within that defined area.

The design must revolve around the management systems in your office from information systems to financial systems to diagnostic/therapeutic modalities. Once you have delineated and established your systems, you will be able to use the variables to determine the scope of your business area, how to plan for future expansion of this area, how your appointing systems will operate, and where records will be stored. While performing these preliminary tasks, it is imperative that you are constantly reminded of the paramount tenet in your office design: *management style and procedure drive the design of the office.*

Chapter I

DEFINING YOUR PROJECT

SETTING THE FOUNDATION OF THE PROJECT

Even though this project that you are considering involves brick and mortar, it is actually an exercise in marketing. Yes, you will be practicing in the facility and treating patients, but the environment of the office will speak as loudly to the patients as any of your staff...and even as loudly as your presence with new patients. Patients, especially patients new to the practice, gauge or determine the level of care they receive by assessing the quality of the office environment. Don't believe it? Keep this concept in mind the next time you are a patient of an unfamiliar doctor. Non-verbal communication is very powerful in new or unusual environments. *You have no choice in that your office will speak to patients, but you have the choice as to what will be said.* Regardless of your ability, your success does not depend on your dental or medical diagnostic and treatment skills, but rather your perceived competence as viewed by your patients' perspective.

There are two basic tenets advanced in the above paragraph. First, if you accept the concept that the office, among other things, is a communication tool, a giant billboard that all of your patients view each time they are treated, then it should be the personification of your "marketing" program.

In fact, it is the marketing program.

Second, success is dependent your patients' perceptions. But what is success? Is it greater production, i.e. dollars, fewer direct patient care hours so that you can spend more time elsewhere, focusing on a subspecialty requiring a special environment, hiring an associate to alleviate the workload, or increasing your income while maintaining your direct patient care hours? These goals will dictate certain design objectives such as the number of clinical treatment rooms or dental operatories. Often, there exists a great disparity between what doctors believe they need to achieve their goals and what is actually required for them to accomplish this achievement.

COMMUNICATING YOUR GOALS AND DREAMS

How do you expect the office to assist in reaching your personal goals? Too many times, when questioned as to why this new office project is being undertaken or as to what the goal of the new facility will be, the response has been, “ I need more exam rooms or operatories.” More clinical treatment rooms or operatories are merely a means to reach your ultimate goal. You must decide how you want your office to look. It is helpful to view your office from your patient’s perspective. Would you rather have a quaint, comfortable looking office or a more awe inspiring and dramatic one that conveys the use of cutting edge knowledge and technology? Know your goals because they will undoubtedly impact the manner in which your office is designed.

After stating your expectations or goals you will be able to gauge the amount of assistance you will require, the amount of work you will do on your own, the financial commitment you will make to the project, and how much time you are willing to commit to it. Doctors’ involvement can range from total immersion in the project to completely delegating the design of the office to a staff member, spouse, or more appropriately, the designer or architect. Delegation is ideal for a doctor who wants to devote minimal time and or effort to the process, but remember that you are the one practicing in the facility for, on average, the next 20 years. *Request that the designer or architect confer directly with you at the following key decision points in the design process: (1) your definition of the size and components of the office which is expressed through the use of a design program questionnaire (supplied by the designer), (2) your final approval of the floor plan, (3) your characterization of the elements of the interior design and, (4) your acceptance of the final detailed design drawings.* This sequence of events has the potential to satisfy your goals because modifications are almost always needed to meet individual needs and preferences. If accomplished in an orderly fashion by effective leadership of the designer/architect and yourself, the client, this method of project development will decrease your design costs, reduce your construction costs, and result in an office that you ‘had in your head’ as you began the process.

Defining the character of the office includes establishing a ‘wish-list’ or a laundry list of items/equipment you want to employ and procedures/events that you want to occur in your facility; make certain that this list is in writing and submitted to the architect. Many architects will typically refer to this document as a design program questionnaire, and some will even have one prepared for the doctor to complete. Without the design program, an architect can always design “something”, but this “something” may not coincide with your goals and dreams. If the design program is written as opposed

to verbally communicated to an architect or designer, the architect or designer will have a much clearer vision as to what is to be accomplished, and more importantly, they will have your goals and dreams.

You and the designer or architect become committed to your ideas by intentionally enumerating your thoughts on paper. This step of (you or the architect) drafting your office design desires is vital to the uniform and daily progress of the project.

FORM FOLLOWS FUNCTION...RIGHT?

There are two basic office design criteria that should be foremost in your mind as you begin: office function and office image. Function, i.e. how is the office going to work? This is a dental or medical office, and before everything else and above everything else, it must function effectively to provide quality treatment to patients while minimizing the physical and emotional stress to the staff. It sounds simple, but there are innumerable things that can impede you from treating patients well. Image is the eye candy, the elegance factor. A very simple formula that is critical to your success involves the equation stated such that the functional dollars of the project plus the image dollars will equal the degree of success that you have in reaching your goals and building your practice. *Focus and concentrate on*

Fig. 1-1a



the functional aspects of the office design and establish them, then layer the elements of image or aesthetics onto the functional aspects of the office design.

A common misconception is that a well appointed office costs a great deal more than a relatively plain, simple office. In fact, it is just plain costly to build any technologically driven diagnostic and therapeutic dental or medical office. You are going to make an investment in your professional office, unlike your car or house, because you expect a return on an investment. And if properly designed and constructed in an acceptable location, your office will probably yield more financial return than any other investment made in your life. Unfortunately, dental (and to a lesser degree, medical) offices are far more costly to construct than almost any other type of office. First of all, there are many rooms confined to a relatively small space. The rooms are smaller and, as a result, there is much more framing, sheet rock labor, and many more outlets. A typical five operator office has between 80 and 100 outlets while a 2500 square foot accounting office might have 20 outlets. This plethora of outlets begets a tremendous amount of electrical work and this, of course, is accompanied by extensive plumbing and the resulting stratospheric costs.

Before the appearance of the office is considered you have already invested a considerable amount in the aforementioned physical elements of the office. The remainder of your financial resources will then determine the office's image. In order to create a minimally acceptable appearance for the office, it is necessary to invest \$10 to \$15 per square foot for interior design elements such as crown molding or wall coverings which, in a lease space, might represent between 10-15% of the actually building cost. However, if you were to invest \$25-30 per square foot you will enjoy an office that emits a strong statement concerning the quality of care in a particular space "(Figs 1-1a & b; 1-1a makes a positive design statement while 1-1b is an older outdated design). Many believe that offices with this degree of investment in their image simply have sacrificed something pertaining to function, but this is simply false. Do not succumb to this fallible reasoning and begin to make imprudent judgements such as "Oh I can't have that, I don't want that", or "People in my town won't like that".



QUALITY COUNTS

Why would you not want to make a statement of quality to patients from the instant they walk into your office (Fig. 1-2)? Marketing surveys have been conducted as to how patients assess the quality of healthcare they receive. In these surveys, patients in a number of facilities were asked to rate the quality of care they would expect to receive, based on a scale from one to ten, according to their observations of a particular health care facility. The highest rating any facility received was fifty percent. In other words, patients from a wide spectrum of income levels and facility experiences expected, at best, only mediocre care. It is tragic that people must walk into medical and dental offices and, because of what they see, expect mediocrity.

Fig. 1-2



Patients base their expectations of care on those items they can judge: furniture, artwork, and posters. *Message to all practices: Get rid of the posters!* Nobody enjoys looking at posters, advertisements, and things lacking in visual appeal. Give the patients something aesthetically placating to view. The patients in these surveys also commented that the furniture in the offices appeared to come from a second hand store or a basement. Clutter was another condition for which the patients voiced disdain; it dramatically lowers the patient's opinion regarding the level of care they receive. It is important to take notice of these items... because your patients most certainly will.

The key to success of the practice is congruency. You must be congruent and consistent in everything you do, say, and display to your patients. *The function and esthetics of your office must be consistent and congruent with the treatment you propose and deliver to your patients.* In other words, your environment must reflect who you are as a practitioner.

Success will follow.

Therefore, posing the question whether your *practice can support a new office* is not the manner in which the project should be approached. Indeed, the question should be whether *a new office will support your practice.* The facility must support the practice in order that your life and professional goals are achieved; it is a vehicle for success. The office must support the growth of the business, the practice, and you as a professional, or it is the wrong design. The office, as the marketing centerpiece, should facilitate the functioning of the practice with a significant increase in productivity.

CHAPTER I—WHAT’S THE BIG IDEA?

- Designing a functional and esthetic office while establishing an ergonomic environment in the clinical treatment room or operatory can dramatically enhance your productivity.
- You have no choice in that your office will speak to patients, but you have the choice as to what will be said.
- Focus and concentrate on the functional aspects of the office design and establish them, then layer the elements of image or aesthetics onto the functional aspects of the office design.
- The function and esthetics of your office must be consistent and congruent with the treatment you propose and deliver to your patients.
- Questioning whether your practice can support a new office is not the manner in which the project should be approached. Indeed, the question should be whether a new office will support your practice.

Chapter II

PRINCIPLES OF FLOOR PLANNING

ESSENTIAL ELEMENTS OF THE FLOOR PLAN

The floor plan is foundation of the architectural design and the floor plan will determine the functionality of your office; the floor plan will determine the underlying efficiency of the office, the degree of emotional and physical stress endured by the staff, and the productivity of the office.

Don't skimp on the floor plan...use an architect or designer who is familiar with dental or medical office design. Do not select services that use "canned" programs because they do not understand the function and image aspects of design.

Function is expressed architecturally through the use of a tool termed zoning. Zoning will group functionally similar areas together into uninterrupted contiguous units or zones. Well trained designers, that is, architects and interior designers, are all professionally degreed and trained to fully comprehend the different functional zones in any facility that is designed and built; this is true in hospital, airport, high rise, hotel, and even dental/medical office designing. Your designers will not specifically know the zones of the professional office unless they have designed many medical or dental offices. The novice designers will be unaware of these zones and will rely on you or someone else to educate them as to the locations of the functional zones. There are three primary zones: the Staff Zone, the Public Zone, and the Clinical Zone (Fig.2-1). The first step in reducing your stress and that of your staff involves creating individual zones, unified and uninterrupted zones: Staff Zone, Public Zone, and Clinical Zone. With the Staff Zone it is permissible to separate elements of the zone, i.e, all elements are not contiguous; it is not absolutely essential in terms of reducing stress. However, if you want to reduce the level of stress incurred by your staff, it is absolutely essential to have all elements of the Public and Clinical Zones grouped within their respective zones.

The second step in reducing stress is to have as little interface as possible between the Public and Clinical Zones. In order to achieve this objective, you must construct an eight to ten foot long corridor that is four and a half to five feet wide depending on the facility that connects the Public and Clinical

Zones (Fig. 2-2 cross hatched area). If the trunk corridor is shorter than eight to ten feet you are going to encounter problems of patient flow and zone overlap.

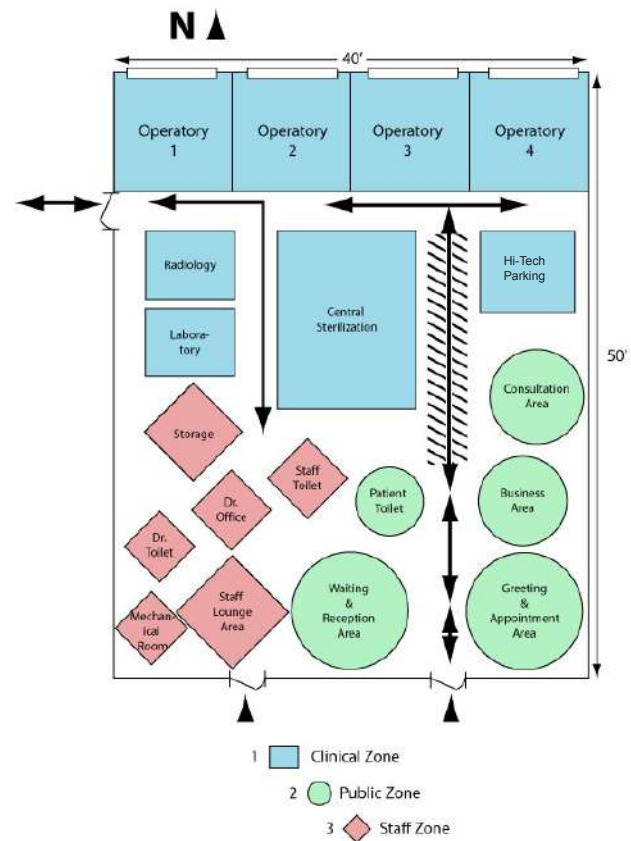
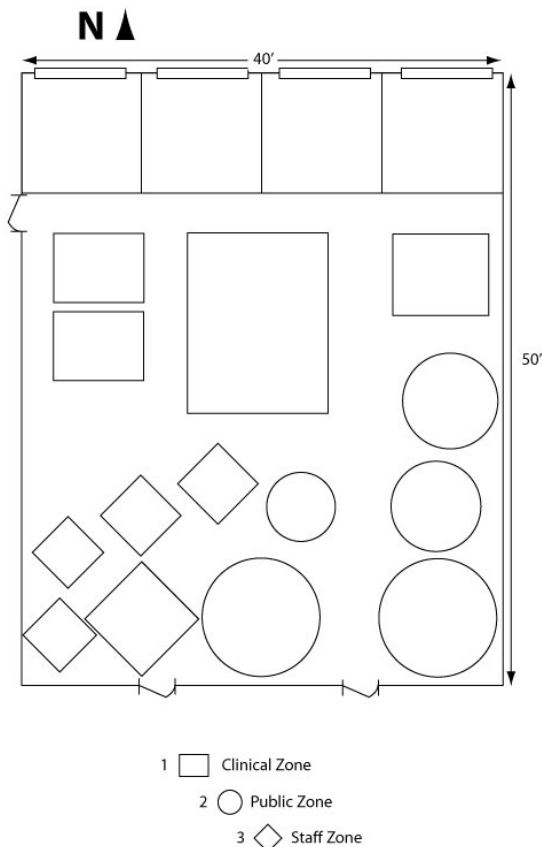
CONSTRUCTING THE FLOOR PLAN

Let's consider a typical space for a four operator office that covers around 2000 square feet: forty feet wide by fifty feet long. North is, by far, the most desirable location for windowed operatories, but this is not because of any clinical considerations. Temperature and heat can be controlled more efficiently with windows oriented in a northerly direction. The sun will not shine directly into these windows, and unless there is a sidewalk or parking lot immediately adjacent to the northern windows, window treatments will not be needed. With windows facing north, you have a near-certain chance of actually being able to control your Clinical Zone environment temperature.

Occasionally you will not be able to place windowed operatories or clinical treatment rooms on the north wall. If this is the situation, placing windows on the east side offers the best alternative. Of course, windows facing east will present a potential lighting and heating problem in the morning, so it

Fig. 2-1

Fig. 2-2





may be necessary to have window treatments to deflect the morning sun. Morning sun is not as harsh as midday or afternoon sun, but you will still require window treatments. Depending on the time of year, after 9:30 to 11:30 in the morning, you can retract the blinds on the east side and enjoy essentially the same light intensity as the northern exposure.

A southern exposure for treatment rooms/operatories is difficult regardless of your location. Geography makes no difference (in the northern hemisphere!); the winter sun has a low trajectory and will penetrate the southern exposure windows. In order to deal with this problem, it may be necessary to extend the roof eaves six to eight feet in order to prevent the sun from entering the southerly windows. Dealing with winter sun on the southern exposure can be difficult because the radiant heating in the operatories or clinical treatment rooms create an imbalance of heating throughout the office. On some occasions, you may feel the need to turn on the air conditioner in January... even in Iowa! The summer sun does not create such a significant problem with windows of a southern exposure because it shines directly overhead. It is possible that the sun may penetrate a short distance into the clinical treatment room or dental operatory floor at noon, but that is entirely manageable. If you are constructing a new building, it will be possible to avoid a southern or western operatory orientation. If leasing a space, your options may be limited to placing devices on the exterior of the building in order to mitigate the penetrating sun.

A westerly orientation for the treatment rooms/operatories is very undesirable because the sun will enter the rooms year round in the afternoon. Many doctors with operatories facing west are compelled to relocate because of the uncontrollable heat in the facility. There are some ways to deal with the heat: zone the office into at least two different HVAC zones with one ton of air conditioning for every 250 square feet and/or employ pin-holed perforated window shades (Fig. 2-3).

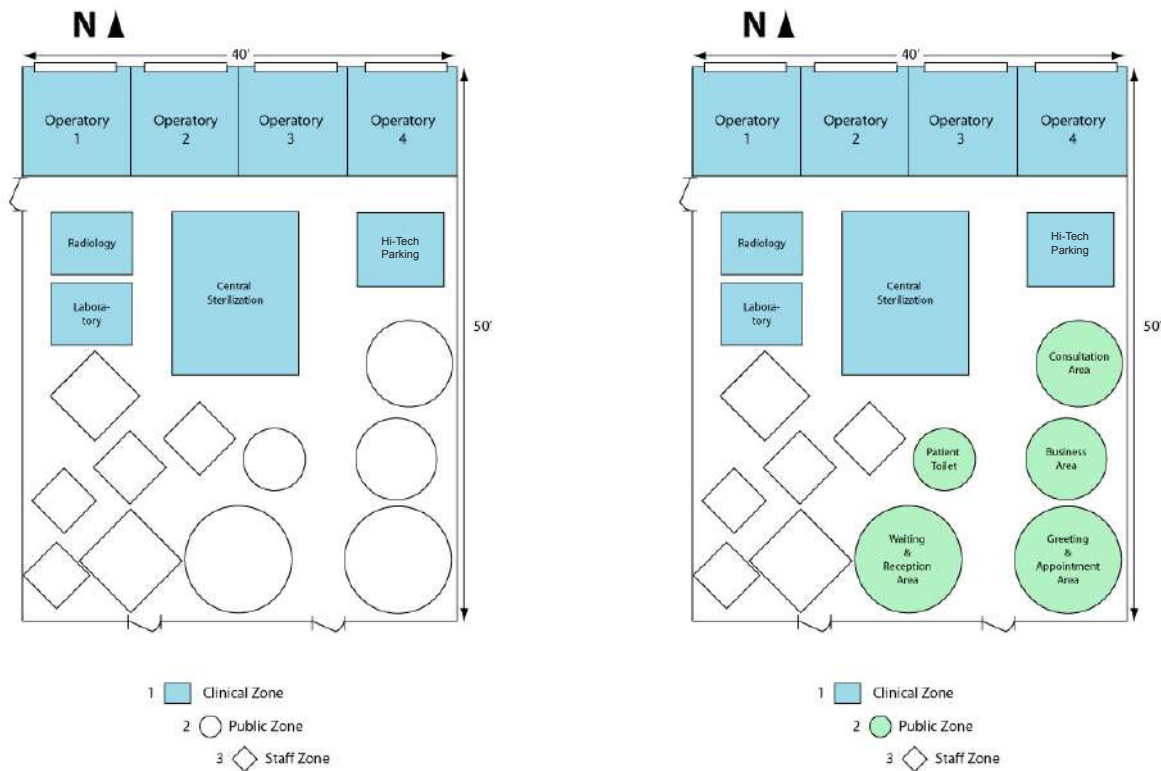
Other elements of the Clinical Zone include the laboratory, radiography, central sterilization, and the high technology parking lot for items such as lasers and endodontic carts (Fig. 2-4). The placement and size and design of these areas will be discussed in the Chapter IV.

The second zone to be addressed is the Public Zone. With all areas of the zone grouped together to promote productivity and reduce emotional and functional stress, the zone includes the business area, waiting area, consultation room, patient restroom, and patient cloakroom (Fig. 2-5).

Finally, there is the Staff Zone, again, all areas of the zone should be grouped together. Elements of the Staff Zone include the doctor's office and toilet, staff lounge and toilet/changing room, mechanical room, and storage room (Fig. 2-6). However, as it was stated earlier, Staff Zone areas do not

Fig. 2-4

Fig. 2-5



necessarily need to be grouped together. Situations do occur in which the doctor's office, mechanical room, or storage room simply fit better in another area of the office. It is acceptable to divide the zone into two groups provided that the waiting area does not need to be traversed. The fracturing of this single (Private) zone will not compromise the functionality of the office and the floor plan.

It is absolutely necessary to create two entrances to the office: one for the staff and one for the patients. You do not want to walk through the waiting room where the punctual patients are waiting for their dilatory doctor or staff! Characteristically, the staff lounge is not used very often, other than for lunch and breaks, so it can be used as an entry and exit corridor. If a staff entrance cannot be created into the staff lounge, one may be created at the end of the clinical treatment room or dental operator corridor or through the lab (Fig. 2-7 see arrows). The lab may not be optimal location, but it is better than creating another corridor. Using this technique, you will not construct an extraneous corridor and you will conserve space.

CONSEQUENCES OF IGNORING ZONING PRINCIPLES

Ignore the principle of maintaining the integrity of each zone at your own risk. The physical and emotional stress of the staff will increase and productivity will suffer as the principles of design are not employed.

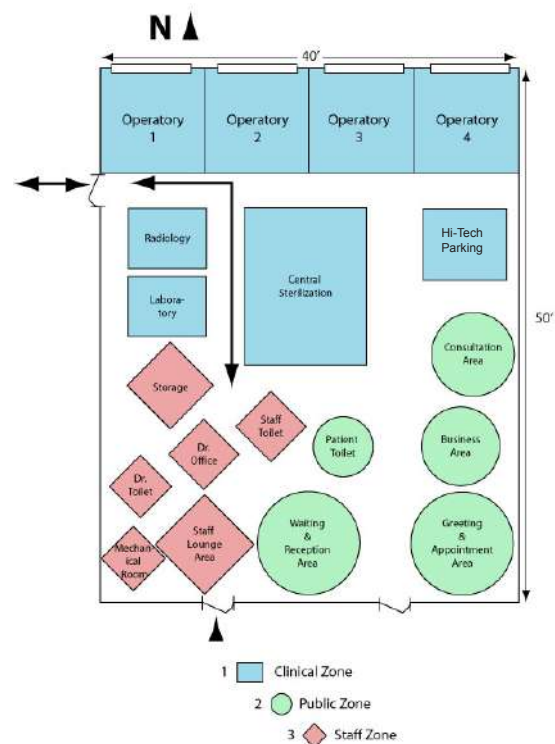
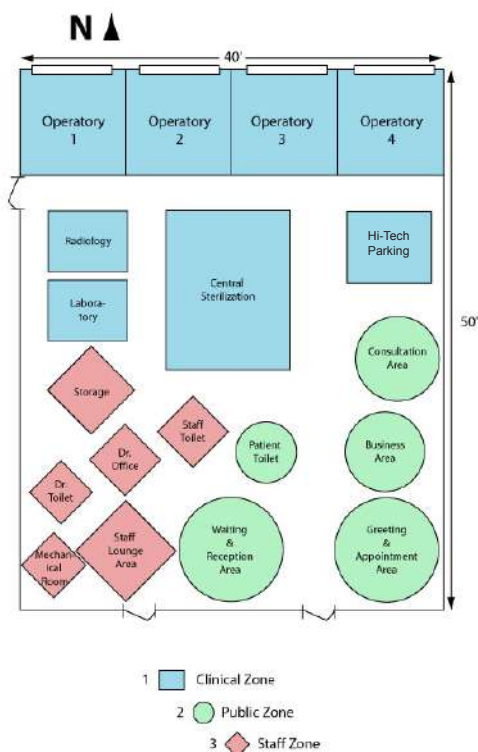
There are innumerable examples of zoning violations, but several of the common zoning violations will be reviewed so that the consequences can be illustrated. Incorrectly zoning the consultation room, or ignoring the need for a consultation room, is a fairly common violation. This error begins with the doctor telling the design team he or she wants the consultation room near the dental operatories or clinical treatment rooms because it is assumed that, if the doctor is treating a patient, he or she can conveniently step across the hall for the consultation.

Far removed from the reception and business areas, the consultation room is very inconvenient for the staff to use as a location for discussion of financial arrangements with the patient. In reality, even in a busy practice the doctor will generally speak with one patient daily (22 new patients monthly), but the office staff will require the use of a private or semi-private consultation room to discuss financial arrangements 3 to 4 times daily. A busy practice means a busy front desk and business area, and the staff will not use an inconveniently placed, distant consultation room. It is inconvenient and the staff must leave the reception or business area unattended; this poor configuration of the office results in increased staff stress.

Productivity also suffers because planned treatment is not performed. When a patient needs to make payment arrangements after the treatment plan has been presented and accepted, the doctor is not involved in these situations, but the patient will require a private area to discuss the personal subject of finances. Management consultants will confirm that a business staff will seldom utilize the consultation room if it is inconvenient. As a result, poor financial arrangements will occur or, worse, the patient will decline treatment because the busy staff has not ushered the ‘financially challenged’ patient to a location where they can comfortably discuss their financial situation. Imagine a scenario in which business staff, in an open appointment area, inform the patient that the fee for the total treatment will be four thousand dollars. When the staff person suggests a payment plan that is beyond the ability of the patient to pay, the patient will be too uncomfortable in the public environment to object to the payment schedule. When a patient is aware that people in the waiting room are able to hear the entire exchange concerning financial arrangements, the patient is not going to say “No, I can’t afford that.” Instead, the patient will say, “Well, okay, I guess I can do that,” thinking the entire time, “There is no way I can possibly do that.” The patient will accept the plan, make the treatment appointment/s, leave the office, and call within one to

Fig. 2-6

Fig. 2-7



two days to cancel the treatment. The patient wants to escape from the potentially embarrassing situation as quickly as possible so the arrangements are made and the appointment is scheduled.

If the consultation room were convenient and the business staff had utilized area to discuss financial arrangements, the patient would have said, “There is no way I can afford one thousand dollars a month. Isn’t there some other way we can do it?” The business person could then offer to call the bank and formulate a feasible payment plan. *The existence and location of the consultation room is very important to the financial health of your practice.*

ALL CLINICAL TREATMENT ROOMS OR DENTAL OPERATORIES ARE EQUAL

Another common design error involves designating the function of specific clinical treatment rooms or operatories: the surgery suite, the bleaching operator, the hygiene operator. Limiting the function of certain clinical treatment rooms diminishes the flexibility of the treatment capabilities of the practice and increases the stress of the staff. Important treatment may need to be delayed because a particular room is not available, so the patient is unhappy and the staff is stressed. The treatment staff is also stressed because they are constantly pressured to turn over the clinical treatment rooms or dental operatories in demand.

In order to remove this stress and increase productivity, we need to ask what defines a particular treatment area. Of course the answer is that the equipment in the room defines the function. In a dental practice, there are usually operatories designated as hygiene operatories. Generally, these rooms are the windowless operatories with all the old dental equipment! The doctor will not work there so it is called the hygiene operator. This functional designation of treatment rooms will dramatically and adversely affect productivity. A well designed hygiene operator will be similar in size to other dental operatories and should have essentially the same equipment. *Therefore, a central tenet of zoning and design is that all dental operatories or clinical treatment rooms should be designed and equipped the same, thereby easily reducing stress.* This not only reduces the doctor’s stress, but it also relieves stress from the person scheduling the appointments. They no longer think, “Can the doctor perform three procedures back to back? We cannot schedule these procedures because we will never get the room turned over in time.” If you do not have the flexibility to move seamlessly from operator to operator, productivity will suffer and staff stress will increase. Any clinical treatment room, including the hygiene operator, is defined by the instrumentation in a tray, pack, and/or a tub. You can change the function of a room from one procedure to the next if the clinical treatment rooms are identical in design and equipment placement.

Without designation of specific treatment rooms for specific functions, staff and patient ‘traffic jams’ are immediately eliminated. The absence of traffic will reduce stress. For example, in a dental practice, when the hygienist finishes her treatment of the patient, the doctor will examine that patient. If the hygiene operator is not an integral and contiguous part of the Clinical Zone, and the Clinical Zone is not separated from the Public Zone by a trunk corridor buffer, the doctor will be frequently interrupted, distracted, and delayed as he or she walks to the hygiene operator. Keep the hygiene operator, which is just another operator and clinical treatment room, in the Clinical Zone.

Another common zoning violation involves placing computers in the operatories or treatment rooms to conduct business and financial transactions. This design configuration results in overlapping or co-mingled Public and Clinical Zones. This design will cost entirely too much because the room cannot be cleaned and prepared until the patient has departed. A very expensive area is being occupied with a task that could be accomplished easily in the consultation or business area. Usually, when patients are appointed in the clinical treatment room or operator, the appointment desk area of the practice is small and congested with patients. Consider appointing patients at an appointment desk with sufficient space or at an assistant station outside of the clinical treatment room (Fig. 2-8). Of course, this practice would require a treatment or clinical corridor of sufficient width (see Chapter V).

Fig. 2-8



HOW MANY CLINICAL TREATMENT ROOMS OR DENTAL OPERATORIES ARE RIGHT FOR YOU?

Determining the correct number of clinical treatment rooms for the current and future needs of a practice is critical to its functionality, i.e. reduction of staff stress and maximization of productivity. As a general rule, a dental practice with one doctor and dental hygienist should have four operatories in order to maintain a fairly stress free schedule. However, the number of patients seen in a day will ultimately dictate the number of operatories needed. A practice treating only six patients could probably manage with just three operatories because, obviously, there are some very long appointments and few room changes. A typical dental practice may have eight to twelve patients a day for the doctor; this number of patients will create a number of room turnovers such that if the slightest obstacle is encountered, the staff will fall behind schedule. Consider a circumstance in which there is an office with three operatories for a doctor and dental hygienist. The doctor is having difficulty with a surgery patient in one operatory, the hygiene patient is ready for an exam, another patient in the third operatory has been anesthetized in anticipation of treatment, and the doctor is informed that an endodontic patient treated yesterday is in severe pain and is in the reception area... crying.

Now what happens?

Besides your blood pressure rising to dangerous levels?

Shuffle patients, scurry, tension rising for you and your staff as it is apparent it will be necessary to work through the lunch break...again. Most doctors will end up forfeiting half the production for that day and will never recover that revenue. Therefore, this is a very expensive experience. The obvious solution to resolve this problem is to construct four dental operatories. With a fourth operatory, it is possible to treat the emergency patient at your convenience.

If all clinical treatment rooms or operatories are scheduled constantly with patients, then something is very wrong with the practice; there is either poor scheduling or a lack of clinical treatment rooms. A four operatory dental office with one doctor and one hygienist will experience a vacant operatory approximately fifty percent of the day, and it is this flexibility that the fourth operatory affords that results in reduced stress and increased productivity. *This seemingly paradoxical concept of the open or unoccupied clinical treatment room increasing productivity is valid in virtually any medical or dental practice.*

Now consider a situation in which there are two doctors, two hygienists, and six operatories. Six rooms may not be an adequate number because all rooms could easily be occupied and this would

leave no rooms for an emergency or an unscheduled situation. However, a six operator office may prove sufficient for a doctor who sees one to two patients a day and has an associate who treats a normal general practice load. A six operator office may also facilitate a practice with one doctor, two hygienists, and expanded duties assistants.

A seven operator office is usually optimal for a two doctor and two hygienist practice. *If you are considering more than seven operatories or clinical treatment rooms, remember that you will eventually sell the office and that you will limit the number of potential buyers with a larger office. A word of wisdom: investigate split schedules.*

The number of clinical treatment rooms is critical to the management of staff stress and productivity; it is also a decision that will to a large degree determine the size of many other supporting areas such as the sterilization area and the reception and waiting room. With the determination of the number of needed treatment rooms, do not neglect the principle of designing and equipping the rooms identically. Designing the rooms similarly will offer limited benefits if these rooms have varying equipment with varying dimensions. For example, dental chairs that are too thick, too wide, or plainly too difficult to address the patient ergonomically will negate the benefits of a well designed operator. Inability to comfortably address the patient in the dental chair will predispose the doctor's attitude about working in that particular operator. Eventually, the doctor will stop scheduling appointments in the dental operator. The obvious answer is to discard the dental chair because it will cost you a fortune in opportunity cost to keep it. Similarly, a poorly placed medical exam table that restricts the movement or position of the physician or nurse is a constant source of aggravation; the exam table should be completely adjustable so that the height may be altered as well as rotated or canted. Office design is critical, but poorly designed equipment will mask the potential productivity of the practice. Please refer to Chapter III for suggestions concerning dental equipment design. Note that items such dental chairs and delivery systems are key to productivity.

ALL CLINICAL TREATMENT ROOMS ARE EQUIPPED IDENTICALLY

Major equipment in the clinical treatment room or operator should be identical in order to optimize productivity and minimize stress. Do not confuse equipment with instrumentation; equipment, for the most part, is fixed and relatively immobile while instrumentation is delivered to the treatment room for a particular procedure in cassettes, trays, or tubs. In general, the instrumentation delivered for the procedure will determine the function of the treatment room at that particular moment. For the

dental practice, the most important operatory element is that all delivery systems be identical from one operatory to the other. Next in importance are the operating lights and dental chairs; desirable characteristics for each will be addressed in the sections on operatory design and lighting, respectively. However, it will be stated here that the most desirable operating light is the track light, followed by the chair mounted light, with the fixed ceiling mounted operating light as the least desirable. Reasons for this suggested order can be found in the lighting section at the end of this Chapter. Dental periapical radiographic units, if placed in each operatory, should be located behind the head of the patient at the twelve o'clock. This positioning has been confirmed by dental radiologists at many universities because units oriented in this manner result in fewer periapical retakes (repeated radiographs) than units positioned on side walls. There are still many items in the operatory that must share the same design: common locations for sinks, countertops, and entries in each room. If you adhere to this advice, you will minimize stress and maximize productivity.

Also, you will discover in the properly designed office that there is an open clinical treatment room or dental operatory approximately fifty percent of the time. This open treatment room is a hallmark of proper planning. With this proper planning, you will reduce stress, increase productivity, and enhance the enjoyment of your daily life.

LIGHTING...ELEGANCE FOR PENNIES

How is effective, accentuating, elegant lighting created in certain restaurants, art galleries, churches, and even dental or medical facilities? Are certain projects lucky enough to have an architect or interior designer on the job site? Do you 'fortunately' find a talented electrical contractor who has great taste? How does it happen that you would meticulously consider the floor plan, carefully select all the furniture, finishes (wall coverings and flooring), and artwork for the office, but the completed facility results in an ambiance that is 'o.k.'? What is the difference between a 'nice' office and a beautiful office?

Lighting.

Light invites people into a space. It gives them permission to enter. It draws people to itself. Light has powerful subliminal messages of invitation, trust, and competence that can be effectively communicated, throughout the office, to the patients. Think about the possibilities: light spilling from the clinical treatment rooms or operatories into the clinical treatment corridor (Fig. 2-9), elegant pendant lighting in the consultation room (Fig. 2-10), or light accentuating technology such as radiographic units (Fig. 2-11). *In other words, use lighting to create an effect that has a purpose.*

And all of this can be obtained for approximately six to seven dollars per square foot. *There is no other component of the office that can make such a dramatic statement to your patients for such a small expenditure; lighting is the greatest interior design value of the office!* So, how is wonderful value realized?

Read on.

HAVE I MENTIONED PLANNING?

Like the rest of the office, great lighting does not just happen. The general contractor or the electrician should not (hopefully) ‘make it up’ as the building is constructed (actually, this happens

Fig. 2-9

Fig. 2-10



with regularity and it is the reason that many offices have a very mediocre appearance). *Office lighting that has a purposeful effect on the patients is created with a lighting plan.* The lighting plan is a separate component/page of the architectural plans that includes a drawing with a legend indicating the location of each light. The legend or schedule that accompanies the drawing describes the type of each light fixture, the color correction factor, the wattage of the light, the manufacturer, and other arcane factors. However, it is these arcane factors that create the beautiful mosaic of light in the office. *Insist on a lighting plan for your office during the planning process. Do not allow the lighting plan to state that lighting fixtures will be selected by the contractor!*



Lighting requirements in the medical or dental office are different than that of an accounting or legal office. Typically, in the non-healthcare office environment, approximately 20 electrical outlets are needed in a 2000 square foot facility, but in a similarly sized dental office, 80 outlets are required. Also, there are different types of lighting required in clinical treatment rooms, varying by specialties, that may require color correction. For example, an ophthalmologist will require a different lighting plan in the eye lane (treatment room) than a physician in general practice. Similarly, most dental practices will require a very different lighting scheme in the operatory than that of any medical practice.

Typically, lighting can be divided into two classes in the healthcare oriented office: clinical treatment room or operatory lighting and non-clinical area illumination. General illumination of these non-clinical areas will be accomplished with lighting of specific intensities and textures passing through one of two types of lenses. The parabolic lens, manufactured in a variety of sizes from one-half inch to

Fig. 2-12



Fig. 2-13



Fig. 2-14



six inches, will focus light down to specific areas; this lens is used in spaces such as the business area (Fig. 2-12). The prismatic lens, however, is used for general lighting in spaces that require a diffused or scattered light, that is, any area in which people are to be invited. The operatory is an example of the use of general lighting with the prismatic lens accented with a focused light from an additional source such as the side valence over the side cabinet (Fig. 2-13).

Other general lighting can be used to accent specific areas of the office. Up-lighting can be employed to display the architecture of the ceiling (Fig. 2-14) or down-lighting can be used on headers in the trunk corridor (Fig. 2-15) and underneath cabinets or counters (Fig. 2-16). In fact, ceiling lighting can be eliminated from certain rooms while effectively using only cabinet lighting (Fig. 2-17).

PREVENTING AFTERNOON EYE STRAIN...EFFECTIVE OPERATORY LIGHTING

How often do you experience eye strain or a headache in the late afternoon? Is this due to the stress of the practice and patient treatment...or is it a function of the lighting in the clinical treatment room or operatory? The general principles of lighting configuration in the clinical treatment room or operatory apply to almost all specialties and the general practice of medicine and dentistry. However, those practices which require great visual acuity, such as dentistry and surgical medical specialties, will benefit most from the principles described here.



Fig. 2-16



Using the dental operatory as an example, there is ambient light and high intensity operating light present in the room. The eyes of the doctor and assistant are constantly required to accommodate to these vastly different light intensities in the course of a single patient and day. The greater the disparity between the light sources, the greater the challenge to the accommodating mechanisms of the eye and the greater the opportunity for eye fatigue and headaches. Therefore, in order to minimize the potential for such eye strain, *the ratio of (foot-candle) intensity of the operating light to the (foot-candle) intensity of the ambient light over the head of the patient should be approximately 10:1* (Fig. 2-18). As the ratio becomes greater than 10:1, the risk of eye strain increases. For example, if the operating light has an intensity of 2500 foot-candles, the ambient laid-in grid lighting above the patient's head should yield about 250 foot candles. Specifically, two side by side laid-in grids, each with four fluorescent, four feet bulbs should be installed (Fig. 2-19). Each of these lights should use prismatic lenses and have a color index of 90 or above. Practically, most people are comfortable with an ambient light intensity of approximately 150 to 175 foot-candles, and many operating lights manufactured today have the capability of delivering 5000 foot-candles. You can 'see' the dilemma taking shape, so ask the question,

Fig. 2-17

Fig. 2-18



Fig. 2-19



Fig. 2-20

Fig. 2-21



“How much light do I need to adequately visualize the operating field?” There are instances in which we can have too much of a good thing, and this is such an instance.

There are several types of operating light configurations; the most desirable operating light is the track light (Fig. 2-20), followed by the chair mounted light, with the fixed ceiling mounted operating light as the least desirable (Fig. 2-21). Track lighting has the greatest flexibility in illuminating different areas of the patient and this lighting configuration does not dictate the exact position of the treatment chair or table. The fixed ceiling mount is the most commonly used configuration, undoubtedly because it is less expensive than track lighting, but you pay for this ‘bargain’ every day in terms of adequate visibility. With the fixed ceiling mounted light, it must be located at a very specific point to provide adequate lighting; it has no flexibility. This configuration dictates the location of the treatment chair or table and does not allow for movement of the table or chair in the reconfiguration of the treatment room or operatory. Side mounted or pole lights offer the same limitations, but to a lesser degree. Also, side or pole mounted lights have a greater tendency to drift from the operating field.

Fig. 2-22





While the suggested operating light candle power to ambient light candle power ratio may or may not be able to be achieved in your office, be aware that you are increasing the stress level of you and your staff as you deviate from this ratio. As a final comment on operatory lighting, side valences (Fig. 2-22) can be used to house two four foot fluorescent bulbs with prismatic lenses to create ambient lighting that will be diffuse and spill into the clinical treatment corridor (Fig. 2-23).

Hopefully, you have the message by now: *no where in the office will you receive such a return on your investment as you will in the creation of an effective lighting plan with a purpose.*

CHAPTER II—WHAT’S THE BIG IDEA?

- The floor plan is foundation of the architectural design and will determine the functionality of your office; the floor plan will determine the underlying efficiency of the office, the degree of emotional and physical stress endured by the staff, and the productivity of the office.
- Function is expressed architecturally through the use of a tool termed zoning. Zoning will group functionally similar areas together into uninterrupted contiguous units or zones.
- There are three primary zones: the Staff Zone, the Public Zone, and the Clinical Zone. The first step in reducing your stress and that of your staff involves creating unified and uninterrupted individual zones: Staff Zone, Public Zone, and Clinical Zone.
- North is the most desirable location for windowed operatories, but this is not because of any clinical considerations. Temperature and heat can be controlled more efficiently with windows oriented in a northerly direction.
- Maintaining the integrity of each zone will decrease the physical and emotional stress of the staff and productivity will increase as the principles of design are employed.
- A central tenet of zoning and design is that all dental operatories or clinical treatment rooms should be designed and equipped the same, thereby easily reducing stress.
- Determining the correct number of clinical treatment rooms for the current and future needs of a practice is critical to its functionality, i.e. reduction of staff stress and maximization of productivity.
- You will discover in the properly designed office that there is an open clinical treatment room or dental operatory approximately fifty percent of the time.
- Use lighting to create an effect that has a purpose.
- There is no other component of the office that can make such a dramatic statement to your patients in such a cost effective manner as purposeful lighting.

Chapter III

DESIGNING THE CLINICAL TREATMENT ROOM OR OPERATORY

CLINICAL ZONE

Especially with operatories or clinical exam/treatment rooms, form follows function because active movement and treatment occurs in these rooms. 'Form follows function' is a time honored phrase in any design process, but most dental and medical offices are designed so that function follows form. Who would argue that traditionally the doctor is encouraged to purchase the desired equipment and cabinetry before planning and designing the facility, and the office is then designed around the equipment?

Hold the phone!

The staff, not the equipment, is the most important thing in the room. The design should revolve around the people and only then should a decision be made as to how to implement the equipment and cabinetry. This process is the true meaning of form follows function. Any surgical or dental bur was not designed because the designer wanted to create a pretty shape, but rather because it will create a chamfer, reduce an occlusal surface, open a contact, or perform an osteotomy. The rotary bur is designed to perform a specific function and it is shaped accordingly. Able designers insist that form must follow function and this principle produces truly beautiful finished products. This principle should also be observed when considering the integration of high tech components into the design of the office. Often, high tech equipment clutters operatories and offices because no thought has been given as to how or when it will function and whether it requires storage in the clinical treatment room or a separate parking space(see Chapter VII for more information on technology planning).

Clinical treatment room or dental operatory circulation must be considered, that is, movement of the doctor, staff, and patient. In terms of design for the medical and dental office, everything that will be described complies with the Health Insurance Portability and Accountability Act or HIPAA. Generally, there is no need to soundproof the operatories or clinical treatment rooms. The key elements of HIPAA include a patient's right to a private conversation (not every conversation, but a private conversation

when it is needed), the need for a secure an electronic database, and a need to secure/ lock patient file cabinets.

OPERATORY ERGONOMICS AND DESIGN

When operatory circulation was initially evaluated ergonomically, dental chairs were placed in a large empty room and the doctors and assistants were requested to approach the chairs, and then their traffic patterns were charted. When the dental personnel were totally unhindered or unobstructed in their movement, they chose the path of least resistance and least distance; a pattern was established that was parallel to the long axis of the dental chair. The subjects tended to travel along these lines or paths parallel to the dental chair over 90% of the time. If this is the pattern in which staff travel, it suggests that people will always choose the path that offers the least resistance and the path that reduces physical stress. This information indicates that walls may be constructed for privacy where people do not travel and where there is no equipment. *Therefore, the logical configuration of the dental operatory is dual rear entry with easy ingress and egress for the individual doctor and assistant (Fig.3-1).*

In order to achieve a non physically damaging work environment, i.e. an ergonomically favorable environment, the dental operatory must be designed with doctor, patient, and assistant in

Fig. 3-1

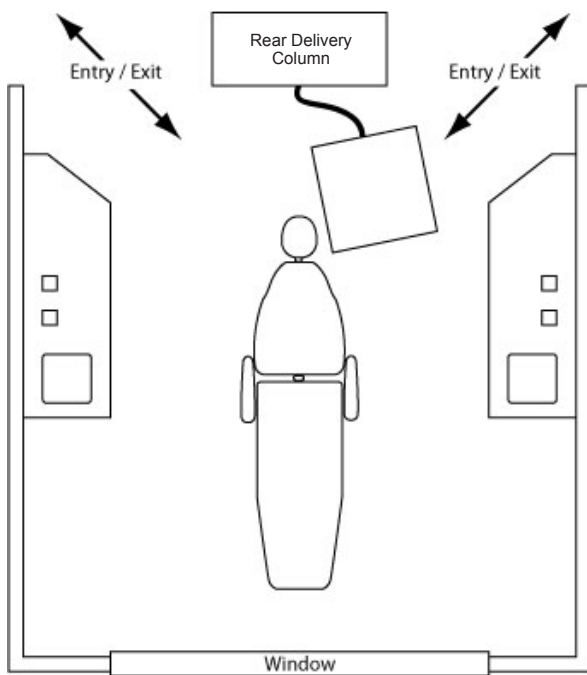
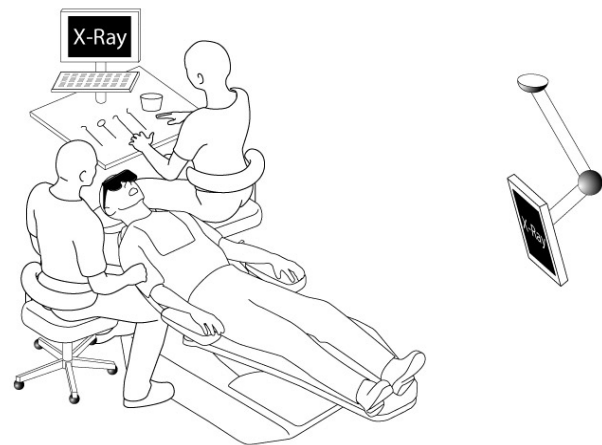


Fig. 3-2



the seated position. That is, the patient is reclined, the doctor is seated at the nine to twelve o'clock position relative to the head of the patient, and the assistant is situated so that her left hip is adjacent to the patient's left shoulder and her eye level is eight inches higher than that of the doctor (Fig.3-2). With this positioning the assistant can visualize the operating field and efficiently pass all instrumentation to the doctor. Instrumentation and materials should be managed and controlled by the assistant with the doctor receiving, using, and referring all equipment and materials to the assistant with "four handed instrument" passing technique. Employing "four handed dentistry" should result in minimal class I, II, and III movements for the doctor during the treatment procedure.

There are five ergonomic classes of movement designed to communicate which movements are desirable and which movements are damaging to the skeleton and musculature. Class one movement is finger only movement. Class two movement involves the wrist and hand. Class three involves the elbow in adduction. Class four involves abduction or elevation of the elbow and shoulder which, on a repetitive basis, can be very damaging and lead to inflammatory joint disease. Class five movements involve rotation of the trunk at the waist and are to be avoided whenever possible.

With the assistant managing and passing all instruments and materials, the operatory should necessarily be designed around physical dimensions and functional movements of the assistant. The objective is to achieve a doctor's range of motion that goes no further than class III movement and an

Fig. 3-3

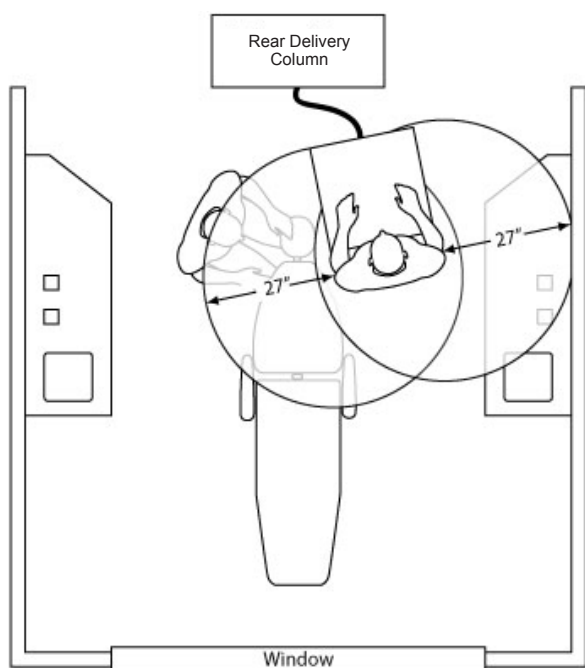


Fig. 3-4

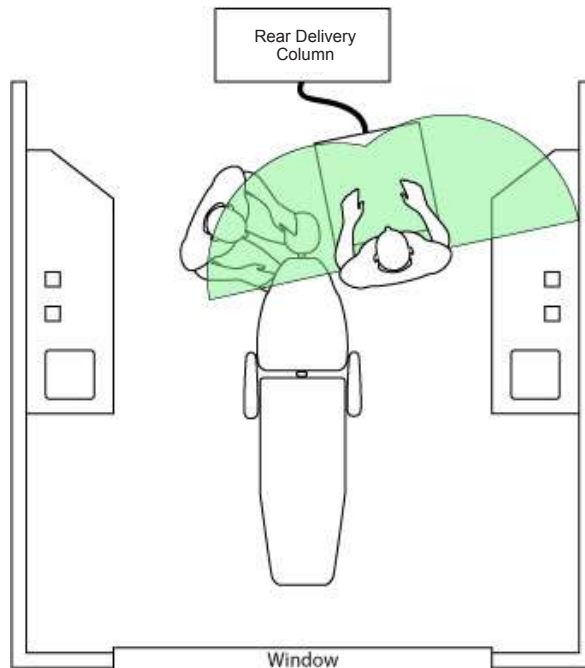


Fig. 3-5a

assistant's range of motion goes no further than class IV during eighty percent of the procedure time. Therefore, the 27 inch reach of the average female, from the shoulder girdle to the wrist, is a key element in operatory dimensions. However, the average reach is 32" with palm and fingers included. This dimension will indicate the placement of instrumentation and materials that are primary and secondary in usage during the dental procedure. With the dental assistant in position beside the patient, two circles can be drawn with a 27 inch radius with the circle centers placed at the assistant's



Fig. 3-5b



shoulders; (Fig.3-3). Any area within the frontal hemispheres of these circles can be reached with a class IV movement; this is the desirable location for all procedures, specific equipment, and materials which the dental or surgical assistant will access.

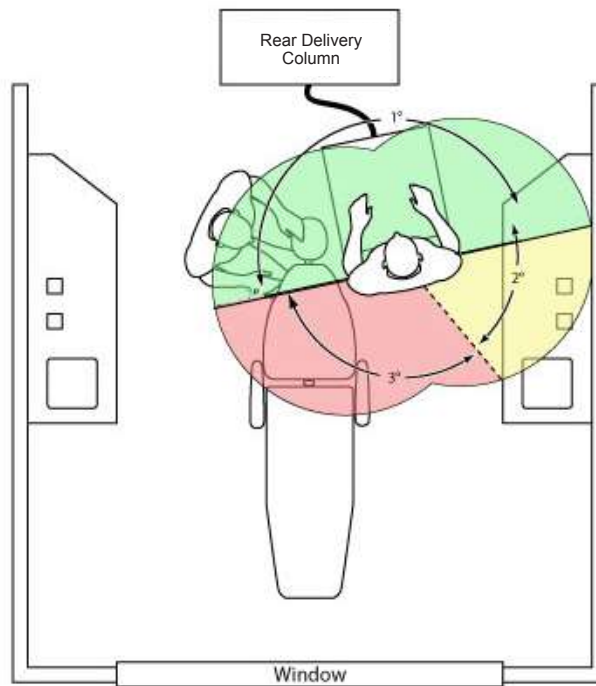
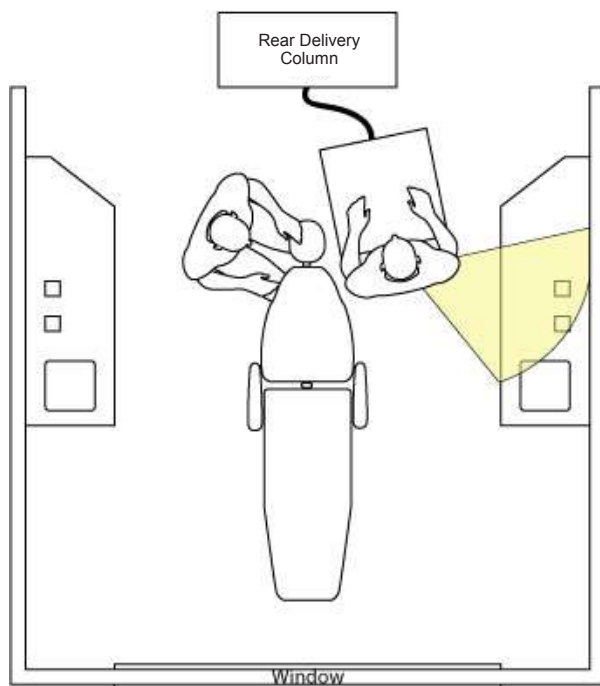
The position of the assistant is important. The assistant is not facing the patient. Instead, the assistant is facing the rear delivery column and treatment hallway so that the left hip is adjacent to the patient's left shoulder (when assisting a right-handed doctor...see Fig. 3-2). This is important for ergonomics in terms of working around the vicinity of the chair. Of course, the left-handed doctor would employ a mirror image seating configuration. However, if the assistant's left hip is at the patient's left elbow, the dental assistant must lean to reach the oral cavity; an elbow of the assistant will invariably

be placed on the bar of the stool for balance while the assistant leans. As a result, the assistant's spine is rotated and the assistant may or will incur lower back pain and perhaps problems with internal organ displacement over many years. Also, in this position the assistant will not have a clear view to keep the operating field clear, and as a result, the assistant will not be able to anticipate the doctor's needs. However, with the assistant positioned properly relative to the patient and with the assistant's eye level preferably six to eight inches above the doctor's eye level, the assistant will be able to fully participate in the procedure without compromising their physical health.

The primary workspace is the area encompassed by the two semi-circles in front of the assistant (Fig 3-4). Instrument transfer as well as static and dynamic storage of instruments occurs in this area because instruments are easily retrievable and replaceable. There is drawer access for consumables but not for instruments; they belong on trays or cassettes. Consumables may also be on a tray but supplies are readily available. During the course of the treatment, if a consumable from the primary instrument tray is depleted, the assistant can retrieve additional supplies from a drawer either by pickup forceps or the use of a barrier on the drawer pull (such as a 4" x 4" gauge), which is very simple. Therefore, it is desirable to install drawer pulls for operatory drawers. Metal drawer pulls are easy to disinfect as opposed to heavy routed ledges underneath the drawer which cannot be disinfected easily. In retrieving

Fig. 3-6

Fig. 3-7



supplies from a drawer, the assistant can either use pickup forceps, over-glove, or glove when necessary. Do not risk cross contamination of instrumentation or puncture wounds by storing instruments in operator drawers; all instruments should be in trays, tubs, or cassettes and stored in the central sterilization area.

The secondary workspace (Fig.3-6) is intended for mixing and temporary storage of backup tubs or additional procedure trays if more than two procedures will be performed with the same patient. Once the assistant rotates her stool, the secondary workspace functions just as the primary space. Tertiary areas (Fig.3-7) should never be used because access requires a severe class five movement to retrieve anything in this area. Do not place anything in tertiary space that the dental assistant must retrieve, replace, or access during the procedure.

OPERATORY DESIGN

Now that we are aware of the functional dimensions associated with the assistant, we can ergonomically construct the dimensions of the dental operatory. The distance from the back wall, separating the operatory from the clinical treatment hallway and otherwise known as the rear delivery

Fig. 3-8

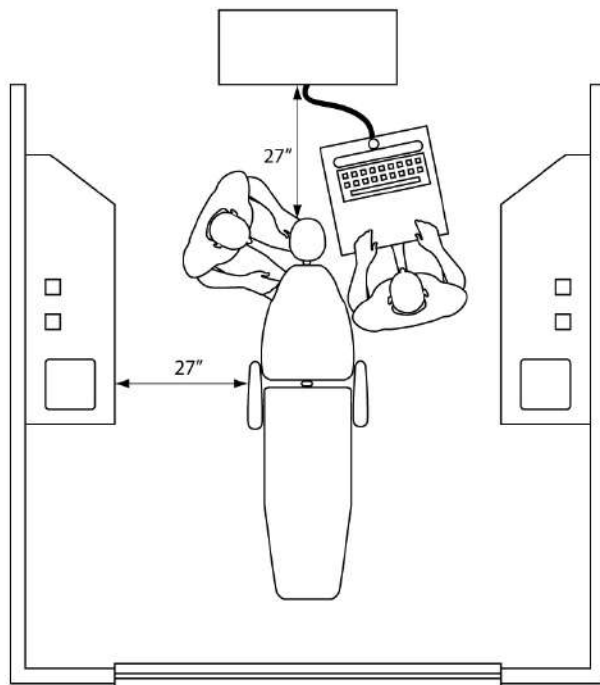


Fig. 3-9



column, to the head of the reclined chair should be 27 inches (Fig.3-8). All small equipment usually used in the operatory should be stored on and in the rear column (Fig. 3-9).

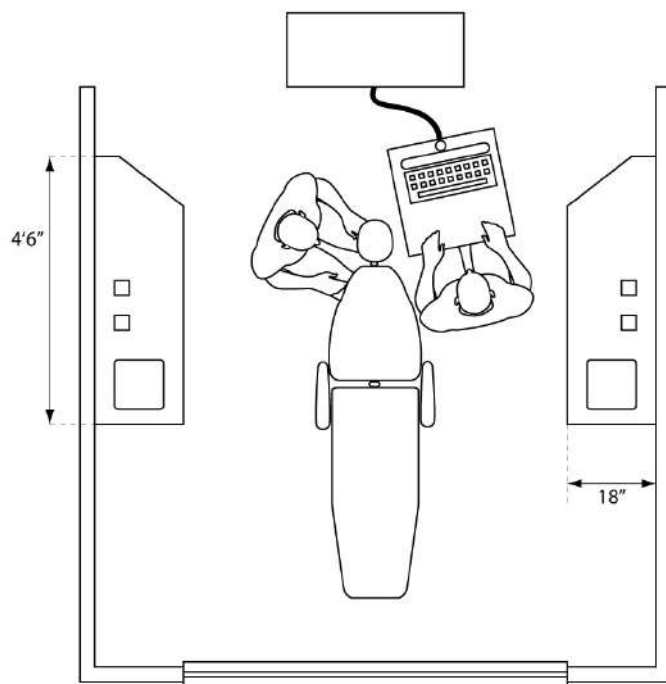
The rear delivery column also facilitates the mounting and placement of the x-ray tube head behind the head of the patient. This tube-head placement is a recommendation of dental radiologists simply due to the consistency of quality images generated when the x-ray tube-head is placed behind the head of the patient. There are significantly fewer retakes because overlapping, elongations, and cone cuts are avoided with the centralized positioning of the tube-head. This does not imply that good radiographs cannot be obtained from side or swing through cabinet delivery; it does mean that consistently more radiographs will be retaken because of tube-head drift or difficulty in aligning the patient, sensor, and tube-head due to the complete extension of the radiographic unit.

It is a common misconception that you will save money with pass through cabinetry and a stored side delivery tube-head that services two operatories. In fact, the cabinetry required to store the tubehead frequently costs more than another tube-head! Additionally, with the side cabinet stored periapical unit approximately 10 square feet of very expensive real estate is permanently occupied and the counter tops

Fig. 3-10



Fig. 3-11



associated with the cabinet cannot be used for any equipment placement a storage because the cabinet doors must be free to open! There should be a 27 inch space from the vertical wall of the side cabinet to the arm of the dental chair so that the dental assistant can reach all functional ergonomic space (Fig. 3-8).

The majority of dental chairs are approximately six feet four inches long and 27 inches wide. When selecting a chair design for the operatory, it is desirable to use a thin back chair that allows the doctor to come close to the patient and maintain a posture with the doctor's elbows at his side.

Of course, this positioning leads to the stool design that will put the doctor in the ergonomically correct seated position. The thighs should be at approximately a 10° slope relative to the floor and the pelvis should be canted downward toward the floor; this requires a stool that has a seat which will tilt forward (Fig.3-10). Additionally, the front edge or tip of the stool should be beveled to prevent the embarrassment of the circulation to the legs and lower body. *So, purchase the dental chair or surgical table based on your ability to move very close to the patient; patients will be in the chair or on a surgical table a maximum of two hours, but you are going to be there your entire practice life.* This ergonomic advice is applicable in any dental or medical practice in which the patient is surgically treated.

Fig. 3-12

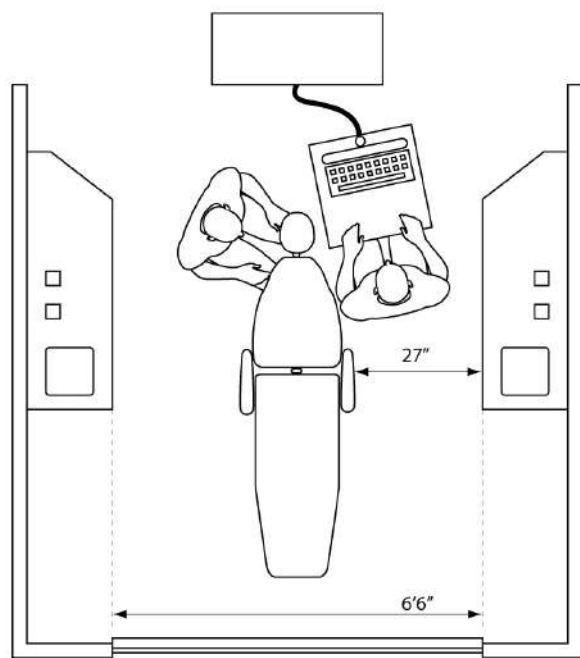
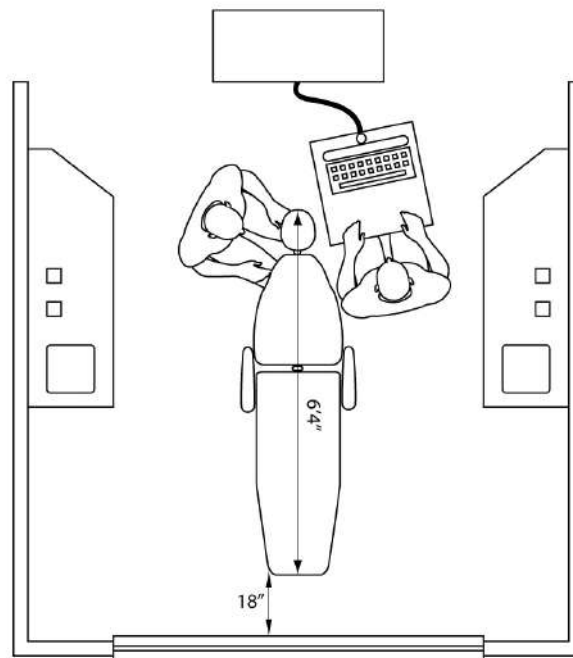


Fig. 3-13



Continuing to consider the reach of the assistant and safe ergonomic movement, the operatory side cabinets will have approximately 18 inch deep counters, which is as far as the seated assistants can reach. Also, the counter is deep enough to hold an adequate hand washing sink. There is no point in making the cabinet any wider because the additional space is not ergonomically accessible (Fig.3-11).

A key dimension of the operatory is the six and a half feet which is optimal for the width of the operatory from the vertical surface edge of one side cabinet to the other cabinet (Fig.3-12). If the operatory space is wider than this distance, either the doctor or the assistant will not be able to reach the side cabinets without rising from the stool or attempting to slide the stool. This additional movement, of course, begets stress. Also, this is a critical dimension because anything less than this will impede movement while any greater dimension will not allow the seated assistant to reach all areas of the side cabinet. The side cabinetry must have drawers and room for trash receptacles underneath the two trash drops for bio-hazardous materials and for non contaminated trash. Additionally, there must be plumbing under the sink. These functional items require four and one-half to five feet lineal counter feet for the side cabinet.

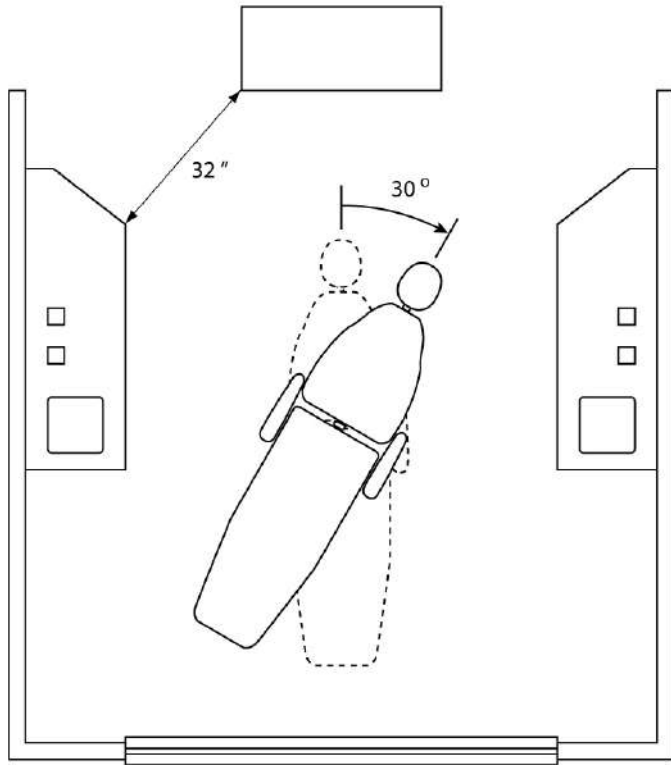
The side cabinet should be approximately 18 inches deep and, therefore, the wall to wall width of the operatory will be nine and one-half feet. In order to completely achieve an ergonomic working environment, the dental chair should not exceed a 27 inch width.

The operatory should have a length of 10 feet from the back windowed wall to the opening at the front and the inside surface of the rear delivery column (Fig. 3-13). With a six foot-four inch reclined chair in place, this dimension would provide one and a half feet of space at the foot of the chair and 27 inches from the head of the reclined chair to the inside surface of the rear delivery column.

When designing the operatory, be certain to design it around the size of the average assistant and not physical characteristics of any one of the staff... including the doctor. Altering the dimensions from the chair to the side cabinets or to the rear delivery column (at the head of the reclined chair) will impede the motion of and efficiency of the assistant and or any other hygienist or doctor working in the operatory. If a staff member or doctor is very large, accommodations may be made for them with an oversized operatory, but the cabinets will be out of ergonomic reach for the rest of the staff or future staff. Mobile cabinets can be an optional correction for the average size assistant in an oversized operatory, but the cabinets frequently become so heavy with instruments and materials that they are difficult to maneuver.

In designing a floor plan, codes such as the American with Disabilities Act must be considered

Fig. 3-14



which dictates handicap minimum access. Compliance with the Code is achieved with the cited dimensions for the operatory in this book. For example, this code is one of the factors that determine the position of the head of the chair. The head of the reclined chair should be 27 inches from the rear delivery column and the vertical surface of the side cabinets are both 27 inches from the armrests of the chair. With this configuration, then a distance of two feet-eight inches is created from the corner of the utility wall to the side cabinet. This 'entrance dimension' is necessary and sufficient to meet the ADA Code for handicap access, but as the wheelchair moves toward the chair, there

is only twenty-seven inches between the side cabinet and chair. However, two feet eight inches are required for handicap access... resolve this dilemma by purchasing a chair with a foot release so that the chair can be rotated 30 degrees to easily achieve handicap/ wheelchair access (Fig.3-14).

Having carefully planned for code, it is suggested that the dental chairs are not drawn or indicated on the floor plan submitted to the municipal permitting/building office. The bureaucrat at the building department will measure the distance from the chair to the cabinet and determine that it is not two feet, eight inches. The plans will be rejected and will need to be redrawn; this is very, very expensive. Explanations and discussion with the planning/permitting department are not very effective, so avoid the need for such discussion. No chairs, no problem.

The difficulty created by flared, thick-backed chairs is the displacement of the dental assistant and the doctor such that ergonomic positioning of either person is very difficult. The doctor cannot place his legs sufficiently under the chair for close proximity to the patient, and the assistant cannot be positioned for clear visualization of the oral cavity because her left hip cannot be immediately next to the patient's left shoulder. The desired shape of the dental chair which will facilitate comfortable ergonomic staff movement is thin and narrow (approximately 27 inches). With the head and shoulder

Fig. 3-15



Fig. 3-16



portion of the chair especially narrow, this will allow ergonomic access to the patient from the nine or three o'clock to the twelve o'clock positions (Fig.3-15).

SPECIALTY OPERATORY DESIGN

Oral surgery operatories tend to be designed somewhat differently. Most surgeons stand during patient treatment, there can be a greater need for privacy during treatment especially with sedation, there may be an additional third party such as an anesthesiologist or care-giver in the operatory during treatment, and there are generally fewer patients scheduled necessitating fewer operatory turnovers and less staff movement through the operatory. In general, oral surgery operatories utilize a single side entry with cabinetry and equipment centered around the head of the chair (Fig. 3-16). The operatories are oversized to accommodate the factors mentioned above with varying dimensions tailored to the needs of the surgeon. If there are less than seven operatory changes or turn-overs a day, staff and patient flow will not be impeded with only one opening to the operatory. Additionally, many surgery operatories utilize two operatory lights mounted on a single ceiling track.

In addition to the surgical suite, most surgeons have exam rooms that also serve as post operative treatment rooms. These spaces can utilize the dual rear entry design for easy and efficient doctor and assistant movement in and out of the room (Fig. 3-17 a & b). Post operative care generally requires more movement on the part of the assistant due to the particular equipment and instrument needs in caring for the post operative patient; the convenient entry and exit afforded by dual rear entry dramatically enhances efficiency.

The design of the surgical recovery area can be addressed in two different manners. A smaller recovery area can be created with the space of a standard clinical treatment room or dental operatory. A room of 10 feet by 10 feet can be divided with a ceiling suspended curtain to create two 10 feet by 5 feet spaces which will accommodate two recovery gurneys or beds. Also, with the dual rear entry design, each space has its own portal. Conveniently, this space offers the option of becoming a treatment room if necessary. Alternatively, a larger recovery area can be created in a larger room, but the space requirement increases to approximately 70 square feet per individual patient recovery area in accommodating walking space and a observation or nurse's station (Fig. 3-18).

Pediatric and orthodontic operatories share similar design characteristics, but they may diverge with individual preferences for things such as side cabinets. With either specialty, the doctor, or assistant, should be able to view all chairs at all times for children misbehaving or in distress. Particularly

Fig. 3-17b



for the orthodontist, a bay configuration is recommended such that, with a six-chair bay, the diagonal distance from chair number one to number six is 20 feet (Fig. 3-19a). Alternatively, six chairs arranged in a single line would require 40 feet; that is great deal of extra travel everyday! With the heads of the chairs back to back, counters are recommended at the head of each chair along with flexible rear delivery dual function carts.

Circular bays and pin-wheel bays have been popularized over the past few decades but they create terrible, chaotic patient and staff flow. Patients approaching the circle do not know whether to proceed clockwise or counterclockwise, while children will pass

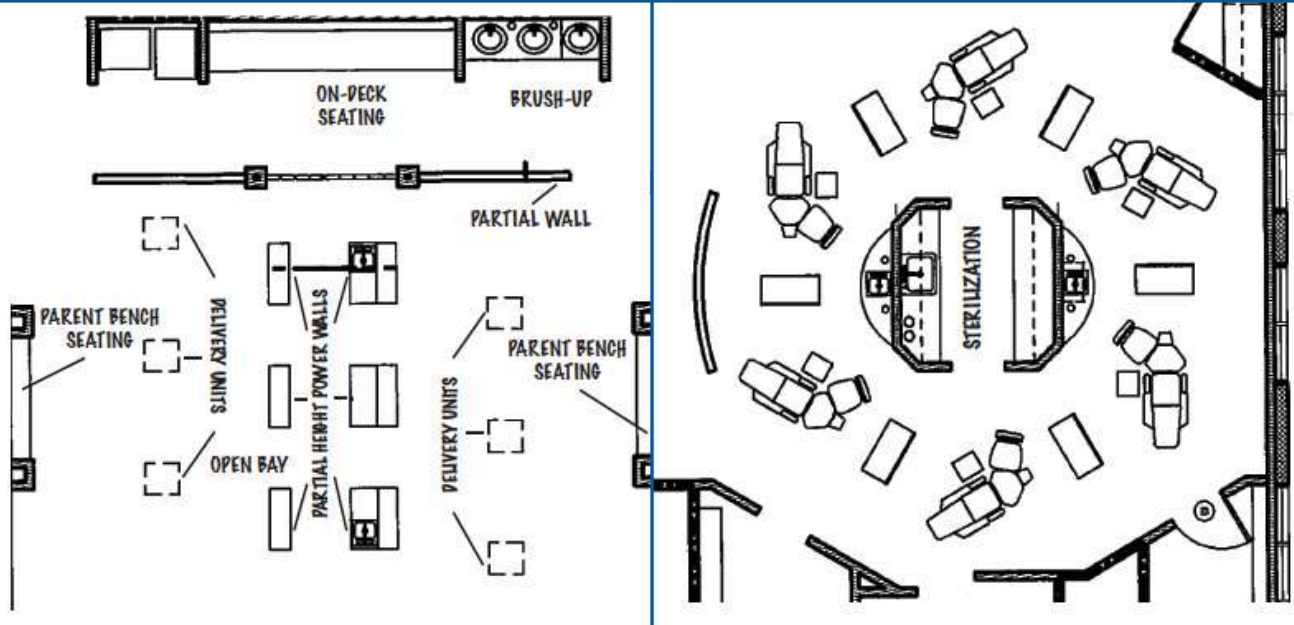
Fig. 3-17a





Fig. 3-19a

Fig. 3-19b



through the interior of the circle or pinwheel and disturb the staff or staff flow. Ten minutes of this traffic confusion is immaterial, but a lifetime of low-level ‘hub-bub’ confusion is very stressful to you and the staff (Fig. 3-19b).

DELIVERY SYSTEMS

There are three basic delivery systems in dentistry: the single unit trans-thorax (over the patient) system designed to serve the doctor and assistant, the dual unit or split system with separate carts or platforms for the doctor and assistant, and the rear delivery system positioned at the head of the chair (Fig.3-20a&b). The single unit trans-thorax system is designed to serve both doctor and assistant but, in reality, it serves neither. Class IV and V movements must be executed by the doctor and assistant to utilize this system during patient treatment. The genius of this system was employed with the solo practitioner sans assistant who desired a delivery platform connected to the chair as a space saving device. Whether or not an assistant is employed for patient care, this delivery system may cause injury with repeated class IV and V movements. The dual or split system is an improvement in that each of the two delivery platforms serves its user. The assistant’s delivery platform is usually a rear delivery column mounted mobile workstation and the doctor’s delivery platform may be a free standing or wall mounted workstation or a chair mounted handpiece delivery head. Of course, the wall mounted side delivery

Fig. 3-20a

Fig. 3-20b

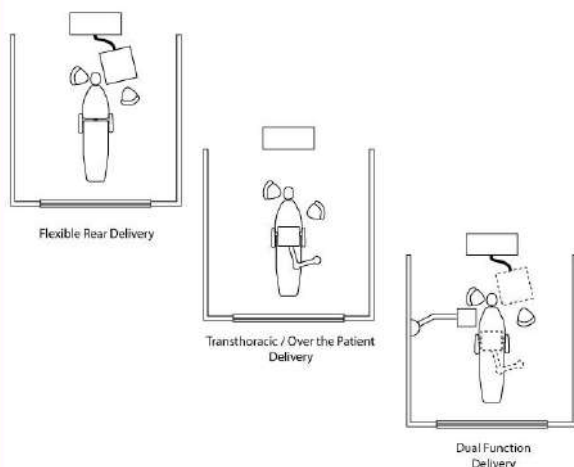


Fig. 3-21



system supposes that the doctor has a desire to act as his or her own assistant during portions of the procedure. While each doctor has individual preferences, the type of delivery system employed defines the tenor of the practice; the clinical treatment rooms or dental operatories will be “right or left handed” and will not be suitable for doctors or hygienists of the opposite hand. This system limits operational flexibility, “sale-ability” of the practice, leads to a crowded operatory, and may cost more than a single unit delivery system.

With an objective of providing adequate working space for trays and cassettes, facilitating class I to III movements of the doctor and occasionally class IV movements for the assistant, and an ambidextrous operatory capability, *it is recommended that a mobile rear delivery system be employed in the operatory.* The working surface of the delivery cart would be 34 inches above the floor and is positioned between the rear delivery column and the assistant facing the rear delivery column (Fig. 3-21). Positioning the assistant for ergonomic movement and efficient patient care/ instrument transfer is discussed earlier in this Chapter. The electrical/computer umbilical and water/air umbilical connections, from the rear delivery column to the dual function assistant’s workstation, should provide a five to six foot travel arc around the head of the chair. The term ‘dual function’ refers to the fact that the assistant and doctor are served by the workstation, i.e. the handpiece delivery head and assistant delivery head are mounted on the workstation. In order to keep the floor clear and allow uniform, unimpeded movement of the workstation, the umbilical connection from the rear delivery column to the mobile assistant’s workstation should be mounted in the power wall 28 inches above the floor. The tubing of the assistant’s workstation should be trimmed after the working service height is established at 34 inches to prevent tubing from dragging on the floor (Fig. 3-22).

The mobile rear delivery workstation contains the handpiece and assistant's delivery heads on arms that rotate and swing around the head of the workstation. Greater flexibility is more desirable, so the operative portion of the unit should swing around 360 degrees rather than only 180 degrees. With the workstation located behind the dental chair with the ability to travel to the left or right, this configuration can be termed mobile or flexible rear delivery. Fixed rear delivery, on the other hand, would be described as a delivery system built into the rear delivery column that does not permit any left to right travel about the head of the chair. Ideally, the delivery system will be able to travel from the "ten o'clock" position (twelve o'clock position is the absolute head of the reclined chair) to the "two o'clock" position. This travel arc will permit a left or right handed doctor or hygienist to treat patients with or without an assistant. The unassisted right handed doctor would place the workstation to their right, and the opposite configuration would be used for the left handed doctor (Fig.3-23). The mobile rear delivery system is strongly recommended for reasons cited earlier in this section of this Chapter.

Fig. 3-22

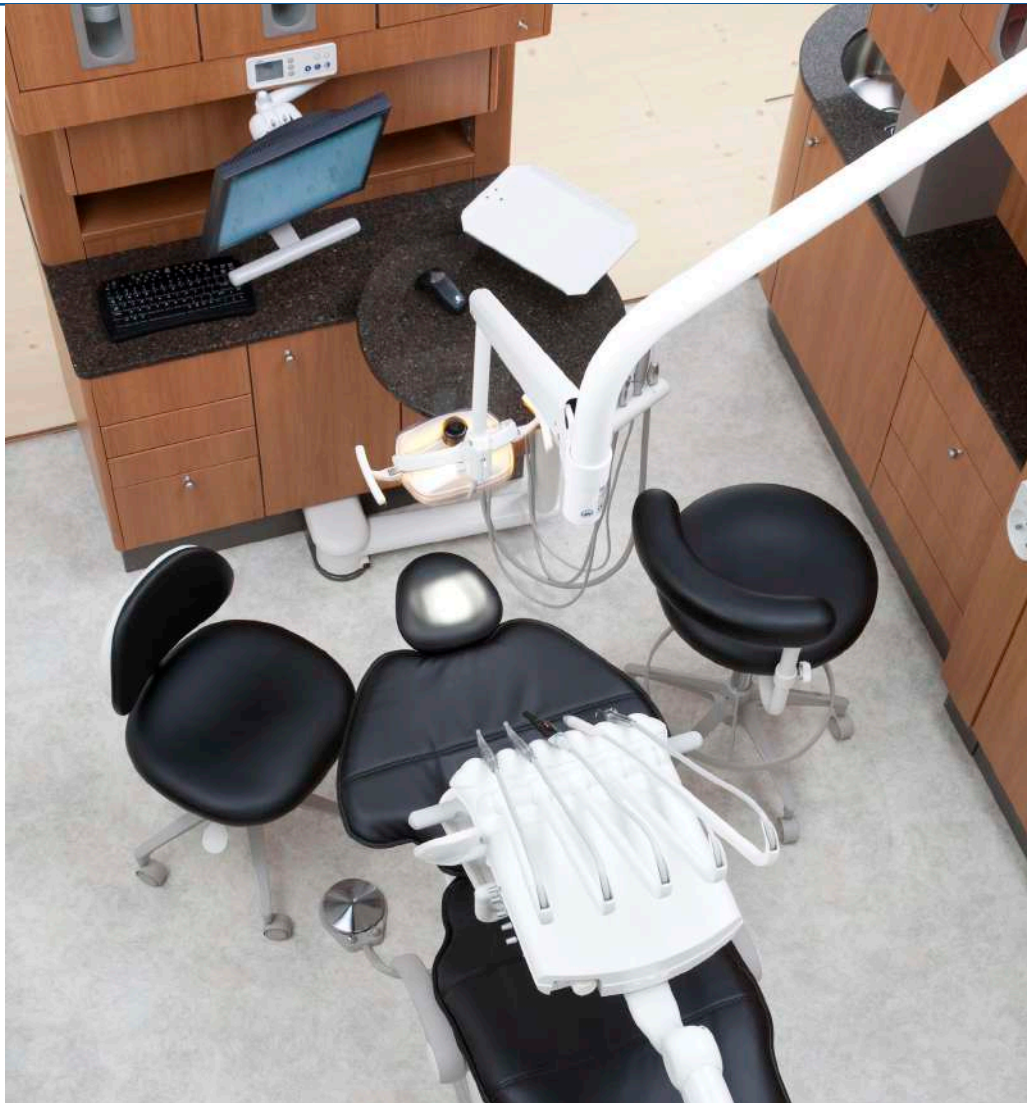


Fig. 3-23



A few more words about the trans-thoracic or over the patient system mentioned earlier are in order; the most common form of this system today is the “whip” or continental model (Fig. 3-24). If utilized properly, this system can be employed to perform a modified form of four handed dentistry with the assistant delivering all instrumentation to the doctor with four handed passes. The modification of the system involves the doctor accessing the handpieces due to personal preference. However, with training and practice, the doctor can access the handpieces with only tactile sense and maintain their visual field in the oral cavity. The trans thoracic delivery system was designed for use without the employment of an assistant, but if you are working alone, it is recommended that the mobile rear delivery system be used with workstation placement by the side of the dominant hand. This will result in fewer class IV and V movements than with the use of the trans thoracic delivery system.

Fig. 3-24



POSITIONING THE TREATMENT TEAM AND ERGONOMICS

A philosophical decision needs to be considered as a doctor determines how the team should be positioned during patient treatment. If the objective of the doctor is preservation of the musculoskeletal health of the treatment team and staff, then proven ergonomic principles in dentistry should be employed. The ergonomic objective is to minimize class IV and V movement while employing class I-III movements: finger, wrist, and elbow movement with occasional shoulder rotation, but not elevation, is the objective. In order to achieve this objective it is necessary to begin with proper positioning of the doctor or hygienist. The seated operator should have their feet flat on the floor with the pelvis and thighs at approximately a ten-degree angle to the plane of the floor. This positioning will permit and position the operator's back upright without the active use of back muscles. The operator should then address the reclined patient such that the operator's elbows are at his side and hands "drop" to the patient's head and mouth (Fig.3-25). Of course, this requires the patient to be in a fully reclined position with the back of the chair completely horizontal or in a trendelenberg position (the patient's head is lower than the horizontal plane). Remember, *the patient will be in this position for a relatively short period, but the doctor and assistant are in a "treatment position" daily, so place the patient in a position that is ergonomically convenient for the treatment team.* The assistant's positioning has been previously discussed in detail, and because of the assistant's seated height, the feet

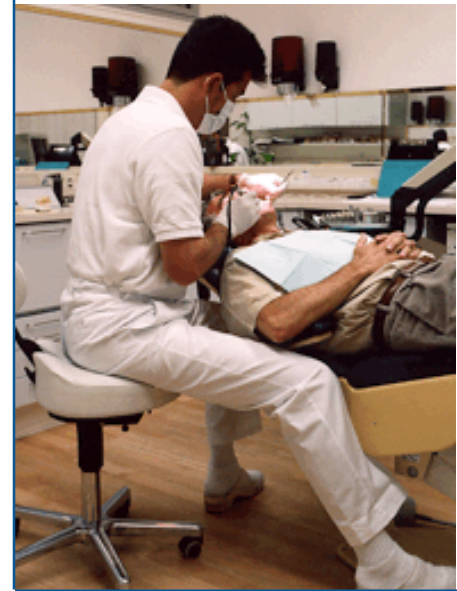


Fig. 3-25

Fig. 3-26



should be resting on a foot ring. The assistant's pelvis and thighs should also be at a ten-degree angle to the horizontal plane so that the back is straight throughout the procedure without requiring the active use of back musculature. This pelvic positioning precludes or negates the perceived need for an abdominal bar on the assistant's stool; the abdominal bar usually results in one arm resting on the bar for body support thereby converting the concept of four handed dentistry into a three handed procedure! The position of the assistant's workstation is at the one-thirty to two o'clock position (relative to the head of the chair), and the left corner of the workstation is over the assistant's right knee and thigh. The tubing of the handpiece should

be straight “dead” (not coiled) silicone that lays over the patient’s left shoulder (for a right handed doctor); the patient will not even sense the presence of the tubing. With the handpiece tubing in this position, the handpieces can be passed between the doctor and assistant with only hand movement by the doctor. If the tubing is behind or under the chair, the doctor will be required to move, i.e. push back from the chair, in order to pass the handpiece to the assistant.

Many of the staff spend a significant part of each working day sitting on a stool, yet little thought or consideration is given to the desired features of these stools to facilitate ergonomic posture and movement. First and foremost, the stool seat should have a positive and negative cant of five to ten degrees (from the horizontal plane). This feature provides the pelvic tilt necessary to maintain the back and vertebrae in an effortless upright position during patient treatment (positive tilt) or during non treatment rest (negative tilt). Ideally, the stool seat edge will be beveled to allow unrestricted blood flow to the lower legs; this feature is especially important in longer procedures. An example of seating to accomplish this is a triangular shaped seat with the legs of the doctor, assistant, or hygienist straddling the apex of the triangular seat. (Fig.3-26). Additionally, there should be a backrest that will engage the lumbar portion of the user’s back when in the “resting” or non treatment position.

Other considerations for the ideal stool include five legs with double casters and, be aware, different casters are made for carpeted floor and hard finished floors. Selecting the wrong casters may make movement on carpet very difficult, or the stool may catapult across a room on a hard floor! Armrests are unnecessary if proper ergonomic positioning of the patient, doctor, assistant, and equipment is observed because armrests are designed to blunt the effect of repeated class IV movement, i.e. shoulder elevation.

CABINETS ARE CRITICAL

Cabinetry for any office is expensive and it can easily equal fifty percent of the equipment cost for a new office. Accordingly, this subject deserves attention to be certain that value and the anticipated style are obtained by the buyer. When considering a supplier for cabinetry, remember to include all areas of the office which will require cabinetry: the operator, sterilization/ tray-prep area, laboratory, staff room, consultation room, and appointment/reception desk all require cabinetry; even the restrooms may require cabinets.

Cabinets may be factory prefabricated or made by a cabinet maker. If the former alternative is selected, the operator, sterilization, and perhaps some laboratory cabinetry can be purchased, but all

other areas will require cabinetry supplied by a cabinet maker. Some cabinetry shops will design and draw cabinet elevations while others will require architectural drawings of the cabinets. Regardless of the cabinetry source, it is important that the office project architect be informed of the decision early in the design process so that the selected option can be incorporated into the design.

Selecting prefabricated cabinetry with standardized dimensions will permit the buyer to know the quality and features of the cabinetry. Additionally, dental cabinetry purchased from a dental equipment manufacturer will most likely be constructed of materials which will withstand the harsh environment of a dental office with the use of surface cleaning agents. Prefabricated cabinetry from a dental equipment manufacturer will also have a wide variety of designs from which to choose most often based on the decades of experience in creating (hopefully) efficient cabinetry formats. Finally, it is important to note that cabinetry from an equipment manufacturer can be declared equipment for tax purposes because you have a receipt from the manufacturer and it is dedicated dental equipment. Custom cabinetry may not stand up to the scrutiny of a tax court because the cabinet maker is not a “specialist” manufacturer. This tax effect can have a very positive effect on the cash flow of your practice; in a practice with a \$750,000 facility, the cash flow will be positively affected by \$6,000 to \$30,000 annually utilizing the cost analysis technique term cost segregation.

FLOORING

Flooring can be a dilemma for the medical or dental office; most people view the choice as one between comfort or cleanliness. However, closer examination of the facts about modern flooring materials reveals that comfort and cleanliness can be obtained in a single source: carpet. Currently, nylon carpet (not acrylic or acrylic/wool blend) can be produced which is very bacterio-static; the surface of the nylon strand can be fabricated so that bacterial adherence and colonization is very difficult and unlikely. This fact, coupled with the periodic maintenance schedule of the carpet manufacturer, can produce a clean, comfortable and attractive walking surface for the staff and patients. While not documented, anecdotal experience with private offices maintaining non-carpeted flooring has revealed that fewer than 5% of the offices will clean the floors daily. Additionally, maintaining the finish of most hard flooring is rather expensive and time consuming.

Carpet is desirable for the sound attenuation feature, the cushion it provides for the knees of the staff, and the esthetic value it provides. The Occupational Safety and Health Administration does not restrict the use of the carpet in private medical and dental facilities, but has recommended hard flooring

in the past because of a perceived , but not researched, problem with mercury spills in dental operatories. Free mercury (liquid) is almost never used in dental offices today, so this factor is no longer a practical consideration.

If carpet is selected for use in the office, there are several guidelines that should be observed for longevity and a fresh appearance. Commercial grade, not residential or contractor grade, carpet should be used...with no padding in order to prevent stretching of the carpet. In high traffic areas, looped (not cut) pile is preferred so the carpet does not appear “crushed”. Also, the carpet should be “solution dyed” to prevent discoloration from caustic items such as sodium hypochlorite. Finally, the carpet should have a face weight of approximately 30 ounces. These guidelines should be followed throughout the office, i.e., treatment and non-treatment areas. However, carpet is not recommended in bathrooms...but yes, it is great in the dental laboratory. Following these guidelines, carpet life can be expected to be a minimum of 10 years. In fact, many office staff change the carpet not because it is worn but because they are weary of the color after so many years!

CHAPTER III—WHAT’S THE BIG IDEA?

- The logical configuration of the dental operatory is dual rear entry with easy ingress and egress for the individual doctor and assistant.
- Instrumentation and materials should be managed and controlled by the assistant with the doctor receiving, using, and referring all equipment and materials to the assistant with “four handed instrument” passing technique.
- The operatory should necessarily be designed around physical dimensions and functional movements of the assistant. The objective is to achieve a doctor’s range of motion that goes no further than class III movement and an assistant’s range of motion goes no further than class IV during eighty percent of the procedure time.
- Purchase the dental chair or surgical table based on your ability to move very close to the patient; patients will be in the chair or on a surgical table a maximum of two hours, but you are going to be there your entire practice life.
- When designing the operatory, be certain to design it around the size of the average assistant and not physical characteristics of any one of the staff... including the doctor.
- It is recommended that a mobile rear delivery system be employed in the operatory.
- The patient will be in a “treatment position” for a relatively short period, but the doctor and assistant are in a “treatment position” daily, so place the patient in a position that is ergonomically convenient for the treatment team.

Chapter IV

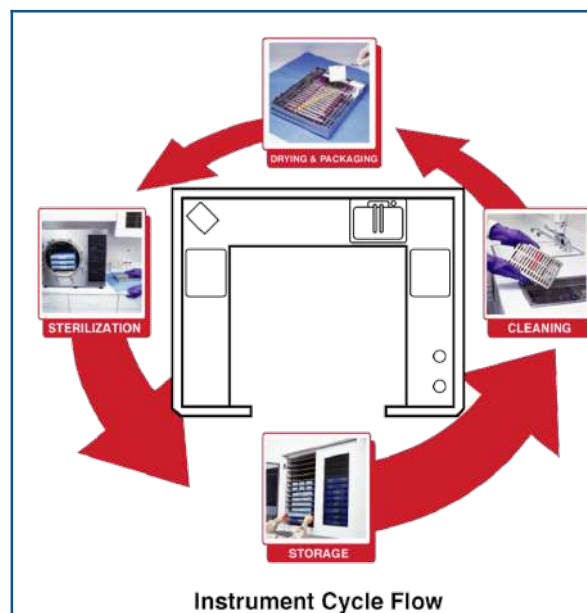
ELEMENTS OF THE CLINICAL ZONE

CENTRAL STERILIZATION AREA

The sterilization area is the heart of the dental or medical surgical practice; it must be proportionately sized to the number of existing operatories or clinical treatment rooms to facilitate the flow of instrumentation through the cleaning, packaging, and sterilization process. Too often, a doctor will observe a full waiting room and surmise that the room is not of sufficient size to accommodate the patients. In reality, the problem is an undersized sterilization area which is impeding the “turn-over” or preparation of the clinical treatment room for the waiting patients. *If the central sterilization area is congested, patient throughput and production will decrease.*

In order to promote efficiencies and patient flow, the sterilization area should be sized to facilitate the flow of instrumentation; for a five operatory/ treatment room office, there should be approximately 18 linear feet of counter space. While more treatment rooms/ operatories will require more sterilization area counter space, 7 to 8 operatories will require approximately 22 to 23 linear feet of counter space which is the maximum for almost any sized office. *Utilization of cassettes for procedural instrument set-ups can significantly reduce the amount of counter space and storage area needed in central sterilization; for the five operatory office cited above, approximately 11 linear feet of counter space would be required.* See the sections, “Calculating Needed Storage” and “Conserving Space” later in this Chapter.

Fig. 4-1



INSTRUMENT FLOW IS CRITICAL TO PRODUCTION

Instrumentation and supplies should be bundled or packed in trays, tubs, and / or cassettes to enhance flow and safety. Used instruments should enter a designated contaminated area in central sterilization, move to a clean area after they have been washed/dried, then packaged and sterilized, and finally transported to a designated sterile instrument storage area. The “u” shaped central sterilization area demonstrates this instrument flow most graphically (Fig.4-1). *Orderly instrument flow can work in a clockwise or counterclockwise direction; direction of instrument flow is determined with the location of the sink and recessed ultrasonic cleaner.* In order to maximize production, minimize staff stress, and increase scheduling flexibility, *four important principles of medical and dental office design* must be observed that will directly impact the efficiency and throughput in central sterilization: (1) *all operatories should be identically equipped,* (2) *all instrumentation is stored in central sterilization,* (3) *instrumentation should be organized into procedural set-ups(cassettes or trays) to optimize flow and efficiency,* and (4) *instrumentation is brought from central sterilization to the operatory / treatment room: the operatory function is defined by the instrumentation.* Trays are dismantled in the contaminated area with the disposables discarded in trash drops designated as biologically or non biologically contaminated; injurious “sharps” such as needles or scalpel blades not discarded in the operatory should be deposited in the “sharps” container in the contaminated area of central sterilization. For a five operatory office, 36 linear inches of counter space should be dedicated to break down trays while 12 to 18 linear inches is adequate for cassettes. Contaminated instrumentation is then placed in an ultrasonic cleaner or instrument washer of sufficient size; it is recommended that the cleaner be at least a gallon

Fig. 4-2a



capacity for individual instruments (three gallon unit for cassettes) (Fig.4-2a) and that it is recessed into the cabinet countertop (some cabinetry design may be recessed so the countertop ultrasonic is at counter level) so there is sufficient clearance with the upper cabinets to remove the lid of the cleaner. Also, this configuration allows smaller assistants to safely visualize the

Fig. 4-2a

contents of the ultrasonic cleaner (Fig. 4-2b). Usually, two linear feet of counter space is adequate for the ultrasonic cleaner, but the dimensions should be confirmed for the selected equipment. The primary advantage of employing the recessed ultrasonic cleaner is that the staff cannot move the cleaner and disrupt the conceptual flow of the instrumentation sterilization cycle from contaminated to clean.



Fig. 4-3a

Next to the ultrasonic cleaner, a sink should be placed that is large enough for two assistants to use simultaneously; the sink should also have two faucets or water sources for the assistants to work side by side (Fig.4-3a). On the side of the sink opposite the ultrasonic cleaner, an instrument drying device may be located in the lower cabinetry and, if applicable, a station for lubricating



and maintaining handpieces. The clean instrumentation or cassettes with instruments are moved to the clean area to be wrapped or bagged and sterilized or, in some cases, sterilized and placed on trays (Fig.4-3b). Once the instrumentation has been sterilized, it is then moved to the sterile/ storage counter space area where instrumentation can be stored in the upper cabinetry as cassettes or tray set-up can be compiled with instrumentation and disposables. Sterile instruments should not be stored above the sterilizer.

The concept of distinct “workstations” in the sterilization area, progressing from contaminated instrumentation and equipment to clean to sterile instrumentation, is key to an efficient and productive

Fig. 4-3b

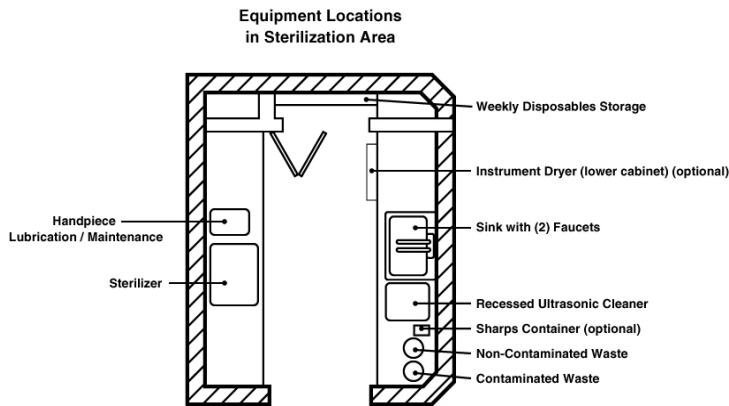
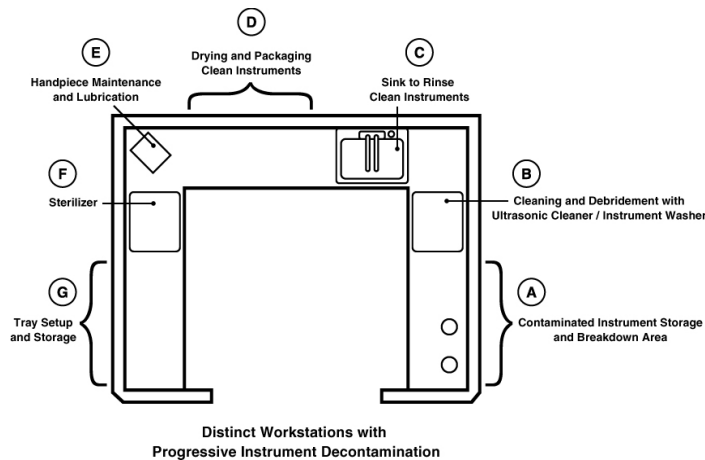


Fig. 4-3c

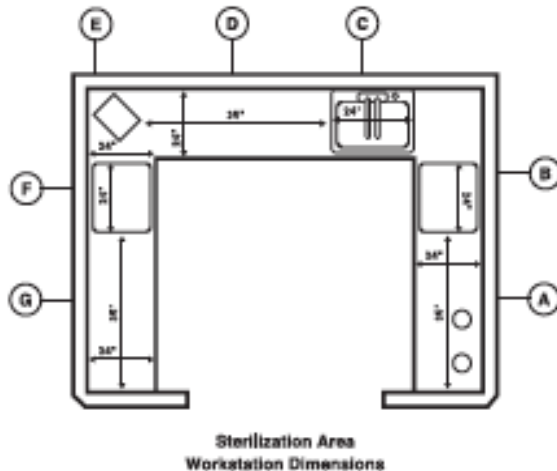


practice (Fig.4-3c). Developing this concept in the minds of all staff members also creates a much safer environment for the patients and staff...to say nothing of the fact that it fulfills a cornerstone principle of the CDC Guideline for infection control in dental healthcare settings: Divide the instrument processing area... into distinct areas for (1) receiving and cleaning, (2) preparation and packaging, (3) sterilization, and (4) storage. The complete CDC Guideline can be obtained by going to the website www.ada.org/prof/resouces/topics/cdc/guidelines.

ONCE AGAIN, CABINETS IS CRITICAL

Cabinet and countertop design in the sterilization area will, along with the amount of space dedicated to the area, dictate the flow of instrumentation and productivity in the clinical section of the office. *Improperly designing this area will sacrifice productivity every day and will compound the daily stress of every member of the dental team.* Every dimension specified in the following pages has an ergonomic or functional purpose to either enhance instrumentation flow through the “sterilization cycle” or decrease the physical stress of the staff. These dimensions can be obtained in prefabricated stericenters or in custom cabinetry. The main advantages of selecting a steri-center include the confirmation of quality, the ease of installation, and knowledge of the exact appearance of the cabinetry before purchasing the product.

Let’s begin constructing the sterilization area and cabinetry by examining the linear counter space needed to maximize the flow of instrumentation in a five operatory/ treatment room facility. The counter depth should not be greater than 24 inches because most equipment does not require greater



depth and most assistants cannot reach much beyond 27 inches safely at a 34 inch counter height (Fig.4-4a). However, it is always important to confirm the dimensions of selected equipment before designing the final configuration of the sterilization area. The contaminated instrument receiving area counter space area should be approximately 36 linear inches so that two trays can be broken down simultaneously; *this area can be reduced to approximately 12 inches when utilizing cassettes*. Additionally, space may be conserved using cassettes as contaminated instrumentation is temporarily stored in overhead cabinetry; smoked glass doors are very helpful in obscuring the presence of the dirty instrumentation from the view of patients. On average, a 24 inch allowance for the ultrasonic cleaner is adequate, but an oversized ultrasonic cleaner, two cleaners, or automated washer may be needed in larger practices. The linear counter space allocation for the sink should be 24 inches (and 9 inches deep), while approximately 24 to 36 inches should be dedicated to the clean area for instrument drying, instrument bagging, and instrument maintenance; with the use of cassettes, this counter space may be reduced to approximately 18 linear inches. One or two instrument wrapping drawers can be utilized to expand the counter space of this clean area workstation (Figs. 4-4d & 4-4e). Handpiece maintenance, if necessary, will require another 12 to 24 inches of counter space. Most sterilizers require 24 to 30 inches of counter space, and the “sterile” tray set-up area should have 30 to 36 inches of space so that multiple trays can be assembled simultaneously; practices employing cassettes will require only 12 to 18 linear inches of counter space. In a galley configuration of the sterilization area, the aisle width should be no less than 44 inches and no greater than 54 inches; anything less will impede two assistants passing each other and anything greater will require additional unnecessary steps from one counter to another (Fig.4-4b).

Fig. 4-4c

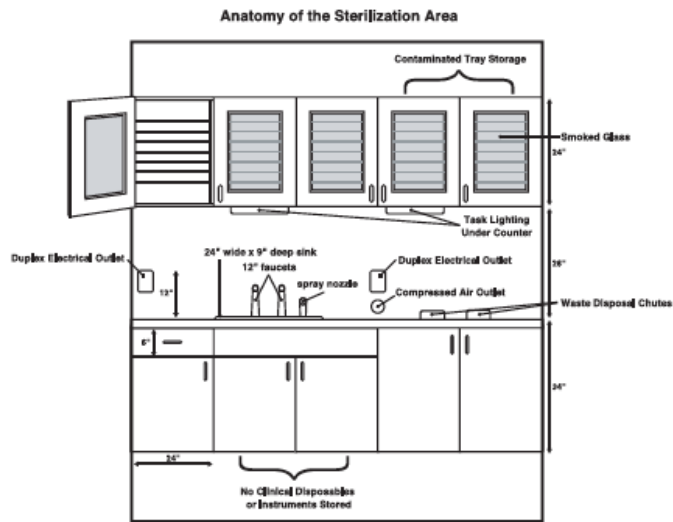
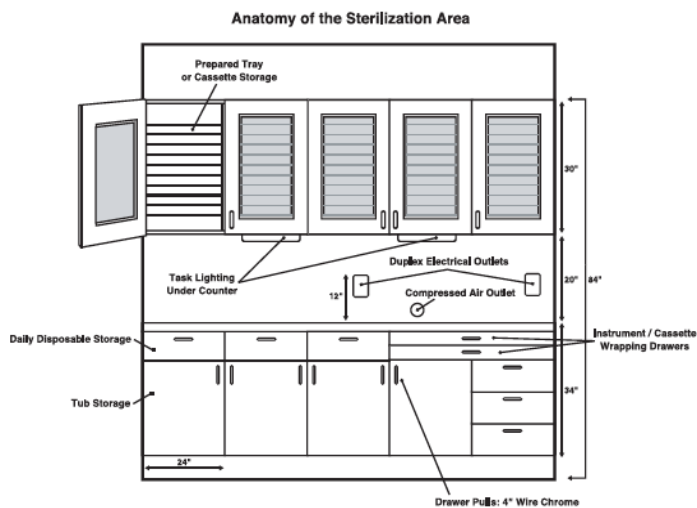


Fig. 4-4d



The cabinetry above the counter surface/s of the sterilization area should be uniform in design throughout the sterilization area but functionally different. This designation of the upper cabinetry will conform to the “sterilization” state of its associated (lower) countertop surface: contaminated, clean, or sterile. Therefore, the upper cabinetry designated as contaminated may contain “used” or contaminated cassettes/trays that the busy staff has not been able to disassemble; the cassettes or trays are stored/stacked in the cabinets until a staff member has an opportunity to ‘break down’ the trays. However, cassettes will not require any breakdown or space required for breakdown. In the interim, the sterilization area will remain neat and orderly. This appearance factor will be

important as we discover why there are usually no doors on the entrance/exit to the central sterilization area.

The upper cabinets should not exceed seven feet in height as most assistants cannot reach much higher and the use of step stools is to be avoided for productivity and safety reasons. While the lower cabinets should all be at a uniform height of 34 inches, the upper cabinets over the contaminated area will be smaller than those over the clean and sterile set-up areas. Because there is greater vertical working space required in the contaminated instrument area, the upper cabinets are only 24 inches in height (Fig.4-4c). Therefore, only seven to eight trays can be stored in each 24 inch wide cabinet over

the contaminated area. Because the cabinetry over the clean and “sterile” set-up counter space is 30 inches in height, 10 shelves can be installed in each cabinet for trays or cassettes. The number of upper cabinets required to store trays or cassettes, of course, dependent upon the number of instrument set-ups required. In order to determine the storage area needed in central sterilization for the cassettes or trays and tubs of a practice, see the following section.

Lower cabinets should be fabricated 34 inches high, 24 inches wide, and 24 inches deep (Fig.4-4d). Drawers typically have dimensions of 6 inches by 24 inches with 4 inch wire chrome drawer handles. Carefully consider the number of drawers needed as they will cost approximately \$150 each. In fact, take the time to calculate the number of linear feet of cabinetry needed for your practice because central sterilization cabinetry can cost up to \$1,000/ linear foot. See the following section to determine the storage area needed.

The average assistant will enter the sterilization area approximately 80 times daily. Due to this heavy traffic, a

Fig. 4-4e



Fig. 4-4f



‘door-less’ central sterilization area is recommended because doors will be simply secured with a door-stop in the open position by the staff as they will not tolerate opening the door so frequently. With door-less sterilization areas, patients are likely to view the area on their travel to or from treatment. *In order to portray a clean and orderly office, place dark (smoked) glass on the upper cabinet doors so that soiled/used trays or cassettes can be placed in the cabinets. The patients will see only an orderly sterilization center and the assistants will be able to determine whether soiled cassettes/trays need attention by looking directly into the dark glass of the cabinets* (Fig. 4-4f).

Lighting of the cabinetry counter space and the entire sterilization area is accomplished with task lighting under the upper cabinets and recessed ceiling lighting utilizing parabolic lenses (Fig.4-4g) (see Chapter Two). Ideally, 150 to 200 foot candles of light should be provided on counter top surfaces for effective, but not irritating, illumination of the workstations.

CALCULATING NEEDED STORAGE FOR CENTRAL STERILIZATION

(1) Calculate the number of cassettes and tubs/trays needed for the practice

For hygienist: $(\text{number of patients treated daily} / 2) + 1 = \text{number of set-ups needed for } \frac{1}{2} \text{ day}$

Note: With this calculation, instrumentation must be processed twice daily.

Fig. 4-4g



For the doctor:

- In a full day, 50% of the procedures will be restorative. Restorative set-up should be equipped for amalgam, composite, and crown & bridge procedures. So, number of restorative set-ups needed = (total daily patients / 2) + 1
- For a full day, begin with not less than two set-ups per specialty procedure per doctor (periodontal, endodontic, oral surgery, exam, etc)

As an alternative to the above calculation, the following calculation can be performed:

Review two months of appointments; total the number of each type of procedure.

Daily average of a specific procedure = total number of each type of specific procedure / number of days,

(2) Calculate the number of cabinets needed in sterilization

10 trays / upper cabinet and 3 tubs / lower cabinet

20 cassettes / upper cabinet and 3 tubs / lower cabinet

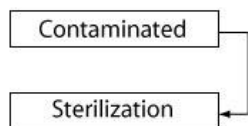
WHAT CENTRAL STERILIZATION SHAPE IS BEST FOR YOUR PRACTICE?

Ideally, a galley style sterilization area should be considered if there is adequate space in the office “footprint”, i.e. the shape and size of the office space (Fig.4-5a). If a galley style sterilization area is not feasible, then a shallow U-shaped design can be employed or an L-shaped sterilization area

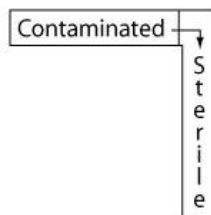
Fig. 4-5a

Central Sterilization

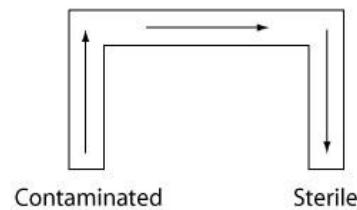
3 Standard Configurations



Galley



L-Shape



Shallow U Shape

with two entrances/ exits. When employing the L-shaped or galley design, the aisle or walkway width between opposing counters or cabinets should be four feet so that two people can easily pass or work on opposing counters.

In general, employ the L-shaped sterilization area when an L-shaped configuration of clinical treatment rooms or operatories is encountered (Fig. 4-5b). With this configuration, there is access to the sterilization area from each row or arm of the clinical treatment rooms. This design consideration is important because it dramatically enhances staff flow, efficiency, and turnover of treatment rooms. Occasionally, there are so many clinical treatment rooms (more than 8) that a satellite sterilization area needs to be considered. This area could range from simple cabinetry, located on the treatment (room) hallway, which stores contaminated and clean/sterile procedure trays to complete, albeit smaller, sterilization areas (Fig.4-5c).

The shallow U-shaped style of sterilization area (Fig.4-5d) is employed when there is insufficient width in the office footprint (shape and square footage size of the office). Generally, an office with four to six treatment rooms should have a “footprint” or total floor space width of approximately 40 to 45 feet

Fig. 4-5b



Fig. 4-5c



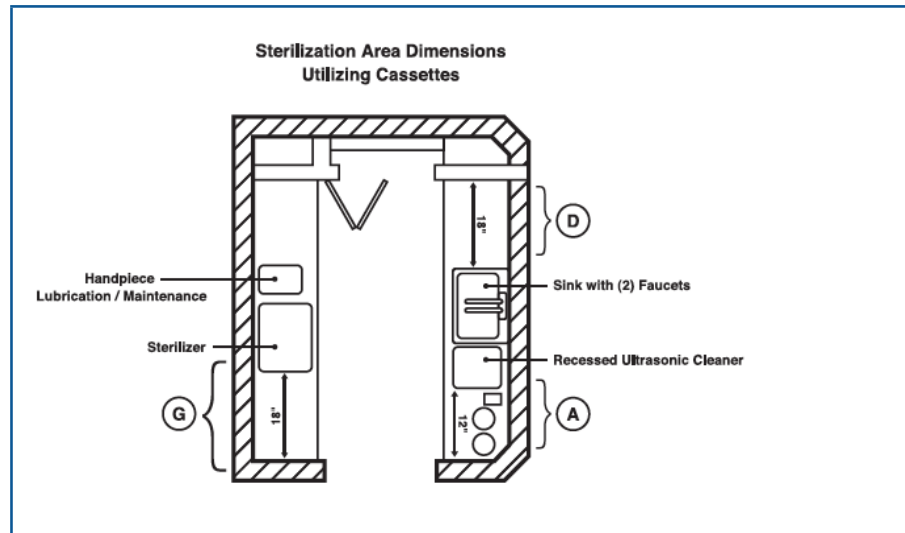


to create optimal patient and staff flow. With this dimension, a galley or L shaped sterilization area can be utilized; when the width of the entire facility drops below 40 feet, the shallow U-shaped sterilization area should be considered.

The effective use of these configurations will allow the placement of the sterilization area to be centrally located in relation to the treatment rooms/operatories. Ideally, every clinical treatment room doorway or opening should be within 30 feet of the sterilization area ingress/egress to maximize staff flow, efficiency, and treatment room turnover. In large practices where this dimensional principle cannot be employed, the use of satellite sterilization areas should be considered.

CONSERVING SPACE: THE CASSETTE EQUIPPED COMPACT STERILIZATION AREA

Ideally, following the space and design guidelines will provide the most efficient and stress free function in central sterilization. However, many practices face space constraints, especially in urban leasehold environments. So, how do you develop the efficiencies and instrument flow in smaller sterilization space?



Cassettes.

Cassettes will decrease the amount of linear counter space required to process instruments and will require less storage space in the upper cabinets. Even if tubs of disposables are needed, they can be distributed for storage throughout the side cabinets in the operatories.

How much space can be saved? Lots.

A quick calculation of the needed counter space for a five operator office using cassettes in the central sterilization area reveals that 1.5 to 2 linear feet of counter space is saved in each of the contaminated, clean, and sterile / storage areas (Fig.4-6). Because individual instruments are not being

Fig. 4-7



sorted, packaged, or placed on trays, much less room is needed at each workstation. Also, cassettes will require approximately two-thirds of the upper cabinet storage needed for an identical number of and mix of trays (Fig.4-7). Consequently, *using cassettes in a tight space can result in downsizing the sterilization area by one-third and still maintaining the efficiency and flow of the larger central sterilization area.*

In addition to conserving space, cassettes can also achieve significant time savings for the practice. And, since labor is the single biggest operating cost for almost any practice, it is important to recognize this huge advantage in employing cassettes. *A careful analysis of the potential time savings revealed that over one hour of labor can be saved for every nine procedural set-up processed when utilizing cassettes.* Hand scrubbing instruments, disinfecting trays, sorting instrumentation, and tray assembly are all eliminated from the sterilization cycle, thereby accelerating the flow of instrumentation through the cycle. In a week, *this translates into a noticeable savings that falls to the bottom line of the income statement, i.e. net profit.*

THE DENTAL LABORATORY

The dental laboratory is a high traffic area of the dental practice and should be placed, if at all possible, on the clinical (treatment room) corridor near the operatories. In contrast to the central sterilization area, the laboratory should have a door to prevent the potentially threatening laboratory sounds from traveling through the office. With the placement of the lab dictated by the location of the operatories, the laboratory will be rectangular or L-shaped with recommended dimensions of 7 feet by 8 feet to 7 feet by 10 feet. This 56 to 70 square foot room will be adequate as a polishing and adjustment laboratory; production laboratories will require much more space (Fig.4-8a).

It cannot be over-emphasized that the laboratory be a single purpose facility and not a multipurpose lab/ staff lounge/central sterilization/mechanical engine room. Space may be conserved with such a configuration, but staff flow and efficiency suffers mightily as well as production. It is a false economy to combine these disparate functions for the above reasons.

The maintenance of a clean and orderly laboratory begins with the design of the room. Countertops will occupy two or three sides of the room and should be all be a uniform height of 32 inches; this is the optimal height for seated laboratory work. Upper cabinets are usually employed in the lab and should extend no farther than 7 feet above the floor; under cabinet lighting should be installed to facilitate bench-top lab work. In dedicating counter space during the design of the lab, consider placement of the sink (18 to 24 inches) with a plaster trap, model trimmer, dust collector, impression pour-up area, lathe, Bunsen burner, hand-pieces, and some free work counter space (Fig.4-8b). Centered around the sink, of course, will be the model trimmer and the plaster bin; the plaster bin should be mounted on the wall above the sink equipped with a plaster trap. The dust collection device

Fig. 4-8a



Fig. 4-8b

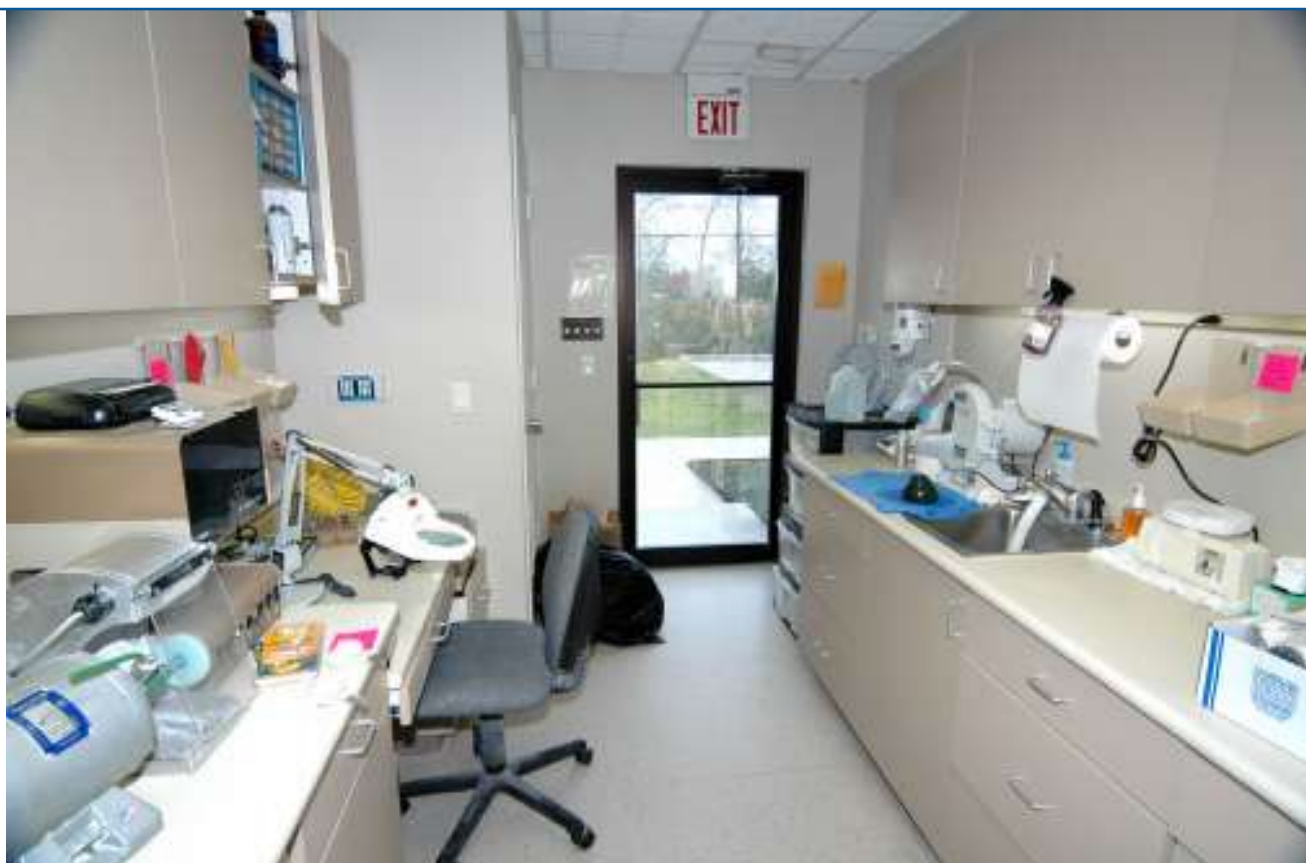


Fig. 4-9



should be designed as such and not simply a commercial vacuum cleaner configured with a counter top receptacle because it is not nearly as efficient as an engineered dust collection device.

An issue often overlooked in the lab is sound attenuation. Many threatening noises can emanate from the lab, and these sounds can be controlled with a closed door as well as carpeting on the lab floor. Using carpeting described in Chapter Three, the lab noise can be contained as well as preventing any powder or liquid spills from being tracked or carried on shoes from the lab to the corridor and operator carpets. While this suggestion may strike some readers as odd, carpet in the lab will definitely be a good decision. At approximately \$35/ square yard, it will cost approximately \$150 if the carpet is (ever)

replaced. So, purchase a few extra yards as the office is constructed and store it for possible future use.

RADIOLOGY

Radiography may be a primary diagnostic tool in some medical practices and non-existent in others, but it is a constant fixture in dental practices. However, practices will vary in that some have a central radiography room or area, while others have some type of radiographic capability in every operator. Compounding these differences, some practices will employ digital radiography with tube-heads of varying (kvp)size, while others will use conventional film. Therefore, the following recommendations may need to be adapted to meet the reader's individual requirements.

DENTAL RADIOGRAPHY

Addressing dental radiography, it is recommended that any central radiographic equipment such as a panoramic or cephalometric unit be placed in an alcove on the pathway to or from the operatories, i.e., the trunk corridor or the treatment corridor/hallway (Fig.4-9). Necessarily, these diagnostic records are taken or created at the beginning or end of an appointment and therefore central radiography area does not need to be placed on the clinical treatment hallway or corridor. However, it does need to be on the path of the patient's ingress or egress from the clinical treatment area to the appointment desk.

If an alcove configuration is utilized on the central trunk corridor or the clinical treatment area corridor, then a panoramic unit will usually require a space of 5 feet wide by 5 feet deep. A panoramic/ cephalometric combination unit will require an average alcove space of 5 feet wide by 7.5 feet deep (Fig.4-10). If a completely enclosed room option is chosen, the space requirement increases to almost 8 feet by 8 feet. A cone beam (CBCT) unit will require approximately 6 feet by 8 feet space. An alcove configuration for a central periapical unit would require a space of 6.5 feet wide by 6.5 feet deep, while a completely enclosed room will require a dimension of 6.5 feet wide by 8 feet deep to accommodate the arc of the tube-head. If central radiography includes both periapical and panoramic/cephalometric units, it is recommended that the two units be separated by a wall so that the different units can be used simultaneously if necessary in a busy practice.



MEDICAL RADIOGRAPHY

Definitive architectural dimensions for medical radiographic units is more problematic due to the wide range of potential equipment that could be utilized. In general, the dimensions will be dictated by the focal distances of the employed equipment, and dimensions of the actual space will be somewhat larger because the emitted radiation will require an enclosed and possibly shielded room.

Regardless of the selected equipment, it is recommended that digital radiography be employed in medical practices. The quantum leap in diagnostic value of the digital radiograph makes the purchase of the sensors and software a true value proposition. Ignoring the mechanical advantages of the absence of film, the processing equipment and maintenance, and the time savings, the analytical software used to examine the radiograph will reveal pathology that even the most trained radiologist will not be able to discern with conventional film based radiography. The radiograph is composed of 256 shades of gray from absolute white to black, but the human eye is capable of detecting only 12 to 14 shades of gray. A tremendous amount of information is present but not detected when conventional film and equipment, i.e., the eye, are employed. Diagnostic software can shift the gray scale range of the entire image and also stretch the gray scale of the image on the monitor so that the pathology “enters” the gray scale range of the human eye. Hair-line fractures, quantitative determination of a structure’s density, metabolic disorders manifested in hard tissue, and many other diagnostic functions can be employed. The point is that digital imaging transforms radiography from a diagnostic aid to a pathopneumonic diagnostic tool.

CHAPTER IV—WHAT’S THE BIG IDEA?

- The sterilization area is the heart of the dental or medical surgical practice; it must be proportionately sized to the number of existing operatories or clinical treatment rooms to facilitate the flow of instrumentation through the cleaning, packaging and sterilization process.
- There are three possible configurations for the sterilization area and the configuration employed is dictated by the dimensions of the office and the number of operatories.
- In order to portray a clean and orderly office, place dark (smoked) glass on the upper cabinet doors so that soiled/used cassettes or trays can be placed in the cabinets.
- The entrance of the sterilization area should be no more than 30 feet from the most distant operatory.
- If the central sterilization area is congested, patient throughput and production will decrease.
- Utilization of cassettes for procedural instrument set-ups can significantly reduce the amount of counter space and storage area needed in central sterilization; for the five operatory office cited above, approximately 11 linear feet of counter space would be required.
- The concept of distinct “workstations” in the sterilization area, progressing from contaminated instrumentation and equipment to clean to sterile instrumentation, is key to an efficient and productive practice.
- Using cassettes in a tight space can result in downsizing the sterilization area by one third and still maintaining the efficiency and flow of the larger central sterilization area.
- The dental lab should occupy approximately 56 square feet of office space.
- It is recommended that any central radiographic equipment such as a panoramic or cephalometric unit be placed in an alcove on the pathway to or from the operatories, i.e., the trunk corridor or the treatment corridor/hallway.
- Every operatory should have a dedicated periapical tube head placed behind the patient.

- Digital imaging transforms radiography from a diagnostic aid to a pathopneumonic diagnostic tool.
- Comparison of required counter space in the 5 operatory sterilization area: cassettes vs. trays.

	Cassettes	Trays
Instrument break down area	12''	36''
Ultrasonic cleaner area	24''	24''
Sink	24''	24''
Drying & packaging area	18''	36''
Handpiece maintenance area	12''	12''
Sterilizer	24''	24''
Tray assembly & storage area	18''	36''
Total	11 feet	16 feet

Chapter V

ELEMENTS OF THE PUBLIC ZONE

THE OFFICE ENTRANCE

Careful consideration of the office entrance is overlooked more often than it is not. Unfortunately for the majority of those offices, the first impression of the office in the mind of the patient is not a positive one. According to the premier practice management companies, the new patient will form a first impression within two minutes of entering the office, and this perception will become increasingly difficult to change as the initial appointment progresses.

So do yourself a favor and make the first few minutes of the new patient's office experience very positive.

FIRST IMPRESSIONS COUNT

The entrance may not be clearly defined leading the patient to search for the correct door (Figs.5-1a & b). *Make the entrance obvious!* In addition to this faux pas, the entrance may be unintentionally foreboding through the presence of a large, heavy door with no opportunity to visualize the interior of the office from the outside. Consider the mindset of the new, apprehensive patient: what is behind this (ominous) door? Why does the office need such privacy? What happens in there (Fig. 5-2)?

A vertical window panel parallel to the door or a glass door represents two alternatives to solve this problem. In fact, a lease space or condominium with an entrance on an interior corridor can utilize an entire glass wall to showcase the elegance of the reception and waiting areas. This architectural feature can actually serve as a huge "billboard" and advertising tool for the practice as people in the building walk by the glass wall (Fig.5-3).

RECEPTION AND WAITING AREAS

Any patient entrance from the outside elements should incorporate a vestibule to insulate the reception and waiting areas from the weather. Of course, always avoid always and never say never; in this case, offices in Hawaii are exempt from the above suggestion! Once beyond the vestibule,

Fig. 5-1a



Fig. 5-1b



the reception or greeting desk/ area should be within 5 feet and very obvious to the new patient. The reception area should open and inviting to the patient using flooring, lighting, and architecture to draw the patient to the reception area and greeting desk (Fig.5-4). *Do not use the extremely threatening sliding window (stained glass is even worse!) configuration at the greeting desk!* This design shouts to the patient, “Don’t bother us!” and “Scary things happen back here with terrible noises !” What is the point of intimidating new or existing patients with this (almost) insulting insulation from the patient? If management of noise or sound is a concern, speak with an architect or design professional about the use of ceiling design to trap sound waves and carpet to absorb noise. The reception area and greeting desk is really an extension of the business and appointment areas (Fig.5-5) and, as an extension, allows the business staff to politely but quickly greet patients as they arrive. After the patient has been greeted at the reception desk, they can take a seat in the waiting area (Fig.5-6).

Seating in the waiting area should be placed so that patients have their own ‘space’ and are not

Fig. 5-2



Fig. 5-3



Fig. 5-4



Fig. 5-5



Fig. 5-6



Fig. 5-7



forced to sit in chairs that are next to doors, restrooms, or the greeting area (Fig.5-7). Also, the number of seats in the waiting area has a definite relationship to the number of operatories or clinical treatment rooms in the practice. In a general dental or medical practice, there should be approximately 1.5 to 2 seats in the waiting area for every operator/ treatment room. For pediatric medical and dental practices and orthodontic practices, there should be approximately 2.5 seats per treatment room/operator/dental chair. Other high volume specialty practices, such as dermatology or ophthalmology, should plan on 2.5 seats per treatment/exam room. Also, rural general practices may require 2.5 seats per operator or treatment room because more people typically accompany the patient. Note that many doctors will observe the waiting area to be crowded and assume that either more treatment rooms are needed, a larger waiting area is needed, or both. In fact, many times the problem lies with staff flow, treatment room turnover, and instrument/ equipment management...all pointing to an inefficient, poorly designed central sterilization area. Therefore, *carefully analyze the cause of poor patient flow in the office and do not immediately rely on seemingly obvious observations and solutions.* Lastly, be certain to check building codes in your locale to determine whether the office is required to include a lowered handicapped accessible reception/ greeting counter (Fig. 5-8).

Fig. 5-8



Fig. 5-9a



“WOW FACTOR” CONSIDERATIONS IN THE RECEPTION AND WAITING AREAS

Frequently there is a desire to place an object of interest or design in the reception or waiting area such as an aquarium, waterfall, fireplace, or other appointment. These are all a matter of personal choice, but the doctor should be aware that these options will require significant maintenance and/ or additional non functional space. Indeed, the average fireplace will require an additional 60 to 80 square feet of office space. If the objective is to create an inviting environment, consider working with an architect or interior designer to use lighting, ceiling design, furniture,

Fig. 5-9b

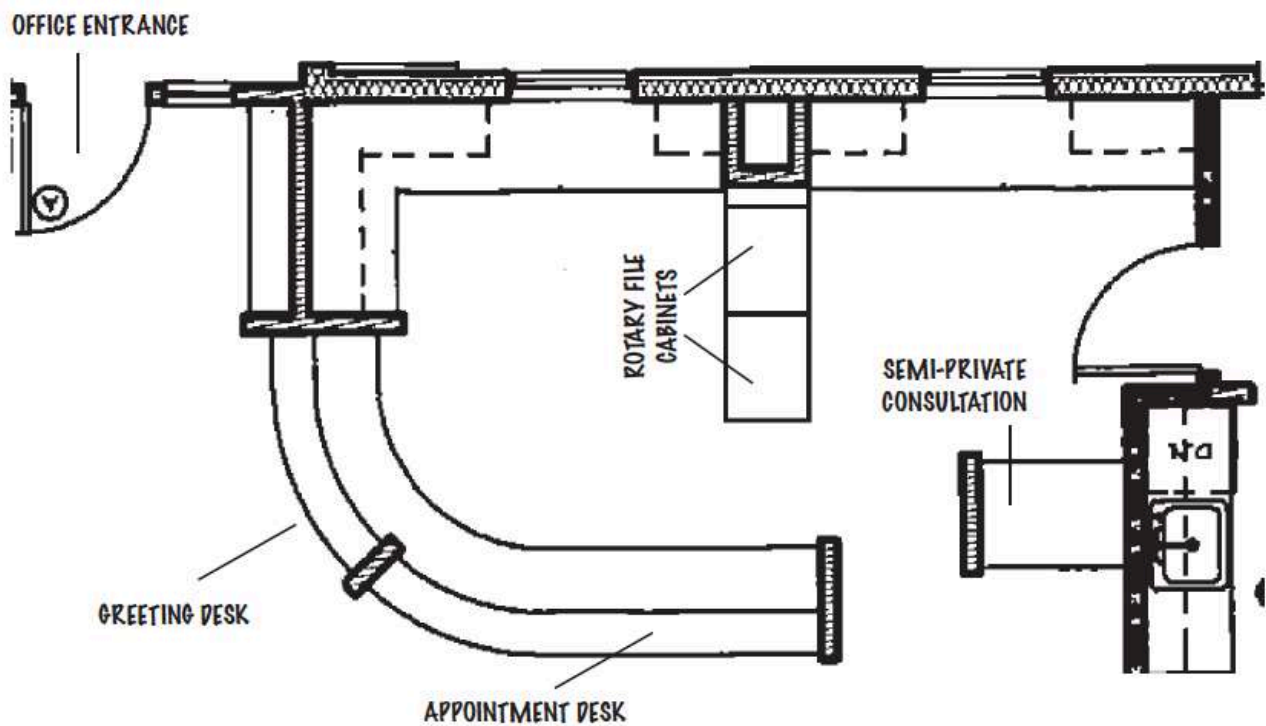


and finishes such as art, wall coverings, and flooring to make the patient comfortable...and make a statement about the practice's quality of care (Fig.5-9a & b). *The reception and waiting areas will speak to your patients and make a statement about the practice.* If the practice focus is cosmetic dentistry or plastic surgery, a statement of elegance and attention to detail would be desirable. For any other practice, the reception and waiting areas should deliver a statement of quality because all patients desire quality or competent care. And, since most patients have not attended medical or dental school, the only manner in which they can initially determine the quality of care in the practice is through assessment of their surroundings. *Therefore, be certain that your office environment is congruent with, and expresses, the level of clinical care delivered in your practice to your patients.*

FRONT DESK AND BUSINESS AREAS

This area must be appropriately sized for the practice because it is the control center of the office and the main intersection of patient flow. If it is too small for the number of business staff, their efficiency will be compromised but, more importantly, the patient flow will be disrupted. This will result

Fig. 5-10



Front Desk
Greeting/Appointment Desks & Semi-Private Consultation Area

in diminished production because patients who have questions or concerns about payment or a payment schedule will not voice their concerns when other patients are near and can overhear their conversation with the business staff.

SIZING THE BUSINESS STAFF AREA

As a general guideline, there should be approximately 8 lineal counter feet for every business staff person. For example, with two business staff there would be approximately 16 lineal counter feet for the business area. Of this 16 lineal feet, about one third or 5 feet would be dedicated to the front desk or greeting area and the balance of the counter feet would be used for the appointment and payment desk. The final several counter feet of the appointment desk can optionally be designed with a semi-private financial arrangements area if it is determined to be needed (Fig. 5-10).

Of course, the next question involves the appropriate number of business staff to support the practice. This is a question for a practice management consultant familiar with your particular specialty but, as a general rule, there should be one business person for every \$35,000 to \$50,000 of production revenue per month. Because of the wide range of needs for various types of practices, the upper range of the above estimate could extend to \$75,000 per business person per month.

Fig. 5-11



Fig. 5-12



The shape of the counter which creates the perimeter of the greeting and appointment areas, both of which circumscribe the business area, has taken many forms over the years, but the most efficient shape for the patient flow through the practice is the “shepherd’s hook” design (Fig. 5-11). Although the reception and appointment desks are essentially one piece of cabinetry, their separation is created by a wall that creates division between these desks as well as the waiting area and the entrance to the trunk corridor leading to the treatment area (Fig. 5-12). This passageway may or may not have a door, but the door is not necessary for ‘crowd control’. Patients realize that they must be invited through the doorway and into the treatment area of the practice. If you are concerned about sound or noise management, the use of only the door will not prevent sound from traveling into the waiting area if an open design of the reception area is utilized. Manage sound through the use of a ceiling design employing soffits and floating beams to trap sound and install carpet throughout the office to absorb sound (Fig. 5-13). The curved ‘hook’ portion of the desk serves as the reception desk and the straight ‘business’ portion of the shepherd’s hook counter design serves as the appointment and semi-private financial arrangement area for the business staff. This financial arrangement area can be very valuable and appreciated by the patients. Usually, this area is at the end of the appointment desk/counter with a small passageway into the business area punctuating the termination of the appointment counter and isolating the semi-private financial arrangements area (Fig. 5-14). Sandwiched between a passageway and wall, this semi-private financial area can serve as overflow for the consultation room as well as ‘stand-up’ or quick clinical consultations for certain specialists such as pediatricians and orthodontists.

One final admonition must be articulated before leaving the reception, appointment, and waiting areas. *The tenor of the design style that is being advanced in this text is one of ‘open-ness’ ...a style that promotes a sense of trust among the patients and minimizes any element of fear.* This theme of design is displayed throughout all treatment and public areas.

CONSULTATION AREA

For some practices, such as a pediatric medical practice, the consultation room is unnecessary. However, a ‘stand-up’ consultation counter, previously discussed, can be very helpful. For others, such as a general dental, plastic surgery, or orthodontic practice, the consultation room is critical to patient understanding and acceptance of the proposed care. In general, a consultation room will enhance the productivity of the office if the procedures offered to the patients are: 1) elective, 2) expensive, 3) involve extended question and answer periods about care (surgical specialties, obstetrics/gynecology,

Fig. 5-13



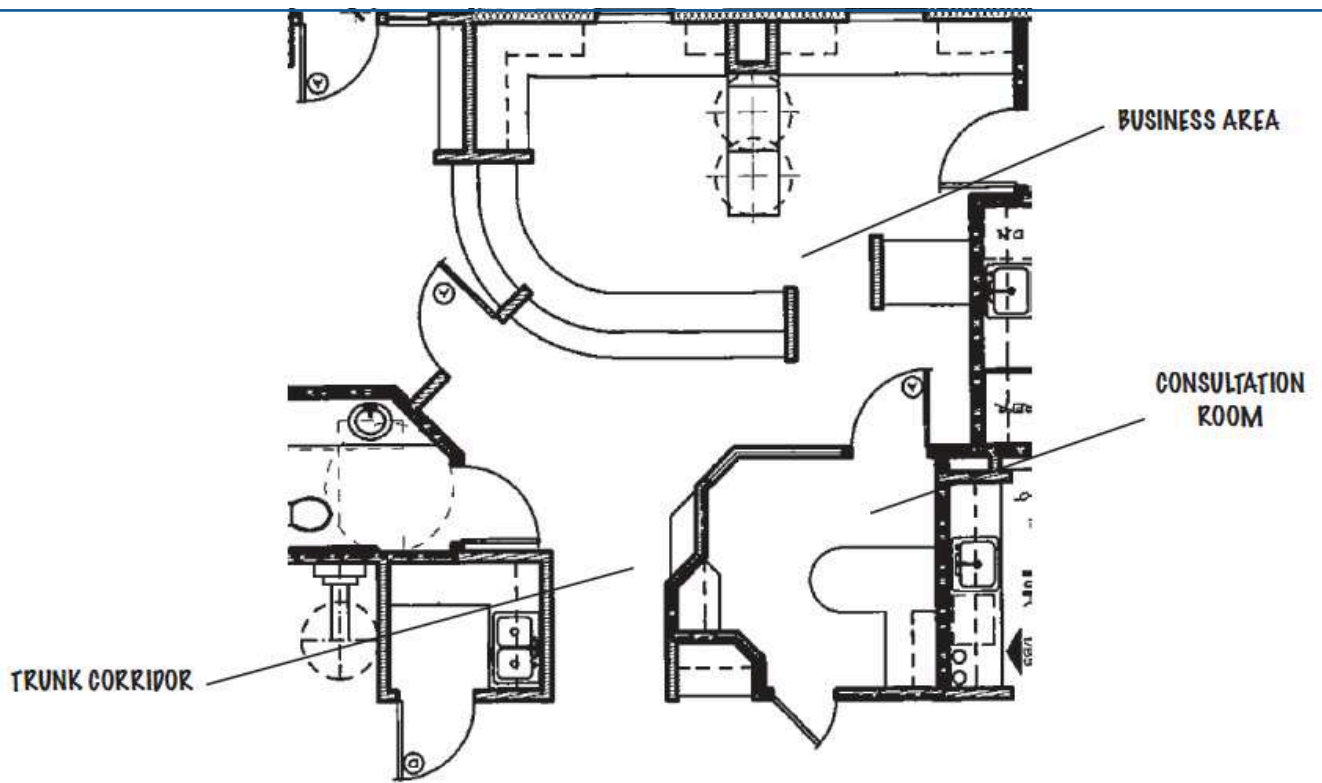
ophthalmology, esthetic or cosmetic dentistry), and 4) the clinical benefits of the procedure must be translated into quality of life benefits.

The consultation room should be placed along the trunk corridor separating the waiting room from the treatment area as patients will usually be directed from the treatment /exam area to the consultation room. Also, the placement of the consultation room serves as a transitional space between public and treatment areas (Fig. 5-15). *The consultation room should be elegant but not opulent; its design coordination and balance should convey competency, order, and control to the patient. Remember, the patient is trying to trust the doctor at this decision point of their care; make it easier for them to do this with*

Fig. 5-14



Fig. 5-15



Consultation Room separates the Public Zone & Clinical Zone

Fig. 5-16



Fig. 5-17



an atmosphere of confidence and competence (Fig. 5-16).

The consultation room should be no smaller than 9 feet by 9 feet and , if at all possible, a minimum ceiling height of 9 feet should be employed. Ceiling relief with crown molding is important and infinitely more impressive than a simple laid-in grid ceiling typically found in commercial space. A pendant light fixture is desirable as it draws people to the center of the room and adds interest and elegance to the space (Fig. 5-17). Etched glass walls are recommended to maintain the open style of the office; blinds may be employed if desired, such as with certain plastic surgery practices, but most patients appreciate the ambiance provided through the use of glass.

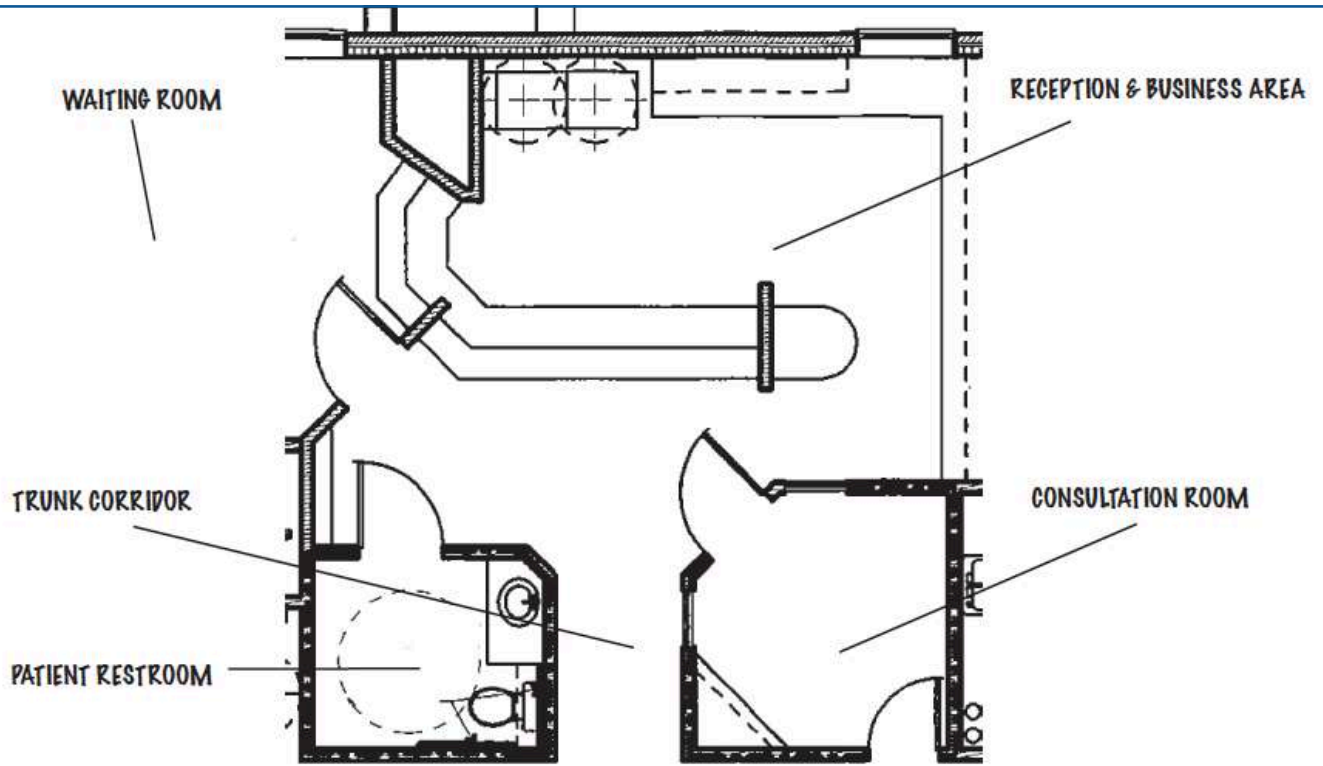
While a minimal amount of cabinetry is recommended, employ confidence- building technology such as computers, flat screen monitors, and cutting edge software to educate and inform the patient. Built in desks or free-standing tables can be used to furnish the room, but a dimension of at least 10 feet square will be required for a free standing table with adequate room for movement (Fig. 5-18a & b). As a last point, two entrances /exits may be designed for the consultation room for the convenience of the business staff; they must have the consult room in close approximation to the business office or they will not use the room during busy periods. And, typically the office staff will use the consultation room six to

Fig. 5-18a



Fig. 5-18b





Patient Restroom Placement on the Trunk Corridor



eight times daily if it is conveniently located near the business office.

RESTROOMS

Yes, the office should have a dedicated patient restroom and it should offer the patient a comfortable degree of privacy. Because using the restroom is not a spectator sport, the patient restroom should not be placed in the waiting area! Rather, it should be placed in the trunk corridor opposite the appointment desk/counter and inside the entry way separating the waiting area from the trunk corridor and appointment desk (Fig. 5-19). With this location, the front desk staff can monitor the restroom for cleanliness as well as noticing the traffic of any compromised patients who may have been medicated or treated (Fig. 5-20 with the appointment area, patient entrance to the trunk corridor, consultation room to the left, and patient toilet door to the right).

Fig. 5-21a



The size of the patient restroom will be dictated by the Americans with Disability Act (ADA) and, therefore, will be larger than necessary for the ambulatory patient. In fact, there will be a number of ADA requirements throughout the office; it is estimated that ADA requirements have added 15 to 20 percent to the cost of constructing a medical or dental office. Having recognized this fact, resign yourself to the reality of this law, not code, and comply with the law as you work with an architect or designer. Understand that the architect or general contractor can lose their license if they design or build a facility without observing the ADA requirements. Even if they were willing to ignore the law, the local permitting process and the periodic building inspections offer an additional monitoring mechanism to identify violations. Finally, if your new or newly remodeled facility does not comply with ADA requirements, you risk being sued by a handicapped patient...the risk is not worth the savings. In general, the ADA dictates that the patient restroom be able to accommodate the unimpeded 360-degree rotation of a wheelchair; this translates into a circle with a 5 foot diameter. However, be prepared for the local interpretation of the ADA requirements by your municipal building and permitting department.

While it may seem ridiculous at first thought, the patient restroom should make a dramatic design statement and it should be spotlessly maintained. Patients will evaluate the cleanliness of the practice,

Fig. 5-21b



Fig. 5-21c



Fig. 5-22a



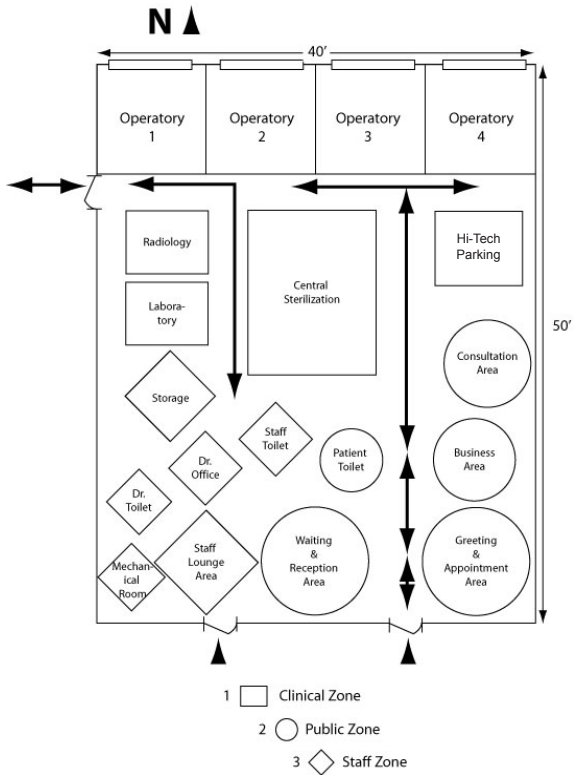
Fig. 5-22b



Fig. 5-22c



Fig. 5-23



in a large part, by their observation of the patient restroom. Design can be emphasized with color, lighting, materials, and art accents (Figs. 5-21a, b, & c). Flooring should be tile or stone with a floor drain.

Other restrooms in the practice would include a staff restroom and a doctor's restroom. The staff restroom can also serve as a dressing room. These restrooms will be in the staff zone of the office and should not be in the patients' field of sight because patients do not want to think of the staff in the restroom due to cleanliness issues. In some locales, separate male and female restrooms are required, so consult your architect or local building codes as the facility is planned.

Fig. 5-24a



CORRIDORS

Corridors are often an after-thought or not even considered in the design of an office. Most doctors want to minimize the size of the corridors as they view the space only as a useless expense.

Nothing could be further from the truth.

The corridors will be one of the office areas in which the patient can be impressed with a dramatic presentation that conveys the message of a 'quality office with quality care'. The corridors, patient restroom, waiting area, and the consultation room are all areas that should be used to create and convey a



definitive message of elegance and quality to the patient. Using space, lighting, color, and the geometry of architecture, impressive images can be created with corridors (Figs. 5-22a, b, & c).

There are three classifications of corridors in the dental or medical office: public, clinical, and staff corridors (Fig. 5-23). The public corridor extends from the passageway separating the waiting room and the appointment area to the beginning of the clinical corridor. In addition to the visual impact, another design concern is smooth and unimpeded patient and staff flow through this area. Therefore, the corridor area adjacent to the appointment desk should be 6.5 to 7 feet wide and the public trunk corridor accommodating the patient restroom, consultation room, and possibly radiography should be five feet

wide (Figs. 5-24a, b, & c).

The clinical (zone) corridor offers the opportunity for an uninterrupted vista of ceiling relief, up-lighting and decorative lighting, decorative columns or colonnade, and the use of color and art (Figs. 5-25a, b, & c). This corridor should be ideally 4.5 to 5 feet wide and certainly no less than four feet wide. In addition to esthetics, the clinical corridor should be designed for sound control and attenuation through the use of higher ceilings with floating beams and headers to trap sound waves. Also, the use of commercial grade carpet in the clinical zone will aid in dampening sound.

The staff (zone) corridor/s should be no less than three feet-eight inches wide as this is recognized by the Uniform Building Code as a minimum width for a corridor in a commercial facility. Because of the relatively little use of this corridor, staff flow and esthetics are not of primary concern with this space.

Fig. 5-24c



Fig. 5-25a



Fig. 5-25b



Fig. 5-25c



CHAPTER V—WHAT’S THE BIG IDEA?

- Make the entrance obvious.
- Do not use the extremely threatening sliding window (stained glass is even worse!) configuration at the greeting desk
- Carefully analyze the cause of poor patient flow in the office and do not immediately rely on seemingly obvious observations and solutions.
- The reception and waiting areas will immediately speak to your patients and make a statement about the practice. Therefore, be certain that your office environment is congruent with, and expresses, the level of clinical care delivered in your practice to your patients.
- The tenor of the design style that is being advanced in this text is one of ‘openness’...a style that promotes a sense of trust among the patients and minimizes any element of fear.
- The consultation room should be elegant but not opulent; its design coordination and balance should convey competency, order, and control to the patient. The patient is trying to trust the doctor at this decision point of their care; make it easier for them to do this with an atmosphere of confidence and competence.

Chapter VI

ELEMENTS OF THE STAFF ZONE

CONTINUITY IS KEY

Recall that there are three zones in the medical or dental office: the Clinical, Public, and Staff zones. In order to optimize the functionality of the facility and practice, i.e. optimal staff and patient flow and productivity while reducing the staff's emotional and physical stress, it is imperative that all elements of the Clinical and Public zones be contiguous and uninterrupted. While it would be desirable to treat the Staff zone in the same manner, fracturing the Staff zone into two sections will not compromise the objectives of increasing productivity and reducing stress (Fig.6-1). However, separating the Staff zone into more than two sections risks compromising the above objectives.

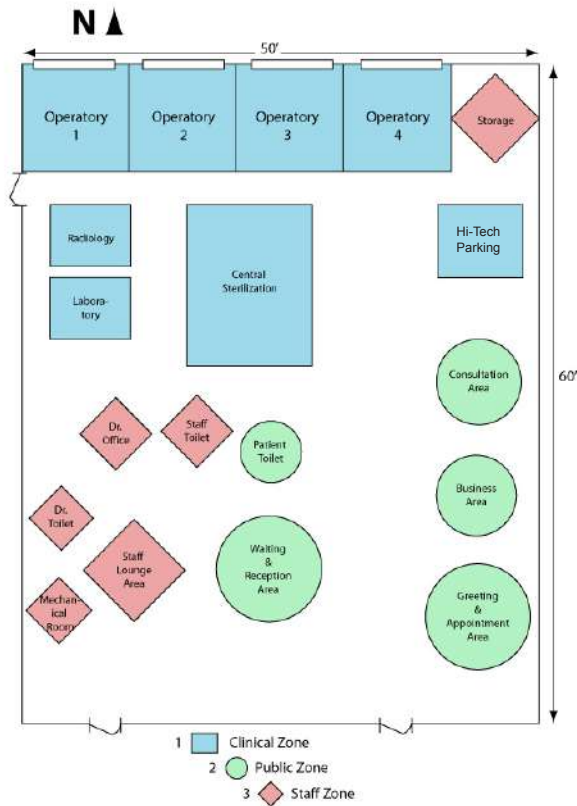
WHAT IS EFFICIENT?

It is appropriate, at this point, to address the issue of efficiency as the floor plan comes to completion with the addition of the Staff zone. *Efficiency will be achieved with the correct amount of space for the facility of the practice.* Conversely, as the amount of space deviates from the optimal, either in compression or expansion, efficiency will be compromised by staff waiting for another staff member to vacate space or being forced to repeatedly travel excessive distances throughout the day in the office. Take time to review the office sizing guidelines in Chapter Two and consider the number of doctors, clinical and business staff, and the number of patients flowing through the office daily in order to properly size the office.

DOCTOR'S OFFICE & OPTIONS

For the practice with only one doctor, the options are relatively simple. A very modest office can be created in a seven by seven feet space with a built-in desk, cabinet, a drawer stack, and a side chair (Fig.6-2). A more standard size of office would require a space of nine feet by thirteen feet, and these dimensions would accommodate a free standing desk, credenza, two side chairs, and adequate

Fig. 6-1



travel circulation around the furniture (Fig.6-3). If at all possible, a window is a definite plus for the private office, but hopefully the doctor is not spending much time in this space!

Multiple doctor practices can utilize individual offices or a bullpen configuration that will accommodate two or more doctors. With the office carrels on the perimeter of the office space, the center of the bullpen can hold a conference table with a centerpiece accented by lighting. Of course, some privacy is compromised, but all doctors are accommodated and a tremendous amount of space is conserved while not compromising any functionality in the practice (Fig.6-4).

Fig. 6-2



STAFF ROOM

Is this portion of the office really necessary to conduct the practice of medicine or dentistry? Especially when the cost per square foot is considered as well as the interest on the mortgage debt?!

Of course, it is not necessary.

The staff room is not necessary if you do not want to tangibly demonstrate the value you place on your employees. The staff room is not necessary if you do not care about the quality of the staff... because good employees will not tolerate working under poor conditions. The staff room is not necessary if you do not plan to effectively communicate your plans, desires, and methods of practice to the employees.

So, the modified answer to the question of the staff room becomes, "It is necessary if you desire a successful practice, i.e. one in which stress is minimized and productivity is maximized."

With the justification of the staff room, the next question about this space centers on the appropriate size of the staff room for each practice. In general, the size depends on the number of total

Fig. 6-3



Fig. 6-4



Fig. 6-5



staff and the functions this room will serve. Also, it may be advisable to consider the size of your private office and be certain that the staff room is at least as large for obvious reasons.

The standard elements of the staff room consist of a handicap accessible restroom and clothes changing area, a coat rack or closet, stacked lockers with keys, a full-sized refrigerator, a run of 24-inch deep counter space to accommodate a microwave, coffee maker, working space, and dishwasher (Fig. 6-5). Also, the room should be large enough for a table at which the majority, if not all, of the staff may be seated when all are present (Fig. 6-6). In order to accommodate the above items, the minimum size of the staff room would be 11 by 13 feet. In order to employ larger tables with more chairs, more counter space, and additional lockers, more space will be needed and should be discussed with your designer or architect. Of course, the staff room can also become a continuing education center for specialists lecturing to local general practitioners (Fig. 6-7).

As a final point concerning staff rooms, remember that this room may serve as a ‘hidden hallway’ for the staff entrance (Fig. 6-8). This additional function of the staff room decreases the perceived cost of the room and increases its utility. Beyond the exit, it may be possible to create an inexpensive

Fig. 6-6



Fig. 6-7



courtyard for the staff to enjoy a ‘picnic’ during the lunch hour (Fig. 6-9). If you have not heard the recommendation yet, *the staff room or lounge offers great value to the practice when comparing its cost to its benefits. So be certain to include one in the floor plan!*

MECHANICAL EQUIPMENT/ ENGINE ROOM

At this point in the design process, most doctors are trying to conserve space and treat the mechanical room as an after-thought. It is characteristically too small for the equipment placed in it and is poorly positioned within

Fig. 6-8



the floor plan. Remember, your practice depends on this equipment to function flawlessly, so provide adequate ventilation and space for technicians to repair the equipment (Fig. 6-10). The equipment specialist/s providing and installing the equipment should be consulted during the drafting of the floor plan to determine the optimal or adequate space for the mechanical room. For most dental practices, an adequate space for the mechanical equipment room will be 4.5 feet by 4.5 feet. Be certain to consider sound-proofing the room with sound board for any walls adjoining interior spaces as well as employing door stripping and a floor apron (for the door). Venting for exhaust and sound will probably be necessary. Consider using shock absorbing platform or feet for items such as compressors to eliminate the transmission of vibration to areas adjacent to the mechanical room (Fig. 6-11).

Fig. 6-9



Fig. 6-10



Fig. 6-11



Fig. 6-12



Fig. 6-13



Note that building codes may dictate that medical gases are stored separately from the mechanical room and may be required to have an external or outside access to service the gases (Fig.6-12). Additionally, it is advantageous to place the medical gases near the staff entrance so that gas cylinders can be replaced without disrupting patient care.

The mechanical room is part of the Staff Zone, but if it is adequately insulated and is readily accessible for repair technicians, it can be placed in other zones of the office without sacrificing functionality. The cost of running electrical, pneumatic, or plumbing lines is

Fig. 6-14a



Fig. 6-14b



Fig. 6-15



Fig. 6-16



negligible, so positioning the mechanical room next to the operatories or clinical treatment rooms is not necessary. Nevertheless, do not place mechanical rooms above operatories on higher levels or stories as the suction will not draw fluids uphill!

OFFICE STORAGE

There are four classifications of storage that are needed in dental and medical practices: daily, weekly, bulk, and large equipment storage. Again, this is an area of the office in which the doctor will attempt to conserve floor space and save money, but this effort is a false economy. If you are striving to

Fig. 6-17



create an elegant design that conveys the level of care being provided in your practice, it is absolutely necessary to create the impression of spaciousness and order. These qualities cannot be achieved in an office desperately attempting to utilize every square foot of available space.

Incoming supplies are initially stored in the bulk storage room. The sizing of this room is dependent upon the number of doctors in the practice; a single doctor practice will require approximately 150 lineal counter feet and each additional doctor in the practice will require the addition of approximately 50 lineal counter feet to the bulk storage room. Also, this room will need to have handicap accessibility, so there must be a five foot diameter circle of free space for a wheel chair to turn freely. Therefore, opposing shelves should be separated by a space of five feet (Fig. 6-13).

From bulk storage, items should be removed to stock the shelves of the weekly storage area in central sterilization; this storage area should have doors (Figs. 6-14a & b). Obviously, this storage area will contain only those items regularly needed and only for one week. Accordingly, the supplies from this area may be rather small and tend to be lost on larger shelves. For efficient inventory management and a minimum amount of 'expired' supplies, consider using shelving in this weekly storage area that is no greater than 8 inches deep (Fig. 6-15). Additionally, use only approximately 30 lineal counter feet for weekly storage.

From weekly storage, supplies are drawn to stock daily storage areas in central sterilization or in the clinical treatment rooms or operatories. Drawers in central sterilization may have expendable supplies which are used on procedure trays and the clinical treatment rooms will have drawers or tubs which will need to be replenished with expendable supplies (Fig. 6-16).

Finally, do not forget that storage area is needed to 'park' larger pieces of equipment that you may periodically use in the clinical treatment room or operatory; lasers and surgical microscopes come to mind. Of course, the size of this area depends on the sum total size of the equipment employed. Plan for this storage area along the treatment corridor in the form of an alcove or as extra space in the laboratory (Fig. 6-17); this area is also known as the high tech parking lot. Obviously, you will need to project and plan ahead with your best guesswork as no one knows the future development of equipment that will be a 'must have' in the practice.

CHAPTER VI—WHAT’S THE BIG IDEA?

- Efficiency will be achieved with the correct amount of space for the facility of the practice.
- The staff room is not necessary if you do not want to tangibly demonstrate the value you place on your employees.
- The staff room or lounge offers great value to the practice when comparing its cost to its benefits.
- There are four classifications of storage that are needed in dental and medical practices: daily, weekly, bulk, and large equipment storage.
- Separate functions require separate facilities or rooms; storage room, mechanical room, staff room, laboratory, and sterilization areas should all be separated.

INTEGRATING TECHNOLOGY INTO THE DESIGN OF THE OFFICE

TECHNOLOGY SHOULD MAKE THE DAY EASIER

The practice of dentistry and medicine are becoming more complex and difficult in spite of, and perhaps because of, the advent of more advanced technology. This seeming paradox can be solved with the observation that *any technology employed in the practice should enhance productivity and reduce emotional and physical stress of the staff or the technology should be discarded because it is not achieving the desired effect*. When examining technology for incorporation into the practice, there will be software and hardware considerations as well as compatibility issues between the two modalities. Additionally, practice management functions, therapeutic devices, and diagnostics will be employed to either collect data for analysis or patient treatment. As a result, there are many variables in this complex system which must always and constantly perform harmoniously to achieve the desired result. As these computer software and hardware systems are utilized, many times there are conflicts among these various information or therapeutic systems.

Integrating this diagnostic and therapeutic hardware and software into a coherent design that will facilitate the practice of medicine and dentistry is the goal; productivity must be enhanced and not impeded. The objective of technology planning is to design the integration of all desired technologies to create a seamless utilization of the technologies in the clinical treatment room or dental operatory and throughout the office. Therefore, this chapter will examine the incorporation of the office's technology into the concept of ergonomics and design.

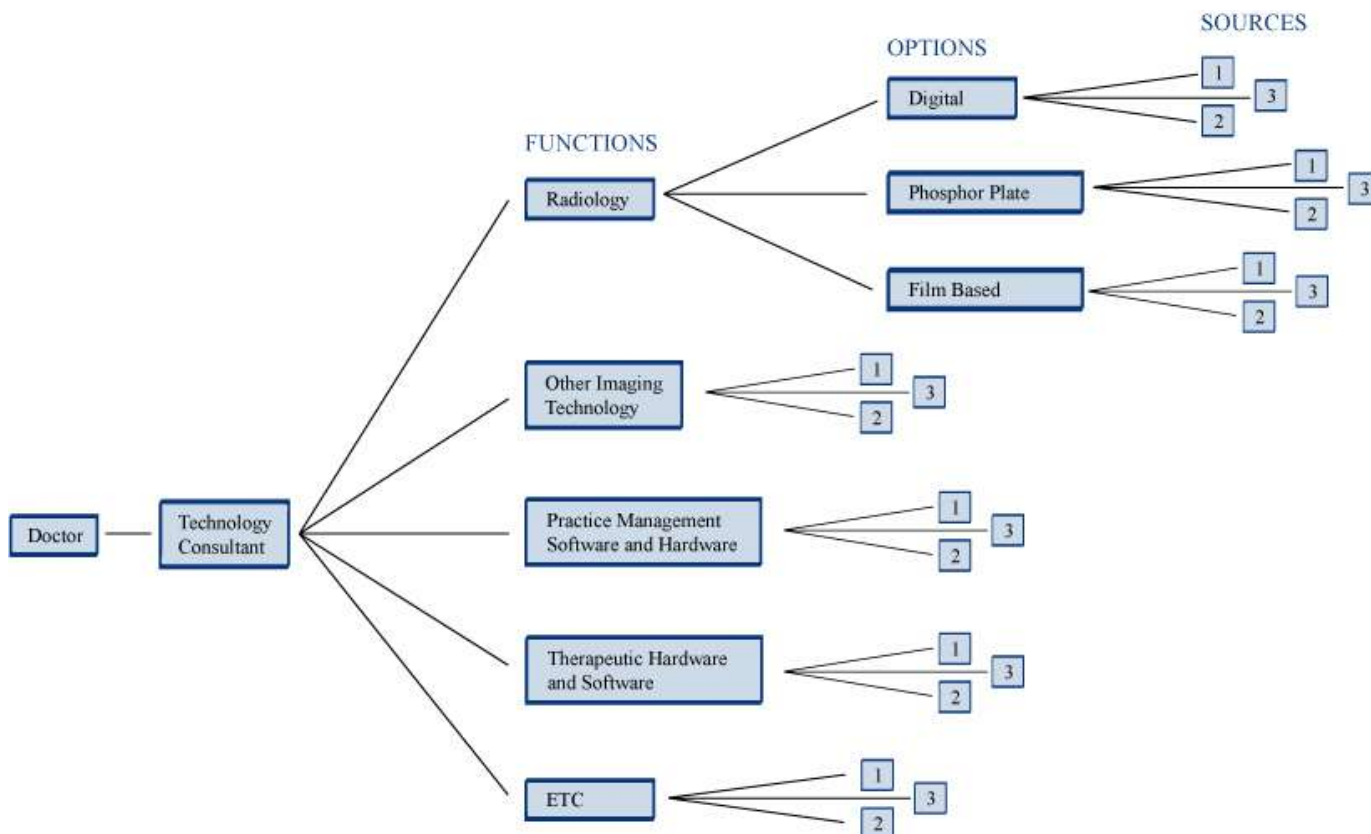
It is strongly recommended that a dental or medical (computer) technology expert be engaged or hired to: direct the hardware and software selection process, develop the "technology blueprints" (yes, just like the architectural blueprints created to construct the facility), manage the installation of the hardware and software, and oversee the technology implementation and staff training (Fig.7-1). The utilization of this consultant will save countless hours of product assessment, possibly (and almost certainly) prevent bad software or hardware selections, increase the probability that your technology/

information system will function correctly from the first time without conflicts, and avoid the dreaded and frustrating “shakedown” period. Based on a written questionnaire or an extensive question and answer dialogue with the doctor, the technology consultant should select several hardware and software solutions that are compatible with the practice’s clinical and management needs while also being harmonious with the design of the facility and the area of use. With an understanding of the advantages and disadvantages of each alternative, the doctor can then make an informed choice.

IDENTIFYING THE INFORMATION SYSTEM FOR YOUR PRACTICE

Beginning the development of the information system should include defining the function/s of the system. For example, will radiography be used in the practice and, if so, should a sensor based or phosphor plate based system be used? What type of clinical diagnostic “tools” or functions should the radiographic software employ? Will only gray scale imaging be employed or will other diagnostic or therapeutic devices require color imaging? What size monitor is optimal and what is the recommended

Fig. 7-1



resolution of the monitor? How much memory is needed to archive (store) images and how many images will need to be archived? Will the imaging software need to be integrated with the practice management software?

You get the idea.

Answering a carefully crafted set of questions for each function of the information system will yield a single best software and hardware solution for each function. Then, all 'function' solutions can be considered in creating a compatible information system to serve the entire office.

Creating the technology or information system 'blueprints' should be accomplished after all functional solutions have been identified and before any item is purchased or any cable installed.

For example, based on the identified need for gray scale and /or color, what is the required resolution (clarity and detail of picture) of the computer monitor? What is the optimal dot pitch for the monitor? What is the maximum viewing angle of the monitor? These may be highly detailed questions, but as the information system for the office is assembled and constructed, the function and efficiency of the system is dependent on the cumulative hardware and software choices. As a result, you are again encouraged to utilize an experienced medical or dental technology consultant to identify the information system that will best meet your particular needs, design the system on paper, negotiate the purchase of the components of the system, and install the information system. If you are still not persuaded of the need to employ a technology consultant, consider that the system being created must be able to adapt to future advances in hardware and software applications. *The average practice will occupy a facility for 20 years, so the designed information system must be expandable and adaptable as technology races forward.* Think of all of the changes in technology over the past twenty years and you will realize the challenge of crafting an information system that will absorb advances without requiring major upheaval ...such as tearing cable, incapable of efficiently transferring information generated by new technology, from the walls or ceiling!

PLANNING IS KEY TO THE SUCCESSFUL INFORMATION SYSTEM

Therefore, seven steps can be identified in creating and utilizing an information / technology system that will meet your clinical and practice management needs. These steps include:

- Establishing clinical and practice management technology goals and objectives
- Developing an initial budget
- Identifying various options for each clinical and practice management objective/ use and

selecting the best option for each objective

- Identifying the optimal components for each chosen objective and designing the information system while reconciling the design with the budget
- Purchasing the identified components and equipment
- Installing the information system
- Implementing each clinical and practice management component of the information system with training of the staff

Intentionally completing each one of the above steps, with the informed leadership of a proven technology consultant, will yield an information system that will facilitate the function of your practice. It sounds simple, and it is simple, but few people exhibit the discipline of proceeding in an orderly fashion through the above steps.

BLUEPRINTS FOR THE INFORMATION SYSTEM

Now let's examine the elements of an adequately designed information/ technology system. *A number of diagrams or "blueprints" must be created to define the design of information system and they include: computer hardware requirements illustration, computer network drawing, network layering diagram, and a dental operatory or clinical treatment room wiring diagram.* Without this planning function, the doctor is randomly selecting and purchasing components that may or may not be compatible with each other, and the installation is left to the creativity of the guy wearing the utility belt on the job site!

The Computer Hardware Requirement illustration graphically describes or lists the location and specifications for each CPU (central processing unit), monitor, server, modem, router, printer, clinical imaging technology hardware, DVD, and the software that will run on the hardware. For example, the type and speed of the specified processor, RAM and hard-drive capacity, and special CPU cards are listed for each CPU. Further, each workstation is identified as existing, new, or planned (for the future).

The Computer Network Drawing, as the title denotes, should graphically depict the location of each piece of hardware in the information system and the type of cable connection for each piece in the system. For example, the diagram could depict category 5E cable running from a port on a central ethernet switch to the singular CPU in the operatory or treatment room. The CPU would be depicted connecting to a digital radiography USB box, an intraoral camera via an S-video cable, and a (patient dedicated) cable TV capable monitor via an SVGA cable.

The Network Layering Diagram is another critical component of the information system “blueprints” because it illustrates the location of each CPU in the office as well as the location of the file server and ethernet switch. Importantly, this diagram is drawn to scale to determine the actual distances between the server, switch, and the individual CPUs; the distance between these items will determine the type of cable to be used as well as the quantity of cable. Because of the cable’s expense, it is not advisable to order and purchase more than needed, but an insufficient amount could delay construction of the office while securing an excessive amount of cable could result in a great deal of extra expense. Therefore, an accurate measurement of the required cable is vital. Additionally, as distances among the server, switch, and CPUs increase, different cable may be required to prevent attenuation of the electronic signal. Usually, category 5E cable will suffice for the vast majority of medical and dental offices, but distances of more than 100 lineal feet between components will require a cable of higher rating up to category 6E. While the amount of information transmitted today through 5E cabling does not even approach the capacity of the cable, the future may produce technology which challenges the capacity of 5E cable; plan for the future with cable that far exceeds the current requirements of your information system.

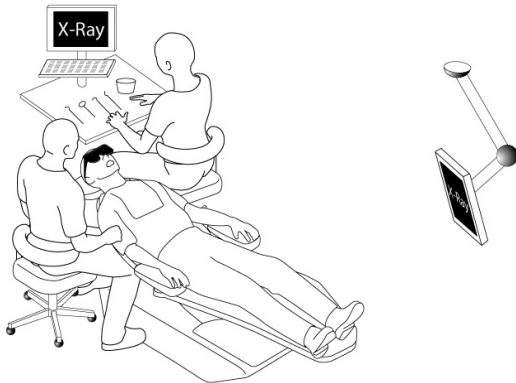
Other cabling considerations include:

- Do not run cable under carpet
- Avoid placing the cable near sources of heat, i.e. heat ducts and hot water pipes.
- Do not bundle electrical power wiring with any information system cable in the same conduit.
- Do not splice information system cabling...ever.
- Carefully observe the cable manufacturer’s recommendations for maximum pulling tension when installing (pulling) cable.
- Do not place cable within four inches of electrical power wiring or within 18 inches of transformers.
- Use insulating sleeves, conduits, or grommets when the cable must pass by or through metal structures.
- The installation of the information system and wiring must comply with all local electrical, building, and fire codes.

This is not intended to be a primer on cabling design and installation, but the reader should understand with the above guidelines that considerable knowledge and planning are required to



Fig. 7-2b



successfully install and implement a functional information system.

CLINICAL TREATMENT ROOM WIRING DIAGRAM

The clinical treatment room wiring diagram is very important because the complexity of the many peripheral devices attached to the CPU require careful planning and installation. Information will be entering and exiting the treatment room through shielded category 5E cable; information entering

the treatment room will be displayed either on the clinical workstation monitor, the patient (viewing) monitor, or transmitted through the patient's headphones (Figs.7-2a & b). Information displayed on the clinical workstation would include: schedule/s, paging/office communication, digital radiographs and ultrasound, digital clinical photographs, any digital medical or dental diagnostics, visual monitoring of

Fig. 7-3a



Fig. 7-3b



any area of the office, and Internet conductivity.

Information displayed on the clinical workstation is considered confidential according to HIPAA and, therefore, the workstation monitor should be placed so that only the staff is able to view the displayed

information (Figs.7-3a & b). The other monitor of the clinical treatment room or dental operatory is the patient viewing monitor and the information displayed would include: digital images such as radiographs and photographs, cable television, educational programs, movies, and patient scheduling. Generally, this monitor is positioned in the corner of the treatment room that is in the patient's line of sight. It is suspended from the ceiling or the wall with a double jointed gas cylinder pendulum mount such that the bottom edge of the monitor is 80 inches above the floor, thereby preventing (most) people from inadvertently striking their head (Figs.7-4a & b). The remaining possible conduit of information in the dental operatory is the patient's audio headphones which would carry the audio track associated with the programming on the patient viewing monitor or music from an accessed library.

Necessarily, the clinical treatment room wiring diagram should illustrate the complete circuitry and interfacing connections between the CPU and each piece of peripheral equipment. The two flat panel display monitors driven by the single CPU in the treatment room can simultaneously display different images and support different applications or programs if the CPU has been equipped with a dual head graphics display card. It is recommended that the flat panel monitors be 17 inches (diagonal screen dimension) or greater and that the resolution of the monitor be at least 1024 X 768. Laptops generally

are not useful in the treatment room because the monitor is too small, there is limited expandability in attaching peripheral devices, and the footprint of the laptop occupies a great deal of valuable counter space. It is important to note that all information system components in the treatment room can be controlled with a single programmable foot control, but this electrical feat requires detailed planning.

ARCHITECTURAL CONSIDERATIONS IN TECHNOLOGY PLANNING

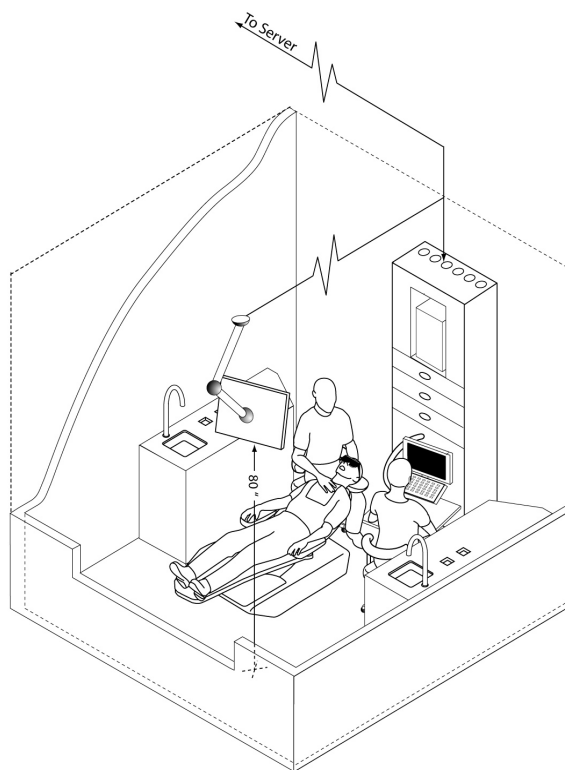
In order to complete the planning process for a successful long term, functional information system, two additional issues must be addressed. The *mounting specifications and blocking diagrams* for any equipment or monitors that will be suspended from walls or ceilings should be a component of the information system plan; this will ensure that the supporting structures will be able to support the weight of any equipment. Also, a *detailed illustration of the physical space occupied by the server and network switch* is necessary to provide adequate room and ventilation for the components (Fig. 7-5).

Ventilation is also an important consideration in the placement of the CPU in the treatment room. By utilizing a rear delivery column in the clinical treatment room, there is a single point from

Fig. 7-4a



Fig. 7-4b



which all information enters and exits the treatment room (Fig. 7-6); this facilitates compliance with the guidelines for cable management enumerated earlier in this Chapter. The CPU can be positioned in the rear delivery column with adequate ventilation at the top of the wall. In positioning the CPU, it is also important to consider the distance from the CPU to any of the peripherals in the treatment room because the information signal may be attenuated or weakened with excessive distance. In the clinical treatment room with the dimensions of approximately 10 feet X 10 feet, it is recommended that the CPU be placed on or in a rear delivery column no lower than 54 inches above the floor (Fig. 7-4b).

Following these recommendations of careful planning for the contemplated information system, the practice will be rewarded with the integrated technology that will enhance production and the quality of care rather than impeding the delivery of medical and dental care.

Fig. 7-6



Fig. 7-5



CHAPTER VII—WHAT’S THE BIG IDEA?

- Any technology employed in the practice should enhance productivity and reduce emotional and physical stress of the staff or the technology should be discarded because it is not achieving the desired effect.
- It is strongly recommended that a dental or medical (computer) technology expert be engaged or hired to plan and install equipment as well as train personnel.
- Answering a carefully crafted set of questions for each function of the information system will yield a single best software and hardware solution for each function. Then, all ‘function’ solutions can be considered in creating a compatible information system to serve the entire office.
- Creating the technology or information system ‘blueprints’ should be accomplished after all functional solutions have been identified and before any item is purchased or any cable installed.
- The average practice will occupy a facility for 20 years, so the designed information system must be expandable and adaptable as technology races forward.
- A number of diagrams or “blueprints” must be created to define the design of information system and they include: computer hardware requirements illustration, computer network drawing, network layering diagram, and a dental operator or clinical treatment room wiring diagram.

Chapter VIII

PROPERTY AND LEASE SPACE/ CONDOMINIUM SELECTION

HOW MUCH IS ENOUGH?

One of the first steps in creating the new office is selecting property, a condominium, or a lease space in which the office can be constructed. Of course, the obvious questions center on the location and size of the property or space: where to go and how much space is needed? The question of location is addressed in Chapter Nine under the section, “The Right Place for Your Practice,” but the question of property size cannot be answered until the appropriate size of the building is known. And to know the size of the building, you must have determined the number of operatories or treatment rooms that will be incorporated into the office. But, the number of operatories or treatment rooms required to create a functional office is dependent on the number of doctors, physician assistants, or dental hygienists working in the dental or medical office. See the section entitled, “How Many Clinical Treatment Rooms or Dental Operatories Are Right for You” in Chapter Two for guidance on this topic. To supplement that information at the risk of over simplifying the analysis, *the following generalization may be considered in determining the required number of (general practice) operatories or treatment rooms:*

One doctor (and one hygienist) ...four or five treatment rooms

One doctor (and two hygienists or one physician assistant) ...five or six rooms

Two doctors (and two hygienists or two PAs) ...six or seven rooms

Recall the management principle from Chapter 2 that advises one operatory or treatment room be vacant approximately fifty percent of the day to increase the practice’s productivity and reduce the physical and emotional stress of the day. With the operatory or treatment room requirement answered, the decision making process can proceed to determine the size of the building to support a practice with the selected number of operatories. Remember, *the objective is to create a facility with optimal function, i.e. stress reduction while increasing productivity, so the following recommendation is made to achieve this objective:*

Four-five ops / treatment rooms ...500 sq. ft. of office space / operatory

Six-seven ops / treatment rooms ...450 sq. ft. of office space / operatory

Eight-nine ops / treatment rooms ...400 sq. ft. of office space / operatory

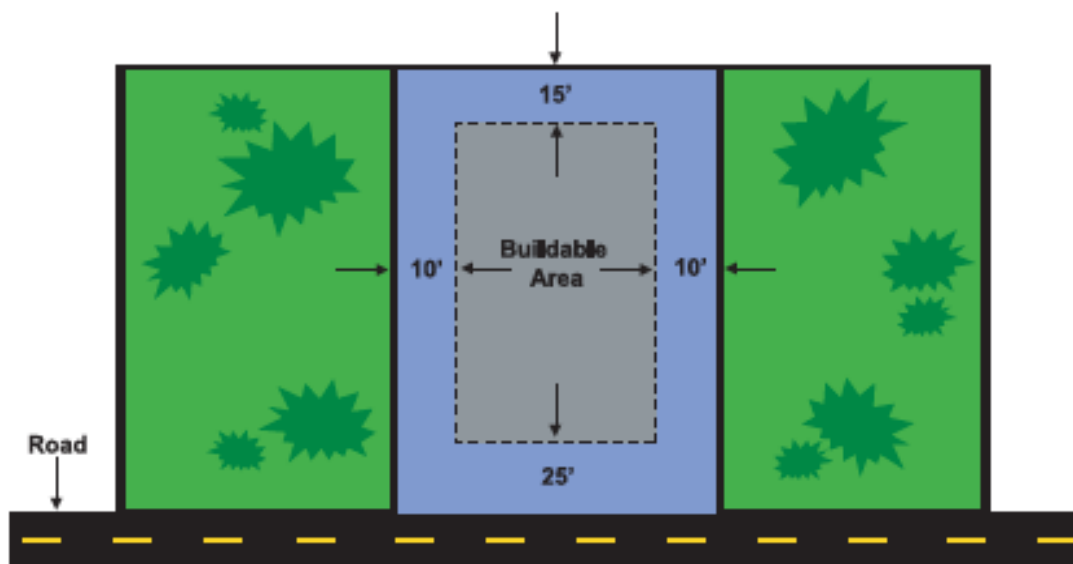
For example, a five operator office would have, for optimal function, approximately 2,500 square feet of usable floor space, while an eight operator office would have 3,200 square feet.

Finally, the size of the property needed to support a building of a specific dimension can be determined. While there are a number of considerations that must be investigated before purchasing a specific property that are reviewed later in this Chapter, a useful guideline is that *the property size should be six times greater than that of the contemplated office size. For orthodontic and pediatric practices, the ratio is increased such that the property size should be seven times greater than that of the contemplated office size.* Usually, this rule will suffice to accommodate adequate parking, setbacks, easements, and an acceptable site plan.

BUYER BEWARE

There are many caveats in evaluating potential properties and, consequently, *it is strongly recommended that you enlist the assistance of an architect or dental office designer in determining which property best meets your office needs and request a written architectural consultation* be performed. The major considerations include the setback requirement, easements, zoning designation, the ability to orient the building's treatment rooms to the north or east, and adjacent/ surrounding properties. Setbacks refer to land buffers from the property borders to the perimeters of the building; this regulation is established by the municipality in which the property is located but are usually the values denoted in (Fig. 8-1). Easements denote ready access to certain areas of the property and are generally for utilities or fire equipment. Of course, *the property should be zoned for a medical or dental office.*

Fig. 8-1



If it is not so zoned, DO NOT BUY THE PROPERTY. Horror stories abound about doctors who have purchased property with the intention of having it rezoned, only to find it will take months or years or never and the effort will require thousands of dollars!

Usually, the above information can be obtained by reviewing the property survey, the plat, or the topographical survey. The property survey will indicate any existing structures or improvements and will reveal the boundary lines between adjoining properties. The plat will describe the dimensions and locations of lot lines, any common areas, streets, and any other features as well as a written legal description of the boundaries. The topographical survey will indicate the location of natural and constructed features of the property such as the slope or contour of the land, fences, setbacks, easements, streams, existing buildings, and trees.

OTHER PROPERTY CONSIDERATIONS

Adequate parking space is often overlooked or miscalculated when developing a site plan for a medical or dental office. Many municipalities will require one space per 250 square feet of building space, but this is very inadequate for most dental or medical offices. However, requirements will vary so it is imperative that the local regulations are researched to be certain that the minimum requirements are met otherwise a building permit may not be obtained! *For a general practice, parking needs can be calculated as follows:*

- *One space for every staff member; this includes counting the doctor.*
- *One to one and a half spaces per dental chair or treatment room.*
- *One labeled handicap space.*
- *One space for another vehicle such as repair service or spouse.*

For orthodontic and pediatric practices, two parking spaces per dental chair or treatment room are needed while the other factors remain the same.

The configuration and placement of the building, parking lot, and landscaping must, of course, be addressed in the planning and this document is referred to as a site plan. If there is such a thing as an ideal site plan for a 2,500 square foot building, it would resemble Fig. 8-2. The building would have a northern orientation for the windows of the operatories or treatment rooms, the singular parking lot would be on the south side of the building with a “back to back” parking configuration, while standard setbacks and easements would exist. *Corner lots, which many doctors believe to be desirable or essential, are not necessary for a dental or medical practice.* Drive-by traffic and high visibility

Fig. 8-2

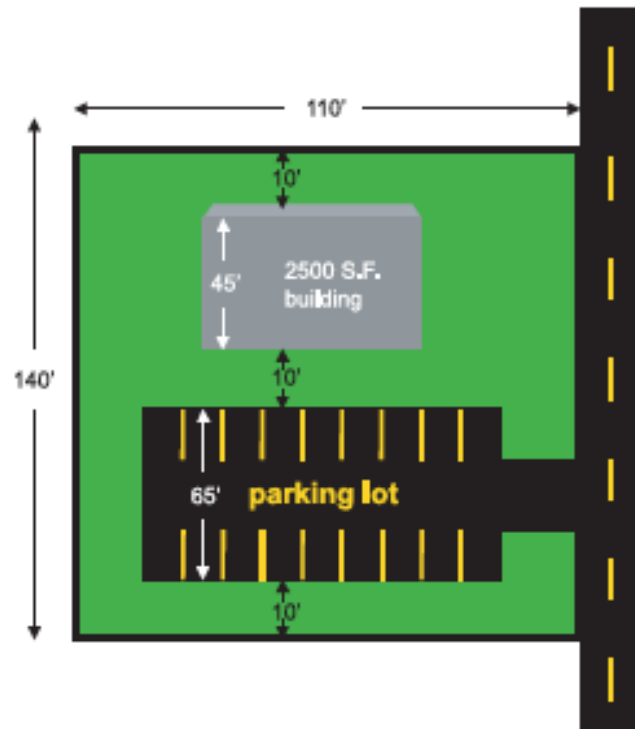
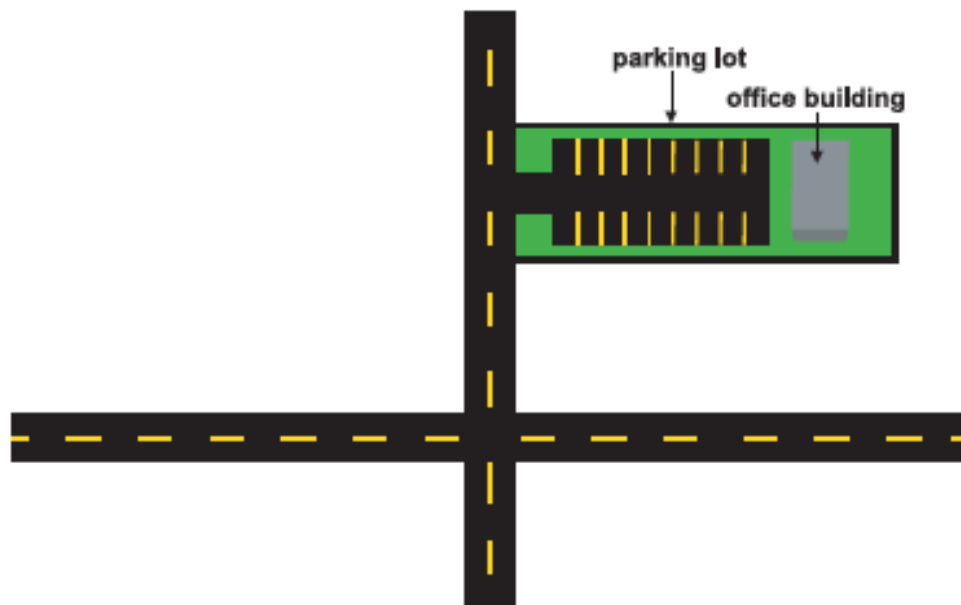


Fig. 8-3

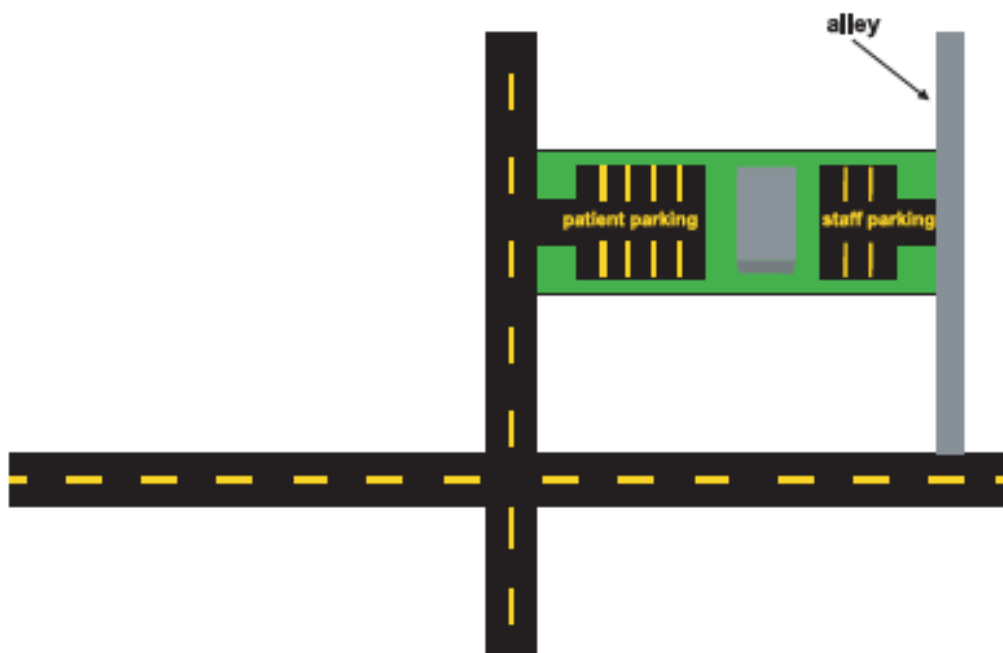


are necessary for lower-priced, impulse-purchased items. Corner lots are very expensive, usually have greater setback requirements, and are useful for businesses that rely on impulse purchases; most dental and medical procedures are not the result of the patient's immediate impulses. The exterior features that are important include the legibility, elegance, and positioning of the signage, the style and maintenance of the building, making the entrance obvious, adequate parking, and parking in proximity to the entrance.

The ideal dimensions of property to support a 2,500 square foot building are enumerated in Fig. 8-2, but many times such property is not available. Rather, longer and /or narrower lots may be the only alternatives (Fig. 8-3) resulting in an office with its visibility hampered by the cars in the parking lot. In such cases, an acceptable solution to the situation would be obtaining a conveyance easement from the adjacent property owners and splitting the parking between patient and staff (Fig. 8-4).

It is not intended that all possible property selection considerations be included in this Chapter but to give the doctor a working knowledge of the major considerations and caveats associated with assessing property use for a dental or medical office building. Other factors which should be discussed with the project architect or office designer include: required water retention / flood plain designation, any plan for a basement, the ability to site the planned building on the property, unusual site features

Fig. 8-4



such as sloping, escarpments, additional land that will be sold or developed for another purpose, available utilities, the need for a septic system, any demolition that will be required, and unusual code requirements.

LEASE SPACE AND CONDOMINIUM SELECTION

Evaluating lease space and condominiums require different criteria. Having made that statement, the parking space requirements remain the same as enumerated earlier in this Chapter. Of course,

the common parking lot serving the building will have many spaces, but it is important to discuss the practice's parking needs with the landlord or property manager and evaluate their rationale for the apportionment of spaces for the variety of tenants.

Site evaluation of a lease space is difficult to universally address but a number of factors will be reviewed. The space requirements of the office are reviewed earlier in this Chapter, but there are some exceptions to the rule that are peculiar to lease space and condominiums in multi-story buildings. Multi-story buildings will have columns with older buildings exhibiting a higher column to floor space ratio. Columns may or may not present obstacles in the design and construction of the office, but you need to plan as if they will obstruct by adding 50 to 75 square feet of floor space (to your previously calculated space requirement) for each column present in the space being considered. Also, columns closer than 15 feet from a wall may present a problem as that may be the space required for the most critical clinical area of the office: the operatory or treatment room (Fig. 8-5). *A final word about columns: have the number and configuration evaluated by an architect or medical / dental office designer before leasing space!*

Lease space or a condominium may not have linear (straight) perimeter walls but may be irregular in shape (Fig. 8-6). For every perimeter irregularity, it is suggested that 50 to 75 square feet of floor space be added to the previously calculated space requirement. This precaution may or may not be necessary, but you will not know this until the final, dimensioned floor plan has been drawn which will be after you have leased the space or purchased the condominium space.

Multi-story buildings offer a special challenge regarding the location of the office space in relation to the central hallway that will surround the building core; the core will contain utility chases, elevator shafts, and structural columns. Selecting corner office space will yield more windows, but it

Fig. 8-5

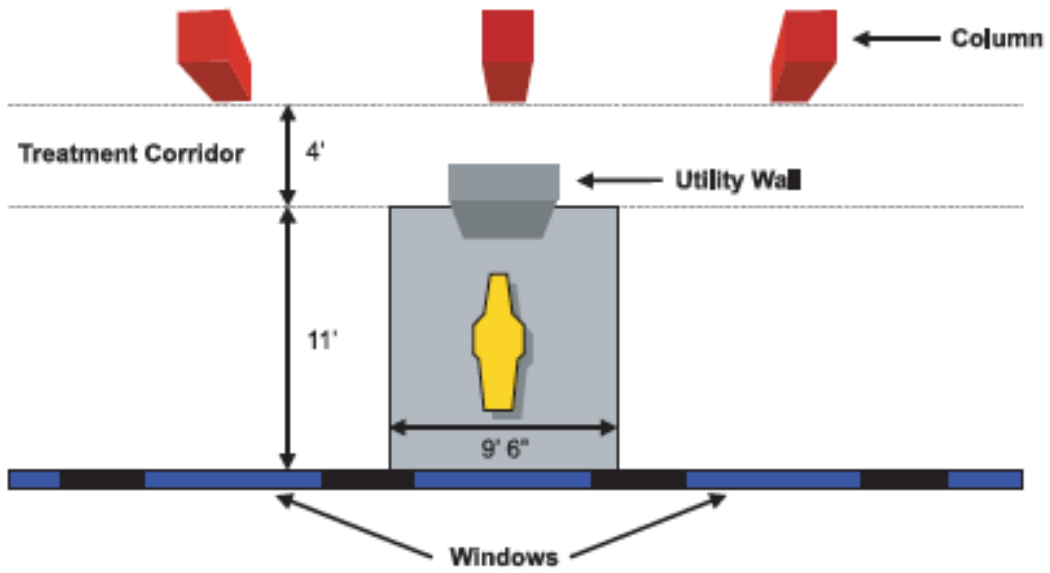
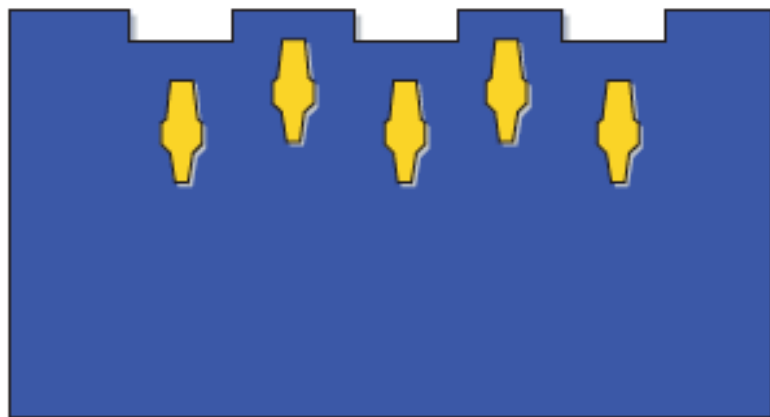


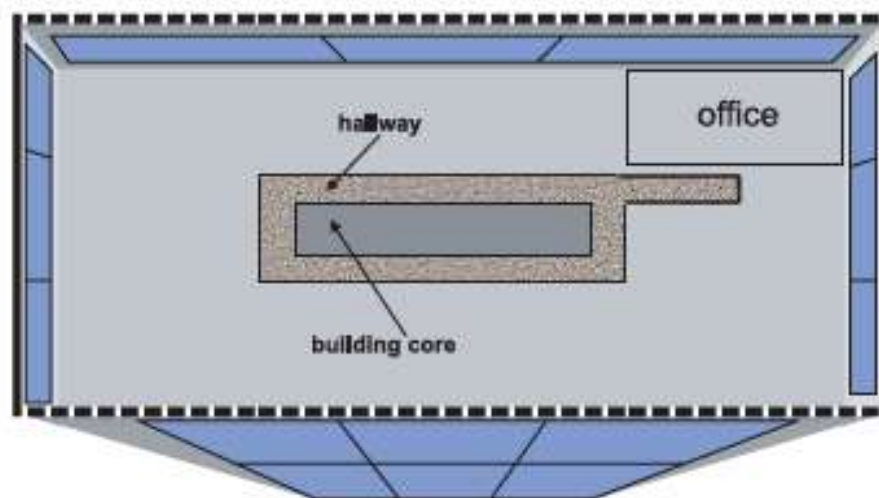
Fig. 8-6



will also force you to rent more floor space because additional hallway space will be needed to gain access to the office (Fig. 8-7). The indicated office space in the illustration is said to be “trapped” because it is not on the central hallway and therefore more hallway space must be leased (as indicated with the extension of the hallway). A better choice for the location of the lease space would be anywhere on the central hallway such that the central hallway can be used to access the office for both the patient and staff entrances.

When evaluating any lease space or condominium, request from the landlord or your realtor the architectural plans of the floor on which the potential space is located so that the space might be evaluated for conditions such as load bearing walls, columns, window and door locations and whether they can be relocated, adjacent suites, and the solar or north orientation. It is very important to also research and note the following: *useable square feet*, configuration of the space, mechanical chases, access to public restrooms, possible asbestos abatement, any demolition required, and any unusual code requirements. Useable square footage refers to the actual space that can be used by the office and is generally defined as that space within the walls of the office. *Rental or “rentable” square footage* refers to the space for which the tenant must pay the landlord; this figure will include the useable square feet plus the office’s pro rated portion of the common areas such as the lobby, restrooms, corridors,

Fig. 8-7



elevators, stairwells, and atriums. This figure is termed the ‘load factor’ and usually is 10 to 15 percent of the office’s useable square feet. For example, the load factor for an office of 2,000 useable square feet would be 200 to 300 square feet, and the rent would be based 2,000 plus 200 (or 300) square feet, i.e. ‘rentable’ square feet.

A final word about leasing space or purchasing a condominium especially for a dental practice: this is the most difficult lease, of all professions, to negotiate because of all the equipment, plumbing, mechanical, and electrical needs of a dental office. From experience, there are four common errors that doctors consistently commit:

- Not yielding control of the project. When you hire the architect or employ the medial/dental office designer, listen to their counsel and trust them. If you do not trust them, fire them; they are worthless to you.
- Clinging to unrealistic market rates. Everybody wants something for nothing or wants to believe the seller doesn’t realize the value of their property. News flash: something for nothing is a myth and the seller almost always knows the value of their property or lease space. Again, listen to your realtor or lease space negotiator and believe and trust them to represent you to the best of their ability. If you don’t feel that they are representing your best interest, fire them.
- Believing that a medical or dental practice is a desirable tenant. Work hard to sell your benefits to the landlord or condominium sales agent. In the mind of most landlords, a medical or dental office is not a desirable tenant because of noise, odors, and traffic.
- Misunderstanding the dates of the lease document. Realize that the lease execution date and rent start date can and should be separate because your dental or medical office will need time for the finish-out of the lease space to create that special environment that is required by dentistry or medicine.

CHAPTER VIII—WHAT’S THE BIG IDEA?

- The following generalization may be considered in determining the required number of (general practice) operatories or treatment rooms:
 - One doctor (and one hygienist)...four or five treatment rooms
 - One doctor (and two hygienists or one physician assistant)...five or six rooms
 - Two doctors (and two hygienists or two PAs)...six or seven rooms
- The objective is to create a facility with optimal function, i.e. stress reduction while increasing productivity, so the following recommendation is made to achieve this objective:
 - Four-five ops / treatment rooms...500 sq. ft. of office space / operatory
 - Six-seven ops / treatment rooms...450 sq. ft. of office space / operatory
 - Eight-nine ops / treatment rooms...400 sq. ft. of office space / operatory
- The property size should be six times greater than that of the contemplated office size. For orthodontic and pediatric practices, the ratio is increased such that the property size should be seven times greater than that of the contemplated office size.
- It is strongly recommended that you enlist the assistance of an architect or dental office designer in determining which property best meets your office needs and request a written architectural consultation.
- The property should be zoned for a medical or dental office. If it is not so zoned, **DO NOT BUY THE PROPERTY.**
- For a general practice, parking needs can be calculated as follows:
 - One space for every staff member; this includes counting the doctor.
 - One to one and a half spaces per dental chair or treatment room.
 - One labeled handicap space.
 - One space for another vehicle such as repair service or spouse.
- For orthodontic and pediatric practices, two parking spaces per dental chair or treatment room are needed while the other factors remain the same.

Chapter IX

PUTTING YOUR IDEAS INTO ACTION

THE RIGHT PLACE FOR YOUR PRACTICE

Where should you locate your practice? Should you lease space or buy a condominium? Or buy land and build a free-standing office? But what about remodeling your current office? Would that not be less expensive? Will you lose patients by moving your office?

These are all questions that you are undoubtedly asking yourself...or should be! This project will be the single biggest investment for 99.9% of all doctors; if you 'don't get it right', you will pay for your mistakes in lost productivity as well as physical and emotional stress for the life of the office.

A daunting thought.

It need not be overwhelming because you know (some) the questions to ask of your designer or architect concerning the floor plan and functionality of the office. This Chapter will assist you in assembling other questions, and answers, as you embark on turning your dream into a reality. It will serve as a primer on the major questions and decisions points that you will encounter in designing and building your office. This Chapter, however, cannot serve as a comprehensive tome on the selected topics of project implementation because there are myriad variations for each topic and, rest assured, your colleagues have probed and stumbled through all variations known to man!

So, where do you locate your practice? This is a question that anyone who has been in the practice of medicine or dentistry has faced...occasionally, multiple times during their practice life. If you are a specialist with an established practice, there is relatively less sensitivity and a greater margin of error that can be tolerated concerning this question. Of course, the other end of the spectrum is the new general practitioner with no patient base.

Everyone must start somewhere.

Locating a site for a dental or medical practice does not require an 'optimal' location...you are not selling an impulse item such as fast food! You do not need to be on the corner of the busiest intersection in town. If you have been in general practice and have a patient base, what is the source of

the vast majority of your referrals? If you are like almost all of your colleagues, *your referrals come from your existing patient base*. The specialist referral base is a mix of general practitioners and patients but, *for both the specialist and general practitioner, impressing the existing patients with a facility that makes a statement of highest quality is the largest marketing tool you will ever use*. In almost all situations, there will be at least two locations that will meet your facility needs: (1) *adequate space to meet your facility's design needs (floor plan size, windows orientation, adequate parking, etc.) to support your practice*, (2) *a compatible neighborhood or business district character*, and (3) *be within your budget of absolute cost and acceptable cash flow*.

So, how do you go about confirming the above items that are absolutely critical to the success of your building project?

First, define the number of clinical treatment rooms needed, the scope of (any) radiological equipment, the role of technology in the practice, the presence or absence of a laboratory, other specialty diagnostic or treatment rooms. In other words, define the practice in terms of the facility characteristics. This can be accomplished with an experienced medical or dental office designer or architect or practice management consultant. Based on this information, the projected size of the facility can be determined.

Second, request that an architectural consultation be performed on the two or three sites that interest you most. The architectural consultation will determine and confirm the 'designability' of the proposed site or space, i.e., whether the physical needs of your facility can be accommodated in the confines of the site or space.

Third, determine the cost of the project and the impact the cost of the project will have on your practice's cash flow. This calculation may be able to be performed by an accountant familiar with real estate and construction costs (for medical and dental practices) or similarly experienced architect or mortgage broker.

Fourth, and last, there will be a single best site or space choice based on the architectural consultation result and financial calculation; choose the site that offers the most optimal 'designability' and that is within your financial capability. See the section, *Can You Afford Your Dream*, in this Chapter for more information on financial analysis of the office project.

Perhaps by now you have realized that *this multi-step analysis of site selection has taken a very, very subjective process and converted it into an objective, disciplined analysis*; this methodology should offer a great deal of comfort to you. Now you have the capability of selecting a site or space that truly

meets your architectural and financial practice needs...without being confused with many extraneous issues that serve only to confuse you.

CAN YOU AFFORD YOUR DREAM?

Nothing, and I mean nothing, could be more risky than beginning your building or remodeling project without adequate funding. Running out of money before the project is finished can be the kiss of death because lenders are loath to repeatedly fund a project.

And many doctors have been kissed.

Repeated project funding is a mark of extremely poor planning. You don't know what you are doing, and this makes lenders very nervous. Your multiple requests for funding may exceed your ability to repay the loan and therefore make the project 'undoable'...but a third, half, or three-quarters of the 'undoable' project has been constructed. Now what???

In order to avoid this nightmare scenario, it is critical to have an accurate estimate of the project costs. While an entire course could be taught on construction cost accounting, a short but comprehensive list of costs are assembled below to serve as a guide in assessing the cost of the project:

- Land or Condominium Purchase Price
- Site Improvements. This can be as simple as landscaping or as complex as leveling the side of a mountain and running utilities to the site. For more complex projects, cost estimates should be solicited from a construction architect or civil engineer.
- Capital Cost. The cost of the actual building (without dental or medical or business equipment) or build-out completion of the interior space.
- All Service Fees. Architectural, legal, (structural, civil, electrical, mechanical, soils) engineering, and accounting fees may be encountered depending on the scope of the project.
- Margin of Error Factor. This factor, which is a function of the capital costs, is usually dictated by the lending institution and can range from 5% to 20%. If it is not required by the lending institution, this figure should be included in your calculation to the degree of confidence you have in the validity of the capital cost.
- Other Expenses. Interest on the interim or construction financing, double rent, and additional maintenance fees are examples of additional expenses.
- Medical or Dental Equipment costs

- Office Furnishings. This figure will include all the items to yield a finished look to the office. If carpet and wall coverings are not included in the Capital Cost calculation, be certain to include those expenses in this calculation.

The sum of all of the above items will yield a relatively accurate assessment of the project cost. Of course, this calculation does not offer any cash flow analysis, but your accountant can determine the impact of the project cost on your monthly cash flow. Discuss the results with your accountant to determine your financial options and tolerances.

FINDING THE MONEY!

CLUE #1.

Appearing organized with as much project detail as possible will decrease the lender's perceived risk and decrease the interest rate of your loan. To appear organized, include the information listed below in "The Organized Borrower's Information Checklist".

CLUE #2.

Real estate loans, equipment loans, and building loans are generally separate loans in the commercial credit arena. Do not forget the need to discuss a working capital loan if you believe there is even the remote chance that you will require it as you move into your new facility!

CLUE #3.

Have the property and building appraised by an independent, reputable appraiser. You want the appraisal to equal or exceed the purchase price. If your appraiser and the lender's appraiser do not agree, attempt to negotiate with the lender. **YOU WILL BE REQUIRED TO PAY THE DIFFERENCE BETWEEN THE APPRAISED VALUE AND THE PURCHASE PRICE!** This circumstance could be a "deal killer" if you do not have the cash.

THE ORGANIZED BORROWER'S INFORMATION CHECKLIST

- Site designability analysis—how the site meets the needs of the practice
- Detailed list of project costs and impact on practice and personal cashflow
- Civil engineering, site survey, soils testing result
- Personal financial statement (dated within the last 90 days)
- Complete corporate (if applicable) tax returns for three years
- Complete personal tax returns for three years
- Business financial statements—income statement, balance sheet and cashflow statement for three years
- Current year interim (current quarter or month) financials for practice
- Copy of existing or proposed lease(s)
- Resume
- Organizational documents for each of the businesses involved
- Business debt schedule
- Copy of professional license
- Copy of driver's license
- Life, disability and malpractice coverage statements
- Statements showing the current balance to be paid off (if applicable)
- Full narrative appraisal report
- Preliminary title report
- Business financial projections (B/S and I/S—fiscal year-end and next full year)
- Month by month cash flow projections for the first 12 months of operation in new facility
- Purchase agreement or letter of intent (if applicable)
- Earnest money sales agreement
- Evidence of owner's ability to provide equity

HOW LONG WILL YOUR PROJECT TAKE?

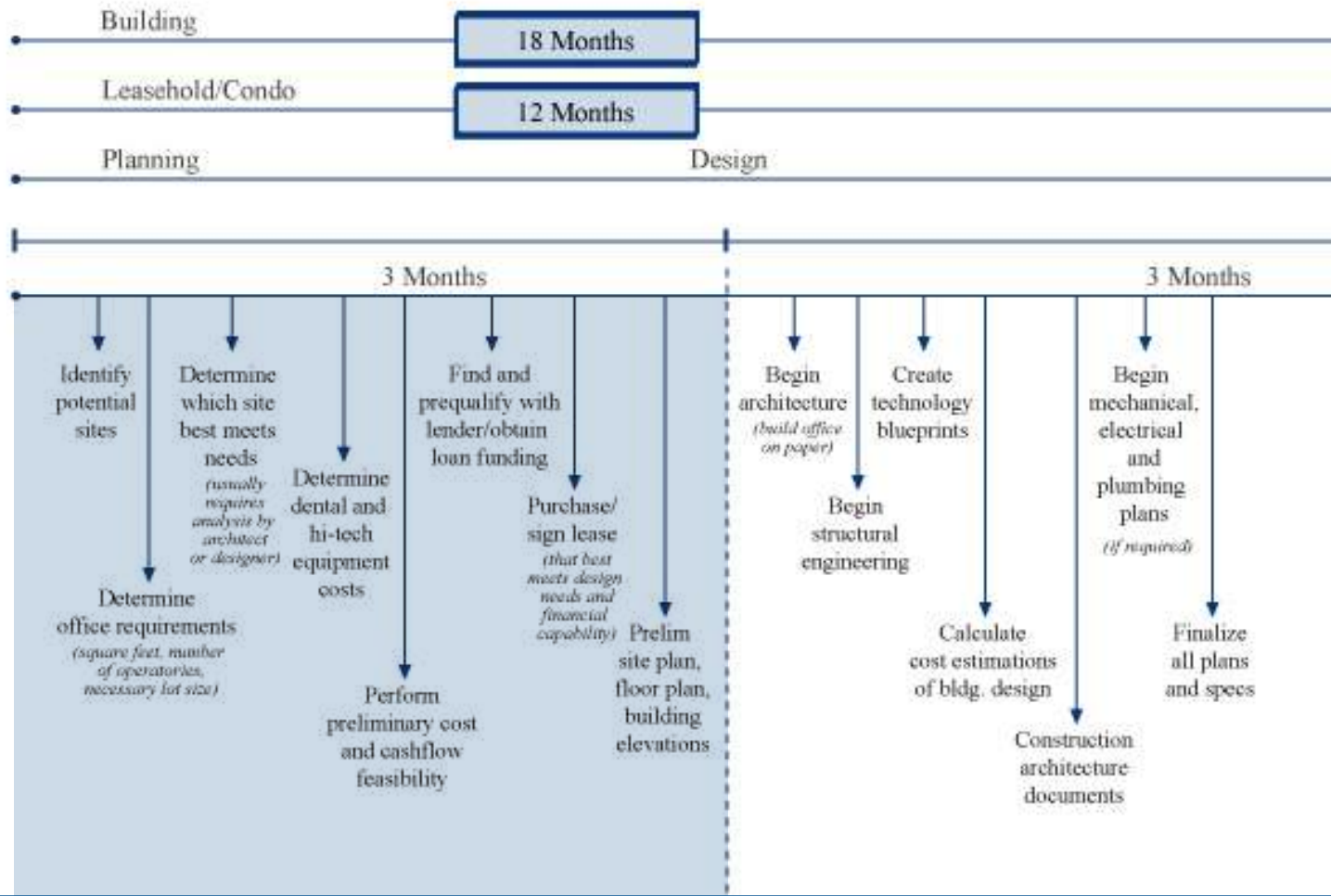
Longer than you think.

The short answer to this question is that designing and constructing a free standing building will take approximately one year of continuous, methodical effort and the finish-out of a lease space or remodel may involve an effort of eight to 10 months. Of course, there are many variables that may influence the time frame: the size of the project, site preparation, obtaining building permits, securing interim and long term funds (construction financing and a mortgage), and weather delays are only a few of the delays known to man. Therefore, for planning purposes, *increase the suspected total project time by one-third to account for unforeseen events*. This planning will prevent a cash flow crisis at the end of the project as you are moving into your new facility, and nothing can rob you of the joy of the new office like a money squeeze. Have I mentioned planning? Looking ahead? Anticipating the unanticipated? It sounds simple, and it is simple, but very few people heed the advice to seek good counsel and adhere to the suggested plan of action.

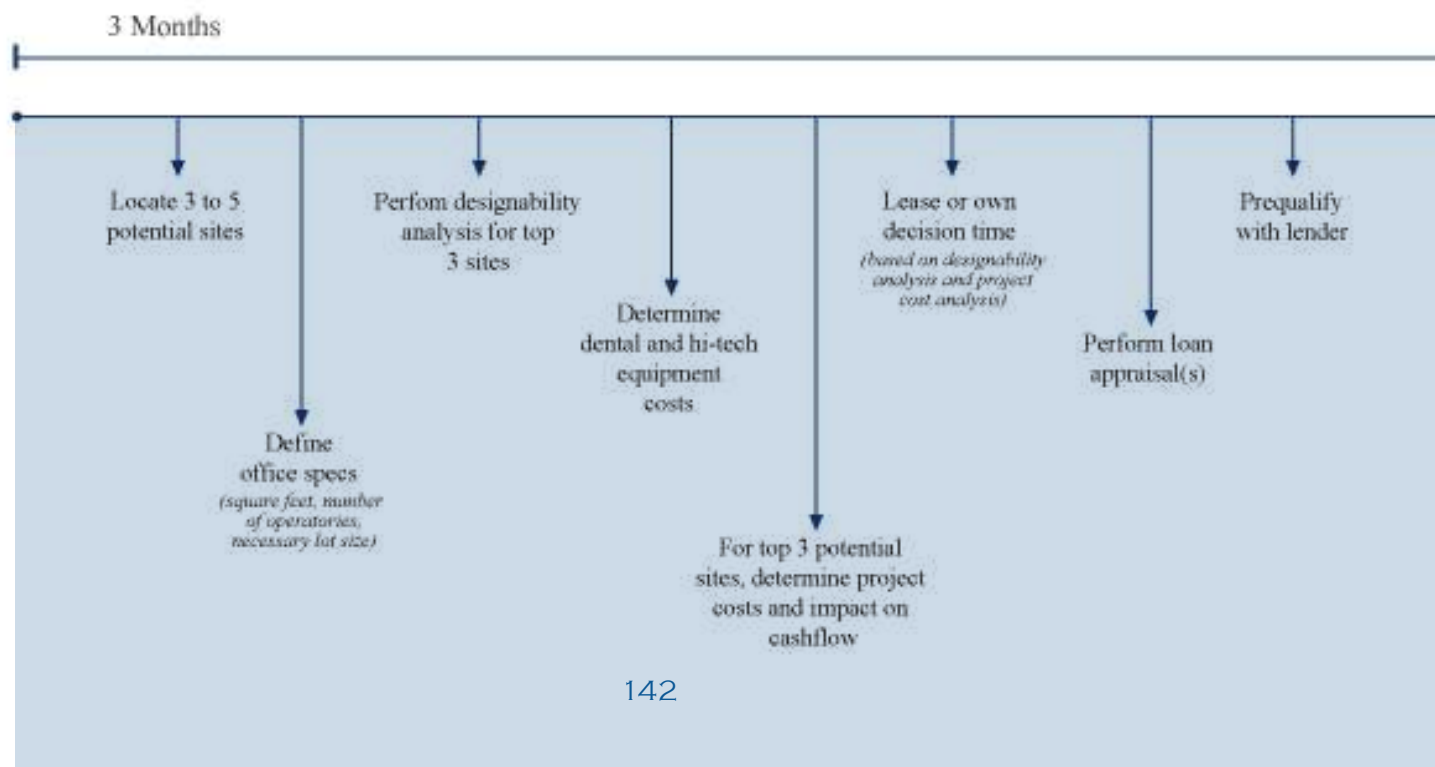
A word about one of the possible delays is in order at this point. For some reason, healthcare professionals, i.e. dentists and physicians, are especially susceptible to the notion that they are immune to certain constraints that hinder the remainder of the citizenry. Specifically, a number of us believe that many of the building codes do not apply to us: fire, handicap, and many other codes are often ignored by doctors during the planning and designing phase of the office project. However, with unbridled and unfounded optimism, many anticipate no problem in obtaining permits to begin construction or passing the periodic building inspections. Most often, the doctor has a patient who works for the city or, better yet, works in the permitting office or is a county commissioner. Save yourself a great deal of time and money and realize that they cannot help you. They are part of a process involving many people and many departments and, if they have the bad judgement to give you a pass in their department, the ‘oversight’ will be discovered somewhere in the permitting or inspection process. Then delays and possible fines will be visited upon you, and the city employee will face far worse.

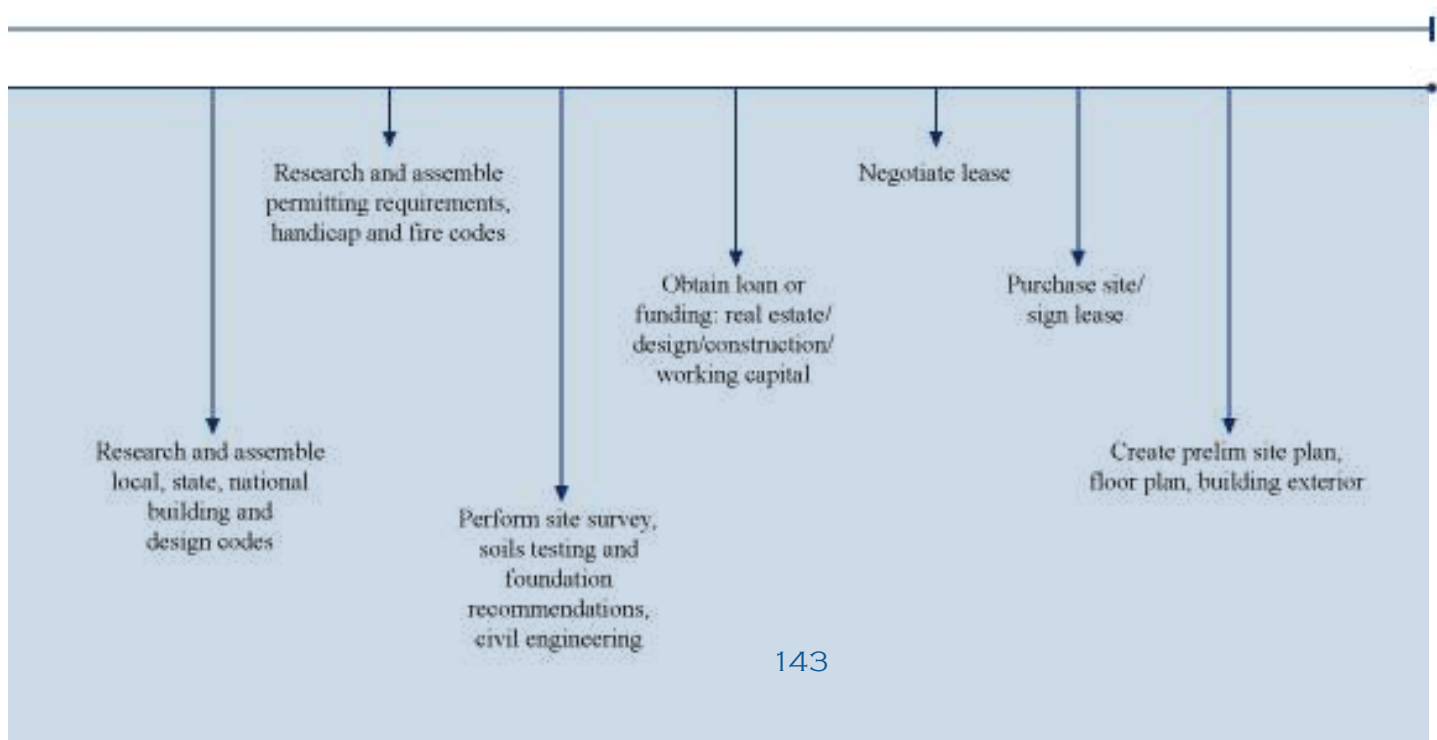
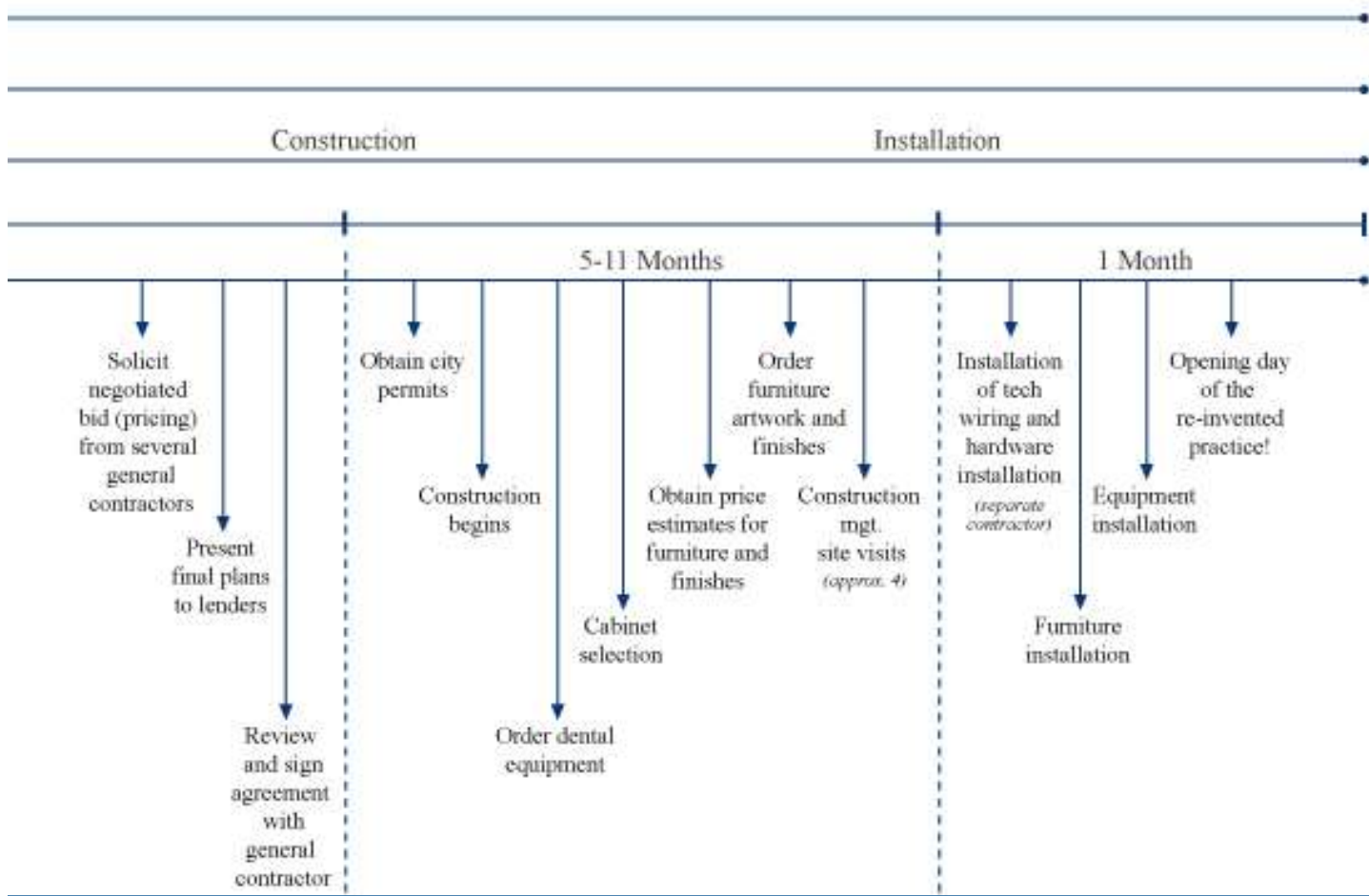
So, make it easy on yourself and everyone else: comply with codes and permitting requirements with a willing attitude...you will live longer.

TIMELINE FROM DREAM TO DENTISTRY



THE PLANNING TIMELINE... EXPANDED





THE BEST FLOOR PLAN FOR YOUR PRACTICE

Sounds like a very subjective concept...the best floor plan for you. Creativity must be subjective or it will not be artistic: true or false? There is no right or wrong with a floor plan, only that which satisfies your (sometimes unarticulated and unfounded) desire: true or false? A floor plan without creativity and artistic flair is dull and unimaginative: true or false?

Hopefully, you will have passed this 'pop' test.

As stated in Chapter Two, the *floor plan will establish the functionality of the office and, to a degree, of the practice*. Again, functionality is defined in this context as the decrease in the staff's emotional and physical stress and the increase of practice productivity. *The esthetic character of the office will be provided through the interior design: color, light, wall coverings, flooring, furniture, and art. You will lose the functionality of the office and practice if you do not remember and employ this principle.*

To be clear, there is a right (and therefore, wrong) floor plan for you.

The right floor plan is based on a number of established principles or facts that have been sequentially developed throughout this text. As doctors, we are all grounded in facts: factual diagnostics, statistically proven therapeutics. So how do you factually assess the floor plan to determine if it is correct for *your* practice?

Some of the major principles of floor plan design are listed below as interrogatives and include:

- How many clinical treatment rooms or dental operatories are needed for the practice based on the number of doctors/treatment providers (dental hygienists, nurses, physician assistants, surgical technicians) and number of patients treated daily?
- Do the clinical treatment rooms or dental operatories have a northerly orientation and some windowed access?
- Is there approximately 500 square feet of office space for each planned operatory?
- Are the elements of each Zone grouped together? Is any Zone fractured and, if so, does it compromise patient and staff flow? Are all elements of each Zone present?
- How large is the waiting room relative to the number of clinical treatment rooms or dental operatories?
- How large is central sterilization relative to the number of clinical treatment rooms or dental operatories?
- Are all treatment rooms similarly designed and designated?

- Is the size of the business office appropriate for the number of business staff? For now and the future?
- Has the planned technology been accommodated with adequate space in the floor plan?
- Are the corridors of sufficient length and width to provide unimpeded patient and staff flow?

These are only some of the questions that you must ask as you review a floor plan that has been presented to you. Hopefully, the designer of the floor plan will have already asked the questions and incorporated the answers into the proposed plan!

WHO DO YOU ENLIST TO DESIGN AND BUILD YOUR OFFICE?

The project you will undertake requires a team. The good news is that you can elect to be the owner and / or coach of the team, but hopefully by now you know better than to be a player-coach and owner! There are only 24 hours in a day, you are already the owner of a busy practice, and many of us have other life roles such as father, mother, basketball or soccer coach, president of the school board, and general manager of the universe! *Carefully consider your level of involvement before the design of the project begins because the momentum of the accelerating events of the office project will drag you along if you are not leading* in front of the project events. And it won't be pretty...in addition to adding a great deal of cost for late decisions.

So, who is on, or should be, the team and what are their positions? Obviously, an architect is needed. In fact, two will be needed: a design architect and a construction architect. The design architect should understand the zones of a medical or dental office, have a design program questionnaire oriented to the dental or medical office to solicit your desires, and have experience designing dental and medical offices. They should literally build the office on paper. The construction architect will address the foundation and soil conditions, building codes, and other structural issues associated with the construction including performance of site visits during construction. These two individuals will be required in almost any project: free standing building, lease space, condominium, or remodel. It will be unusual to find both skill sets of design and construction architecture in one individual. Both individuals should be hired directly by you so that you are the client.

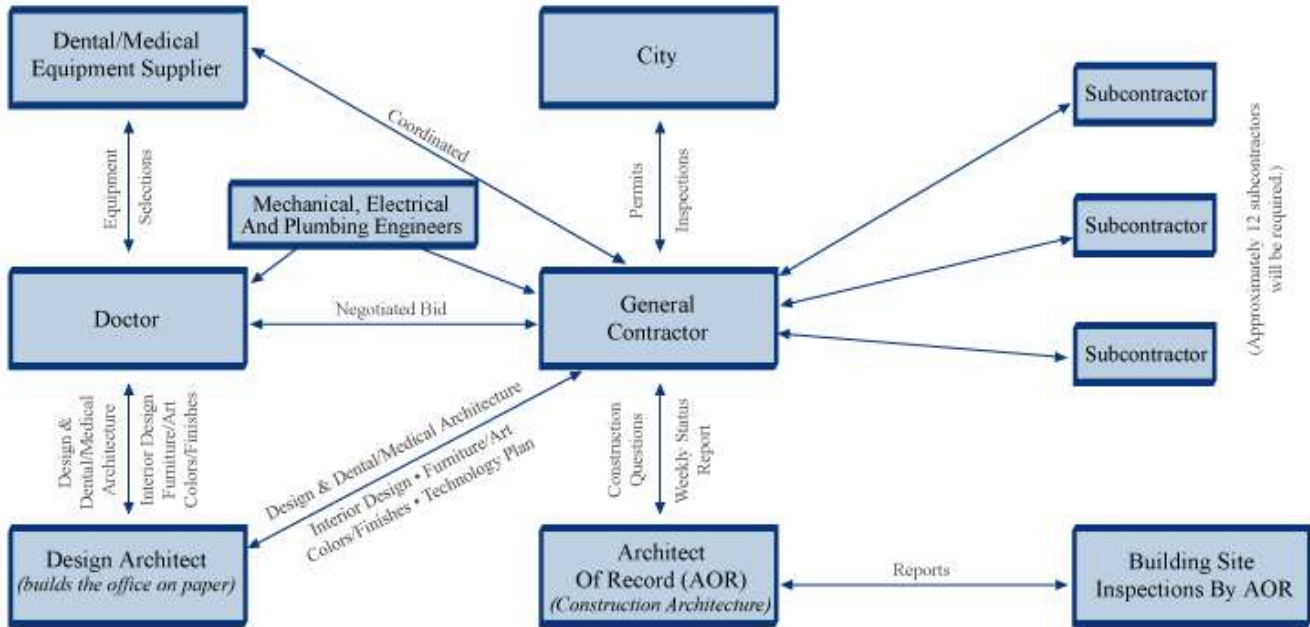
Next, an interior designer who is familiar with materials employed in healthcare facilities environments should be the next member of your team. An interior designer is not an interior decorator; the designer has a four-year college degree and is licensed. The interior designer will work hand in hand with the design architect and you to develop the tenor and character of the office through color, light,

furniture, wall and floor coverings, and art. Accordingly, the architect and interior designer should be familiar with each other's style and be capable of working in a complementary fashion; your office will demonstrably benefit from this familiarity. It is strongly recommended that you request that the designer specify commercial grade materials whenever appropriate such as with carpeting. And unless you are prepared for a very labor-intensive event, request that the designer order and coordinate the arrival of all interior design materials and furniture during the construction process.

The building contractor is the third member of this triumvirate but extremely important because this individual will convert the building on paper into a reality. *You want this individual to be your advocate, to be on your side, to be working with you and not at cross purposes...so do not employ a competitive bid process!* Rather, employ a negotiated bid process while selecting your building contractor. This method of securing the contractor allows you to select a contractor with whom you are comfortable and believe you can trust to work in your best interest. With this process, you agree to pay the general contractor a set percentage of the projected (estimated) construction costs, usually between 12 and 16 percent. The general contractor then solicits bids from all necessary subcontractors and, together, you and the contractor select the best team of subcontractors for your project. There is full disclosure of all costs and expenses to you and you and the general contractor are working together, not against each other.

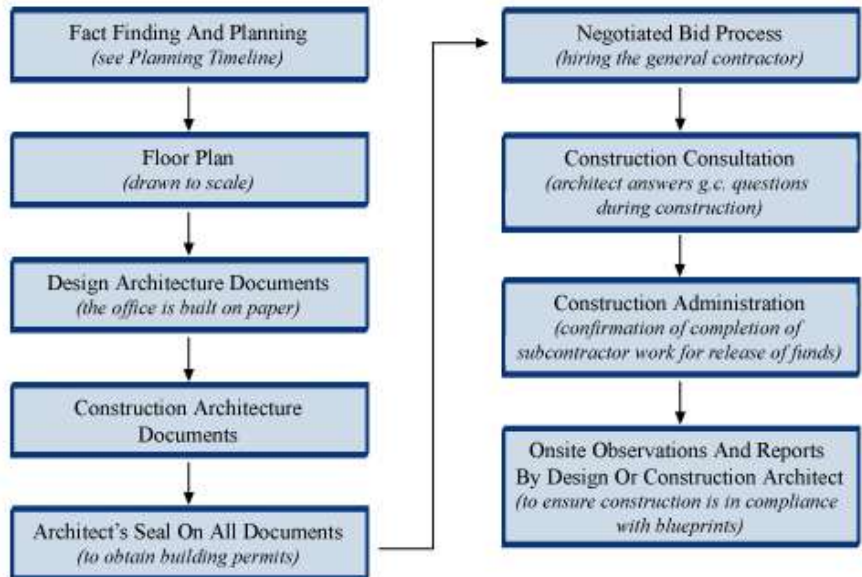
Of course, there will undoubtedly be others involved with your project: the lender, the dental supply company equipment specialist, a technology consultant and installation team, and mechanical / electrical/ structural/civil engineers. If this appears to be a great deal of effort, you have the message! And you should be concerned, not frightened, with sufficient interest to pay attention to the details of the project. Thousands of doctors have successfully completed beautiful offices that are very functional, and you can do it too. Surround yourself with a good team who has experience designing and constructing dental and medical offices and then follow their advice if it makes sense. You have a frame of reference for assessing their advice because you have read this book. In designing and building a new office, *the ultimate mark of success is revealed a year after completion with the owner's comment that they would not change any element of the design.* When you stand in your new office and make this statement, you will have the office of your dreams.

OFFICE DESIGN & CONSTRUCTION TEAM FLOWCHART



ARCHITECTURAL SERVICES FLOWCHART

- These architectural services should be in the contract with any design firm.
- These services and flow of information create a "check and balance" relationship/ system among the design firm, general contractor, and lender.
- If you do not have each of these services provided in this order, project definition will decrease and costs will increase.



CHAPTER IX—WHAT’S THE BIG IDEA?

- Impressing the existing patients with a facility that makes a statement of highest quality is the largest marketing tool you will ever use.
- The practice does not need to be located at a busy intersection; you are not selling fast food.
- This multi-step analysis of site selection has taken a very, very subjective process and converted it into an objective, disciplined analysis.
- Nothing could be more risky than beginning your building or remodeling project without adequate funding.
- Designing and constructing a free standing building will take approximately 18 months of continuous, methodical effort and the finish-out of a lease space or remodel may involve an effort of 12 months.
- The floor plan will establish the functionality of the office and, to a degree, of the practice. Functionality is defined in this context as the decrease in the staff’s emotional and physical stress and the increase of practice productivity.
- The esthetic character of the office will be provided through the interior design: color, light, wall coverings, flooring, furniture, and art.
- Carefully consider your level of involvement before the design of the project begins because the momentum of the accelerating events of the office project will drag you along if you are not leading.
- You want the general contractor to be your advocate, to be working with you and not at cross purposes...so do not employ a competitive bid process! Use a negotiated bid process when selecting your building contractor.
- The ultimate mark of success is revealed a year after completion with the owner’s comment that he or she would not change any element of the design.

ABOUT THE AUTHOR

Dr. Mark Tholen graduated from the University of Texas Dental School and U.T. Graduate School of Business with an MBA. He served in the U.S. Air Force and was engaged in practice before turning his attention to industry. He is the former CEO of the country's premier dental and medical office design firm and author of the book, [A Guide to Designing the Elegant Dental Office... The Largest Marketing Tool of Your Career](#). He can be contacted at drmark@tholenconsultants.com or 972-365-6151.