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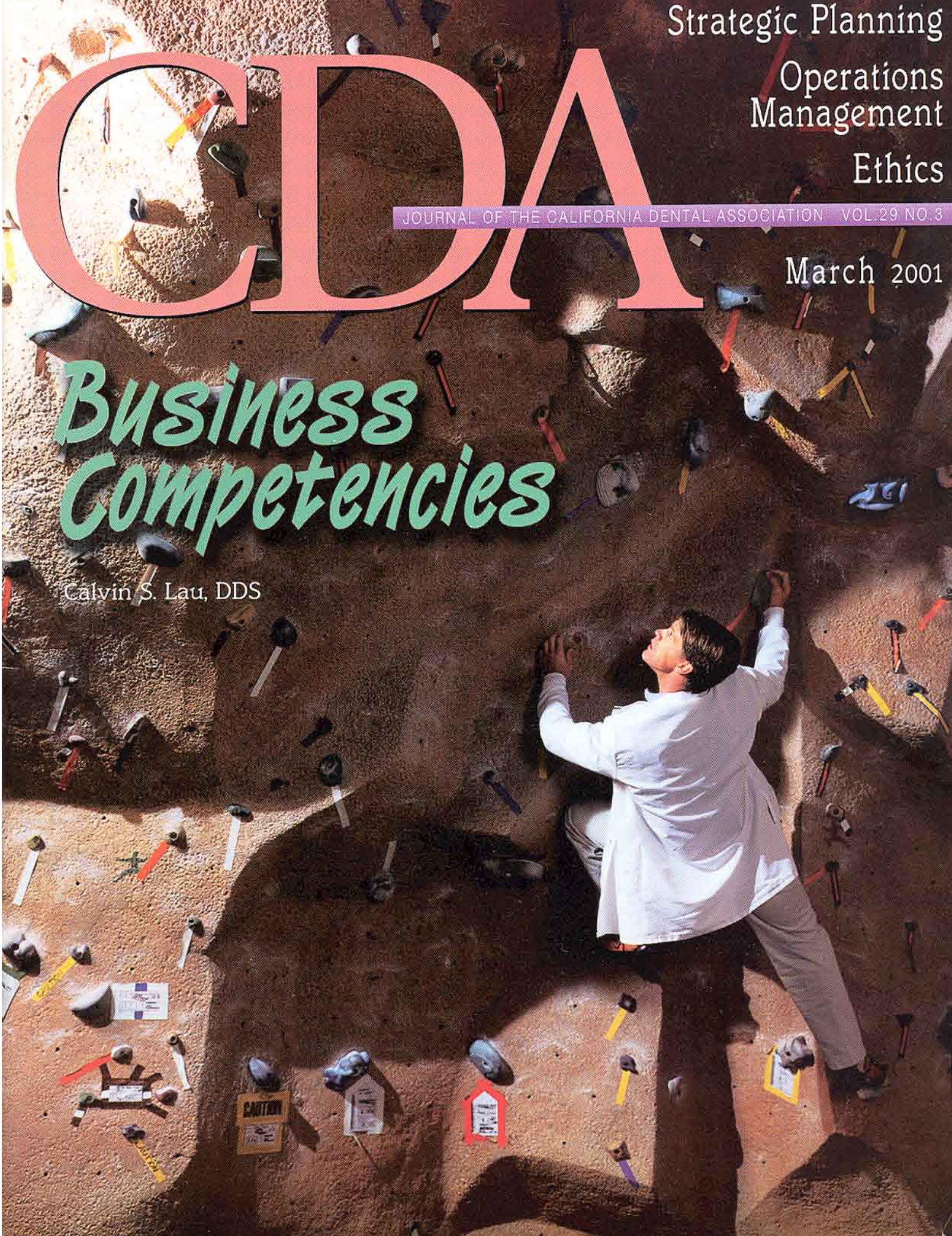
Strategic Planning
Operations Management
Ethics

Business Competencies

Calvin S. Lau, DDS



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The Courage to Care

Steven A. Gold, DDS

It is a personal pleasure to welcome Steven Gold as associate editor of the Journal of the California Dental Association and to introduce him to the readership this month through his editorial comment.

Steve has been recognized for the excellence of his editorials and his publication, WestViews of the Western Los Angeles Dental Society, for which he served as editor for the past four years.

In his initial comment on these pages, Steve discusses courage. I believe he understands the importance of courage in engaging in the business of dentistry better than most of his peers. Not only did he initiate his own general practice of dentistry in fewer years than the average these days, but he also assumed a role of considerable service responsibility to his profession when he became editor of his component society a mere three years after graduation from dental school. For most new dentists, the factors and challenges described by Steve keep them focused on addressing their debt and starting up and building their own practices for a good number of years before they believe they have time to devote to their profession.

Steve's courage in rapidly learning to make the important practice-related business decisions of contemporary dental practice and his interest in dental journalism have prepared him to contribute to his profession at an early time in his career. I believe that can be invaluable to his colleagues, be they new or long-time practitioners.

-- Jack F. Conley, Editor

I have been asked to contribute to the *Journal of the California Dental Association* in part because I fall into the category of "new dentist," meaning one who has been practicing 10 or fewer years. I applaud CDA for its efforts to reach out to new dentists and embrace diversity on all fronts. I thank our association for giving me the opportunity to contribute to our profession as CDA's new associate editor. Representing the views of all new dentists is a daunting task and as such, I will not even attempt to do it. Rather, I will draw upon my own experiences, including my conversations with other new-dentist colleagues, to give some insight into what new dentists are facing today as they enter the profession.

So what are the challenges facing new dentists? I have identified three, which are of such importance that they deserve the attention and efforts of the entire dental profession. The first is debt. Today's dental school graduates are the most indebted in history with some facing more than $200,000 in student loan debt. Compounding this is the fact that, while dental school tuition continues to increase by as much as 10 percent a year, starting salaries for young dentists in associateship positions have not increased appreciably in the past 20 years. This, naturally, leaves many recent graduates feeling the effects of high levels of

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financial stress. Well-meaning colleagues, friends, and family usually offer words of encouragement such as, "Don't worry about the debt. Just work hard, and it will eventually get paid off." The comfort in these words soon fades when reality hits, typically in the form of the first mailing of student loan coupon books.

The second challenge facing new dentists is a rapidly changing health care marketplace. Managed care and third-party payment plans have frustrated even the most seasoned dentists. The confusion and frustration is magnified for new dentists who do not have experience in dealing with these issues. Many new graduates were warned in dental school not to get involved in managed care because quality dentistry cannot be practiced when fees are overly discounted. But avoiding managed care is simply not that easy. Many of the dental offices offering associate positions are already involved in managed care. Dentists attempting to start their own practice face the dilemma of keeping their schedules full, and managed care plans may appear to be an attractive option for them. Their rationale? I want to practice quality dentistry, but if I don't keep my schedule full and find a way to pay the bills, I won't be able to practice any dentistry.

Finally, new dentists face the challenge of acquiring the skills to run and manage a practice. A criticism the dental profession has faced is that dentists receive inadequate business training and, as a result, are poor business managers. In spite of this widely held opinion, many dentists have been able to build successful dental practices and are delivering quality care and enjoying a comfortable lifestyle. Today, however, competition and personal indebtedness leave little room for error in managing the business of a dental practice. Practice management courses in dental schools do an admirable job of providing an overview of the business of dentistry in the limited time allotted in busy dental school curricula. However, they fall short of providing the real-world, hands-on experience beginning practitioners need. Private consultants and firms can help, but consulting fees are high for new dentists and results are certainly not guaranteed.

Having painted such a grim picture, I can now tell you that, with very few exceptions, new dentists I speak with are excited and optimistic about the profession of dentistry and look forward to the joy their careers will bring. They see a future that will allow them to provide life-improving services to patients, gain personal pride and satisfaction from their careers, and enjoy comfortable lifestyles.

For this picture to continue to be a reality and for the profession to maintain its respected status in society, all dentists young and old must work together to overcome these challenges. Some may argue that doing so requires a multitude of complex solutions, however I feel it takes only one: courage. Older, more-experienced dentists must have the courage to give of themselves to the newer generations of dentists, to become mentors and be willing to pay new dentists the salaries they need to live on. In doing so they will, by nature, be the lights young dentists can follow. New dentists must have courage as well. In the face of financial adversity, they must maintain the high ethical standards the profession demands and continually seek to better themselves and the quality of their services through lifelong learning. Finally, organized dentistry must have the courage to explore creative and innovative ways of serving its members and of maintaining a profession that will always have a bright future for those who enter it. Courage of this nature is not difficult to find. It is within all of us who love dentistry and who truly care about the future of the profession.

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Planning Helps New Dentists Handle High Debt

By Debra Belt

The challenges facing recent dental school graduates is a hot topic of conversation among those in the dental profession. Foremost in these discussions is the subject of debt, and the $121,500 average student debt figure is bandied about like a shuttlecock at a badminton tournament.

The ADA 1999 Survey of Dental Graduates reports a student debt increase of 33 percent from the $93,172 reported by the class of 1993. Of the survey respondents, 89 percent had debt from student loans upon graduation. More than half of the nation's 4,041 dental school graduates responded to the annual survey and offered insight to the professional and financial challenges of newly minted dentists.

To connect with some of the young dentists making up these statistics, the CDA Journal talked to a sampling of recent California dental school graduates to find out how they are managing student loans while progressing in their careers. In spite of cumbersome loans they must begin paying six months after graduation, new dental professionals are making payments, forging ahead professionally, and enjoying a variety of experiences. Those reporting the most success say they planned ahead, live within their means, and keep expenses to a minimum.

"I am managing pretty well," said Stuart Yoon, DDS, a 1998 graduate of Loma Linda University. "I was fortunate to be able to buy a practice that is doing well. I think a lot of people worry about student loans and then the additional debt to purchase a practice. But when I talked to the bank and they looked at the practice and saw that it was solid, I was able to get a practice loan."

According to the ADA survey, Yoon is among 25 percent of 1998 dental school graduates nationwide who have purchased their own practices.

In finding a practice to purchase, Yoon networked with alumni and fellow dentists and worked closely with a financial adviser. He found a practice in Riverside and worked for 18 months before buying it. "When you purchase a practice, the first six months can be difficult, but working in the practice and getting to know the patients really helped. I lost very few patients when I took over," he said. "The practice is doing well, and I'm on a graduated payment plan with the students loans. I will pay more as I earn more."

Also, Yoon lives within his means. "Some people earn a lot and spend a lot. There is a need for balance between earning and spending."

Damani Mitchell, DDS, a graduate of the University of California at San Francisco class of 1999, said he also worked to avoid excess expenses and was able to start his own practice with careful planning. "I started making decisions early on in dental school about what I wanted to do when I graduated. I knew that I would return to Oakland. I knew that I didn't want to be an associate and that I didn't want to work for a large clinic."

Mitchell spent time talking to other dentists about how they got started. "In my junior year of dental school, I met another dentist, James Sweeney, DDS, and we knew a lot of the same people. I knew the children of many of his patients. When I graduated, I worked out an arrangement to share a building with him. We have two separate practices, but share office space."

Mitchell said the arrangement offers several benefits including keeping start-up costs to a minimum as well as consultation with an experienced practitioner.

"Upon start-up, business was a little slow, but grew tremendously in the first year," Mitchell said. "This opportunity also allowed me to develop speed at my own rate."

Mitchell said he is managing monthly loan payments. "I have to remember that the loan is an investment in myself. Without the loans, I wouldn't have been able to attend school and increase my earning potential. Sometimes, I'm not able to purchase something I want, but everything will come in time."

Student loans are also on the minds of nearly one-quarter of the graduate population who make the decision to become a resident, intern, or graduate student. According to ADA's survey, 22 percent of 1998 graduates chose to further their education.

"When you are a resident, there is a deferment on student loans, but as you can imagine, the interest and accumulation of debt is steep," said Paul Lund, DDS, a University of the Pacific graduate of the class of 2000 who is in his first year of UOP's orthodontic program. "I trust that I will be able to set up a practice in a community that will allow me to pay off accumulated debt. Admittedly, this may be at the expense of practicing in a more underserved area."

Lund said he is encouraged by the success of his colleagues who are managing loan payments and have still been able to buy homes and practices. "Many of my colleagues are doing very well in just a few years out of college, and this gives me an optimistic outlook. When I get out of school, balancing payments on student loans with building clinical expertise will be the biggest challenge."

Nicole Nalchajian, DDS, a 1999 graduate of UOP's orthodontic program, is currently facing this challenge. She is making monthly payments on student loans while buying into an orthodontic practice in Fresno. "Financially, I still have to budget, but my student debt was less than many grads' since my dad, who is also a dentist, helped me through school. I'm hoping to be able to pay off student loans in five years."

In five years Nalchajian also plans to own 50 percent of the practice she is working in. "I'm spending the time and money now, building a practice, and financially things will be better in the future. Demographically, other orthodontists are retiring and there is plenty of work to do."

U.S. Sets Plan to Combat Antimicrobial Resistance

The federal government, through the Department of Health and Human Services, has unveiled an action plan that provides a comprehensive national approach to combating antimicrobial resistance.

In the 1940s, the widespread availability of newly discovered antibiotics led to a dramatic reduction in illness and death from infectious diseases. However, bacteria and other disease-causing organisms have been able to develop resistance to existing antimicrobial drugs. Many scientists and public health specialists expect this resistance problem to worsen.

The Health and Human Services plan has four major components: surveillance, prevention and control, research, and product development. Within those four components are 84 action items, including 13 priority action steps considered essential to addressing antimicrobial resistance. Of these 13 initiatives, seven are already under way, and six are planned to begin within the next two years.

- Surveillance. The Centers for Disease Control and Prevention will work with state health departments and other task force members to design and implement a plan that will define national, regional, state, and local antimicrobial resistance surveillance responsibilities so that these entities are coordinated and use similar methodology. Additionally, the Food and Drug Administration, the Department of Agriculture, and the CDC plan to develop systems that can monitor patterns of antimicrobial drug use in medicine, agriculture, and consumer products.
- Prevention and control. HHS and partners will launch a national public education campaign to reduce the overuse and misuse of antimicrobial drugs and to improve antibiotic use in health care systems. Along with professional societies and other interested parties, CDC has already started to prepare clinical guidelines for health professionals on how best to use antimicrobials.
- Research. NIH will lead a team of agencies that will provide the research community with new information and technologies, including genetic blueprints for various microbes, to identify targets for desperately needed new diagnostics, treatments, and vaccines that could assist in preventing the emergence and spread of resistant pathogens.
- Product Development. To identify and publicize priority health needs for new products that prevent resistance or treat resistant infections, HHS plans to create an interagency antimicrobial product development working group. Once formed, this group will also identify incentives that encourage this kind of product development.
- The Public Health Action Plan to Combat Antimicrobial Resistance is available online at CDC's antimicrobial resistance Web site, http://www.cdc.gov/drugresistance/.

ER Becoming Primary Source for Pediatric Care

In the last half of the 20th century, the number of emergency room visits dramatically increased in the United States with evidence strongly attributing this increase to dental visits.

According to a recent article in the journal Pediatric Dentistry, a Dallas study indicates parents are using the ER for their child's nonemergency, primary dental care that can be more appropriately and economically treated in an office setting.

Traditionally, dental services provided in an ER setting were primarily for oral trauma to the mouth and its associated soft tissues. However, recent studies suggest an increasing pattern of nontraumatic dental treatment is occurring in the ER. One 10-year study in Seattle evaluating trends in patients seeking emergency dental care showed more than a 10 percent increase in two simultaneous five-year intervals. Tooth decay was responsible for the increase in visits, despite an overall decrease in cavity rates for U.S. children.

In the study conducted at the Children's Medical Center of Dallas, researchers investigated its outpatient ER population. During a two-year period, 61 percent of the patients were age 6 or younger -- 25 percent were age 3 or younger. The most common dental treatments provided were for cavities (48 percent) and periapical abscess (47 percent).

Although most of the recorded visits could have been prevented with regular dental care, a need clearly existed by the time the patient's parents sought treatment.

National Conference to Explore Caries

An independent panel will draft a statement on dental caries prevention and treatment as part of the National Institutes of Health's Consensus Development Conference on Diagnosis and Management of Dental Caries Throughout Life to be held March 26-28.

This NIH Consensus Development Conference has been convened to examine the current state of dental caries research so that health care providers and the general public can make informed decisions.

During the first day and a half of the conference, experts will present the latest dental caries research findings to an independent, non-Federal consensus development panel. After weighing all of the scientific evidence, the panel will draft a statement that will be presented to the conference audience on the third day. The consensus development panel's statement will address the following key questions:

- What are the best methods for detecting early-stage and late-stage dental caries?
- What are the best indicators for an increased risk of dental caries infection?
- What are the best methods available for the primary prevention of dental caries initiation throughout life?
- What are the best treatments available

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for reversing and stopping the progression of early dental caries?
- How should clinical decisions regarding prevention and/or treatment be affected by detection methods and risk assessment?
- What are promising new research directions for the diagnosis of dental caries?

Saliva Can Promote Skin Healing

Scientists have discovered that a multipurpose protein found in several bodily fluids, including saliva, has another important function -- it can promote the healing of abnormal skin wounds, which are a significant problem in the elderly.

Working with a new animal model for delayed wound healing that they produced, researchers at the National Institute of Dental and Craniofacial Research demonstrated that the protein, called secretory leukocyte protease inhibitor, or SLPI (pronounced slippy), plays a critical role in normal wound healing. When SLPI was applied topically to nonhealing wounds, it reversed tissue destruction and hastened healing.

Each year, more than 4 million older people suffer from chronic, nonhealing wounds such as diabetic ulcers, bedsores, and venous ulcers. Inflammation and bacterial infection are two of the major problems that often contribute to delayed healing. Even acute wounds sometimes fail to heal properly in the elderly. Not only are nonhealing wounds painful, but they are expensive to treat. The cost of wound care is more than $3 billion a year.

Previous laboratory studies have suggested that SLPI is involved in the wound healing process. The protein, which is also found in fluids that bathe mucosal surfaces such as bronchial fluids and cervical fluids, in addition to saliva, is a versatile substance. It has anti-inflammatory, antiviral, antifungal, and antibacterial properties. In recent years, NIDCR investigators demonstrated that SLPI found in saliva blocks HIV-1 infection.

Reporting in the October issue of Nature Medicine, the scientists noted that the fact that animals tend to lick their wounds may be nature's way of delivering SLPI to the wound site via saliva.

Plans are under way for a clinical trial to test SLPI as a treatment for delayed healing of skin wounds in the elderly. The researchers also suggest that findings from their current study may be extended to other conditions that involve excessive elastase activity, such as gingivitis and bullous pemphigoid.

Cigar and Pipe Smoking Match Cigarettes in Danger to Perio Health

A slew of celebrities have appeared on covers of cigar magazines sending the message that cigar smoking, a growing habit among the young and affluent, is sophisticated. What the covers don't show are models with missing teeth.

Yet, according to a study published in the Journal of Periodontology, cigar and pipe smoking may have nearly the same adverse effects on periodontal health and tooth loss as cigarette smoking.

Researchers analyzed 705 individuals ranging in age from 21 to 92 years old, and found that 17.6 percent of current or former cigar or pipe smokers had moderate to severe periodontitis -- nearly three times the rate of nonsmokers. In addition, they averaged four missing teeth.

For each given tobacco product, current smokers were defined as individuals who smoke daily. Former heavy smokers were defined as individuals who had smoked daily for 10 or more years, but had quit. The nonsmoker group included individuals who had quit smoking cigarettes after smoking for less than 10 years and those with no history of smoking.

"Cigarette, cigar, and pipe smokers all head a much higher prevalence of moderate and severe periodontitis compared to former smokers and nonsmokers," said Jasim Albandar, DDS, PhD, professor of periodontology at Temple University School of Dentistry and lead researcher of the study. "Research also indicated that there was a correlation with the number of missing teeth with the current, former, and nonsmokers having 5.1, 3.9 and 2.8 missing teeth, respectively."

Cigar smokers are at a higher risk of alveolar bone loss than nonsmokers. "The increase in risk is similar in magnitude to that of cigarette smokers," Albandar said.

Researchers Genetically Modify Primate

Researchers have completed the first successful effort to introduce a new gene into the unfertilized eggs of rhesus monkeys, a member of the family of mammals that includes human beings.

After the gene was introduced, the eggs were fertilized, resulting in several pregnancies and the birth of three live monkeys. The gene was successfully incorporated into one monkey's DNA, making it the first genetically modified nonhuman primate. Previous gene transfer attempts in animals have been confined largely to rodents and agricultural animals.

The technology could lead to the development of a variety of animal models of diseases having a greater resemblance to the corresponding human conditions than do any animal models now in existence. The new accomplishment could also provide insights into human diseases and techniques for treating a variety of human disorders, from cancer, to cystic fibrosis, Alzheimer's disease, birth defects, heart disease, and AIDS. The research appears in the journal Science.

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Business Competencies for Contemporary Dental Practices

CALVIN S. LAU, DDS

CONTRIBUTING EDITOR

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The business side of dentistry is oftentimes learned through trial and error. Yet, just as there are fundamental dental concepts, there are fundamental business concepts, which apply quite readily to contemporary dental practices. The underlying assumption is that dentistry is a business that must sustain itself by continuously incorporating sound business concepts into its everyday operations for long-term success.

This issue of the *Journal of the California Dental Association* will explore some of those concepts. The authors are all working health care professionals. In addition, four are second-year students in the Executive Masters of Business Administration Program at the Marshall School of Business, University of Southern California.

Business uses numbers and data to gauge performance. So, too, should dentistry. We as a profession tend to focus on the clinical aspects of dental care -- techniques, procedures, equipment, and materials associated with dentistry -- at the expense of running a sound business. After all, those of us in clinical practice spend the vast majority of our office time doing what we were trained to do, that is, perform clinical dentistry. If we can pay the bills and support our chosen lifestyle, that is our heuristic measure of success. Is there another perspective that we can apply from the business world? Is being in business about making the most profit? No, that is not the real lesson in today's business world. Rather, it is maximizing shareholder (owner/dentist) value while

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creating value for all the constituencies a dental practice serves. Those constituencies include staff, patients (customers), laboratories, suppliers, and manufacturers.

The term competencies is used here as a description for knowledge and performance at the minimum desired level. The intent is to identify areas where standards can play a key role. This is different from best practices and benchmarking, which are at the other end of the knowledge and performance spectrum, and are topics for future development.

Using the competency framework implicitly, the authors identify key business concepts in four distinct areas and describe how they apply to dentistry. There is an additional article that describes appointment scheduling as a vehicle for increased productivity. This shows the synergies that can result from blending areas, which are described below.

We start this issue with a view of strategic planning. In our haste to do "real" dentistry, we may shortcut or bypass the planning stages. This is akin to doing clinical dentistry without having gone through a thorough process of diagnosis and treatment planning. What is the dentist's role in all of this? How much can be delegated within the office team? When should the outside expert, the proverbial consultant, be engaged? What are we doing to build the practice through marketing? This article is a starting point for the business cycle.

Rich Hirschinger, DDS, explores the scope of digital dentistry. We are in a digital age. Information technology is the great enabler for the conversion of numbers and data into information from which management may make decisions and monitor progress. The more integrated support systems in a dental practice become, the better we'll be able to serve our patients through efficiencies, analysis of inter-relationships, deliberate changes in policies and procedures, and improved management methods. How much high tech is needed to practice dentistry today? Is more better? While it is important to plan introduction of technology, some of the consequences are not foreseeable. The observant and prepared leaders will grasp the significance and leverage knowledge into greater value. Internet-based systems are already affecting the business world. Dentistry in the near future will have the integrated software applications to make the World Wide Web more than just an e-mail vehicle for the typical dental practice.

Michael Mulvehill, DDS, sheds light on the infrastructure, or operations management, that supports a well-functioning dental practice. Matching the capacity of an office and its resources for optimum performance can be a daunting task. There are ways to analyze the capacity of a system, identify constraints, structure productivity around the bottleneck, and utilize resources more efficiently. Labor, equipment/facility, and material resources are major aspects of a dental office. How can the work flow be improved? What systems will have the most impact on the bottom line? Set-up time, inventory, control systems, and scheduling all fall in the realm of operations management.

Putting these concepts together, Brenda Goldstein, MPH, shows how combining the preceding can synergize the outcomes into a better and more dynamic result. One of the keys to the profitability in a dental practice is the productivity of the appointment schedule. Being busy is a readily accomplished goal; but being busy, efficient, and productive is another matter. What kind of profits do you expect to generate each year? Is there a way to systematically achieve profitability? Applying the concepts of strategic planning, digital dentistry, and operations management can potentiate efficient use of resources to maximize productivity and profitability.

A discussion of business would not be complete without an ethical component. Alvin Rosenblum, DDS, reminds us about the inter-relationship of ethics and business. This is a contemporary discussion, yet traditionally based. The principles are immutable. Their application to the contemporary world sometimes becomes subordinated to the profit motive in mutually exclusive ways. While that decision will ultimately rest with the individual practitioner, this article suggests that there is a way to find harmony.

The business side of dentistry includes much more than practice management. From the business world, there are tools that can help today's practitioner to be better positioned for the future. Having a clear sense of purpose, utilizing technology, developing efficient systems, and having a strong ethos are all important competencies of a contemporary dental practice. There must be a balance of technical skills, business skills, and performance for today's dental practice to thrive in the future. By masterfully incorporating these concepts, a dentist will be able to start this century with a clear advantage in a successful career journey. Will the dentist choose to thrive or just survive? It is ultimately an individual decision.

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Strategic Planning: A Guide to Success

CALVIN S. LAU, DDS

ABSTRACT One of the key business concepts applicable to the contemporary dental practice is strategic planning. Just as a dentist diagnoses and treatment plans patients, so too should a business diagnose and treatment plan its future. Strategic planning offers a systematic approach for analyzing a current situation and creating a work plan toward the future goal.

AUTHOR

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Faster, better, cheaper. That seems to be the credo of business today. This credo started with the National Aeronautics and Space Administration many years ago.1 But can a contemporary dental practice maintain its competitive advantage by following such a credo?

It was a freezing morning on Jan. 28, 1986, when the space shuttle Challenger lifted off with disastrous results.2 It was the 25th shuttle launch. All previous launches had been successful. Time and cost were now on the public stage with the addition of public members to the normal military crew contingent. NASA was convinced that faster, better, and cheaper would lead to its continued success. Indeed everything was faster and cheaper, but was it better? All seven astronauts were lost when a catastrophic failure occurred in an O-ring just 73 seconds into the launch. That tragedy set NASA back several years. As of this writing, NASA has reached its 101st launch and redirected its efforts to the International Space Station, a more valuable and tangible goal. Some have suggested that NASA philosophically change to faster, better, cheaper, and smarter.3

Dental practices can learn from this piece of history, but the contemporary interpretation must change. It is hard to argue with faster and better. These translate into the speed and quality that characterize much of American and global society. But if cheaper means competing solely on price, this can lead to a downward spiral from which recovery is difficult if not impossible. Being smarter, though, means adding more

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value to the care and services delivered. Putting quality first will also bring a more universal foundation to dentistry.

A better credo for dentistry? Better, faster, more value.

Creating Value

The worth of any enterprise in a free market is the value that the community perceives. The community in dentistry's case needs to include not just society in general, but also the specific players. The dentist serves not only the public but also other, more specific, constituencies. Those constituencies include staff, patients, laboratories, and suppliers. Of what value is dentistry to those it serves?

The underlying goal of most businesses is to increase shareholder value. Taking a bottom-line approach might be interpreted as making more money. That is only the end result. Certainly a successful dental practice must make a profit if it is to survive, stay in business, and continue to serve society. The broader interpretation is to create more value for all constituencies and allow for everyone to win.4 What this means is that there is no fixed pie to divide amongst the players. Instead there is an ever-expanding pie from which all can profit and derive more value.

Value creation takes the self-centered approach of owner profitability to a higher level and mutually benefits all the constituencies the dentist serves. It is with the realization that value is at least a two-way proposition that the dentist can truly find continuing prosperity. To sustain profitability and a competitive advantage over the long term, the prosperity must be shared amongst those the dentist serves -- namely patients and staff internally, but also suppliers and laboratories externally.

It may be possible to be successful through a trial-and-error approach, but once again business has developed a more systematic method to reach that ever-shifting goal of success. That approach needs to have enough specificity and flexibility to accommodate change. This is the concept of a business plan and developing a marketing strategy.5

Strategic Planning

What if a dentist started each work day without a schedule? How efficient and profitable would a dental practice be if it relied on walk-in patients who had an unpredictable mix of dental needs? Some structure and organization are needed to keep a dental office functioning smoothly.

Most of a dentist's time in a practice is devoted to patient care delivered through dental services and treatment. Compensation for providing services and treatment largely depends on performing clinical dentistry. Practicing dentists take this for granted. After all, the main way to generate dental office revenue is to provide treatment for patients. The treatment needs are established by making a diagnosis based primarily on patient history, radiographic evidence, and clinical examination. The process of diagnosis and treatment planning is very familiar to dentists. It helps to systematically set a foundation for patient care and practice productivity.

Diagnosis and treatment planning are analogous to the business concept of strategic planning. Without a treatment plan, the dentist is left to deal with too much uncertainty in conducting a dental practice. Unless the mix of care is devoted to a very narrow range of basic services like extractions and simple dental restorations, it is difficult to keep a dental office functioning efficiently, which is the basis for two other articles in this issue. Those articles will start with a broad view of operations management. This deals with allocating resources -- people, facility, materials, and equipment -- and one article discusses applying operations management to a dental practice's functional center, the appointment schedule.

Just as the daily operations depend on a productive appointment schedule, so does the long-term success of a dental practice benefit from having a strategy6 and using strategic planning.

Strategic planning is an ongoing process that can build success in a systematic and measurable fashion.7 It is cyclical and driven by information and quantifiable data. Numbers become one of the measures for comparing where a dental practice is starting and where it intends to be. Strategic planning can be very qualitative and requires judgment, just as a treatment plan requires judgment. The dentist moderates that judgment based on personal knowledge, skills, and willingness. So too should a dentist moderate a strategic plan.

The process takes into account the vision that leadership provides.8 Vision is the general concept that characterizes what a dental practice stands for and expresses a very broad sense of what the dental practice wants to become. In most dental practices, the leadership rests with the owner. In California, the owner must be a dentist. This creates a situation in most dental practices where the dentist must play two key roles, owner and main producer. Finding time to do both well is a challenge that may lead the dentist to default to decisions that fail to benefit the practice for the long term.

How can a dentist find time to strategically plan when the pressures of productivity and generating income seem so directly tied to having a busy clinical operation? The short-term focus of the dentist's spending time doing just clinical dentistry sometimes becomes the default long-term focus as well.

It is helpful to look at strategy and planning separately. Strategy is a way of thinking organizationally, using and leveraging competencies, and increasing value. Planning is also a process, but one that tries to foresee likely scenarios and systematically accomplish a desired outcome. It is in this sense that strategic planning can benefit the dental office. Identifying and implementing the mission, objectives, and goals are the heart of strategic planning.

Applying Strategic Planning

Taking a business slant on the dental world, what better place to start than

where it counts so highly? The bottom line. How much money does a dentist want to earn each year? What will be the profit?

One way to determine this is to begin with the intended profit and work all the way back to the required actions identified in small measurable quantities. The dentist can choose a number and convert that into daily performance or even hourly production by converting the intended profit by the variables that affect the bottom line. The main yearly variables to factor in would be:

- Percent overhead
- Collection rate compared to production rate, and
- Number of days the office will be open.

This type of estimation can be broken down to the hourly productivity a dental practice must achieve to reach that monetary amount. In other words, a dentist can look at past performance and use that as a basis for forecasting future earnings. This is also a reality check. If the dental practice has not consistently been performing at the desired level, then doing the same thing in the next annual period will probably lead to the same results unless some significant changes occur. It makes more sense to determine what should be done in the future by design, rather than by happenstance. That is the value of strategic planning.

Implementation

It is very tempting to say that a dentist is capable of successfully implementing strategic planning in the dental office. Sometimes with years of practical experience a dentist is able to consistently produce a profit and add value. Yet it took more than experience for that same individual to become a dentist. It took education and formal training. This is where is the importance of an outside consultant can play a pivotal role in facilitating a dentist's achieving desired outcomes on a consistent basis. If the dentist lacks the business tools and understanding to implement strategic planning, hiring the expertise will accelerate the process and avoid fundamental errors that may not be intuitively obvious.

The decision about whether to hire a consultant or to try to perform the task with in-house resources will typically rest with the dentist. There is no best approach adaptable to all dental practices. To formulate the appropriate strategic plan, a valid assessment of the practice must occur. The key is the diagnosis, whether it is a dental ailment or a business situation.

With that caveat stated, the dentist wanting to do this process in-house should enlist all available resources for developing a strategic plan.

The Team Approach

The majority of dentists still work in a solo practice. That doesn't mean that this will always remain the situation. In fact, the demographic trends that the ADA measures in its Survey of Dental Practice9 clearly point to a shift from solo practice to dental practices having two or more dentists.

Whether in solo practice or in a group, the vast majority of dentists have staff to keep the dental office functioning in the clinical and administrative areas. Delegation of duties is taken for granted too. Within the licensed and unlicensed categories for dental allied health personnel, there are dental hygienists, dental assistants, and laboratory technicians. Most dental offices also employ administrative staff to deal with appointment scheduling, billing and collections, inventory ordering and management, and myriad other essential tasks to support the delivery of dental care and services.

Just as a dentist utilizes a team for the day-to-day operations of the dental practice, so too can the dentist involve the dental office staff in the strategic planning process. In fact, without the active involvement by team members, the culture of the dental office enterprise tends to take a top-down approach. While there is still a place for an authoritarian approach, when it comes to planning the direction of an enterprise that relies so heavily on delegation of duties, it makes better sense to involve this constituency and gain the support of the people who will implement the system and profit from its success.

Vision

In today's business culture, the planning cycle often starts with leadership determining the vision for the organization. From this vision, the team -- employees representing the various components of an organization -- develops a mission with general goals and measurable objectives. This is the framework that can be likened to establishing a treatment plan. This is literally starting with the end in mind and working the business systems back from that point. Some differentiate the strategic planning process from long-range planning by the envisioning perspective that strategic planning enables, which opens up more creativity and dreaming than forward-moving long-range planning tends to entail. Vision implies thinking outside the box. That is, rather than being limited by what the current circumstances seem to dictate, the process enables nonlinear ideas to develop. Strategic planning provides a framework with which to tap the human creative potential.

Carrying the analogy of strategic planning and treatment planning further, the dentist will gather information to form the database for making judgments, recommendations, and decisions. In strategic planning terms, this is the classic SWOT analysis, which stands for strengths, weaknesses, opportunities, and threats. That is essentially the equivalent of establishing the current condition and making an assessment about the risks, benefits, and alternatives. If this sounds like the dental equivalent of informed consent, that is no mistake.

All of this gathered information forms the basis for the treatment plan. In business terms, that is the strategy or strategies that the dental office will use to reach its

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objectives. Just as the dental treatment plan is written down, or at least electronically recorded, so too should the strategic plan of a business be documented. In order to be useful, the strategic plan needs to have qualitative and quantitative measures for assessing the intended actions and potential outcomes. Additionally, the process needs to be iterative via a periodic cycle in order to validate the judgments and assumptions made in formulating the strategic plan. Having ways to compare performance by using specific measures can be likened to the recall appointment. How did the practice or patient do over time after completing the strategic plan or treatment plan?

Key Element -- the Recall

The analogy of a treatment plan and a strategic plan holds true all the way through the cycle. A key element of most dental practices is the recall system for monitoring patient health and progress. Typically, the periodontal needs of a patient coincide with the timing for such a periodic evaluation. So too does a strategic plan need continuous monitoring.

The recall affords an opportunity for course correction based on the most current condition. The strategic plan also needs such an iterative process as well. The end is just another beginning in the continuous process of strategic planning.

Refinements

Further refinements of strategic planning could also look at the mix of services that the dentist has historically provided and whether that is in alignment with what the dentist would prefer, what patients want, and the current trends in dental therapy. Another aspect to consider is the quality and quantity of new patients coming into the practice. If the dentist is providing successful care, then the current patient base should not need retreatment at frequent intervals. This leads to the conclusion that new patients or a broader mix of services, including new technology, will be important aspects of a dental practice's not only surviving, but thriving in the new century.

One final lesson from NASA. The NASA Strategic Plan 200010 states: "If a high-performance organization is to achieve its strategic objectives, it cannot simply practice good management; it must manage strategically. Ordinary good management entails responding to constituencies and customers, minimizing costs, seeking efficiencies, and investing in resources for maximum returns. By integrating these general management practices with management of our strategic processes, we seek to manage strategically. Managing strategically means that all parts of the organization proceed together coherently, comprehensively, and expeditiously toward the achievement of a single set of strategic goals. This requires that we leverage our limited resources, standardize processes where it makes sense to do so; streamline processes for timely results; and ensure rapid, reliable, and open exchanges of information."

Conclusion

One of the key business concepts applicable to the contemporary dental practice is strategic planning. Just as a dentist diagnoses and treatment plans patients, so too should a business diagnose and treatment plan its future. The recommended process is strategic planning. It offers a systematic approach for analyzing the current situation and leads to objective-based results that are measurable and realistic.

The rewards are many. Engaging the dental team in this process provides a sense of ownership and control that traditional authoritarian approaches often miss. While the dentist still remains the key person in providing leadership, the management of the multiple levels and aspects of the dental office is shared amongst the people whose destiny is dependent on successful performance. Dentists should enter the 21st century with the flexibility and control that business requires. They should start with a strategic plan.

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Digital Dentistry: Information Technology for Today's (and Tomorrow's) Dental Practice

Rich Hirschinger, DDS

ABSTRACT Digital dentistry is not the wave of the future; it is occurring now. Whether a dentist embraces new technology will define his or her practice and, possibly, future. The aim of this article is to inform practitioners of the various components that constitute a digital dental practice, the technologies available today, and those on the horizon.

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"Good morning, you've got money, changes to your schedule and new mail." Margaret, the front office administrator has just logged on to the electronic system administrator. Margaret is informed of the following; "Patients A, B, and C have replied to their electronic billing statements and have paid their accounts in full. The funds have been transferred to the practice bank account, and the patient's ledgers have been credited. All of tomorrow's patients have confirmed their appointments. Mr. Smith, who was scheduled for today, had to change his appointment and has rescheduled for a week from today. Mrs. Johnson, who was on the electronic to be notified of a last minute change of schedule' list, will be taking Mr. Smith's place on the schedule. Three new patients have completed an online new patient registration form, their insurance eligibility has been checked, and they are waiting to be scheduled. Seven new hygiene appointments were scheduled via the Web since you last logged on. Sarah (one of the back office assistants) has notified the system that she is not feeling well and will not be working today. Temporary Dental Staffing was electronically notified and they have sent a replacement to cover for Sarah."

How convenient would it be to have a practice that is managed like the above example? A staff member who calls in sick is replaced without a phone call. Statements are sent without printing, stamping, and mailing. Ledgers are credited as they are paid, and staff do

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not have to input the data. Last-minute cancellations are filled without the need of a staff member contacting people through the call list. New patients fill out registration information electronically over the Web, eliminating input errors by staff. All radiographs are digitally transmitted. Patients' insurance eligibility is checked, and their benefits are updated in their account. Patients make appointments using the Web after logging on to a secure system with their passwords. The possibilities are endless. The barriers to this type of practice are time and the dentist's comfort level with adopting new technology. Some of these technologies are in use today (**Table 1**), and others are under development.

The aim of this article is to inform practitioners of the various components that constitute a digital dental practice, the technologies available today, and those on the horizon. The article is divided into three sections: software, hardware, and the Internet.

The ideal digital dental practice consists of the following:

- Practice management software;
- A practice Web site;
- Online patient registration;
- Online commerce applications;
- High speed Internet connection;
- Digital radiography;
- Intraoral camera;
- Digital camera; and
- An office network.

Practice Management Software

The majority of dental practices utilize practice management software. A minimum front office package should include appointment scheduling, treatment tracking, insurance tracking, financial reporting with customizable reports, letter generating, and electronic claims submitting capabilities. The back office system should include periodontal and restorative charts; clinical chart notes; digital radiography and intraoral camera integration; links to e-mail photos, images, radiographs or chart notes; and comprehensive treatment information including pre-existing, planned, completed, scheduled, and canceled appointments. The patient information section should include a patient photo, patient and family information, referrals, recall, financial information, insurance, health notes, and alerts including premedication requirements and current prescriptions.

Advanced functions of software packages include integration between the software and a portable organizer such a PalmPilot or PocketPC device. Softdent by Dentsply can integrate with a device running the Palm operating system. Information such as the practice's financial data, schedule, and prescription list can be downloaded into the Palm-enabled device. Online appointment scheduling programs are available, but they are currently stand-alone programs. These modules need to be able to integrate with the available management software to be adopted by the industry.

Hardware

Digital Radiography

There are two platforms for digital radiography: one uses charge coupled device/complimentary metal oxide semiconductor sensors (see definition of terms) and the other uses phosphorus sensors. Both systems eliminate the need for a darkroom and the chemicals required for developing conventional film. Both also allow radiographs to be stored digitally with a time and date stamp; allow for the enlargement, enhancement, and transmission of the image; are good for patient education; and expose the patient to less radiation. Both systems require a computer in the operatory to view the captured image. A patient can then view the image, which can be enlarged to fill a monitor screen. Finally, there are no radiographs to mount, no chemicals to ethically and safely dispose, and no misplacing of the images.

First, there is CCD/CMOS, or a direct

Table 1. Using Technology

Which of the following technologies are in use in your practice?	
Computer	89%
Telescopic loupes/headlights	52%
Intraoral video camera	50%
Patient education system (CD-ROM, DVD, or other interactive format)	22%
Air-abrasion cavity preparation system	20%
High-intensity curing light (e.g., plasma arc)	20%
Digital still camera	15%
Phone on-hold messaging system for marketing	14%
Electric handpiece	13%
Digital (filmless) radiography system	10%
Cosmetic imaging simulation (own system)	6%
Laser for soft-tissue surgical procedures	5%
Laser for composite curing	3%
Surgical operating microscope	3%
CEREC chairside CAD/CAM restoration fabrication	2%
Cosmetic imaging simulations (outside service)	2%
Laser for hard-tissue applications	1%

Source: March 2000 Dental Products Report survey
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digital, sensor-based system, which gives the user the advantage of being able to view the image within seconds. The sensor captures the image and sends it to the hard disk where it can be viewed, enhanced, and stored. This makes it a good application for both endodontic and implant procedures. Another image can be captured immediately using the same sensor. The downsides to CCD/CMOS are that the sensors are rigid, fragile, and expensive; the technology is rapidly changing; edge-to-edge exposure isn't possible; and the initial investment is expensive (although it will surely drop with time). Additional sensors, for example, cost between $3,000 and $7,000.

Second, there are phosphorus sensor-based systems that can be thought of as "electronic film." This means they require the use of a scanner as an intermediate step between capturing and viewing the image. The sensor cannot be re-exposed until it is scanned or the original image is lost. The advantages in comparison to the CCD/CMOS sensors are that the sensors are less fragile, they are somewhat flexible, and edge-to-edge, or 100 percent active, exposure is possible. The phosphorus sensors produce a better image quality and a better gray scale image interpretation than do the CCD/CMOS sensors. Additional phosphorus sensors cost between $40 and $120.

In addition, a digital image can be obtained by scanning radiographic film. This process requires the greatest number of steps as well as the most time in comparison to the other two methods. A conventional film is shot and developed using standard techniques. After viewing, the film is scanned into a computer where it is then available for viewing, saving to a hard drive, or transmitting electronically. A scanner can be thought of as a digital camera that needs a stationary object to work properly. A scanner uses a CCD with a single row of light-sensitive pixels. This method is also referred to as the indirect method.

Scanrite and Tigerview are two vendors with proprietary products that can be used if the scanning route is chosen. A standard scanner can be used but only with the required transparency adapter. Panographs can be scanned as long as the scanning surface is large enough. Scanning is the least expensive way to obtain digital images and requires the least amount of time for staff to be trained. However, no matter how good the film scanner is, scanned images can only be as good as the original film images.

The advantages of digital film over radiographic film include less time needed for the process, possible reduction in radiation exposure, enhanced communication with patients, easy storage and retrieval, simplified electronic claims, simplified teledentistry consultation, perfect duplication, and the elimination of chemicals and their subsequent disposal. The disadvantages of digital film over radiographic film include cost, training, and constantly changing technology.

Digital Cameras

The amount of camera capacity is needed depends on the intended use of the images. Typically, the more money invested in a camera, the higher the resolution and the sharper the image. To print a sharp 8-x-10-inch image, a camera capable of capturing at least a 3-megapixel image is required. If the largest image to be printed is 5 x 7 inches, a 2 megapixel capable camera will suffice. If only 2-x-3-inch images are desired, or if the images are for electronic distribution or for posting on the Internet, a basic digital camera can accomplish the task.

After a digital photo is taken, the image needs to be transferred to a hard drive. The image can be transferred directly from the camera to the hard drive if the camera has a FireWire or USB port. Some cameras can store images on a floppy disk, but they are limited to a maximum image size of 1.44 Mb due to the capacity constraints of the disk itself. Sony has also developed a camera that burns the images onto a small CD.

Digital cameras allow the swapping of memory cards, which are essentially digital film, so more shots can be captured before transferring images to a computer. The card is reusable once the images are downloaded and stored. The two main types of memory cards are Compact Flash and SmartMedia. Compact Flash II is a new standard with increased capacity. Compact Flash cards are virtually indestructible. The sliver-thin SmartMedia cards are less durable,

Definitions of Terms

Charge coupled device — An electronic memory that can be charged by light. CCDs can hold a variable charge, which is why they are used in cameras and scanners to record variable shades of light. CCDs are analog, not digital, and are made of a special type of metal oxide semiconductor transistor. Analog-to-digital converters quantify the variable charge into a discrete number of colors. The CCD is kind of like film, but instead of slivers of silver halide, the CCD is made up of pixels. East pixel represents a dot of color in the finished picture.

Client — The computer in a client/server architecture that requests files or services. The computer that provides services is called the server. The client may request file transfer, remote logins, printing, or other available services. The client also means the software that makes the connection possible.

Complimentary metal oxide semiconductor — Pronounced "c moss." One of two major categories of chip design (the other is bipolar). It derives its name from its use of metal, oxide, and semiconductor layers.

Depth of field — When focusing on the main subject, a camera actually has a range of focus, in front of and beyond that point. This range is referred to as depth of field. Anything within this field will be sharp in the final image, and the further an object is outside of the field, the more blurred it will be.

Network -- Any time two or more computers are connected together so that they can share resources, a network is formed.

Server — A computer, or a software package, that provides a specific kind of service to client software running on other computers. The term can refer to a particular piece of software, such as a Web server, or to the machine on which the software is running. A single server machine could have several different server software packages running on it, thus providing many different servers to clients on the network.

with exposed contact edges that, if deeply scratched, make the card useless. Some cameras come with memory slots but not cards. Others skimp on the amount of memory the cards can hold. Cards should hold a minimum of 4MB. The cost of memory needed to store at least 20 photos at the highest resolution should be taken into consideration when one is shopping for a digital camera.

The most compelling difference between Compact Flash and SmartMedia is the fact that SmartMedia is a "dumb" memory chip that requires the camera to include a controller chip. While that can make the memory itself cheaper, the result is that in some cases an older SmartMedia compatible camera can't read new, larger-format SmartMedia cards. A Compact Flash compatible unit, on the other hand, has its own controller chip in each card and is both forward and backward compatible.

Intraoral Cameras

Intraoral cameras capture images using S-video or NTSC, both of which use analog technology. An image captured and displayed on a video monitor cannot be saved unless a connection to a digital device is available. The only way to convert an image captured by an intraoral camera from analog to digital is to save it on a hard drive. Once this is done, the image is digital. Images from an intraoral camera can be saved to videotape, but this must be done when the original image is captured.

Intraoral cameras can increase treatment acceptance rates, can facilitate patient communication and education, and are excellent marketing tools. In addition, the benefit of documentation is often overlooked. The practice of dentistry is very visual. Trying to explain a "leaky" amalgam to a patient without a visual aid can be difficult. Patients will "buy" what is being "sold" if they can see what is being communicated.

Size, shape, viewing angle, and depth of field of the handpiece should be considered when one is looking for an intraoral camera. An intraoral camera should have monitor images that are crisp and clear, a sterilizable handpiece, and networkability and mobility (if required). A review of products from 1994 is available at http://dentistry.vh.org/paper.html. Clinical Research Associates can be contacted at http://www.cranews.com to request a copy of its most current review of intraoral cameras from March 1998.

Computers in the Operatory

About 24 percent of dental professionals have equipped their operatories with computers (**Table 2**). Another 12 percent are planning to do so. Digital radiography, computerized charting, and chairside scheduling are driving this trend. Chairside scheduling offers the advantage of eliminating the bottleneck at the front office. This frees the front office staff to answer phones and questions, attend to collections, or attend to their regular tasks. Backed-up patient traffic, which can be stressful to both front office personnel and patients, is common in offices that employ one staff member to manage the front office.

The Network

After all the hardware and software is installed, it needs to be networked for all the machines to communicate with each other and to be able to back up the system. Each computer, known as a client, needs a network interface card capable of transmitting at least 10 Mbps. The computers are usually linked with Ethernet wiring, known as Category 5 wire, to a hub or switch (switches have more overall bandwidth), which is connected to the main computer, referred to as a server. If the network consists of three or more clients, the main server should be running Windows 2000, formerly known as Windows NT. Fiberoptic and category 5E and 6 wiring are becoming more and more common.

Once the computers are networked, they can form a connection referred to as an intranet. The intranet can be up and running by itself without a connection to the outside world. The network will still be using technologies prevailing on the Internet, such as Web servers, browsers, chat scripts, news and mail servers, etc., but the network does not have to be connected to the Internet.

If the intranet is not connected to the Internet and dial-in access is not provided, there are fewer security issues. Even with an incoming connection, which is needed to send and receive messages, files, etc., there are a number of options to secure an intranet. Firewalls, secure socket layers, password authentication, Internet protocol blocking, and other techniques are available to secure an intranet from intruders.

The Upcoming Wireless World

Bluetooth technology promises to rid offices of wires. This new wireless technology, which is soon to be introduced, uses simple short-wave radio links to allow digital devices to communicate with one another over short distances. More than 1,600 companies are developing devices and applications for Bluetooth, which was named for 10th century Danish King Harald Bluetooth, best known for uniting Denmark with Norway. Using Bluetooth technology, it will be possible to send appointment schedules to a patient's hand-held digital assistant, print documents, use a headset to speak to a computer, automatically update schedules and contact lists with a PC and cell phone, and transfer images from a Bluetooth-equipped digital camera to a PC, all without wires. A Bluetooth sensor for digital radiography should be on the market in a few years.

The wireless range for this technology is 33 feet. Current Bluetooth applications are capable of moving data at about 723 Kbps, more than 10 times faster than a 56k modem and about half as fast as current DSL and cable modem connections. Increases in speed can be expected with further research and

development. Additionally, manufacturers are making products that will enable most of the existing digital devices to be capable of using Bluetooth technology.

More information on Bluetooth technology is available at www.bluetooth.com.

Backing up

The two main sources of failures in the computing world are the power supply and the hard disk. Hard disks will usually give off some sort of sign that they are about to fail. Writing to the hard disk that takes longer than usual is one sign of impending failure. The power supply, on the other hand, fails without warning. This is overcome by having a redundant power supply. Uninterruptible power supplies are also crucial for network uptime in case of power outages. A uninterruptible power supply is essentially a continuously recharging battery, which the power supply is plugged into. In the event of a power failure, the uninterruptible power supply will buy time to complete a current task and have time to properly shut down the system. More powerful, and therefore expensive, uninterruptible power supply units can power a system for several hours.

A highly recommended way of backing up data is to configure the main server using RAID.1 RAID is an acronym for redundant array of independent disks. There are different configurations of RAID; RAID 1 means that data is being written to two independent hard drives at the same time. The hard disks mirror each other. This solves the problem of a hard drive crashing in the middle of the day. One hard drive has crashed, but the other hard drive is functioning normally. This would be analogous to driving a car with two independent engines. They both serve the same purpose, but if one engine fails the other independent system is unaffected and continues to function normally.

The Internet World

A Professional Web Site

"I practice dentistry, what do I need a Web site for?" "I don't want to attract new patients via the Internet, so I don't need a Web site." Those are common responses received when dentists are asked, "Do you have a Web site?" A Web site is useful if internal marketing is used, if credit card payments are accepted, if increased office efficiency is a goal, if appointment reminders and/or bills are sent electronically, or if the office is proud of the level of dentistry that is provided. A Web site can raise awareness of what a practice can offer to a community.

Web sites are an efficient way to communicate and market to current and potential patients. Printed office brochures, business cards, and other assorted stationery can become obsolete because of a location change or an area code change. With a Web site, those types of changes can be updated in a matter of minutes and the cost, if anything, is minimal.

Having a professional Web site portrays a unique and professional identity. It also shows the following about a practice: professionalism in organization, an inclination of organization toward customer service, and a certain level of techno-savvy.

Online Patient Registration and Scheduling

The advantages of offering patient registration and scheduling online include increased productivity and attracting the Web-savvy consumer. The downside to these services is the lack of integration with current practice management software. Once this obstacle is overcome, the benefits will outweigh the risks. With online scheduling, patients can make an appointment request though e-mail or book their appointments online. Online scheduling enables current patients to log into an office schedule through a secure Web site using a sign-in name and password that the office has established. After they sign on the first time, patients can change their password if they so choose. This effectively eliminates the concern of most practitioners, which is a person making an appointment they have no intention of keeping. An office might let patients schedule only hygiene appointments or only appointments shorter than one hour, etc. Each office can control the scheduling parameters that it is comfortable with.

How nice would it be to have a new patient show up at the office and not need to fill out any paperwork? Online patient registration effectively serves three purposes; it eliminates time-consuming data entry by the front office staff, it eliminates data entry errors by the staff, and it shows the new patient that the office is a leading edge, efficient, technology-enabled practice.

As organizations and companies learn to work with the Internet, dental Internet resources will become more tailored to the needs of their users.1

Electronic Business Applications

It is useful to think of the electronic economy as having three primary components: supporting infrastructure, electronic business process (how business is conducted), and electronic commerce transactions (buying and selling). E-business infrastructure is the share of total economic infrastructure used to support electronic business processes and conduct electronic commerce transactions. Examples of e-business infrastructure include computers, routers, satellites, wires, Web site hosting, and human resources, such as programmers. E-business is any process that a business organization conducts over computer-mediated network channels. Examples of electronic business processes include logistics, online purchasing and selling, support services, and internal communication. Electronic commerce is any transaction conducted over computer-mediated network channels that transfers

ownership of, or rights to use, goods or services.2

The Internet not only gives buyers access to information and pricing, it gives the sellers access to more buyers. E-commerce applications for dentistry include secure online billing and payment, secure hosting of practice management applications, secure system back-ups, and secure connections to online suppliers.

Online Billing and Payment

The following time-consuming steps are required to send out a snail-mail statement: ordering statements, stamps and envelopes (including return envelopes); inventorying those items; setting up the statements in the printer; maintaining printing supplies; setting up the software to run the statements; sorting, stuffing and stamping the printed statements; and, finally, mailing them. Once they are received, the payments need to be posted, the credit card payments need to be transmitted, and the checks need to be deposited. In the case of checks, most accounts are not credited until the checks clears, which might be a few more days.

Being able to conduct all those processes electronically through a Web site would save money and staff time. Ideally, a staff member indicates to the practice management software which statements to send electronically and hits "enter." Patients who choose to do so can then pay their accounts via a secure Web site. The payment is electronically entered in the patient's ledger, and the funds are deposited into the practice bank account. This represents savings to a practice in ordering, cash flow, inventory, and payroll, while leading to an increase in efficiency.

Online Practice Management Applications

Some software companies are going to be offering the option of utilizing their services as an application service provider or ASP. Instead of paying a large up-front fee for a software package, a monthly fee is paid to access the practice management software via the Internet. The data resides with the ASP and is accessible via the Internet. This would enable the software vendor to provide updates to their entire ASP clientele all at once. This is a more cost-effective way for them to do business. It remains to be seen how many health care professionals are comfortable not having the practice management software installed inside their office, or Intranet. The advantages to the ASP model are that a database can be accessed from any computer, and the data is probably safer outside an office for a number of reasons. For example, Web-hosting centers are built for protection against humans and nature and provide redundancies for data back up and power supply. Additionally, the only hardware requirements of this system for the user are a monitor and a Web browser. Most ASPs can be accessed from a computer running a Macintosh or Windows operating system as long as either Netscape or Internet Explorer is installed on the computer accessing the site. The constant upgrading of hardware is eliminated since a unit with a monitor and browser is all that is required to access the ASP.

The barriers to entry for this type of software model are in educating the profession about the security of online applications and the requirement of high-speed access to the Internet. Large law firms have adopted this model so their lawyers can access the firm's data while in the office, at home, or at a remote location.

A valid concern is in the area of security and the safety of confidential data on the Internet. There have been numerous breaches of Web sites by hackers as reported by the media. Because of these breaches, the market for security software and hardware has grown tremendously, and the safety of the Web is increasing. That is not to say that data on the Web is 100 percent secure. The good news for the dental profession is that hackers tend to go where the publicity is and prefer to breach sites that affect millions of users. Hacking a dental practice Web site is not going to make a hacker famous.

Online Supply Ordering

How many practitioners want a supply salesperson interrupting staff during the course of a business day? The staff member who is in charge of ordering drops what he or she is doing to place the required order. Online supply ordering enables the staff to place orders at their convenience. Not only does electronic supply ordering eliminate a possible disruption to the office staff, it enables the tracking of expenses, timing, and quantity of goods. Comparisons can be made with local, and electronic, colleagues to compare cost, quality of service, and responsiveness of the dental supply companies.

Offering online services such those discussed will increase the utilization of a Web site through interactivity, while easing the staff-intensive processes required to schedule appointments, pay bills, etc.

High-Speed Connection

The key term in connections is throughput. Throughput is the amount of data transferred from one place to another or processed in a specified amount of time. Data transfer rates for disk drives and networks are measured in terms of throughput. Typically, throughputs are measured in Kbps (thousands of bits per second), Mbps (millions of bits per second), and Gbps (billions of bits per second). Dial-up modem speeds top off at 56 Kbps, which is too slow for transmitting images or maintaining a Web site on a server. High-speed connections such as DSL, cable modem, and T1 lines are capable of transmitting data up to 1.544 Mbps. These services are available through phone and cable companies.

When to Adopt

It is no coincidence that two of the largest wireless companies in the world, Nokia and Ericcson, have headquarters in Scandinavia. How could two companies from a remote part of the world come to lead the world in development of wireless technology? The answer is necessity. Neither Sweden nor Finland has a wired infrastructure. They became early adopters of wireless technology out of necessity, and now more than 70 percent of their citizens use wireless technology. As of summer 2000, a Helsinki-based bank, Nordic Baltic Holding, claims the world's biggest Internet banking network with 1.5 million active customers online. Citibank, by comparison, has 1.1 million online customers worldwide.3 It is no surprise then that the United States lags behind Europe and Japan in the deployment of wireless technology. The United States has a wired infrastructure and has been slow to adopt the "new" technology.

The adoption rate of technology is sometimes born of necessity. Is it necessary to adopt digital radiographs when a technique that is 100 years old is still an option? Is it necessary to use electronic scheduling when a paper and pencil are available? Technology is about change, control, efficiency, and information. Profit zones can be found using data mining; control of the schedule can be obtained using productivity scheduling. Access to office data from anywhere in the world is possible. It is hard to back up a paper-based appointment book without technology. After all, a copy machine is needed to duplicate a schedule, unless writing it out long hand is the chosen method.

The Class of 2004 at the University at Buffalo School of Dental Medicine will be the first dental class to go "paperless," meaning they will have no printed textbooks, laboratory manuals, workbooks, course outlines, or reading lists.4 Students will receive DVDs instead of paper. Six other dental schools are considering adopting an "electronic curriculum." These doctoral candidates will likely set up digital practices when they graduate. They will have a competitive advantage over a practice that has not welcomed technology into the office.

Change is difficult for most practitioners. Dentists tend not to be early adopters because they want to know that what they are using is going to work. For example, few dentists wanted to be the first to offer porcelain veneers to their patients; but it is now a proven technology. The technologies discussed in this paper offer an opportunity to increase the productivity, profitability, and marketability of a practice. Patients are aware of change, and it is something they will talk to their friends about. "My dentist is using this new technology," a patient might say to a friend. It creates interest and can lead to an increase in business. After all, in addition to providing excellent patient care, dentistry is about business.

Conclusion

Digital dentistry is not the wave of the future; it is occurring now. The proportion of dental practices utilizing computers increased from 11 percent in 1984 to 79.5 percent in 1997.5-7 The ultimate goal is to integrate the Internet into the clinician's workflow so that it becomes invisible.8 Whether a dentist embraces new technology will define his or her practice and, possibly, future. A patient put it well when he noticed his dentist still used a paper-based scheduling system, "How up-to-date can a dentist be when they are still using a paper and a pencil to schedule appointments?"

However, a dentist must not lose sight of what matters most -- the patients. Dr. Jack Preston said it best in 1996 when writing about adopting technology into a dental practice, "Patients must continue to receive personal care; the electronic adjuncts must be made to be servants rather than masters. The electronic environment can improve doctor-patient relationships and should never be allowed to make the encounter less personal."9

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Operations Management: A Tool to Increase Profitability

Michael J. Mulvehill, DDS

ABSTRACT Operations management enables the efficient utilization of the production systems in a business. This paper will address several key elements in the business competency of operations management. Specifically, this discussion will review the components of a material requirement planning system and a "just-in-time" system for inventory control and time management to enable the dentist to monitor a portion of the practice's overhead costs.

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Business and economic climates have been positive, and most dental practices are thriving. Statistics from the American Dental Association 1996 Survey of Dental Practice show the average real net income for all independent dentists to be just less than $135,000 per year. But as sure as night follows day, the profitable good times will be tested with lean times. What will determine whether a practice survives? Will dentists be able to change or re-engineer their practices to meet the future demands so they can maintain their productivity and, more importantly, their profitability? Each dentist must evaluate the economic health of his or her practice to sustain prosperity. If the practice makes money, it will prosper; and the value created by the delivery of dental services will benefit the dentist, the patient, and the office staff, as well as dental suppliers and manufacturers.

Dentists not only diagnose the oral health of their patients and provide the appropriate therapy and care, but also are responsible for the quality of that care, the daily work schedule of patient treatment, and the efficient utilization of all the practice's resources. Dental practices are therefore subject to the same requirements as other business enterprises with respect to sound financial planning and adequate resource management. Dentists need to become excellent business diagnosticians to stave off failure or misfortune. Some may disagree, but the main goal of every business is to make money.1 To achieve this goal, dentists must carefully examine the business operation of their practices.

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This paper will address several key elements in the business competency of operations management. The focus of operations management is the efficient utilization of the production systems in a business. Chase, Aquilano, and Jacobs, in their book Production and Operations Management, Manufacturing and Services, define operations management as the design and control of business systems responsible for the productive use of materials, human resources, equipment, and facilities for the development of a product or service.2 To increase productivity and profitability, dentists need to deliver their services more efficiently and cost-effectively. Specifically, this discussion will review the components of a material requirement planning system and a "just-in-time" system for inventory control and time management to enable the dentist to monitor a portion of the practice's overhead costs.

Material Requirement Planning

In every production system, there are primary inputs and necessary resources that undergo a transformation function to produce a desired product or service. In the dental practice, the inputs are the patients. The necessary resources are the dentist, the auxiliary staff, and the required supplies and materials, along with the appropriate dental equipment. The transformation process is the physiological oral health care or therapy provided and the desired outcome or output is the oral health of the patient.

The material requirement planning system began in the manufacturing industry, as a way of calculating the amounts of materials required in the production process. In its basic form, the system takes into account the amount of each item and when it will be required to complete the product or service within a specific time frame. The main purpose of material requirement planning in a dental practice is to control inventory levels, minimize inventory investment, maximize operating efficiency, and manage the dentist's time with respect to the scheduled patient appointments.

To manage the inventory, the office should be set up to order the appropriate materials, in the correct amounts, within a specific time frame so that the practice never runs out of supplies. All materials and supplies can be categorized in an inventory file in the computer. This database can contain the specifications on each item used in the practice, the vendor or supplier, the unit cost, and the delivery or cycle time. For the efficient utilization of resources in the dental office, the dentist should know the sequence of the use of the materials, supplies, and labor for every procedure performed.

Most office computer systems can summarize how many specific dental procedures were performed in a given year and the cost of the associated materials. With this information, the dentist can calculate the cost of materials or supplies for each procedure. In doing this analysis, the dentist will discover the cost of a portion of the overhead and which procedures are the most expensive for the office to deliver. For example, a dentist can make a list of each item used in a composite restorative procedure (anesthetic cartridges, needles, cotton products, rubber dam, composite material, etc.). Then the per-unit cost and the quantity of each item used in the procedure is calculated. This sum gives the material and supply portion of the procedure overhead, excluding the fixed costs. Taking this to another level would include calculating the cost of labor, rent, and equipment to arrive at an overall true cost of performing each procedure. This is somewhat time-consuming, but it can be a very useful starting point for determining an initial level of cost control measures.

An assumption to be made at the outset is that every practice must have control over the office appointment schedule. The old adage, "time is money" is never more true than in a dental office. The management of the dentist's and hygienist's time is critical because they are the primary revenue producers. Dr. Roger Levin in the May 2000 issue of the *Journal of the California Dental Association* remarked that the scheduling system reflects the use of time, and this system overpowers all other systems and must be the focal point for change.3 As the schedule goes, so goes the production for that particular day or session and along with it the utilization and consumption of the office resources, namely, the supplies, dental materials and staff labor. An office should plan for a full productive day with a specific dollar amount as the daily goal. The target amount is then divided by the number of hours in a work session to arrive at an hourly rate of production. This will assist the front office staff in the preparation of the daily schedule as they allocate time for the different patient appointments. The schedule should be as accurate as possible with respect to the specific amount of time the dentist will need to complete the procedure. The dentist and auxiliaries should periodically review their time requirements and discuss any improvements with the schedule coordinator or office manager. Saving a few minutes by becoming more efficient will allow the dentist and team to increase daily production. There could also be an assessment of which procedures can be appropriately delegated to an auxiliary to increase the dentist's and hygienist's productive time. Some offices have found it very helpful to schedule for the assistant's and hygienist's time, in addition to the dentist's time.

Just in Time

The "just-in-time" production management system was developed by the Japanese after World War II. This system streamlines the production of quality goods and services by using minimal amounts of resources and supplies. The necessary materials and supplies arrive "just in time" to be used in the production process. The just-in-time system is based on high quality performance along each stage in the process, upgrades in

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housekeeping, good supplier relationships, a strong desire to minimize the waste of time and inventory, and a stable demand for the product or service. The just-in-time system works well for controlling costs in service industries such as dentistry.

A true cost-saving measure is to ensure quality in the delivery of all dental services. This is commonly known as total quality management, and it applies to the entire dental office team. Quality in dental practices can be improved by implementing a reliable treatment sequence. Quality is the goal at each step to ensure that each patient receives the maximum value for his or her health care dollar, regardless of who performs that particular service or task. Stressing quality in the beginning ensures uniform treatment procedures for patients the first time they are performed. Procedures that have to be repeated to maintain high quality standards dissolve the profit margin.

A dedication to good housekeeping will allow the treatment procedures to work better. The necessary instruments and supplies must be kept in the operatory and laboratory respectively. Everything should be in its proper place, clean, and ready to use. Each member of the dental staff cleans and maintains his or her own work area. This focus on organization, preparation, and cleanliness will allow the treatment process to flow more efficiently. Also, the attitude of continuous quality improvement will be easier to develop, and patients will perceive they are receiving better care.

Patients and employees are important components of the just-in-time system, but so are the supply vendors. The supplier network in this system is the cooperative association between the dentist and the dental supply company. The supplies represent a major portion of the office overhead cost. If an office is able to forecast its material and supply usage to its suppliers, they will have a picture of the demands that will affect their business over the same period. This will allow the vendors to plan future shipments and thereby improve their material and supply flow with increasing efficiencies and decreasing costs. This might give the dentist an opportunity to negotiate a lower cost, as the vendor and manufacturer will also save money.

Dentists can minimize the material and supply costs by looking at the dollar investment resting on the shelves. It makes no fiscal sense to buy in such bulk and tie up resources if the consumption of these materials may be months away. A logical cost-saving approach would be to talk with the supply representative about bulk discounts in relation to consumption rates and delivery times. For example, instead of purchasing 6,000 toothbrushes in bulk, it may be more advantageous to have the vendor ship 1,500 toothbrushes every quarter with an appropriate discount for the guaranteed order. An opportunity exists to save money if the delivery or cycle time of an order can be shortened along with a monthly or quarterly commitment regarding how much of a particular item will be purchased. A more recent purchasing option for the dental office is the use of the online dental supply companies. In some states, dental organizations have partnered with online suppliers to offer discounts on material and supply purchases for member dentists. This modality may offer decreased cycle and transportation times, lower inventory levels, and less waste of motion, everything the just-in-time system espouses. Although this system may be scaled down for dental practices, it offers a standard or benchmark to measure present inventory levels against in relation to waste or excess supplies. This could result in substantial monetary savings.

By reviewing and clarifying the process flow in their offices, dentist can improve treatment and service performance. Staff should regularly discuss ways of improving patient satisfaction in all areas of dental practices. Reviewing and evaluating equipment and treatment protocols is a must if dentists are to stay up-to-date with the rapidly changing dental environment. Each staff member should have a specific responsibility in caring for patients, be it in the operatory, the lab-sterilization area, or the front office.

The elimination of waste of motion, a prime factor in the just-in-time system, can be applied to the dentist-assistant relationship at chairside to make the delivery of each service more efficient. Some operational objectives designed to improve efficiencies include looking at decreasing the set-up times between patients, including the disinfection of the operatory and instrument sterilization. A checklist should be developed for all necessary instruments and supplies for each procedure. Another objective would be to decrease the operating time for each patient, while maintaining the appropriate skill and quality of care necessary for each procedure. Procedures should be designed to make patients feel assured about the treatment being provided. Cross-training all members of the office staff will increase flexibility and improve overall performance.

Unique approaches to leveling demand should be developed so patients' waiting times can be minimized. One such idea is to offer discounts to patients if they schedule appointments during hard-to-book time periods. Dental practitioners should be respectful of patients' time as they move through their daily schedules. The office should do everything it can to stay on schedule. When treatment requires additional time, the staff should inform patients who are waiting and ask them if they would like to reschedule at their convenience. This can be an opportunity to improve customer-patient satisfaction and to increase the rate of return business.

The staff should be asked how they see their responsibilities and problems associated with the overall process flow. The dentist should seek their opinions for improving treatment delivery, patient flow, and the elimination of unnecessary activities in an effort to increase patient satisfaction through quality performance. Communication among the team is of utmost importance.

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Conclusion

The material requirement planning/just-in-time combination provides several benefits. The material requirement planning system allows for the scheduling of dental services with specific time allotments and information regarding the needed materials, supplies, equipment, and personnel. The just-in-time system provides quality control and reduced inventory levels so dental procedures can be performed in a more cost-efficient manner.

The work flow should be analyzed. The dentist and hygienist should be kept busy with revenue-producing procedures whenever possible. Waiting time between patient appointments, unnecessary activities, and any down time during individual procedures should be reduced or eliminated. The "right" or appropriate inventory items should be reduced to cost-efficient quotas to prevent running out. The number of employees required to perform the necessary professional services as well as the auxiliary duties should be evaluated for the smooth operation of the entire practice. High quality should be demanded in all phases of the practice. To borrow a phrase from Dr. Terry Donovan, "Excellent clinicians pay strict attention to details." The same can be said for the successful entrepreneur with regard to business competencies. This article's aim is to help dentists maintain their competitive advantage in today's health care market by producing the highest quality of dental services efficiently, on schedule, and on budget with great customer service and satisfaction.

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Appointment Scheduling System: A Vehicle for Increased Productivity

Brenda Goldstein, MPH

ABSTRACT Operations management is the design and control of systems responsible for the productive use of human resources, equipment, and facilities in the development of a product or service. Applying those concepts to appointment scheduling can coordinate efficient use of resources. The focus of this paper is to assist the dentist and dental team in creating an appointment scheduling system that maximizes productivity and profitability.

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One of the keys to profitability in a dental practice is the productivity and efficiency of the appointment scheduling system. Being busy is readily accomplished, but being efficient and productive is another matter.

Each dental practice is unique in its patient base, philosophy, and practice approach. How a dental practice incorporates these variables into the appointment scheduling system helps to determine profitability. By efficiently utilizing the time of the dentist, staff, and patients, value can be created. Applying the concepts of operations management to the appointment scheduling system can coordinate efficient use of resources to maximize productivity and profitability.

The focus of this paper is to assist the dentist and dental team in creating an appointment scheduling system by using the concepts of operations management. Operations management is the design and control of systems responsible for the productive use of human resources, equipment, and facilities in the development of a product or service.1 Dental services are a mix of tangible and intangible attributes that constitute a dental service package. An appointment scheduling system supports and controls the practice, which provides dental services.

The purpose of an appointment scheduling system is to manage time for the dentist and the staff. Time must be utilized to its fullest potential to pay the cost of overhead and generate profits. Time must also be controlled to minimize stress on clinical staff and to provide a smooth

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and accessible schedule that is almost invisible to patients.

The dental practice must create an appointment scheduling system that is consistent with the operating focus of the practice, user-friendly, structured to cope effectively with variations in demand, and cost-effective. Prior to creating an efficient and effective appointment scheduling system, the dentist must define the production goal for the practice.

To do this, the dentist must begin by looking at the prior year's production figures. How much profit did the practice make? How much would the dentist like to make this year? Calculating the costs of running the practice and adding the profit the dentist would like to generate creates a total income figure. This number can then be broken down into monthly, weekly, and daily figures. The daily figure is the average amount the practice needs to make every day to meet the overall production goal.

Once the production goal has been determined, this information needs to be communicated to the staff. Each member of the team needs to understand and support the concept of a production goal before moving forward.

The appointment scheduling system must blend together the highly profitable dental work, the recall work, new patients, emergencies, and no-shows. Each of these categories should be assigned production values. Taking these production values into account, the number of each type of procedure or patient that should be scheduled each day to meet the daily production goal should be calculated.

Since most dental procedures are fairly standardized, the team should be able to break down the sequence for each procedure the dental team performs. Each team member has a different responsibility for what happens when a patient comes in for a particular procedure. These procedures need to be broken down, based on the dentists specialty, and each one worked through with the team. The team needs to negotiate to come to a consensus on the steps and time it takes to perform each procedure. All must agree on the allotted time for each procedure the office performs.

Given that the dentists' time is the most valuable, it is essential that his or her time be used for the most productive procedures. To maximize the use of the dentist's time, all activities that the dentist is not legally required to do should be delegated to the staff.2 The dentist should design his or her ideal day.3 At what time of day does the dentist prefer to perform certain procedures? Is the dentist most productive in the morning or afternoon? These questions need to be asked and the answers incorporated into the allocation of procedures for creating the ideal day.

The hygienist's time is quite valuable as well. The hygienist should be actively involved in incorporating the hygiene exam into the appointment scheduling system. The balance between new patient exams and recalls should be taken into consideration when creating the production goal. The hygienist's work is the backbone of the general practice and the hygienist's time should be factored into the ideal day as well.

After these steps are completed, the existing appointment scheduling system needs to be evaluated in light of the production goal. Because almost everyone in the dental office -- from the receptionist to the dentist -- is involved in the success of the appointment system, everyone should be aware of and contribute to defining and evaluating the existing appointment scheduling system.

Factors That Affect Scheduling

Because of its complexity, the appointment scheduling system is one of the most time-consuming management systems in the practice. Scheduling is the responsibility of the whole team -- not just the person administering the appointment system. There are a variety of factors that should be taken into consideration that affect the production goal and the appointment scheduling system.

Emergencies

The dental team should plan for emergencies. Historical data should be reviewed to determine if the office has a pattern for receiving and handling emergencies. If there is, emergencies need to be incorporated into the daily schedule and accounted for as part of the production goal. The dental team should decide how to handle emergencies. These procedures are to be incorporated into the coordination of the daily schedule. When an emergency patient arrives at the office, the front and back office staff must coordinate to ensure that the pain can be relieved and the patient either be seen that day or be re-appointed for another day.

No Shows

Also affecting the daily production goal are patients who do not show up or who cancel on short notice. Broken-appointment and no-show ratios should be analyzed. This can be done by looking at the previous month's scheduled production and calculating the amount of production that was canceled. The amount of canceled production divided by the originally scheduled production will give the percentage of broken appointments. In addition, it should be determined how many of those changed appointments were scheduled and how many voids were filled. If most of those changed appointments are filled, the time spent on filling those voids was probably substantial and stressful.

Working with the dental team to come up with solutions for these events before they happen will aid the team in reaching the daily production goal. Some possible solutions are the creation of a quick-call list of patients who live and work close to the office and can come in on little or short notice. The appointment scheduling system should keep such a list.

Repeat Offenders

Repeat offenders are people who are notorious for canceling at the last minute or who are constantly late. This human factor should be taken into account

when developing the production goal and creating the appointment scheduling system. One solution is to schedule the repeat offenders for the last appointment of the day. The office should also implement a policy regarding charges for missed appointments.

Down Time

Down time is not profit-producing time, but it can be productive. There are many things the dental team can accomplish during down time that still keep the day productive. For example, the dentist can get caught up on his or her treatment planning, laboratory work, and chart audits. The dental assistant can maintain the office's clean, neat professional appearance. Back-office staff (hygienists or registered dental assistants) can catch up on instrument sterilization, tray set ups, and inventory control. Staff should be cross-trained in a variety of functions to ensure that they are working efficiently during down time.

New Patients

New patients are essential to a thriving dental practice. When creating the production goal, time should be allocated for new patient exams. Reviewing prior year's data on how many new patients came in to the practice and estimating how many new patients are desired for the coming year will assist the team in setting the production goal.

The Electronic Scheduling System

A well-thought-out, effective appointment scheduling system that takes into account all of the above factors will increase productivity, decrease stress, allow flexibility for complications and emergencies, improve appointment availability, increase efficiency, and meet the dental practice's production goal. However, today's dental practice cannot fully compete in the future unless the appointment scheduling system is automated and connected to the main practice management system.

A practice management system is a set of software packages that is designed to help perform in a shorter time and with greater accuracy many of the clerical, administrative, and accounting tasks traditionally carried out manually. A practice management system that incorporates an automated appointment scheduling system will eliminate many of the routine administrative scheduling duties, leaving more time for patient care. A well-maintained system will provide accurate data on which to base decisions for future developments and may even improve the practice's image.4

The technological advances that have been made to date in the field of dental appointment scheduling systems are encouraging. An electronic appointment scheduling system is a necessary tool for the dental team to increase productivity and achieve its production goal.5 Many dental offices are looking at incorporating on-line or Web site appointment scheduling for their patients. On-line appointment services may help to increase productivity and customer loyalty while significantly reducing scheduling costs.

Providing patients of record access to a practice's Web site for scheduling recall exams or cleanings may facilitate patient "buy-in" into the appointment-making process and may reduce the no-show rate. This will allow patients to schedule appointments at their convenience and become more committed to keeping their appointments. Many on-line systems provide appointment notification. On-line appointment scheduling will also allow the patient to electronically update pertinent information such as new address, change of insurance carrier, etc.

In creating an online system, the dental team controls the scheduling parameters and the information-gathering abilities of the system that the patients access. The information gathered online should be monitored regularly, then entered into the existing practice management system.

Conclusion

Establishing and maintaining an effective appointment system requires coordination of provider time, active communication, and attention to detail. Properly done, a well-run appointment system will move a practice to a higher level of productivity and performance by generating new benefits for the patient, the practice, and the dental team. The appointment scheduling system will increase production by making the practice run more efficiently while maintaining a high level of patient service.

An effective appointment system will be well worth the time spent creating it. Staff should be involved in the process so that they feel a sense of ownership in the new system. Once everyone understands and is committed to the system, the new appointment schedule will provide the way for greater efficiency, greater productivity and profits for the practice.

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Ethics Competencies in the Business of Dentistry

ALVIN B. ROSENBLUM, DDS

ABSTRACT Ethics is the systematic study of human conduct examined in the light of moral values and principles. It is the most important competency in dentistry, in business, and in life. Competency in ethics requires an understanding of its accepted principles, and such competency is the obligation of every dental professional.

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On hearing that the Harvard School of Business was gifted $21 million to teach ethics, someone said, "Teaching ethics to business people is like taking up a collection among Christians to buy new lions." Is ethics in conflict with business, as this statement would imply? Does adherence to the discipline of ethics hamper the goals of business? Many feel the primary goal of a business is the generation of a profit, while the primary goal of a profession is provision of a service. If so, then the core values of the dental profession would be at odds with those of business. Ultimately, the moral conflicts faced by those of us who engage in both the profession of dentistry and the business of dentistry are always the responsibility of the individual. Competencies in ethics require an understanding of the discipline of ethics and its accepted principles. Such competency is the obligation of every individual professional.

An Ethics-Based View of Business

A single-minded view of business holds that wealth is built by the creative ability of people and is inherently compassionate. Adam Smith, the architect of capitalism and of the ideas that shaped the concept of private ownership and the free enterprise system,1 is the foremost proponent of this optimistic contention. Smith, considered by most to be the first economist, wrote in the 18th century that the capitalist system of economy proposes to enrich both the individual and the state. He argued for capitalism with a conscience

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that was designed to enable people to gain revenue at least for subsistence, and that it would also supply the state with sufficient revenue to provide public services.

Adam Smith came to question issues of economic decision-making while a student of moral philosophy. He was concerned about how people made good moral judgments, and this led him to a concern about how good economic judgments were made. In his curiosity about how people made economic decisions, he looked at how they weighed their own self-interest against the interest of others. Smith believed that the competitive urge was ingrained in human nature, and he felt that a person's passion to get ahead would be kept in check by competition. He wrote that people do the right thing most of the time and that conscience and people's capacity for compassion is the force behind self-regulation. For more than two centuries, his work has been the best statement in defense of the fundamental principles of capitalism.

Any system has flaws, and the capitalism of Adam Smith is no exception. But despite any shortcomings, the world is increasingly embracing free enterprise and an open market economy. William E. Simon, when secretary of the U.S. Treasury, said, "Capitalism sets forth sure principles by which we can meet the moral and financial challenge of the 21st century."

In modern times, many economists and business gurus have argued for a more cooperative and ethical approach to business. Team building has come to the fore, and many argue for more collegiality. Where war with its winners and losers is often a metaphor for business, "game theory" is now in vogue. At Yale University, they have coined the word co-opetition2 to describe the more cooperative competition that is being encouraged. In this vein, the founder of Amway has written a book titled Compassionate Capitalism.3 Some view this as an evolutionary process moving from the capitalism of exploitation to the capitalism of service.

Every man, as long as he does not violate the laws of Justice, is left perfectly free to pursue his own interest his own way, and to bring both his industry and capital into competition with those of any other man or order of men. -- Adam Smith

We are now experiencing the most dramatic change ever in the world's economy. There is a greater focus on principle-centered business management4 as well as a heightened awareness that business must be respectful of people and the planet. Globalization is creating wealth and changing the politics of nations.

Business as an Unethical Force

An alternate view of business, which is equally single-minded, sees business as almost exclusively motivated by greed. It is not difficult to conjure up a view of business that recalls the days of the robber barons, child labor, and gangs of thugs hired by large companies to break strikes and keep workers in line. It was a time of ruthless, greedy, uncaring capitalists, who wouldn't allow ethics to affect the bottom line. Today we need only watch the evening news to see the tobacco company CEOs lie to us about the dangers of cigarette smoking; insider trading skewing market values; and corporate decisions leading to polluted rivers, poisoned air, and ruined lives. We have to wonder what the decision-makers at Bridgestone/Firestone and Ford were thinking in the recent tire failure tragedy. Was it the same kind of thought process that allowed GM to weigh the cost of litigation for the loss of life as a result of rear-end collision explosions against the cost of recalling vehicles? This view sees business profiting from human suffering and the destruction of the planet.

A *Wall Street Journal* survey of business managers5 concluded that ethics can impede a successful business career, and more than half of those surveyed said they would "bend the rules" to get ahead. One 50-year-old executive said, "I know of unethical acts at all levels of management. I have to do it in order to survive." According to the vice president of a Midwest company, "Opportunism, cleverness, and cunning are taught in business; and

Table 1. Principles of Ethics*

Primary Duties
Beneficence
The quality or state of doing or producing good, especially performing acts of kindness and charity.
Veracity
Truth-telling and the avoidance of deception. This applies to dentistry in direct communication or in advertising and promotion.
Autonomy
Autonomy is the right of personal decision-making. In dentistry, the vehicle for patient autonomy is "Informed Consent."
Justice
Justice is the most complex of the ethics principles. It is, simply put, when one gets what is due, or fairness.
Non-Maleficence
The admonition of the Hippocratic Oath, which promises to do no harm. A major issue in dentistry concerns the appropriate assignation of responsibility when a mistake is made and harm is done.
Reparation
Reparation is to make amends, to restore to original condition or to compensate for harm done.

*Rosenblum A, Ethics, Dilemmas in dentistry. Dentistry 12(3):7-8, 32, 1992.

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fairness and equity aren't given equal time and importance." Caveat emptor -- let the buyer beware.

Famed economist Milton Friedman said, "There is only one social responsibility of business -- to use its resources and engage in activities designed to increase its profit without deception." Unfortunately, deception has become a common tool in business. So, in the admittedly single-minded negative view presented here, the nature of business is all about making the most profit and maintaining competitive advantage at almost any cost. In so doing, inherent adversarial relationships are created with both consumers and competitors.

If one views dentistry in this context, it is not difficult to cite the litany of wrongdoings in the profession performed as a result of greed, ignorance, and insensitivity to patients. The sacrifice of quality, overcharging, falsification of records, overtreatment, insurance fraud, and the like, are all at the expense of hard-won ethical standards.6 As Horatio says in Hamlet, "It takes no ghost come from the grave to tell us this"(that something is rotten in Denmark, etc.). We all know there are dentists among us who put their own wants ahead of patient needs. Each one of us must guard against even the subtlest violation of the principles of ethics (**Table 1**).

Dentistry as a Profession

Dentistry had its origins in early Greek medicine. Sacrifice of personal benefits for the benefit of the patient can be traced to that time.7 Its history is based on attitudes of benevolence and sympathy toward those it served. Dr. Pierre Fauchard, the French dentist of the early 18th century, set the standards for modern dentistry. He taught by word and deed that the sharing of knowledge and the minimization of the profit motive were necessary elements in the development of dentistry as a profession. It was generally accepted that the quality of patient care must never be sacrificed because of economic considerations.

It is widely accepted that dentistry is a respected healing, helping art and a learned profession that is more than a mere trade or business. An understanding of dental history helps us to appreciate the difference between a business and a profession.8 As professionals, dentists are holders of a public trust and must be accountable to that public both individually and collectively.9 As such, advancement of common social interests is a professional obligation.

Dental Practice as a Business

The interests of the dentist must also be served. One of those interests is economic success. It is intelligent to be concerned about remuneration, and that is a legitimate goal of a professional. Dentists are not expected to be motivated entirely by selfless goals.

By definition, a business can be any form of employment. It can be an occupation, a vocation, a trade, a calling or profession, or any combination thereof. In any such setting, the competencies of modern business, some of which are delineated in other articles in this journal issue, are unquestionably valuable and tend to be neutral from the perspective of ethics. These tools used properly are a means to increased profitability through efficiency, cost containment, and increased productivity without sacrificing the interest of the patient.

There are, however, numerous accepted business practices that are unacceptable, illegal, or frowned upon in dentistry. For example, in business, technical secrets are zealously guarded. Some businesses actively "spy" to acquire such secrets and to gain competitive advantage. Entirely acceptable in that competitive environment is the purchase or licensing of information and/or technology from competing companies. Random solicitation, "cold calling," is another commonplace practice. Finder's fees, actively courting other's clients/customers, and claims of superiority are also commonplace. These practices and others in business are almost universally considered counter-professional in dentistry.

Aggressive advertising, marketing, and solicitation are a hallmark of business. Dentistry banned such practices as early as 1866, and the stated purpose of that ban was concern for the public. It was feared that self-promotion by dentists would mislead patients. There was also a concern that such activities are demeaning to the dental profession. In 1960, dentistry officially declared advertising unacceptable. This ban was in effect until 1979 when despite the profession's argument that advertising reduced dentistry to the level of an ordinary business and put patients at risk, the Federal Trade Commission and the courts influenced the removal of dentistry's traditional prohibition. The FTC in essence declared that all learned professions are trades and subject to regulation as such. Since that time, competitive advertising has proliferated in dentistry. A recent court ruling has put the position of the FTC in jeopardy, perhaps once again distinguishing between the professions and other enterprises in the eyes of the law. Last September, the 9th Circuit Court ruled that regulation of dentist advertising was a benefit to consumers, and encourages rather than discourages competition.

The way dental practices have been promoted in the past two decades has presented an ethical dilemma. Many in the profession still consider advertising a questionable practice. They believe that such activity by dentists could rightly be viewed as an effort to motivate a "sale" and thus have dentistry viewed as a purely commercial enterprise and dental care viewed as a commodity, an article that is bought and sold.

Advertising is intended to create in the mind of the consumer the belief that there is a qualitative difference between the advertiser and others. In spite of clearly spelled out regulations against false and misleading statements in publications, such advertising abounds. Those promotional

pieces that do not violate the regulations are generally punchy one-liners that render meaningless the complex issues about which patients must decide. Dentists are advertising in greater numbers. The result, according to renowned dental ethicist Dr. Clifton O. Dummett, "has been a growing tolerance of unproven claims by enterprising entrepreneurs and an encouragement of invidious comparisons among fellow professionals."

Dentistry and those it serves have benefited greatly by the advances in technology. We do, however, need to be aware of the potential for abuse. The intraoral camera has great educational and diagnostic value. Some dentists use the camera at times more for their own benefit than for that of their patients. Many serviceable restorations can be made to look frighteningly defective to a patient when magnified by a factor of 50 on a T.V. monitor. Computer imaging also has diagnostic and educational value but is abused when patients are influenced to undertake treatment with unattainable goals.

What the impact of information technology on dentistry will be is as yet unclear, but there is no question that it will play an ever-increasing role. E-commerce, the selling of goods and services over the Internet, will undoubtedly have an impact on the business of dentistry. Some dentists are already promoting themselves on Web pages that claim to educate patients. No matter that the prime purpose is the solicitation of patients. The "paperless office" and remote consultation with the transmission of patient X-rays and photographs present a threat to confidentiality. Despite the possibilities for abuse, data management has become a keystone of business success. There is no reason to believe it will have less impact on, or less benefit for, dental practices. We must nonetheless be aware of the potential risks posed by any new technology.

Much dental care is now procured, funded, and administered by business corporations. Third-party involvement in the provision of care has led to ethical quandaries. There is a perception that treatment of patients is determined as much by bureaucratic rules as by doctors' judgment. Proponents of managed care argue that patients get "quality" care for less cost, and more patients can avail themselves of care. In opposition to that, it can be argued that an inherent conflict of interest exists when dentists are paid for patient care whether or not care is delivered. Nevertheless, the motivation behind third-party systems is economic. Cost containment and profit for business entities are essential goals. It is arguable whether the care of the patient is a goal of the same priority.

Conclusion

If teaching ethics to business people is like the purchase of more "lions," then is the teaching of ethics to dentists equally antithetical? In truth, neither is the case. In dentistry, as in business, there is certainly potential for wrongdoing. True, the rules of business are different from those of dentistry,10 but no legitimate enterprise is inherently unethical. The ethics failings in business and in dentistry are purely idiosyncratic, and both disciplines transcend the wrongdoings of the individuals who practice them.

Certainly the ethics challenges faced in various disciplines differ. Whether business people are more influenced by the pursuit of money and power than are dentists is debatable. As dentists, we must recognize that we have a fiduciary responsibility11 and are held to higher standards by virtue of society's trust and by our own established codes. In any event, the teaching of the discipline of ethics12,13 is essential. Ultimately, we all must be measured against the basic universal moral principles. It is those principles that have come down to us through the wisdom of the ages that make up the complex discipline of ethics. Ethics is not simply right behavior. Rather it is the disciplined study of morality, a branch of philosophy called moral philosophy.

When we violate ethics principles, it is because we underestimate the value of doing the right thing. Doing the right thing pays off in the long run. The dentist who uses good business practices but does not put the exigencies of business ahead of patients' interests, benefits over time. Growth of the practice through solid patient referrals, a sound reputation in the community, and greater peace of mind are just some of the rewards. So, in the long run, behaving ethically is good business.

This issue of the Journal is about competencies in the business of dental practice. Arguably the most important competency in dentistry, in business, and in life is ethics. It is ethics that provides a common language that allows humans to interact with mutual understanding. It provides a structure to explain our intuition. Ethics is the systematic study of human conduct examined in the light of moral values and principles.14 Applied professional ethics helps us relate the abstract principles of moral philosophy to practical problems. It is a competency for which we -- as dentists and as humans -- are obligated.

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Fly-by-Night Research

Robert E. Horseman, DDS

Several readers have written in complaining that we devote entirely too many column inches to reporting current research projects. They point out the irrelevancy of mice-cloning and mad-cow statistics to the day-to-day practice of dentistry. When we waste their time with these tedious reports, they assert, we risk obscuring or missing altogether the important work being done on maximizing profits from mass tooth-whitening techniques and the complications arising from reporting routine prophylaxis as four-quadrant scaling and root planing.

They are absolutely right, and we shall cease this expository flapdoodle except when it directly affects us in the wallet, a condition met by today's report. But first, a little research on the research.

Picture this: Austria, 1827 -- Mrs. Shirley Mendel, mother of 5-year-old Gregor, is having the usual hassle mothers have with kids who won't eat their peas but leave them in little rings under the edge of the plate, hoping they won't be noticed.

"Gregor," she says, "if you won't eat the damn things, at least do something useful with them."

So Gregor inserts them up his nasal passages. No, seriously, we all know how young Mendel experiments with pea plants and goes on to found the whole science of genetics by inventing the gene. He could have made a lot more money by inventing the Jolly Green Giant company, but that's another story.

Interest in genetics and inherited characteristics catches on like wildfire, and soon whole teams of scientists are vying with one another to invent new names like ***zygote, gamete, cytoplasm, mitosis, migraine, chromosome*** and ***Kodachrome***.

One thing leads to another, a phenomenon upon which the whole foundation of research is based, and interest shifts from plants to fruit flies. Fruit flies have one big thing going for them -- their life span is only 37 days, so even though they are harder to catch than peas, it is possible to observe a family's span from great-great-grandkids through great-great-grandparents in just a few months. The fruit fly family motto is "So much fruit, so little time!"

Fast forward 100 years and we find researchers still inexplicably fascinated with fruit flies, an interest not reciprocated by the flies, who regard the scientists as Nosy Parkers and wish they would go back to bothering pea plants.

Enter Dr. Stephen L. Helfand, a whimsical chap and senior author of a new study that he says "offers a target for future drug therapies aimed at extending life." The Zero Population Growth people may not agree that extending life is such

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a good idea, citing statistics proving that the SRO sign will have to be put out before long, at least on this planet. This is not the concern of the researchers at the University of Connecticut Health Center who already have a place to stay. They find out that the life span of our old friend the fruit fly can be extended from an average of 37 days to 70 days when -- pay attention -- a gene is modified on a single chromosome.

Some flies who neither smoke nor drink, but exercise daily, live for 110 days. The fun folk there at the university name this mutation the "I'm not dead yet" gene, or INDY for short. Unless you are a Monty Python fan and recognize this line from an old Python movie, this makes no sense at all, but it does indicate that researchers are lightening up and may eventually wear funny hats, use hand buzzers and put whoopee cushions in each others chairs.

In human terms, impatient readers, if this INDY gene could be applied to us, we could double our life span to about 150 years. This means we take out 120-year mortgages and pay off a car in 30 years instead of five. Your great-grandkids come home to live with you, and you might live to see the day when national voting reform goes into effect.

In dental terms, what will a 120-year-old patient want? He will seek out a periodontist willing to fight for every millimeter of alveolar bone he's got left. He will insist on a prosthodontist who makes house calls and distributes denture adhesive samples freely. He won't want any more palaver about cosmetic dentistry, and your chances of selling him a $900 root canal treatment are going to be slim. If you happen to be an endodontist, chances of finding an open canal in a century-old tooth are going to be even slimmer. The fact that he may be in his second childhood is not going to benefit pedodontists at all. Most of all, he is going to want everything at a price no greater than the researchers are charging the fruit flies.

Speaking of which, researcher Helfand reveals that not only do the fruit flies live longer, but they seem to maintain a *higher quality of life*. A higher quality of life -- we're talking flies here. You'll have to use your imagination.

Fly One: Wow! They just doubled my life span!

Fly Two: Yeah, five more weeks! Man, this changes everything!

Helfand explains. "It prolongs active adult life," he says, "and I think it delays the onset of aging." Some fruit flies with the altered gene who normally would have been on assisted care in rest homes are seen out skateboarding, staying up all night, and chasing each other giddily around the fruit compote.

Since it took 134 years from 1866 when Mendel first published until now to achieve this level of knowledge, we hold little hope that this latest discovery is going to affect dentistry significantly in the coming months. However, rest assured, if an opening occurs for volunteers for gene altering at the Connecticut Health Center, we'll let you know when applications are due. In the meantime, watch out for flies that seem to be enjoying themselves more than the occasion calls for.