Mission

The Journal of the American College of Dentists shall identify and place before the Fellows, the profession, and other parties of interest those issues that affect dentistry and oral health. All readers should be challenged by the Journal to remain informed, inquire actively, and participate in the formulation of public policy and personal leadership to advance the purposes and objectives of the College. The Journal is not a political vehicle and does not intentionally promote specific views at the expense of others. The views and opinions expressed herein do not necessarily represent those of the American College of Dentists or its Fellows.

Objectives of the American College of Dentists

The American College of Dentists, in order to promote the highest ideals in health care, advance the standards and efficiency of dentistry, develop good human relations and understanding, and extend the benefits of dental health to the greatest number, declares and adopts the following principles and ideals as ways and means for the attainment of these goals.

A. To urge the extension and improvement of measures for the control and prevention of oral disorders;

B. To encourage qualified persons to consider a career in dentistry so that dental health services will be available to all and to urge broad preparation for such a career at all educational levels;

C. To encourage graduate studies and continuing educational efforts by dentists and auxiliaries;

D. To encourage, stimulate and promote research;

E. To improve the public understanding and appreciation of oral health service and its importance to the optimum health of the patient;

F. To encourage the free exchange of ideas and experiences in the interest of better service to the patient;

G. To cooperate with other groups for the advancement of interprofessional relationships in the interest of the public;

H. To make visible to professional persons the extent of their responsibilities to the community as well as to the field of health service and to urge the acceptance of them;

I. To encourage individuals to further these objectives, and to recognize meritorious achievements and the potentials for contributions to dental science, art, education, literature, human relations or other areas which contribute to human welfare—by conferring Fellowship in the College on those persons properly selected for such honor.
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What Can We Be Sure of In Dentistry?

There is a class of words that pester most of us. Affect the verb or effect the noun. Farther for physical distance; further for conceptual comparisons. The speaker implies and the listener infers. The owl can sit on the roof, unless it is a decoy to scare the pigeons, in which case it is set on the roof. This words are neither synonyms nor homonyms. They are just words that are spelled almost identically and mean nearly the same thing. I believe this whole business was concocted by junior high school teachers to torment adolescents.

There is one set of such terms, however, where the fine shadings of meanings matters to dentistry. I have in mind the trio insure, ensure, and assure. Some dictionaries list these words as synonyms, along with guarantee and secure. Others point out differences of derivation and nuances in use. My Oxford Dictionary of Modern English Usage makes a clear separation between insure and assure and then proceeds to give several examples of common interchangeable usage. For example, one could buy both insurance and assurance policies.

Here's how to make the distinctions: Insure concerns guaranteed compensation in the event of unlikely damage. Ensure concerns effort made to achieve a desired end. Assure concerns evidence given to create confidence. We insure against loss; we ensure for a successful conclusion; and we assure of satisfaction. Insurance is purchased; we work to ensure; and assurance is given.

Let's look first at insurance. Insurance has a long history in all businesses and is generally required by law. I am referring, however, only to worker's compensation, malpractice, and insurance on automobiles.

So-called denial insurance or indemnity coverage is a misnomer. The fact that it is underwritten by firms that also sell life or medical insurance contributes to this confusion. There are six conditions commonly required for insurability. These include: (1) losses being stable across groups (the average loss fluctuates little within identifiable risk-factor segments), (2) losses are unpredictable for individuals, (3) losses are very large for each individual who suffers a loss, (4) risk of loss is relatively homogeneous throughout a group, (5) availability of insurance does not create demand, and (6) payouts for losses are not so frequent that they prevent the accumulation of working reserves.

There are six conditions commonly required for insurability. These include: (1) losses being stable across groups (the average loss fluctuates little within identifiable risk-factor segments), (2) losses are unpredictable for individuals, (3) losses are very large for each individual who suffers a loss, (4) risk of loss is relatively homogeneous throughout a group, (5) availability of insurance does not create demand, and (6) payouts for losses are not so frequent that they prevent the accumulation of working reserves. What is normally referred to as dental insurance satisfies the first of these conditions but fails the other five. Dental disease is anything but unpredictable; virtually everyone has it. The losses associated with dental disease, however, are not catastrophic. Neither is the risk of loss homogeneous throughout the population—approximately 80% of dental carries among children is in 20% of the population. Car and house insurance do not cause automobile accidents, fire, or theft; but there is now substantial evidence that dental benefits do stimulate dental care seeking behavior. Finally, the predictable, regular payout of small amounts of money for dental care make it difficult for insurers to develop appropriate reserves.

What we have come to call dental insurance is now an essential part of oral health care and dentistry. It accounts for approximately forty-five cents of every dollar spent on dental care—forty-five cents that most dentists would unwillingly forego. It is more properly a form of partial prepayment for services widely held to enhance the quality of life. This scheme is so attractive because it allows entities other than patients themselves to subsidize this benefit. This includes employers, the government, unions, and others who recognize that oral health is a transferable private and public good. Another advantage of “dental insurance” is
the ability to purchase these benefits with pre-tax dollars.

To assure means to remove doubt. In the health fields, quality assurance means chart audits and report cards. It is also a way of communicating with patients. Insurance guarantees a compensation in the event that desired results do not occur. Assurance guarantees nothing but relies on the historical weight of averages to promote confidence on the part of those who receive care or those who pay for it. In this sense, CE credits, initial license examination, accreditation, and credential verification are examples of assurance.

Aside from the problems of making inferences from general results to the case of each individual patient, there are two other troublesome features in dental assurance. Quality remains an elusive concept. One of the shortcomings of the quality assurance movement, especially as it relates to third parties, has been the emphasis on assurance at the expense of quality. We tend to measure those things where we can get certainty as opposed to measuring those things that matter most. Finally, assurance can be achieved by misrepresentation. The confidence a patient expresses for his or her dentist may have more to do with salesmanship than professional skill.

My choice would be to ensure oral health. To ensure means to work hard, to work smart, and to work conscientiously towards a result. There is no guarantee that the result will be achieved (there is no word "ensurance"); what is guaranteed, however, is that the best practices will be followed. Isn't that really all that could be asked of a professional?

The ingredients in ensuring oral health care are the best training possible; kept up-to date by continuous learning; modern equipment and materials and a well trained staff; a sincere interest in patients’ welfare; and limiting one’s practice to those procedures where success is virtually certain, while exercising all prudent precautions. Some of the adjunctive activities that supplement the skill, understanding, and ethics of professionalism for ensuring oral health are practice parameters and protocols developed through the collective wisdom of professionals, evidence-based dentistry where the choice of treatments is guided by scientifically grounded literature, outcomes-based dentistry where choice of treatment is guided by systematically collected and analyzed experience in each practice, and TQM, an approach to practice which strives for constant improvement through proven methods.

The American public likes dental insurance and appreciates assurances that our health care system is effective. But what they hold as a right, what they expect and demand, is that dentists will do everything in their power to ensure oral health.

The differences among insurance, ensure, and assurance can be illustrated in the case of “life.” Life insurance (a very bad choice of names if there ever was one) means a compensation will be received when one dies—the only question being how much one will have paid out before it happens. Life assurance is something like a breathing person presenting a birth certificate and a convincing argument that they are the person described on the paper. To ensure life, however, is the real issue. Intelligent action, sound habits, and persistent hard work, all inspired by a reverence for a worthy goal are the marks of ensuring life. These distinctions apply to oral health as well.

—David W. Chambers, EdM, MBA, PhD, FACD

Editor
Dear Sir;
Your Editorial in the Winter 1997, volume 64, number 4, caught my eye while rearranging my bookshelf today, and I sat down to read it again. I do agree with your thesis in general, but beg to take exception to one statement included on page 2.

You wrote that “The demand for services, especially chronic and preventive ones, also exceeded patient’s abilities to pay for them and so indemnity plans were created as a forced savings plan for patients and a mechanism to channel massive amounts of money from union groups, employers, and others into the oral health care system.” It has been my observation during thirty-five years in practice that the indemnity plans were a large part of causing the demand for services to exceed the patients’ abilities to pay for them, and it was not the other way around as you assert.

In the traditional marketing situation in business, a demand exists only when there is both a desire to have a product or service and the ability to pay. The mindset of the general public seems to be that when there is a third party involved, someone else is paying the bills. Nothing could be further from the truth. As was always the case and ever will be, “There ain’t no free lunch!” It’s a shame that our society has managed to hang a shroud on that truth.

Thanks for your good work.

Very truly yours,

Donald A. Morgan, DDS, FACD
Houston, TX

To the Editor,
In David Chambers’ editorial, the Role of Patients in Dental Ethics (Fall, 1997), he discusses the need for three codes of ethics in dentistry: the relationship among dentists; the relationship between dentists and patients; and the relationship between the profession and other entities such as insurance companies and the government. However, as his editorial suggests, the very heart of the dental and other health professions is the relationship between the practitioners and the patients.

Hippocrates, who lived approximately 2500 years ago, is perhaps the first to address this relationship. He establishes certain ethical principles, such as treat patients corresponding to one’s ability, do no harm, avoid violating the law, and keep patient’s communications confidential. Hippocrates also is known for originating aphorisms, those short phrases that teach or instill a moral lesson. With apologies to the ancient Greeks and Romans, I would like to suggest several updated and expanded aphorism on the relationship between practitioners and patients.

Inform Patient—Practitioners should go beyond the legal considerations of informed consent to be certain that their patients undeniably understand a proposed treatment, its possible side effects, and available options. Proactive communication between practitioners and patients is critical before, during, and after treatment.

Use Patient-Specific Protocols—Therapy should be individualized to each patient. Too often, treatment is routinely performed or prescribed without taking into account a patient’s risk factors or a patient’s interest or ability to follow directions.

Weigh Risk versus Benefit—This combines the needs of informed consent and the original principle of “do no harm.” Since many therapies in modern medicine have side effects, the potential harm must now be considered in relation to the benefits.

Adjust Patient Expectations—There are many conditions in which care will not cure, or will only partially cure, a problem. Such situations must be communicated to the patient and acceptance of the probable outcome should be understood before treatment begins.

Follow Established Procedures—Diversity in the treatment of dental/medical conditions can produce large differences in outcomes among practitioners. Procedures agreed upon by experts in specific health care domains produce more uniform and higher quality health care.

Assess outcomes—Some form of objective assessment of treatment results will go a long way to improve a practitioner’s health care delivery.

If You Don’t Know, Don’t Do—Two different concepts are addressed in this phrase. First, since many conditions spontaneously improve without treatment, one should be conservative about initiating therapy. Second, the original tenet of “treat patients corresponding to one’s ability” applies here.

Treat Chief Complaint—This is a variation of proactive communication and treating with the consent of the patient. The principal complaint always needs to be addressed.
Evaluate Previous Treatment—The success or lack of success of previous treatment for the same condition is a good indicator of how successful retreatment will be. If this is the first time such treatment is being attempted, initial therapy should be evaluated to allow for mid-course corrections.

Respect All Patients—this goes beyond the original principle of practitioner-patient confidentiality by adding the notions that every patient should be treated politely and compassionately and that no patient should be denied treatment for financial reasons.

Sincerely yours,

Norman Tinanoff, DDS, MS, FACD
Farmington, CT

Dear Dave,

It was a pleasure to read your Editorial in the Spring issue of the JACD. A consequent sequel to the material presented, naturally leads one to consider possible means of evaluating the safety, efficacy, and appropriateness of procedures done for patients.

Certainly the results of continuing education for renewal of a dental license falls short of its intent. There is no way to determine if a licensee has understood the material nor is there a means of knowing whether the knowledge that might have been gained will be implemented. Furthermore, the person with the microphone is rarely challenged when presenting inaccurate information.

The obvious means of maintaining and increasing the quality of patient care revolves about periodic and continuing competency evaluation of practitioners by responsible parties. Several years ago, the American Association of Dental Examiners approved a document that presented many different techniques for evaluating the pertinent knowledge of a dentist and reasonable consideration by the dentist of valid alternatives for patient care.

To date, no licensing jurisdiction has availed itself of the proposals encompassed in that document, mostly because of the costs involved in implementation and the perceived threat of those who are already licensed and would be evaluated.

Dentists are people who take care of people. Shouldn’t verification of optimums in that regard be the ultimate objective of our relicensure process? After all, airline transport pilots are re-evaluated semi-annually. Should we be less responsible to our patients than pilots are to their passengers?

Kindest personal regards,

Don-N. Brotman, DDS, FACD
Baltimore, MD

Editor’s Note: The Winter 1997 issue of the Journal of the American College of Dentists contains a paper by Drs. Carlson and Kalkwarf presenting the AADE’s development of alternative continued competency evaluation.

Dear Sir;

Thank you for your editorial in the Spring issue of the Journal of the American College of Dentists, “Double Standard in Professional Development.” I enjoyed the five contrasts you drew between the products and the knowledge used in dental practice. I agree with your conclusion that “What is needed are individual standards for the safe and effective treatment of patients and collective standards for product and knowledge…”

Such standards differ from the criteria used to accept articles for publication in today’s dental journals, but such standards do already exist elsewhere.

The medical profession seems, in my opinion, to be far ahead of dentistry in the development and use of these standards. The evidence-based medicine movement has led to the publication of standards for the safe and effective treatment of patients designed for the specific use of the individual practitioner. A “Users’ Guide to the Medical Literature” appears occasionally in JAMA and is published on-line at http://hiru.mcmaster.ca/ebm/userguid.htm. The movement also has led to a few journals (such as ACP Journal Club and Evidence-Based Medicine) targeting the practitioner with articles selected only because they meet the published standards. I am unaware of any dental publication that consistently applies such a filter.

Dentistry could benefit from a periodical filtered according to these already-published standards. Such a publication would be a slim, but useful guide to the clinician’s evaluation of both dental products and dental knowledge. In this era of information overload, who in clinical practice would not welcome a slim journal containing a high clinical yield?

Sincerely yours,

S. Thomas Deahl, II, DMD, PhD
Edwardsville, IL
Total Quality Management in Dentistry

TQM: The Essential Concepts

David W. Chambers, EdM, MDA, PhD, FACD

Abstract
This is an introduction to the major concepts in total quality management, a loose collection of management approaches that focus on continuous improvement of processes, guided by routine data collection and adjustment of the processes. Customer focus and involvement of all members of an organization are also characteristics commonly found in TQM. The seventy-five-year history of the movement is sketched from its beginnings in statistical work on quality assurance through the many improvements and redefinitions added by American and Japanese thinkers. Essential concepts covered include: control cycles, focus on the process rather than the defects, the GEAR model, importance of the customer, upstream quality, just-in-time, kaizen, and service quality.

Management fads like re-engineering, emotional intelligence, and empowerment lasts only a few years—just long enough for all who are interested to read the books. Movements, or major ways of looking at the whole field such as scientific management, social relations, or quantitative approaches, tend to have a twenty to twenty-five year cycle. There is also a special class of management theories that we just can’t shake. Maslow’s hierarchy of needs and MBO have been with us half a century; never fully implemented—always present in one form or another.

Another example of this category is the quality movement. With roots tracing back sixty or more years, quality constantly reinvents itself, assuming new forms and promoting new heroes. Each generation has added something to the quality movement; it is something like a stew.

The complex character of quality gives it vigor but also confounds precise definition. We are not even certain what to call it. For 1998, the most serviceable term is probably total quality management (TQM). The essential components of TQM include (1) a comprehensive and integrated approach, (2) being customer driven, (3) disciplined control of both work design and work practices based on constant measurement which is understood by all employees, and (4) continuous improvement—good enough just never is.

Sometimes one encounters the abbreviation QC. This stands for quality control, that part of TQM where measurement and statistical methods are used to ensure uniformity of results. QA (quality assurance) is part of QC. Another frequently heard term is continuous quality improvement (CQI or sometimes the Japanese term kaizen) when the emphasis is on always doing better. The current preference for TQM as a label for the quality movement stresses the “T” to show that it is everyone’s job and the “M” to emphasis a comprehensive and integrated approach.

TQM in America
The development of TQM has been a joint venture between the United States and Japan, with the U.S. taking the lead in the early years of research and the Japanese excelling later, bringing these ideas into practical industrial applications.

The origins of the quality movement are normally traced to the 1930s and a statistician working at Bell Laboratories named W.A. Shewhart (1931)—although the first book on the topic appeared nine years earlier (Radford, 1922). Shewhart was interested in the pattern of errors in the manufacturing process. It wasn’t enough to find and correct the defects, he also wanted to know which defects where most likely to occur and what could be done to prevent them. He conceptualized a simple model of SDCA—standards-do-check-act. By repeating this cycle, it is possible to drive down the number of surprises and rejects in any system. This is known as a control cycle because product improvement comes from increased likelihood that each product will be exactly as planned. Early in the Second World War, the War Department began working with Bell Labs to...
The complex character of quality gives it vigor but also confounds precise definition.

as the first strong proponent of the notion that quality is defined by the customer. He has continued to write into the 1980s and '90s, and his works are perhaps the most accessible to the serious American student of quality (Juran, 1988a, 1988b, 1989).

The best known name in quality is W. Edwards Deming (Aguayo, 1990; Gitlow & Gitlow, 1987). This may be a historical accident attributed to the Japanese naming a prize in his honor. His own writings are very loosely structured and sometimes dogmatic (Deming, 1950, 1972, 1975, 1976, 1982, 1986). For example, he showed that all production systems, including those that are under control, have variance. This means that a certain number of errors are inherent in any system. He dramatized this in his famous "red bead experiment." A number of red beads are added to white ones in proportion to the variance in a production system. Executives and engineers responsible for this system are invited to fill a scoop with a predetermined number of beads. The process continues until inevitably one of the scoops contains enough red beads to show that the operation is defective. In mock sternness, Deming would berate the luckless executive in whose hands the scoop happened to be at the moment. Then he would explain his belief that employees should not be criticized for discovering the design errors in production systems.

Deming also argued for a salary cap on executives, one pegged as a multiple of the lowest paid individual in the firm. Management principles such as these have not been popular in the United States for the first forty years following the Second World War, and they are by no means widely accepted today. This helps to explain Deming's greater popularity in Japan and his more recent rediscovery here.

Another early American contributor to quality was Phillip Crosby (1979, 1984). For many years he was director of quality at ITT, and later, like Juran and Deming, opened his own consulting organization. Crosby downplayed the statistical foundations of quality and popularized quality as a management philosophy. He was the first to drive home the paradoxical notion that good quality costs less to produce and maintain than does poor quality. But in characteristic Crosby style, he exaggerated this point in his well known book Quality is Free. He also oversimplified the statistical notions of variance and their impact on the shipment of defectives or the improvement of manufacturing processes. His alternative was the notion of "zero defects." He defined quality as conformance with specifications (revealing his engineering background) and stressed programs and slogans. Today, his quality assurance approach—if it works, it's good enough—is considered superficial.

The most significant contribution in the early part of the quality movement was to use statistical patterns to identify the causes of poor quality. The old model was to inspect the output of a process and improve its average quality by finding the defects and destroying or reworking them. In the TQM model, defects are signals that point to parts of the process that must be improved so that quality is the result of fewer defects being produced.

TQM in Japan

The story of how the quality movement came to Japan and how it revolutionized that country's economy has been told repeatedly, from both the American point of view (Garvin, 1988; Juran, 1989; Gitlow & Gitlow, 1987) as well as from the Japanese perspective (Ealey, 1994; Ishikawa, 1985). Following the Second World War, the Japanese economy was in a shambles, particularly its infrastructure. The U.S. Army, assisting in the reconstruction, took a particular interest in the telephone system in Japan and brought over experts from Bell Laboratories, including Drs. Juran and Deming and Armand Feigenbaum (1983).

Western versions of the success of quality in Japan stress social and cultural values such as patriotic pride in workmanship, company loyalty, and cultural hegemony. Japanese writers on the subject acknowledge these forces but also point to the practical power of an impoverished economy. In the late 1940s and for years to follow, Japan could not afford defects, or even afford to correct them—they had to get the process right from the beginning. With no powerful industrial interests and little functioning capacity, it was an opportune time to create meaningful, country-wide industrial standards. There were neither the resources nor the time for comprehensive and sophisticated product development testing, so new engineering methods were developed to bring products online faster. And there wasn't enough money
to buy training manuals for all workers on the shop floor. This lead to buying a single copy to be shared in a group meeting, hence the origin of quality circles.

Fifty years ago in Japan the timing was right for the quality message: use data to find and fix those places in the production process where defectives are detracting the most from value added. But circumstances in Japan have left their own distinct mark on the movement. The "total" part of TQM is a Japanese contribution. In the United States, quality has historically been the territory of specialists in the quality department. In Japan, it is everybody’s business. CEOs are suppose to understand Pareto graphs, control charts, and fishbone diagrams; and so are drill press operators. Japan has also contributed the notion of continuous incremental improvement. In the West, we value "new" and mean by it that a radical change was thought through by a special group who produced something distinct from what preceded it. The Japanese notion of progress involves continual small enhancements, even making this a habit or lifestyle. The impact of everyone in an organization making constant improvements can be very dramatic.

GEAR
A fundamental concept in quality is that processes can be managed through a four part cycle. Sometimes this cycle is abbrevi- ated SDCA (for standardize-do-check-act); sometimes the cycle is called PDCA where the “P” stands for plan and the “S” stands for study. In its most generic form, the four parts are GEAR, as shown in Figure 1 (Glassman & Chambers, 1998).

In the GEAR cycle a goal is agreed upon—either a maintenance standard for a steady state or a planned improvement. Activities are executed with the intent of reaching the goal ("experienced" is a more appropriate word than "executed" when referring to service or education in the TQM model). Next, the impact or outcome of the execution is assessed and compared against the goal. Differences are reconciled in the response phase of the four-part model.

There are six responses which can be taken. (1) The goal can be reconsidered—experience may show that it is inappropriately high or low. (2) The execution can be redesigned. This is the most common response in TQM model because it is usually (but not always) the least expensive in the long run. (3) Sometimes the assessment mechanism is inappropriate because it is too vague, too inconsistent, or even biased. Corrections at this point are referred to as reassessment. (4) Another common alternative is rework—making minor adjustments on individual pieces of work necessary to bring them up to standard but without changing the production process. When TQM is applied in the service economy, this response is called "recovery" (Hart, Heskett, & Sasser, 1990); when applied in education it is called "remediation." (5) The old model of quality was called "inspecting defectives out." The idea is to sample the results and identify those that do not meet standard and rejecting them. This is still one of the alternative responses that must be considered in the GEAR model. (6) The final response is the "hidden treasure" in GEAR. The residual of experience is learning. It is the know how that leads to faster, more accurate, and innovative responses on the next cycle. It is the foundation upon which the learning organization is based (Edvinsson & Malone, 1997; Schön, 1987; Senge, 1990; Stewart, 1997; von Hippel, 1988).

The GEAR cycle is not a term that can be found in the established literature on quality. It is the author's attempt to generalize several similar, but sometimes confused, concepts within the field. For example, many who are familiar with

Figure 1. GEAR Model for Continuous Growth.

<table>
<thead>
<tr>
<th>Goal</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Execution</td>
<td>Assessment</td>
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</table>

Responses:
- Reconsideration of the goal
- Redesign of the execution, experience
- Reassessment

Rework, recovery, remediate
- Reject
- Residual, learning

The most significant contribution in the early part of the quality movement was to use statistical patterns to identify the causes of poor quality.
TQM do not realize that Shewhart’s SDCA model is different from the PDSA model developed by the Deming and the Japanese. The first is called a control cycle; the latter is an innovation cycle.

In TQM, control has a special meaning. The American statistical approach to quality begins by identifying the “normal” variation inherent in each process. Superimposed on the natural variation are the “special” factors that produce excessive numbers of defects. For example, airplane landings normally range from the smooth to the bumpy; pilot or equipment error, often combined with unusual weather circumstances, cause the extreme variations which lead to severely uncomfortable and dangerous landings or worse. Deming and others arbitrarily defined three standard deviations above and three standard deviations below the standard as the boundaries of “normal variation.” (In a normal distribution, approximately 1% of observations fall outside of plus- or minus three standard deviations.) This is the origin of the six sigma standard (6σ) that has become a motto for several quality improvement programs.

The early phases of the quality movement focused on the control process, using the SDCA cycle to drive each process to 6σ—to bring each process “under control.” The impact of gaining control over production processes is enormous, but it is not enough. Markets change constantly and technological innovation is accelerating. Therefore, an innovation cycle is necessary in TQM, where the “P” in the PDSA process denotes a planned improvement or raising of the standard.

Quality control engineers at Hewlett-Packard have developed a useful way of integrating and extending these two quality cycles. The principle is known as “USA,” standing for understand, standardize, and automate. Any innovative process goes through the three life stages where we first struggle to understand the factors influencing the process; then we standardize it using something like the control cycle; and finally we automate it or delegate it to those with lower levels of training. Companies will suffer competitively if they fail to take advantage of the economies of standardization and

Summary of Deming’s Fourteen Points (Deming, 1982).

1. Create constancy of purpose toward improvement of product and service, with the aim to become competitive and to stay in business, and to provide jobs.
2. Adopt the new philosophy. We are in a new economic age. Western management must awaken to the challenge, must learn their responsibilities, and take on leadership for change.
3. Cease dependence on inspection to achieve quality. Eliminate the need for inspection on a mass basis by building quality into the product in the first place.
4. End the practice of awarding business on the basis of price tag. Instead, minimize total cost. Move toward a single supplier for any one item, on a long-term relationship of loyalty and trust.
5. Improve constantly and forever the system of production and service, to improve quality and predicitve, thus constantly decrease costs.
6. Institute training on the job.
7. Institute leadership. The aim of supervision should be to help people and machines and gadgets to do a better job. Supervision of management is in need of overhaul, as well as supervision of production workers.
8. Drive out fear, so that everyone may work effectively for the company.
9. Break down barriers between departments. People in research, design, sales, and production must work as a team, to foresee problems of production and in use that may be encountered with the product or service.
10. Eliminate slogans, exhortations, and targets for the work force asking for zero defects and new levels of productivity. Such exhortations only create adversarial relationships, as the bulk of the causes of low quality and low productivity belong to the system and thus lie beyond the power of the work force.
11a. Eliminate work standards (quotas) on the factory floor. Substitute leadership.
12a. Remove barriers that rob the hourly worker of his right to pride of workmanship. The responsibility of supervisors must be changed from sheer numbers to raising of quality.
12b. Remove barriers that rob people in management and in engineering of their right to pride of workmanship. The means, inter alia, abolishment of the annual or merit rating and of management by objective.
13. Institute a vigorous program of education and self-improvement.
14. Put everybody in the company to work to accomplish the transformation. The transformation is everybody’s job.
Total Quality Management in Dentistry

automation. Similarly, they will suffer competitively if they attempt to standardize those processes they do not understand or to automate or delegate those things which have not been standaredized.

The Importance of the Customer
There are a few writers in the quality movement who focus on the quality of products, but they are rare. It is generally agreed that quality is the privilege of the customer. Juran says "The most effective way to identify customers is to follow the production process—that is, anyone who must try to work with the product or service that you hand off to them.

"Upstream" Quality
The best-known examples of TQM are application of the control cycle of production on the manufacturing shop floor. Some have said that the success of Japanese industry over the past thirty years is attributable to an army of dedicated workers who understand and religiously apply quality control techniques. As important as that may be, another powerful factor is "upstream" quality or control of defects in the production process where defectives are detracting the most from value added.

Use data to find and fix those places in the production process where defectives are detracting the most from value added.

product to see whom it impacts. Anyone who is impacted is a customer" (Juran, 1988, p 18). Deming defines quality in terms of "Surpassing customer needs and expectations throughout the life of the product." According to this view, quality is not a characteristic of products in the abstract or in the ideal circumstances or even at the time they are shipped. Taguchi refers to quality as the loss a product imposes on society after it is shipped (Ealey, 1994).

Of course there are many customers for any product or service. Dentists would immediately think of patients, but there are also those who pay for oral health care, policy makers, and the public at large. It is seldom a problem identifying who the most critical customers are. Using the Pareto Principle (sometimes called the 80:20 rule), we can distinguish the affected many from the critical few. An interesting twist on the notion of customers is introduced by one of the Japanese pioneers in the field. Kaoru Ishikawa (1985) includes any member of one's own organization who is "downstream" in the practice of designing quality in. The quasi-ethical belief that Japanese managers are responsible for the defectives produced by their employees is partially cultural and partially a very profound understanding of the production process. Rapid control in the production process can best be achieved by designing products that are easy to produce because they do not depend on sophisticated equipment, complex processes, or highly trained individuals.

Adding quality "upstream"—also called "off-line quality"—is considerably more cost effective than trying to achieve it during production. Adding quality at the production stage, in turn, is more cost effective than is the approach based on inspection or quality control; and this in turn is still less expensive than correcting mistakes once they have been delivered to the customer" (Gavin, 1988, p. 32).

The name most often associated with the design aspect of quality is Genichi Taguchi (Ealey, 1994; Taguchi, 1992, 1993). Taguchi is a Japanese engineer who has devoted his life to the statistical properties of product development. He defines quality as freedom from economic loss suffered by customers during the normal use of products—sometimes called "robustness." This economic loss function can actually be calculated through marketing research and has been found to take the predictable form of a quadratic equation. As a product (and presumably a service as well) deviates from the optimal design, the loss of value increases at an accelerating rate. If Taguchi is correct, there is no minimum standard of "good enough," there is only "better and better." Taguchi does, however, demonstrate mathematically how to calculate the tolerance value for production quality based as the ratio of the economic loss function to customers and the cost of rework—a concept which is probably intuitively understood by most dentists in practice. Finally, Taguchi is justly famous for his saying "to improve quality, don't measure it." At first this seems counterintuitive. What Taguchi really means is that quality can only be achieved by identifying those factors that control the things customers value most (these are known as "drivers") and then measuring and controlling them (see also Ishikawa, 1985). It is analogous to saying one can't lose weight by buying a scale, but can lose weight by measuring and controlling fat intake and exercise.

JIT
One of the more popular components of quality is just-in-time productivity, also called the "Ohno method" after its founder (Taiichi Ohno) or the "Toyota Production System" (Imai, 1986). JIT means much more than arriving for work one minute before necessary. The basic concept is to reduce waste by pulling work through the production system based on customer demand rather than pushing it through the system based on efficiencies in productivity. JIT rewards people and their processes based on what is delivered and not on what is produced.

In the traditional American system, both suppliers and customers are treated at arms length and often assumed to be adversaries were the gain of one neces-
necessarily means the loss of another. In this system, the smart move is to stockpile raw materials and work in progress, pit one supplier against another in competitive bidding, standardize everything, and compete on price. The producer pushes the market, but this is inefficient because of the warehoused resources and finished product needed to protect against the uncertainties of supplier and consumer behavior.

In the JIT model, suppliers, producers, and customers cooperate to form a smooth chain with as little waste as possible. Producers, often because some of their own employees are working with customers on the design of needed new products, know in a timely fashion what needs to be produced, how much of it will be required, and when it is to be delivered. Similarly, producers have cooperative relations with suppliers who will deliver high-quality raw materials in the quantities needed at precisely the times they are required. This drives down the waste in the entire process, and the resulting economic advantage is shared by suppliers, producers, and customers. In addition to the change of attitude required to implement JIT, computer technology and industry-wide standards and a robust infrastructure are all required to make the system effective.

**Kaizen**

Sometimes the quality movement is presented as an elaboration of statistical procedures. Often it is portrayed as a management philosophy. Of course there are marketing, engineering, and human resources components of quality as well. Yet another aspect of quality comes close to personal discipline or culture. The name for quality when looked at from this perspective is *kaizen*. This is a Japanese term which can be roughly translated as the discipline of continuous improvement (Imai, 1986, 1997). The American phrase "continuous quality improvement (CQI) points in the same direction, but lacks the overtones of personal discipline.

### Malcolm Baldrige Award Criteria for Performance Excellence

<table>
<thead>
<tr>
<th>Category</th>
<th>Points</th>
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<tbody>
<tr>
<td><strong>Leadership</strong></td>
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<tr>
<td>Leadership system</td>
<td>80</td>
</tr>
<tr>
<td>Company responsibility and citizenship</td>
<td>30</td>
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<tr>
<td><strong>Strategic planning</strong></td>
<td>80</td>
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<tr>
<td>Strategy development process</td>
<td>40</td>
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<tr>
<td>Company strategy</td>
<td>40</td>
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<tr>
<td><strong>Customer and market focus</strong></td>
<td>80</td>
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<tr>
<td>Customer and market knowledge</td>
<td>40</td>
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<tr>
<td>Customer satisfaction and relationship</td>
<td>40</td>
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<tr>
<td><strong>Information and analysis</strong></td>
<td>80</td>
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<tr>
<td>Selection, use of information and data</td>
<td>25</td>
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<tr>
<td>Selection, use of comparative information</td>
<td>15</td>
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<tr>
<td>Analysis of company performance</td>
<td>40</td>
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<tr>
<td><strong>Human resource focus</strong></td>
<td>100</td>
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<tr>
<td>Work systems</td>
<td>40</td>
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<tr>
<td>Employee education, training</td>
<td>30</td>
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<tr>
<td>Employee well-being and satisfaction</td>
<td>30</td>
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<tr>
<td><strong>Process management</strong></td>
<td>100</td>
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<tr>
<td>Management of product processes</td>
<td>60</td>
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<tr>
<td>Management of support processes</td>
<td>20</td>
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<tr>
<td>Management of supplier processes</td>
<td>20</td>
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<tr>
<td><strong>Business results</strong></td>
<td>450</td>
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<tr>
<td>Customer satisfaction results</td>
<td>125</td>
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<tr>
<td>Financial and market results</td>
<td>125</td>
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<tr>
<td>Human resource results</td>
<td>50</td>
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<tr>
<td>Supplier and partner results</td>
<td>25</td>
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<tr>
<td>Company-specific results</td>
<td>125</td>
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<tr>
<td><strong>Total</strong></td>
<td>1000</td>
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One of the key elements in *kaizen* is the concept of waste (the Japanese term is *muda*) which means roughly anything which reduced the value added in a production process. Typical examples of waste include overproduction, inventory that is not in use, rework, defectives, superfluous movement, waiting, and moving things unnecessarily. Eliminating waste, in the TQM sense, is more than the traditional time and motion studies popular in America seventy years ago.
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and somewhat popular in dentistry today. Quality looks at degradation of value added from the customer's perspective not efficiency of isolated operations.

A second example of kaizen is the “five Ss of good housekeeping.” The five Ss stand for Japanese words which roughly translate as follows: (1) sort—separate the necessary from the unnecessary in the workplace and eliminate the latter; (2) straighten—put everything essential in order so that it can be easily accessed; (3) scrub—keep everything clean; (4) systematize—make orderliness and cleanliness a routine; (5) standardize—this is a poor translation since the Japanese word (shitsuke) really means to build self discipline.

Other components of kaizen include quality circles, publicly visible charts and graphs of progress, written procedures for all tasks, reports of unsafe practices or conditions, and regularly scheduled meetings for public autopsies of failures, with examples of the actual failures (known as gembutsu in Japanese) physically present.

Service Quality

The vast majority of work on TQM has been in the manufacturing or production segment of the market. There are significant problems in extrapolating the findings there to the service sector of the economy, and to health and education in particular. Nonetheless, some promising work has been done in the field of service quality (Albrecht & Zemke, 1985; Lovelock, 1981).

Service Quality

The vast majority of work on TQM has been in the manufacturing or production segment of the market. There are significant problems in extrapolating the findings there to the service sector of the economy, and to health and education in particular. Nonetheless, some promising work has been done in the field of service quality (Albrecht & Zemke, 1985; Lovelock, 1981).

For example, Zeithaml and her colleagues (1990) have developed and empirically validated a model of service quality based on minimizing the difference between what a customer expects service to be and what they think of the service actually delivered. Their approach uses something like the GEAR cycle to continuously reduce the gap between expected and perceived service. In particular, they urge that a corrective response should be taken if there is a problem at any of the following gaps: (1) are the customers' expectations accurately understood? (2) are there specific standards for meeting customer expectations? (3) do services meet or exceed the established standards? and (4) is accurate information given to customers about the services they receive?

Another development in the service area that closely parallels development in quality, especially JIT, is the blurring of distinctions between customers and employees with regard to service. Now customers are being asked to perform some duties previously reserved for employees—self-service everything and computerized banking are examples. The education of customers and the physical arrangement of service facilities so that customers can effectively perform their functions are also a growing part of service quality.

The Payoff and the Prizes

Arguably, too much credit for Japan's economic success during the past fifty years has been given to TQM. Other factors have been at play and Japan's success in manufacturing has not been copied in every country or across diverse industries. But there is compelling evidence that the careful and correct application of TQM can return handsome results on the corporate bottom line.

Numerous studies of American industry, summarized by Harvard's David Gavin (1988) show that investments in quality positively affect both market share, net profit, and return on investment. The logic is simple and compelling. First, give customers what they want and make it as good or better than expected, and you will have many loyal customers. Second, pushing quality “upstream” decreases the number of defects and decreases the cost of correcting them.

The U.S. government has recognized the importance of quality as a contribution to the national economy by establishing a national prize for quality. Each year the Malcolm Baldrige prize (National Institute of Standards and Technology, 1998) can be awarded to as many as two for-profit companies in the United States in each of the three categories of manufacturing, service, and small business. The criteria for this prestigious award are shown in the side bar. In 1997, the Baldrige award was given to the Dental Products Division of the 3M Company. For the first time, in 1998, the Baldrige competition will be open in two new categories, education and health. The Baldrige award is patterned after the most prestigious international competition in quality, the Deming Prize, sponsored by the Japanese government. A fair number of states and some other countries also have prizes in quality.

Applications in Dentistry

The quality movement has made some progress in the health care field, most notably in hospitals but significantly less so among primary health-care providers such as physicians and dentists. Several of the essentials of TQM are already a natural part of the health care professional habit—the Five Ss of kaizen, the focus on efficiency of process, and choices among the six responses in the GEAR cycle are examples.

On the other hand, there are some characteristics common among dentists that are antithetical to the central concepts in quality. The first obstacle is customer focus. Dentists are “patient-centered.” That means they have a deep-seated service ethic of doing what they believe is best for anyone who will put themselves in the professional care of the dentist. That is quite different from letting the customer define quality. Some dentists place such a high value on per-
sonal control that inviting employees to participate in shared office responsibility for management of care is uncomfortable. Many dentists resemble their counterparts in industry with the inclination to blame the employee holding the defect rather than the one who designed a system that allows defects to occur. The all-too-common preference for replacement work over prevention is inconsistent with “upstream” quality concepts. Current discussions of evidence-based and outcomes-based dentistry (using the GEAR cycle) reveal a lack of enthusiasm among dentists for submitting their personal judgment to any empirical tests—even those of their own devising. Another factor in the reluctance of dentists and physicians to embrace TQM is the historical pattern that they “run their own shops”—suppliers, payers, co-professionals, and others are adversaries or certainly not potential partners.

References


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Profile of TQM in a Dental Practice

Bruce D. Waterman, DMD

Abstract
A private practitioner describes the application of TQM concepts to his practice. Customer focus is illustrated through a survey, teamwork through enhanced communication, process improvement through a flow diagram, and overall quality through graphs showing the effects of handoffs among office staff.

The application of TQM to a dental practice can give the dentist more effective tools to manage, make decisions, and methodically increase quality and profits. There are several major barriers in applying quality concepts to a dental practice:
1. There are few small business examples of TQM. Most examples are large corporations.
2. There are virtually no examples specific to dentistry.

The application of TQM to my practice has been a journey of research and development. I had to examine the basic principles found in large corporations and extrapolate applications to a dental office. What follows in the examples of TQM implementations are just a few samples of these pioneering efforts.

Customer Focus
To become more customer focused, I followed common industry examples and surveyed my customers. I solicited feedback regarding facility, services offered, hours, staffing, comfort, and quality of care. The survey was designed to be confidential or identifiable per patient option. It was mailed and handed out personally to patients in the office. The format allowed for a user-friendly, 10-digit scale ranging from “agree” to “disagree” that is common to many surveys.

Response: The mailed survey had a very limited response. In contrast, surveys handed personally to patients in the office approached a 95% level of participation. Accordingly, we began to emphasize this modality so we could achieve the maximum level of response. Eighty-five percent of the patients chose to put their names on the surveys. The total surveys received was seventy-two over a one-month period of active promotion.

Hours: The survey data revealed that my demographic blend of families and business people wanted early, late, and lunch-hour appointments. Accordingly, we redesigned our hours to include two early days, two late days, and two days that we worked through lunch. This offered a balanced blend for multiple needs.

Financial Arrangements: The survey identified that we were not consistently making financial and insurance calculations and arrangements for treatment recommended at recall visits. Our forms were modified and checks and balances instituted to ensure that this was always done and explained to the patient. Additionally, I am currently revising the administrative team to allow the proper staffing and time needed to execute these vital functions.

Staffing: The survey also confirmed some patient frustration over dental hygiene availability to adults and children. An additional hygienist was added and we expanded dental assistant availability for children. The unforeseen positive effect of these improvements was increased family convenience. For example, a parent, teenager, and child could often be seen within the same hour.

Validation: The survey validated the emphasis given to quality clinical care, gentle techniques, and families.

Next Survey: Consistent with the PDCA (plan-do-check-act) cycle of TQM, one must continuously check and refine plans to really determine if improvements are working. Consequently, I am planning to implement a daily, postcard style of survey to make patient feed-

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back part of our routine, not just a project. Additionally I will use the more extensive survey on a periodic basis.

Data Collection and Problem Diagnosis

Early in my analysis and attempts at applying TQM, I skeptically approached implementing “data collection” as a management tool. My hygienist had noticed that it would often take a while for me to check a patient even though we had a light communicator system. Using the traditional management mentality of impulsive reasoning, we both felt that the cause was that I was too busy at the time of notification. Our consequent speculative solution was to find different ways to interrupt me.

However, instead of the traditional management approach, we decided to “test” TQM and collect data. We documented all circumstances surrounding appointments when there was a time delay in checking patients. It was easy to do, especially since the hygienist was waiting anyway. The results were startling: 80% of the time the delay was because the hygienist’s patient was late! This had thrown off the entire sequencing of the schedule that allowed the best flow of dentistry time. The surprising contrast of our traditional management and TQM diagnosis was a defining moment for me. I began to truly believe in the credibility of TQM effectiveness.

Since our data collection revealed the problem was mainly related to late patients, our solution could be 80% more effective than the traditional management approach. Stated bluntly, traditional management was at least 80% wrong. The initial steps of our solution was to focus on guidelines for late patients. These included modifying their appointments, no radiographs, reappointment as appropriate, etc. Since we knew the real problem, we could find much more effective solutions. Consistent with PDCA cycle, we were PLANNING and DOING in terms of these initial solutions. However, in the CHECK and ACT phase of the PDCA cycle, further refinements were needed to continuously improve our solutions. These refinements are detailed in the next section on teamwork.

Teamwork

The growth of TQM in my practice required a leadership decision to increase hygiene staff as determined by the patient survey data. The consequent new logistics of a dentist having to check more patients was compounded by late arriving patients. To further increase the effectiveness of our solutions and enhance communication between hygienist and dentist, teamwork and participative management were needed.

The traditional management approach to refining the logistics of dentist-hygienist interaction would usually depend totally on the dentist to make management decisions. With TQM, the dentist supplies the leadership to encourage staff to participate in management to diagnose problems, define, refine, and take responsibility for solutions. Subsequently, by using teamwork and encouraging staff input, my dental hygienist suggested we should try Post-it notes as an adjunctive tool in the communication process. Even though we had a light communication system and had guidelines for late patients, the logistics of coordinating two hygienists could be tough. The hygienist would put the Post-it note on the counter by me in the room where I was treating a patient to remind me to check her patient. Fortunately, due to our TQM systems mindset, we discovered the Post-it notes could be used for more than just a reminder. We began to add pertinent treatment concerns, such as “check #16 or patient wants porcelain veneers.” Our guideline was to put anything on the Post-it note that the hygienist wanted me to know before I came into the room. With this increased communication effectiveness, patients are often surprised when I know a summary of any new needs or concerns without even looking in their mouths. I am able to quickly validate these needs and focus on their solutions. From a TQM perspective, teamwork has optimized the system by decreasing wasted time and improving the focus and flow of information. In the CHECK and ACT parts of the PDCA cycle we further refined our system by reducing variability.

Process Improvement & PFD

Dr. Deming found that 85% of problems were caused by the process and
only 15% of the time were people at fault. Unfortunately, people are usually blamed. Blaming employees is contrary to the statistics that delineate the location of the problem. To properly diagnose problems and consequently become six times more effective, you must focus on process improvement. Even though you can preach this to staff and it intuitively makes sense, it is human nature for dentists and staff alike to blame people first and become defensive when a problem occurs. I found I must continuously reiterate to staff process improvement vs. the “blame game” in order to function in the 85% area of effectiveness. A process improvement example in my office not only illustrates its effectiveness but also introduces practical application of a tool of process analysis called a process flow diagram (PFD). We found with emergency patients that there was tremendous variation in patient needs and time required for an appointment. Since the receptionist is in charge of the schedule, this unpredictability often would put her at odds with clinical staff. The “blame game” would occur when we really needed to look at the process. Therefore, using TQM tools, we did the PFD shown in Figure 1 to analyze the system for emergency patients. The result was a reduction from forty-five down to fifteen minutes average in diagnosis time. The original PFD had ten steps (not shown). The new PFD has five that reflect deletion or consolidation of redundant or ineffective steps. The PFD and its analysis yielded eight improvements (in italics on the PFD). These are explained below:

**Phone sheets:** We found that often there was a lot of valuable information given to the receptionist that was not conveyed routinely to the treatment areas. The main format was verbal and often there was not time or opportunity for this. A form was developed that specified needed information that could be easily circled or filled in. Consequently, with better information, we could anticipate needs, know likely treatment setup and time needed, as well as make other scheduling decisions related to this emergency patient. For example, if the patient likely has a TMJ problem, the TMJ handout is given to a patient which starts their education and helps in diagnosis.

**Dental Assistant Notes:** The dental assistant routinely supplements the phone sheet information with subjective information from the patient and records this in the chart.

**Quick Report Summary:** A verbal summary by the dental assistant to the dentist of findings and any health history concerns is an improvement in efficiency. This is similar to a report given at the change of shifts by nurses in hospitals.

**Focused Data:** Such information allows the dentist to quickly determine the problem and not repeat previous data collection steps. These data can be quickly validated.

**Improved Financial System:** Refinement of the system and verification of financial arrangements are performed before treatment is initiated.

**New Referral Form:** I created my own referral form that allows referral to multiple specialists and a summary of needs. For example, a patient may not be able to decide if he or she wants to see an oral surgeon or endodontist. We will attach my referral form to both specialists in order to meet this need. My referral form is also helpful in the situation in which I may use one of several endodontists. Often the endodontist the patient sees is determined by circumstances beyond my control, such as appointment availability, insurance, and office policies. Attaching my referral form to all of theirs covers...
this contingency. Instead of having to fill out all of the specialists' forms, we just fill out mine and attach it to theirs. Of course, the duplicate x-ray is ready because of steps already taken.

It can be seen from the PFD that we made multiple improvements. The PFD took fifteen minutes to draw. Analysis often leads to innovation: the act of drawing the PFD sparked the ideas for the eight improvement mentioned. Dentists should not be intimidated by a PFD; my fourth grader informed me they use them all the time at school. From a TQM perspective, the PFD analysis greatly reduced wasted time and variability by focusing the flow of vital information.

Quality

No discussion of TQM would be complete without an understanding of its middle name. There are multiple definitions of quality, but most of them are very mystical or rhetorical. For example, I have heard that quality is like jazz—you know it when you hear it or see it. In my quest to understand why TQM had increased my practice growth and profits, I developed a retrospective definition of quality. In a dental practice, we need a definition of quality that is tangible, operational, and practical. Quality is meeting or exceeding the internal (dentist and staff) and external (patient) customer requirements throughout the entire patient experience. Based on this definition, the multitude of improvements I made in my practice, such as the examples I have detailed, had a cumulative effect of improving overall quality. The bottom line is often the best measure of the effectiveness of quality initiatives. “Without a margin, there is no mission.” For example, after three years of applying TQM, my office net increased 65%. Subsequent growth has been steady but not quite as dramatic. Often, the next level of growth occurred after TQM analysis revealed limiting factors such as the need to increase and improve staff.

To understand how patients experienced quality as related to the steps of a process, reference Quality Graph 1. When a patient calls and comes to an office, each encounter with staff and dentist can be either positive or negative relative to quality. For example, the experience that our emergency patients encountered before we made improvements is evident. An example of line 3 would be the receptionist pulling the wrong chart, then the dental assistant having the wrong set up, and the dentist being stressed because now everyone is behind and consequently, the chart is returned to the receptionist incomplete. The ultimate goal is to achieve line 1 of high quality. This requires a system that enhances quality and everyone in the organization paying attention to the quality of their steps and the transition to the next step. These transitions are called handoffs. If handoffs are not quality, there is a decline in overall quality and there is the likelihood of an increased number of steps. For example, if the dental assistant gives an incomplete chart to the receptionist, the poor handoffs will result in additional steps for the receptionist. If staff can understand the big picture of quality steps and handoffs, then quality becomes tangible and operational for them. It is very motivating for employees to realize they can have a major impact on quality. I find they must be continuously reminded

The application of TQM to my practice has been a journey of research and development.
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of the “big” picture of steps beyond their areas of operation.

Conclusion
Interpretation and application of TQM principles to a dental practice can be a complex, dynamic, and evolving process. There are no cookbook solutions because all practices and their problems are different. My experience substantiates that TQM is remarkably more effective than the old style of traditional management that I used previously. TQM will never create the perfect practice, but it certainly provides more tools to move one consistently in the direction of continuous improvement.
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The Integration of TQM at Park Dental

Gregory T. Swenson, DDS; Karen A. Kohler, DDS; and Jean L. Lind, RDH, BS

Abstract
The objective of this article is to present real life examples of how one general dental group practice has integrated concepts of total quality management successfully into their practice. The specific steps taken include initial training, development of Personal Action Plans, Pre and Post Schedule Meeting project, Clinical Care Guidelines, a Patient Satisfaction Survey, and Individual Practice Quality Improvement projects.

How do the concepts of total quality management apply to dentistry? That is a question that Park Dental has been actively answering within its organization since 1992. Park Dental has incorporated TQM into its daily operations by focusing on patient satisfaction and preventing problems through process improvements. What the group has proven is that TQM does apply to dentistry, and after over five years of experience, the process has helped Park Dental continue to grow and be a successful dental practice. Bringing the philosophy and concepts of TQM into this dental group practice has been a learning experience that has been both challenging and valuable.

Commitment to Quality
Park Dental is a twenty-seven-location dental group practice in the Minneapolis/St. Paul metropolitan area of Minnesota. Dr. Gregory Swenson and Dr. Brian Murn started the group with a single location in 1971. Early in the group's development, Dr. Swenson formed a personal and professional friendship with Dr. Charles Jerge. Dr. Jerge at that time was working to bring systems thinking into the dental profession through the promotion of quality assurance programs, and the development of a dental accreditation program sponsored by the American Academy of Dental Group Practices. The accreditation process requires a defined program of quality assurance and a willingness to open the practice to external examination. Park Dental became accredited and has had a long-term commitment to the accreditation process now known as the Accreditation Association for Ambulatory Health Care. This commitment created an ongoing quality culture within the organization.

Movement to TQM
Park Dental has maintained a long-term, close relationship with health care organizations in the community. In the late 1970s, as Park Dental was beginning to expand, Dr. Swenson sought outside advice, which led to discussions on quality assurance approaches with physicians at Park Nicollet Medical Center, in particular with Dr. Lawrence Vorlicky and Dr. Paul Batalden. Both of these physicians were quoted in W. Edwards Deming's book Out of the Crisis. They adapted Dr. Deming's fourteen points for medical service. Dr. Batalden also was a member of the advisory committee for the National Demonstration Project. This ex-

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The training was well received since it used everyday examples from the dental practice.

same community as 3M. In retrospect this was a fortuitous choice since 3M recently won the Malcolm Baldrige National Quality Award for their quality achievements (Deming, 1986).

Quality Training
To begin the process of implementing TQM into its organization, Park Dental sent a dentist leadership group and a group of facilitators to a week-long training session presented by 3M. The Park Dental facilitators included three long-term team members with clinical, practice management, and customer service experience. All of the essential TQM concepts were then customized with Park Dental examples for training all of the Park Dental team members. Within a six-month period of time, all team members from Park Dental attended from six to twelve hours of training presented by Park Dental's facilitators. The training was well received since it used everyday examples from the dental practice. New Park Dental team members continue to receive the same orientation to quality concepts. This consistency in training gives everyone in the group the same framework and basic understanding of the quality objectives of Park Dental.

Initial Steps
Following the initial training, each team member participated in developing Personal Action Plans within their individual team at their practice location. The objective of this project was to demonstrate that quality starts with teamwork. Teams in dentistry are an ideal size to work together on quality improvements and team interaction. The Personal Action Plans were documented in a format developed by 3M for each person to assess his or her "internal customers." This included defining who these customers are and what they need from that individual personally. Each person was asked to develop a Personal Action Plan to improve in one area over the following month. For example, a dental assistant might work to more consistently set up the correct instruments and supplies for each procedure or a dentist might work to complete hygiene exams on a more timely basis.

The outcome of this initial project was positive. It quickly included everyone within the organization in taking quality improvement steps. The meetings and discussions helped to increase the level of team interaction and cooperation. The Personal Action Plans also gave everyone concrete results personally on a daily basis so they could see the benefits of TQM.

Demonstration Projects
During the same period of time that the Personal Action Plans were being developed, Park Dental planned and initiated two large demonstration projects. It was considered very important to choose an area for improvement which would have a significant impact on the organization as a whole, and to choose a project with which success would be achievable to illustrate how valuable the TQM process could be to everyone.

The management team at Park Dental met to propose project ideas. Quality at Park Dental was broken down into two major categories; clinical quality and patient service quality. The group decided to choose one demonstration project in each category.

The first project chosen in the patient service area was the development of a Pre and Post Schedule Meeting process. The original idea for a quality improvement project was to achieve a more productive schedule. Patients are more satisfied with organized, on-time appointments and minimal delays. A cross-functional team was developed consisting of dentists, scheduling managers, dental assistants, and dental hygienists. The group met and used techniques such as process mapping and brainstorming to better define their task. The group determined that the greatest barriers to a smooth, productive schedule were communication problems and not being prepared for the day. To solve these problems they worked on developing a process for the dental teams to use to meet prior to their schedule each day. It was proposed that this would alleviate communication problems, eliminate "surprises" from the day, and lead to more productive schedules.

It was at this point that the team found its first major hurdle: how to measure the outcomes of the project? Finding suitable measurements has been a challenge for Park Dental. Unlike manufacturing businesses, dentistry does not have a strong history of statistical analysis. Useful and appropriate measurements are necessary for quality improve-
ment. To solve this problem for the Pre and Post Schedule Meeting project, the group developed a survey evaluation for the team members. The survey was distributed prior to implementing the new process and also as a follow-up to compare satisfaction ratings. The premise was that if the new Pre and Post Schedule Meeting process was successful, team members would be happier with their day due to better communication and preparation. An important outcome of this project was that patients had a more positive experience with their appointments because the schedule ran more smoothly.

The second demonstration project focused on dental care quality. At the time, health care groups in Minnesota were beginning to develop clinical care guidelines. A group of dentists at Park Dental gathered as a “think-tank” to propose topic ideas for new dental care guidelines. At Park Dental, this project was a continuum of the development of Accountability Guides, which they had completed in the mid-1970s. The parameters for the new guidelines included (1) an area of significant impact on the practice and (2) an area where there was a difference in decision making within the practice from dentist to dentist. The group decided on eleven topics for the development of dental care guidelines. Examples included “management of third molars,” “management of complex restoration of a single tooth,” and the “recall interval.”

The most important factor in the success of this quality improvement project was the commitment of the dentists involved. The most accurate and efficient measurements are acquired through the use of computer systems. Individual patient record audits are impractical for measuring every patient case seen within the practice. To really determine if the guideline was followed and successful, most of the dental care guidelines required a measurement correlating diagnosis to treatment rendered. In the medical field this is a common measure, but in dentistry there has not been a history of using diagnostic codes. Park Dental completed research into available diagnostic codes. The group looks forward to a time in the future when the dental profession agrees on a standard set of dental diagnostic codes. In the interim, measurements through Park Dental’s Comdent computer system were devised. For example, the Recall Interval Dental Care Guideline is being measured by correlating the computer information regarding the recommended recall interval and the patient’s periodontal classification.

The development of the dental care guidelines was a successful project for all dentists in Park Dental and an external review by dentists who were recognized experts in the respective fields. As the dental care guidelines came to completion after a nine to twelve month development period, the groups began to look at how to measure them. Again the measurement issue became a problem.

The most accurate and efficient measurements are acquired through the use of computer systems. Individual patient record audits are impractical for measuring every patient case seen within the practice. To really determine if the guideline was followed and successful, most of the dental care guidelines required a measurement correlating diagnosis to treatment rendered. In the medical field this is a common measure, but in dentistry there has not been a history of using diagnostic codes. Park Dental completed research into available diagnostic codes. The group looks forward to a time in the future when the dental profession agrees on a standard set of dental diagnostic codes. In the interim, measurements through Park Dental’s Comdent computer system were devised. For example, the Recall Interval Dental Care Guideline is being measured by correlating the computer information regarding the recommended recall interval and the patient’s periodontal classification.

The development of the dental care guidelines was a successful project for Park Dental for a number of reasons. First of all, it brought the dentists together to discuss dental care decision-making in a planned and objective way. With the dentist involvement in the development and review process, consensus was easily achieved by the time the guidelines were completed. The project helped bring consistency to the manner in which dental care was being provided within Park Dental from practice location. Nearly all of the dentists within Park Dental participated in developing a guideline and therefore also learned first hand the quality improvement process.

**Minnesota Quality Award**

Following the success of the demonstration projects, Park Dental decided to apply for the Minnesota Quality Award in a pilot health care category during 1995. This award is patterned after the national Malcolm Baldrige Award. Historically the participants in the award process were from industrial manufacturing companies. During 1995, the Award Committee wanted to investigate how quality improvement criteria fit into different business sectors such as education, nonprofit organizations, and health care. Park Dental was excited to submit an application as a learning process and a way of evaluating their progress in implementing TQM within the group.

A major benefit of taking part in the pilot category for the Minnesota Quality Award was that each applicant received a site visit by trained examiners. For these days, a group of seven examiners spent time within Park Dental evaluating all aspects of the practice and how they demonstrated the integration of TQM within the organization.

The examiners provided written and verbal feedback to Park Dental following their visit. Of all the feedback received,
one suggestion stood out. The examiners suggested that the group have a more quantitative method of surveying patient satisfaction. They felt that this information was essential for the practice in determining future quality improvement efforts. Park Dental had been surveying patients by using various formats for years, but the current survey did not allow for valid statistical analysis.

Patient Satisfaction Survey

Park Dental partnered with Parkside Associates in Chicago, to develop a new patient satisfaction survey instrument for dentistry; (the shared “Park” name is a coincidence). Parkside Associates came highly recommended because of their experience in measuring patient satisfaction in healthcare. Parkside has a strong emphasis on measuring satisfaction for quality improvement objectives. Park Dental and Parkside Associates partnered to develop the new dental survey during 1996 and spent considerable resources in both time and money.

The first set of surveys was mailed in July 1996 to 5400 Park Dental patients. The results were formatted by practices based on a Park Dental norm. In 1997, Parkside Associates validated the completed Dental Patient Satisfaction Survey by conducting a national study involving over thirty dental groups. With the addition of the study data, the survey results can now be used to benchmark against a national norm. The questions on the survey have also been weighted based on how important they are in determining patient satisfaction. These weighted scores helped Park Dental focus improvement efforts on the areas most important to patients.

Patient Satisfaction Surveys are mailed to Park Dental patients weekly for ten weeks out of each quarter. The survey results are tabulated by Parkside Associates into a report format by practice location. The dentists and practice managers review the results and share the information with their team members. This sharing of information began with the initial survey results. Each question and score is carefully reviewed so that everyone within the practice takes ownership in the process and future results.

Practice Quality Improvement Projects

Each of the Park Dental practices is asked to develop a quality improvement project of its own. This step occurred after the initial completion of the large demonstration projects and continues today. The practices are asked to select a topic to focus on for improvement, and one that will help improve service to their patients. Initial projects tended to be very simple processes that were reviewed and improved. Appropriate measurements for the projects were again a problem. With the implementation of the Patient Satisfaction Survey this problem was solved. The survey not only offered measurements, it helped direct the practices to appropriate improvement project ideas.

Standardization of the process for giving patients post-op instructions for each procedure is one example of a project completed at a Park Dental practice. Other projects included improving the process for handling patient emergency calls, the process for making patient care calls, and the process for transferring care to another dentist.

Steering Group

The Park Dental management team formed a steering group early on to oversee efforts in the implementation of TQM. This group consists of a cross-functional team representing all areas within the organization. The main focus of the steering group is service quality. The group approves new projects proposed by the practices, reviews quality improvement projects in process, and helps select organization-wide projects for Park Dental. Another group of dentists focuses on the dental care quality issues.

Supplier Partnering

Partnering with suppliers is one of the principles of TQM. Park Dental has two main types of suppliers, dental laboratory services and dental supplies. Park Dental has worked to partner with both. Dentists and laboratory technicians meet regularly to improve communication, with the objective of improving the laboratory product. Park Dental also partners with their dental suppliers. A group consisting of a dentist, dental assistant, facilities manager, and equipment service technicians meets monthly. The group’s mission is to improve communication and to improve the quality and costs associated with equipment maintenance and repairs.

Quality’s Role in Park Dental’s Future

A strong leadership commitment to quality and desire for continued learning led Park Dental to TQM. Park Dental continues to incorporate quality improvement into its strategic plan. Park Dental is committed to providing patients with the best possible service. The concepts of total quality management fit well with Park Dental’s existing quality culture and professional quest for excellence.

References


Delivering the Promise Through Quality Processes: A Summary of 3M Dental’s Malcolm Baldridge National Quality Award Application

Abstract
3M Dental Products Division’s Baldrige application is grounded in a ten-year process of continuous improvement in the basic business principles of customer commitment, innovation and reliability, and sensitivity to employees and the community. The application is summarized in the seven standards of the Baldrige program.

In 1997, the Dental Products Division of 3M Company received the Malcolm Baldrige National Quality Award, an ongoing national quality program sponsored by the United States Department of Commerce. The Malcolm Baldrige National Quality Award honors U.S. companies that demonstrate extraordinary commitment to quality and excellence in a wide variety of business functions—including a company’s leadership role, its strategic planning, information and processes management, and how the company relates to its own employees, customers, and markets.

A Decade of Building the Foundation
We exist for the customer. This realization was first recognized early in the 1990s and has grown to become a leading idea in our drive toward quality. Other historical foundations upon which we built were the 3M tradition of product innovation, dedicated employees, customer interaction, industry citizenship, and product safety. Our Vision 2005 statement is: To become THE supplier of choice to global dental professional markets, providing world class quality and innovative products.

Customer commitment. In the United States, virtually every dentist—an estimated 98%—uses one or more 3M Dental products. Within the European market, use of one or more 3M Dental products is estimated at 85%. 3M Dental is making strong headway in the 3M Emerging Markets, which includes several third-world and South American countries.

The key to the quality improvement process. In 1990, realizing the need to better focus on the customer, 3M established “Q90s,” an umbrella term describing the company’s “uncompromising commitment to customer satisfaction.” Of course, to make Q90s a reality meant action within 3M divisions—first, to identify strengths and areas for improvement; then to develop and implement plans that would focus on meeting customer requirements.

As Q90s evolved, so did our commitment to numerous processes that management established to accomplish goals. At the same time, recognizing how the Malcolm Baldrige National Quality Award processes mirrored our own, it became a natural succession to set one more goal: To strive for world-class quality—which is the nucleus of the Baldrige program—from an outside perspective and to be a recipient of the Malcolm Baldrige National Quality Award.

Innovation and reliability. The 3M Company is known throughout the world as a leader in innovation and is admired for its extraordinary ability to take already existing technologies and materials used by one area and apply this expertise to new products and markets—which is how 3M got into the dental products business.

3M Dental was created in 1964 with the introduction of 3MTM AddentTM...
Anterior Restorative, the first commercial resin composite dental restorative. This product combined two 3M technologies—polymers and ceramics—and launched a new era in dental product manufacturing that would emphasize improved esthetics and healthier, stronger restored teeth.

**Dedicated employees.** Absolutely nothing is possible without dedicated employees. About five hundred people work for 3M Dental, located at either division headquarters in St. Paul, Minnesota, at our manufacturing plant in Irvine, California, or at sales offices throughout the world. Our current image campaign tag line summarizes how we, as employees, view ourselves: The people behind the products behind your practice.

**Customer interaction.** Listening to customers is an essential function for every 3M Dental employee. The company collects information about current and potential customers through a wide variety of processes—surveys, simulated operatories, clinical studies, customer service personnel, sales representatives in each major market and hosting annual conferences and symposiums that bring 3M Dental employees face-to-face with all sorts of customer groups.

**Industry citizenship.** 3M Dental strives to go beyond quality products and customer satisfaction by contributing to a wide variety of programs that advance the dental profession. In 1991, 3M Dental became the founding industrial partner with the University of Minnesota, donating $1.2 million to establish a research center. In 1994, the company provided funding to establish a preventive dentistry unit, part of the 250-bed Shanghai (China) Children's Medical Center.

Furthermore, since 1992, 3M Dental has taken a leadership role in Oral Health 2000, the largest preventive oral health initiative ever undertaken in the world. And, donations to organizations that exist to improve oral health, mostly with the poor and needy, exceed $50,000 annually.

**Product safety.** 3M Dental has won numerous domestic and international awards for our environmental and energy-saving programs and initiatives. In 1991, 3M Dental received ISO 9001 certification; in 1996, our Irvine plant was the first manufacturing facility of a U.S.-based corporation to receive the ISO 14001 certification.

**Responding to the Baldrige Standards**

The Baldrige quality award is judged against a predetermined, weighted set of seven standards. These are summarized in the introductory article to TQM in this journal. What follows is a highly condensed summary of the 3M Dental Baldridge application, mentioning the key features in each of the award categories.

1.0 Leadership.

Our Steering Committee, which includes our division vice president, six functional directors and managers, our human resources manager, and controller, creates and maintains 3M Dental’s Vision, Values, and Quality Policy, as well as sets financial and operational goals. 3M Dental’s leaders keep one word in mind with each and every decision made: THE—the most important word in 3M Dental’s Vision 2005: To become THE supplier of choice…”

3M Dental’s key processes for incorporating its Vision, Values, Quality Policy, as well as direction, customer focus, high performance objectives, and continuous learning into the company’s leadership system includes: (1) The Strategic Planning Process, (2) Business Process Management Matrix, (3) Functional and operational reviews, (4) Teaming approach, and (5) Employee Contribution and Development Plan.

1.1 Business conduct leadership. 3M Dental aligns public responsibilities with performance improvement efforts through our Strategic Planning Process. Senior management has identified key individuals throughout the company who work with regulatory agencies and various governmental entities to assure compliance and respect for the social and physical environment. Regardless of the situation, 3M Dental always strives to exceed expectations relative to business environment and ethical conduct.

1.2 Community leadership. 3M Dental’s leadership and management promote, support, and recognize employees who volunteer for state and local service. In all, executives and employees give over three hundred presentations annually outside the company.

2.0 Strategic Planning

2.1 The Strategic Planning Process. The 3M Dental Strategic Planning Process is critical to our business. It’s what aligns and drives all the steps toward the deployment of virtually every company action. The Strategic Planning Process: (1) pulls together vast amounts of data and information for analysis, (2) determines priorities, (3) defines approaches, (4) assigns responsibilities, (5) allocates resources, and (6) aligns activities toward 3M Dental’s vision.

This plan is ten years in vision, with detailed information covering the following five years. Each year, 3M Dental develops specific strategies, goals, and business plans during our annual Strategic Planning Process—a process cited as a “best practice” by Fortune Magazine in its March 1995 issue.

Business units plans. The major business units of the company use a variety of data and information to identify strategies, goals, objectives, and priorities. The business units receive input from numerous sources, ranging from various global planning sessions to surveys, market research, and complaints analysis. Each
One global plan. All regional and business unit planning sessions culminate in one Global Strategic Planning session, with about ninety U.S. and sixty global employees participating. The output from this session is the recommended 3M Dental Strategic Plan, which the Steering Committee reviews and approves. It's the foundation for all functional and operational action plans that will take place throughout the world, having had received input from virtually every marketplace 3M Dental reaches.

2.2 Strategy action process. Translating strategy into action plans is one of the most critical parts of the Strategic Planning Process. Following the global planning session, the Steering Committee translates the plan so as to align it with our business drivers and goals, taking into consideration such aspects as human resource requirements, program priorities, key assumptions, and risks.

Business drivers, goals, and success factors. 3M Dental’s business drivers are the aspects that make the company operate, including its employees, value-added products, and services and reliability. The company’s goals and success factors include: (1) financial, (2) customer satisfaction, (3) dentist focus, (4) products that deliver common benefits, (5) reliable products and services, and (6) 3M Emerging Markets focus.

Deployment. Assigning responsibilities to accomplish all plan goals is accomplished by way of the Employee Contribution and Development Plan process. Furthermore, the company puts its Business Process Management Matrix to work, establishing measurement needs to gauge the success of all plans.

Employee responsibilities. Human resource planning is integrated as an extension of the Strategic Planning Process. In addition, data from such sources as employee satisfaction surveys and benchmarking are gathered to determine how work loads should be organized and what skills are needed to support goals and objectives.

3.0 Customer and Market Focus

3.1 Customer and market knowledge. 3M Dental has two segmented customer groups—dentists and channel partners. Both groups have been further segmented, based upon requirements, operating profiles, buying patterns, and geography. U.S. dentists are served by a sales force that devotes about 70% of its time to nurturing dentist relationships and by the U.S. marketing, sales, and services organizations at 3M’s headquarters. Dentists outside the U.S. are served by the 3M subsidiaries with the support of the headquarters-based marketing organization.

Listening to the customer. We are forever evaluating ways to improve upon our approach to listening and learning from customers, and we believe we do this better than any other company in the dental industry. Our means of listening and learning includes feedback gained from the Strategic Planning Process, tracking buying patterns, focus groups, survey results, simulated operatory settings, our Key Influencer Program, customer comment cards, and “Innovation” themes (e.g., “Reliability” and “Innovation” themes) to establish a respectful presence within the marketplace.

Customer relations. In the U.S., almost every dentist uses some 3M Dental product; in Europe, this will be true within the near future. Therefore, much of the company’s market growth will come from increasing share of profit from each dentist, rather than attracting new customers (with the exception of 3M Emerging Markets).

We have established a customer relationship management process that assures easy effective, efficient, and pleasurable contact for customers. Considering that we receive over 100,000 telephonic customer-initiated contacts per year, it
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goes without saying how important it is to truly listen to each customer.

With respect to complaints, company policy requires that all product quality issues are addressed without question. Products are replaced immediately. 3M Dental maintains a complaint database, which provides efficient data management to develop charts, indices, and special query options.

In the area of one-on-one contact, U.S. field sales representatives summarize their observations about the market via letters that provide a timely mosaic of customers' activities and requirements. These letters are circulated to over one hundred company employees worldwide. Sales, Irvine Customer Service, and 3M Customer Service maintain daily contact with dentists and channel partners to assure needs and expectations are met.

4.0 Information and Analysis

4.1 Company information and data. 3M Dental, leveraging off of successful programs established by 3M Corporate, selects data and information linked to business drivers and goals that: (1) monitor business performance for alignment with strategic plans, (2) identify improvement opportunities, (3) initiate and drive corrective action, and (4) feed back into the Strategic Planning Process.

Customer Information System. One major source of data for our employees is the Customer Information System that contains over 30,000 dentists' names. The database tracks: (1) purchases of 3M Dental and competitive products, (2) contact activity, (3) complaints by market segment, and (4) complaints by dentist.

4.2 Competitive data. 3M Dental uses competitive comparisons and benchmarking to improve operational performance and compare its level of performance to industry and world-class business leaders. Knowledge gained from competitive comparisons and benchmarks supports the Strategic Planning Process and prioritizes projects.

4.3 Company performance analysis and review. 3M Dental developed the Business Process Management Matrix (BPMM) based upon Performance Management, an approach developed ten years ago to quantify an organization's activities and outcomes to support continuous improvement. It's this unique process that we believe sets 3M Dental apart from most businesses. Matrices are constantly monitored and evaluated to gauge the relationship between continuous business improvements and business results.

The process uses a matrix format where scores, on a scale from 1 to 10, are assigned to each outcome and activity, then weighted for comparative importance with other components of the specific index.

3M Dental's BPMM measures the company's performance in all key areas—such as business drivers, goals, functional groups, and the Strategic Business Process—against prior year performance, current year goals, and stretch goals. For example, a score of 1,000 points would indicate all stretch goals were achieved, 700-800 would indicate major goals were accomplished, and 300 points would mean performance equal to the previous year. This major 3M Dental process, which has been refined twelve times since its inception in 1995, has been featured in Performance Management magazine (Winter 1996) as an example of quality excellence.

5.0 Human Resources

5.1 Development and management. Our approach to promoting high performance is centered around encouraging employees to participate in flexible and responsive cross-functional teams (currently about one hundred and fifty). This team approach is enabled by: (1) the comprehensive training and skill development program, (2) a judiciously designed recruiting program, and (3) properly established recognition and compensation programs.

The team approach, which is aligned with company goals, the Strategic Planning Process, and process management techniques, has contributed to 3M Dental doubling its world wide sales in the past seven years with very little change in head count—while simultaneously improving customer and employee satisfaction and reducing cycle time.

3M Employee Contribution and Development Plan (ECDP). Of course, before the team comes the individual. Leveraging its parent processes, 3M Dental uses this corporate asset to align employee and manager goals with division goals. The ECDP, a means of appraising performance, includes sections on business results, team effectiveness, and employee development and is the measuring tool in determining salary increases and promotion decisions.

3M Dental sees rapid improvement and reliable performance when responsi-
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help identify and prioritize well-being and satisfaction activities. Based upon this input, several programs and alternatives have been established corporate-wide that include: (1) flex time, (2) employee assistance and counseling programs, (3) tuition reimbursement for courses assisting employees' growth, and (4) recognition for volunteer activities outside work.

6.0 Process Management

3M Dental believes in processes to react quickly to changing customer requirements, environmental and societal requirements, and technology. Processes allow for consistency, clear communication, thoroughness, and accuracy. Two of the most important processes, the Business Process Management Matrix and the Employee Contribution and Development Plan, have already been described. Others are presented now.

6.1 Product and service. Each phase of 3M Dental's New Product Introduction Checklist process provides a checklist of questions to be answered, activities to be completed and documents to be acquired before moving ahead. This checklist has become a benchmark within 3M and has played a key role in our success in key support processes are designed using the New Process or Service Introduction Checklist.

6.2 Management support. Information used to define key requirements for support processes is gathered through such avenues as surveys of internal and external customer requirements, benchmarking and comparisons, and knowledge of available technology. Any major changes

Mattrices are constantly monitored and evaluated to gauge the relationship between continuous business improvements and business results.

in key support processes are designed using the New Process or Service Introduction Checklist.

6.3 Supplier management. 3M Dental maintains a Supplier Management Program that covers such issues as maintaining a clear communication of requirements, certifying key suppliers, and providing regular performance feedback to suppliers. As part of this program, 3M developed a measurement process to evaluate supplier performance—a point system that leads a supplier toward certification. Currently, twenty-eight suppliers are certified with another eight in the certification process.

7.0 Results

Our business results are impressive, and we're proud to say that we've earned this success. Through thousands of hours of work on the part of numerous 3M Dental employees throughout the past decade, we've earned a leadership role within the industry as a company that can deliver on its promises, largely due to our methodical, consistent, knowledge-based approach to each and every business decision. Namely, our processes.

7.1 Customer satisfaction. 3M distributors are asked bi-annually how 3M Dental compares to our major competitors on a wide variety of aspects relating to overall satisfaction with 3M products and services. Our channel partners consistently rate 3M Dental as #1 in overall satisfaction.

Dentist results. Dentists are also asked bi-annually to compare 3M Dental to other dental manufacturers regarding overall satisfaction with products and services. In virtually every category polled, dentists who rate 3M as "excellent" is twice what competitors receive for the same rating.

7.2 Financial and market. 3M Dental outperformed its #1 competitor in sales growth from 1992 through 1996. While our major competitor has depended upon acquisitions for a substantial part of their sales growth, 3M Dental's has been the result of new product development, increased share of pocket per dentist, and global market expansion. 3M Dental has doubled its sales in the last ten years, with no change in employee head count.

7.3 Human resources. Keeping employees heavily involved with a wide variety of business functions is key to our overall employee satisfaction. Fortune Magazine has consistently ranked 3M as one of America's finest companies for which to work.

Safety. The single most important internal measurement for 3M Dental is its safety, a function that's been integrated into the company's overall culture. From the perspective of OSHA recordables, 3M Dental actually exceeds DuPont, recognized as a global leader in safety.

7.5 3M Dental-specific. The overwhelming success of our product capability program has contributed to significant waste reductions and reduced factory costs.

Product-specific. Ours are among the highest margin products channel part-
ners stock, in part, due to our ability to improve their inventory turns by shipping products quickly, accurately, and completely. 3M Dental outperforms a national leader in mastering development cycle time efficiency.

The customer. Just as we started our story with emphasizing the importance of responding to our customers, we'll end on the same note. One gauge of acceptable customer service is to monitor response time with customer calls. 3M Dental's response time matches that of Eastman-Kodak, an industry leader in customer service.

Summary
3M Dental is a company that thrives on process—an established plan of attack that's institutionalized and knowledge-based, and that is reviewed and refined when needed. 3M is also customer driven, with many of the processes developed over the past ten years focused on finding out clearly and quickly what our customers need for their own success.

The Malcolm Baldrige National Quality Award is truly a prize—but it is also a process, a structure for ensuring that the highest standards are met. We at 3M Dental offer this story of how we laid the foundation for our application and the highlights of our application itself in hopes of stimulating others in the profession to participate in such processes of quality improvement.
Incorporating Quality Management into Dental Academics: A Case Report

Samuel B. Low, DDS, MS, MEd

Abstract

Financial challenges to dental education and accreditation requirements for outcomes assessment prompted the Florida College of Dentistry to consider CQI (Continuous Quality Improvement) processes. Key concepts in CQI are identified and a case study of its implementation is presented. The program was more successful in the process aspects of patient care (e.g., patient intake) and with staff than with faculty and educational or dental quality aspects.

Managing a college of dentistry is indeed a challenge, and all trends indicate that the "busification" of dental academics will continue into the next decade. Many variables have contributed to this change in culture and most are economic in nature. Financial resources to support dental schools primarily reside in (1) federal and state support, (2) research, (3) patient services, and (4) tuition dollars. By 1990, federal contributions to dental education had been reduced by one-third the amount distributed in 1970. As the federal government began to move the financial responsibility of many social programs to the individual states in the 1980s, states began to bend with this new burden, resulting in decreased support for higher education. To add to the dilemma, federal research grant funding also began to decrease, with colleges of dentistry placing greater emphasis on corporate grantsmanship. It is not surprising that student tuition began to increase, especially in the private schools, to enable the balancing of budgets.

Since 1970, the cost of operating a dental school has accelerated by approximately 8% a year. Several factors have contributed to these increases, such as human resources and overhead. Physical plants constructed in the late '60s and '70s are now showing wear and tear, and therefore maintenance costs continue to increase over time. Added to this financial responsibility is adherence to state and federal guidelines, especially with OSHA regulations of the recent past.

To offset the decreasing traditional revenue streams and increasing expenses, dental schools now place a renewed emphasis on diversification of revenue sources like continuing education, patient services, and endowments. The most effective resource within time constraints is enhancing productivity of all arenas where the predoctoral, postdoctoral, and faculty are providers (Hunt, 1994). However, this requires a level of organization and management that may be feeble at best in these academic environments. Colleges of dentistry may now look to organizational processes used by corporate institutions, including health care facilities.

The TQM Process

Quality management has its roots in the statistical control methods of Deming and Juran. A key objective is to strive for continuous improvement in products and services. Teams are developed from within the organization to determine the issues and to analyze and measure data to determine if the solution resolves the problem. Berwick, using total quality management principles in health care settings, demonstrated that the TQM process can function in hospitals and that...
teams can be formed to remedy definable problems. Moreover, the needs are significant because the cost of poor quality contributes to tremendous loss of revenue (Berwick, 1991). The role of the customer takes on new meaning and customer satisfaction becomes a key priority as the measurement of success. Customers are defined as all internal and external groups involved in the process.

A formula used often in TQM is PDCA—known as Plan-Do-Check-Act. Cross-functional teams meet in structured process environments and use this systems approach to identify priority issues (Adelson, 1997). Plans are implemented, appreciating that measurement will be used to monitor activity and revise the process if necessary for continuous improvement. The practice of dentistry is an organization of individuals, and many TQM concepts are applicable. The principle benefits of implementing these concepts include: (1) increased productivity, (2) loyal patients, (3) improved profitability, (4) practice growth, and (5) enhanced job satisfaction (Ross, 1993).

The past fifteen years has seen the emergence of two additional "quality" concepts: quality/outcomes assessment and quality assurance. Quality assurance programs evolved primarily from the federal government, third party payers, and corporate purchasers of health care. They call for a system of care that is appropriate, available, and accessible. (Guba, 1995). Outcomes assessment is a process included in assurance programs that systematically collects information to compare and contrast establish objectives and develop recommendations to guide improvement (Feldman, 1995). For dental education, formal implementation of outcomes assessment became a reality in 1988 with the adoption by the Commission on Dental Accreditation of a standard requiring each dental school to evaluate, through a formal assessment of outcomes, the degree to which its goals are being met. This change resulted in dental schools scrambling to first understand quality processing and then attempt to implement them in an academic culture often resistant to change.

The CQI Process
Continuous quality improvement has its roots in TQM and is a management philosophy that recognizes that true improvements come from understanding the processes and involving the people (stakeholders) who know those processes the best. It requires a commitment from all players, including the administration, in recognizing that meeting the customer's requirements is critical to success. The process centers around "doing the right things right."

Philip Crosby became a leader in the CQI process in corporate America with his "Four Absolutes of Quality" that guide efforts to operate, manage, and improve the work process. The four absolutes are: (1) Define quality as attention to the price of nonconformance (Crosby, 1979).

This concept is only a process, not a definable end point that can be judged by the organization. When the project to be implemented centers around a product that can be measured, the CQI process fulfills the objectives. As an example, through measurement analysis, we find that 80% of problems are caused by 20% of the activity, thus the "80/20 rule."

Example of a CQI predoctoral clinical project at the Florida College of Dentistry.

Plan: Identify a problem and select a task force team. The Core Quality Council decides that screening of patients is a major concern. A quality workgroup is selected, comprised of stakeholders who include four staff members and three faculty, with a staff member as the team leader. The charge is to review the patient screening process and develop methods to attract and retain quality patients. The measurement will be the ratio of the numbers of patients screened to the number accepted as patients.

Do: The team suggests that a training video be developed for staff answering calls of potential patients, additional phone lines be installed, and the consideration of an informational video for patients. Implementation begins with the exception of the patient video.

Check: Data are collected and indications are that there are fewer broken appointments and the ratio of patient acceptance to the predoctoral program has improved. The committee suggests additional solutions.

Act: The revised process is implemented which includes computer appointment support and better communication to potential patients via a welcoming information letter. Data will continue to be collected and the results may be a springboard for a new issue, thus the continuous quality improvement.

While some may question the formality of the above process, to improve "quality" one must first define it and be able to measure it before getting results.
A Case Experience
The College of Dentistry at the University of Florida was no exception to the challenges that beset higher education in the mid-eighties. As federal and state dollars for education began to shrink, emphasis was placed on research, especially in grantsmanship for federally funded centers. As the decade ended, so did the decrease in dollars at the federal level, and a strategic planning committee began to review the future for the College. This group determined that an ongoing planning process was critical for the future and that patient services were the most predictable revenue resource. Parallel to this activity was the evolution of a vertically integrated health center in which the College was a member. Experiencing its own challenges, the parent health center reassessed its components for cost effectiveness and redefined its mission. With managed care the predominant delivery system, teaching hospitals required reengineering to compete with local health care facilities to keep beds and clinics full and make a profit while still being attractive to third party payers.

With the advent of a new dean in 1995, a decision was made to consider an external consultant and Crosby and Associates was selected to assess the needs of the College and determine whether dollars were being used inefficiently in day-to-day activities. Four areas were defined where opportunities may exist for quality improvement. These areas included (1) faculty practice, (2) clinical student practice, (3) grants management, and (4) finance and administration.

The group felt that they (1) were not sufficiently involved in the planning process, (2) the organization was not effective in dealing with problems, and that goals were not defined or communicated effectively, and (3) questioned whether the organization could bring about major change to enhance quality. However, they did feel that they had been empowered as individuals to bring about changes that would lead to enhanced quality and high levels of customer support. An additional interpretation was that morale was low. This was not unexpected given a decade of decreased financial support and mixed missions.

Educating the team. The price tag for the first proposal by the consulting group was more than the College could support and a second, workable option involved the consulting group training College employees to be facilitators, who in turn would train the remaining faculty of CQI principles. Staff related more to measurable end points (e.g., instances of patient satisfaction) and tangible entities (e.g., sterilization turn-around time). Faculty challenged the concepts as being too product-oriented and not applicable to educating dental students. A formal education process was initiated, with a level of orientation for each group, beginning with the dean, chairs and associate deans, faculty, and staff.

Implementing the Process. A key events schedule was developed and the CQI process would prioritize the student clinical practice area and issues that would be identified with the assignment of educated teams. To make the organization aware of the CQI process, activities such as kick-off events, press releases, posters and badges were created. Again, some faculty resisted by not volunteering for task forces nor attending sessions, while staff were enthusiastic and continued the process. The mission in selecting the initial issues for quality work groups was to center on problems (1) that were readily defined, (2) where progress could be measured with ease, (3) where chances of success were great, and (4) where most individuals could visualize or benefit from the results. This is the concept of "low hanging fruit," where that fruit which is easiest to pick is taken first and the results of the harvest provide immediate gratification. The side bar shows an example of a predoctoral clinical project using a CQI process.

The Aftermath. In total, eight quality workgroups were formed between 1996 and 1997. Some were successful, such as the one described in the side bar, and some disbanded soon after implementation. The reason workgroups were discontinued was lack of commitment to the process or lack of well-defined issues. The Core Quality Council began to
have fewer and fewer meetings. The “quality” badges were still worn on some clinical lab jackets and there were a few “quality” posters on the walls, but formal CQI processing ceased for lack of momentum.

Looking to the Future
The College will now began a resurrection process using the successful CQI efforts of the parent teaching hospital in a partnership. The effort will not be global, but will identify an issue of high impact and value. The team will be facilitated initially by the parent hospital staff. If successful results are achieved, the effort will be marketed by means of recognition and awareness campaigns. Training will be conducted for future team leaders and facilitators as we identify future issues and teams. The primary process will be issues that are staff driven with faculty receiving benefits. The following are suggestions from this experience: (1) leadership must maintain the CQI process at the forefront, (2) a quality process must be implemented that can be understood by all, (3) small teams are created with few “outsiders,” (4) start with “top down” in hierarchy but must involve the “bottom up,” and (5) commit and adhere to the principles of processing.

Conclusion
The challenges for dental schools will continue, and fiscal management for survival will be paramount. Administrators will continue to balance the faculty-driven teaching, research, and service missions with the practical mission of being financially solvent. The survival process must include the quality process. However, until the faculty accepts the cultural change of process, including fiscal responsibility, academic leaders will be alone in this quest.

Bibliography
Under Oath: Examining the Role of the Hippocratic Oath in Dentistry

Eric K. Curtis, DDS, FACD

Abstract
The context in which Hippocrates practiced is presented as an explanation for the content of the oath. Today oath-taking invokes respect for high principles shared among a community of practitioners even though the specifics of Hippocrates' code may be outdated or even unknown to many health professionals. More recent oaths particular to dentistry are also presented.

In the summer of 1997, The Wall Street Journal ran an editorial titled "Out to Lunch" that examined a modern reality of medicine: the Hippocratic Oath is passé. Only half of British medical schools, the editorial noted, offer any form of oath taking at graduation. Moreover, it may be that even doctors who swear the oath seldom understand its contents. In an informal 1990 survey, twenty-six medical residents were asked to name the Hippocratic Oath's guiding principles. The only principle mentioned by more than fifteen was "do no harm," which is not even an explicit part of the text's content.

Medical educators might be excused for ignoring a relic such as the Hippocratic Oath. Modern circumstances change fast, and the oath comes from a whole different world. It was part of the so-called Corpus Hippocraticum collected by librarians in Alexandria, Egypt, about AD 400, some eight hundred years after it was written. Attributed to the famous Greek physician Hippocrates, its actual authorship is uncertain. The oath's content suggests it may have actually been formulated during the fourth century BC according to doctrines of the minority Pythagorean medical philosophy, which opposed abortion, suicide, and the shedding of blood (including surgery)—and which were in fact practiced by most Greek physicians of the time. Many of Hippocrates' own dictums contradict some of the tenets of the oath.

But even bathed in confusion, and frayed and faded after its dusty, millenial journey, the Hippocratic Oath is the most enduring tradition in Western medicine. A strong moral force that still conditions medical practice, the oath has four parts. The first is a preamble calling on the Greek gods of medicine and health to witness the oath. The second specifies the duties of a physician to his teachers and his obligations to share medical knowledge. The third, laying out rules to be observed in the treatment of diseases, is a short summary of ethics expressing general guidelines for doctor-patient relationships. The fourth suggests examples of three specific ethical principles: beneficence, or acting in the patient's best interest; respect, including propriety and professionalism in personal behavior; and confidentiality. The first document to ever suggest altruism as a motive for medical practice, the oath emphasizes the doctor's overarching moral responsibility and the importance of preserving patient dignity.

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Because the oath eventually became the basis for all medical ethics, it bears scrutiny even for health professionals who never swore it. One version is as follows:

I swear by Apollo the physician and Aesculapius, Hygieia, and Panacea and all the gods and goddesses, that, according to my ability and judgment, I will keep this oath and this covenant.

To reckon him who taught me this art equally dear to me as my parents, to share my substance with him, and relieve his necessities if required; to look upon his offspring in the same footing as my own brothers and to teach them this art if they shall wish to learn it, without fee or stipulation; and that by precept, lecture, and every other mode of instruction, I will impart a knowledge of the art to my own sons, and those of my teachers, and to disciples bound by a covenant and oath according to the laws of medicine, but to none other.

I will follow that system of regimen which, according to my ability and judgment, I consider for the benefit of my patients, and abstain from whatever is noxious and mischievous. I will give no deadly medicine to anyone if asked, nor suggest any such counsel; and in like manner I will not give a woman a remedy to produce abortion. With purity and holiness I will pass my life and practice my art.

I will not cut persons laboring under the stone, but will leave this to be done by men who are practitioners of such work. Into whatever houses I enter, I will do so for the benefit of the sick, and will abstain from every voluntary act of mischief and corruption; and further, from the seduction of females or males, of freemen and slaves. Whatever, in connection with my professional service, or not in connection with it, I see and hear in the life of men which ought not to be spoken of abroad, I will not divulge, as reckoning that all such should be kept secret.

While I continue to keep this oath unviolated, may it be granted to me to enjoy life and the practice of the art, respected by all men, in all times. But should I trespass and violate this oath, may the reverse be my lot.

So given such noble concepts, why don't graduating dentists take the Hippocratic Oath? The venerable document may not be very relevant to dentists in its specifics, but neither is much of it to physicians. The answer to the oath's conspicuous absence from dentistry may lie in a more political realm. Although Hippocrates is the Father of Medicine, he is more like a stepfather to dentistry. Dentists are surgeons, spiritual descendants of those cutters pointedly excluded from the ancient medical brotherhood. When dentistry coalesced as a profession in the early nineteenth century, its leaders were consciously, conspicuously looking to go their own way, independent of medicine.

Yet the public may assume dentists also raise their right arm to take the vow. Although nonbinding, the Hippocratic Oath appeals to patients, who are as reassured by affirmations of predictability, stability, and consensus as their doctors are. The Wall Street Journal noted with approval that the British Medical Association had recently reaffirmed the value of Hippocrates' oath. "In any event," the Journal wrote, "the British ought to be commended for at least rediscovering that it is useful if doctors adhere to a common set of principles."

And, in fact, dentists likewise have felt the pressure to declare their professional commonality. The American Dental Association, for example, long sponsored its own oath. In 1955, the ADA's House of Delegates accepted a resolution to adopt a formal pledge, a decision that was reaffirmed in 1972 and again in 1991 after a proposed revision was defeated:

I, (dentist's name), as a member of the dental profession, shall keep this pledge and these stipulations.

I understand and accept that my primary responsibility is to my patients, and I shall dedicate myself to render, to the best of my ability, the highest standard of oral health care and to maintain a relationship of respect and confidence. Therefore, let all come to me safe in the knowledge that their total health and well-being are my first considerations.

I shall accept the responsibility that, as a professional, my competence rests on continuing the attainment of knowledge and skill in the arts and sciences of dentistry.

I acknowledge my obligation to support and sustain the honor and integrity of the profession and to conduct myself in all endeavors such that I merit the respect of patients, colleagues, and my community. I further commit myself to the betterment of my community for the benefit of all society.

I shall faithfully observe the Principles of Ethics and Code of Professional Conduct set forth by the profession.

All this I pledge with pride in my commitment to the profession and the public it serves.

Like the Hippocratic Oath itself, the ADA's pledge apparently was never universally accepted. In a 1985, president's message to the Illinois State Dental Society, Dr. Cyril Friend recalled the (different) oath he took as a 1959 graduate of the University of Illinois:

I, realizing the privileges and opportunities that have been given to me in my study of the arts of dentistry and appreciating the significance of the dental degree to be conferred on me, do hereby willingly pledge:
That I will diligently uphold the dignity, honor, and objectives of the dental profession and, to the best of my ability, will contribute to its prestige, proficiency, and progress;

That I solemnly accept my responsibility to the patient, to give him the best of my knowledge and skill, and to maintain an impeccable relationship with him that will warrant his trust and confidence;

That I will faithfully observe and Principles of Ethics set forth by the profession;

That I will lend my influence and support to dental education, to organized dentistry, and to all segments of the profession which will contribute to the fulfillment of its purpose.

Various dental schools have likewise devised their own graduation oaths. Some, such as this one from Loma Linda University, are simple and streamlined:

I solemnly pledge to live my life in the service of humanity.

I will hold in gratitude my school, its teachings, and the inspiration of my teachers and classmates.

I will do all in my power to uphold and promote the honor and dignity of my profession. I will strive to conduct myself so that I may merit the respect and confidence of my colleagues.

I will accept my civic responsibility.

I will abstain from greed and will practice the charity I owe my fellow men. I will show the same solicitude toward my patient that I would have shown toward me.

I will make honesty my goal, in service, in teaching, in seeking knowledge.

These things I pledge to do, freely and upon my honor.

Other dental oaths are more densely packed. In 1996, the University of Louisville's graduating dental class took an oath, based in turn on a 1994 pledge from Harvard, that was peppered with references to inter-health provider relations, the study of history, the ethics of research, and dealing with mistakes:

Now being admitted to the profession of dentistry, I pledge myself to the service of humanity, my patients, my community, and my profession. I will use my skills to serve all in need, with openness of spirit and without bias. The health and well-being of my patients will be my first consideration. I will hold in confidence all that my patients entrust to me. I will not subordinate the dignity of any person to monetary, scientific, or political ends.

I recognize that I have responsibilities to my community to promote its welfare and to speak out against injustice. The high regard of my profession is born of society's trust in its practitioners; I will strive to merit that trust.

I will promote the integrity of my profession with honest and respectful relations with other health professionals. I am indebted to those who have taught me its art and science, and I recognize my responsibility, in turn, to contribute to the education of those who come after me. I will strive to advance my profession by seeking new knowledge and by reexamining the ideas and practices of the past.

I assume these responsibilities knowing that their fulfillment relies upon my own good health. I ask that my colleagues be attentive to my well-being, as I will be to theirs. I will seek to improve my practice by maintaining my skills and addressing my mistakes.

I take this oath freely and upon my honor.

The Hippocratic Oath, regardless of the goddess it invokes, was never a panacea—nor are its dental derivatives meant to be. Which may be news to many. "Laymen who never heard the words of the Oath and doctors who have long since forgotten them are united in their certainty that all the ills of modern medicine would undergo coction and lysis if only we would return to what they conceive to be its unambiguous code of virtue," medical historian Sherwin Nuland wrote in Doctors: The Biography of Medicine. "Undeterred by their total ignorance of the contents of the acclaimed document, some of medicine's critics are nevertheless convinced that its lofty title must mean that it contains some all-embracing statement of ethical impeccability. Like all seekers after a lost perfection, they yearn for something that never was; the moral purity of the ancient oath-takers is about as lost, and as irretrievable, as the continent of Atlantis."

While it may serve to focus new graduates on the moral dimensions of their impending career, perhaps the dental oath as a contract of conduct is just window dressing. The ancient Greeks never had to deal with such hard legal realities as dental practice acts or state examining boards. But such a pledge is hardly worthless. It can help bring dentistry's sweeping obligations to a personal level. "Consistent moral decency," as Nuland called the oath's goal, is certainly a worthy one. Even more, the Hippocratic oath laid the foundation for a broad vehicle to pursue that goal: medical societies. A more inclusive modern manifestation of common principles, ones that a majority of dentists publicly agree to uphold, might be found in the ADA's own code of ethics. In large measure, organized dentistry itself could be considered a present-day successor to Hippocrates' primal pledge.
Leadership

Adding Value to Your Work

David W. Chambers, EdM, MBA, PhD, FACD

Abstract

Dentists and many staff enjoy characteristics of work associated with high levels of satisfaction and performance. Although value can be added to oral health care professionals’ jobs through enlargement, enrichment, rotations, and autonomous work groups, there are limits to these techniques. Controlling work performance by means of rewards is risky. Probably the most effective means of adding value to jobs is through the Quality of Work Life approach, concentrating on job design and placement to make work meaningful and autonomous and to provide feedback.

Designing Better Jobs

There is a long history in American business of work design, extending back to the period around WWI and Frederick Taylor’s time-and-motion studies. Efficiency is still a hotly persuade goal, especially in dentistry. There are practice management experts who will be happy to assist any dentist who can’t drive out reasonable waste through trial and error, visiting other dentists, and listening carefully to people with products to sell. Aside from removing annoying or perhaps dangerous practices, efficiency adds little to the quality one experiences doing the work. It may even erode that quality by limiting creativity, building performance stress, and promoting the monotony of routine. Four job design practices are often suggested as ways to add value to the work experience. These include (1) job enlargement, (2) job enrichment, (3) job rotation, and (4) autonomous work groups.

Job enlargement means nothing more than giving people more kinds of work to do. Enlarging the job of an employee at the front desk who answers the phone, files, and greets patients would involve added tasks such as completing insurance forms, handling accounts receivable, ordering supplies, and so forth. Dentists enlarge their jobs by learning to do multi-rooted endodontics or by adding an intra-oral camera to the diagnostic routine.

Job enlargement works because it adds variety, novelty, and often challenge to one’s work. Self-employed individuals and those whose careers are in a plateau often give themselves a “promotion” by voluntarily enlarging their jobs. This can, however, be a trap. When the challenge and novelty wear off, the job is no longer rewarding, it is just bigger. All that is left are the expectations and commitments of working harder without the satisfaction that it once produced.

Job enrichment is subtly different from enlargement. Rather than adding more tasks, enrichment means giving people greater control over the tasks they already have. Enriching the front desk position means allowing greater freedom in how the work schedule is organized, performing fewer evaluations, and even letting employees change work standards.
with little or no consultation from the dentist. It means empowering employees with control over their jobs. Dentists are especially jealous of the enrichment they enjoy in their jobs. A common complaint among associates is perceived lack of freedom to do their work the way they feel it should be done, and the profession bitterly complains about third-party interference. Strangely perhaps, there are some dentists who willingly sacrifice the natural enriched dental job to the rigid schedules prepared by their staffs and other limitations imposed in the name of efficiency.

Job rotation is difficult in the dental practice. The small size of a dental office and its focus on efficiency limit the number of laterally comparable positions one might do temporarily in order to get a working knowledge of the overall organization. Residencies and advanced formal training might qualify as rotations, but probably the best model in dentistry is the uniformed services.

Autonomous work groups change the conventional wisdom that jobs are people-sized collections of tasks. In the work group model, responsibility is assigned to a group rather than to individuals; it is up to the group to redistribute the tasks, based on talents, circumstances, and group dynamics, in the way it sees fit. Again, there are limited opportunities for adding value to the job of dentistry through autonomous work groups. The exception in this case is the group dental practice. When generalists or combinations of generalists and specialists share the dentistry (in addition to sharing the space, personnel, and ordering supplies in common), value can be added to the job of doing dentistry.

Rewarding Work
The heading for this section is ambiguous. There is a difference between someone finding their work rewarding and rewarding someone who is working in an effort to influence their behavior. It is the difference between intrinsically satisfying work and extrinsic manipulation.

Trying to add value to someone else's job by giving them rewards is the most delicate and difficult challenge any manager faces. Here is a partial list of the problems. How do you know what reward another person is seeking? Some people want money, others challenge, some praise, a few status, and many can't make up their minds what they want—they just know it's something other than what they have. If you customize the rewards to the diverse wants of employees how can you preserve the impression of being fair? Is it possible that individual's desires actually change over time or because of circumstances? And then there is the ticklish business of connecting the rewards with the behavior you value. For a month, for example, the staff has been slaving under abnormal pressure and work load. You notice they are crumbling

After all, dentists can't complain about their bosses the way the rest of the working public does.

and decide to acknowledge their special effort. One day, when the work load is light and some employees are even frivolous, you announce a bonus or some "comp" time. You may end up encouraging frivolous behavior because that is what was occurring at the time the reward was given. Who knows what is encouraged by annual raises? And then there is "the amazing shrinking reward." All rewards suffer inflation through use. The Christmas bonus is a surprise one year and an expectation several years

Job Characterization Inventory
Indicate the extent to which you (SD) strongly disagree, (D) disagree, (N) are neutral, (A) agree, or (SA) strongly agree that each of the statements below characterize the job you currently perform.

SD D N A SA
1. SD I am required to use a full range of skills and talents to accomplish the job.
2. D I regularly receive clear, direct information about the effectiveness of my work.
3. D I have great latitude in determining when and how I do my work.
4. D I often doubt that my job makes much difference to others, even when well done.
5. D Most of what I do is determined by rules, directions, or other peoples' schedules.
6. D I usually do small tasks, leaving others to put things together.
7. D I can always tell from the work or from others how well I am doing my job.
8. D My job allows great freedom, independence, and a chance to exercise judgement.
9. D I would describe my jobs as very important—I believe it makes a difference to others.
10. D It is sometimes hard to get an accurate sense of how I could improve my performance.
11. D I have limited discretion or control over what activities I do and when I do them.
12. D This job is predominantly a repetition of the same tasks.
13. D I get to do the whole job from start to finish.
14. D There are times when I disagree with the feedback I get from others about my work.
later. Complements are valued but soon forgotten and may become stale. The more often a person receives a money bonus, the larger that bonus has to become to stimulate their appreciation.

Frederick Herzberg had an interesting twist on motivation in the work place. He argued that there are two kinds of influences, each with its own dynamic. If the office environment is unpleasant because it is crowded, noisy, or overheated, if people are abusive, if there is job insecurity, or if there is any other negative factor, ameliorating the trouble will improve performance and contribute to job satisfaction. Removing the irritant entirely will lead to large measures of job satisfaction. But the improvements only go as far as correcting the problems that exit and bringing performance to a normal level. Making the environment plush, the co-workers and patients effusive, and the prospects of promotion thrilling add little or nothing to the satisfaction and performance achieved by normal correction. Herzberg calls this first lever of work value “hygiene factors.”

The other way to improve job satisfaction is through “motivators.” Motivators tend to be intrinsic: challenging with regard to their need for their hygiene and motivation factors. Money is not easily classified. For a hygienist who is a single mother struggling to make ends meet, the salary is a hygiene factor and the absence of it will depress performance or cause job changing. For a hygienist married to a wealthy executive with no children at home, salary is a matter of status. Below a certain point, changes in salary will have no effect; but as salary increases, so does performance.

Certainly the best known motivation theorist is Abraham Maslow. He posited a hierarchy of needs beginning with physiological ones such as protection from hunger and physical discomfort. The second level of needs is general security such as housing, a predictable income, and a safe neighborhood. Next in order of priority is a sense of belonging, followed by self esteem. At the top of the order of needs is “self actualization;” a vaguely defined pull to pursue esthetic and philosophical goals in the quest of becoming “all one in capable of being.”

Maslow’s argument is that individuals focus their energy on the lowest of their unmet needs. This is why it is difficult to discuss long term preventive measures with patients who are experiencing pain.

Be careful not to rely on intrinsic satisfaction when basic human needs are absent and not to be lavish with external factors when the job lacks inherent meaning.

It is also why successful dentists’ at the peak of their careers who are looking at issues of social justice and ethics in their drive for self actualization become impatient with the young practitioner seeking to satisfy a security need through managed care contracts. The level of needs of individuals within an office can vary significantly, and dentists, or anyone else with responsibility for the job satisfaction and performance of others, runs an enormous risk in assuming that the needs they face are the same needs that confront others.

One of Maslow’s greatest contributions was to point out the simple truth that satisfied needs are no longer motivating. The struggle for economic security and professional identity that characterized the first dozen years of many dentists’ professional lives no longer have the same animating force for many practitioners in their in their 40s, 50s, and 60s. One danger point in the career of dental professionals occurs at precisely the point where they achieve mastery of the technical and business aspects of their practice. Having satisfied the basic motivators, they are faced with finding new challenges in serving the needs of patients, serving the needs of the profession through organized dentistry, or looking outside of dentistry for their fulfillment.

Quality of Work Life

One of the best researched and most highly regarded theories of work was developed by Richard Hackman and Gene Oldham. It is called the Quality of Work Life (QWL) model. First, these researchers clarified something that had been a source of controversy for many years. They showed that job satisfaction and job performance are highly related, although high job performance is as likely to lead to high satisfaction as is high satisfaction likely to be associated with good performance. It is a cycle, and each factor seems to promote the other. This tight association is true, however, only for those who value work as an important part of their lives, which would easily cover most oral health care professionals.

Another significant contribution by Hackman and Oldham is the identification of the components in a quality work life. There are three main ingredients; (1) meaningfulness, (2) autonomy, and (3) feedback. Meaningfulness is seldom an issue for dentists—dental students, associates, those who work for large clinic, and dental staff being a possible exception. The three parts of meaningfulness at work are the opportunity to perform a variety of tasks, a chance to do the job from start to finish rather than repeating isolated segments and passing them off...
to others to complete, and doing those things perceived to have value and significance to other people. Autonomy, the second factor in quality of work life, means freedom to determine how one's job is to be organized, what order and when various components are performed, and even such choices as where, what equipment, and how work is to be documented. Autonomy is closely related to the concept of job enrichment and is one of the cherished privileges of the dental profession.

The final component of QWL, feedback, presents some challenges to dentistry. Feedback is the ability to understand, by looking at the work itself or through information provided by others, whether the work is being done well, expectations are being met, which parts of the job are done effectively, and whether attempts to improve performance are being successful. Dentists tend to work in isolation from anyone who would be qualified to provide valid feedback and their self-assessments tend to focus on the technical quality of dental procedures rather than the overall and long range impact of oral health care. My own research and the dental management literature show that dentists tend to be more focused on and more effective in providing treatment for patients than in giving feedback to their staffs.

The side bar on page 37 contains a QWL questionnaire. This can be photocopied and used individually or with whole offices. Information about scoring is found in a separate sidebar. The quality of work life questionnaire generates seven separate scales. Three of the scales (task variety, identity, and significance) have scores ranging from 10 to 100, with high scores showing greater meaningfulness in the job. These three scores are averaged together to produce the meaningfulness score. Autonomy and feedback are calculated directly from the survey instrument and also have scores in the range of 0 to 100. The scores for meaningfulness, autonomy, and feedback are combined to give an overall quality of work life score. What is unusual about the instrument is that QWL is not the average of its three components. Hackman and Oldham observed that high scores in one area could not compensate for low scores in another. The worst part of one's job pulls down the other parts of oneself and the whole office tends to operate in a disproportionate fashion. Hence, the QWL score may still range between 0 and 100, but it is skewed so that lower scores are much more likely than are high scores.

My own research with this instrument over the past ten years shows that practicing dentists exhibit a QWL profile similar to that of corporate executives. Staff members in both dental offices and in business show a different pattern. Overall quality of work life scores for dentists are typically in the 40 - 50 range; for staff, between 30 and 40.

Can anything be done to add value to one's own work or to the work of others? The answer is yes. Attempts to improve the satisfaction and performance of people at work are probably uncertain and unpredictable if the emphasis is on external factors such as rewards. Better success can be achieved through designing jobs. People want to know that they are making a meaningful contribution in their own way. Dentistry stacks up very well against these criteria.
Leadership

**Recommended Reading**


The former president of Intel describes his approach to management in plain English. A key concept is management leverage—"the output of a manager is the output of the organizational unit under his or her supervision or influence." He is high on coaching, training, performance appraisal, and developing employees. There are also some nice insights into how to run a business and respond to customers' needs. The management theories underlying his style tend to be dated (in the 1980s) despite a modern introduction.


Readable and accessible introduction to the basic principles of work design (enlargement, enrichment, etc.) and summary of the research literature on job satisfaction and job performance. The quality of work life model is presented in full detail.


The two-factor theory of motivation is presented. Hygiene factors (typically external and aversive) can only improve performance and satisfaction to a point as the negative consequences are attended to. Motivators (typically intrinsic and meaningful parts of the work) will promote higher levels of satisfaction and performance if there are no deficiencies in the hygiene factors.


Summary of types of work-related rewards and their drawbacks. Rewards must meet criteria of importance, flexibility, visibility, frequency, and cost. None of the reward systems used in business meet all criteria.


Give individuals at the lowest levels of the organization more information, knowledge, power, and rewards. Design work that is satisfying; involve employees in designing their work; pay people not jobs. The organization cannot succeed other than through the work of its employees, and meeting their needs at work is the foundation for successful organizational performance.


In this, perhaps the most frequently cited work in all of psychology and even business, Maslow lays out his theory that humans are motivated to satisfy needs that are arranged in a hierarchy. Lower needs such as physiological and safety needs must be met before higher ones such as belonging and self-esteem can be addressed. At the peak is a need for self-actualization. Satisfied needs are no longer motivating.


This is the reference for the serious student of work design, motivation, and performance. It is collection of classic papers and integrating commentary.

**Editor's Note**

Summaries are available for the three recommended readings preceded by an asterisk (*). Each is about four pages long and conveys both the tone and content of the book through extensive quotations. These summaries are designed for busy readers who want the essence of these references in fifteen minutes rather than five hours. Summaries are available from the ACD Executive Office in Gaithersburg. A donation to the ACD Foundation of $15 is suggested for the set of summaries on adding value to work; a donation of $50 would bring you summaries of all the 1998 leadership topics.