MILLENNIAL DENTISTS: How They Work, How They Learn and What It Means for the Practice of the Future

Christian Piers, DDS, MFA
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Some folks say they enjoy genealogy research because they love being part of history. History is fascinating, but why is history more captivating if somehow one's own DNA is involved? It is not difficult to empathize with a historical character regardless of the degrees of genetic variation that separate us. After all, we are all more alike than different.

It must be that extra connection, that supposed commonality, that imbues the life and times of an individual with greater meaning for us. After all, we are more alike than different. It must be that extra connection, that supposed commonality, that imbues the life and times of an individual with greater meaning for us. After all, we are all more alike than different. It must be that extra connection, that supposed commonality, that imbues the life and times of an individual with greater meaning for us. After all, we are all more alike than different.

For example, Walter Clement Noel was one of us. He was on his way to study dentistry in Chicago in 1904. Born in 1884, he was the son of wealthy landowners on the British colony of Grenada. He was a 20-year-old man traveling from one of the Windward Islands of the Lesser Antilles. He was moving from the beautiful tropical island of his birth to the landlocked industrial center of the United States. After graduating from Harrison College of Barbados, he sailed to New York and made his way west by train to the Chicago College of Dental Surgery.1

To be so transplanted must have been a shock to his system, both physically and culturally. “It was unusual in 1904 for a student of African descent such as Noel to be permitted to study in the United States outside of a traditionally ‘blacks-only’ secondary school; however, Noel was well-to-do and was also a foreigner, and educational opportunities for black students were slowly beginning to expand.”1

Chicago in the winter must have been an added obstacle to overcome in attaining his dental degree. In November 1904, after a monthlong bout with respiratory problems, he sought help at a hospital. Ernest Irons, the intern who worked up Noel’s case, employed a relatively new clinical test: microscopic examination of the patient’s blood. He described his observations of Noel’s blood smear as having “many pear-shaped and elongated forms — some small.”1 Irons recorded his observations and made detailed notes over the next 2 1/2 years while tending to Noel’s frequent bouts of illness. Irons consulted with and passed his records on to his supervising physician, James Bryan Herrick.

Noel graduated with his class in 1907 and returned to Grenada to establish his dental practice. He set up his private practice in a building owned by his family. He lived in rooms over his office in Grenada’s capital city of St. George’s. In April 1916 at the age of 32, after practicing dentistry only nine years, he died of pneumonia.1 His was a life cut tragically short. But Noel’s life would have an impact that extended beyond his friends, family, colleagues and patients. Walter Clement Noel would prove to be the proband, or patient zero for sickle cell disease.

In 1910, Herrick presented Noel’s case at a national meeting and, later that year, published a detailed report.1 His was the first published account of sickle cell disease. “By the early 1920s, enough experience had accumulated that Dr. Verne Mason was able to name the illness sickle cell anemia. By the 1940s, the inheritance pattern and physical chemistry of hemoglobin S were well enough understood that renowned scientist Linus Pauling (1901–1994) could call sickle cell anemia ‘the first molecular disease.’”1

Sickle cell disease is an example of how a very small genetic variation can have wide-ranging ramifications for science, for nations, for communities and for individuals. The sickle cell trait is the manifestation of a substitution of one amino acid in the construction of the hemoglobin molecule. With the substitution of a valine for a glutamine in the sixth position of the beta chain of globin, the hemoglobin S molecule cannot fold into the three-dimensional shape of normal hemoglobin. This misshapen hemoglobin S is unable to bind to and release oxygen as effectively as the normal hemoglobin molecule. This results in a mishandling of the delivery of oxygen, a molecule essential to the biochemical reactions of life.
The affected red blood cells have a shorter life span and are less flexible and stickier than normal red blood cells. The red blood cells reflect the presence of hemoglobin S by assuming a sickle shape. They are not efficient in transporting oxygen; in crisis they may clog small capillaries, obstructing the delivery of oxygen to distal sites. These episodes can be very painful.

Sickle cell disease is the result of the inheritance of the sickle cell trait from both parents. It is a classic example of Mendelian genetic inheritance.

In anthropology, we studied sickle cell trait because it appeared to be an observable evolutionary adaptation for improved survival in areas with high levels of malaria. Being heterozygous (having inherited only one copy of the sickle cell trait) can provide an advantage in the body’s fight against malaria parasites.

Pauling became interested in the disease because it did not stem from an infection by bacteria or viruses. It was a molecular disease that demonstrated the importance of the three-dimensional folding of a protein in order for that protein to successfully perform its biochemical function. Such a small variation produced such a huge problem for the person afflicted.

Noel was sickle cell disease patient zero but he was also a human being. Like you and me, he wanted to use his skills and knowledge to help others. He experienced his dental training like we did. He returned to his home and set about growing his practice. However, while learning and perfecting his skills and providing care for his patients, his biological clock was ticking and his time was running out. He was losing an invisible biochemical battle.

Now when I see “sickle cell” checked on a medical history, I think of the special care and attention that patient may require. I think of Mendel and Pauling and then I think of Walter Clement Noel, a fellow dentist.

REFERENCE

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CBCT and Endodontics

This is in regard to an article in the April 2018 issue, “Can Use of Cone Beam Computed Tomography Have an Effect on Endodontic Treatment?” by Robert S. Roda, DDS, MS. While I found the article very informative, there were two items that were problematic for me. Both were in regard to copies of X-rays and CBCT scans on pages 242 and 243.

On page 242, Figures 4A–4C of tooth No. 19 show the progress of the treatment. Figure 4B shows an untreated canal that presumably was filled, resulting in a successful outcome as shown by the reduction of the apical radiolucency in the mesial root. My problem is that Figure 4B shows that the untreated canal was in the distal root, not the mesial root, so it is not clear to me how filling a canal in the distal root reduced the radiolucency at the mesial root. I understand that all canals are typically refilled, but that is not the point here.

On page 243, it was noted that the patient decided to have the tooth extracted because the patient’s tolerance for risk was low. If I had a patient with a large radiolucency from the periapical film and a probe extending to the apex, I think I would discuss the alternatives before continuing. From the information above, it almost certainly was due to a vertical fracture. If it wouldn’t show a vertical fracture, why was the scan taken? I respectfully refer you to the title of the article.

Thank you again for your fine work, and please thank Dr. Roda for a generally excellent article.

ARTHUR SCHULTZ, DDS Manhattan Beach, Calif.

Dr. Roda Responds

Thank you for your inquiry Dr. Schultz. As to your first question, Figure 4B indeed shows the missed distolinguinal (DL) canal but, as you surmised, it was not just the missed canal that was treated. All of them were. The seven-month reevaluation of the nonsurgical retreatment showed two clinical outcome measures: that the mesial periapical low density area was reduced in size and that the tooth was no longer symptomatic. I did not mean to imply that somehow finding and treating the missed DL canal would result in healing of the mesial periapical tissues and I apologize if my wording was not clear on that point. If the CBCT had not been made, then the result could have been a retreatment where the untreated canal was not found and the treatment could have had a poorer outcome.

As to Figure 5, the preoperative periapical radiograph showed the low density area around the distal root apex extending coronally to about the cervical one-third of the root. The CBCT image (Figure 5B) showed the low density area extending through the crest of bone. While I agree that the pre-CBCT information (including the probing depth) was indicative of a possible fracture, it was also possible that this situation was the result of a combined endo/perio lesion. The buccolingual narrowness of the low density area (visible only on the axial CBCT view, Figure 5C) was another indication of vertical root fracture and so it was another important piece of the diagnostic mosaic.

Another reason to use this case as a figure in the manuscript was that it shows the classic pattern of bone loss seen with cracked teeth. Even with all of the diagnostic evidence indicating root fracture in this case, I feel that sometimes we can be wrong. If a tooth is removed that was not fractured and, indeed, could have been saved with root canal therapy, then this would be a very undesirable situation. It is incumbent on all of us to make sure we leave no stone unturned and CBCT almost always helps with this decision.

Thanks for your dedication to our profession and to the highest levels of patient care.

ROBERT S. RODA, DDS, MS Scottsdale, Ariz.
identification. Remarkably, research has shown that X-ray fluorescence is effective in facilitating identification even with cremated remains.4

In mass disasters, forensic odontologists play a major role in identifying disfigured and unrecognizable victims.5 They assess and report on orofacial trauma injuries in cases such as in child abuse and serve as expert witnesses in dental malpractice, assault and abuse cases for the living and the dead.

Best Practices for Routine Documentation of All Patients
- Record a complete odontogram, including documentation of all sound restorations and dental material seen at examination (including photographs of removable prostheses).
- Keep up-to-date panoramic or full-mouth series of radiographs to help evaluate root canal obturations, bone height and bone morphology (if deemed clinically relevant).
- Keep current intraoral photographs or dental casts that capture occlusal scheme, presence of identifying features/anomalies and rugae patterns.
- Keep current extraoral photographs of the smile line.
- Ensure dental notation is correct for teeth present/missing — evaluate the documentation accuracy at recall exams.
- Ensure dental records are completed as soon as practicable after patient care is delivered.

REFERENCES

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A Plague of Laws

David W. Chambers, EdM, MBA, PhD

Aristippus of Cyrene, an ancient Greek philosopher, said it would be easy to identify an ethical person: Look for the one who, when all intelligent laws are passed and enforced, would not change his behavior.

The politicians have misstated the problem: We do not have too much government; we have too many laws. The famous Italian economist Vilfredo Pareto, who invented the 80-20 rule, proposed that taxes should be entirely voluntary because it is patently obvious that the more we contribute to the common good, the more everyone gains. There has been some hesitancy on the concept, so legislators have been working to be more specific. Currently, Title 26 of the United States Code — our federal tax law — comes in 20 volumes, 16,845 pages and is available for purchase at $1,153, including shipping. There is still no good evidence that anyone has actually read it.

It has been observed by wise people such as Lao Tzu, a fifth century BCE Chinese philosopher, Edward Gibbon in his *The History of the Decline and Fall of the Roman Empire* and Jay Leno that the only certain consequence of more rules is a reliable increase in the number of rule breakers.

Laws come in two flavors. There are those that cannot be broken, such as gravity, greed and the impossibility of living to be 150. The other type is convention with penalties attached in hopes of redistributing benefits and costs. Regulations of dental practice are examples of selectively adjusting who benefits from and who pays for oral health.

Arguably the best known philosopher of the last century was John Rawls. In his masterpiece, *A Theory of Justice*, Rawls argued that Western liberalism depended on everyone having an opportunity to maximize his or her economic position. But there are two qualifications: Laws should not be created that (a) restrict social mobility and (b) no one should be allowed to benefit at the expense of others. A plague of laws comes from selectively tilting the playing field.

The Black Death of the 14th century is a fascinating example because it created capitalism as we know it. The 50 percent mortality rate in Europe wiped out the agricultural labor force. Wages started to rise, but were checked by laws fining landowners from paying more and forcing laborers to work and preventing them from moving.

The man-made laws could not hold back the natural laws of economics. We all find ways to work around inappropriate laws and regulations. The laws to preserve an ineffective system remained on the books but were ignored and creative work-arounds were found. The only place in Europe that was spared the plague was Russia, and serfdom remained the standard there for another 500 years.

Laws and regulations can be established to redistribute the goods and benefits in society, but they cannot reallocate human needs.

The nub:
1. Ethics cannot be legislated.
2. Attempts to do so often redistribute benefits to the powerful.
3. Natural law eventually corrects man-made law, after an appropriate period of hypocrisy.

David W. Chambers, EdM, MBA, PhD, is a professor of dental education at the University of the Pacific, Arthur A. Dugoni School of Dentistry, San Francisco, and the editor of the American College of Dentists.
Macular Degeneration Linked to Periodontitis

Many clinical studies link chronic periodontitis (CP) to various systemic disorders. Now, age-related macular degeneration (AMD) is found to be associated with periodontal disease.

The keystone oral pathobiont and one of the major causative organism for CP, Porphyromonas gingivalis (Pg), has been identified with the ability to invade epithelial, fibroblasts and dendritic cells, according to a study conducted by the Dental College of Georgia and presented as a poster at the 2018 meeting of the American Association for Dental Research (AADR).

“Our study was designed with an objective to interrogate the role of Pg and its fimbriae-mediated infection of human retinal-pigment epithelial cells and retro-orbitally injected mice retina, thus revealing possible molecular links between CP and AMD,” said Hyun Hong, a predoctoral dental student, and Pachiappan Arjunan, PhD, who directed the study.

Human retinal-pigment epithelial cells were infected with Pg and its isogenic mutant strains and genes were analyzed by qPCR. The results showed that human retinal-pigment epithelial cells take up Pg381 and that qPCR shows a significant increase in expression levels of genes, important in immunosuppression and angiogenesis/neovascularization markers compared with uninfected control. Certain complement regulatory-related genes were upregulated, while others were downregulated. In a mouse model, AMD-related effects on mouse retinae were induced by Pg injection compared to control group.

“This is the first study to demonstrate the link between oral pathobiont infection and AMD pathogenesis and that Pg can invade human retinal-pigment epithelial cells and elevate AMD-related genes, which might be the target molecules for both diseases,” Dr. Arjunan said.

Learn more about the AADR at iadr.org/AADR.

New Study Could Help Diagnose, Prevent ECC

Research presented as a poster at the 2018 meeting of the American Association of Dental Research (AADR) provides novel insights into the metagenomics of early childhood caries (ECC) that are foundational for the development of precision medicine/precision dentistry approaches for diagnosis, prevention and treatment in the oral health domain.

The research sample was comprised of 118 children, aged 3 to 5, who were enrolled in ZOE 2.0, a community-based genetic epidemiologic study in North Carolina. Examiners recorded caries experience at the surface level using modified ICDAS criteria and classified children in three groups — as being caries-free, having restored disease or having untreated disease.

Calibrated clinical examiners collected supragingival biofilm samples from the children. Biofilm samples were frozen onsite and subsequently processed and carried forward to pair-ended 150bp read length whole-genome sequencing (WGS) shotgun using Illumina HiSeq-4000.

From 712 million reads, 85 bacterial genera and 201 bacterial species were identified, 185 of which were identified down to the strain level. Notable differences in species abundance were found between the three groups, including — caries-free: Streptococcus intermedius and Capnocytophaga; restored disease: Actinomyces odontolyticus and Streptococcus australis; and untreated disease: Streptococcus mutans.

“Our long-term goal is to characterize oral health and disease at the molecular level; in other words, define taxonomic or functional signatures in the supragingival biofilm that represent the ECC-associated oral dysbiosis prior to clinical disease development,” said Kimon Divaris, DDS, PhD, lead researcher and associate professor at the University of North Carolina at Chapel Hill School of Dentistry.

Study results suggest that restorative care alone may not reverse the ECC-associated dysbiosis to a status resembling health. To further validate this notion, researchers are now overlaying this taxonomic information with metatranscriptomics data from the same biofilm samples, as they believe that this step will help illuminate the important functions and processes at play.

Learn more at iadr.org/AADR.
Dental Health Inequalities Most Evident in Young Children

Inequalities in dental health are most evident in 3- to 6-year-old children, according to a thesis at Sahlgrenska Academy in Sweden. Preschoolers in socioeconomically disadvantaged families had a more than four times higher risk of tooth decay compared to age cohorts with better living conditions.

“We shouldn’t forget that most kids have healthy teeth, but there is a minor group of children who we see at the dental clinic repeatedly and who have a lot of cavities,” said Ann-Catrin André Kramer, DDM.

In the course of her thesis work, Dr. Kramer studied the dental health of 300,988 individuals aged 3 to 19 years in the Västra Götaland region of Sweden. The analyses are based on data from the Swedish Public Dental Service and private dental care providers that treat children and young people in the region, as well as information from Statistics Sweden (SCB).

The research confirms that from an international perspective children and young people in Sweden generally have good dental health. However, despite the fact that the Swedish government has provided free dental care to children and young people for decades, large discrepancies in dental health do exist.

Children and adolescents living in rural areas had a lower risk of cavities than their age cohorts in larger towns and cities. There were also differences in caries experience among children of different genders.

“It was interesting that the girls had a lower risk of cavities than boys during adolescence, with a reverse pattern before adolescence when girls exhibited a higher risk for caries experience compared to boys. This trend had not been observed previously,” said Dr. Kramer. “The question is whether this pattern can be linked to behavior such as diet and oral hygiene habits or if something biological is occurring in the body.”

Ten percent of 7- to 9-year-olds exhibited tooth decay in their permanent teeth, and two-thirds of older teenagers had cavities or fillings. The results of the thesis indicate that children in families with limited socioeconomic resources were most at risk of caries experience. This was especially true of preschool-aged children.

Read more of this thesis at hdl.handle.net/2077/54528.

Peptide-Based Product May Cure Cavities

Researchers at the University of Washington (UW) have designed a convenient and natural product that uses proteins to rebuild tooth enamel and treat dental caries.

The research finding was first published in the journal ACS Biomaterials Science and Engineering.

“Remineralization guided by peptides is a healthy alternative to current dental health care,” said lead author Mehmet Sarikaya, PhD, professor of materials science and engineering and adjunct professor in the UW departments of chemical engineering and oral health sciences.

The new biogenic dental products can — in theory — rebuild teeth and cure cavities without today’s costly and uncomfortable treatments.

Taking inspiration from the body’s own natural tooth-forming proteins, the UW research team designed the product by capturing the essence of amelogenin — a protein crucial to forming the hard crown enamel — to design amelogenin-derived peptides that biomineralize and are the key active ingredient in the new technology. The biomimetic repair process restores the mineral structure found in native tooth enamel.

“These peptides are proven to bind onto tooth surfaces and recruit calcium and phosphate ions,” said Deniz Yucesoy, co-author and a doctoral student at the UW.

The peptide-enabled technology allows the deposition of 10 to 50 micrometers of new enamel on the teeth after each use. Once fully developed, the technology can be used in private and public health settings, in biomimetic toothpaste, gels, solutions and composites as a safe alternative to existing dental procedures and treatments.

It enables people to rebuild and strengthen tooth enamel on a daily basis as part of a preventive dental care routine.

“Peptide-enabled formulations will be simple and would be implemented in over-the-counter or clinical products,” Dr. Sarikaya said.

Learn more about this study in ACS Biomaterials Science and Engineering (2018); doi/10.1021/acsbiomater.7b00959.

UW researchers have developed a way to cure cavities.

(Credit: University of Washington)
Primary Care Physicians Feel Unprepared To Provide Prenatal Oral Health Counseling

A new study from the University of North Carolina (UNC) at Chapel Hill suggests that primary care physicians may feel underequipped to provide adequate oral health counseling to pregnant women.

Gentry Byrd, DDS, and Rocio Quinonez, DMD, of the UNC-Chapel Hill School of Dentistry, co-authored a paper published in the *Maternal and Child Health Journal* in March 2018 that investigates prenatal oral health counseling by primary care physicians. This is the first study to provide national estimates and predictors of their prenatal oral health counseling. The study used data from the 2013 Survey of Primary Care Physicians on Oral Health by the United States Department of Health and Human Services’ Office on Women’s Health.

More than 350 primary care physicians across the country who treat pregnant women were surveyed. The authors found that while many primary care physicians addressed prenatal oral health in the form of counseling and agreed that preventive dental care is very important, just 45 percent of respondents felt prepared to identify oral health issues and counsel pregnant patients on the importance of oral health.

This study illustrates the disconnect between prenatal oral health practice guidelines and primary care physician workforce preparedness, according to the paper.

“Pregnant women remain an underserved patient population, even after dentists from the American Dental Association and physicians from the American College of Obstetrics and Gynecology came together on the national level to develop joint consensus practice guidelines for medical and dental providers that detail the safety of dental treatment in all trimesters,” Dr. Byrd said.

The study also found that primary care physicians who received oral health continuing education had a higher likelihood of counseling pregnant women on oral health than those who did not, suggesting that oral health continuing education is a key component to improving prenatal care.

The authors also address areas of future research, such as the quality of oral health counseling given by primary care providers and physicians and barriers to addressing prenatal oral health.

Learn more about this study in the *Maternal and Child Health Journal* (2018); doi.org/10.1007/s10995-018-2483-4.

Effects of Periodontitis on the Colon Microbiome

Research presented as a poster at the 2018 annual meeting of the American Association of Dental Research (AADR) has demonstrated that polybacterial infection can alter colon microbial environment and may impact on colon motility.

Severe gum disease is among the most prevalent chronic infection and is associated with complex microbial infection in the subgingival cavity. The polybacterial nature of periodontal disease is a risk factor for several various systemic diseases.

The study sought to determine whether oral pathogens are found in the colon and to investigate how these pathogens modulate the microbiome of the colon. Colon specimens were obtained from 16-weeks polymicrobial-infected and healthy mice. Microbial DNA from colon specimens were isolated and analyzed by use of 454 pyrosequencing of 16S RNA genes.

Through BLAST and RDP analysis, several microbiome were found in the colon that belong to oral and colon microbiome.

“We have shown that the synthesis of nitric oxide (NO), known to regulate gut motility functions and NRF2, a transcriptional factor known to regulate several antioxidant genes, mediated Phase II protein expression and have been altered in colon specimens of polymicrobial infected ApoE−/−mice,” said Miriam Walker, an undergraduate student at the Meharry Medical College School of Dentistry in Nashville, who presented the study.

The gut microbiome plays a vital role in intestinal motility, however it is unclear whether oral polybacterial DNA is present in the colon and how it alters the microbiome and NO synthesis in this mice animal model, Walker said.

Learn more about the AADR at iadr.org/AADR.
Absence of Transcription Factor Halts Tooth Development

Researchers at the University of Alabama at Birmingham (UAB) have found a key role in tooth development for the transcription factor Specificity protein 7 (Sp7). Using an animal model, researchers found that a lack of Sp7 interrupts the maturation of two types of specialized cells that help create teeth.

Transcription factors are proteins that interact with DNA to turn genes on or off. In embryos, they guide differentiation from the single fertilized egg into all cells that form the different tissues and structures of the body. One of those complex structures is the tooth.

The teeth of mammals develop during embryonic growth, though they erupt only after birth. In research published in the Journal of Bone and Mineral Research, Amjad Javed, PhD, a professor in the UAB School of Dentistry’s department of oral and maxillofacial surgery, used a mouse model with mutations in both copies of the gene for Sp7.

It was previously known that Sp7 is required for bone development. Embryos with a double mutation in Sp7 completely lack mineralized bone. In humans, mutation of the Sp7 gene causes osteogenesis imperfecta, a condition that affects the development of bones and craniofacial structures. However, the role of Sp7 in embryonic tooth development was unknown.

Through the study of mice lacking Sp7, researchers found that initial tooth morphogenesis was normal, even though the animals lacked mineralized tooth sockets. However, tooth development did not continue. The animals failed to produce normal dentin and normal enamel. This was due to reduced proliferation, maturation and polarization of the tooth-forming cells called odontoblasts and ameloblasts. Without Sp7, the animals had small, misshapen teeth and the odontoblasts and ameloblasts failed to mature beyond the pre-odontoblast and pre-ameloblast stage, as measured by absence of mature cell markers for those two types of cells. The odontoblasts and ameloblasts were fewer in number and showed disorganized alignments according to the study.

The researchers concluded that Sp7 is obligatory for differentiation of ameloblasts and odontoblasts, but not for the initial tooth morphogenesis.

Learn more about this study in the Journal of Bone and Mineral Research (2018); doi.org/10.1002/jbmr.3401.

Combined Caries Strategies Prove Most Effective

A new study by researchers at the NYU College of Dentistry suggests that cavity prevention programs with a combination of prevention strategies may be more effective than one alone for reducing tooth decay.

“Given the high variability in school-based programs to prevent cavities, comparing the effectiveness of different prevention agents, frequency of care or intensity of treatment can lead to optimal program design,” said Ryan Richard Ruff, MPH, PhD, the study’s lead author.

In the study published in the journal BMC Oral Health, researchers compared two cavity prevention programs in elementary schools serving more than 8,200 students over 10 years (2004-2014). Both programs provided school-based care twice a year to children aged 5 to 12.

One program provided sealants on molars (primary prevention) while the other provided sealants on all teeth and interim therapeutic restorations (primary and secondary prevention). Interim therapeutic restorations are a minimally invasive method for controlling tooth decay by filling a cavity with a fluoride-releasing agent. They are intended to bridge the gap between identifying a cavity and having the cavity filled or crowned in a more permanent procedure.

Both school-based cavity prevention programs reduced the risk of untreated decay over time. While the total number of all decayed or filled teeth observed over the course of the study increased across both programs, the comprehensive program that provided primary and secondary prevention significantly lowered the rate of new and untreated cavities when compared to only sealants on molars.

Read more about this study in BMC Oral Health (2018); doi.org/10.1186/s12903-018-0514-6.
Three years ago when I was a third-year dental student, the president of the ADA asked me what my generation really wanted out of dentistry. I was sitting at the front of a conference room with two other dental students. The rest of the ADA board was clustered around focus-group tables, watching us. A facilitator stood behind them with an easel and a pack of colored markers.

I was struck in that moment — as I am struck again now — by how horrendously incapable I feel about speaking for my generation. I’m fresh enough out of dental school that I still have the hierarchy of evidence burned into my mind. Meta-analysis. Systematic review. Randomized controlled trial. When I’m asked to speak “on behalf of millennials,” all I can think about is that line near the base of the pyramid: unsupported opinion of the expert. Depending on who taught you, it’s either right above animal studies or it’s rock-bottom. But you know what it means. Beware of the guru.

Have you ever asked a millennial how their generation feels about something? Odds are they will tell you how they, as an individual, feel about it. They might go so far as to restate something they read in an interview or heard on TV (or on their smartphone). But most have trouble even telling you what their peers in dentistry feel about it. In fact, I just did that. I just told you what I do. Because aside from a few policy statements from the American Student Dental Association (ASDA) or ADA New Dentist Committee, it’s hard to say for sure what our dental generation thinks about any particular topic. We don’t get together that often to caucus about our beliefs.

Our primary goal in this issue is to give millennial dentists a chance to paint a careful, studied picture of their generation. But we’re also going to talk about data. We’re going to fight against the “guru effect.” Where no data exists, we’ll hear from those who pay attention to trends in dentistry — the vice president of the ADA Health Policy Institute, the founder of a nationwide C.E. community for dental students and new dentists, the vice president of a large DSO. Where we can’t talk to experts, we’ll hear from those in
Millennials are defined by the Pew Research Center as anyone born between 1981 and 1996. They are also, according to Pew, the largest generation ever.

In the trenches — a clinical instructor turned dean of dental admissions, a millennial who is herself teaching millennials. And where we need to hear the voice of millennial dentists, we’ll ask millennials themselves.

This issue aims to be a relatively quick and easy resource for people asking about this dental generation. It works to reconcile some of the conflicts between the data and conventional wisdom, and wherever possible, paint an evidence-based impression of millennial dentists (or Dentennials, as I’ll call them).

While you’ll hear from at least one millennial author in each of these articles (I want to give you the millennial take on millennials), don’t expect a self-righteous echo chamber. My goal is to give you a sense of the Dentennial voice and honestly answer some questions. What will dental practices look like in the coming years? Will millennials change the landscape of the dental profession or be forced to adapt to a landscape changing beyond their control? (See page 363.) How do millennials consume their dental education — and do they all do it the same way? (See page 355.) What do educators who are millennials and teach millennials think about that? (See page 359.) What happens when a millennial leaves the city to practice in a small town? (See page 375.) Who are Dentennials in the flesh? Who aren’t they? (See page 379.)

You may be thinking, “How could we still need to learn anything about this dental generation?” We’ve been talking about it as a profession for years. Certainly many Dentennials feel it’s time for this panicked conversation to come to an end. Switch out a few words and our dialogue has at times sounded like a panel of wildlife biologists talking about how invasive Asian carp will alter the Great Lakes ecosystem and drive our beloved native perch and walleye extinct.

To be clear, I’m not saying it’s bad to talk about the future. Sometimes trying to predict it is the only way to sensibly prepare for it. But when that future becomes the present, it’s a lot less effective to look at what was going to happen and more effective to talk about what is happening. The problem with our conversation thus far, in my opinion, is that much of it has focused on stereotypes built from guessing at how millennials were going to behave. We’ll set the record straight with a discussion of how millennials are behaving in Dr. Vaughn’s piece, “Are Millennials Really That Different?”

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Parts of this issue may feel like a review. The authors cast a wide net to gather evidence and report not only the findings of original studies but also on their levels of scientific quality. But don’t expect review articles. We’ve elected to paint as much of the picture as we can with good data, fill in the rest with the evidence we have (even if they’re “case studies” and “expert opinion”) and label all of the evidence according to its quality. But this is a collection of commentaries. Its authors have opinions. We’ll let you know when we’ve extrapolated data about
use public libraries. They are more diverse and less married. They are no more likely to job-hop than Gen Xers but just as likely to be living in a metro area. They are more critical of their own generation than generations past and less likely than boomers and Gen Xers to consider themselves part of their generation. Forty percent of millennials don’t consider themselves millennials, and more than half would prefer to speak to a colleague in person instead of using email or text.

Does any of that surprise you? Certainly, this issue has changed my perspective.

It’s been a few years since I was first asked about millennials in that ADA conference room and the more I’ve looked into the statistics, the more I’ve wanted to go back and change my answers.

If anyone from that conference room three years ago is reading this, this is my attempt to give you something more true. Our profession is moving in an exciting direction, and hopefully this issue can foster some understanding between generations for the journey ahead.

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How To Educate Millennials

Colleen C. Greene, DMD, MPH

I’m a millennial educator and a millennial myself. Speaking as a new dentist, a former high school teacher and a full-time faculty member, the millennial learning style can both inspire and frustrate. I’ve watched senior doctors and experienced teachers struggle to understand our demographic. We are hard to pinpoint even though our lives are constantly interconnected and exposed. The digital extension of our world pushes us to rapidly adapt and evolve. When this pace is applied to brick-and-mortar environments, it can be perceived as impatience, or worse, entitlement.

Mentors today can better impact new dentists and students by digging deeper into the forces that shape us. Having entered the profession recently, we are a highly scrutinized cohort. Our qualifications are historically high and we face unprecedented financial stakes. Grade point averages and DAT scores among entering classes are rising just like the cost of attendance. According to the American Dental Education Association (ADEA), the mean GPA was 3.55 for the 2016 entering class compared to 3.35 in 2003. The mean DAT score is now 20.3, up from 18.5 in 2003. Dental school costs more on average than the median U.S. home price ($219,000 average student debt upon graduation in 2016 versus the average $188,000 house).1,2

I believe that the internet is as much a real and native environment for millennials as our in-person communities. We face unique exposure via a lifelong online footprint and worldwide connectivity that no prior generation has experienced. This uniquely global scale of perspective is an asset to the profession as we must take care of a diversifying population. Dentists must provide care to every segment of society, which includes more people unlike us than just like us.

How do you not only teach a digital native but also harness our constant curiosity for the greatest benefit to both patients and the practice? I believe that the following strategies are concrete examples of how to succeed with the millennial learner.

Teach Faster

Young dentists have a sense of urgency about their development. We know that the rate of knowledge generation through research is galloping forward at increasing speeds. It is reported that the rate of publication in dental journals more than doubled from 2003 to 2012.3 It’s not practical to expand the length of training significantly to handle such a widening field of facts. Therefore, mentors and educators need to make difficult decisions about finding the highest yield examples of what should be taught. This may seem to fit into the stereotype of millennials believing that they deserve more personalization than prior generations. Instead, we expect an unbiased truth and anticipate a future in which we’ll be accountable...
to the standard of care, which by then will surely be a different set of rules than what we were originally taught.

Millennials are less loyal to the title of “professor” or “owner” as absolute sources of knowledge. While personal experiences are valuable to teach, proven truth behind the decision is expected. To some, this may come across as resistant to the conventional approach of accepting what is taught as long as the teacher is more experienced. To others, this is a welcome recentering of dental education on objective evidence.

Effective instructors are those who demonstrate how a decision was made at the nexus of available evidence, patient preference and hard won clinical wisdom. The challenge here is that by definition, adhering to evidence means constantly scanning trusted resources for updates and being willing to leave behind that which is later proven less effective. A 2016 study published in the Journal of Dental Education identifies a significant gap between the learning preferences of millennial students and the teaching styles of nonmillennial faculty. Meeting the expectations of students is a difficult challenge between generations, but creative adaptation will ensure our profession stays nimble and patient-centric. In this way, millennial learners will excel, as we are accustomed to rapid changes in norms and trends. We know science will progress quickly and we will always be accountable to published standards.

Applicants are gaining a powerful upper hand in choosing schools and residencies. According to the ADEA, when I was applying to dental school in 2007 only one in three applicants was admitted. Now, with expanding class sizes, new schools and declining application volumes, it’s more than a 50-50 shot. One day, dental schools may no longer be able to count on millennials to fill every available seat. When students are finding their needs unmet in educational quality, they may provide public feedback quickly. As strong networkers, we will find a way to aggregate data on our experiences as students and employees. Internet forums accelerate knowledge transfer between us as consumers. We reward what we love with devoted publicity. Dental schools can avoid falling behind by soliciting and responding earnestly to feedback to sustain a favorable reputation.

**Millennial dentists may struggle to find the balance between personal social media and a more professional public identity.**

**Teach Authenticity**

Employers and educators of millennials should demonstrate high standards while acknowledging their own stress. Dentistry is incredibly demanding and we have fought through fierce competition to enter this profession. Teaching millennials about how to succeed in practice means normalizing chaos especially as it relates to balancing career and family priorities. The very personal stress of our jobs is a common ground rarely acknowledged openly in formal education, yet sharing failures is critical to teaching millennials how to adapt in our most error-prone career phase.

Give feedback often and identify blind spots compassionately. We have grown up in an era of instant quantitative and qualitative feedback online. By accessing information constantly, we sometimes confuse data with wisdom. Entering practice feels like jumping off a cliff into new clinical challenges without the safety net of calibrated coaches. Teach millennials how to recognize their individual strengths with immediate praise and share how patients are really perceiving them as clinicians. Inspire honest feedback by self-reflecting openly on how you have focused on your strengths and worked around your weaknesses. Dig deeper in connecting with millennials because they are accustomed to an unfiltered stream of consciousness in social media. Though it’s rarely the full truth, we crave the truth.

Millennial dentists may struggle to find the balance between personal social media and a more professional public identity. Working with new dentists as a mentor or employer means guiding appropriate boundaries. Encourage us to unplug more often and also learn from our adept digital presence. Be transparent in how you have made decisions related to personal boundaries with staff and patients. Based on shared norms and goal setting, leverage the existing digital influence of the millennial for the benefit of the practice and patients. Mentors looking to market their practice in the age of social media are often advised to embrace a “professionally personal” relationship with patients that goes a step beyond the office hours, and this could in fact be an area where the millennial becomes the mentor.

Another unique characteristic of new dentists is gender parity compared to past generations. Although dental schools are nearly 50-50 male/female, the broader profession is still vastly majority male. While men and women are both equally capable of tremendous success as dentists, there
are unique considerations for pregnant and nursing dentists that deserve open discussion without judgment or fear. Critique your current office or program for ways that certain new dentists might not be represented, or worse yet, underestimated or blocked from reaching our potential. When in doubt, just ask us.

**Teach Advocacy**

Dentists attain the top 1 percent of educational levels in America. Even today, only one in three American adults has a bachelor’s degree. In the U.S. House of Representatives, 26 lawmakers have not earned a bachelor’s degree. For millennials, this means that as of graduation day they are obligated to apply their elite training for the greater good of communities beyond their clinical care. They need proactive coaching to confidently influence those in power. This begins with ensuring that educators and mentor dentists are role modeling civic engagement at the local and state level. Student services departments and local dental components must engage voter drives for all dentists who are legally able to vote, no matter what state is their original home.

Millennial students are inspired by close connections to those who influence. We seek role models who succeed in taking risks that combine personal and professional exposure. Based on our education, I feel that dentists are responsible for influencing the officials who develop taxpayer-funded budgets. As future high earners, dental students and residents are about to disproportionately fund public programs like Medicaid. Teach what it means to be an effective citizen by bringing local, county and state level officials to campuses and practices to discuss their areas of passion in health care and oral health issues. Rigorous Q&A sessions as well as personal reflections and career advice from legislators will benefit millennials greatly.

In 2013, the Commission on Dental Accreditation (CODA) approved a new educational standard of “Advocacy” for one specialty: pediatric dentistry. I see this as visionary and essential for the future of dentistry. As of now, no other accredited type of program includes a similar focus on advocacy as a distinct requirement like “Embryology” or “Biostatistics.” Right now is the ideal time to recruit millennials through demonstrating community consciousness. Predoctoral and postdoctoral programs alike may benefit from incorporating this new standard.

The following CODA objectives will propel new pediatric dentists to greater impact:

“Clinical experiences must provide exposure of the advanced education student/resident to:

a. Communicating, teaching and collaborating with groups and individuals on children’s oral health issues.

b. Advocating and advising public health policy legislation and regulations to protect and promote the oral health of children.

c. Participating at the local, state and national level in organized dentistry to represent the oral health needs of children, particularly the underserved.”

As advocates, new dentists will need to strongly push for changes that will include their voices in the power structures that guide the profession. Power is not evenly held within educational institutions nor actual governments. Enlightened mentors will be ones who push us to learn decision-making by actually making important decisions. Educators who are themselves frustrated with institutional policies would do well to engage students in strategic reforms. Remember that pushing boundaries is a hallmark of youth and students may be especially effective when it comes to making a case for change to senior-level administrators. Use the energy and fearlessness of millennials to activate positive changes on campus.

**Summary**

Millennials are bringing unprecedented energy into society through our diversity and our connectedness.

The following CODA objectives will propel new pediatric dentists to greater impact:

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I believe the most effective lessons for millennials will focus on patient-centered clinical strategies while acknowledging provider stress and coping skills. Dentistry is a very challenging career with long-term risks to our bodies and high demands on our minds as guidelines and techniques evolve. We must support our newest colleagues with frequent honest feedback to help them grow quickly into the leaders our communities deserve. Reinforce their enthusiasm for achievement by sharing your wisdom and you’ll give millennials the tools to lead our profession.

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Dentists’ Almanac

Stephen Rogers, MS, DDS

The 1960s saw the peak of the space race shortly after the launch of Russia’s Sputnik satellite. NASA sent Alan Shepard on a suborbital flight in 1961, and less than a decade later, 530 million people watched Neil Armstrong’s first steps on the lunar surface. Popular culture reciprocated with an explosion of future-gazing architecture, fashion and particularly television. Generation X, those born between 1965 and 1980, grew up with their eyes fixated on the cosmos and progress. They also became known as a group of self-reliant skeptics.1 Solo practice reigned in this era,2 and Gen X dentists thrived in practice models successfully developed by the disciplined boomers before them.

The Space Age animated sitcom “The Jetsons” depicted this world of tomorrow. Holograms and Googie cityscapes generated impressions of a technology-forward society. Some of the cartoon depictions preempted present-day technologies, including smartwatches, flat-screen televisions and household robots. In one episode, George Jetson pays an urgent visit to his dentist. The frame retreats outward from George’s teeth revealing a dental chair, basic lighting and a rather large X-ray unit. In fact, unlike anything else in “The Jetsons,” the operatory is nearly identical to what you’d find in a 1960s’ dental office. In a world filled with flying cars and floating cities, the dental operatory remained untouched or unimproved.

David Rice, DDS*, a New York-based general practitioner, founder of igniteDDS and a 1994 University at Buffalo School of Dental Medicine graduate, explained in an interview that “Gen Xers, by definition, are a lost generation. Dentistry didn’t move during Gen X. From a technology and materials standpoint, we did dentistry the same way for two decades.” Dr. Rice claims that this continued until Ivoclar Vivadent declared the “aesthetic revolution, and at that point, dental technology became a race.”

As we approach another generational transition, what can we anticipate? In 2018, we can merely speculate about what dental practice will look like in two or three decades. Here we’ll ask industry experts where they see our profession heading in the coming years and for insights about the role they envision millennials, those born between 1981 and 1996, playing in it. As the token millennial in this piece, and also the national editor-in-chief of the American Student Dental Association (ASDA), my perception of the field is nuanced. While I don’t have the experience of any of these experts, I do have some insights on millennial wants and needs because the dental student “voice” passes through my inbox and into our national publications every day. I’ll occasionally share that perspective where I believe it can add dimension to our discussion.

1 David Rice, DDS, discloses a business association with Ivoclar Vivadent, which also supports his business venture igniteDDS.
Generation Y

Over the last five years, millennial dentists have started entering the workforce and, by extension, the marketplace. Economists have already learned how to exploit the consumer trends of today’s 20- and 30-somethings. But how will these new clinicians affect the profession?

Ryan Dulde, DDS, a 2011 graduate of the Marquette University School of Dentistry, asked in a 2014 Dental Economics piece, “What happens when tech-savvy, hyperconnected narcissists take over the dental profession?” He says there is cause for both worry and excitement, which outlines the dangers of making generalizations about such a large and diverse cohort.

Brad Guyton, DDS, MBA, MPH, vice president of clinician development for Pacific Dental Services, associate professor at the University of Colorado School of Dental Medicine and a 1997 Baylor College of Dentistry graduate, explained in a phone interview, “The stereotype stories and speculations are tired. We have to be better than labeling one another and get past the oversimplification of one generation being better than another.” Dr. Guyton spends time with thousands of dental students each year and suggests, “We must recognize that we’re all dentists first and we are all here to serve patients. We’re a lot more alike than we are different. When I graduated from school I was seeking mentorship and development so I could build a business that makes a difference in the lives of my team and my patients. The baby boomers thought similarly and so do millennials.”

Others believe that some basic, objective characteristics about millennials will inevitably change dentistry for the better. Marco Vujicic, PhD, chief economist and vice president of the ADA’s Health Policy Institute, said in a phone interview, “There are a lot of myths about [millennials]. I really feel that this generation has the potential to change the trajectory of the world in so many ways. I’m convinced this is the smartest generation of dentists in history.”

Dr. Rice described millennials as “the generation that will save the profession. Generationally, they’re purpose-driven and community-driven, which is something Gen X lacked in dentistry. There was a whole era of, ‘we do this thing on our own’ … nobody shares the ‘secret sauce.’” And sharing may be what millennials do best. The advent of social media platforms may be the most definitive characteristic of the cohort. Millennials feel compelled to share everything — and that might be their most important asset.

Collaborate or Perish

The rise of collaborative practice between multiple health professions is newer to dentistry than it is to the rest of health care. In an April 2014 Journal of the American Dental Association (JADA) article, Dr. Vujicic discussed collaboration as being “incentivized” as health care delivery models in the U.S. continue to transition into the later phases of the Affordable Care Act (ACA) implementation. “It is exactly in this area that the dental profession could be seeing some major new opportunities … [this] environment will provide a chance to reexamine the role of dentists within the health care system.” Dr. Vujicic is referring to the ACA’s focus on developing accountable care organizations (ACOs) that manage entire groups of patients with reimbursement tied to patient outcome.

Today’s dental health care relies heavily on prophylaxis and a focus on overall health, which means prevention of disease should be prioritized as a mutual benefit for patient and provider. The kicker is that dental reimbursement is still mostly fee for service. If ACOs are effectively implemented, then for the first time in the U.S. an outcome-based model can be realized in both dentistry and medicine. Conceivably, more collaborative clinics — those with medical, dental, optical and other departments — may begin popping up. Because nearly all of today’s graduating health professionals are receiving some form of interprofessional education, millennials may be more open to this prospect.

In some ways, the road to these clinics has been paved by a shift in practice models toward group practice. Dentistry has been moving away from the solo-practitioner archetype for some time now. In a September 2017 JADA article, Dr. Vujicic claimed that 80 percent of dentists in private practice [are] sole or part owners of their practices. Assuming the current data trend, he predicted the 50 percent threshold would be reached in 2090.

Marc Cooper, DDS, a former private practice periodontist, wrote in a 2013 Dentistry Today piece, “Most dentists are rejecting the notion that things are changing at all and [are] holding on tightly to preserve the past.” Considering the mounting evidence to the contrary, those same dentists may have a different perspective in 2018. This isn’t all to say that solo practices will completely disappear. But Dr. Rice explained that
“midmarket practices, or owning two to three practices, will be massive.” In his opinion, because of technical and financial limitations, solo practices as we know them will effectively be “gone.”

The structure of dental education is also an actor in the shift to group practice. Of the dozens of Commission on Dental Accreditation (CODA) standards, only one refers to competence in owning a practice. Competency 2–18 from the Accreditation Standards for Dental Education Programs reads: “Graduates must be competent in applying the basic principles and philosophies of practice management, models of oral health care delivery and how to function successfully as the leader of the oral health care team.” The standards simply do not prioritize preparation for any aspect of business management or sole proprietorship.

Dr. Guyton explained, “Group practice 1.0 was in the ’90s when there were management services that tried to partner with practices and add value. Many ultimately failed because they weren’t involved enough in promoting best practices in business and standardizing IT systems. Group practice 2.0 began about 20 years ago and sprouted in many places from practices trying to find ways to effectively treat managed care patients. This model can be shared ownership or an employee model that has mastered the value in group ownership can go beyond the obvious advantages of a diluted time commitment and increased work-life flexibility. The rapidly rising cost of dental materials and technology can be mitigated, in part, by a group arrangement. Supplies may be purchased at deeper discounts, portable technologies like lasers and scanners may be shared and data management software costs are a relatively smaller financial burden for larger practices than solo practitioners. Economies of scale are alive and well in dental group practice.

The more significant question of what practice models will look like in 2030 and 2040 may not be a function of millennial stereotypes, but instead a reflection of the markets that influence dentistry.

Who’s Driving Anyway?

In a 1993 episode of “The Simpsons,” Homer’s labor union is charged with approving the contract of its nuclear power plant’s owner, Mr. Burns, who graciously provides a keg of beer for the meeting where the vote takes place. The union leader explains that in exchange for the keg, “We have to give up our dental plan.” Distracted by the keg’s contents, the crowd cheers and rushes to the tap without regard for the true cost of their concession. In 2016, the Kaiser Family Foundation reported that among large firms (more than 200 employees), total companies offering retiree benefit plans have shrunken from 66 percent in 1988 to 23 percent in 2015. The real-world analogues of Mr. Burns have been frighteningly successful over the last 30 years, which has contributed to dental access issues. These numbers are crucial in characterizing both who will be utilizing health care in the future and how exactly they’ll be using it.

It’s unlikely that this trend will reverse anytime soon. An October 2017 Reuters article stated that “U.S. companies are facing a 4.3 percent increase in health benefit costs for 2018, the highest since 2011.” Dr. Guyton explained, “Politics aside, as long as medical is broken, dentistry suffers. Employers can only afford to contribute so much toward their employee benefit plans. The first two benefits employees ask for are medical and retirement. Dentistry is typically third.” As people spend more on medical, there is less to subsidize dental.

It’s well understood that dental insurance isn’t insurance as many people know it. Policies do not undertake the risk of dental emergencies. Dental benefits resemble more of a subsidy plan, and that market’s been nearly the same for decades.

But that’s changing, and it will change practice models.

Dr. Guyton said, “We are starting to see reimbursement rates in competitive urban and suburban areas starting to go down. That pressure on rates is critical. More dentists accept PPO plans now than they ever have. In some markets, HMO capitated plans are trending up. This will continue to put pressure on dentists to control costs to maintain the same profit level. Within the next decade, we’ll see unprecedented pressure on insurance companies to come up with something better. Dentists and patients must both win for a plan to be sustainable. The current state, however, is unsustainable.”
An important consideration in the insurance landscape is the prevention-treatment paradigm. Dentists are largely reimbursed on completed treatment. Preventive measures are not proportionately compensated. David Preble, DDS, JD, vice president of the ADA’s Practice Institute, explained in a May 2017 Washington State Dental Association article that, “Dentistry has been very good at prevention. Still, the prevention that dentistry does so well is not compensated for.” The essential cog in this wheel is diagnostic coding. For dentistry to incentivize preventive care, the data must have a diagnostic starting point to compare with procedure outcomes. “If your goal is to get and keep patients healthy, you’ll be able to track what procedures resulted in less dental disease.” Then if preventive measures are recognized — through an analysis of coding data — to be more cost effective by third-party payers, the practice model of dentistry would be forced to change. That is, prevention could be financially incentivized.

Insurance markets are an important money player. But the true elephant in the operatory is debt. Everyone wants to know: Is debt driving the transformation of dental practice in America? And does that factor alone fuel the rise of dental practice organizations (DSO or DMSO)?

Excitement and skepticism has surrounded DSOs for the last decade. Chris Salierno, DDS, chief editor of Dental Economics and a 2005 Stony Brook University School of Dental Medicine graduate, wrote in September 2017 that he doesn’t “believe the DSO business model is going to disappear.” In fact, he believes that their market share will continue to grow. However, Dr. Salierno claims that the “DSO bubble” is primed to burst. He wrote that, “While there are DSOs that are enjoying success, others have grown too quickly, are unable to obtain capital to fund future growth or have failed to attract dentists for long-term employment. The consolidation of these less-successful DSOs has already begun.”

Dr. Guyton disagreed. “DSOs and private practice both have a place in the current and future marketplace,” he said, “It isn’t the model of practice we need to worry about. Choice in how you want to practice is good for dentists and ultimately for our patients. What we need to be focused on is how do we continue to improve both group and private practice so that both models continue to be great opportunities for graduating dentists.”

While many have speculated about the correlation between debt and career choices of new graduates, an August 2017 JADA piece finally published the numbers. Kamyr Nasseh, PhD, and Dr. Vujicic reported that graduating dentists were 0.9 percent more likely to join DMSOs and 0.6 percent less likely to join a non-DMSO group practice over solo practice for every additional $10,000 of educational debt they accrued as dental students. While educational debt was revealed to be a motivating factor for new dentists, the authors explained that race and sex showed even stronger associations.

When asked about debt’s influence on decisions, Dr. Guyton was reassuring. “Educational debt is manageable,” he said. “Many dentists get out of school, they feel that burden their first two to three years, and as soon as they find success, they quickly learn that their level is manageable. I am very optimistic that the debt will not define how [millennials] practice. It better not.”

The true effect of debt on students, and by extension practice models, may not be represented in the data just yet. Average graduate indebtedness has nearly doubled since 2000 and has risen sharply in the 2010s, according to data from the American Dental Education Association. With no plateau in sight, it may be too early to anticipate how this will affect career decisions 20 or 30 years from now. Debt averages in the $300,000 to $400,000 range will likely exacerbate these early trends and reveal new challenges for students over the next few decades.

It is partly the cost of dental technology — that schools purchase in order to train students in state-of-the-art techniques — that has driven up tuition rates and debt levels in recent years. But it is also this mastery of technology that will help shape the practice of the future.

**Dr. Guyton believes that it’s not only the way millennials learn but also the efficiency with which they learn that can give them an edge on their predecessors.**
The next 30 years of dentistry won't be defined by its technology as much as the rapidity of its development and adoption.
majority of millennial dentists are seeking mentors, “and they should be. In fact, we all should be. As soon as we stop being mentored, we risk halting our own personal and professional growth.” He says that mentorship is “so critical if you really want to see your career and practice take off. Commit to being hungry and humble and realize that other and better ways of doing dentistry are possible.”

Dr. Rice hired a recent graduate to his Buffalo, N.Y., practice and is fully dedicated to her development as a clinician. Dr. Rice explains it as a “boarding process” that he uses for every team member, not just new clinicians. This isn’t just one-on-one hand-holding. There are prescheduled milestones and checkpoints. “I’ve always found that random sit-downs connoted trouble. We wanted celebrations for victories and scheduled opportunities to beat, calibrate and continue our progress. The mentorship process included funded hands-on clinical C.E., business development and lessons in team building.” Dr. Rice explained that his efforts in mentoring manifested in his protégé’s personal leadership growth. He says, “It was important for our team and patients to see her as their leader from day one, even though she had much to learn.” Dr. Rice claims that new grads must prioritize “mentorship over money for the first three to five years. The money will come.”

This type of arrangement isn’t native to dentistry or even the health professions. A 2014 Gallup poll revealed that “graduates who had a professor or professors who care about them as a person — or had a mentor who encouraged their goals and dreams, and/or had an internship where they applied what they were learning — were twice as likely to be engaged with their work and thriving in their overall well-being.” In order to access these benefits, millennials entering less traditional practice opportunities after dental school may need to be more purposeful about finding a mentor.

**Tomorrow Will Come**

“The Jetsons” had an admissible knack for predicting future technology and inspiring generations to reach higher. But this doesn’t mean that “The Jetsons” have to be right about everything. Despite their depictions of an unchanged dental office in our not-so-distant future, dentistry can and will look different. Some aspects of this future will be due to the millennial provider-effect, but largely it will be driven by patient desires, changing reimbursements and emerging technologies.

When the frame pans outward from George Jetson’s millennial analogue, perhaps we’ll see full-mouth, stem cell-mediated tooth regeneration in real time. Or maybe we’ll witness a space blaster aimed at the mouth, stem cell-mediated tooth regeneration in real time. Or maybe the button — psychokinetically.

Sometimes the best we can do to prepare for tomorrow is to ask the visionaries of today what it’s going to look like. And who knows, maybe we’re doing what “The Jetsons” did and the dental operatory we’re envisioning is just the one we see today with some futuristic paint on the walls. Maybe we’ll all be surprised beyond our wildest imaginations. The bottom line is that the profession must subscribe to advising generations to reach their full potential.

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The Four Millennials You Meet in Dental School: Effort, Outcomes and the Consumer/Investor Mindset in Millennial Dental Students

Eric Mediavilla, DDS, and Christian Piers, DDS, MFA

As a Generation X dental faculty member and a millennial resident, we feel dentistry lacks a framework to talk about the future elements of the profession: dental students. Without such a framework, it’s hard to talk about how dentistry is changing. While dental schools offer a unique venue for watching the behaviors of future dentists in large numbers, in great detail and for long periods of time, we still struggle to find words for how dental student mindsets have changed through the years because we don’t have a nomenclature for their mindsets today. This is our attempt to give language to that discussion.

A few comments before we begin. Noticing change requires an unmoving reference point — a fixed, objective lens through which to observe the variable of interest. We don’t believe a dentist is an unchanging entity. Philosophies change as we age and gain experience, so as instruments we aren’t well-calibrated to analyze change in our profession over time.

While the nomenclature we’re about to propose will make it possible to compare millennial dental students with Gen X, baby boomer and silent generation dental students, we as authors only feel suited to look at millennials in a cross-sectional way, at a single moment in time. Any comments we can provide using this nomenclature are limited to our own institutions and by our own powers of perception, and we will restrain ourselves from commenting on how millennials may be different from generations that came before them.

We’re also aware that dentists from one generation are prone to criticism of other dental generations. Our work together as co-authors is an attempt to mitigate that, but we know this is only a partial solution. It’s important to understand this is a work of theory and opinion.

And perhaps the best place for it to begin is with an established theory.

Dunning-Kruger and Dentistry

The Dunning-Kruger effect is a psychological term that describes cognitive bias. Specifically, it uses the phrase “illusory superiority” to describe the difficulty that low-cognitive-ability people have in recognizing their own incompetence. Low-ability individuals tend to lack the self-
awareness that would allow them to objectively evaluate their ineptitude, so they believe their skill levels to be much higher than they are.1

We believe the Dunning-Kruger effect has been at work in dental schools for generations. To our eyes, most students begin in a place of low ability and lack the proper frame of reference to identify their ineptitude in certain tasks. This leads them to believe they are already “good enough” at, say, certain preclinical skills, so they don’t need to invest further time in developing them. It isn’t until much later that they recognize the quality of their earlier work for what it was.

Some educators have expressed to us a belief that today’s dental students are focused on trying to slip by doing substandard work with little regard for their future patients’ clinical outcomes. We disagree with this notion. We believe there exists a spectrum (four broad categories) of dental student mindsets, and most dental students don’t stop trying to develop their skills when they reach the point of minimum competence. Those who do are neither trying to graduate as minimally competent clinicians nor disregarding their future patients. They believe they’re producing competent work because, due to the Dunning-Kruger effect, they can’t see it for what it is.

We believe the four dental student mindsets — like the Dunning-Kruger effect — have been around for generations. We’ll use an economic analogy to explain them further.

I Pay, Therefore I Am

Let’s begin by defining, for the purposes of our discussion, the difference between a consumer and an investor. A consumer is one who acquires goods or services for their own direct use or ownership, while an investor is one who allocates assets to generate a future gain. One could argue that a consumer receives instant and predictable gratification from their purchase, while an investor assumes a degree of risk by delaying a potential return for the future. When we apply these concepts to dental education, a student with a consumer mindset might believe that if one pays tuition and demonstrates an acceptable degree of competency, one should receive a diploma that makes one a dentist. Completing those tasks fulfills the obligations of the contract.

The dental student with an investor mindset, on the other hand, embraces the idea that becoming a dentist is a process that requires time, effort and often failure. They accept that they themselves need to be altered, and that becoming a dentist involves changes in thinking processes, learning to conduct oneself in a professional manner and developing not only psychomotor skills but also scientific and clinical knowledge. The investor is less likely to engage in unethical behaviors because they understand that shortcuts won’t lead them to mastery. They also realize that struggle is a productive part of their metamorphosis. Their philosophical axiom might be less in line with, “I pay, therefore I am” — a twist on Descartes — and more aligned with the Japanese proverb, “Fall seven times, get up eight.”

We have already pointed out that the Dunning-Kruger effect makes it difficult for an incompetent clinician to see incompetence for what it is. But we should clarify that an inept dental student is no more likely to be a consumer than an investor. For an investor, there is simply less danger in Dunning-Kruger because the idea of being satisfied when the work is merely acceptable doesn’t make sense. One doesn’t stop investing in a stock that is doing well the moment it begins issuing returns. When one is making a purchase, however, they do. A good consumer doesn’t pay more than the asking price. The problem is that consumers may not totally understand that the skill set they have “purchased” is only good enough for the here and now — for plastic teeth in a mannequin mouth.

It’s the Effort That Counts

While determining if a dental student is a consumer or investor offers important information, we have found it more useful to analyze this in conjunction with another dimension: whether a dental student focuses on effort versus outcomes. The term “trophy generation” has been used to describe some millennials who believe everyone should get a trophy in order to preserve every participant’s self-esteem. The Washington Post reported on a poll conducted by the magazine Reason and the pollster Rupe that found more than half of Americans say trophies should only be for winners, while those 18–24 years old preferred participation trophies — albeit by a narrow margin of 51–49 percent.2 Because a study by IBM found the opposite to be true in a report titled “Myths, exaggerations and uncomfortable truths: The real story behind millennials in the workplace,”3 it seems there are some millennials who believe effort is worth rewarding over outcomes and some who believe the opposite.
Analyzing where a student falls on the effort spectrum (with a focus on effort versus outcomes) as well as the economic spectrum (with a consumer versus investor mentality) allows a dental student to be categorized as possessing one of four mindsets, for which we propose the following nomenclature.

The Four Millennials You Meet in Dental School

Many faculty members will recognize their pupils as one of the following: a consumer-oriented student with an effort mindset (Mortgaging Millennial), a consumer-oriented student with an outcome mindset (Minimal Millennial), an investment-oriented student with an effort mindset (Mismanaged Millennial) or an investment-oriented student with an outcome mindset (Maximizing Millennial). Plotting these economic and effort spectra against one another (TABLE) is a helpful way to conceptualize this.

While these spectra are largely independent, we believe a slight correlation exists. Millennials who are more focused on outcomes seem more likely to invest than those who see effort and desire to be of more value, for example. It also seems that dissonance occurs in the places where the correlation breaks down (Minimal and Mismanaged millennials in TABLE). It’s in these regions of the TABLE where students seem to find themselves surprised or disappointed by their outcomes.

We will describe each of these mindsets below. Our hope is to understand each student in the context of their generation and also to understand how they might best be redirected to optimize their educational experience.

The Mortgaging Millennial is a true consumer of their education. They tend to lack self-motivation and the ability to self-assess and are more focused on “putting in the effort” than striving for outcomes. These students would rather keep taking out additional “mortgages” with easy money — to continue our economic analogy — rather than trying to build educational equity. These students become buried in what we might think of as intellectual debt — academic ignorance, lack of critical thinking and minimally acceptable clinical skills. The Mortgaging Millennial is more likely to engage in unethical behaviors because they struggle to acknowledge the value of what they do every day. These students often define educational success as the attainment of a physical diploma and are most likely to subscribe to the “C’s get degrees” philosophy.

The Minimal Millennial also possesses a consumer mindset but places value on outcomes over effort. While this generally means Minimal Millennials are better judges of their own abilities, they self-assess in order to gauge the minimum possible amount of energy required to produce an acceptable outcome (and not to reach maximum competence). This is not to say that the Minimal Millennial is simply an acceptable student. They may define their desired outcome as being the top-ranked student in the class. The key is that they look to invest the minimum amount of effort to get there. If they set the goal as being at the top of the class and a 94 percent is required to get an A, they will study only hard enough to score 94 percent — even if that means ignoring clinical takeaways. High-shooting Minimal Millennials tend to be actively reinforced by both peers and professors because they generate their desired results while maintaining active social lives and cultivating outside interests. These individuals are actually underachieving by definition, but they take comfort in knowing that they are not “overpaying” for either their educations or their outcomes. Minimals put in a modest amount of principal and expect only the desired product. However, they sometimes find themselves stunned when faced with simple clinical situations that they don’t know how to handle while their lower-ranked colleagues handle them with ease. If they engage in unethical behaviors, they don’t do so because they see a lack of value in what they’re doing — they do it because they see it as a quicker route to the goal. Accomplishments — whether they be receiving a diploma for a low-shooting Minimal or becoming valedictorian for a high-shooting one — are as thrilling as a well-executed business deal. The Minimal Millennial knows they have always paid the lowest possible price for the desired product (and often far less than everybody else).

### Table: The Four Dental Student Mindsets

<table>
<thead>
<tr>
<th>Effort</th>
<th>Outcome</th>
<th>Mindset</th>
<th>Description</th>
<th>Example</th>
<th>Expected Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumer</td>
<td>Minimal Millennial</td>
<td>Consumer-oriented student with outcome mindset.</td>
<td>Example: Student focused on achieving a certain outcome and trying to achieve it in as little time as possible. Students are often disappointed by unexpected outcomes.</td>
<td>Expected outcomes (positive and negative) are generally achieved.</td>
<td></td>
</tr>
<tr>
<td>Investor</td>
<td>Maximizing Millennial</td>
<td>Investment-oriented student with outcome mindset.</td>
<td>Example: Student who practices long hours and seeks input to get “better than good enough.” Expected outcomes (positive and negative) are generally achieved.</td>
<td>Expected outcomes (positive and negative) are generally achieved.</td>
<td></td>
</tr>
<tr>
<td>Consumer</td>
<td>Mortgaging Millennial</td>
<td>Consumer-oriented student with effort mindset.</td>
<td>Example: Student who practices incorrectly and does what they “have to do.” Expected outcomes are generally achieved.</td>
<td>Expected outcomes are generally achieved.</td>
<td></td>
</tr>
<tr>
<td>Investor</td>
<td>Mismanaged Millennial</td>
<td>Investment-oriented student with effort mindset.</td>
<td>Example: Student who practices incorrectly for long hours without seeking faculty input. Students are often disappointed by unexpected outcomes.</td>
<td>Expected outcomes (positive and negative) are generally achieved.</td>
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</tbody>
</table>
The Mismanaged Millennial is likely the most frustrating mindset — both for faculty members and for the dental students who possess it. These students want to invest in their education but are effort-oriented, which means they work harder as opposed to “working smarter.” If we revisit our economic analogy, these are the students who know they need to save for retirement but try to do so by putting money into the stock market without knowing anything about how the market works. These students never get a return on their investment because they don’t seek advice to help shape their outcomes. In dental school terms, they invest lots of time studying or cutting preparations in the simulation clinic but see no improvement because they never look for feedback from faculty.

Unfortunately, this group seems disproportionally affected by Dunning-Kruger. When pressed in one-on-one discussions about a poor performance, these students often say they didn’t seek out input because they thought they were already doing it right. Their core belief that success is dependent upon repetition to lock movements into muscle memory hurts them when they lock in the wrong movements. Fortunately, we believe a portion of this group eventually transitions to an outcome mindset. (We’ll get into more specifics later about how to help effect those transitions.) For those who make this switch in dental school, the payoff is growth. Many such students view their diploma less as an achievement or “end” and more as a representation of the obstacles they overcame during dental school. Students who remain Mismanaged likely are the least satisfied with their dental school experience and see themselves as having worked very hard for minimal results.

The Maximizing Millennial, conversely, understands that they need to use the resources available to them in combination with a strong work ethic in order to get the most out of their education. They make a large investment and expect a large return. They have the ability to self-assess and also seek out and implement feedback, and they realize that the end goal is their personal development — not a diploma. They understand the effort it takes to achieve mastery. Because they embrace challenge, making themselves vulnerable by asking questions is simply a part of the process. These students don’t mind putting in long hours because they actively believe they are delaying the payoff for a later date. For them, pumping the metaphorical 401(k) is done in hopes of graduating from dental school truly competent, with the abilities and knowledge to be immediately successful. These students seek out teaching assistantships and volunteer over school breaks to add additional experiences to their learning banks. The diploma for such students is a formality. Maximizing Millennials understand they have transformed into doctors long before putting on a mortar board.

We don’t believe these categories are permanent once assigned. While a single student can only have one mindset at a time, they can have different mindsets at different times. In fact, most students likely occupy all four of these boxes at different moments in dental school. Perhaps the best way to visualize a dental student’s “propensity” toward a particular mindset is to visualize a scatterplot with the economic spectrum on the x-axis and the effort spectrum on the y-axis. While it wouldn’t make sense to do such a thing, if one plotted a student’s predominant mindset every day during dental school, it would create a scatterplot with a cluster of dots concentrated in one area or another, which would give
are likely overrepresented in our minds. Since Mismanaged students are easier to "detect" thanks to the problems they experience in two schools. While the proportions of students with each mindset would likely have been different in the past than they are today, we can’t say for sure. As we mentioned in our introduction, the changing perspective of a dentist over a lifetime makes it difficult even for experienced educators to comment on how dental generations have changed through the years.

We should reiterate that these same types of students have probably always existed. Twenty or 30 years ago, this chart could just as easily have been used to plot out the four types of boomers or Gen Xers you would have met in dental school. While the proportions of students with each mindset would likely have been different in the past than they are today, we can’t say for sure. As we mentioned in our introduction, the changing perspective of a dentist over a lifetime makes it difficult even for experienced educators to comment on how dental generations have changed through the years.

We have likewise decided that offering a nationwide, cross-sectional take on millennial dental students would be inappropriate, because we only have direct experience with millennials at our own institutions. While we have certainly entertained ourselves by guessing at what the actual proportions might be today — we think there would be a slightly greater proportion of Mismanaged Millennials if we plotted out the students with whom we have worked — we only have experience in two schools. Since Mismanaged students are easier to "detect" thanks to the problems they cause for both students and faculty, they are likely overrepresented in our minds.

The greater benefit of this nomenclature, in our eyes, is less for documenting how dental students have changed over the years and more for categorizing a particular student’s mindset so as to tailor-fit an educational approach. Is this fanciful thinking? The scatterplot in the FIGURE suggests that a dental student can occupy multiple mindsets throughout the day, week, semester and program of study. Certainlly this implies it would be impractical — using this nomenclature — to tailor-fit the perfect educational approach to an individual student for every moment of every day, and we agree.

But unless that scatterplot has a perfectly even distribution about the origin — meaning the dental student employs each mindset an equal amount of time — it reveals a propensity. And an educational approach geared toward that propensity would be tailor-made more times than not. If a student happens to be occupying a Minimal mindset when the teaching strategy is geared toward their Mortgaging propensity, then the approach in that moment would be no different from that of traditional dental education, not tailor-made. We believe these concepts could be practical for helping those who want to meet their students where they are most of the time.

We’ve already made it clear that the Maximizing Millennial does the most to take advantage of their dental education. So how does a teacher — after identifying a non-Maximizing propensity — help redirect a student toward Maximizing? We’ll address each mindset in turn.

The changing perspective of a dentist over a lifetime makes it difficult even for experienced educators to comment on how dental generations have changed through the years.

Changing Minds[ets]

Mismanaged Millennials already have an investment mentality — they simply need to be guided toward a focus on outcomes. If one encounters the classic student who practices frequently in preclinic but doesn’t get better because they never ask for input, a faculty member must first make themselves approachable both in clinic and during office hours. The task is then to encourage the student to focus on what they are doing and not how long they are taking to do it. A key aspect of these conversations, of course, is an emphasis on seeking input early and often to make sure it’s being done right. Plenty of sports analogies exist for such discussions (UCLA basketball coach John Wooden has said, “Don’t mistake activity for achievement.” Cal Ripken Jr. has said, “Perfect practice makes perfect.”), but it’s important to make sure, as in any educational interactions, that this advice is shared in a respectful and collegial manner. These students want to improve and need direction. Condescend at the risk of turning them away. While it’s a short-term fix to offer unsolicited opinions, the long-term fix is to engage Mismanaged Millennials in serious discussions about seeking guidance as a part of directed practice.

The Minimal Millennial, on the other hand, is challenging because they are already focused on paying as little as possible for the end product. The silver lining is that these students — with their elevated self-assessment skills — are often already conscious of the fact that they are underachieving. Minimals may harbor a sense of guilt about the fact that they don’t always achieve the best possible outcomes for their patients. If they sense that this conversation has been a long time coming, simply acknowledging that you,
too, believe they are selling themselves (and their patients) short can be an important catalyst for change. The change won’t happen overnight, but periodically checking in with these students can make it clear that you’re trying to help, not critique, and that you’re in it with them for the long haul.

The Mortgaging Millennial is the most difficult to redirect because they need to move in two different dimensions. While it’s important to talk about personal experiences you’ve had — the ones where simply having a diploma didn’t prepare you to address problems that face dentists in practice — one of the defining aspects of Mortgagers is that they worry less about results. Those who invest the minimum are less fazed when they experience a bad outcome. When one shoots for C’s in every class, for example, one has already accepted the possibility of a few D’s. An entire paradigm shift is necessary for these students, and in our experience such a shift tends to happen only when a student is ready for it. It’s very difficult to try to redirect a Mortgaging Millennial when that shift doesn’t happen organically, but the authors welcome discussion on how best to reorient students in this group.

Unfortunately, it’s not fast or easy to change any of these mindsets, and it’s hard to accomplish any of these redirections without serious sit-down conversations. An already-cultivated mentor/mentee relationship is ideal for keeping a student open to this kind of discussion, and a collegial relationship is the next best thing. Dental educators who embrace an adversarial or belittling approach to teaching will accomplish little in these conversations.

We also don’t mean to imply that Maximizing Millennials are perfect and should be left alone. These students thrive most when given opportunities to be pushed further — perhaps even beyond the limits of normal dental education. Faculty may choose to offer after-hours study clubs to discuss the dental literature with these students to give them the opportunity to take their education into their own hands. Educators may also find Maximizers who have clinically proven themselves able to take on more complicated cases not typically treated by dental students. These students are willing to put in long hours to complete lab work and learn advanced concepts, but require detailed guidance as they move beyond the scope of “normal.” It can be more work to challenge a Maximizer to reach their full potential, but those teacher/student relationships can be some of the most fulfilling.

It’s also true that some students can’t be redirected toward Maximizing. Our hope is that future work can focus more deeply on how to educate Mismanaged, Minimal and Mortgaging millennials.

We also recognize that while those reading this piece likely have students jumping to mind who exemplify each of the four dental student mindsets, it’s unrealistic to believe any teacher could intuit the propensity of every student in today’s large dental classes. It’s possible that in the future faculty could administer a test reminiscent of the Myers-Briggs Type Indicator (MBTI) personality inventory to address this issue and determine, on more than a hunch, the strength of each student’s propensity, but such a test would require years of research and development. For the time being, these concepts are likely most useful in focused work with individual students.

Teaching dental students has been and will always be a challenge, but some of the joy in our work would be lost if we solely taught groups of Maximizers. Our charge is to shape real people into doctors who will be able to do their best to care for patients and continue to improve as clinicians after they leave dental school. We hope these concepts can be useful for those looking to develop educational approaches for dental students with each of these four mindsets and help move us closer to an era not just of personalized medicine, but also of personalized learning.

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Health Care in the Middle of Nowhere: Millennials Who Practice in Small Towns

Kyle Luis Larsen, DDS

Hi, my name is Kyle and I’m a millennial. I am addicted to technology. I would rather text than talk to someone on the phone. I value experiences and traveling over buying a home or saving for retirement. I would rather work less to maintain a better work-life balance, even if that means having less money. I am spontaneous and have seriously considered dropping everything to move to Guatemala for a year just to learn Spanish. I can be irresponsible with money and splurge on big and unnecessary purchases. I can sometimes seem entitled and selfish. I have also found a job that I love, working at a federally qualified health center in rural Colorado.

I’m often asked how a young person who is hooked on lightning-fast video streaming speeds and high technology can survive going from big-city Denver to a town where some businesses just barely started accepting credit cards, the only Starbucks is inside one of just two grocery stores and cell service drops to 3G anytime one enters a building. But it’s easier than you might think. It’s true that living life in a rural town can seem so different from living life in an urban city center that it seems impossible that the same base word — life — can be used to describe both of them. But it definitely has its perks: zero traffic, driving for days with the gaslight on without worrying and rent being one-third what it was in Denver. And I’m not the only millennial who has made the decision to practice in a rural area. For some of us, it was an opportunity too good to pass up. For others, you can take us out of the small town, but you can’t take the small town out of us.

I grew up in a little college town in eastern Washington. My dad is a dentist there and my original plan was to go back home and take over his practice. Well, Denver won me over and my plans changed. My wife and I decided to stay there or at least in Colorado. I ended up accepting a job in little old Cañon City, population 16,000. Coming from a small town but not necessarily set on returning to one, the decision to go to Cañon City was bittersweet. On the one side, I had grown to love the young energy and city buzz of Denver. On the other side, moving to Cañon City meant a three-minute commute instead of 30. I knew that it would be challenging but exciting, so when my wife was able to get a job nearby, we decided to go for it.
The transition was a little bit more than I was expecting, both clinically and culturally. I hadn’t lived in a small town in over five years and the fact that I was practicing alone coming right out of dental school just added to the stress. Did I make a mistake? How did others do this? I couldn’t be the only one to “go rural” after graduation, could I? Fortunately, I was able to connect with some dentists who graduated a few years ahead of me and who were able to give me some guidance. Both Ryan Dulde, DDS, who graduated from Marquette University in 2011, and Gabe Holdwick, DDS, who graduated from the University of Detroit, Mercy School of Dentistry in 2014, found themselves in similar situations when they first started practicing and agreed to share their experiences with me in a phone interview.

Dr. Dulde didn’t have firm plans about where he wanted to practice after dental school either. But like me, he wasn’t opposed to much as long as the situation was right.

“I tried to leave my mind open to going where there was the greatest opportunity,” he said. “Deciding where to practice takes careful consideration.”

For Dr. Dulde, the transition was a welcomed change, especially coming from dental school. He has enjoyed his practice and become very comfortable with the population that makes up his patient base. He faces some challenges, such as trying to be “everything to everyone” because he knows that he is one of only a few options in the area. And the benefits of being in a small town?

“I would say the relationship and rapport with my patient base. They value health care, they make time for health care, they are willing to pay for health care, they trust their providers and make thoughtful decisions,” he said.

Dr. Dulde doesn’t see himself as the prototypical millennial, and he thinks this may have made the transition easier for him. “I tend to be more willing to make commitments, started a traditional family at the traditional age, work independently rather than needing a collaborative environment and delay gratification for a bigger payoff later.”

Dr. Holdwick is likewise not a prototypical millennial. He says practicing in a rural area had always been on his mind.

“My family has lived in Harbor Beach, Mich. (population 1,616) for generations and rural life appealed to me from an early age,” he said.

Had I not taken this route, I probably wouldn’t have had the opportunity to be the lead dentist in my office and grow in the ways I have grown.

Speak for any period of time with Dr. Holdwick and it almost seems as if he was born for the rural life. He was literally the secretary of the Michigan State Future Farmers of America at one point. For him, the biggest challenge is the distance that some patients have to travel to get to his office. There is not a traditional public transportation system in Harbor Beach. If a patient needs a ride to the dentist, they have to book a seat on a regional minibus known as the “Thumb Area Transit.”

“Although the public transportation that you are familiar with does not exist, no-shows fortunately aren’t a huge issue,” Dr. Holdwick said. “In fact, with some of our more elderly patients, when the weather is bad and it isn’t safe to travel, we have to call them and tell them not to come to make sure they don’t still try!”

Coming from the community where he is now practicing has given him a head start on building relationships and making his mark as a respected health care professional.

“I am viewed as a member of the community, where my skills and talents are needed and make a difference in individual lives and in the community as a whole. My patients and I are partners in maximizing their oral health. We are also partners in making the community in which we live a better place. That is a part of my job in which I really find great satisfaction,” he said.

Because of this, Dr. Holdwick also seems to be immune to other challenges that may affect a typical millennial with his background, like feeling isolated or having a hard time connecting to others in such a remote location.

“I absolutely love the people who I interact with on a daily basis,” he said. “I can hardly walk to the bank without stopping to talk to someone along the way.” And what social and professional interactions he can’t get from his community, he still able to get from continued involvement in organized dentistry.

“Professionally, I am not missing out,” he said. “I have to be creative and make an effort to be a part of it when I can, but Detroit is still only 150 miles away.”

Unlike Drs. Dulde and Holdwick, I do consider myself a typical millennial. For better or for worse. Being so new to a community where we didn’t know anyone has made it somewhat difficult to assimilate, especially when about 60 percent of the population is more than 10 years older than us. We have been trying to attend community events and eat at different locally owned restaurants, but needless to
say, we have had some extra time on our hands. I have been able to keep busy by continuing my education online (how millennial of me) and earning a certificate in public health. I have also been serving as president of the Southeastern Colorado Dental Society (SECDS), which has given me an outlet for my creative energy. I created a SECDS Facebook page, designed a logo, reformatted our bylaws document and more.

Practice has been a different animal for me. Not just because I am in a rural area, but also because I work at a community health center, which is already very different from private practice. Some of the technologies that new grad dentists are excited about — such as digital impressions, CAD/CAM, lasers, implants and cosmetics — just aren’t on my radar. My treatment plans are very baseline but can be very complex. Because my target population is Medicaid patients and the underinsured or uninsured, my treatment is usually aimed at stabilizing patients with the $1,000 Colorado Dental Medicaid benefit. Oh, how I wish I could scan my preps and have patients walk out the door with a same-day crown. Or place my own implants. Or even just not have the extra day of shipping it takes for cases to get to my area from my dental lab. But I would be remiss not to mention how fulfilling and satisfying it is for me to work with this demographic. My patients are some of the most grateful and appreciative people I have ever worked with.

I know what you are thinking. With all of this said, would I do it again? Absolutely. I may not be getting better at “high-end” dentistry or the latest and greatest cosmetic techniques, but I am getting better at dentistry and discovering what kind of provider I would like to be, which I don’t think I would have been able to do with all the hustle and bustle of a big city dental office. Had I not taken this route, I probably wouldn’t have had the opportunity to be the lead dentist in my office and grow in the ways I have grown. Is a rural practice for everyone? Probably not, but it is definitely possible, even for someone as millennial as me. And honestly, it is probably only because I am a millennial that I have grown this much as a person.

My wife and I still don’t have many friends in town, but we have grown closer to each other (and Netflix) and have learned to take life slow. I get the sense that there are more transitions ahead, but I don’t feel the sort of struggling-for-air panic that I subconsciously worried about when I first realized that streaming video on my phone was going to require very strategic trips outdoors. We are looking forward to the next few years of our new lives in the middle of nowhere, and there’s a part of me that hopes this town doesn’t grow up too fast. ■

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Are Millennials Really That Different? Yes. No. It’s Complicated.

Joe Vaughn, DMD

Everyone seems to have an opinion about the millennials these days. They’re narcissistic. They’re lazy. They don’t have the same types of values as generations past. “Entitled selfie-lovers,” they’re sometimes called.

But at the other end of the spectrum, some say they’re changing the world. Some say they see life in a whole new way, that their upbringing and their values are different and that they’re rewriting all the rules on how business is done and how the world should work.

All of these statements and opinions are readily accessible online, of course. The internet is an incredible thing and, as a millennial, I have found it to be an integral part of my life for as long as I can remember. But sometimes we may lose sight of what the internet really is and where its information is coming from.

When we’re reading an article online, no matter what the topic might be, it’s important to approach it in much the same way as we would a topic in our own profession. Is the article credible? Does it have supporting evidence? Are there any flaws in its research design?

When we approach topics like stereotypes and generational differences and how the millennials are something the Earth has never seen before, it gets really foggy trying to figure out how these claims came to be. Why are the millennials so different? Are they really that different? Does being a millennial dentist mean anything different than the generations before them? First, let’s take a look at what’s out there.

The Problem With “Studies”

Have you ever been watching an interview — or having a casual conversation with a friend — when someone starts a sentence with the phrase “Studies have shown …”? Oftentimes, our inclination is to trust whatever follows. Studies hold academic weight and it makes sense to put our trust in research. However, it becomes a problem if we begin to blur the lines of what constitutes research, science and “studies.” I saw an interview recently with author and marketing consultant Simon Sinek about millennials in the workplace. Although Sinek had several great insights about what sets millennials apart, I couldn’t help but notice his continual use of unsupported claims. He stated his opinions as facts.

“Too many of this generation grew up to failed parenting strategies.”

Are Millennials Really That Different? Yes. No. It’s Complicated.

Joe Vaughn, DMD

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“Some of them got A’s (in classes) not because they earned it, but because the teachers didn’t want to deal with the parents.”

“We’re seeing in this generation an increase in suicide rates.”

Several other points were anchored with phrases like “we know that” and “the science is very clear ...” With confidence like that, it’s easy to believe that whatever follows must be the capital-T truth.

To his credit, Sinek is well spoken and his arguments are convincing. In 15 minutes he almost made me a believer. But he provided no concrete evidence for his claims. It only took a two-minute Google search to find an article on U.S. suicide statistics clashing with one of his only researchable conclusions. Yes, millennial suicide rates have increased 8 percent in the last 15 years, but suicide rates have increased all across the board. In fact, suicide rates for middle-aged women and men have increased 63 percent and 43 percent respectively — a much more drastic change than seen in the millennial generation.

This interview is the perfect example of how the millennial stereotype has become so powerful. Take a reputable source (a well-known marketing consultant) and combine that with brilliantly articulated conclusions about millennials that are backed by science and voila! The stereotype goes viral. Everyone believes it, even the millennials.

And once it becomes a thing in the marketing world, everyone wants a piece. Instead of handling the topic with the care it deserves, it becomes more important to provide fast, brand-new information with flashy titles that will bring in more web traffic and identify the company as a leading voice in the millennial conversation.

Take the Forbes 2012 post titled “How Millennials Work Differently From Everyone Else.” This title is bound to turn the heads of CEOs and managers nationwide. The article discusses a survey of 3,800 full-time workers and 2,200 full-time managers all across the country. The survey asks questions about topics such as communication style, perspectives on career path and working preferences. In the post, Forbes only includes the answers for the age groups 25–34 and 55-plus. Of course at the end, they conclude that this survey proves generational differences exist when related to communication, work style and career advancement.

Open and shut case, right? Millennials work differently. You can’t argue data.

The differences we see among employees aren’t so much a product of generational differences as they are differences between younger and older employees.

No, but you can argue misuse of data. Something that seems obvious to me — and that Forbes fails to mention — is that this survey isn’t a true comparison among generations. It’s a comparison among age groups.

Take a pool of people from all different ages, ask them the same questions about career development and the workplace and you are bound to get different answers. It’s unlikely that a 65-year-old and a 25-year-old are going to agree on how often you should get a promotion. Opinions change as we grow. The differences we see among employees aren’t so much a product of generational differences as they are differences between younger and older employees. Those differences will always be part of every company and in every office.

This isn’t the only example of questionable data being used to cultivate the stereotype that millennials are the most difficult group of employees to have ever entered the workforce. Joel Stein did it for Time magazine in the 2013 article “Millennials: The Me Me Me Generation.” Jon Forknell did it for tweakyourbiz.com in an article that made ridiculous claims that millennials would rather endure physical pain at the dentist than get advice at a bank.

We’ve really let this get out of hand. And when I say “we,” I reluctantly must include dentists. You might think we would be above all this. We were trained in the sciences and had our fair share of evidence-based training and we should recognize bad science when we see it. Unfortunately, debates on issues like fluoride and amalgam serve as a reminder that we are not exempt from the tribulations of misused research.

What Do Millennials Want? Probably the Same as You

When we get rid of all the statistical fluff, questionable data and because-science-says-so arguments, what’s left? Are millennials still a total mystery? What do they want from work and life?

Take the 2012 meta-analysis done by researchers at The George Washington University and the Department of Defense. Their research looked at a collection of 20 studies on generational differences in work-related attitudes and concluded that meaningful differences between generations probably do not exist, and any differences that do appear are probably more attributable to stage of life than to respective generations.

CNBC found similar results in 2015 when it conducted a nationwide survey of 900 American adults. The survey took a look at the importance of six traits in a potential employer.
— ethics, environmental practices, work-life balance, profitability, diversity and reputation for hiring the best and the brightest. They found that “millennial preferences are just about the same as the broader population on all six.” Steve Liesman, the author of the CNBC article, went on to say that although the millennial generation has some unique characteristics, “young people today in some critical areas are more similar to the rest of the population than they are different.”

IBM takes it a step further with its report, “Myths, exaggerations and uncomfortable truths: The real story behind millennials in the workplace.” The report comprises a multigenerational study of 1,784 employees from organizations across 12 countries and six industries and compares the preferences and behavioral patterns of millennials with those of Generation X and the baby boomers. What they found was that millennials want many of the same things as their older colleagues. The authors went on to address the following five myths about millennials:

- Their career goals and expectations are different.
- They want constant acclaim and think everyone deserves a trophy.
- They want to do and share everything online without regard for personal or professional boundaries.
- They can’t make a decision without asking everyone to weigh in.
- They are more likely to jump ship if a job doesn’t fulfill their passions.

The team at IBM, among others, argues that the millennial we have come to know is in fact just a collection of myths. Ben Casselman states in his post for FiveThirtyEight.com, “The myth of the job-hopping millennial is just that — a myth. The data consistently show that today’s young people are actually less professionally itinerant than previous generations.”

Bruce Pfau, in a piece for The Harvard Business Review, sums it all up in the following passage:

“While pithy descriptions of what makes millennials unique are presented as self-evident and seem to have a ring of truth to them, very few are supported with solid empirical research. On the contrary, a growing body of evidence suggests that employees of all ages are much more alike than different in their attitudes and values at work. To the extent that any gaps do exist, they amount to small differences that have always existed between younger and older workers throughout history and have little to do with the millennial generation per se.”

While it can be entertaining to talk about these stereotypes and think of this group as being unique in all of history, the supporting evidence out there is about as strong as the tabloids you see in line at the supermarket. Pointing a finger at the millennials and claiming that they are different or worse than those before them is simply not true. It’s bad science. And unfortunately, this bad science, misinterpretation and finger-pointing will continue for the millennials.

That is, until the next generation comes along. Because it’s quite likely the generation that follows us will be viewed in much the same light as we are. They will become the “Me Me Me ME” generation, and we, the millennials, may be the ones pointing the finger. Elspeth Reeve makes this point in a 2013 post for The Atlantic, a satirical rebuttal of Joel Stein’s Time magazine article.

Stein claims that studies show millennials have a rate of narcissism three times that of the baby boomers, but Reeve argues this is a misuse of research. She references a National Institute of Health article called “It Is Developmental Me, Not Generation Me” that concludes “every generation is Generation Me, as every generation of younger people are more narcissistic than their elders.” Reeve points out that it’s not that people born after 1980 are narcissists, it’s that young people are narcissists and they tend to “get over themselves” as they get older.

Stein isn’t the only one guilty of pointing a condemning finger at young people. Reeve claims he is just the latest among a long line of culture writers using media to declare the youth as self-obsessed. Magazine covers over the last few decades have called baby boomers the “Me Generation” who created the “Me Decade.” Generation X was termed the “Video Generation” due to their obsession with media to declare the youth as self-obsessed. Magazine covers over the last few decades have called baby boomers the “Me Generation” who created the “Me Decade.” Generation X was termed the “Video Generation” due to their obsession of recording life’s every detail. And a 2007 Time cover story about young people in China was titled, “It’s All About Me.”

It’s a Millennial World

When we talk about people and what they want, it’s easy to see the similarities among the millennials and the generations that precede them.

When we talk about people and what they want, it’s easy to see the similarities among the millennials and the generations that precede them. They want the same things. A good job and a good life with the right balance.

Before we conclude the millennial conversation, however, it would be a disservice to do so without discussing what actually is different, particularly when talking about the workplace and what it looks like to be a dentist in today’s world.
To the best of my knowledge, a few of these areas have not yet been explored in research within the niche of millennial dentists. I’ve provided references as they pertain to millennials in the workforce on a broad level. And outside of these references, many millennial conversations and anecdotes fill in the gaps.

Technology Is Imperative

The most undeniable fact is that millennials know technology. It has been an everyday part of their lives from the beginning. They live and breathe with the latest and greatest of the tech world. And not only do they know how to navigate a digital world, they prefer it.

Take the fact that more than 85 percent of them own a smartphone.17 Or how 42 percent of millennials said they would likely quit their job if workplace tech didn’t meet their standards, as reported in a global survey of 4,000 employees commissioned by Dell and Intel. That’s three times as many baby boomers (14 percent) in the same survey.16

So as millennial dentists, they recognize the importance of staying informed and up to date on the latest technology in their field. It’s difficult for them to understand why some offices might hold on to paper charts or film radiographs.

This also translates to continuing education. If they aren’t keeping up with the latest techniques and equipment, it’s likely they won’t be happy. Millennials aren’t used to being behind on technology. So in a dental world where implants, cone beam CTs and 3D printing are quickly becoming as common as crown and bridge, the fear of missing out is real.

Debt Is Soaring

The state of the dental profession is changing. Dental students are graduating with more debt each year. I graduated with just short of $280,000 of debt. And although that’s above the national average of $262,11919 for students who graduate with debt (some graduate with none), it’s nowhere close to those who paid tuition at some private schools.

Take that and pair it with the average salary for general dentists, which is not just remaining stagnant but decreasing. An average net income of $179,960 was recorded in 2015 compared to an average income of $219,638 in 2005.10 This produces a debt-to-income ratio that becomes increasingly more disproportionate. A study in the New England Journal of Medicine found that the average education debt held by dental students graduating in 1996 was 70 percent of the contemporaneous median income in the profession, versus 103 percent for 2011 graduates.24 What that means for my millennial friends and me is that it will take us much longer and be much more difficult to pay off our student debt.

The Profession Isn’t the Same

The job market is changing as well. There has been a shift from the primarily solo practice landscape to group practice and corporate models. More dentists have begun choosing employment instead of ownership. In 2014, 48 percent of dental school seniors said they planned to work at either a corporate dental practice or a group practice.22 In fact, dentists younger than 35 were three times more likely to work in a practice as part of a larger company, according to a Journal of Dental Education article.21 I believe student loans have played a large part in this, as they have with my own career choices. This is explored more in depth in this issue by Stephen Rogers, MS, as well as by authors such as Marko Vujicic, PhD.23

New dental schools are popping up around the country, producing more dentists to meet a growing need for dental care in the U.S. This appears promising for rural and underserved areas, but some reports suggest that the percentage of dental school graduates who actually enter these rural areas can range anywhere from 1 percent to 35 percent depending on the dental school. Therefore, opening new dental schools can help with access-to-care issues, but it can also contribute to oversaturation of urban areas. This leads to dental practices in these areas being forced to adapt and set themselves apart. Often times, this might mean keeping the doors open later into the night. It means remaining open on weekends. It means keeping as much specialty treatment in house as possible.

This is the job market I entered two years ago. Rest assured, there are plenty of classified ads out there, plenty of owners and dental service organization job recruiters looking to hire. But you have to be willing to work nights and weekends. You have to be willing to give up any hope of paid vacation time for two years. You have to be a general dentist who is “proficient at molar endo and third molar extractions.” And if you actually get the job, it’s probably only for two days a week. And so if you want to make your student loan payment and still have enough for dinner that night, you try and get a second job that doesn’t conflict with the days you’re already working.
I’ve talked to millennial dentists who get modest pay and no benefits. I’ve talked to dentists who work until 8 p.m. weeknights and every single Saturday. I’ve talked to dentists who work at a different practice every day of the week, traveling up to 200 miles in a single day.

Does that sound like fun to you? Does that sound like a sustainable career?

But it’s real. And every time a dentist has had enough of this lifestyle and musters up the courage to quit, it gets talked up to the shortcomings of a generation. Millennials aren’t loyal. We’re hard to manage. We’ll drop the job in a moment’s notice. Even though studies show we are quite the opposite.12

Beautiful aesthetic cases. All-on-4 implants. Procedures and techniques that I have no idea how to perform, despite the fact that I’m the same age as these dentists. I see people traveling the country for C.E. courses. Playing golf on Fridays. Stamping their passports several times a year. And these same people are telling me they’re paying off their loans faster than I am. They’ll be debt-free in five years. And so it’s easy to see how an overworked millennial who gets no respect or vacation time can see their friends and peers on social media and think, “If they can have that, so can I.”

Conclusion

Are millennial dentists special? Are all those stereotypes online true? Are we really that different from everyone else? The answer could be any of “yes,” “no” or “it’s complicated.”

Like most of our millennial peers, we want many of the same things that our older professional friends would have wanted at our age. I’ve had many millennial colleagues complain that their older bosses seem to have forgotten what it’s like to be an associate fresh out of school, and that this is a root cause of many problems in their work life.

So whether you’re a millennial trying to figure out your baby-boomer boss or you’re a Gen Xer trying to figure out your millennial associate, the moral of the story is to throw out the stereotypes and do your due diligence. Critically evaluate the information you’re getting and where you’re getting it from.

Because at the end of the day we’re all more alike than you may think, and any differences that might separate us could simply be a product of where we find ourselves in space and time.

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Same Name Mix-Ups: Verify Patient Information To Reduce Risk

TDIC Risk Management Staff

If your first name is an uncommon one, you’ve likely had it misspelled on your to-go coffee cup by countless baristas. However, if your name is common, you’re more likely to have been handed a cup intended for someone else. While James and Jennifer were once the most popular monikers, the names Sophia, Jackson, Emma and Aiden are now shared by young customers in many cafés. Getting a latte meant for another customer may not be a serious issue, but getting dental treatment intended for someone else can yield calamitous results.

How do mistaken identity incidents happen?

The Dentists Insurance Company’s Risk Management Advice Line recently received a call from a practice that was dealing with a case of mistaken identity for same-name patients. The caller actually represented two practices: a pediatric dentistry office and an orthodontic office, which were managed separately but shared a common patient waiting area. Two patients named Haley were scheduled for treatment at the same time — one in each office. Haley X. (the orthodontic patient) checked in and, in error, an assistant took her into the operatory. Haley X. was not a patient of record at the pediatric side of the office at all, and Haley N., the scheduled pediatric patient, was still in the reception area. The clinical mix-up continued because Haley N. was scheduled for fillings on teeth Nos. 2, 4 and 18, and Haley X. appeared to need small fillings on teeth Nos. 2, 15 and 18. So, it appeared to the doctor that a minor charting error had been made — not that the wrong patient was in the chair.

To make matters more confusing, the orthodontic assistant did come by to ask during treatment if Haley N. was seated in the operatory at which time the chairside assistant confirmed yes. It was uncertain why the patient did not correct them or if she simply misheard the question. The practice finally realized its mistake 30 minutes later when Haley N. asked why it was taking so long to be seen. The staff advised Haley X.’s mother of the error. She was appalled and left the practice in distress. Shortly thereafter, the mother called the practice and asked that they contact her daughter’s current dentist to review the errant assessment and treatment. That practice, where Haley X. was a patient of record, confirmed that she did not need any fillings as of yet because the teeth were not fully erupted and the decay was very shallow.

By the time the Risk Management Advice Line was called, the situation was already a stressful one for all parties. The analyst advised the caller to carefully review the practice’s protocols for checking patients in, including confirming information at
the front and back office and comparing X-rays, charts and treatment plans against the schedule. The analyst also encouraged the dentist to call back with further developments, which he did when Haley X.’s mother requested records from the practice where the incident occurred. The analyst urged the dentist to comply with the request for a copy of the treatment notes. Not releasing the information or altering the information would only escalate the situation and the practice’s culpability.

In another call to the Risk Management Advice Line, a dentist shared a concern about a clinic that was set up in a school as part of a grant program. The clinic sees approximately 1,200 students per year, with parents having the ability to opt children out of screenings and any further treatment requiring parental consent. The caller relayed an incident in which a volunteer went to retrieve a student for treatment from room R3, but he went to room 3 instead. The volunteer asked for the student by first name only and, coincidentally, both rooms R3 and 3 had students with the same first name. The full name was not checked and treatment was performed. In this case, the dentist had a sit-down with the patient’s parents, principal and clinic supervisor, at which time the child’s mother then claimed her son was traumatized by the incident. The dentist asserted that the performed treatment was, in fact, correct and needed. The mother then demanded a letter outlining the treatment so she could visit another dentist to review it. Again, a risk management analyst advised the dentist to revisit processes and protocols, as well as to comply with records request.

What can you do to reduce your risks?

■ Emphasize the team’s responsibility to check patients’ identities and match them with the correct care before any treatment is administered. Incorporate verifying identity into the practice’s training procedures.

■ Define and document the ways your office verifies patient information. Ideally, use at least two identifiers (e.g., name and date of birth). Consider taking patient photos for identification purposes and including them in the charts.

■ Review the daily schedule during morning huddle and cross-reference charts and treatment plans against the schedule at the time the patient is taken into the treatment room.

■ In addition to verifying treatment plans against the schedule, ensure that radiographs belong to the patient and match the treatment plan.

■ If the patient is a minor, review the treatment plan and an informed consent discussion with the parent or guardian.

■ Allow the patient and/or patient’s parent the opportunity to ask questions to understand what to expect at each appointment.

Review your practice’s protocols and gain the entire team’s commitment to verify patient identity. A few essential steps can protect your patients and your practice from costly mix-ups.

To schedule a confidential consultation with an experienced risk management analyst, visit tdicinsurance.com/RM consult or call 800.733.0633. TDIC’s Risk Management Advice Line is a benefit of CDA membership.
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4222 CUPERTINO GP  Well established general practice in outstanding Silicon Valley location with 40+ years of goodwill and great staff. 4 ops, 1,300+ sq. ft. office with digital x-ray, and recently updated equipment. All fee-for-service. Asking $525K.

4215 SILICON VALLEY ENDO  Practice in prime Silicon Valley location with 40+ loyal referral sources. 900 square foot office in modern professional center with 2 operatories. Averaging 20 new patients per month. Long term staff. 2017 gross receipts $603k. Asking $399k.

4232 SAN JOSE GP  Amazing Almaden Valley location on major thoroughfare. 3 yr. average GR $592K. Asking price $430K.

4217 WEST SAN JOSE GP  Seller retiring, offering 35+ years of goodwill in well-established practice with loyal staff and stable patient base. 10-15 new patients a month. Office accepts Delta PPO and Premier. Excellent location on busy thoroughfare near O’Connor Hospital in desirable West San Jose neighborhood. 3 fully equipped ops in 1,150 sq. ft. office. GR (2 yr average) $773K with adj. net (2 yr average) $258K. Asking $509K.

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Each state has its own laws on the management of medical waste. The California Medical Waste Management Act (MWMA) was enacted in 1991 and is enforced by the California Department of Public Health (CDPH) and some county and city environmental health agencies. Requirements for small-quantity waste generators differ from requirements for large-quantity generators. The rules described in this article apply to small-quantity generators, which are defined as entities that generate less than 200 pounds of medical waste per month. Many dental practices are small-quantity generators.

Medical waste is regulated differently than hazardous waste. Medical waste includes sharps waste, biohazardous waste, pathology waste and pharmaceutical waste (except for controlled substances). Medical waste must be managed separately from hazardous waste.

Enforcement and Fees

A medical waste generator must complete a registration application and submit the application and fee to the appropriate enforcement agency. In addition to CDPH, two cities (Vernon and Long Beach) and 33 counties enforce the MWMA. Annual registration fee amounts vary among the agencies and there is an additional fee if the generator treats the waste to render it noninfectious before disposal. In counties and cities where CDPH is the enforcement agency, the waste hauler is permitted to collect the annual registration fee from the waste generator.

The rules described in this article apply to small-quantity generators, which are defined as entities that generate less than 200 pounds of medical waste per month.

Containment and Storage of Sharps Waste

Sharps are devices that have acute rigid corners, edges or protuberances capable of cutting or piercing, including but not limited to hypodermic needles, hypodermic needles with syringes, blades, needles with attached tubing, acupuncture needles, root canal files, broken glass items used in health care, such as Pasteur pipettes and blood vials contaminated with biohazardous
waste, and any item capable of cutting or piercing from trauma scene waste. Collect contaminated sharps in containers that are closeable and difficult to reopen after sealing shut, puncture-resistant and leak-proof on all sides. The use of an FDA-cleared sharps containers is required. Sharps containers can be any color and should be labeled “Biohazardous Waste” or “Sharps Waste” with fluorescent orange or orange-red labels and letters and symbol in a contrasting color. The container should be maintained upright and be easily accessible to the immediate area of sharps use. Do not fill past the fill line.

Dispose of sharps within 30 days of the container being three-quarters full or filled or within 90 days if the sharps container is stored at less than 32 degrees Fahrenheit. If the sharps container is combined with biohazardous waste in another container, the waste generator must follow the disposal schedule for biohazardous waste.

**Containment and Storage of Biohazardous and Pathology Waste**

Biohazardous waste includes containers, equipment or disposables (e.g., gauze and cotton rolls) that drip blood or saliva when compressed or flake dried blood when shaken. Pathology waste includes human body parts, with the exception of teeth removed at surgery and surgery specimens or tissues removed at surgery or at autopsy that are suspected by the health care professional of being contaminated with infectious agents known to be contagious to humans or have been fixed in formaldehyde or another fixative.

Place biohazardous waste in a red biohazardous bag and pathology waste in a white biohazardous bag. The biohazardous bags should be placed in rigid, leak-proof containers of any color. The container must be closeable with a tight-fitting lid. A container with biohazardous waste must be labeled “Biohazardous Waste” or “Biohazard” on the lid and sides. A container with pathology waste must be labeled “Pathology Waste,” “PATH” or other label approved by CDPH on the lid and sides. Before disposal, bags must be tied to prevent leakage or expulsion of contents during storage, handling or transport.

Dispose of biohazardous and pathology waste stored at room temperature within 30 days of the date waste accumulation starts if the dental practice generates less than 20 pounds of such waste per month or within seven days if more than 20 pounds of waste is generated per month. Dental practices that generate less than 20 pounds of biohazardous waste per month may store the waste at 32 degrees Fahrenheit or below for up to 90 days before disposal.

**Containment and Storage of Pharmaceutical Waste**

Pharmaceutical waste includes expired drugs and unused drugs but does not include controlled substances. Expired or unwanted controlled substances must be

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**TABLE**

**Dental Medical Waste Management**

<table>
<thead>
<tr>
<th>Type</th>
<th>Treatment or Disposal</th>
<th>Storage Time</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sharps</strong></td>
<td>Mail-back, pick up by a registered medical waste hauler or a CDPH-approved alternative treatment.</td>
<td>30 days, when full and ready for disposal (HSC §118285). Or up to 90 days if stored at ≤32 F (HSC §118280).</td>
</tr>
<tr>
<td><strong>Anesthetic carpules</strong></td>
<td>If empty (=trace), place in trash. If pourable (=residual) amount remains, manage as pharmaceutical waste. If blood has been aspirated, place in sharps or biohazardous container.</td>
<td>See pharmaceuticals.</td>
</tr>
<tr>
<td><strong>Red-bag, blood and other potentially infectious materials [OPIM]</strong></td>
<td>Mail-back, registered medical waste hauler, onsite autoclave or CDPH-approved alternative treatment.</td>
<td>If &lt;20 lbs. per month, 30 days if stored at &gt;32 F, 90 days at ≤32 F (HSC §118280).</td>
</tr>
<tr>
<td><strong>Pharmaceuticals</strong></td>
<td>Mail-back or registered medical waste hauler.</td>
<td>90 days when full and ready for disposal or at least once per year (HSC §118280).</td>
</tr>
<tr>
<td><strong>Teeth (if dentist deems infectious)</strong></td>
<td>Mail-back, registered medical waste hauler, on-site autoclave or CDPH-approved alternative treatment (HSC §118280).</td>
<td>See red-bag.</td>
</tr>
<tr>
<td><strong>Teeth with amalgam</strong></td>
<td>Not medical waste.</td>
<td>Universal waste.</td>
</tr>
<tr>
<td><strong>Combined waste</strong></td>
<td>May combine all waste streams, except pharmaceuticals and amalgam. Sharps must be in a sharps container.</td>
<td>See red-bag.</td>
</tr>
</tbody>
</table>

Source: California Department of Public Health cdph.ca.gov/certlic/medicalwaste/Documents/MedicalWaste/2013/Dental%20chart.pdf.
6143 BERKELEY’S ALTA BAILES MEDICAL VILLAGE
Perfect opportunity for nearby Delta Premier Dentist to relocate their practice into this stand-alone building on Webster Street. On 3-day week, collections totaled $550,000 in 2017. 4-days of Hygiene saw 1,558 hygiene appointments last 12-months. 4-ops.

6142 OAKLAND’S PIEDMONT  “Out-of-Network” practice averages 16 new patients per month. Great views. 3-ops and Planmeca ProMax. 2017 collected $667,000. Profits of $200,000. Successor should be proficient in ortho or willing to learn. Seller able to effect an orderly transition.

6141 NORTH NAPA VALLEY 3-day per week Delta PPO practice. 3-days of Hygiene. 2017 Collected $359,000. Attractive 3-op office. 15 new patients per month. Full price $170,000.

6140 SAN RAFAEL Dentist retiring after long career. Delta PPO provider. Has averaged $390,000 in annual collections on 26.5-hour week. $223,000+ in Profits in 2017. Full Price $150,000.

6139 SAN FRANCISCO BAY AREA PROSTHODONTIC PRACTICE Very strong pedigree. Well positioned for the future. Excellent platform for younger Prosthodontist. "Out-of-Network!" 2017 billed $1.2 Million and collected $1.19 Million. 4-days of Hygiene. Owner can work back to help assist with transition.

6138 SILICON VALLEY Phenomenal opportunity shall secure a rewarding career. Best technology, perfectly designed suite and optimum stage to practice your craft. 2017’s collections topped $500,000 in 2017. Collections for 2017 restored to $1+ Million. New homes being built nearby. Great area to raise a family!

6137 SACRAMENTO’S ELK GROVE Growing PPO / HMO practice collected $1.495 Million in 2017. Profits exceeded $560,000 after paying Associates. 6-days of Hygiene. 6-ops, 3-D Pano and paperless. Over $400,000 invested here recently. Great location.

6136 SAN RAMON Strong foundation. Collections for 2017 totaled $575,000. And this was on a work schedule averaging 2.5-days a week. 3-ops. Seller can work back 1-day a week for transition.

6135 SONOMA COUNTY’S ROHNERT PARK 2017 collected $1,067,000 reflecting nice growth over 2016 which collected $940,000. Available Profits exceeded $500,000 for the second year in a row. Six days of Hygiene. There shall be no change in fees for the Successor. New homes being built nearby. Great area to raise a family!

6129 FOSTER CITY Wish to infuse your practice with quality patients? “Out-of-Network” practice collected $500,000+ in 2017 on part-time schedule. Seller and Hygienist shall relocate into Buyer’s practice to transition patients. Full Price $100,000.

6122 SANTA CLARA - STARBUCKS “LIKE” LOCATION! Best exposure in beautiful strip center on El Camino Real. Office just remodeled. 5-ops. This Delta PPO practice is currently trending $1+ Million in Collections on 4-days. Perfect platform to operate 6-days a week. Wants to do $1.5+ Million.

ALTA LOMA  Shopping Center. Hi identity. Absentee Owner. Grossing $700,000. Hands-on successor can do $1 Million. 5-ops, 3 equipped.

BAKERSFIELD Free-standing 3,000 sq.ft. building. 5-Ops. Established 60-years. Can do $1 Million. FP $650,000 includes RE.

BAKERSFIELD AREA Small City. Grosses $40,000/month on 2-day week. 1,800 sq.ft. 5-os with small apt. FP $330,000.

BELLEFLOWER Lady DDS doing $100,000. 3-ops. FP $65,000.

COLTON Hispanic practice grossing $350,000. Absentee Owner. 5-ops. Rent $1,450. Hands-on Owner will do $500,000 first year.

DIAMOND BAR Korean / Chinese Shopping Center. Very busy until 9 PM. Owner works 1-day week. Does $450,000. Hands-on successor will do over $1 Million.

GLENDALE / BURBANK Absentee Owner grossing $840,000. Beautiful corner building. Newly renovated. 5-ops with room for more. RE includes small apt. HMO almost pays mortgage. $2 Million location. Gorgeous.

INLAND EMPIRE 3,000 sq.ft. building. 7- Adec ops, Cone Beam. Grossing $1.3 Million. FP $2.5 Million includes real estate.

INLAND EMPIRE Dentical. Grosses near $300,000. 4-ops. Rent $1,350. FP $150,000.

INLAND EMPIRE Union Practice can do over $1 Million. 5-ops.

IRVINE Female Owner grossing $1.2 Million. 5-ops.

LA MIRADA Hi identity shopping center. HMO pays rent. Like new 3-ops with 2-more available. Grossing $450,000. Million Dollar location. New next-door tenant with 1,000 family members. Great upside.

LAKE FOREST Adec equipped. Like new in appearance. Female DDS grossing $385,000. 30 new patients/month. Buyer shall do $500,000 first year. Option to purchase condo.

LOS ALAMITOS Gorgeous. 5-ops. Grossing $1.4 Million. Special “All on 4 ” Program. Refers out OS, Endo, Pedo, Ortho. Absentee Owner.

ORANGE COUNTY BEACH Professional building. 6-ops equipped. Dentrix, digital & computerized. FP $150,000.

ORANGE COUNTY BEACH CITY Absentee Owner. Grossing $550,000. 4-ops with room for 5th. Hands-on Owner will do $1+ Million first year. Valuable RE possible.

ORANGE COUNTY’S FASHION ISLAND Unique situation. Female grossing $400,000.

ORANGE COUNTY’S FASHION ISLAND Grossing $650,000. Rare opportunity.

PEDO – CHINESE / HISPANIC Grossing $450,000. Long established. FP $285,000.

REDLANDS 6-ops. Long established. Has done $1 Million. Lots of potential. Low rent. Grossing over $400,000. HMO pays rent.

RIALTO 210 Freeway. Professional building on 2.2 acres. HMO practice once did $1+ Million. Now only $325,000. Can be restored to $1+ Million.

SANTA CLARITA 70,000 autos pass daily. 8-ops. Absentee Owner. FP $250,000.

SANTA CLARITA Hi identity shopping center. Owner wants to share office and remain 2-days in 2-ops. 5-ops available. Possible for long term employee DDS, with or without ownership. Upscale area.

WEST COVINA Grossing $650,000. 2-days hygiene. Absentee Owner. Refers out OS, Endo, Pedo. Ortho.
disposed of through a DEA-registered reverse distributor. Contact your local DEA regional office for a list of approved reverse distributors.

Place pharmaceutical waste in a leak-proof container that is closeable and has a tight-fitting lid. The container should be labeled “High Heat,” “Incineration Only” or have other wording approved by the CDPH on the lid and on the sides. The pharmaceutical waste must be disposed within one year of when waste accumulation starts if the dental practice generates less than 10 pounds of waste per year or within 90 days if more than 10 pounds per year is generated.

The CDPH does not endorse the combining of all pharmaceutical waste with hazardous waste, a practice that the agency has noted is promoted by some medical waste haulers.2

What Is Not Medical Waste

Medical waste does not include (1) disposal items, such as gauze or cotton, soiled with nonfluid blood or saliva, (2) teeth not meeting the definition of biohazardous waste or (3) urine, feces, saliva, sputum, nasal secretions, sweat, tears or vomitus unless it contains visible or recognizable fluid blood. These items are not considered “regulated medical waste” and may be disposed of as regular solid waste. Such items should be disposed of in regular solid waste containers.3

With respect to extracted teeth, neither Cal/OSHA nor the MWMA prohibit dentists from giving patients back their own extracted, nonbiohazardous teeth. Teeth containing amalgam or other heavy metal should be managed either as universal waste or hazardous waste and should never be discarded as regulated medical waste or as solid waste.

Treatment, Disposal and Waste Vendors

Treating medical waste to render it non-infectious requires a permit as well as other documentation. Use of state-approved alternative treatment technology may or may not require a permit; check with the respective local enforcement agency for more information. A list of state-approved alternative treatment technologies can be found on the CDPH website.4

Options for waste disposal include using a state-registered transporter, a U.S. Postal Service-approved mail-back system or self-hauling under U.S. Department of Transportation Materials of Trade (MOT) regulation. If using a hauler, verify that the company is registered with the state as a medical waste transporter. USPS-approved mail-back systems exist for sharps, biohazardous and pharmaceutical waste. A dental practice may self-transport small quantities of medical waste to a transfer station or treatment facility or another waste generator for the purpose of consolidation before treatment and disposal as long as all conditions of the MOT regulation are followed.

More information on compliance with the MWMA can be found on cda.org/practicesupport.

REFERENCES
1. View the map at www.cdph.ca.gov/Programs/CEH/DRSEM/Pages/EMB/MedicalWaste/LocalEnforcement-Agencies.aspx. Dental practices in areas regulated by the state can find the application form and list of fees on the CDPH website, www.cdph.ca.gov/Programs/CEH/DRSEM/Pages/EMB/MedicalWaste/Generators.aspx. Other practices should visit the website of the appropriate enforcement agency for application and fee information.
4. www.cdph.ca.gov/Programs/CEH/DRSEM/Pages/EMB/MedicalWaste/Alternative-Technology.aspx.
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DC-812 REDWOOD CITY Facility: Reasonable rent and great landlord! 740 sf w/ 3 fully equipped ops $85k
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DG-785 SANTA CRUZ: Known for its amusement park & beach boardwalk, this community has much to offer! 1000sf w/ 4 ops. $200k
DG-842 FREMONT: 3200 sf w/ 10 ops $395k
DN-796 SAN JOSE: This well-oiled general practice w/ emphasis on treating Pediatric patients! 3473sf w/ 10 ops + 2 add’l $550k
DN-806 WATSONVILLE: This quality, family-oriented practice focuses on delivering quality care. 1,182 sf. 4 ops. $495k/ Real Estate TBD
DN-809 PLEASANTON: Ranked as “one of the best cities to live in”, one can certainly understand why! 1100sf w/ 3 ops + 1 add’l. $480k
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EN-664 SACRAMENTO Facility: Great corner location, excellent visibility & easy access! 2300sf w/ 4 ops. Now Only: $30k
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NC-729 GREATER SACRAMENTO AREA: Seller retiring! FFS Practice and Real Estate Available!
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EN-755 FOLSOM: A perfect location, envied by all! Enjoy an amazing quality lifestyle in this thriving city. 1200sf w/ 4 ops. $175k
EN-791 SO. SACRAMENTO CO: Highly esteemed practice to an adoring & appreciative patient base! 1950sfw/ 5 ops. $450k
EG-788 ROSEVILLE: Do not pass up on this remarkable opportunity!
2700sf w/ 6 ops. $300k
EN-797 WOODLAND: Do not hesitate or this enableable will fulfill someone else’s dream! 2316sf w/ 6 ops. Practice $575k/ Real Estate TBD
EN-803 ROCKLIN: Continue the philosophy of serving your patients as if they are family! 150sf 3 ops + 1 add’l. $425k
EN-831 SACRAMENTO: Location & practice philosophy make this opportunity “a cut above” others! ~1600sf w/4 ops. $775k
EN-836 CRISTUS HEIGHTS: well-established, quality practice comes loaded w/ 30+ years of goodwill. 1300sf w/3 ops + 2 add’l. $150k
EN-824 SIERRA FOOTHILLS: well-known, well-loved, well-established practice focused on quality dental care! 1000sf w. 4 ops. $625k
PC-650 FORT BRAGG: Family-oriented practice. 5 ops in 2000sf, 6 npts/mo $350k for the Practice & $400k for the Real Estate
FN-754 SO. HUMBOLDT: If you love the lure of sea air, a relaxed lifestyle & charm of coastal living, then look no further! 1500sf w/ 3 ops + 1 add’l. Now $150k!
GC-472 ORLAND: Live & practice in charming small town community. 1000sf w/ 2 ops. Seller Retiring $160k
GN-746 YUBA CITY: State-of-the-Art Equipped! Includes the latest technology in CBCT Imaging. Real Estate also available! 1600sf w/ 3 ops + 1 add’l. Practice $480k/ Real Estate TBD.
GG-769 REDDING AREA: Offering a full spectrum of general dentistry and total care! 2700sf w/ 6ops. Practice $390k, Bldg $540k
GN-799 PARADISE: This remarkable opportunity is undeniably too good to be true! 1800sf w/ 4 ops. Practice $375k, Bldg $325k
GN-808 CHICO: It just doesn’t get any better than this! Hesitate & you might miss out! 2800sf w/ 6ops. $495k/ Real Estate TBD
HG-732 GRASS VALLEY: Seller retiring. Well established practice. 1250sf w/ 3 ops. Real Estate also available. $205k
HG-815 SIERRA CO: Perfect location for outdoor enthusiast! 1000 sf w/ 3 ops $180k / Real Estate $437k
HG-827 SO. LAKE TAHOE: Ski, live, play and practice here where your lifestyle can’t be beat! 1200sf w/4 ops. $310k
HG-851 SO LAKE TAHOE: Don’t wait another day to start living your dream of a serene lifestyle! 2100 sf w/ 5 ops $425k
HN-280 NORTHEAST CA: Only Practice in Town! 900sf w/ 2 ops $60k
HN-618 SIERRA FOOTHILLS: Seller Retiring! Huge opportunity for growth by increasing office hours! 750sf w/ 2 ops $65k
HN-740 SHASTA CO: Beautiful mountain community, well-established practice, exceptional long-term staff. 2400+sf w/ 5 ops + 1 add’l. $475k/ Real Estate $350k
HN-773 SUTTER CREEK: Seller Motivated! Location known for beautiful scenery, excellent wine & rich history! 1536sf w/ 4 ops + 1 add’l! Will Consider Reasonable Offers! $195k
HN-816 CHESTER/ALMANOR AREA: The perfect place to work, live and play! Do not hesitate, or this practice will be gone! 1250 sf w/ 4ops. Practice $140k/ Real Estate TBD

CENTRAL VALLEY

IC-468 SAN JOAQUIN VALLEY: High-end restorative practice! 6 ops in 2500+sf office. Call for Details! $425k
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IN-764 STOCKTON: Well-established, fully computerized, paperless, digitalized practice just waiting for your talent & skill! 5,000sf w/10 ops $267.5k
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IN-830 LODI: Start living the life! Small town charm, stable patient base & low overhead! 1,550 + 800sf w/4ops. $360k, Bldg $300k
IC-811 FRESNO COUNTY: Amazing Opportunity! Considerable Goodwill in Community! 3,000 sf w/ 6 ops $350k
IG-778 FRESNO: What a steal. Consistent collections over $600k with cash flow over $300k! 1452 sf w/ 4 ops $275k
IG-807 FRESNO: Reasonable Overhead, Stellar Reputation, Excellent Location! 1000 sf w/3 ops $158k

SPECIALTY PRACTICES

BC-784 CENTRAL CONTRA COSTA CO Perio: Seasoned Staff. Office runs like well-oiled machine! 3 ops $395k
EG-826 ROSEVILLE Perio: Create your success story with this warm and caring, patient-centered practice! 1000sf w/3 ops + 1add’l $150k
EN-821 GREATER SACRAMENTO AREA Perio: Live, practice & play here! It’ll be the BEST decision you’ll ever make! 1700sf w/4 ops + 1 add’l. $395k
EN-822 SACRAMENTO Perio: This practice is known throughout Sacramento for its stellar reputation! 2200sf w/ 5 ops + 1add’l. $840k
IC-543 CENTRAL VALLEY Ortho: 1650sf w/ 5 chairs in open bay & plumbed for 2 add’l. Strong referrals and PT base $125k
JG-757 VISALIA Perio: Keep implants in house and imagine the growth possibilities! 9 hygiene days per week! Rare Gem! 2,000 sf w/ 5 ops Reduced Price: $375k
Grasshopper (Free, Area 120)

A programming language, like any other form of spoken or written dialogue, is a formal language used to perform instructions on computers. Almost everything that users interact with on a daily basis, from microwaves to mobile phones, has an underlying programming language that scripts its functionality. Learning a programming language, otherwise known as coding, can be quite overwhelming for the inexperienced. Grasshopper is an app that seeks to help everybody learn how to code in as little as five minutes a day. It teaches JavaScript, the most popular programming language in use by more than 70 percent of experienced coders, and can be used to make websites and mobile apps, analyze data, animate shapes and more.

Grasshopper requires a Google account to login and keep track of user progress. The app takes users through a series of courses that start from fundamentals and progress to more complex functions, such as animations in JavaScript. Each course comprises of concept topics with small lessons, quizzes and optional bonus challenges displayed in a linear chronological format that users can pick and choose from at their convenience. The small lessons contain a background of the topic with instructions to follow in order to solve a coding puzzle. An example solution to the coding puzzle is displayed and users subsequently enter their own code solution. Immediate feedback is given and results of their code are displayed. Step-by-step walk-through assistance is available to users who are stuck. Completing topics, quizzes and challenges awards the user on a milestone chart that keeps track of concepts unlocked, coding day-streaks and JavaScript keys used.

There is also a code playground where users can test their own JavaScript code creations and see their output displayed. Notifications are available to remind users to learn and practice coding at custom-specified intervals. The content is easy to understand, and the interface is addictive — users will feel like they are playing a game, but the result will be that they are learning JavaScript.

Young grasshoppers, commonly known as students or novices of JavaScript, can now receive their formal training from Grasshopper and learn at their own patient pace.

— Hubert Chan, DDS

App Used To Quantify Parkinson’s Disease Motor Symptom Severity

A new study published in the Journal of the American Medical Association has found that an app can be used to quantify Parkinson’s disease (PD) motor symptom severity. The study was conducted by researchers at the University of Rochester Medical Center, Johns Hopkins University and Aston University. The researchers developed an app called HopkinsPD that creates an “objective severity score” of Parkinson’s symptoms. The app assessed individuals with Parkinson’s disease who performed five tasks (voice, finger tapping, reaction time, gait and balance) within the app. In total, 6,148 smartphone activity assessments were analyzed from the 129 participants. The researchers demonstrated “construct validity of an objective PD severity score derived from smartphone assessments. This score complements standard PD measures by providing frequent, objective, real-world assessments that could enhance clinical care and evaluation of novel therapeutics.” For more information, visit jamanetwork.com.

— Blake Ellington, Tech Trends editor

Study Says 97 Percent of Nurses Will Use Bedside Mobile Devices by 2022

Mobile devices may continue to be more prevalent in health care delivery systems. A new study found that by 2022 97 percent of nurses (98 percent of physicians) will utilize mobile devices at the bedside. The study, conducted by Zebra, a tracking technology and solutions company, analyzed responses from nurse managers, IT executives and patients. In total, 1,532 people participated from the U.S., Brazil, United Kingdom, China and the Middle East. The study also found that by 2020 there will be a 40 percent increase overall in the number of hospital workers using mobile devices. The study stated that 70 percent “of medical errors are attributable to communication breakdowns. By integrating clinical mobility throughout their organizations, hospitals will improve staff communication, make real-time access to medical records possible and ensure faster availability of lab results, to name just a few.” For more information, visit zebra.com.

— Blake Ellington, Tech Trends editor
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