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# THE EDITOR'S CORNER

## The Information Revolution and Orthodontics

The latest JCO Orthodontic Practice Study shows that more than 93% of orthodontists now have computers in their practices. These machines have undoubtedly made many of our common processes more predictable and efficient. For instance, with a cephalometric software program, it is now possible to complete a cephalometric tracing in five minutes or less, rather than 30 minutes. We already use brackets that can virtually eliminate the imprecise and time-consuming chore of hand-forming archwires with 1st-, 2nd-, and 3rd-order bends; soon we may have three-dimensional scanning mechanisms and computer-controlled robots that will not only control these three dimensions, but automatically adjust the wire to compensate for incorrect bracket placement. Another intraoral scanning and computer program now offers orthodontists exact-size virtual models that provide all the information we need, but without the wait, cost, or storage problems involved with plaster models. A computer-based examination software program has revolutionized my own technique of doing clinical examinations, turning what was previously a haphazard and ambiguous portion of the practice into one of its most precise functions. Within two to three years, I expect digital photography, or perhaps a new analog imaging system developed by Carver Mead, to totally supplant the 35mm cameras most orthodontists now use.

For all their utility and ubiquity, however, computers have not changed the way orthodontists make decisions. We still rely on our knowledge, skill, and experience, along with the examination and the patient's chief complaint, to decide on a diagnosis and treatment plan. In fact, the technological advancements of the past 35 years of orthodontics—stainless steel appliances, preadjusted brackets, titanium wires, and bonding, to name a few—have only mechanized the production of the same services that orthodontists have performed since they first started moving teeth.

Actually, orthodontists have only begun to experience the most dynamic feature of the Information Revo-

lution: electronic commerce. Peter Drucker tells us in a recent *Atlantic Monthly* article that back in the '50s, only two or three consultants besides himself saw much future for computers in ordinary business transactions. And even these optimists failed to envision how the new technology would ultimately become a conduit for goods, services, and jobs via the Internet.

With his wide and unique perspective on the history of management, Drucker sees e-commerce becoming for the Information Revolution what the railroad was to the Industrial Revolution. Like the railroad of 170 years ago, e-commerce has been totally new and unexpected. The steam engine improved and patented by James Watt was originally intended only for pumping water out of coal mines. Watt never imagined that his engine might one day power textile mills and other industries. Neither did he see the possibility of combining the steam engine with a vehicle on rails. Although rails had been used to move minerals out of mines for decades, it wasn't until 1829 that rails and the steam engine were combined for moving people and later freight. As the railroad did in the 19th century, e-commerce is creating a boom that is rapidly changing our economy, society, and politics.

The railroad shrunk geographic boundaries, but e-commerce promises to erase them altogether. As an example, a midsize Midwestern company made ceramic dinnerware for 60% of the restaurants in its area—until one of its customers went surfing on the Web and discovered a European manufacturer that offered better-quality merchandise at a greatly reduced price, including air shipment. Almost overnight, this once-solid company lost half of its customers.

Orthodontic patients are not likely to travel long distances for treatment (although I wouldn't totally discount the idea, considering the feasibility of eight-to-12-week intervals between appointments). Still, I will be astonished if some enterprising orthodontic manufacturer doesn't latch onto the idea of offering high-quality orthodontic supplies via the Internet at much lower

costs, with overnight delivery.

Like the railroad, e-commerce promises to transcend more than geographic limits. The dynamic of a liberating new technology often shifts in unexpected directions, resulting in wholly new industries that may have little to do with the original invention. Immediately following the development of the railroad, we saw the appearance of photography, the telegraph, sophisticated optics, and modern farm implements. Almost simultaneously, public health contributed major advances such as vaccines, sewers, safe public water supplies, and quarantines, which, for the first time in history, made cities safer than rural areas. Horace Wells discovered the use of nitrous oxide for anesthesia, ushering in a new era of painless dental services.

These new technologies made possible new social institutions: the modern postal service, daily newspapers, investment banking, and commercial banking. None of them was a direct result of the steam engine or the Industrial Revolution, but they were all made possible by the expectancy and mindset that the revolution had created, as well as the skills it had built and nurtured.

In America, unlike in England, the Industrial Revolution also created new social values that made heroes and role models out of inventors such as Eli Whitney, Samuel Morse, Thomas Edison, and Alexander Graham Bell. These people were greatly instrumental in making the country dominant in technology, commerce, and science. We see a similar willingness to accord wealth and prestige to present-day captains of e-commerce: Jeff Bezos, Michael Dell, Bill Gates, Scott McNealy, and others. Indeed, America has always been willing—even eager—to shower riches, honor, and fame on those who make our lives more comfortable, safer, and better. While orthodontists ride a wave of prosperity documented by the JCO Practice Studies, they would be well advised to pay attention to the new revolution, and to stay ahead of the information curve.

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