Collaborative Treatment Intelligence: Sharing information to help doctors grow

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Introduction

Technology moves fast. It is safe to say that nearly every orthodontist has a mobile device on which he or she shares ideas with others every day. Whether it is sharing a photograph from a vacation or a groundbreaking idea, this form of sharing is here to stay.

It is becoming increasingly evident that orthodontists will soon use their mobile devices, paired with a trusted dental community, to share everything about their treatments—both challenges and solutions—to help themselves and their colleagues grow. This future world of sharing will fall into the category of Collaborative Treatment Intelligence (CTI) and will consist of meticulously organised data, combined with artificial intelligence (AI) and expert insight. It will be the catalyst for tremendous progress. Dentists of the future will no longer have to practise in isolation, nor will patients have to wait decades for good treatment solutions to reach their area. When good ideas are shared quickly, everyone will benefit (Fig. 1).

Fig. 1: A CaseCard detail view showing records sharing and a verified treatment timeline from CTI platform Polaris (OrthoScience).

Collaboration is giving back

Dentists are altruistic by nature. Given this natural inclination, one can say with confidence that every orthodontist hopes to play a part in elevating the specialty of ortho-
Our orthodontic work is what matters most. By studying our work—the successes and the failures—we grow much faster as a specialty. We learn to make better decisions. We learn more about what our appliances can achieve. When we share these lessons with each other, we all become better, faster. In turn, millions of patients benefit. This is the power of CTI. CTI will drive innovation. By using it, dentists will harness their collective power to revolutionise orthodontic validation, education, unification and commerce.

Why CTI matters: The big four

1) Validation

Validation of treatment solutions is important. It is why we do clinical research. All of us are looking for the best solutions (treatment approaches) to treat our patients’ conditions (malocclusions). What works best? What defines best? How will we know when we get there?

Well-organised treatment records provide the validation dentists need. Now that 3-D data can reliably quantify tooth movement relative to stable biological structures, dentists can finally examine their treatment results using truthful data. By using computer-assisted superimpositions, we can validate treatment effect in 3-D (Video 1). This new understanding of treatment efficacy will be significant in the growth of our specialty.

Technological advances over the last few decades have brought computer-assisted orthodontics to the forefront of our specialty. Digital orthodontics is now commonplace in nearly all orthodontic practices. Computer-assisted treatment, using 3-D data acquired from intra-oral scanners and CBCT imaging, has become the go-to option for many orthodontists. These advancements have resulted in wonderful improvements for many dentists, allowing them to become more efficient in delivering high-quality care.

However, the arrival of computer-assisted treatment has also created opportunities for misunderstandings, namely, the assumption that meaningful dentist–patient relationships might be reduced (or even eliminated),

Video 1: Three-dimensional dynamic superimpositions will change the way we understand treatment effect. Such validation will lead to significant advancements.
given that computers control so much of the treatment. We believe the opposite to be true: never before has the well-trained mind of an orthodontist been more important. Computers undoubtedly increase our clinical efficiency, but this newfound efficiency will be worthless without the well-honed clinical judgement of the treating dentist.

Dentists are what matter most in oral healthcare, and this becomes more obvious when we use data in smart ways. The abundance of data being acquired across the globe can be used to improve patient care for everyone. The objective of CTI is to combine data and an orthodontist’s crucial treatment decisions, to ultimately give all of us a better understanding of what it is we do. We think differences between varying types of orthodontic treatment are measurable, and when we use data in discerning ways, we can help differentiate our specialty where words alone often fail. We think this differentiation becomes even more important as direct-to-consumer tooth straightening products become more commonplace.

2) Education

Orthodontic education is struggling. Quality education still exists, but it is becoming more difficult to access as ever fewer orthodontists choose careers in academia. This means that many of the world’s top orthodontic teachers are now found in private practice, not in universities. This may be due in part to rising financial constraints for recent graduates, but many practising orthodontists still want to teach; they want to give back to their profession—if only it was easier to do so. CTI offers a solution.

Digital technology and improved data acquisition tools now make it possible for every orthodontist to become an educator. Digital inter-connectivity allows everyone to contribute to orthodontic education. Why can top clinicians not contribute simultaneously to every orthodontic residency programme in the world? If we can instantly share educational content with millions of connected devices across the globe, then we can certainly create a digital classroom in which learning happens on a global scale. CTI addresses this challenge by organising valuable digital content in smart ways and can improve orthodontic education for the next generation of orthodontists by providing every orthodontist with a continually updating digital global classroom.

For experienced clinicians, learning should always be at their fingertips, but with thriving practices and busy family lives, attending continuing education courses can sometimes be a challenge. Therefore, clinicians at any stage should be able to learn more about the latest techniques and appliances from the convenience of their mobile devices. But users need trusted content. They need content that complies with privacy laws (Health Insurance Portability and Accountability Act, HIPAA), and they need content in which theories and statements are supported by actual evidence. Words alone are no longer enough. Knowledgeable clinicians want proof in the form of validated casework. Sharing casework and ideas is what CTI is all about.

Given all of our inter-connectivity, learning should be easier. Science should be easier. When properly implemented, CTI provides thousands of trusted learning opportunities for clinicians, every day, all across the globe. Sharing globally creates a new way of educating (Fig. 2). The CTI approach will apply to young residents who are just getting started and to experienced clinicians who have been practising for decades. Let us all learn faster. Let us all share our good ideas. Let us all help everyone to grow together.

3) Unification

Orthodontics is becoming increasingly digital. Of course, patient contact will always be at our core, but orthodontists are using digital tools to diagnose and treat problems more than ever before. Education and information sharing are no different. Online social media are now responsible for a large amount of informal orthodontic education. But,
as in so many other areas of oral healthcare, it is fragmented.

CTI offers a solution to fragmentation by consolidating orthodontic information. Using global data in clever ways and organising it carefully can help us grow faster. Now that evidence, education and sharing can all be experienced digitally, we have fewer limitations. But it is important to provide a HIPAA-compliant platform on which searchable information can grow organically and exponentially. Everything in a CTI database must be tagged, organised and easily accessible, but most importantly, privacy and data protection must be of the highest calibre.

Imagine having one location where you can easily find everything you need to know about orthodontics and a speedy answer to your burning orthodontic questions. We imagine that having a well-designed CTI platform will be like having your own private orthodontic Facebook, Google and LinkedIn all rolled into one, except that it will be built specifically for orthodontists. Plus, if data can be presented using an easy-to-understand and easy-to-navigate user interface—one that makes learning fun and interesting—everyone will get better, faster.

4) Commerce

By examining the current world of e-commerce, now dominated by companies such as Amazon, Alibaba and eBay, it is easy to see that oral healthcare is lagging behind. The orthodontic supplies market, which provides orthodontists with the tools that they need to do their work, is surprisingly antiquated. With e-commerce rapidly becoming the expected norm for most consumers, the orthodontic supplies market is far behind. Many supply companies largely still operate using the door-to-door salesmen technique, whereby customer sales representatives introduce new products using cold-call office visits. These can be frustrating for both the sales representative and the orthodontist. There has to be a better way.

We think CTI introduces an opportunity whereby dentists and industry can develop together, organically. Dentists do not need or want industry suppliers “meddling” in their patient care. However, we do need their often exceptional appliance designs to do the work we love. Boundaries are important, but effective communication between dentists and industry is essential.

CTI provides a unique opportunity for dentists to share ideas in a private, dentist-only environment, but it also offers tools that bridge the gap between oral healthcare providers and industry suppliers. In the same way that the American Association of Orthodontists meeting brings together the lectures of the scientific sessions and the product displays of the exhibit hall, carefully designed CTI can marry these two often-competing enterprises by using dentist verification, privacy protection, rigorous science and intentional demarcation.

Historically, new orthodontic products have been introduced with little initial evidence of their efficacy. However, once in the hands of industrious clinicians, products are often taken to new heights—sometimes beyond initial expectations. We like to call this “organic validation” and we think it is important. Orthodontists want to use products that work. And they want to buy products that work for them—period. We think it should be easier for them to do both, especially when it comes to discovering new appliances.

When CTI reaches critical mass, orthodontists will have easy access to every orthodontic product on the market (Fig. 3). Imagine seeing a new product used by a clinician you trust. Once you have validated that a product is ready for use in your own office, you would be able to buy what you need with the click of a button. Or, if you prefer to learn more about that product in person, you would have the ability to summon a sales representative to your office, in your time, according to your agenda, and from your mobile device. Vetting new products will become easier than ever. This future world is not that far off.

Fig. 3: An example of appliance exploration on the CTI platform Polaris (OrthoScience). Doctors can search across brands for appliances related to orthodontic treatment. From an appliance page, they can link directly to casework that has used that appliance.
What does the future hold?

Three-dimensional data is the future. There is simply too much evidence and too much adoption to suggest otherwise. The benefit of this is that the 3-D data being acquired in dental offices every day, all around the world, can be instantly shared. This will be the foundation of CTI, and the reason it will become commonplace. Because the data is digital, it can scale quickly. If we develop methods to harness its power, our specialty will advance quickly. That is exactly what CTI is meant to do.

Recent clinical advancements in orthodontics have been significant. This has put our specialty in a very healthy position to offer better treatment. However, the direct-to-consumer movement, which seems to have a large number of orthodontists worried, has capitalised on some of this technology. Orthodontists need not be concerned in the long term. Achieving consistently good orthodontic results is difficult. Even simple cases can be difficult. So many things have to go right to have a well-finished case. Therefore, decision-making by knowledgeable orthodontists will never become obsolete. The intelligence part of CTI (a human trait) will always be necessary, and the expert insight of the dentist will be one of the most important parts of the equation (Fig. 4). AI is valuable, but it is never going to put smart dentists out of work. Therefore, orthodontists need not be concerned that they will be replaced by computers or laboratory technicians. Orthodontists are oral healthcare providers, and oral healthcare is not scalable. It will always require an expert dentist.

That said, computers and dentist-dependent CTI will rule the future. We need to accept that. There are certain things we do in orthodontics that computers can do better, and we should embrace that. Moving teeth more efficiently using computer technology should be something that we embrace as a specialty. However, knowing where to move that tooth is the important part. What final position will be the most healthy? What will be the most stable? What will be the most attractive? That decision will never be replaced by AI or computers. It is too complex and it is ever-changing. The more we learn, the more we will refine what we consider “best”. In the future, that process will be driven by CTI. And this iteration process of learning and growing and changing will forever be the nature of oral healthcare.

Conclusion

Orthodontists occupy one of the most opportune areas in healthcare. We are incredibly fortunate to have the luxury of treating our patients in the way that we think they should be treated. Compared with medicine, orthodontists have minimal constraints from outside interests aiming to sway our clinical decisions. This is one of the most valuable assets of our specialty and deserves our utmost attention and protection.

It is clear that data will be one of the most valuable currenccies of the future. By controlling their data, orthodontists will better control the direction of their specialty. CTI will be about giving orthodontists control. Understanding that our orthodontic work is what matters most will give us the power to maintain control of this crucial asset.

It seems clear that, as a specialty, we can protect our position as exemplary in oral healthcare. In the future, we will use CTI to grow even stronger. As we move forward into a new digital online era, smart dentists, using collaborative tools like CTI, will establish an even more exemplary position. This will likely lead the way for other areas of oral healthcare. Dentists are much more powerful together than when isolated. Given that CTI will lead to more of that unification, the future of our specialty is very bright.

about

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