

## Please tell us a bit about your background.

**LC:** Certainly. I earned my dental degree at Universidad Complutense de Madrid and my MSD in orthodontics and PhD from the University of Barcelona. In private practice in Barcelona, Spain, with my father since 1991, I also keep quite busy lecturing internationally and publishing journal articles. I serve as a contributing editor to the JCO and am on the editorial board of the AJO-DO. Things that drive me are innovation, elegant design and brainstorming that takes me out of my comfort zone. I'm always looking for simple solutions to complex issues.

## What or who made you choose a career in orthodontics?

**LC:** Both the 'what' and the 'who' of my most notable career influences are related to my father, Jose Carrière, DDS, MD, PhD. His passion for the profession and the joy his special brand of patient care gives him has always been my source of inspiration. He views the practice of medicine as much an art as a science. And he's taught me how creating a beautiful smile, good occlusion and facial harmony positively affects an individual's self-esteem and that there's a responsibility in the social importance orthodontists play in someone's life. I strive every day to emulate him.



## What got you interested in the design aspect of orthodontic appliances?

**LC:** Whenever I see inefficiency or discomfort, whether related to our patients, family or staff, I always try to envision possibilities for creating something that could work better. It's in my DNA, I guess. It may sound geeky, but it's just the way I think. It's where my mind always asks, what could I do to solve this? What would be more effective? It seems a little obsessive, I know, but it's this continual questioning that naturally led to orthodontic appliance design.

## Tell us more about your invention of the Carriere Motion Appliances and the Carriere SLX self-ligating bracket.

**LC:** Non-invasive treatment to resolve the sagittal aspect of malocclusions is essential to preserving or enhancing

facial harmony so offering appropriate nonextraction and non-surgical therapy is a cornerstone of our practice. But traditional non-extraction CL II correctors are cumbersome and uncomfortable for patients and most class III patients are strongly against the idea of surgery if they can avoid it. The notion for the Carriere Motion CL II appliance dawned on me first. It was sparked by my desire to give orthodontists an appliance that would resolve sagittal issues simply, with predictable results, reproducible in every patient.

When the idea for the CL II Motion hit me, I quickly carved it into a single piece of soap before it slipped away. I then worked with a friend to create a computer model of it and, later, engaged a university lab to generate a to-scale 3D silicone mould. I then got a local jeweller to fabricate a number of prototypes. Happy with its application in my practice, I contacted Class One, now Henry Schein Orthodontics (HSO), to make it available to the profession. The success of Motion CL II prompted development of the CL III version.

For the Carriere SLX bracket, I went directly to HSO. HSO's R&D team is top notch and the engineers are stimulating and fun to work with. Their state-of-the-art capabilities are remarkable. They use 3D appliance design, virtual simulation testing, additive printing,

# The orthodontic architect

With a passion for effectiveness through pioneering appliance design, **DR LUIS CARRIÈRE** tells us the fascinating story about how he came up with the idea of the innovative Carriere Motion Appliances and the Carriere SLX self-ligating bracket

## Fact file

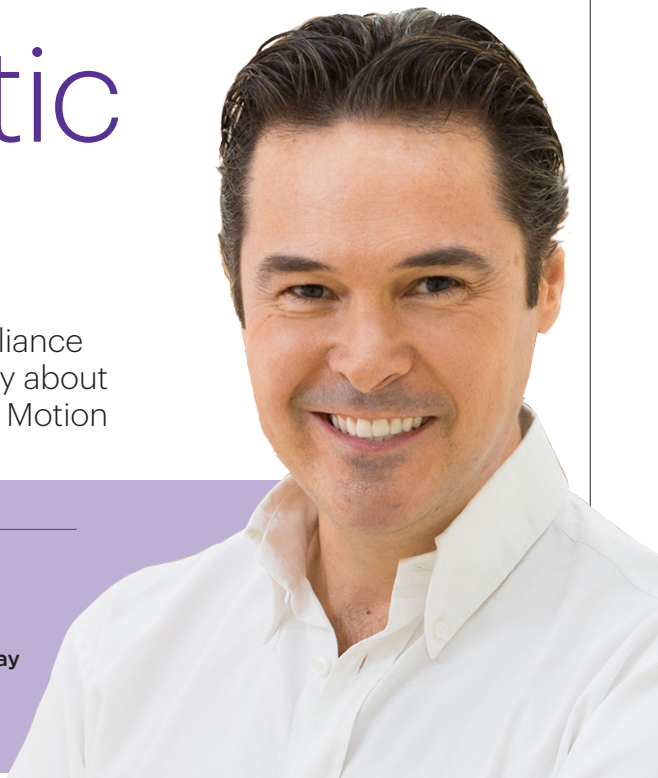
**NAME:** Dr Luis Carrière

**QUALIFICATIONS:** DDS MSD PDH

**POSITION:** Orthodontist

**DENTAL INTERESTS:** Importance of facial aesthetics in orthodontics, airway friendly orthodontics and TMJ in orthodontics

**INTERESTS OUT OF DENTISTRY:** Sculpturing, painting, photography, skiing, sailing and golf.





slow-motion videography and advanced manufacturing techniques. Each progressive step of their process brings another layer of precision to their work. Because of their detail orientation and conscientiousness, our appliances are beautifully designed and manufactured with great precision. They offer countless innovative features that ensure consistent and predictable clinical performance.

### What are the advantages of using this system?

**LC:** The Carriere system is biomimetic, minimalistic and non-invasive in its approach. One of its underlying philosophies is 'Sagittal First'. Establishing a class I platform prior to comprehensive orthodontic treatment, with either fixed brackets or aligners, simplifies treatment. It eliminates competing force vectors when A/P traction is employed concurrent with finishing treatment. After the class I platform is achieved, usually in three to four months, finishing to a high-quality result is easier and more efficient.

Each Motion appliance addresses its intended sagittal dimension to reduce either extractions or surgery while helping reposition the jaws in better relation to one other, balancing the relationship between the nose, upper and lower lips and chin for facial harmony. Both are biomimetic in function and consist of a small single-part design. This offers patients considerable freedom of movement for significantly greater comfort than traditional A/P correctors.

While Motion works together with the SLX bracket as a system, any fixed appliance or aligner system can be used to finish treatment. Motion now comes



not only in stainless steel, but a clear version for the ultimate in aesthetics as well as six different colours, which particularly appeal to the younger patient.

The SLX passive self-ligating bracket optimises the use of thermally activated wires in applying minimal force loads to move teeth. In a passive system, small, round archwires used at the start of treatment can express themselves freely without the binding prevalent in conventionally ligated brackets for superior patient comfort and tooth movement efficiency. The secret of this approach is its intention to deliver only the amount of force necessary to stimulate cellular activity for tooth movement without completely occluding the blood vessels in the periodontal membrane for optimal metabolic bone apposition and resorption.

### What are the specific advantages of each Motion appliance individually?

**LC:** The class II Motion appliance is based on the action of the human hip

ball-socket joint and employs a gentle and uniform force to reposition the mandible forward as a unit, in those patients needing it and controlling it with built-in stops for direct molar movement to the ideal position. This prevents over-rotations and unwanted tipping and can be an effective means of increasing a patient's airway.

CL III Motion likewise optimises the relationship between the maxilla and the mandible, both occlusally and aesthetically, by initiating a counterclockwise rotation of the posterior occlusal plane. This produces

a significant improvement in prognathic profiles thus minimising the need for surgical correction. Again, the goal of each of these appliances is to minimise invasive treatment while creating facial harmony by positively affecting the patient's skeletal, postural, functional and dental dimensions.

### And, finally, tell us about your practice in Spain.

**LC:** My father opened the Carrière Clinic in 1979. The concept for it is comprehensive in scope. The clinic operates on three floors with the other two floors dedicated to fostering a collegial environment for hosting orthodontists and other specialists to share knowledge. The décor (and here's a nod to the importance of design again) is contemporary and sleek yet comfortable.

It's an ideal setting for networking, for developing interdisciplinary case approaches and for conducting research. The space lends itself to supporting our commitment to advancing the profession while having fun doing it! [OP](#)