

Solved: occlusion confusion

Occlusally confused? **Ken Harris** was, overwhelmed by the plethora of conflicting theorems. Here he shares what he has learnt from much education, particularly John Kois' three-step protocol, which has brought clarity to his thinking

Is it just me or are we seeing patients with more complex restorative needs than we did a generation ago? Full mouth reconstruction could almost be considered routine treatment in practice today. These cases can appear so daunting it is problematic just deciding where to begin, let alone how to complete the task. Equally, little or no guidance seems to be forthcoming as to when treatment might be deferred, or perhaps not carried out at all.

How long will it last is perhaps the most common question posed by patients and dentists alike when these cases are restored. Academic colleagues recommend every large case we restore should be fitted with a correctly adjusted, full coverage hard acrylic splint. This immensely complex device requires significant time and skill to fit and significant laboratory bills, but do our patients wear these appliances anyway? Full coverage gold on all posterior teeth may be another approach, but this could be considered over-treatment and furthermore, the days of patients accepting gold teeth, at least in my practice, are very much numbered. Consequently, I have been searching for a simple and reliable system that I can use in my daily practice with some degree of predictability as to the outcome.

So many theorems

There are plenty of occlusal theorems and concepts on offer, with each dogmatic group drawing up battle lines and building spectacular temples of study to propagate their beliefs with almost missionary zeal. Feelings run surprisingly high in this confrontational environment, and peaceful open debate is not easily found. I suspect progress in occlusion has perhaps been held back in this battle of egos.

I well remember a group of otherwise sensible middle aged-men whose fighting years, it is fair to say, were well behind them, literally squaring up to each other during a heated discussion at the AACD conference in Vancouver some years ago; a situation that is apparently not uncommon in the USA.

I felt perhaps somebody needed to draw all these conflicting and yet still remarkably similar theorems together into a usable method. Eventually I was lucky to attend a lecture by Dr John Kois at yet another AACD conference. Dr Kois has a huge following in the USA and his down-to-earth approach and willingness to listen to all the evidence without prejudice has rightly built his reputation. He teaches

an evidence-based yet wonderfully simple occlusal process that actually works.

Unlike many occlusion gurus, Dr Kois does not write textbooks as he feels they would be out of date by the time they came to press. He is renowned for never resting on his laurels, with each lecture always guaranteed to have something new. The absence of a high-profile textbook may explain why he is relatively unknown over here, and of course he has very rarely lectured in the UK either. However, he does run a highly regarded teaching programme at his purpose-built facility in Seattle and I have been privileged to study there on many occasions in recent times, aiming to complete the cycle in the summer.

Just three steps

Dr Kois has managed to classify and as a result, simplify the treatment of occlusal problems. He teaches his system describing just three steps, which he terms P1, P2 and P3. In strict order he teaches us to position the condyles into a stable position (P1), then balance the posterior tooth contacts in maximum intercuspation (P2) and finally build the anterior tooth guidance (P3) so it falls within the 'envelope of function'. Each step should be completed before moving to the next.

Step one

The first step in common with all occlusal philosophies is to locate and record a stable and reproducible jaw joint position. Most agree this position relates only to the jaw joint, and has nothing to do with teeth. Some people refer to this as centric relation (CR), others as the myocentric position, and some feel the position the jaw joint adapts at habitual closure is the acceptable position. The decision as to which jaw joint position to use is probably the major area of conflict between the differing occlusal theories, and many methods of varying complexity have been described to achieve this position. Dr Kois uses his own deprogramming device known as the Kois Deprogrammer to record this position, which may or may not be classical centric relation, but the recorded joint position has to be reproducible before it is accepted. Using the Kois Deprogrammer, this stable, reproducible position is not achieved by the dentist guiding the mandible into place with his hands on the patient's jaw, but rather it is passively achieved by the patient closing



Figure 1: A common sight



Figure 2: Anterior wear treated



Figure 3: Bimanual manipulation

unassisted along the arc of closure following a period of deprogramming. Like other approaches such as when using a leaf gauges or lucia jig, the interocclusal relationship is then recorded with the teeth slightly apart so the teeth are not involved. After this stable position, which Dr Kois calls P1, has been established and recorded with interocclusal records, we can proceed to step two.

Step two

In contrast to step one, which is the subject of much heated discussion, step two is perhaps the area where most experts would agree. We are looking for stable, equal intensity, bilateral contacts on the posterior teeth in full closure. This is a solid, stable and again reproducible position, this time relating to the posterior teeth. It is popularly described as when centric occlusion (CO) equals centric relation (CR), and although current terminology may no longer accept this description, it is still in common use in the UK. Dr Kois calls this position 'home', and he terms it P2. 'Home' is the basis for occlusal stability and for Dr Kois, its accuracy is deemed more important than the accuracy of the jaw joint position described in step one. However, if the teeth do not meet equally at the 'home' position, it is difficult for the mandible to close into it consistently during chewing, so a process of tooth adjustment is often necessary to create a 'home' that is easily found. To create this stable position, either classical equilibration or a process of additive occlusal surface restoration may be needed, but more often than not a combination of both is indicated to create stable holding contacts. We now have step one and step two completed.

Step three

Apart from parafunctional patients, our teeth remain apart most of the time, but because occlusal function is dynamic, a guidance system is needed to help the mandible smoothly close from open into the tooth supported 'home' position of step two in order to complete the chewing cycle. This system has various terms such as lateral guidance, canine

guidance, and protrusive guidance and it involves the anterior teeth functioning as guides for mandibular closure during chewing.

Using articulators, I was taught that the function of anterior guidance was to separate the posterior teeth during function with the canines separating the posterior teeth during lateral excursion, and the incisors doing the same during protrusive movements. For years I had mounted models on articulators, moving the lower model side to side, pushing it against the upper model, usually with red articulating paper between the casts. My goal was to create smooth red lines on the palatal aspects of the upper anterior teeth, aiming to disclude the posteriors. I would then ask my patients to make the same movements with their own teeth as I had made with the articulator. It was no wonder they struggled to both clench and slide at the same time as this difficult and unnatural movement just does not occur in nature, except in parafunctional patients, and these parafunctional patients show a classical pattern of tooth wear as a consequence.

However, Dr Kois reminds us that we actually chew from an open to a closed position, and that the mandible moves from outside to in during the process, and not from inside to out as we study it upon articulators.

In effect, the upper palatal tooth surfaces contact the lower labial surfaces of the anterior teeth as the jaw closes, thus directing the mandible to locate the stable 'home' position termed P2. Dr Kois refers to this guidance system as P3.

Envelope of function

The way in which Dr Kois directs us to study guidance pathways by recognising the jaw moves from outside to in during function is a real paradigm shift. He reminds us the habitual chewing pattern (envelope of function) is a three-dimensional movement of the mandible with horizontal and vertical components, which ideally keeps



Figure 4

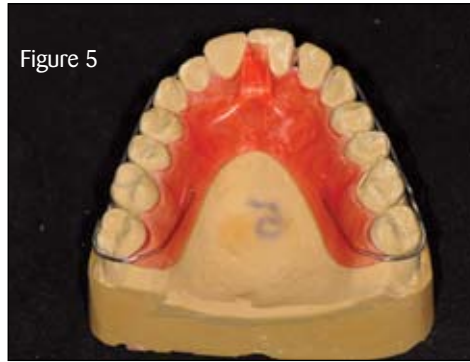


Figure 5



Figure 6



Figure 7

Figure 4: It can't be that difficult **Figure 5:** The Kois Deprogrammer **Figure 6:** Not such an easy case **Figure 7:** Traditional dots and stripes

the functional mandibular movements within the confines of the established tooth arch space. Among others, Dr Kois considers the envelope of function to be a consistent and unchanging movement pattern generated from the higher centres. He suggests we should restore teeth with reference to this in-built pattern of movement and any teeth that obstruct the path of the moving mandible are subject to forces producing wear and/or mobility. Equally, any restorations we inadvertently place in the way of this envelope of function will eventually fail too.

It is still advisable to mount study models correctly on articulators to allow detailed examination of the occlusal system, and most authorities would still agree immediate posterior disclusion is still desirable during lateral movements thus preventing working side and non-working side contacts. Many experts still suggest using the canines to achieve this disclusion, though not all; I'm thinking of the concept of group function. However, once studied on the articulator, Dr Kois does not ask his patients to duplicate in the mouth the movements we dentists make with the articulator.

A full understanding of the concept of envelope of function is of course important when considering this concept, and Dr Kois teaches it admirably well.

Learn from the master

Dr Kois will no doubt explain the entire process in much greater detail when the man himself speaks in London later this year. I cannot promise any fisticuffs, but I still urge you to take this opportunity to listen to a clear-thinking teacher who helped resolve my own 'occlusion confusion'. [PD](#)

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Dr Ken Harris BDS MFGDP(UK) maintains a fully private practice in Sunderland in the north east of England focusing on cosmetic dentistry and complex reconstruction cases. He is an accredited member of BACD, a sustaining member of AACD and holds full membership of BAAD. He is a UK mentor/instructor for the California Center for Advanced Dental Studies (CCADS) and has for many years been a senior UK clinical instructor for the Rosenthal Institute's Aesthetic Advantage in London. Ken is scheduled to be the first UK graduate to complete the nine-stage continuum studying with Dr John Kois in Seattle in the summer of 2008. He can be contacted on info@riveredge.co.uk.

John Kois is coming to the UK!

John Kois will be coming to London to present his seminar called, 'Functional occlusion' on Monday

19 May 2008 at the

Royal College of Physicians. To book your place, call event organiser Independent Seminars on 0800 371652 or visit www.independentseminars.com. Delegates will earn seven hours' verifiable CPD at this event.

