

Interview with Prof. Dr. Norbert Krämer: SmartLite Pro

Prof. Dr. Norbert Krämer is the Director of Pediatric Dentistry at Giessen University. He has been working with the new SmartLite Pro curing light from Dentsply Sirona for around four months. We asked him about his first impressions, especially with respect to use of the device in pediatric dentistry.

Question: What properties are you particularly interested in when selecting curing lights?

Prof. Krämer: For me, one important criterion is consistent performance. I prefer LED lights, as these lights show less loss of performance. Today, a light should offer homogeneous light distribution and a capacity of at least around 800 to 1,200 mW/cm² – the SmartLite Pro from Dentsply Sirona is within this range.

Another important point when selecting a light is the size of the light-emitting window. The minimum should be 10 mm in order to cover the entire occlusal surface, e.g. when sealing molars. The SmartLite Pro scores well on this count as well.

For me a third criterion, especially for pediatric dentistry, is the size of the head. It may not be too bulky in order to allow the light to reach the tooth, in case the mouth cannot be opened widely.

Question: LED technology has been the standard for curing lights for around ten years, but there are big differences among the units on the market. What do you consider to be the specific advantages of the SmartLite Pro?

Prof. Krämer: The light is ideal for pediatric and adolescent dentistry – my specialty. It is small and easy to handle, but very effective. Thanks to the small head, it can also be used on deciduous teeth. It has a high light output. With 1,200 mW/cm², we are in a range where we can easily cure sealants, fillings and adhesives in 20 seconds.

For me, the modular system with the transillumination tip is interesting. Especially in pediatric and adolescent dentistry, we need to detect initial carious lesions. Fiberoptic transillumination (FOTI) plays an important part in this.

Question: You mentioned the even, homogeneous light distribution and a large active curing diameter. Why are these properties so important?

Prof. Krämer: Because the composite or adhesive is not cured outside of the curing diameter, lights with smaller curing diameter must be applied several times with overlapping exposures. A sufficiently large active curing area thus equates to considerable time savings while the curing quality remains the same. Especially in pediatric and adolescent dentistry, we often have situations where larger areas and surfaces need to be cured.

Question: Some manufacturers advertise extremely high output (more than 2,000 mW/cm²) and very short exposure times (5 sec. or less). What do you think about this?

Prof. Krämer: I am very skeptical, because there can be optimal light output only when the light is correctly positioned over the cavity and then switched on – and it may not be moved afterwards. However, that is a problem in daily practice. Frequently, the light is switched on earlier and taken out again too soon. The remaining effective light output for the cavity is then insufficient which can lead to undercured resins



Especially in pediatric and adolescent dentistry, you have to consider that the patient may move their head so the light is moved out of position during curing. But if the light-emitting window does not cover the entire area to be cured, this results in a light deficiency where it is necessary – in the cavity.

However, it is true that there are several lights on the market today that can ensure sufficient curing for special composites, adhesives and flowables in a short time. But there is not enough clinical experience with these lights. Up to now, only data from laboratory studies are available, in which the factors mentioned above had no effect on the outcomes. I tend to be conservative before giving recommendations for shorter curing times.

Question: SmartLite Pro also has a transillumination probe for detecting caries. How would you assess this modular concept, especially in view of the clinical benefits? What added value does this tip have in combination with an X-ray?

Prof. Krämer: I first became aware of the SmartLite Pro because of the possibility of transillumination. The whole system is modular and can also be used for other applications, such as caries diagnostics as in this case. And we anticipate that additional probes will add other applications, e.g. support for gentle caries excavation.

For me, transillumination is an important aid for detecting proximal caries or showing cracks in teeth after trauma in order to use a targeted treatment approach.

Science tells us that transillumination is good for enamel caries diagnostics up to the enamel-dentine junction. And this is the precise area where pediatric and adolescent dentistry works. This means that we make the initial diagnosis, we see the first signs of caries and we have to decide whether invasive filling therapy is indicated or whether the enamel lesion can still be stabilized non-invasively. I think transillumination plays a very important part in this.

FOTI is also an excellent aid for deciding whether to expect dentine caries over the course of treatment and whether an X-ray will be necessary. The X-ray image gives me additional information on how far the caries has progressed in the dentine.

Transillumination is thus an important tool for clinical diagnostics. This is a clear added value. Psychologically as well. There are naturally many parents who ask whether an X-ray is really necessary. If I can explain to them where I see caries using transillumination – in particular with this device and the high light output – it is very convincing. I also like to use an intraoral camera to show parents the defect.

Question: What distinguishes transillumination with the SmartLite Pro from other devices you have previously used for this indication?

Prof. Krämer: The SmartLite Pro has a very well made metal housing of the transillumination probe. This means that I have a much more collimated, intensive light compared to the other devices I have used in the past – and thus also a much stronger illumination of the proximal space. This can be seen in intraoral images I take. I don't have to edit them or use a flash in order to make enamel caries readily visible up to the enamel-dentine junction in the photo.

I am very happy with the light output of the transillumination tip on this device. It costs more, but the benefit is worth the money.

Question: What role does the pen-style design without a curved light guide play for you in clinical applications?

Prof. Krämer: As I said, for me in pediatric dentistry, a small probe is key – and the SmartLite Pro offers precisely this. If you look at the fiber optical light guides of other devices, they are bulkier at the



tip. Due to the curved design, these lights are also a bit higher, which can cause problems at the occlusal surfaces of the teeth at positions 6 and 7. So the straight design of the SmartLite Pro also has a clinical advantage.

Prof. Krämer, thank you for the interesting discussion.



Images



Fig. 1: Young patient with enamel caries at tooth 11 mesial



Fig. 3: In the 9-year-old patient, it was not clear clinically whether there was proximal caries in the space between tooth 55 and 54. The buccal retentions indicate the ongoing orthodontic treatment.



Fig. 2: Transillumination shows the extent of the caries at tooth 11 mesial limited to the enamel. In addition, several superficial cracks are easily detected using FOTI.



Fig. 4: The tooth must be clean and dry for diagnostics with FOTI. The OP lamp must also be turned away.



Fig. 5: In caries diagnostics with FOTI, a slight opacity can be seen at tooth 54 distobuccal. The dentine does not appear to be affected by the change.





Fig. 6: Young patient with molar incisor hypomineralization. The filling at tooth 16 had to be repaired 10 years after the primary treatment.



Fig. 7: Both the adhesive and the composite material were cured with the SmartLite Pro. The optical fiber covers the entire occlusal surface.



Fig. 8: Tooth 16 after placing the restoration and before occlusion check.

