

ORAL ENDOSCOPE

Operate while looking at a monitor

Thanks to the most advanced technologies and lessons obtained from the experiences in other medical sectors, now also the dentist can work in a more specific and less invasive way. Resulting in an improvement in quality of the cure, a reduction of problems caused by bad posture & poor visibility and favouring a major comfort for dentist as well as for the patients. INSIDE, an endoscope studied for the dental sector, makes it possible.

To get a first impression about the product and its advantages we have interviewed the **Project Manager** of the company Faro Spa; **Emiliano Bacco**, responsible for the realization of the INSIDE endoscope.

How is INSIDE originated?

The INSIDE endoscope is originated from our efforts to find solutions for problems like poor visibility and bad posture that in principal all derive from accomplishing accurate proceedings in areas of the mouth difficult to reach. For the project we have taken experience from other medical sectors where the endoscope has become an indispensable instrument and interventions observing your activities on a monitor by means of an endoscope, is by now daily practice.

The INSIDE endoscope combines the advantages of the previous possibilities of magnification. That is, it contains lenses like the optic part of the microscope and a sensor like the electronic part of an inter-oral camera. The attachment of the endoscope on an articulated arm guarantees image stability and frees the hands of the dentist. Thanks to these characteristics the INSIDE endoscope is the first oral instrument that supplies the combination of an optimal image quality as well as an instrument easy to use for all normal activities.

What is INSIDE and how does it work?

INSIDE is an oral endoscope and is the result of 5 years of study of our Research and Development centre in collaboration with dentists on international level. By means of dedicated electronics and an optic system, it is possible to rotate the image and moreover to mirror it in a way to make the image coherent with the movements of the hand. That is, what you see on the monitor is the point of view of the endoscope. This means that normally spoken the movements that you see on the video do not correspond with the movements thought and this creates difficulty in its use. The result of the coherency of the INSIDE endoscope is that you see your hand going to the right on the monitor when your hand is moving physically to the right. Moreover the endoscope is provided with special protection equipment containing a cleaning system that guarantees a continuous brush of compressed air on the mirror, as if a syringe is continuously blowing on it. This keeps the mirror clean from dirt and water thanks to which also in critical conditions clear visibility on the monitor is maintained.

Performance

The INSIDE endoscope system works with indirect vision. Therefore magnification factors may vary depending on the distance between the endoscope & the object filmed and moreover on the size of the monitor used. Regardless of the type of monitor used, the INSIDE system has a fixed resolution of 0.065mm. Furthermore there is a working distance between 25mm-60mm. With the working distance we mean the distance between the object and the endoscope, offering the best image quality. The illumination of the image is compensated automatically by the Charge Coupled Device that analyzes the central part of the field in a way that the monitor presents the right balance

between light and shadow. Thanks to sophisticated optic systems “3 dimensionality” of the image is obtained and thus shows contrasts. The illumination is obtained by a LED at high intensity associated with a optic fibre that generates a circular crown around the lens, guaranteeing uniform lighting. The light source is a white mono-LED with cold light with a colour temperature of 6500°K and provides good illumination. Moreover is stable and long lasting over time. We do suggest however the use of a dental light to correct the colour temperature to 5000°K, the temperature of sun light.

In which way does INSIDE improve the work of the dentist?

The INSIDE endoscope magnifies the zone to treat up to 20 times and permits to operate in a more accurate way within the oral cavity, reaching also the most difficult points. Moreover it allows the dentist to sit in an upright position looking at a monitor while operating. This resolves problems like the limited visibility of the operation field, the risk of cross contamination and also the problems caused by bad posture of which, according to a recent research led on European level, suffers 65 % of the dentists. The articulated arm guarantees image stability and freedom of movement for the dentist and is also very suitable for shooting images. While the auto sufficient lighting enables you to create a more comfortable environment for patient and doctor, although we do advise to use a dental light especially when colour is important. The endoscope is moreover adjustable and can reach the entire operation area which makes it possible to place the patient in a more comfortable position and does not need to assume particular positions. This new working position is above all an advantage when treating elderly and children. Working by means of a monitor creates also a lot of communication possibilities between the dentist and the patient as well as between dentist and assistant. Looking at what’s happening the assistant is able to anticipate on the demands while it gives vision and understanding of problems during the visit and interventions. The photographic system and shooting improves the communication with the patient during the treatment. Furthermore it allows the patient to follow the procedure. The dentist can really indicate to the patient what type of work to carry out and allows the dentist to demonstrate the result of his activities.

Learning process

Knowing how to place the endoscope for the best visibility and how to adjust the image for coherent movements requires practice. To enable immediate usage we organize a free course, have handbooks and supply a phantom to practice for a month. Since the endoscope is mounted on the articulated arm that has all the control functions integrated, it is possible to acquire the new working method gradually passing from removing tartar to finally surgery. Besides we want to stimulate the users of the INSIDE endoscope to participate actively on our website to exchange & gather information, to inform colleagues about their experiences and to propose further possibilities & application methods. In the end, the learning process depends above all on the will and the necessity of the user.

The future with INSIDE?

Though INSIDE does not change the working technique, it is a new way of working which, like all great steps forward in technology, demands: predisposition to the novelty, curiosity and a constant use. Universities and distributors certainly can play an important part in divulging and make accessible the innovative technology stimulating this way a pass forwards in quality in the dentist profession. Moreover we are more than pleased to demonstrate the system and to organize a course to get to know the possibilities and the advantages that creates the use of INSIDE.