حكمة

دقاتُ قلبِ المرءِ قائلةً له

إن الحياةَ دقائقٌ وثواني

فارفع لنفسك بعد موتِك ذكرها

فالذكرُ للإنسانِ عمرٌ ثاني

Advances in diagnostic aids

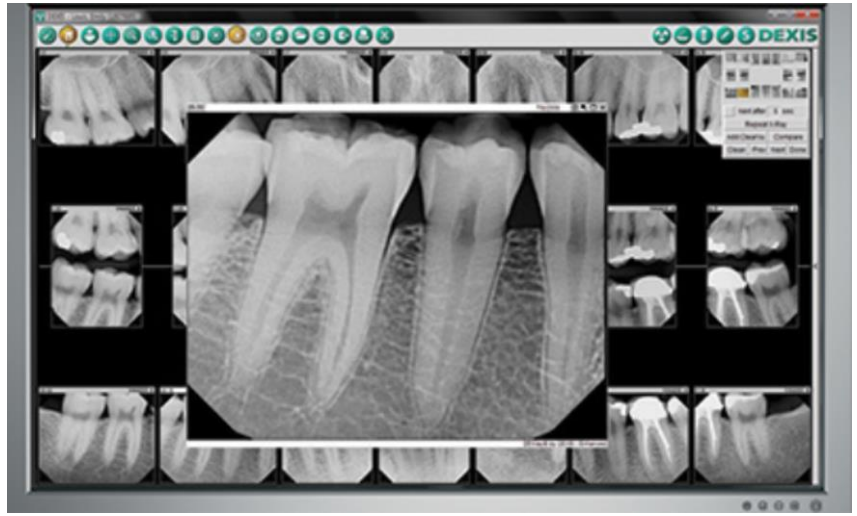
- هبه نافع ياسين .م

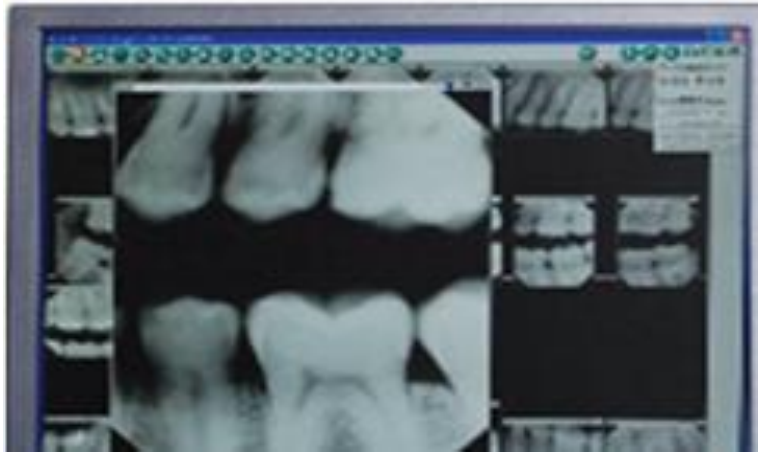
Advances in Pediatric Dentistry

- Advances in pediatric dentistry have led to improved treatment for children with cavities, gingival disease, and other dental problems. New technologies such as digital X-rays, laser treatments, and 3D imaging have made it easier for pediatric dentists to diagnose and treat dental issues quickly and accurately. In addition, advances in dental materials have made it possible for pediatric dentists to provide more comfortable and aesthetically pleasing treatments.

Advances in diagnostic aids
I-Digital radiography

- Is a filmless technique for intraoral radiography, utilizes very little of the radiation to which the patient has been exposed and avoid the need for developing films. This technique has offered the potential to increase the diagnostic yield of dental radiographs.





I-Digital radiography

Advantages

1– The image is displayed immediately and no need of processing

2– Reduction in radiation dose

3– Digital manipulation of the image is possible to enhance the viewing

4 – It can be used as a visual aid to be shown to the patient on the computer screen

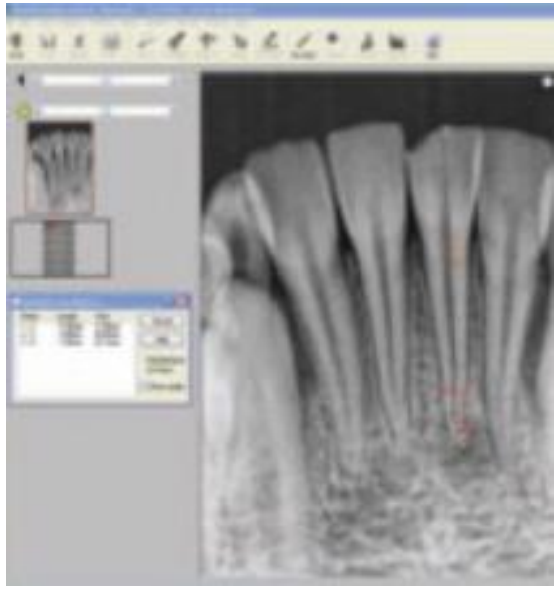
5 – It increases the confidence and credibility in the treatment-decision making process.

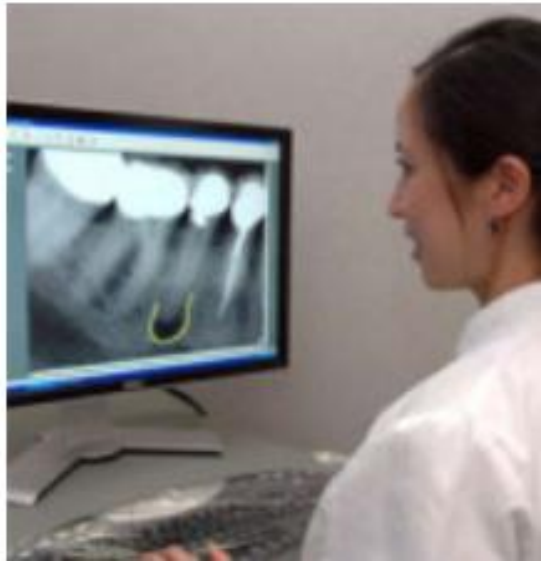
• ***Disadvantages***

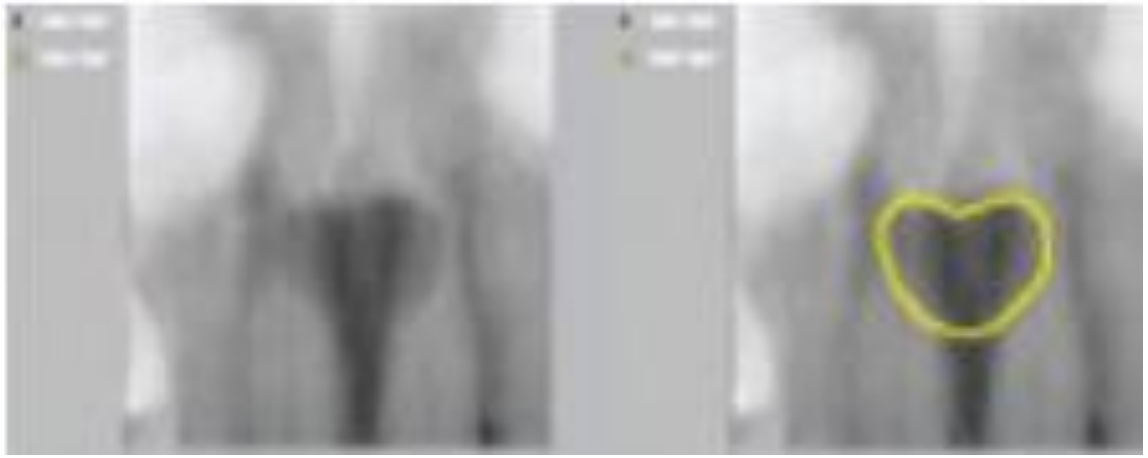
1 – The rigidity and thickness of sensor can cause discomfort to the patient

2-The lifespan of sensor is unknown

3– High initial system cost



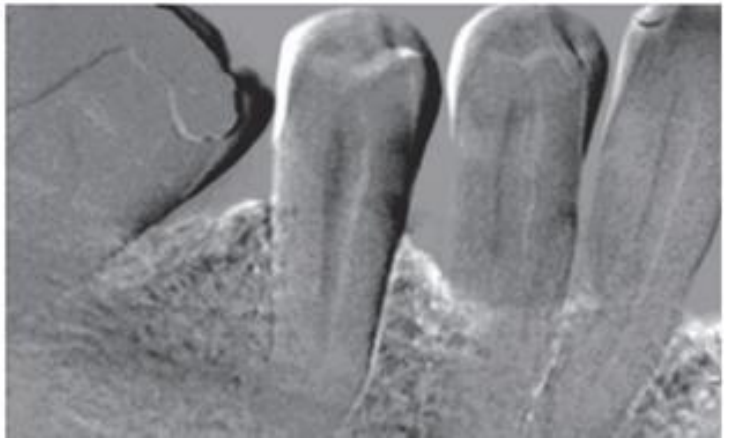




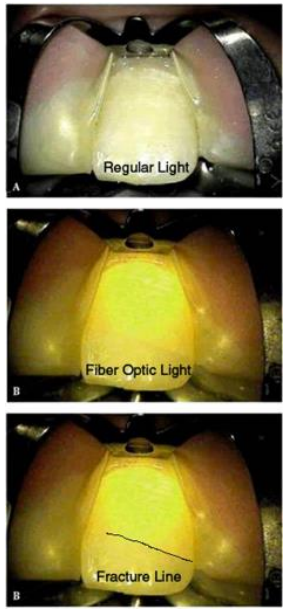
II- Digital Subtraction Radiography (DSR)

- ***The procedure*** is based on the principle that two digital radiographic images obtained under different time intervals,
- If the two digital images are identical, this method will produce an image without details (the result is zero).
- When there is caries progression, the outcome will be a value above zero (increase in pixel values).
- In case of caries regression, the result is opposite, and the outcome will be a value below zero (decrease in pixel values)

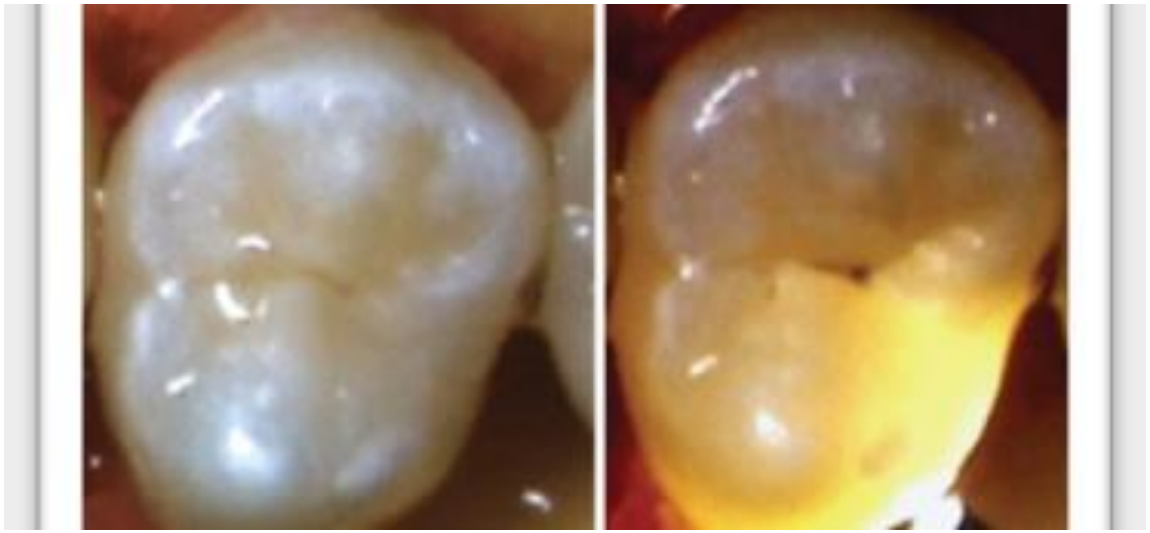
- • The major disadvantage of this technique is very sensitive to any physical noise occurring between the radiographs and even minor changes leads to large errors in the results



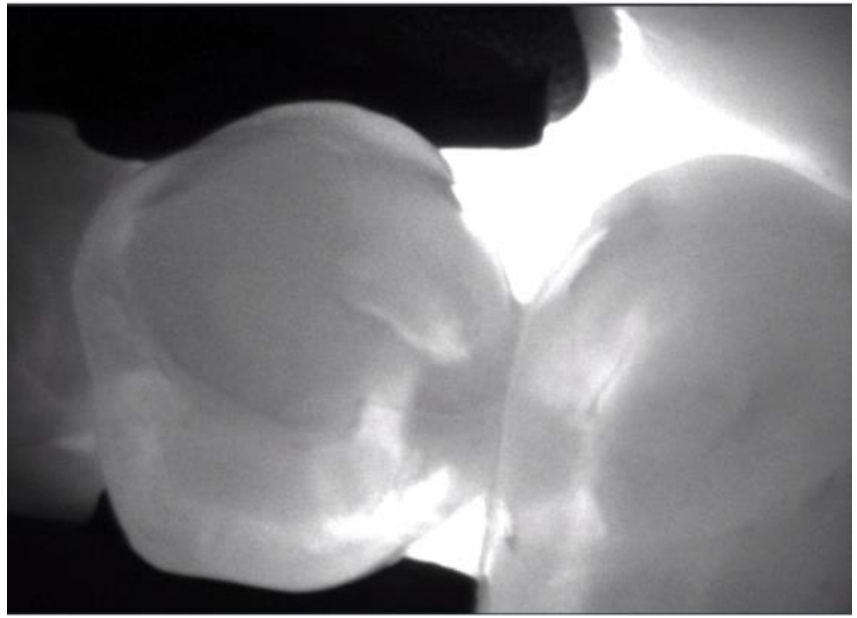
III- Fiberoptic Transillumination



- It is a practical method of imaging teeth in the presence of multiple scattering. The illumination is delivered via light source to tooth surface. The light propagates from the fiber illumination across tooth tissue to nonilluminated surfaces. The resulting images of light distribution are then used for diagnosis. Carious area appears as darkened shadow that follows the decay. It is used for diagnosis of caries and identification of necrotic canals.



VI-Digital Imaging Fiberoptic Transillumination



- This is a new method for detection of dental caries in which the images of teeth are obtained through visible light fiberoptic transillumination and digital CCD camera. These images are then sent to a computer for analysis with specific algorithms. These algorithms are developed to facilitate the location and diagnosis of the carious lesion and provide quantitative characterization for monitoring the lesions.
- It can indicate the presence of incipient and recurrent caries even when radiological images fail to show their presence

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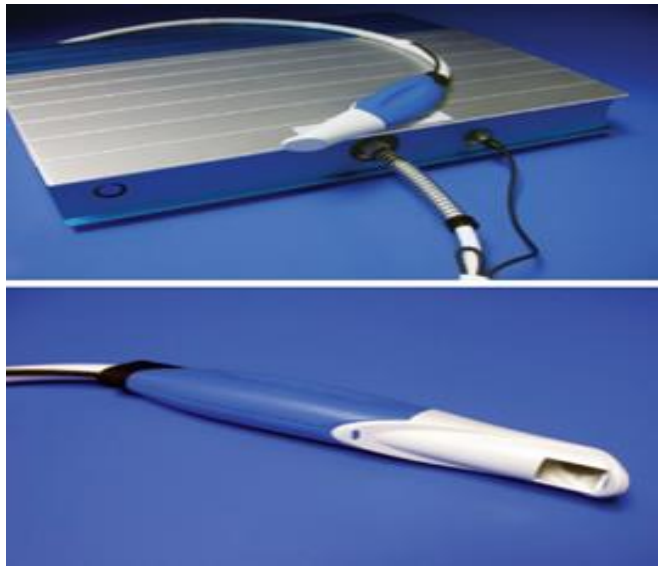
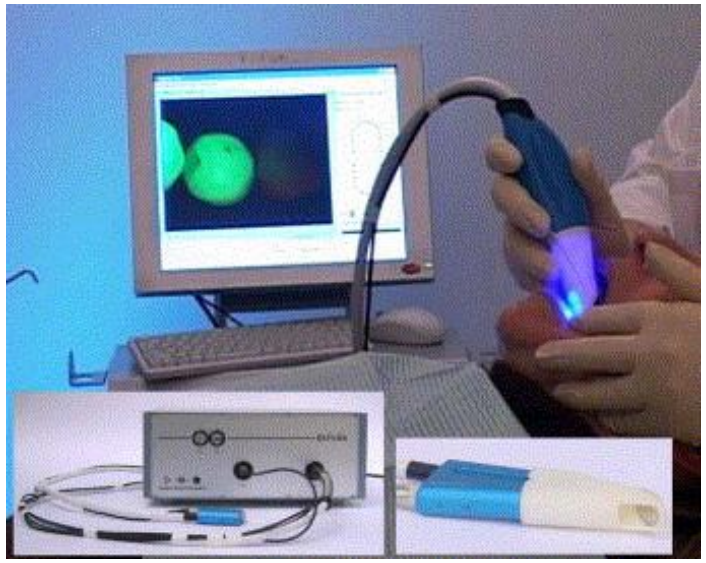
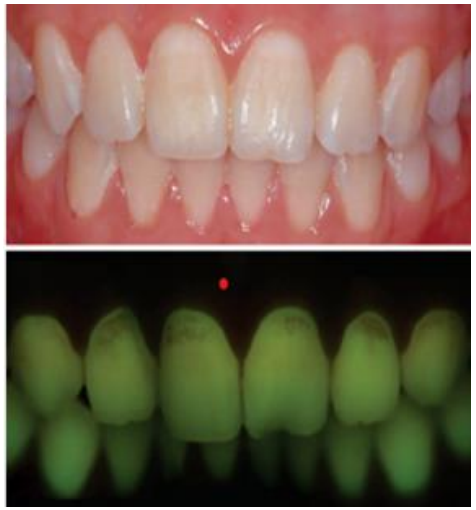
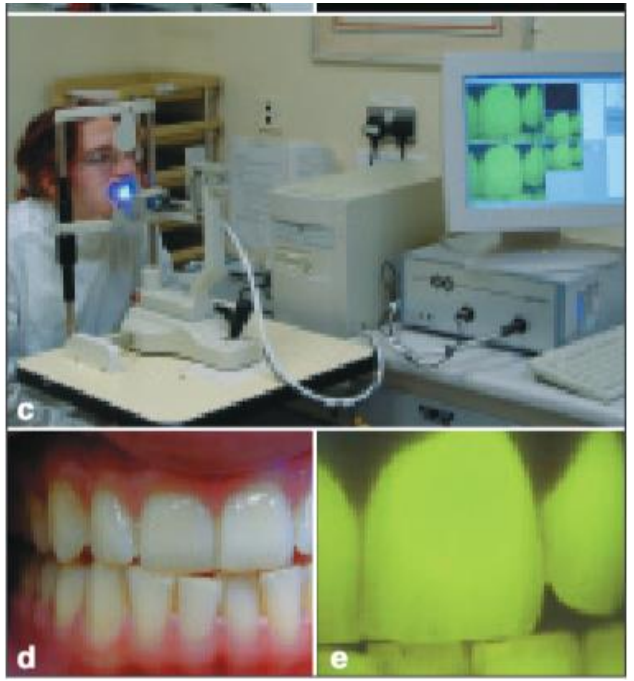
V-Quantitative Light-induced Fluorescence





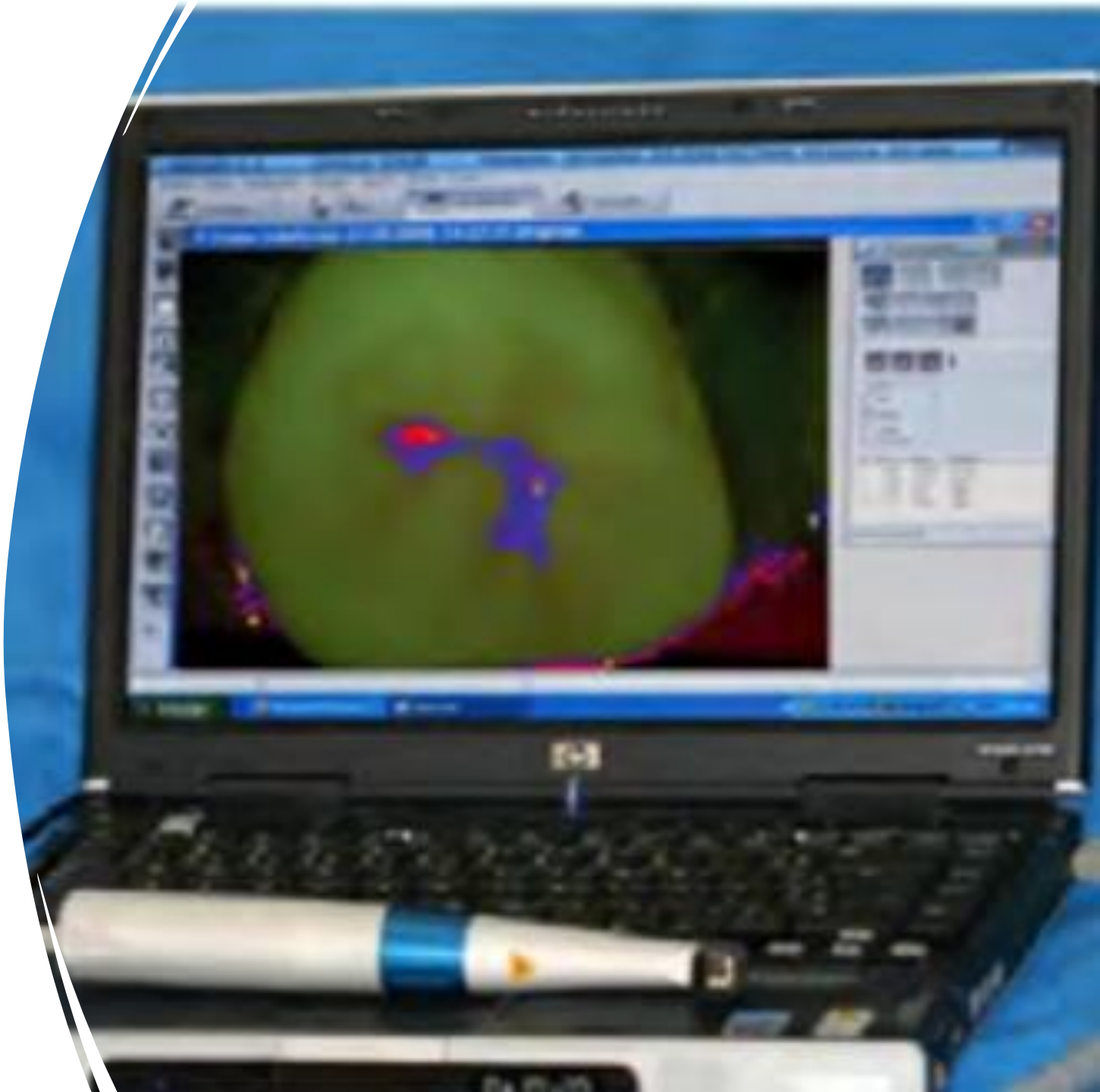
- The QLF equipment is comprised of a light box containing a xenon bulb and a handpiece, similar in appearance to an intraoral camera. Live images are displayed via a computer and accompanying software enables patient's details to be entered and individual images of the teeth of interest to be captured and stored .The software uses the pixel values of the sound enamel to reconstruct the surface of the tooth and then subtracts those pixels, which are considered to be lesion.
- • ***Advantages*** detection of small incipient lesions in enamel and dentin, image storage and transmission and can act as motivational tool for patient.
- ***Disadvantage*** is that it is an isolation sensitive procedure.





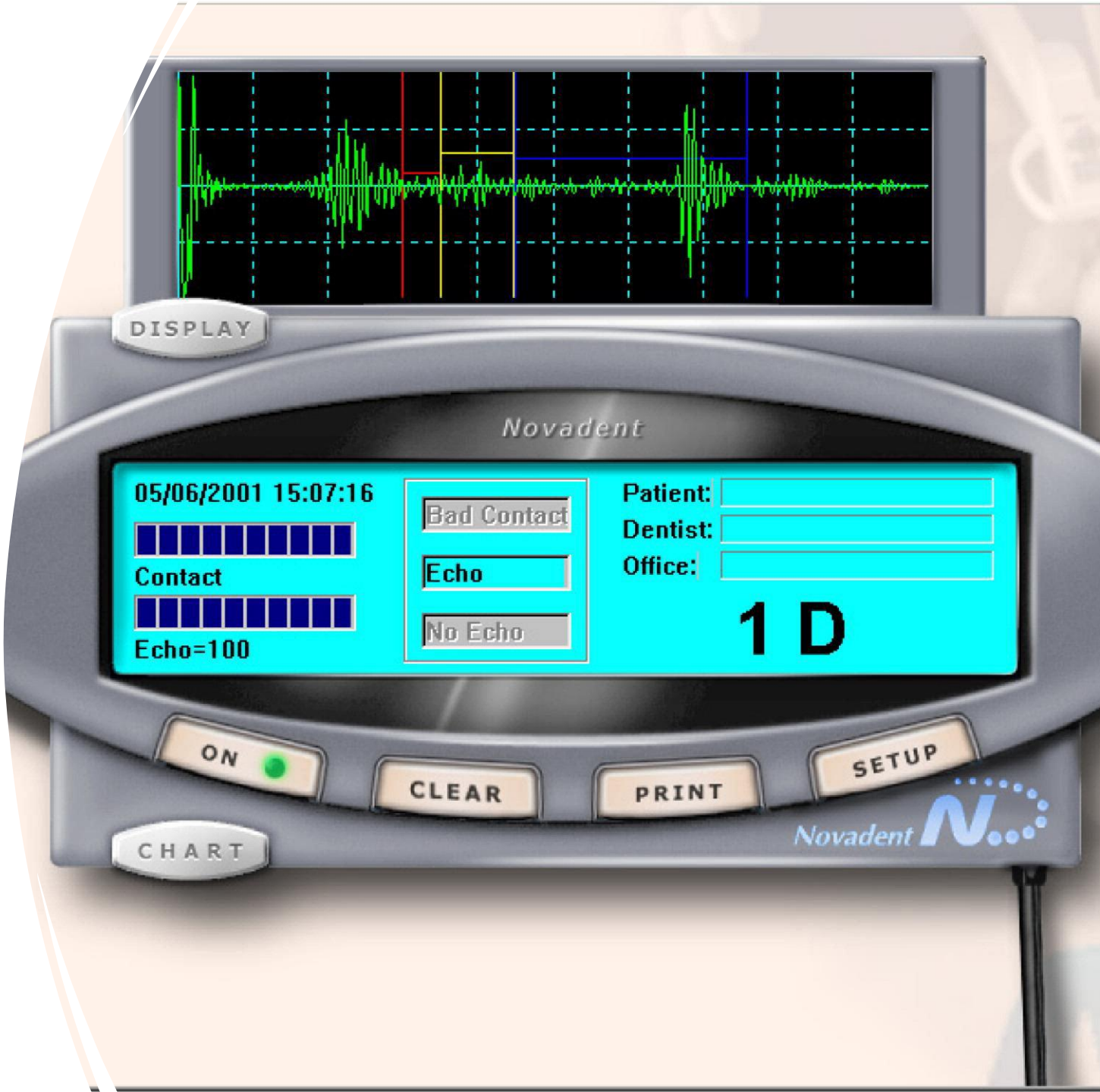
VI-Fluorescence Camera (Vista Proof)

- This device is an intraoral camera which consists of six blue LEDs emitting a 405- nm light, charge couple device (CCD) sensor and software for analysis. With this camera it is possible to digitize the video signal from the dental surface during fluorescence emission using a CCD sensor. On these images, it is possible to see different areas of the dental surface that fluoresce in green (sound dental tissue) and in red (carious dental tissue).
- • ***Advantages*** include motivation for patient and storage of data



VII-Ultrasound Caries Detector

- This is a new ultrasonic proximal caries detector that works by transmitting surface ultrasonic waves. The ultrasound caries detector (UCD) device is based on pulse echo method and has software, hardware and transducer as components.



VIII-Midwest Caries ID (LED technology)

- This technology utilizes a handheld device which emits a soft light emitting diode (LED) between 635 nm and 880 nm and analyzes the reflectance and refraction of the emitted light from the tooth surface, which is captured by fiberoptics and is converted to electrical signals for analysis. The demineralization leads to a change in the LED from green to red with a simultaneous audible signal, which is directly related to the severity of caries lesions.
- ***Advantage*** is that sensitivity and specificity is higher than that of DIAGNOdent.
- ***Disadvantage*** is that Midwest Caries ID is not able to differentiate enamel lesions from sound surfaces

XI-CarieScan Pro

- It involves the passing of an insensitive level of electrical current through the tooth to identify the presence and location of the decay. The device is indicated for the detection, diagnosis, and monitoring of primary coronal dental caries (occlusal and accessible smooth surfaces), which are not clearly visible to the human eye. During measurement, a green color display indicates sound tooth tissue, while a red color indicates deep caries requiring operative, and a yellow color, which require only preventive care.
- ***Disadvantage*** is that it cannot be used to assess secondary caries, the integrity of a restoration, dental root caries, and the depth of an excavation within a cavity preparation.

X-Intraoral Television Camera

- Through intraoral television camera (IOTV) the dentist can educate the patient and at the same time can improve their own diagnostic expertise as they see magnified oral conditions, which are significantly better than direct vision
- • *Advantages* are increased vision and magnification.
- • *Disadvantage* is loss of specificity


THANK YOU