Intraoral cameras and their uses

The intraoral camera is fast becoming the most advanced tool for increasing patient acceptance and patient education. Its introduction into a practice can be very exciting with the entire team finding numerous uses for the camera. Moreover, according to Ken Neuman (1996), the learning curve for the use of the camera is very short.

The intraoral camera is proving itself to be a powerful technological breakthrough in patient care. Patients can quickly see the pictures in full colour on screen, usually the first opportunity they have had to see inside their mouths in full colour. Viewing their mouth from the dentist's viewpoint can prove very illuminating.

Neuman (1996) commented that the 'success of intraoral cameras over the past five years is unsurpassed by any other technology in dentistry. The rapid success of camera systems comes from two main areas, they are easy to use and they are now affordable.'

Many dentists report that intraoral cameras have revolutionised dental practices, improving diagnostic capabilities, enabling dentists to educate their patients more fully, thus allowing for greater acceptance of treatment plans (McLeod, 1996).

In this era of high tech computer use, with many patients working with PCs on a daily basis, the appearance of the intraoral camera and its display finds great favour among visitors to the practice, leaving a lasting impression.

**CHILDREN'S REACTIONS**

Many children love being 'on TV' and taking home a photograph of their smile. The camera helps a child to relax as most are used to watching a television screen to view their favourite programmes. Once they see their face on the screen they relax immediately, often

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**Figure 1: Intraoral camera with patient**

Linda Greenwall BDS, MGDs RCS, MSc, MRD RCS, FGDP RCS, graduated in 1984 in Johannesburg, South Africa, achieved an MGDs RCS in 1989, an MSc in conservative dentistry in 1992 and an MRD RCS in 1993. She was one of the first to achieve FGDP RCS in 1997. Linda practises in North London in a practice dedicated to restorative dentistry.

Neil BH Myers BChD (Stell SA), graduated at the University of Stellenbusch in Cape Town, South Africa, in 1981. He spent two years in the South African Army as a community dentist and since 1983 has practised in North London.
The camera is useful if parents themselves cannot be present at the appointment.

An intraoral image carries a clear message of an 'up-to-date dentist in control.' Some cameras can enable the clinician to print practice details at the bottom of the picture (Figure 5). The patient perceives that this high technology translates into high quality care. At the moment, being a relatively rare diagnostic tool, practices which use an intraoral camera are immediately differentiated from others.

**INTRAORAL PROCEDURE AND MOUTH TOUR**

The intraoral camera should be thought of as a third hand mirror, probe and camera. Every patient should have an intraoral tour of the mouth. Four shots are then freeze-framed and, as is well known, a picture is worth a thousand words.

All new patients are given a tour of the mouth and this is useful to the dentist in helping identify the nature of the problems involved. At our practice, we take one extraoral photograph for identification and then three other shots. This is normally a 'smile' view, the lower linguals as a means of motivating the patient to visit the hygienist, and one 'zoom-in' of any specific problems such as a broken filling.

If the patient's problems are more complex, we will switch to a 16 frame or take two sets of four views. These are particularly useful to give to the patient to take home and the images then can be stored.

**CAMERA USE WITH ADULTS**

The adult patient with a 'take-home photograph' in their hand has a powerful marketing tool.

**TABLE 1:**

**25 USES OF THE INTRAORAL CAMERA**

1. Patient identification: an extraoral photograph can be taken and put on the patient's notes or computer to help staff recognise the patient
2. Examination of patients (oral evaluation)
3. Patient education
4. Patient motivation
5. Better communication between patient, staff and dentist
6. Practice staff education
7. Extra information for technician - colour, characteristics, contour
8. Monitoring health improvements, oral hygiene, peri
9. Recording tissue changes over time (Ower, 1998)
10. Cosmetic treatment, e.g. bleaching, before and after fillings
11. Specialist referral
12. Ideal forensic record (Ower, 1998)
13. Medicolegal matters
14. Monitoring trauma
15. Monitoring children's growth pattern, skeletally and dentally
16. Communication with third parties such as insurance companies and DPB
17. School inspections (community dentistry)
18. Ideal for taking to lectures or demonstrations of dentally related topics - external marketing
19. Magnification (the intraoral lens is normally 40x magnification, helping to identify cracks in the tooth)
20. Some detection of caries (transilluminations and magnification)
21. Treatment planning for new patients
22. Treatment planning for dentures - planning clasping of tooth
23. Duplication of X-rays - it is possible to take a photo of an X-ray on the viewer
24. Practice marketing
25. Can create a practice photo album with before and after photographs of successfully treated patients

**BENEFITS TO PATIENTS**

Patient education

Tartar, staining and gingival problems are shown close up making it easier to treat them after the initial photographs have been taken (Figure 4).

The camera is also useful if the parents themselves cannot be present at the appointment. Photographs can be taken of a particular problem, such as a cavity, with before and after pictures proving useful to send home. Children also show the photographs to their friends, perhaps pinning them up at home for others to see and possibly generating a number of new patients along the way.

Thumb-sucking habits can be discouraged when children see the damage they are doing in pushing lips and teeth forward, and changes in growth patterns and anterior open bites also can be monitored.

Children are susceptible to dental trauma. If they have had a fall, their mouths and lips might still be bleeding or swollen and the intraoral camera could be the only clinical aid that can be used to record these soft tissue and dental injuries. Once healing has taken place, it is helpful to monitor progress. Photographs taken before treatment, i.e. showing the injury, may be used for medicolegal work or claims for compensation.

The camera enables dentists to take a very clear view of all the clinical aspects intraorally, as well as extraorally and radiographic data.
Revealing the whole tooth about your teeth

There are bits of the human body that I would rather not see too close up, even if the chance happens to be me. Take the tongue, teeth cleaning and fillings are another.

But the way Joel S. Blackman, from the UK, does things is so much better. Images taken using the very latest dental software which can photograph the insides of the mouth in full colour and details.

The world’s newest X-ray system is known as the Digital Radiographic System. It produces very detailed images which make diagnosing any problems with the mouth easier and faster. Time in the dental chair is all too brief and you know that the treatment has taken place if you can see it. The digital image can be retrieved from the computer at any time and cross referenced with previous visits. What you have done now is to get a visual record of your dental treatment and save you time and money.

Figures 2a and 2b: Newspaper articles for marketing (appearance in Cricklewood Observer)

DENTIST’S REVOLUTIONARY NEW ORAL CAMERA IS HIS CROWNING GLORY

by Liz Cravisahav

A special dental examination uses the ‘new’ technology for the first time in this region. The patient was seen in the chair with the mouth open and the teeth examined by Dr. Blackman using a digital camera and a simple monitor.

Figure 2a: Press release by Joe S. Blackman as he steps into the dental chair, with a digital camera attached to his shirt.

Figure 2b: Press release by Joe S. Blackman as he steps into the dental chair, with a digital camera attached to his shirt.

Tartar

I was shown the monitor how the beamed light reflected the tartar was removed. Dr. Blackman said that now there has been another breakthrough in dental care. The Tartar can now be removed. In other words, the future of dental treatment is here.

Patient satisfaction was shown improved and people appreciated the new technology.

and in full colour. This motivates the patient to undergo intense prophylaxis with the dentist or hygienist, to complete a course of periodontal treatment or to undergo the preventive care programme. For example, when a patient sees for him/herself a large, old amalgam you have been keeping an eye on for some years, it might prompt him to say something along the lines of, ‘You’re right, it is a big filling. When you tell me it needs a crown I’ll have it done’ or, ‘Do I have to wait until next week to see the hygienist – can’t she see me tomorrow?’

Gaps in the dentition, orthodontic problems, fractured amalgams, stained composites and crown margins are all highlighted by the camera.

Patient motivation

There will be no last minute surprises and the patient can visualise the source of any impending problem. They can see the ‘patches’ you have done through the years of treatment in trying to save the tooth the ‘simple and cost-effective way’. A seed of thought is created in a patient’s mind that more advanced work may be required in time. This helps patients understand the nature of their problems, enhancing treatment acceptance levels. They can rapidly identify the nature of the dental problems seen on screen and in the photographs, spurring them to take action.

Camera users are able to take a picture of an X-ray and print it out. Radiographic images on a light monitor are always a new experience for the patient to look at. The patient feels more comfortable looking at a photograph they can hold. Radiographic findings are far more easily explained.

Cosmetic imaging in a simplified form is an important tool. A midline diastema is pictured before composite and placed to moulded to approximately the closure in
The 'after' shot is taken and the composite removed. This gives a ‘before’ and ‘after’ image for the patient to see. Patients are encouraged to take the picture home. They subsequently went ahead with treatment and recommendations.

**DIRECT BENEFITS TO PATIENTS**

Direct benefits to clinicians

Information to dental laboratories is made far simpler using the intraoral camera. For example, a denture lip line is easy to visualise and the technician can see the facial features while constructing a denture. Sometimes there is no other option but to place a clasp on a heavily filled tooth when constructing dentures. A contemporaneous picture of the relevant tooth is advisable. Shade variations and characteristics can be demonstrated excellently on the screen and sent to the laboratory.

Magnification of, say, molar root canal access is no longer a problem for the dentist. The camera head is small and compact, reducing or eliminating patient fears and preventing patient gagging. The camera can be your ‘eyes’ in difficult posterior areas, while oral lesions show up very clearly indeed.

All dentists have some patients who have a litigious streak. A pre-op and then a post-op picture give almost all these patients instant appeasement.

**Hygienist’s use of camera**

If only one camera is being introduced into a practice, many experts advise putting the camera into the hygienist’s surgery. They often spend longer with their patients and can spend time explaining.

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**Independent Dentistry January 1999**

**ONE-DAY ENDODONTICS SEMINAR WITH LIVE DEMONSTRATIONS**

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GIVEN BY DR JULIAN WEBBER AND DR PETER MACHETTI

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problems or educating them on effective home care. Hygienists can also do a tour of the mouth before cleaning and show patients where plaque is building up. They can take photos after cleaning to show patients the instant improvement. It is, of course, rewarding for dentists to have such appreciative patients.

Patients also tend to ask the hygienist questions they might be reluctant to voice to their dentist for fear of looking 'stupid.' For example, they might ask the hygienist whether it is really necessary to have a crown placed. The hygienist can take a photograph of the tooth and magnify it for the patient to see, relaying the benefits of a full coverage restoration.

The hygienist should use the camera on each patient, particularly every new patient who is undergoing a course of periodontal therapy. At a follow-up visit, photos can be used to show improvements in the tissue, encouraging the patient to adopt an improved home care regime.

The increased acceptance in treatment plans helps to pay off the loan or lease on the camera. Some practices make a small charge for the photographs, while others have an all inclusive rate to show patients the benefits of the camera first. When patients see photographs of the odd, stained or fractured restoration, they often ask the dentist to replace them.

**Benefits to the Dentist**

Benefits to the dentist include:

- Better patient communication and patient education. This helps when presenting treatment plans as lengthy explanations are not needed when the patient can see photographs of these problem areas
- Patients are able to see inside all areas of their mouths, e.g. behind their front teeth
- Patients finally see their teeth from the dentist’s point of view
- Better communication with dental laboratories
- Shading characteristics, shaping problems and alignment can all be seen by the dental technician changing the lens and printing out the photographs.

Dental staff should be able to take both extraoral and intraoral pictures of patients. Once the practice team can use the camera with ease, it can be used on virtually all patients, though some patients are shocked when they see the extent of their dental problems. All patients should be photographed allowing them to see the benefits the camera offers.

The hygienist can use the camera to show stains both before and after the preventive care programme and can take photographs of any problem areas that the dentist ought to see. Staff should be instructed in the benefits of using the camera so that they can answer all queries.

The intraoral camera can be the single most important item of new technology that can rapidly build up an excellent dental practice. Better patient communication is achieved which helps towards practice building and patient satisfaction (Neuman, 1996). [10]

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**FURTHER READING**


McLeod (1996). How to make the most of your intraoral camera. *Oral Health* 33-34


Ower P (1998). *Personal communication*