

PSP technology bringing big changes to dental office imaging

■ Greener technology has advantages, including elimination of the developing chemicals required for X-rays, for example

IN THIS REPORT, DENTAL CHRONICLE investigates a new technology—phosphor storage plate (PSP) radiography—and interviews three clinicians about their views regarding its utility in clinical practice. Panel participants are Dr. Paul Feuerstein, North Billerica, Mass.; Dr. George Freedman, Markham, Ont., and Dr. Howard Glazer of Fort Lee, N.J.

What is phosphor plate X-ray technology?

Dr. Feuerstein: These are small radiation sensitive plates similar in size and thickness to standard dental film. You can expose them with an X-ray machine and the image stays on them until they're processed and then erased.

How do phosphor plate radiographs compare to conventional X-rays?

Dr. Glazer: Phosphor plate radiographs are much better than conventional X-rays since (1) they are reusable and (2) everything is as comfortable as in conventional X-ray. Very easy to use and the picture images are exceptional.

How does PSP sensitivity compare to conventional and direct radiography?

Dr. Freedman: PSP sensitivity is an improvement on conventional radiographs and equivalent to other technologies in direct digital radiology. There is absolutely no loss of sensitivity or data during the scanning process.

Are any chemicals required for the PSP process?

Dr. Feuerstein: Nope. None. Despite the fact it looks like traditional film, it's a totally electronic process. The developer is actually a digital scanner and there are no solutions that have to be disposed of—none. It's very, very green in this day and age.

Are any paper-based hardcopy steps required later?

Dr. Glazer: There are no paper-based hardcopy steps that are required and you can reprint the X-ray as many times as you like. You can forward the digital images to the referring specialist who you might be sending the patient to. There have been times where the specialist and I have looked at the X-ray simultaneously while I still have the patient in my chair.

Is phosphor plate technology more or less diagnostic than direct digital sensor technology?

Dr. Freedman: Actually, the two technologies, the phosphor plate and direct digital sensors, are quite equivalent in terms of the data that they accumulate and then transfer to the digital format. The image area from the ScanX phosphor plate number two size is 1,080 mm², 20 to 30 per cent larger than most other digital sensors.

How long is the acquisition phase for the PSP's sensor plate once it is placed inside the scanner?

Dr. Feuerstein: There are several different models from different manufactur-

ers and each one has a slightly different algorithm on how they process. Some of them can be as short as five seconds; some of them as long as a minute depending on the size of the plate and the number of plates that are processing.

How long does it take to process for bitewings with PSP technology?

Dr. Freedman: Once the radiographs are taken, it takes less than one minute to enter them into the scanner and have results. In fact, four bitewings probably take less than 30 seconds.

How long does it take to process a full mouth series with PSP?

Dr. Glazer: The process for a full mouth series once the X-ray series has been exposed is probably less than two minutes total time. The first image is about 17 seconds and every image thereafter is three to four seconds.

Is the diagnostic information from the PSP loaded directly into the computer database?

Dr. Feuerstein: Yes, it is. The software sets up that image in the room where the image was taken. If the X-ray is stored in a central location, for example, it automatically spins off to the treatment room and then saves the image on the server as well.

How thick is the phosphor plate sensor that it is placed inside the patient's mouth?

Dr. Freedman: The phosphor plate sensor is less than one millimeter thick. In fact, it is less thick and more bendable than conventional X-ray film. That makes it very comfortable for the patient.

Can the PSP sensor plate be bent inside the patient's mouth for increased comfort during radiography, and is this possible with digital sensors?

Dr. Glazer: One of the main reasons I chose to go with phosphor plate technology is that the X-rays can be manipulated and bent so that it is much easier to place in the patient's mouth and is more comfortable for the patient. This is totally impossible with digital sensors.

You cannot bend them or reshape them in any way.

Sensor plates can be reused. How often?

Dr. Feuerstein: Potentially, they can be reused indefinitely. They do need replacement if they begin to scratch or are bent beyond the acceptable range. Despite their similarity to film, they are not really as flexible, but they do have some give. I've seen them used many hundreds of times, it depends on usage and handling.

What is the cost of a new PSP sensor plate?

Dr. Freedman: The number two size, which is the most commonly used for bitewing and periapical radiographs, costs about \$40 to replace. This is far, far less costly than having to replace an entire direct digital sensor which can cost thousands of dollars.

What sizes of PSP sensor plates are available and do they require dedicated scanners?

Dr. Feuerstein: For the latest standard scanners, zero, one, two, three process very nicely. Size four needs a larger scanner. Air Techniques has the ScanX, which comes in different sizes (one that handles the standard sizes and one that handles the larger pans).

How many PSP scanners are used worldwide by dentists?

Dr. Freedman: PSP technology is the most popular throughout the world. There are more than 50,000 dentists who have already incorporated PSP into their practices and it is certainly one of the fastest growing technologies.

How large is the footprint of the PSP scanner on the counter?

Dr. Glazer: The footprint of the PSP scanner is very, very small. About the size of an amalgamator or triturator. In my office, I locate the scanner in what used to be the darkroom, where we had the chemicals and the dipping tank that are no longer necessary. Of course, now we're chemical free and the PSP scanner just sits comfortably on the counter.

PANELISTS



Dr. Paul Feuerstein maintains a private practice in North Billerica, Mass. He was the 2010 recipient of the Yankee Dental Congress Clinician of the Year, and is the Technology Editor of *Dental Economics*.



Dr. George Freedman is a co-founder of the Canadian Academy for Aesthetic Dentistry and a Diplomate of the American Board of Aesthetic Dentistry. He lectures internationally on dental esthetics, dental technology, and photography. Dr. Freedman recently published *Contemporary Esthetic Dentistry* (Elsevier, 2011). He maintains a private practice limited to Esthetic Dentistry in Toronto.



Dr. Howard Glazer is a Fellow and Past President of the Academy of General Dentistry, and Adjunct Assistant Clinical Professor at several universities, including: SUNY-Buffalo and the University of Florida-Gainesville. Dr. Glazer has a private practice in Fort Lee, N.J.