6 Reasons Why You Can, and Should Use a Panoramic X-ray for Bitewings

Planmeca's recent success selling its ProMax imaging units with the bitewing feature may have its roots in research that was conducted in the 1980s (1). Recent engineering developments by Planmeca have made it possible for dentists to use the ProMax unit which is equipped with Selectively Compliant Articulated Robot Arm or SCARA movement, a fully adjustable motorized collimator so that only the areas of interest are exposed and a new high resolution sensor. This patented technology enables dentists the freedom to produce any movement pattern required including standard pans, pan bitewings for adults and children, pan periapicals, and other pan and CBCT functions. Finally accurate, reliable and easy patient positioning is possible. The freedom to image only the areas of interest and to allow for patient size result in a reduction in radiation exposure. The SCARA arm movement, the fully adjustable collimator and a newly developed high resolution sensor all allow dentists to take excellent bitewing x rays with open contacts and a sharp image. This bitewing feature is the focus of this report. Here are 6 reasons why this is a good idea:

1) **Better patient acceptance.** Patients can easily stand or sit during the panoramic x-ray examination that can be performed once, as opposed to a bite wing series of up to four x-ray exposures that take several steps, some of which may be uncomfortable to patients.

2) **Easier for the dentist and staff.** Dentists can now consistenly open up the contacts between the posterior teeth by simply adjusting the panoramic positioning light as compared to setting up a sensor in a holder, placing it in the patient's mouth, aiming the x-ray machine and repeating several of these steps for each of the subsequent bite wing exposures.

3) **Faster.** The Panoramic technique requires fewer steps compared to traditional dental x-rays. Dentists or their staff can turn on the machine, have the patient bite into the groove in the bite block and seconds later the images are ready for viewing.

4) **More diagnostic.** In one study (3), more posterior caries were missed with traditional bitewing x-rays and periapicals than with pans. In a thesis project (4) we found similar findings using the ProMax and PSP intraoral bitewings; in addition raters made their diagnostic decision 2.5 times faster from the pan bitewings that from the full mouth survey. Panoramic images provide more coverage for periodontal bone defects, periapical lesions and pathological jaw lesions than bitewings therefore extending the diagnostic benefit of pan bitewings as compared to intraoral bitewings.

5) **Less radiation exposure.** A panoramic bite wing study may cut radiation dose by 40 percent in comparison with intraoral, bitewing x-ray studies. A digital pan bitewing may create as little as three to five microsieverts versus 8 to 20 or more for intraoral bitewings depending on cone length, machine and sensor type. Also in pediatric mode the

dose may be reduced up to 30% less that the adult bite wing dose. These doses are extrapolated from our film based study (2) and measurements in our lab.

6) **Less infection control.** With traditional bitewing x-rays, dentists will have to wrap and unwrap the sensor after each patient, disenfect it and the sensor holder; disinfect the machine tube head, yolk and cone; disinfect any soiled countertop areas as well as to dispose of and change gloves. Using the panoramic machine requires no gloves and virtually no between procedure cleaning or infection control, only replacement of the bite block sleeve which is removed by the patient. These infection control procedures add to the time and expense elements associated with intraoral bitewing techniques.

With all of these apparent advantages, why has panoramic bitewing use not been more prevalent? Dentists have traditionally believed that the resolution of pans and the ability to open the contacts was not as good as traditional bitewings. In more recent years the profession has become more open to this idea. As part of our research we determined how to open the posterior contacts to get a panoramic bitewing. Planmeca with their SCARA arm technology allows the pan to be programmed to the right angle to open the contacts.

The overriding problem associated with panoramic imaging for the detection of interproximal caries is that the normal and usual pan image displays the interproximal contacts as overlapped or not open. Therefore the contact points cannot be clearly displayed thus most dentists have traditionally believed that pans cannot be used for the diagnosis of interproximal caries in posterior teeth.

In all probability many dentists still believe that since traditional bitewing x-rays are sharper, they will show the cavities better than on pans. This has been a great and widespread misconception because it is not, as most dentists believe, the resolution (sharpness) that makes interproximal caries detection good, it is the imaging characteristics of the technology in use. In our 1985 study (1) using poor resolution pans and only including open interproximal contacts and using the kappa statistic we showed good agreement between the fuzzy pans of the day and "D" speed film bitewings. Others (3) found more caries in the pans than the intraoral periapicals and bitewings.

Fast forward to 2011 and the word is finally getting out about the power of panoramic imaging. According to Planmeca sales rep Jim Hooper, dentists are more open minded to listening to the arguments in favor of gradually replacing bitewing x-rays with pans. "I sold 28 pan units this April because dentists now understand that pans are superior to traditional x-ray units and have several other advantages such as cost, comfort and ease of use," Hooper said. And, in a tight economy, the cost savings of buying a new pan unit outweigh any perceived benefits of using traditional x-rays he said.

Sidebar:

Dentists: seeing is believing when it comes to Planmeca's Pan image quality

Planmeca's ProMax's Pan/Ceph unit can help dentists realize the elusive goal of using their pan ceph machine to take bitewing images. It's versatile design and reliable and functional concept deliver an unprecedented level of flexibility and control to you and your staff. The micro step motors used to power the unit are whisper quiet and the imaging function is microprocessor controlled for accurate imaging. Planmeca's patented panoramic and pan/ceph collimator features unlimited adjustments, which shape the X-ray beam for each use—from panoramic to TMJ**.**

Every dental equipment company touts its products like they are the best. However only when the products are used in the field by practicing dentists, can companies truly make claims that resonate with the profession. Several dentists were more than happy to relate how the ProMax Panoramic unit transformed their practice.

Paul L. Boger, DMD, Warren, Penn.

"I didn't really anticipate just how much my patients would love the panoramic feature. So many patients have difficulty with the intra oral sensors when I used traditional bitewings. Now that the images I get are superior, the old bitewings represent only 5 percent of all the images I take."

Dr. Boger was also surprised that the ProMax made his office more efficient.

" In the case of many of the bitewings, I'd have to ask the hygienist or assistant to retake the image if it wasn't at the right angle, for instance. With the ProMax and Pan Ceph feature, there is no need to reshoot the image because the quality is so good." (What does the ceph part have to do with this?)

Another dentist, *Tom Krah, DMD, from McMurray, Penn*., said the new ProMax with automatic focus creates such impressive images that buying it now seems like a "no brainer." The ProMax purchase allowed Dr. Krah the ability to reduce his use of traditional bitewings . Dr. Krah bought is unit in 2010.

"The images are so consistent that the seven staffers who take images can all perform this task and the images are the same, regardless of who takes them," Dr. Krah said. He also stressed that his patients accept new technology and have not been cautious about embracing it. "Today's dental patients expect their dentist to be up on the latest technology. And, with the ProMax, they really love how hassle and pain free it is to have the image taken."

ProMax Features:

- Any existing film or 2D digital Planmeca ProMax unit can be easily upgraded to a ProMax 3D unit and new imaging programs can be added with software upgrades, resulting in superior maxillofacial radiographs every time.
- Offers 30 different imaging programs and several imaging uses, all in one machine.
- Advanced technology that eliminates some redundant shadows and ghost images caused by objects outside the image layer.
- Unique SCARA (Selectively Compliant Articulated Robot Arm) technology
- DICOM compatibility for ease of image storage.

Benefits:

- Flexiblity to upgrade from your current imaging capabilities to enhanced ability to provide full cephalometric or tomographic uses.
- Cost efficient imaging that can grow with your practice
- Side entry that allows easy accomodation for all patients, including those in wheelchairs.
- Supported by Planmeca's Romexis software to support optimal imaging workflow and image usability at chair side.

References

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4. Hamiddidadin A: A comparison of panoramic and intraoral bitewings for the detection of interproxilal caries Thesis, University of Texas Health Science Center at San Antonio, 2005