

Moving from film to digital radiography

By Bob Workman



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It has been said that the acquisition of images utilising sensors is the same as with film. In fact nothing could be further from the truth. The changing process of moving from film to digital radiography is entirely different. I have lead thousands of dental offices, schools, and dealers through this process.

Diagnostic digital images are achieved when three components are blended appropriately: software settings, x-ray generator settings, and proper positioning technique.

Although there are many tenets of image acquisition that are basically the same with film as with digital, there are enough nuances of change to make the average dental assistant feel inadequate without proper direction. Instruction in the use of the proper holders and positioning will save the office and staff untold frustration and embarrassment, not to mention much patient discomfort!

Because digital sensors are stiff and unbendable, they present a challenge for placement in many mouths. Let's discuss placement of posterior PA's and bitewings. Even if there is adequate space to place the sensor, it is imperative that you push the sensor mid-line in order to avoid scraping the lingual side of the gums while closing. This allows the sensor to sink into the soft tissue unobstructed.

The second major obstacle with a posterior PA placement is the length of the bite block. In many digital and film sensor holders, the posterior PA bite block holder is so long, that you have to pull the cheek out and work the stiff sensor, holder and bite block into place. This can be a daunting task with some patients.

With bitewings, in order to make the process as comfortable as possible for the patient, the sensor needs to be inserted at a 45 degree angle, with the



bottom of the sensor immediately sliding in to the area between the lingual side of the gums and the tongue, tilt the sensor/holder parallel to the occlusal plane, and push the tongue slightly inside toward the

mid-line as you ask the patient to close gently. With practice, this technique will allow the technician to efficient and effortlessly place the sensor in the proper position with minimal discomfort to the patient.

In the acquisition of four bitewings, which is the most common set of radiographs in dental offices, start from the molar bitewing utilising the placement technique described above, move to the premolar on the same side. Without taking the sensor from the mouth, ask the patient to open, slide the sensor



forward, angle toward the canine on the opposite side of the mouth, push in against the tongue so the sensor can seat in soft tissue and angle the stem of your holder to maintain open contacts. If the patient has any trouble closing, slide sensor posteriorly, away from the anterior bone, and further against the tongue. Minute differences in placement will make the difference between a very painful closure and a reasonably comfortable one.

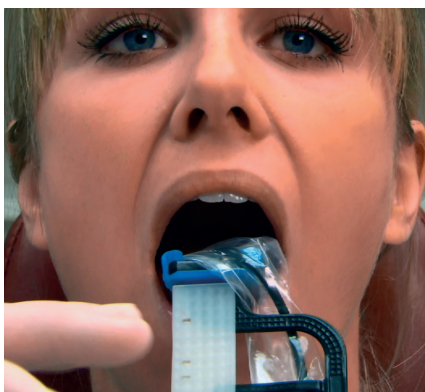
With upper molar posterior images, place the top of the sensor parallel to the molars, in the center of the vault, tilt the sensor handle upward, until the bite block touches the occlusal plane, ask the patient to close gently (only enough to hold the sensor/holder in place). "BITE" should disappear from your vocabulary. It works against you with stiff sensors and patient comfort. Upper pre-molar posterior images pose a unique problem with digital sensors because of the anterior slope of the vault. Once the sensor is placed as directed above, the patient closes, the lower area of the anterior slope pushes the sensor down, creating an angled image in which the anterior apical region disappears. In order to keep this from happening, before asking the patient to close, place a cotton roll under the anterior section of the holder, which will hold the sensor parallel to the occlusal plane, keeping the anterior apical region in the image. A second technique that can be used is to just ask the patient to hold the holder arm in place and not close ... the end result will be the same.

Anterior image acquisition for digital has some uniquely different techniques as well. With the stiff sensor, it simply will not bend up along the curvature of the vault as film does for upper anteriors. In order to obtain the full view from apical region to incisal edge, the upper edge sensor needs to be placed much further back in the mouth, alongside the first molar. Then ask the patient to close gently as the incisal



edges of the upper anteriors rest upon the bite block. A similar vault/tilt procedure is used as with upper posterior PA's. The patient will not be able to close completely, but it doesn't matter, as long as the incisal edges are resting upon the bite block.

Parallel the cone placement with the arm of the holder will guarantee the optimal radiation of the sensor and the best possible image. For lower anterior images, ask the patient to lift their tongue, place the sensor gently against the frenum, in one movement, ask the patient to close



gently as you tilt the handle parallel and seat the sensor in the soft tissue. This allows the tongue, frenum and muscles to relax and receive the sensor, while you tilt it into proper position. As long as the lower incisal edges are resting on the underside of the bite block, the image will be complete from apex to incisal edge. Complete closure of the mouth is not necessarily required.

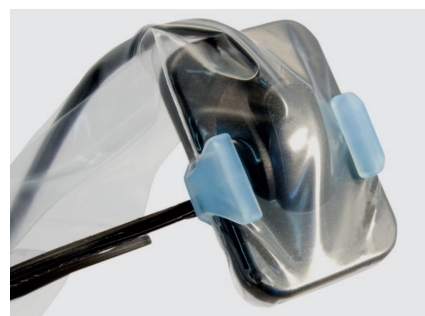
As you will notice, many of the techniques are indeed the same as film, but there are enough small differences that make a huge difference in results.

Over the years the search for the most comfortable and effective holder system has always led me to the TrollDental TrollByte products. The TrollByte Plus model is flexible enough to allow



movement during placement in small mouths, the bite blocks are short ... allowing ease of placement, with have to pull the cheek away from the buckle side of the teeth. They provide enough strength in handle, to allow the user to control the angulation and placement of the sensor in the mouth, which is crucial for the best image quality. TrollByte Kimera is an alternative model with a stiffer aiming pin, if that is preferred (usually due to training on a system with a metal aiming pin). The aiming ring, provides accurate guidance for the application of radiation for optimal exposure of the sensor.

The TrollBag barriers are not only soft, pliable and durable, but they also form a bond with the claw of the holders which increases the grip of the holder onto the sensor...making sure that the sensor stays



where you placed it and provides the best image possible. You will not get the same results with other types of barriers, because the bond mentioned above will not exist and the sensor will slip/move when the patient closes. The speed, simplicity and accuracy with which a technician can obtain a set of images using the TrollByte system is the biggest selling point for the holders.

With new office trainings, I always fit the holders to the need. If they have been using a particular system, I allow them to use them for their first few placements. The first patients to feel the sensors and holders are always the ones being trained ... they learn much more quickly when the sensors are placed and they feel them in their own mouths. The first comment always expressed ... our patients will hate this ... it's so invasive, so uncomfortable. That is point at which I offer to demonstrate the TrollByte System with its distinct advantages. Just the comfort factor alone makes the decision for the staff. When they see the speed with which a series can be obtained, the decision is made.

The combination of correct software settings, correct radiation exposure, and correct technique is what produces the best digital radiographs. No one is any more important than the other... but the three must come together in order for the deployment of digital to be a success ... and the TrollByte System is brilliantly designed to enable the most successful and comfortable image acquisition technique. ♦

For further information, contact Rachael at TrollDental 1800 064 645 or www.trolldental.com/au

Bob Workman, senior trainer and customer support specialist for Suni Medical Imaging since 2004. Bob refers to himself as a change agent and specialises in leading dental groups through the learning processes from film to digital radiography. Bob holds a Masters Degree in Educational Research and resides in rural Oklahoma with his wife and two teenage sons. Bob travels North America in his work in the field of digital radiography.