5 Easy Steps to Buying a Veterinary Digital X-Ray System

Buying a digital x-ray system can be an easy and smooth experience, or it can be quite the opposite pretty easy, or pretty hard. Sorry about the ambiguity. What this article will attempt to do is act as a guide in the selection process of your digital x-ray equipment and vendor. Please keep in mind while reading this that I have tried to remain as unbiased as possible though you should know I manufacture CCD DR systems in my factory in Baltimore, Maryland.

Step 1: Relax.

Use an unemotional evaluation process. I am a small businessperson too, so I understand that large expenditures can be emotional expenditures. When it comes to business, I try to take a practical and unemotional approach as best I can; sometimes I succeed. There are a few wrong ill-advised choices in digital imaging vendors, and most digital x-ray systems provide better images than what you see on film. The acquisition of new, game-changing technology should be fun and as stress free as possible. Digital x-ray will, in most cases, pay for itself over time and will improve the overall care of your patients. Know those things going in and you will be a lot happier in the selection process.

Step 2: Choose the right technology for you and your hospital.

There are a few different technologies to consider: Computed Radiography (CR), Flat Panel Direct Radiography (DR), Single CCD Direct Radiography (DR), and CCD Array (DR). The discussion on technologies is more or less a discussion on work-flow. Without the proper workflow, a digital installation will be less likely to succeed or doomed from the start may prove to be unnecessary. When talking about the different technologies, please keep in mind that all digital x-ray systems require, prior to processing images, the user to enter patient information into a databases that the subsequently acquired images can be labeled properly.

Computed Radiography (CR)

Computed Radiography uses plates just like your analog system uses cassettes. To take an x-ray as it relates to small animals, you start with plates that look just like your cassettes. You will take your first x-ray, remove the plate from the film tray in your x-ray machine and then start the reading process (think of the reading process like developing your film). You then insert the next plate into the film tray and take your next x-ray. Most CR systems require no darkroom, so the reading process can be sped up by having the CR "reader" in the same room as your x-ray machine which allows you to feed your cassettes into the reader at the same time as taking x-rays. If your average analog radiography procedure used to take 20 minutes, CR helps speed that process by 25% or more. The major difference between CR and analog is this: in most cases your images will be somewhat to significantly better than film.

If you are a small animal veterinarian, then by purchasing CR, your workflow has not significantly improved because of image handling issues after capture (that topic will be discussed later when we talk about the need for PACS). If you are a large animal veterinarian or a mixed practice veterinarian, then CR may very well be the choice for you. CR plates are expensive, but cost no where near the cost of flat panel DR and can easily be repaired or replaced if they become damaged. CR readers can be outfitted in mobile vans or trucks. When doctors ask me about who should buy a CR, my answer is always the same: if you are large animal veterinarian(non-auction), or if you are mixed large and small veterinarian, then go with CR.

One advantage of CR systems is that they can be fairly inexpensive and isare generally considered as the least expensive option. As with any system, there are some good manufacturers and some not so good. Generally in CR, you get what you pay for. If CR is right for you, my advice would be to purchase a more expensive system.

Flat Panel Direct Radiography (DR)

Flat panel direct radiography systems are often the most expensive systems. They use a thin plate technology that is a lot like your new LCD TV, but backwards. Instead of converting a digital signature into pictures by exciting a phosphor to display on your LCD TV, a flat panel DR does it backwards. Most take an analog signal (x-ray) and convert it to light using a phosphor, which is then captured and converted into digital signal. Most flat panel x-ray systems do this very quickly. Generally speaking, most flat panels are permanently attached to your x-ray machine in place of the "grid cabinet" or permanently affixed to the film tray under your x-ray machine. To take an x-ray, position the animal on the table, press expose on the x-ray machine, and the images show up essentially almost immediately on the computer monitor in front of you.

Because of the manufacturing techniques involved, Flat Panel DR systems are very expensive, often costing upwards of $30,000+ or more than other systems. Flat Panel DR is the most expensive technology.

CCD Direct Radiography (DR)

CCD DR systems and flat panel DR systems basically do the same thing. CCD systems use a digital camera and a single large lens of sorts to capture the light that is emitted from a phosphor after it is excited by x-ray. All CCD systems must be permanently affixed to the underside of your x-ray table. Because of the nature of them, some can be fairly large and therefore are not considered portable. To take an x-ray repeat the steps taken with a Flat Panel DR system. Position the animal on the table, press expose on the x-ray machine, and the images show up immediately and view the images on the computer monitor in front of you.

CCD Direct Radiography can be manufactured relatively inexpensively using time hardened equipment and production volume CCDs allowing the cost of CCD DR systems to remain fairly low compared to the Flat Panel DR counterparts.

CCD Array Direct Radiography

A few years ago, a manufacturer introduced the mini- CCD Array DR technology. CCD Arrays use many, many small CCD chips and many small lenses similar to like the chip and lens that are in your camera phone or digital camera, to capture the light that is emitted from a phosphor after it is excited by x-ray. The technology is interesting because it is a greatin theory but. There have been alot of problems with this technology for one reason or another and good images were not able to be achieved for the most part. There have been many hurdles in working to achieve good images. The technology may have improved the technology recently, but it seems to have drifted from focus from in the veterinary marketplace. The only advantage to CCD Aarray technology is that it can be made and sold cheaply and can therefore be inexpensive.

DR Workflow

If you are a small animal veterinarian, your workflow has improved dramatically by choosing DR – no matter what type of DR. If your analog radiography procedures take 20 minutes, then your DR procedures will take about 5 minutes. DR is all about immediate results which significantly reduce time spent in radiography and increase overall hospital efficiency. Because far less time is needed in radiography, patient care also improves and client relations improve because there is a significant reduction time spent waiting. When asked the question, "which technology is right for my small animal practice?," I always answer, "DR without question—no choice because of the improvement in workflow." DR is where the industry is headed in small animal.

If you are a large animal veterinarian doing auctions, high volumes of in-hospital exams, or high-value animals, consider portable flat panel DR. Portable flat panel DR is 2-4 times the cost of CR, so be sure that your improved workflow will really justify the cost.

Step 3: Decide on your needs

Congratulations. If you are reading this far, you have probably decided on the technology that you need. If you are a small animal veterinarian, I hope that you have chosen CCD DR.

Before considering vendor options going any further, it's necessary to define what your overall needs are. The way to do that is by asking yourself the followingseveral questions:

Where do you need to display images in your hospital?

Is there a PACS system included with your choice of vendor?

Do you need to "integrate" your practice management system with your digital x-ray system?

Does your practice management vendor support open standards?

Does your digital x-ray vendor also support open standards?

What are the ongoing costs?

Are their service contracts necessary or available?

Are the service contracts mandatory?

Are you going to send radiographs out for consultation?

Are you locked into a single radiologist or a single group of radiologists?

Does the capture software control the x-ray generator?

Is measurement necessary (why or why not)?

Notice that in all of the questions above, not once did I ask, what is the price? Price must be taken into consideration and definitely defines one of your needs. However, price does not matter until you pick the right technology and have several choices in vendors. When car shopping, do you pick the cheapest car on the road without first considering gas mileage, average daily use, and anticipated life span of the vehicle? Well Tata Motors of India just released a car that costs about $2500. If that's your thing, then more power to you. There may be nothing wrong with that car, but I personally would rather spend a little more and get a better car from GM, Toyota, Ford, or even Hyundai.

Take your list of needs and ask every vendor you are considering for the technology the same set of questions. Don't stop asking questions until you feel comfortable with all of the answers you have heard. This process should take about a day. Note to self: If I call a vendor and they don't answer my questions immediately, or at least don't call me back within an hour, it is clear to me they don't really want my business and I should strike them off my list. If they don't respond when I wave money at them, then what do you think they'll do when they have your money and you need their help?

Step 4: Select your machine and vendor.

Step three, deciding on your needs, should help you whittle down your list of vendors. Selecting your machine and vendor should be thought of as one in the same. Most vendors have multiple models that could potentially satisfy your needs. If you have decided on a vendor, (common sense here) do not let them know until you write the purchase order.

The question is, "How do I know that a vendor is the right vendor for me?" The answer is pretty simple: When you select your vendor, you will be selecting your partner in diagnostic radiography for many years to come. You must feel comfortable with them in the sales process. How long has your salesperson been with the company? How old is the company? Call the company's main number and ask for your salesperson. See how long it takes to get a response. If the salesperson is intimidating, barely seen, hard to reach, not knowledgeable, or makes you feel uncomfortable, then that should tell you to walk the other direction even if the product seems like a good one. Who needs a good product with no support?

It is important to know that digital x-ray is more support oriented than your analog system. You have to know that support is available when it is needed. Always try this: Ask your machine vendor for the support number but don't tell them you are going to test it. Wait until it is convenient for you and call their support line. Tell the support personnel that you have their digital x-ray system and that your computer is frozen. Assess their responsiveness, response time, responsiveness, and willingness to help you even if your hospital isn't in their database of installs. Of course, without an actual frozen computer, you will not be able to answer any of the questions they will ask, so don't be afraid to tell them that you were testing their support prior to a sale. Also, don't be afraid to ask the support personnel about their products as well. See if you can talk to the support person to find out more about them. This exercise should be about help you gauge your ability to develop a relationship with your vendor.

If your support has been good and you feel comfortable with your salesperson, then the choice gets to be, from that vendor, what products fit you needs? That's the easy part. Chances are that anything they have will fit your needs and then you need to find the right product to satisfy you.

So, you have a vendor and machine in mind. Don't set your heart on anything, until you read step five.

If one vendor can give you something similar and comparable for $20,000 less, why go with the first vendor?

Step 5: Pricing, Pricing, Pricing

This step isn't really a step. It's more advice on how to price a product. First, don't overspend. Does a person who buys a Mercedes S550 really get $30,000 more of a car than someone who buys a Lexus LS460? Sorry Mercedes people: I love Mercedes, but Lexus generally is a better value long term. Driving up to 5 star restaurant makes me feel better in the Mercedes, but I know my Lexus will last for hundreds of thousands of miles. Both are fantastic cars and both get you to the same place at the same speed. The long and the short of it is: don't over-spend.

Whether you purchase flat panel or CCD DR for your small animal practice, they both do the same thing. They both get you to the same conclusions and both will increase the quality of your radiography and improve your workflow. One will cost you more than the other. One has long term costs that are higher than the other.

Yes, this is very biased, but I also think that it is an argument worthy of consideration.

Be sure that you are comparing apples to apples and always include in your analysis of pricing, exactly what comes with the system. Consider this; you will always need a PACS system whether realize it or not. So, was that was confusing? PACS stands for Picture Archiving and Communications System. It basically allows you to store, retrieve, and backup your images. In the simplest terms, if you have a backup system on your computer and you store and view pictures on it, then it is a PACS system. PACS is another long, long discussion. Here's the easy question: does your system have a multimodality, multi-viewing-capable PACS system included? True PACS systems add value to a point. If you purchased a PACS system separately from your digital radiography system, you could expect to pay $7,000 or more for the software alone. Is it worth it? Maybe. Do you have ultrasound that is capable of pushing to PACS? Do you have digital dental that is capable of pushing to PACS? If the answer to the

previous questions is yes, and you have the desire to view your digital dental images or your ultrasound images in multiple locations and keep them with the same database as your whole body images, then you need a PACS and it will probably be worth it.

Now that you have all of your pricing from several different vendors, you will know who you feel most comfortable with and then, let's face it, a couple of thousand dollars either way will not make or break a deal. Go with whomever you are most comfortable with as long as the pricing is within the reasonable range you find reasonable as you define it.

To purchase new x-ray or not to purchase new x-ray, that is the question!

That depends. Sometimes, going digital and not purchasing a new x-ray machine can be compared to buying a new car and using your old tires and wheels. It will probably still work depending on the technology and the vendor, but it might not roll as well.

Here are some simple things to consider: digital x-ray, by its nature is hungry for good quality x-ray beams because it makes for smoother and sharper images. Some systems will simply not work with older singlephase x-ray machines. Some vendors will tell you they can work with any old piece of junk and then surprise you after the sale by telling you really should have purchased a new machine. Some vendors really can work with older singlephase machines. Here is my recommendation: if you are buying CR and your x-ray machine works consistently and can be calibrated, then keep it. If you are buying flat panel DR, buy a new x-ray machine too. If you are buying CCD DR, and your x-ray machine is less than 10 years old and high-frequency, then ask if your machine can be retrofitted because it could save you tens of thousands. If you are buying CCD DR and your x-ray machine is old as dirt, then buy a new x-ray machine.

Buy your system from a national sales organization or a local x-ray dealer?

Not to beat the car analogy to death, but, if I considered buying a car from a "mail-order" house who did not have a local dealer network, then I would be driving a Fiat right now. I know that one day, as reliable as the new Fiats are, that I will need service and I don't feel like waiting for parts from Italy. Local dealers will consult with you to find your needs. No one will work harder to ensure that you are happy with your decision.