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Diagnostic Efficiency, Ultrasound & Technology in Practice: Living the 24-Hour Rule For The Clinical Patient- 4 Pages

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Having lived veterinary medicine by means of the ultrasound probe for many years now in a mobile practice, the most important thing I have learned is that when we are faced with a sick patient that is presented to us, time is of the essence. The more time that passes the more the patient declines and is less prepared for subsequent therapy whether it be surgery, medical therapy, chemotherapy, and so forth. Rapid diagnosis is essential in a case where a patient is clinically declining owing to a perforating gall bladder mucocele, intestinal obstruction, bowel infarction, pancreatitis and necrosis, emerging lymphoma or may visceral mast cell disease… I can think of hundreds of examples where this is true. Apart from the patient well being, the more time it takes to diagnose a patient's disease, the more costly the bill becomes for the pet owner and the more the frustration builds for the practitioner. Therefore, our sole purpose in practice should revolve around achieving a definitive diagnosis or clinical direction for our sick patients as quickly as possible. This concept is what I have trademarked as "Diagnostic Efficiency" and is the core concept of SonoPath.com.

If we look at how we approach a sick patient, ultrasound examination should be in the forefront of our mind while we perform our clinical exam in these cases right there along with the usual bloodwork urinalysis and radiographs.

Ultrasound allows us to examine the organs directly similar to a scuba diver looking at the fish directly as opposed to us guessing where they may be while fishing from a boat on the surface. CBC, Chem panel and urinalysis give us "markers" to indicate potentially what organ or organs are being affected by the pathology in play. However with blood and urine testing we are looking at "markers" for organs but not looking at the organs themselves. In other words we are "fishing" to find out what is going on with the patient by testing the "waters" of the bloodstream and urine. Direct access to organ histopathology and cytology, on the other hand, give us direct sampling access of specific organs that appear abnormal on ultrasound. Hence ultrasound-guided techniques allow us to basically "point & shoot" at the pathology right then and there similar to the "plug & play" concept in technology regarding user-friendliness. We need to render the diagnostic process more user-friendly in order to avoid excessive or unnecessary steps and delays in the process of achieving an accurate diagnosis or direction for our patients.

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Therefore if we look at all the time that may elapse from the time the pet is initially presented to us, to the time we get the diagnosis, we should be choosing the tests that give us the most direct information in the shortest amount of time. Physical exam, in-house or overnight bloodwork & urinalysis, ultrasound, radiographs (+/- remote support for interpretation if necessary), are all tests that can all be achieved quickly in order to enhance our "gut feeling" and our "diagnostic efficiency." In this manner we can achieve our diagnosis within the "24-hour rule" especially if cytology was obtained from a pathological organ by means of ultrasound guided FNA. US-guided histopathology usually takes longer for interpretation so the choice between obtaining cytology for cellular disease (i.e. lymphoma, MCT, acute inflammation) or structural disease (i.e. cholangiohepatitis, IBD, glomerulonephritis) should be considered with regards to the clinical state of the patient and sonographic presentation. We must ask ourselves if there time to wait out the histopathology or should we obtain cytology in the meantime for a preliminary idea regarding the cellular presence in the organ as opposed to the structural changes that will provide more definitive results by means of biopsy? Each patient will be different in this regard.

Technology today allows us to move images and video around the Internet quickly thanks to improved bandwidth and plug-and-play concepts that are more efficient than 10 years ago, 5 years ago, and even last week. The industry is moving quickly in this regard because there are serious market pressures and competition. A normal folder of ultrasound images and video with radiographs and bloodwork will be about 50-70 mbyte in size and can be uploaded and arrive at any destination email within 30 minutes on average. This largely depends on the bandwidth of the sender and receiver. Therefore, Internet infrastructure is as important to a veterinary facility as having an x-ray machine, electricity, or even a room to work in. Basically you just throw all the info you have in a folder and upload the folder to whoever you wish to interpret the case information anytime, anywhere, in any country and in any time zone. The "World Is Flat" in veterinary medicine is there for those who wish walk across it. This will only improve so people like myself are always in search of an Internet "pipe" to receive images of pathology from all over the world. The amount of specialists doing this remote interpretation will only increase over time and the practitioners and technical personnel that adapt to this way of thinking will achieve more accurate results and direction faster than those that do not. This is a fact that I see and relive every day and represents the way the world is moving in all disciplines. We all are becoming technology dependent whether we wish to or not basically based on market pressures.

However, those that adapt to technology and work flow efficiency in veterinary medicine in a simple and efficient manner will win. These practitioners will find themselves ahead of the diagnostic efficiency curve and be able to live the 24-hour rule every day without effort as this rule becomes Modus Operandum.

In regards to technology and work flow in practice consider the following bullet points:

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Key points to look at in your facility regarding diagnostic efficiency and the 24-hour rule.

1) **Internet infrastructure;** bandwidth, updated software, access of terminals, DR and ultrasound ease of conversion and transmission of images & compatibility and number of steps needed to send images. Is your technology as close to "Plug & Play" as possible to minimize steps in any process? More steps=lost time=lost income=user/owner frustration.

2) **Personnel mindset.** Do you have personnel that live in the technology world? That younger generation smartphone-flipping technician is your motor to adapting technology in practice. Tap his or her enthusiasm so you don't have to. They are starving for responsibility and self esteem in this regard.

3) **Ultrasound and digital radiology equipment.** Is it recent and adaptable to the Internet today and not that of 5 years ago? Do you need to upgrade to more efficient software? How user friendly is it to send in dicom or jpeg/avi and can you send to anyone you want or must you send to a dedicated group and be "married' to their personnel? Ensure you have freedom of choice for interpretation of your material.

4) **Personnel efficiency.** Take a look at who your "diagnostic motors" are in your facility (Dr., technician, support staff) and perhaps tweak their roles a bit to maximize their abilities. Sometimes just standing and watching your people work for a day as opposed to working with them gives a different perspective. Being a consultant and a fly on the wall at hundreds of hospitals I never underestimate the value of objective observation of personnel. If you don't have the correct personnel then invest in it or you will spin your wheels and drag an anchor behind your ship of diagnostic efficiency.

5) **Invest your marketing budget into enhancing diagnostic efficiency in your practice.** There is no better marketing than accurate and rapid results. Those clients that work up their patients have friends. Enhancing diagnostic efficiency ensures that your facility will be the subject of positive conversation at the dinner table. Let the other guys spend money on the big yellow page ad that no one looks at anymore. You just need to be the center of conversation in your local country club. For example, imagine what happens after you diagnosed and saved the club golf champion's Scottish Terrier within a couple of hours that he brought him in for "Not Doing Right" owing to an inflamed gall bladder mucocele that was beginning to perforate and develop bile peritonitis. How much marketing would you have to do to ensure future clients that were in that particular country club conversation become new clients of yours because they want your veterinary "swagger' of diagnostic efficiency?

6) **Invest in a mentality.** This is an investment in effort as much as an economic investment when moving into an efficient technology based practice. I see so many beautiful DR systems and even ultrasound machines sitting and being utilized only to a fraction of their capacities. The investment into the mentality of personnel to drive them is even more important than the machines themselves.

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Basically we should all be counting the steps it takes in our facilities to take a patient from the exam table to the diagnosis and decide where we can eliminate waste and stutter steps. A poorly sensitive or specific test, a non-motivated doctor or technician mentality, distracted personnel, antiquated software, or a complex IT system that isn't plug and play are examples of diagnostic stutter steps. I am sure we all have more examples in our facilities. The diagnostic stutter-step is where everyone loses, especially the patient.

The following abstracts that I and my team have done that reiterate the concepts communicated in these 2 hours of presentation: Full abstracts and PowerPoint presentations may be found on the RESOURCES tab on www.SonoPath.com

ECVIM 2009
SONOGRAPHIC CRITERIA FOR THE DIAGNOSIS OF GASTROINTESTINAL OBSTRUCTION IN 39 DOGS AND CATS.
E Lindquist1, D Casey2, J Frank.1

ECVIM 2009
CLINICAL PARAMETERS IN DOGS WITH SONOGRAPHICALLY DIAGNOSED SURGICAL BILIARY DISEASE
E Lindquist1, A Brown2, J Bush1, J Frank.1

ECVIM 2010
SONOGRAPHIC WHOLE BODY PARAMETERS OF PORTOSYSTEMIC SHUNTS IN 38 DOGS & CATS
E Lindquist1, D Casey2, J Frank1

ECVIM 2011
SONOGRAPJHIC PARAMETER OF ADRENAL GLANDS IN 19 ADDISONIAN DOGS
E Lindquist, J Frank, K Marek.

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