Dr. Bob Wood - Systemic Interpretation of Common Dental Radiographs with Dr. Bob Wood - Episode 4

Dr. O'Keefe: Today I welcome back Dr. Bob Wood, radiology specialist who's the chief of dentistry at Princess Margaret Hospital in Toronto, and we're continuing our series on the systematic approach to radiological interpretation for GP dentists. Bob, today we're going to talk about the systematic approach to interpreting some of the most common radiographs we use in practice, periapicals and bitewings at least. What are the absolute key points to take away from your presentation about how I should approach these radiographs?

Dr. Bob Wood: I think the key points for doing radiology, the interpretation of it, of images, there's some very important things. First thing is slow down, slow down, make sure you have a good viewing environment that you're looking at these things and taking your time to look at every part of the film. Remember; look at the corners of the film, so slow down. Look at all the images. Make sure you observe things rather than just see them. I know you can see them, so make sure you observe them. Make sure you write them down and ultimately, we're gonna figure out how to integrate them into the care of the patient. That is so important. And it is the usual way things are done rather is: practitioners picture-match, so they look at something, even with caries, the radiolucency just apical to contact point caries. So, they do picture match, picture, match, picture, match, and there's, and I hate to use the word systematic but a systematic way of analyzing every part of your image to get the maximum amount of information out of them.

Dr. O'Keefe: So, let's go and have a slow walk systematically through some periapicals and some first bitewings. Let's go have a look at the presentation.

Dr. Bob Wood: Absolutely. Okay. So, today we have been through in the past talking about, you know, film selection and dealing with patients who might have some issues with radiation and radiation safety. And then we talked a little bit about making sure we have a good toolbox, a good a set of images to look at. But the thing is, you can have the best tools in the world, but if you don't take the time to use the tools appropriately or if you don't take the time to learn how to use the tools, then the tools are actually best left in the toolbox. So, today we're gonna talk about just common images that general practitioners use, which are bitewings and periapicals to start. And then we'll move on to panoramic radiographs. And we're gonna talk about, yes, I know you can all see radiographs, if you're sighted person, you can see them, but the important thing is to observe your findings on the radiographs and make note of them.

Dr. Bob Wood: So, in the radiographic or the radiologic radiography being the making of images, radiology, being the analysis, interpretation of these images, you really are without you even knowing it; and in the case of many of the common things that the general practitioners do, you are making a snap diagnosis. So, that's great for things you know, but it's not necessarily great for the odd thing that's going to come across your chair and that you're going to have to make some kind of reasonably intelligent differential diagnosis. So, what do we do when we're looking at any image, whether we know it or not, we are examining the images and we all have our way of examining images in a fashion. Some just like holding it up to the light and looking, waiting for divine intervention, some a bit more of a systematic approach, but we're examining the radiographs and we're looking at the features on the radiographs and we want to list our observations.

Dr. Bob Wood: We should all know normal and abnormal, although I'll tell ya, it's sometimes the one of the hardest things to discern is whether something is normal or abnormal. We examine the radiograph we're going to list our observations we make from the radiographs and that's what we're going to talk about today. After that, we're going to say, okay, these observations, which ones are significant, which ones are not significant to the situation at hand, and then we're going decide the basic nature of the disease, which you're going to do in a couple of lectures from now and we'll formulate a differential diagnosis and then will include for the general practitioner things like patient history information, whether the teeth are vital, whether there's a soft tissue mass, all kinds of different clinical information. We're going to make a working diagnosis. Then we might consider special testing.

Dr. Bob Wood: Now, we're not going to biopsy caries, but if we see a soft tissue mass with adjacent bone destruction and I'm going to show one in a few weeks, then that's something that tells us that there's a malignancy there. I saw a patient yesterday with that. And that's an important observation to make. So, we are going to consider special testing, in her case, we might do a biopsy and that after we get all that together, we're going to treat the patient. Now, we don't do this over a series of nine appointments. The radiologist that you're going to meet Dr. Chadwick and certainly myself, we internalize a lot of this because I'm old and he's smart and so it's just going to be something that we do very quickly and of course, since we see so much malignancy, every time we see something, we have to make sure in our brains that we don't pollute the fact that someone has a malignancy and therefore everything that we see on their films and willingness because you know, common things are commonly seen, right?

Dr. Bob Wood: So, this is what we're going to start with today and we're going to start with the three most common films in general practice, which are bitewings, which everybody takes fairly frequently and we're gonna talk about bitewings. We're going to talk about periapical radiographs, and we're going to talk about pantomographs.

Dr. Bob Wood: So, let's first turn our eyes to bitewings and if we go out of typical business of the digital bitewing radiographs, typically what happens with with bitewing radiographs, depending on the level of debt one has, as you start looking for decay, you're going to look for the things you know, but if you don't know a lot of a lot of diseases, then let's train our eyes to look at a film in a specific way. So, with a bitewing, this is a good bitewing you can see the interproximal areas, we can see the level of the alveolar bone.

Dr. Bob Wood: It's a digital image; I am not a big fan of digital images of one could see some of the C-speed films that exist in the faculty of dentistry at the University of Toronto from the 1960's. When you see a C-speed film, which I can't even project because the computer cannot see that level of detail. They are a work of art. They are beautiful. The contrast density, if they're well done, they're magnificent films to do interpretation on, because we accept the linear hypothesis, as we get into using less and less and less radiation, our film quality goes down, so I'm not sure why we're content to use bad or not as good tools, but that's the direction that things have gone. I have no control over it, but anyway, we have a bite, so what do we do? We sit and look and wait for someone to hit us over the head or for divine intervention or do we have a way that we can look at each part of this in a disciplined fashion.

Dr. Bob Wood: The acronym that I like is CRAPS and that's when we look at bites, we look at the caries zones. The areas we expect for carries. That's going to be the first one because that's what we know best. We're going to do a check of the restoration, so restoration check, look at the adjacent periodontium as much as we can see in a bitewing, the areas of the pulpal zone or the pulpal root canal complex and recognizing on a bitewing you can't see the periapex and soft tissues that we might see on the film. If they're visible, certainly we'd see those C-speed films, but we don't see them all the time on digital film. So, let's just start that. So, when we're looking at caries or for carries, well, where do we expect the caries and then these red circled areas around here and if we expect caries just apical to the contact points, that's certainly one area we're gonna look because that's where the bacteria that eats your food and pees on your teeth lip, they'd like to live in these little nooks and crannies and they also liked to live in these little nooks and crannies on the occlusal surfaces.

Dr. Bob Wood: So, we're going to look at, we're going to systematically and I usually start from one end of the top and go around and look at all these areas on all the teeth, all the interproximal area is just apical to the contact zone and also on the occlusal surfaces where there's a potential opening for bacteria to get in there and cause decay. So, that's the first thing you can do. We all do that because that's in our nature because we treat decay, but we need to discipline ourselves to make sure we look at every one, so this person would come in for a problem on the 2.7, well we still have to look down here. This is actually an artifact of the digital radiograph, but we still have to make sure that you know what, let's just look at everything.

Dr. Bob Wood: Take our time, take few minutes and make our observations. So, we looked at the caries area, the caries zone. So, we'll move on now and we are next going to look at the restorations; we're going check the restorations and we can see on the back of the 2.6, it looks like an area where there's either an overhang or an overhang in an area of decay where the green arrow is right here. So, there may be some decay there. This is a flat contact. May Not be ideal. It might be perfectly serviceable. It's an area where the patient is going to have to pay extra attention to for oral hygiene, but there may be decay. We might have to get our explorer out, so we can get in there, we might have to take a different view. We might want to note in the chart, we'll take another view later on and then we'll carry on with our restorations and look at it.

Dr. Bob Wood: This is, of course a resin and there's another little overhang there we're writing these down. We'll go down to the 3.7 and we can see here, well there's a restoration. This is probably some form of occlusal buccal I'm guessing restoration. I don't know how pulp is in close proximity perhaps or this is a superimposition of a restoration over the pulp. But it's certainly something that we might not see unless we have disciplined ourselves. Again, the overhangs and I said I do the best overhangs in dentistry and an area of artifact here, which is not decay. It's just an artifactual thing we see with digital images. There's an area where there's a defect in the amount of material that has been packed in there. And we see that a lot with composite resins.

Dr. Bob Wood: You know, there's an area where the contact isn't really that great and here's an area where there's a ditch and/or potential decay, and then we're going to move on to the periodontium recognizing that bitewings are actually quite good for looking at bone level, bone quality and whether there's a cortex on the superficial aspect of the periodontium. Those are things we're going to look at. We're gonna. Look at each one, the bone level relative to the cementum enamel junction. It's not too bad here. I don't know how old this patient is. We want to see if this is corticated at the level of the crest of the periodontium. So, we're looking at the level, we're looking at the quality of the bone. Does this look like normal alveolar bone? And it does. Is there a cortex across here? And what is the geometry of this?

Dr. Bob Wood: Is it straight across? Does it look like there's some kind of angular defect? We're going to also look at the areas between these areas. We can clearly see the interproximal periodontium for the bone level because we can actually see it. It obscures the root a little bit. Okay, so we can. We can see that and we'll do that throughout this film and actually it looks quite good: they are well corticated, they've got a decent level, the bone quality in as much as we can see, which is a problem with digital imaging because we have this big occupant here to do the bitewings instead of a little cardboard tab, but it actually looks pretty good. Then we're going to move on to the pulpal areas and again, it seems stupid to have to do this, but it requires a certain amount of discipline, but once you get it, you will always do it this way and it doesn't take that much time.

Dr. Bob Wood: It takes a lot less time to do it right. Let's look at the pulps. You can't see the pulp on this one. That's fair enough. It's not part of the image. Here's a normal pulp; it actually goes further than the blue line. Again, normal. We'll ask ourselves, is it normal for age? This is an accentuated pulp horn, if we're restoring this tooth, which is the 22, we might want to consider this, pulp horn might be a little extended there. Again, we talked about this pulp horn being a little bit up compared to the other one. This one obviously had root-canal treatments, so we make note of that and this one is good and this one is good. We're looking for calcifications or so-called pulp stones or calcareous degeneration. Whatever you want to call; it is where we're going to have to do a root canal.

Dr. Bob Wood: These are things we might want to look at. Clearly, we're going to take a periapical to do the root canal, but still let's make use of all the information that we have on the bitewing. We might as well, we've exposed these patients to what I think is a beneficial level of radiation, but other people think a harmful level of radiation, let's at least make use of the instrument that we've asked them to undertake. Lastly, we're going to look at soft tissue. This is always overlooked by people because they think that imaging only can see if they can only really see hard tissue like decay or periodontal things, pulp, etc. This one has a zone where there's a little bit of soft tissue behind the posterior most molar. This is important to note and it's important to note because it's there and isn't necessarily normal.

Dr. Bob Wood: There might be some fleshy mass here or there might just be some proud flesh. The bone underneath there looks good, so even though there's a soft tissue area here, it's linear, it isn't wobbly and the bone underneath it is good. If you have a soft tissue mass and a fairly significant and observable underlying bone destruction, you should be concerned because that's a sign of something perhaps sinister. Bear in mind that you have to write these observations down and later on we're going to attach significance, but still we're going to look at the soft tissue where we can see it. Certainly, see it here and we'd see a little bit here. Little bit here. We're going to do it, so we've now done a review of the bitewing, which I'm sure everybody's been doing in seconds, just yes caries no.

Dr. Bob Wood: But now we've managed to cover off everything to do with these films and it didn't take that long. Even at the boring slow rate that I was going at. You can do this in a couple of minutes if you do an approach, a systematic approach rather than waiting for divine intervention. And so, you have to make sure that as we said, you not only see things, but you observe them and if you're going to observe them, what you need to do as Doug Stoneman used to tell me and Mike Pharoah too, if you don't write them down, it doesn't count. If you don't say something you can't say later on, well, I thought that's what it was. You know, you have to write them down your observations. You don't necessarily have to write them in the chart. You can have a worksheet and it doesn't have to be part of the permanent record.

Dr. Bob Wood: And now we've looked at caries, associated parallel bone, pulp, restoration, soft tissues. I've rearranged here, but it's still a CRAPS. One of the things that's really important with bitewings and with everything is that if you hear barking, you think, oh, that's probably a dog, it's probably not a seal in my waiting room or outside my office. It's probably a dog. Common things are commonly seen. If you hear barking, you think the dog, not a couple of fur seals. That's because common things are commonly seen; they are commonly seen in even people with bizarre diseases. Caries has has been with us for a long time and it will be with us for a long time as will be periodontal disease. So, they are commonly seen. We see lots of caries, we see more caries and head and neck cancer patients; more caries on people on chemotherapy than quote unquote normal people, whatever they are. And so, even people with strange diseases still have common things. So, always keep that in mind. Common things are commonly. See.

Dr. Bob Wood: So, let's just move on for a second now and talk about the second image in the image series, which is periapical radiographs. The key with periapical radiographs is they should show you the periapex. Okay. I like when a patient comes in with a toothache obviously after a clinical exam, I always like to have both a bitewing and a periapical. If they come in with a toothache or dental pain, bitewing, periapical, and of course clinical exam, which includes vitality testing. But periapicals should show the periapical and it shouldn't just show the periapical, it shouldn't just have the periapical in the last micron of the edge of the film. The periapical should show the periapical in all its glory so that you can see around the periapex.

Dr. Bob Wood: So, let's look at a periapical. It's a digital periapical, very long roots. This periapical is taken for the purposes of looking at the 4.7, which is the middle tooth for those people joining us from the United States and from overseas and our men in combat. So, we're taking it for, this here, but so what? We've taken this periapical or it's been taken. Maybe it's been sent to us for a second opinion. I don't have a nice little CRAPS acronym for looking at a periapical, so let's just look at some of the things that we're going to look here. Are we gonna wait for this divine intervention? Are we going to ignore the other teeth because they've got the tooth that the patient is concerned about? Well of course not. We're going to look at this and we're going to make our observations after we traced the little areas of this in our mind.

Dr. Bob Wood: So, the first thing we're going to look at are the same things that we look at with respect to caries and teeth: is we're going to look at the teeth, the tooth, right?

We're going to look at the same areas for caries, just below the contact area in the area of the undulations of the occlusal table. We're going to look at the roots and what directions, what numbers, maybe we have to extract this tooth; it would be nice to know if this tooth was pointed with a giant dilaceration, that'd be good to know. If we had to extract this tooth, ultimately that's if the patient wants it. If we're referring this patient for a root canal treatment, we can see certain structures which we're gonna get to, but we are going to look at these aspects of the teeth.

Dr. Bob Wood: We can see that if we had taken this film for the purpose of looking at the 4.8, this film would be useless, right? Because we don't see the apex of this tooth, so for this tooth and even the tooth is perfectly fine; for this tooth, how do we know if we're extracting this how do we know that there's not a dilaceration on the apical fifth of this tooth [inaudible], we don't. And so, that's why we have to make sure we're working with good tools. Then, we're going to look at the lamina dura and the laminate dura, for those people who don't know what the lamina dura is, it's that thin white line that surrounds the periodontal ligament. If you extract the tooth and look down in the hole, once you control the hemorrhage, that's that sclerotic white bone that surrounds the tooth, that is the lamina dura.

Dr. Bob Wood: And the lamina dura you should trace the lamina dura around every tooth and you should be able to trace the lamina dura around the entire tooth except in really pointy teeth because in really pointy teeth like an upper cuspid and in teeth with very fine roots, you may not see the lamina dura because it is too thin to cast a shadow. Okay, but we want to trace the lamina dura around the entire tooth. We can see it here in the dotted line here. We can see that this is a thin area where we don't really see as good as a lamina dura in this area, as we do say in this area. We here can see a lamina dura here as well and we can actually see almost like two laminate duras because that tooth surface undulate. Teeth, aren't round pegs, they have a little anatomy to them, and curvatures that tooth may have sort of a figure of eight root shape.

Dr. Bob Wood: So, make note of the fact we might see two lamina dura, this lamina dura on the offending tooth, the tooth of interest, we can trace it to here. And then all of a sudden, you know, there's no lamina dura here; we don't pick up a lamina dura or any kind of sclerotic bone until around the dotted line. And then we pick it up again here. Okay? So, we can see lamina dura. You don't always see them under duress. So, another thing that we're going to check for is the periodontal ligament space. The periodontal ligament space is this black line, if you like. That's where the periodontal ligament is. It's made of soft tissue, it's what we tear when we're taking out a tooth and it, again, should be visible as a uniform thin black line. Here again, between these two areas, we have two periodontal ligaments, visible periodontal ligament spaces because that route is not perfectly round, it has undulations to it, so it's going to have quote unquote two parallel ligaments, although it's just one. So, these are uniform periodontal ligaments. We've seen them even at the apices of very thin roots. We can usually pick up a periodontal ligament like we can here. And in this area here, we can see on the tooth of interest, the periodontal ligament is grotesquely widened up in this area here and the periodontal ligament is sort of lost, and you can't really follow it around the periapex of this particular tooth. Sometimes, even though there's no really convincing lamina dura because maybe you're faced by the overlying presence of dense bone, we can still see a periodontal ligament. Clearly this tooth is not at this rate is not adequate for looking periodontal ligament of this entire tooth, but we can still, even though there's not a really good lamina dura as there are in other areas like here, we can still see a ligament space around the 4.8 even a little bit around the periapex there. So, ligament space, you should be able to trace alright, unless the tooth is extremely tiny and fine which in itself gives you information and we'll look at the pulp and root canal areas.

Dr. Bob Wood: So, let's look at these three. just sort of the pulp chambers for 6, it looks pretty normal. For 7, it looks pretty normal and for 8 it looks like it's not there anymore at least radiographically. So, let's say the patient was contemplating a root canal treatment for 8, this will be certainly, I'd send one to my endodontic colleague, I would probably send all these to my endodontic colleagues in fairness, because a root canal at my age is kind of an unnerving endeavor, but we can't see pulp chambers and root canals in this tooth. So, if this one was a problem, then this is certainly one I'm going to refer, and most general practitioners refer just to if nothing else give the endodontist a headache. So, we're going to look at the pulp chamber and the and the root canals and look for curvatures. We're going to look for extra canals. bearing in mind we know we can't see very fine canals. It's something our endodontic colleagues will have to do usually visually and usually with an operating microscope, but we're going to look at these with a certain amount of discipline. this one is straight as an arrow, this one's a little bit curved, not a lot. I'm sure you might have seen grotesquely curved dilacerations that they'd been in practice longer than two weeks. So, but we're taking the time to look at these. Then, we're going to look at the periapical regions specifically. This area, the 4.6 mesial root is normal, this root is normal. This is not normal. This is not normal. The ligament spaces here and then the periapical area shows that we have an area of radiolucency surrounding the apex of this tooth, which is odd because if you look at this tooth, it looks like what I call a happy tooth. It doesn't look like there's a lot going on with the top of the tooth. I don't see the whole top of the tooth. if I had taken a bitewing of this as well, I might have more information, which is why I always take a periapical and a bitewing film for anybody who has a toothache. And if I was interested in the periapical area of this tooth then I haven't got the right tool, okay. So, and in this area here, I have an area of radiolucency surrounding that area and actually around that I have a little bit of radiopacity which we're going to get to in a minute, but before we get there, so, we were noting this, we know we have a periodontal ligament space that is a periapical problem or issue here, so we're going to write that down and put an asterisk beside that: we might want to do vitality testing of that tooth.

Dr. Bob Wood: Then, we again look at the periodontal bone on this image and we have numbers up here which obscure the... We can turn these up on the digital. We got nice periodontal bone level here. We've got pretty decent architecture in this area and we've got pretty decent, from what we can see, pretty decent architecture in this area. In this area, it's interesting, this periodontal ligament space, this is the area of rarefaction or radiolucency, which may be rarefying osteitis, inflammatory inflammation. There was pus exuding from this crevice of this tooth. That's an important clinical finding. We should and get to keep it in the back of our mind. We can see here, interestingly enough, this periodontium looks like at least is partially a face which may tell us that there's some inflammation going up where that pus coming out of the crevice .

Dr. Bob Wood: That's an important observation to make because it kind of points us in the direction of infection. Then, we're going to look at, okay, let's just sit back from this and look. Let's just go back a bit in space. So, you know this bone looks quite different from this sort of teal vertical line anteriorly. It looks much different overall than the alveolar bone to the left of that. So, to the right of that, we see a number of things. We see these areas which have this laddering of these marrow spaces, which at one point people thought was associated with some kind of pathology. That of course is hooey. It's actually perfectly normal. That's a perfectly normal findings for laddered ligaments. Sorry, these ladder [inaudible] of radiolucency, but they're just normal marrow spaces. They were thought to be related to sickle cell anemia and they thought it related to other anemias etc.

Dr. Bob Wood: They're related to nothing. I've seen sickle cell patients from across the street at the general who don't have this and I've seen tons of these in normal people; that's attaching significance and that's using experience. And then, we see a fairly large marrow space here and some really large marrow spaces, but they are still normal. They're still surrounded by normal bone and let's look at the left of the slide. We can see this area where these little diffused little dots are, and this area here and the area surrounding it, but you see this whole area to the left here is just a little bit lighter, maybe thicker bone, but it may be a result of a reaction to an area of inflammation around the apex of this tooth. This may be sclerosing osteitis, there's these odd little radiolucent poles which to be frank, I don't know what they are.

Dr. Bob Wood: And then, there's other areas where there's these little white sclerotic areas with some surrounding, perhaps some surrounding radiolucency which may represent a furtherance of the infection, and these may indeed be sequestra. So, we've now we've taken some time actually to discipline ourselves to look at things and to observe things and we'll see things that we've never actually, pardon me, we'll observe things we've actually been seeing for years. And that's important. So, here's a nice diagram. So, it's usually the one they put up in first year anything; and they say, okay, look at these. This is actually what we did. And if you look at medical radiologists, and if you look at they track their eye patterns on chest radiographs. There's whole areas of chests they never look at. They look at certain areas; you can track their eyes. I think Dr. Ernie Lam has done this in, the radiology department at the university of Toronto, tracking eye patterns of where people go and we're not terribly disciplined.

Dr. Bob Wood: We tend to go for spot the loony, we see the thing that's the most glaring and we forget to look at the rest of the film. So, we want to stop that. We want to make sure that we've observed everything and that we've written them down. So, we're going to talk about panoramic radiographs a little later, but you have to write them down because we're going to go back to this list ultimately, throughout this course.

Dr. Bob Wood: We've now examined these two types of radiographs. We've milked as much information as we can from these two types of images. We've listed our observations and then we have to attach significance to the observations and decide the basic nature of the disease. So, if I was going to sort of just go back to our film without any aids, I'd say, okay, well, you know, I've looked at all these areas, I've seen that there's a widened periodontal membrane space here. This narrow rarefaction perhaps an area of sclerosis, and it might even be extensive sclerosis, and this is normal. This is all normal. The parallel ligament space here. This is normal. I'm worried about the radiolucency, the radiopacity around that.

Dr. Bob Wood: I'm worried about the radiolucency. I'm worried about the radiopacity, I'm a little worried about the fact that these may be sequestera, may not be. I'm worried that this inflammation which, integrating with my clinical findings, is caused from the [inaudible] of the periodontal support bone at the coronal aspect. And so, I'm starting to, as I list my observations, I'm starting to figure out what is the basic nature of this disease? We're going to talk about that in a couple of seminars. Now, basic nature, all diseases fit into one of seven categories. But I'm leaning in this case, I'll just spoiler alert. I'm leaning towards inflammatory or infection. It leads me, my radiographic finding independent of the pus coming out the crevice even on my radiographic findings should stand independently on their own. I'm leaning towards an inflammatory process here and I am leaning to that because, you know, I am taking the time to look at the films.

Dr. Bob Wood: Okay. So, that's the way we'd like to do things. We like to do things so that we can make sure we've sucked as much information on these films as we can. And then, when we get to attaching significance to these, well some things are significant; like if there are sequestra there, if there is a widened periodontal membrane based on the front of the 4.7, that's important. That's just rarefying osteitis, [inaudible] osteitis. That's important. Those are attaching significance. The area of the 4.6 with that so-called laddered marrow spaces, that's unimportant, that's a variation of normal. It's not unimportant, it's just important that I know that I shouldn't do anything about it. I shouldn't test Mrs. Mc Gillicutty for sickle cell disease because chances are she doesn't have it because she's Scottish. Okay. So, it's important to integrate these findings in with the clinical findings and formulate a differential diagnosis.

Dr. Bob Wood: After that, we're going to, in some cases where when we're going to look at, we're not going to stick with carries with periodontal disease. We're going to move on to some really bizarre stuff later on in this series; and then we're going to give out cases for people actually try their hand at this. After you formulate a differential, that differential is not one thing, I learned that early on. I think other than day one with Mike Pharoah and that did differential is not one thing. A differential is a list of possible conditions that could cause this radiographic appearance from most likely to least likely. Okay? And you can't have a differential of one, that's not a differential diagnosis, it's a diagnosis, but most of the time it's a guess. It's a diagnosis. You formulate a list, differential diagnoses. In this case, periapical. I'm certainly thinking about rarefying osteitis and pus coming out the crevice and causing up some periodontal disease, but I'm a little bit worried about those things.

Dr. Bob Wood: It could be sequestra and this is a problem actually for people who have a lot of experience that people had advanced training in radiology. It's another wordism that experience doesn't give you what you think it should. If you think you should be very, very confident as time goes on, but actually you get somewhat a little bit careful or a little bit less confident, the more things you have seen because what we want to get away from is picture-matching, okay, we don't want to be, I've seen this before, I saw it in the textbook, therefore this matches that. That stamp-collecting or picture-matching doesn't work. We want to analyze things and then after that we'll include all the clinical information, obviously, the patient history, the histological examination, and then we'll make a working diagnosis, we'll consider other special testing methods and then we'll treat the patient.

Dr. Bob Wood: Unfortunately dentistry, what we usually do is we jump from examine not terribly well all the way to treatment and if you look at our fee guide, the examination pages are about three or four and the treatment pages are like 50 or 60. So, we miss, we don't assign the right amount of weight to this part, but if you get this wrong, then you're going to get this wrong. It's pants first, then shoes, diagnosis, then treatment. Don't stand around your pants off and your shoes on. Try to put your pants on, get your pants on first by doing your examination, listing, attaching significance. When you get down here, you can put your treatment shoes on and walk into the clinic with great confidence. So, next time we're going to talk about panoramic radiographs, and we'll carry on with this.

New Speaker: So, that gives us the queue. Next time it's the pantomograph right?

Dr. Bob Wood: The pantomograph, we'll call it for the sake of discussion.

New Speaker: Dr. Bob wood, thank you very much for this systematic approach to bitewings and periapical interpretation.

Dr. Bob Wood: Pleasure. John.