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CONCURRENT: Traditional Chinese Medicine and Supportive Cancer Care

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P R O C E E D I N G S

DR. SAGAR: My name is Stephen Sagar. I'm a radiation oncologist. My practice is in Hamilton, Ontario, which is on the Great Lakes, near Toronto. I'm part of McMaster University, which does quite a lot of work on evaluation and models of health care. Briefly, my interest in Chinese medicine commenced about 8 years ago, when I decided, as maybe many of us fear, that there were major deficiencies in the way we practiced health care. And I started to look outside of our current health care model to actually determine what traditional health care systems were doing and what sort of model of practice were they utilizing. And it became clear after awhile that if was going to be exploring these systems, I'd have to do a bit of training in the systems to at least get a flavor as to what was going on, an understanding of their models of health. So I did training in acupuncture and some traditional Chinese medicine at our Canadian Acupuncture Foundation, which does a lot of the teaching in Canada in acupuncture. We were fortunate also to have Joseph Helms up for part of the course, from Stanford. And I went on from that to actually study Chinese medicine more and more -- not from the slant, necessarily, of practicing it. Actually, if my patients require Chinese medicine, I send the patients to traditional Chinese medical practitioners who I've actually worked with and who have knowledge of oncology but more from a point of view of an interest in a model, a system of care, which we can actually learn from and bring back to our own health care system. Now, being a physician, of course, in the current model of health care, this requires a certain amount of scientific grounding. So a lot of the initial work was simply to survey the literature to actually determine what evidence there was that Chinese medicine can actually work. However, one thing I want to emphasize from the beginning, and many of you may realize it, once you start to dissect a system into its parts, you know, in a positivist, scientific, and reductionist way, you start to lose part of the healing elements of that system. And Chinese medicine, when practiced appropriately, and I don't think it is always practiced appropriately, but when it is practiced appropriately, actually is a psychospiritual speciality which concentrates on the constitutional makeup of each individual patient. Some of the terms that are utilized are very foreign to us in conventional medicine; for example, terms such as chi, which means energy. And one of the difficult things I had to come to terms with was -- because I do have a scientific mind which tends to have a big fight, my left brain fights with my right brain and then my right brain protests -- but at the same time, I think you can start to translate these concepts into modern science. So chi can be thought of as energy. But what is energy? Energy is the ability to do work. But at the same time it's doing work, it's also conveying some sort of information. So chi is a process of energy transfer of information, is one way of looking at it. And then you start to go into yin and yang, which in a sense is a conversion of an analog system of information to digital information and back to analog

information again. Notice how, with the understanding of current systems theories and computer programming, you're starting to get an idea of the philosophy that may have been going through the minds of the great philosophers in Chinese medicine a couple of thousand years ago. And so on with other systems in Chinese medicine. One is called Five Element Theory, where you have such terms as fire, wood, water, metal. But these are difficult to translate into any meaning, because when you translate from the Chinese, it can mean something very different. But simply, they are ways of representing different constitutional types, different personality types of your patients. And what they recognize, that people that come with different personality types have quite different reactions to the treatment that you give them. And when you think about it, perhaps that's not surprising -- and I'm going to go into this a bit more clearly later on -- perhaps that's not surprising because if you -- let's say, for example, you're a very fiery sort of person, let's take fire -- you have a lot of passion in your heart. You may have from that a very strong liver yang, fire in the liver. What that basically means, translating into Western terms, is that you have a lot of sympathetic overdrive. Your heart may actually be beating much faster. You may have a different -- in the irregularity of your heart, you tend to be more tense, you tend to be sweating more. Your thyroid levels may be higher. Well, that's going to affect quite phenomenally how you react to an intervention such as herbs or drugs. It's going to change the metabolism of those drugs. Depending on your sympathetic to parasympathetic balance, you're going to get a very different effect when you give certain herbs or drugs. Your enzyme levels might be quite different as well. So this recognition very early on that people that can actually fall into certain constitution types is starting to -- it's starting to look as though, when you do the physiological measurements, as though they were quite correct; and therefore, how you're going to react to utilizing different acupuncture points or utilizing different herbs is really going to depend on your base line. And that's something that's not been recognized very clearly by conventional pharmacology, that even looking at our genes and the various enzymes that are utilized in metabolizing drugs, we're made up of extremely different combinations of these genes and therefore those enzymes. And how you will react to any agent is going to really depend on where we start from in the first place. In Chinese medicine that was recognized from the start. Now, I'm really more excited by the application of Chinese medicine in North America. To me, Chinese medicine in China is great and it's suitable for the culture of China. And we've learned a lot from that, and there's more to learn from that. But the way Chinese medicine is delivered in China need not be and probably should not be the way it's delivered in North America. If you actually go to a Chinese medicine clinic in China, you often find it's like a conveyor belt. There's hardly any interaction or history taking with the patients in many cases. It's simply a quick taking the pulse, looking at the tongue, and then prescribing the herbs. If you go to a good Chinese practitioner in North America, you would normally spend at least an hour on assessing you individually as a personality, going into depth of how you react to different environments, such as when you feel the heat more than the cold, whether you pass more urine, what color your urine is, and other things, like social, psychosocial relationships and your own beliefs, et cetera. In other words, it's much more like a detailed Western history, but with certain components which are slanted towards making a Chinese medicine-type diagnosis. So a lot of emphasis on history, and then the examination is -- the classic examination, which really is a general assessment of how you appear and your -- and it's still a tongue and a pulse diagnosis. Just briefly on -- because I'm not going to cover this again, but just briefly on the tongue. There's whole atlases of different appearances of the tongue. Classically, in a patient who's had chemotherapy, the tongue would appear extremely bright red, maybe slightly shrunken with

cracks, and hardly any coating on the tongue, and perhaps a scanty yellow covering to the tongue. And that in Chinese terms gives a diagnosis of yin deficiency. And yin deficiency often corresponds also with a kidney essence deficiency. Now, to many of you those are probably quite foreign terms. But what that means to the person practicing Chinese medicine is that certain herbs that correct yin deficiency may actually help to correct the side effects of the treatment, as demonstrated initially by the appearance of the tongue. Also, by taking the pulse you can get information as to the underlying, if you like, autonomic nervous system status and hormonal status and general metabolic status of that patient, because the depth of the pulse, the volume of the pulse, the rate of the pulse, particularly if taken at different points from the radial arteries in the wrist, can give clues as to the general status overall of the mean metabolic balance of that patient, but particularly demonstrating the sympathetic -- again, sympathetic to parasympathetic balance. And sympathetic to parasympathetic balance, which are the two extremes of the nervous system, if you like -- they work usually in opposition to each other -- has now been shown more and more in Western medicine to actually demonstrate health outcome. And we'll come to that again later on. So that's just a brief introduction how Chinese medicine -- we can start to translate some of the Chinese terms into what's actually happening in Western physiology. Now, I wanted to stop like every 5 or 10 minutes for people to ask questions, rather than wait to the end, because I want it to be more interactive. So if there's anything somebody doesn't understand so far, then --

SPEAKER: ----

DR. SAGAR: So why would the practice of Chinese medicine be different in China? Well, number one, culturally we're very different. We're also probably genetically quite different as well. So I think it has to be fine-tuned to the population you're dealing with. But more important than that, my experience in China is that not a lot of time is actually spent taking a history, whereas here we spend a lot of time taking the history. Clearly, that may vary between place to place, but I think that the cultural aspects of traditional Chinese medicine may need to be fine-tuned to the community that you're actually practicing in. The fundamentals should actually remain the same. It's been built up over a couple of thousand years of experience. How many here actually practice Chinese medicine? Okay, so all of you know more than I do. And how many here have had any experience at all in Chinese medicine who don't actually practice it? And how many here have never been exposed to Chinese medicine? Okay, so it's balanced. Yes.

SPEAKER: ---

DR. SAGAR: Some cancers are considered more yin and some are more yang?

SPEAKER: ----

DR. SAGAR: The treatments that -- cancer, you're right, is said to be more yang. But the treatments themselves are extremely yang. And what happens if the treatments themselves deplete the yin? So what you're actually -- so from my perspective, the way I see it is that what you're actually doing when you deplete the yin is you're actually depleting the person's ability to actually cope with the side effects of the treatment. And also, they're often having their immunity diminished, so they find it more difficult to actually fight infections and also the cancer itself. So

what you're doing there is really correcting the terrain -- cancer being the seed -- you're actually correcting the terrain. So that the chemotherapy is still the main destructive agent on the seed, which is the cancer, but you're supporting the terrain. Although there are clearly herbs that are used in Chinese medicine which are herbicidal, they probably are not quite as toxic as some of this chemotherapy. There's probably not a great use for those herbs in general in the current -- currently today in North America. There may be in some instances, but I see Chinese medicine more important in the supportive care, to actually improve the terrain and also to reduce the side effects and improve the quality of life for people getting conventional therapy such as chemotherapy and radiation.

SPEAKER: ----

DR. SAGAR: I think there needs to be more studies. But remember that a lot of the chemotherapy drugs and anti-angiogenesis agents, ---- in general, were actually discovered from Chinese medicine. And ---- now, and then birch and some are now coming to clinical trials. So I agree with you. But it's -- the way that they're used needs to be questioned, because it's very difficult to get good quality assurance on dosing and kinetics if you're simply taking the raw herbs and boiling them up and using those to treat the cancer. That's not to say -- there may be some advantages, and we discussed this today with anti- angiogenesis agents, that combinations of these agents may be much more -- which is ---- in the West than used in Chinese medicine -- may be much more powerful than the single agents alone. And we do need to develop a new pharmacology of synergistic agents being used at lower doses in the treatment of cancer. But my main slant so far is mainly Chinese medicine to be used, if you like, in the supportive care of patients. But yes, it will and does have a role in the active treatment of tumors. So the main components, for those who haven't actually come across Chinese medicine are acupuncture, which is the insertion of fine needles into specific points which are mapped out over the body, called meridians, which may or may not correspond to specific nerve pathways. And Chinese medicine would be looked upon as the flow of energy. And as I said before, energy, or chi, you can look upon as an information system. Chi gong, which is an energy healing system which can be done on yourself, in which case is internal chi gong, or can be done by another practitioner, akin to the therapeutic touch, if you like, in which case it becomes external chi gong; and herbal medicine, of which there are a whole host of herbs derived from animals and plants and minerals -- thousands of herbs, in fact, are in the Chinese pharmacopoeia. And as I alluded to earlier, herbs in Chinese medicine are often used in combination, with a hierarchy of herbs. There's a main herb and there's a selection of other herbs which either have synergy with that main herb or are used to counteract the side effects of that herb. So it's a very different pharmacological system, if you like, than what we're used to, where we tend to use high doses of single agents to treat certain diseases in general. And as I said before, the first thing that occurs in a good history in Chinese medicine, which we can learn from in our own health care system, is the question of who are you, what is your category of constitutional elements that make you up, that you're made of? And Chinese medicine, when practiced appropriately, actually views you as an individual personality, and therefore any treatment, whether it be psychological or spiritual or material with herbs and acupuncture, would be tailored according to your particular personality. And that's something that we've tended to drift away from in conventional medicine mainly because of the introduction, I think, of clinical trials, whereby we get -- and particularly in oncology, many of our practices are actually through protocols of clinical trials, where everybody really has to be all

the same in the particular groups that they go into, and matched. So that everybody really after a while becomes just the mean person -- I don't mean "mean" as a horrible person, but I mean average person. And that's okay for clinical trials. Maybe that has some important aspects. But when we're actually practicing health care, it's important to remember when we're dealing with a person to give them the individuality that they deserve. And the spiritual aspects of Chinese medicine are complex because spirit and energy are interrelated. A lot of the spirituality really is based on taoism. But in addition to that, this concept of relating personality to the mind and to the body has this element running through it which is spirit. And spirit is very difficult to define. I try and allude to what that spirit is in the book I've just published, called Restored Harmony. That may give you a better idea of what runs through the integration of Chinese medicine. That provides a much more, in my opinion, psychospiritual, a whole-body approach to the patient. Okay, Chinese medicine isn't, of course, the only system. Ayurvedic is another power system. So I'm not really here to state that Chinese medicine is the end-all for all therapies. We've got a lot to learn from many other different systems. But they all have a commonality which I think we need to apply back to our own health care system. The commonality is that they mix different therapeutic interventions together. They combine these therapeutic interventions into an energy system diagnosis, which as I said before looks at complex information transfer, whereas what we try and do in conventional medicine is to be very simplistic and reduce everybody down to simplicity rather than complexity. As you see, they concentrate on personality constitutions. I know you've rated medicine pitta, veta, and kapha three major personalities, which would lead to very different recommendations in the sort of herbs somebody be taken or indeed the sort of diet they should be taking. So, do we have any correspondence with what we know in mind-body medicine now? Well, yes, we do. The first important scientific fact that's become clear is that the mind and body are totally inseparable. Our mind doesn't just lie in the brain, it lies throughout all the tissues of our body. And the rational separation which was originally implemented by Descartes, which is called "dualism," really has not held up to scientific exploration. And if you now read papers and books by eminent neurobiologists and neuroscientists, like Damasio from the United States, who wrote the book Descartes, you'll actually see that any processing of any event that happens in your brain is actually being simulated at the same time throughout your whole body. Which basically means that if you were to measure muscle tensions or the flow of data through your nervous system, you'd be seeing that there's a correspondence between what's happening in the tissues of your body and what's happening in your brain. So that all our emotions actually flow not only through the simulator of our brain, but also through our body simulator system, and that this connection that's clearly been established between this fast flow of information through your nerves and the slower flow of information through hormones and other metabolic changes, that somewhere down in that system there's a very much more subtle information system, which I've put down as "nodes." These aren't lymph nodes; these are nodes which are a connection between an information system that we really aren't clear about, which is what appears to be where the acupuncture points actually interact with. And I put a chakra there, which really comes more from Ayurvedic medicine than Chinese medicine, but underlying the flow of information on the meridians, it would appear to be these large focuses of energy, of which there are seven main sites and there are some more as well, which are called the chakras, which do seem to correspond to a certain extent to nerve plexuses and certain endocrine glands. We're only beginning to chip away as to how our material body actually interacts with that energy information system, and it's really only the last couple of years that research institutes are starting to take the subject matter seriously and start to measure actual electromagnetic changes

that might actually correspond to changes in that energy system. So we're getting away from the material nerves being the only way of conducting information. It may well be that there are other ways directly through tissues to the fascia that lies between the muscles. And there may be interesting ways of conveying information that we're actually learning not from ourselves but from quantum computers now -- we've actually started to build computers that instantaneously transfer information from one part of the computer to the other with there being no time gap in-between. There may also be that information system that's going on in our own bodies. So information systems are becoming important in describing how some of these traditional health care systems may actually be working. The other interesting aspect of Chinese medicine is that in Chinese medicine, excess of liver fire, or liver yang -- which translates emotionally in Chinese medicine as repressed anger -- has been known for thousands of years. And then Temoshok, whom some of you may have heard speak in this conference, did some research which shows that the repressed emotional personality in breast cancer, type C personality, may be more susceptible to developing cancer. I know there's controversy around that, but this has been suggested by Chinese medicine for thousands of years. And we do know from psychoneuroimmunology that people who have repressed anger certainly -- we know this is very clearly -- certainly have a reduction in their natural killer cell counts and have a suppression of their immunity. How that may or may not relate to development of cancer, if that actually does occur, we don't know. But there is this philosophy in Chinese medicine of the intimate connection between emotions and health outcome. Okay. This, I think, is really interesting. It's actually how two of -- there's another radiation oncologist where I work who's interested in Chinese medicine. And we actually both scientifically came from the same background, in the sense that independently we were both researching the effects of blood flow on the prognosis and response of tumors. At the same time, we both came across some papers on Chinese medicine, which suggested that in Chinese philosophy the course of cancer was, what they suggested, was the stagnation of chi, a blockage of their energy, caused cells to become malignant and neoplastic. And blood follows chi, so in Chinese philosophy it's the obstruction of blood and chithat results in cancer. At the same time, we were both -- this employee really knew much about Chinese medicine, studied Chinese medicine -- we were both looking at what actually happened in those tumors. And if you actually measure tumors that are developing, the blood in the tumors is very abnormal in the sense that the vasculature has become very disrupted. So you actually get stasis -- the blood becomes very stagnant. You get very slow blood flow through the tumor. On top of that, the fluid leaks out, so that you actually -- the tissues actually swell up. And you do literally get an obstruction of blood and, presumably -- nobody's really measured this -- an obstruction of chi. Well, we do know if you measure the electrophysiology of those tumors, the electrical changes across the membrane, as they become more malignant you get an increase in depolarization across the membrane of those tumors. So once again, from Chinese philosophy, in a sense they were right. Maybe they weren't specific about what they were saying, but the concept was absolutely correct. So logically, if you were a Chinese practitioner, if you have stagnation of blood and chi, how would you treat it -- well, you need to find some de-stagnation herbs. Presumably these were found by trial and error or may have been by divine intervention, but somehow they actually found some herbs that actually allowed de-stagnation to occur and in some situations the tumors would shrink down. And lo and behold, when we actually study these de-stagnation herbs, most of them are actually anticoagulants. And what we do know is that anticoagulants in general -- in some studies anyway, certainly in animals and in some human studies -- actually cause some tumors to shrink and in addition reduce metastases. If

anybody was at the anti- angiogenesis talk this morning -- also this emphasis which was put on the fact that some of these anticoagulants are actually anti-angiogenic agents, including Heparin, which is one of our classic anticoagulants. So once again, the ancient Chinese practitioners were right on. De-stagnation herbs which equal anticoagulants were anti-angiogenic agents, and did indeed shrink some tumors and reduce metastases. Another branch of Chinese medicine is to enhance -- we talked about this earlier -- enhance the terrain, which means basically to increase the immune mechanism to help to fight the tumor cells and to damage them through our own natural immune system. These are called fu zheng herbs. As we'll see later, there is some evidence that these herbs can, at least in the hands of Chinese practitioners, both reduce side effects and also potentially improve treatment outcome by curing tumors more. I should emphasize now that much of the evidence for these herbs actually come from Chinese studies. And as part of the culture in Chinese medicine -- and part of our culture as well, up until recently, maybe still so -- only positive studies are reported, so you very rarely see any negative studies. And in addition to that, many of their studies weren't randomized control trials. But as I'll allude to, some of them were randomized control trials, although probably not of any quality-assured standard that we would expect here. So for those who are not familiar, there are different acupuncture techniques you can use in Chinese medicine. Very broadly, there's medical acupuncture, or anatomical acupuncture, where basically there are certain specific acupuncture points that can be used and generalized to the population as a whole -- for example, a point in the pericardium 6, which is used for antinausea. However, in traditional Chinese medicine, although those points will often be used, with each individual patient according to their personality and constitution, additional points will normally be added. So there will be a combination of points, including some very special points which run along what we call some special extra meridians, which we don't need to go into any more detail about but are more sophisticated and they're actually used in medical acupuncture. So although medical acupuncture can be useful in certain situations, it's certainly not going to give you the best treatment overall. It's not going to give you the complexity that you can expect from TCM acupuncture. So that's the different combinations of points that are utilized. Having said that, there are some medical acupuncture courses now which are very sophisticated, particularly Joseph Helms's, which uses a French-based energy system. So there are different ways of giving acupuncture. And I think that's important, because a lot of clinical trials have been done using medical acupuncture, using fixed points, the same points for each patient. And that just ain't how it works in traditional Chinese medicine. If you're going to do a study, you really should do it according to the way it's traditionally done. Transitory acupuncture needles are utilized and can be either stimulated in different ways to actually what we call tonify (?), which is to stimulate, or you can use a suppression-type technique, so that you're actually suppressing. This can be done either manually, or you can utilize an electrical apparatus to do it as well. Acupressure is useful in emergency situations, but quite frankly generally is less effective than using acupuncture needles. And then there are specialized types of acupuncture that can be utilized; for example, acupuncture of the ears, according to Nogier, who is a French specialist in ear acupuncture. And there's also other types of acupuncture -- just use the hands, a Korean type of acupuncture. So I'm just try to explain to those not familiar with acupuncture there are different ways of giving acupuncture, all of which may have there merits. Interestingly also, more recently in its use scientifically, you can also give acupuncture using a laser beam light. And we know that laser light -- this is a cold laser, a red laser light -- is totally painless; it's not going to burn you. But it has the effects of ----, where you actually have metabolic changes. And this has been shown quite clearly that it's -- at least with

some acupuncture sites, treating with lights can also be very effective as well. And another method, what we've used in research is to directly stimulate with transcutaneous electrical stimulation. We use a machine called a codetron, which actually mimics the pulsation that you get with electro-acupuncture devices.

SPEAKER: Do you know about ---- a homeopathic remedy, of the acupuncture points?

DR. SAGAR: Well, I've heard of it, but it's not something that I've actually evaluated or actually seen widely used. Is that something which you ----?

SPEAKER: No, but I don't think we could do it.

DR. SAGAR: Once you start getting to homeopathic -- mixing homeopathy with acupuncture, I think there may be something there, but it really starts to get complex, particularly to the researcher.

SPEAKER: We're actually using a large volume of research that's coming out of Germany on homeo----- and using homeopathic remedies injected into acupuncture points.

DR. SAGAR: Yes, I've heard that. Yes.

SPEAKER: It's primarily for pain medication right now, but I use it in my own practice --

DR. SAGAR: Yes, it seems to me there's a lot of variations of acupuncture, which just really illustrates how many ways you can give acupuncture, which -- you really need to have the open-mindedness to actually evaluate these different techniques. So that's just a picture of meridians, and a picture of an acupuncture needle going in. How many here have actually had acupuncture - --- themselves? Okay. How many people haven't? The first thing to say is that it's not painful, but it's uncomfortable. And that's okay. If you haven't had it done, then I would recommend that you go and experience it because it's a very interesting sensation. It's very difficult to describe. The sensation of tei chi, which does vary, can be a -- like when the needle goes in, it can be a slight ache or a tingling, which is what you might expect if you're actually putting a needle into a branch of a nerve. But at the same time, there can also be this sensation of like a rush of energy, sometimes a hot flash or just a ---- tingling. Then if you've never had it done, this is often followed by a feeling of complete relaxation, particularly the first time, which I found with myself was the most euphoric (?) time. But I think acupuncture, if you're going to get interested in it, it has to be experienced. Because it is a curious sensation you get. And certainly the first time I had acupuncture -- a close friend of mine gave it to me -- I woke up with a -- I'd had too much rich food and a bit to drink the night before, and I really woke up with the most terrible sickness and headache. So I was offered these needles to be put in, and I -- you know, my normal physician self highly skeptical. And it was a most curious sensation. After about 5 minutes, there was like this rumbling in the tummy. You could actually feel this rumbling in the tummy. It was like the whole of my autonomic nervous system was sort of shaking me up. And then as something gave, this sort of rumble would occur. And the headache just floated away and the nausea just completely went like in about 10 minutes. And the curious thing, when it happens the first time -- and I find this often with patients -- they sort of look with disbelief -- "that's funny, I

feel different. What's happened? I don't understand this." You know. And it's a sort of disbelief that it could have happened. Whereas when you take medication, you just expect it to go away, whether it does or not. This is something extra. There's this curious sort of fascination, if you like, about what's happening and how a couple of needles can within 10 minutes clear all these symptoms. And I think what's actually happening here, it is a total mind-body effect -- that you're having changes in your autonomic nervous system which come up to your brain, you're having an emotional flush that occurs at the same time. So if you haven't had acupuncture, it's worth experiencing it. Okay, I'm going to rush through this. There's a lot of science now that shows that acupuncture has major changes of the nervous system. If you put acupuncture needles into specific nerves and you measure the speed of transmission along other nerves, you find that can be slowed down or sped up. Acupuncture is modulating the speed of nervous transmission plus which nerves are actually transmitting through the base of the brain, through what we call the brain stem. So if you put a needle, for example, in a place in the leg, such as, for example, stomach 36, and you actually do measurements of what's happening in your brain stem, you'll see some quite remarkable changes. Different brain stem nuclei start to light up as the blood flow increases, and in turn you actually then get changes in the output of nerves which are flowing back down into the body. So a single point peripherally can have some very powerful and complex effects in the brain stem, something that up until recently with modern scans had not been recognized. There was no logic from anatomy textbooks why this should occur. So let's just have a look at this picture, which actually -- it's actually the lower -- the one that's lower down is actually the actual acupuncture and the one above -- it's been mislabeled -- is the control. But you would see after acupuncture in the left leg how different parts of the brain are actually lighting up. So a single point in the leg is having quite remarkable effects in the number of brain nuclei. So these wonderful investigations recently with functional magnetic resonance imaging, basically very specialized MRI scans, we took a blood flow showing the complexity of what happens centrally when you do peripheral stimulation with acupuncture. Many of these brain scan nuclei control such neurotransmitters as 5 hydroxy tryptamine and noradrenaline as well as the various encephalins and opioids that are released in the brain. What they're actually doing, when you come to look at pain, is that they're actually raising the threshold of the filtering system for pain. So if you've got pain impulses coming back from the body, this has actually increased the filtration of those pain impulses so you don't actually feel them so much. They reset the level of the pain thermostat. And the other thing that we've learned recently in the last couple of years is that acupuncture has a profound effect on modulating, literally, the yin and yang of the autonomic nervous system. It changes the balance between sympathetic and parasympathetic output. By changing this balance of sympathetic to parasympathetic output may have some quite major effects on the function of various organs in the body. This was published last year showing -- depending on the points of stimulation -- acupuncture can vary the heart rate and the variability of the heart rate. Now, the heart variability -- when your heart's beating, it's not actually beating constantly. It's actually speeding up and slowing down all the time. If the variability increases too much, this can be a sign of pathology, because it's just the autonomic nervous system that's out of balance. And in fact the opposite -- if you have no heart rate variability at all, that's also bad. So you can see here how acupuncture may actually be balancing the sympathetic to parasympathetic nervous system, which may be reflected by the heart rate variability, and that in turn is have a major effect on most of the metabolic functions in our body. So the beauty about the last few years is that we've gone from a stage where really nobody actually knew what acupuncture did at all physiologically and was really thought to just be a

placebo effect, but with modern technology and research we've actually found it's a very sensitive way of fine tuning the central nervous system and can be quite a specific way of fine tuning the central nervous system using peripheral points on the skin. So it's a whole new way of seeing how to modulate our basic functions with a technique that doesn't involve using drugs. Now, for me, one of the exciting studies to come out in the last few years was a study on using acupuncture to control the salivary flow rate. This is particularly important in radiation, because in radiation we treat the salivary glands often in head and neck cancers, and one of the main long-term symptoms that people have is marked dryness of the mouth. And the research in -- this is from the Karl Lindsken (?) Institute in Sweden -- and their research, they actually initially did some Phase I studies, where they measured salivary output and the contents of the saliva before and after acupuncture to specific points. And the first thing that showed is that acupuncture specifically increased the blood flow rates in the parotid glands, in the salivary glands. This was associated with an increased release of certain proteins called calcitonin gene-related peptide and also vasoactive intestinal polypeptide, and both of these proteins are important in dilating arterial as well as the small arteries and increasing the blood flow. So acupuncture would appear to be modulating not only the nervous system but also various neuropeptides which are released by the nervous system and can influence the functioning of various glands around the body. So they then went on to do a randomized control trial, where they actually showed that -- utilizing sham acupuncture, which was superficial acupuncture, versus deep acupuncture, which was more akin to what would normally be used -- they showed that you can actually reverse to a certain extent the dry mouth syndrome that these patients were getting after radiotherapy.

SPEAKER: Have you got ----?

DR. SAGAR: I've got those. They're in your handout. Yeah, I mean, there were a number of both local points and peripheral points, some of them along the stomach meridian and also pericardium 6. But it lists about six or seven points. It's actually in -- later on in the handout.

SPEAKER: And they're in your book?

DR. SAGAR: They're in there. They're in the book and they're in there. In the last 20 years, there's been an exponential report of various clinical trials of acupuncture. I'm not going to go through all these; they're in your handout. But as we go on, the trials are in fact becoming more and more rigorous--better controlled, better well-designed. I think in the next 5 years we're going to be able to build up quite a nice database of conditions that acupuncture works for. The good news is that a lot of these trials have proven to be positive in favor of acupuncture. Now, how do I apply Chinese medicine? What sort of model do I use to apply it to clinical practice? Basically, I'm a conventional physician and I use conventional treatments and I still believe in general that conventional treatments are the best we have. That's not to say -- and I have the occasional patient that uses the combination of herbs and the tumor goes away, but it's usually like one in, you know, a couple of thousand, and you can never predict who that person's going to be. So I actually encourage my patients to follow good conventional clinical evidence, but at the same time I also recognize that many of these agents, which may not have come to clinical trials but there's a lot of laboratory evidence to suggest that they may actually be active. And assuming that those -- we can avoid any toxicity between these agents and the conventional treatments, then I'm very open to discussing those aspects with my patients. How do I actually divide -- to

give some sort of a model, I see these agents as biological response modifiers. In other words, like we mentioned before, the anti-angiogenic agents that may actually help conventional treatments like radiation and chemotherapy to work. We'll look at some of those in a minute. Psychoimmunological techniques -- which means techniques to boost immunity -- and also techniques to improve the site, to improve mood, such that you can also improve immunity through that route. And then symptom control techniques to help such symptoms as we talked about -- dry mouth, pain, fatigue, nausea. And then I'm not going to give too much detail today on psychospiritual techniques -- there's more in the book "Restored Harmony," but that can also be important. The aim -- the common aim that we all have, whatever tradition we work in, is really we want to increase survival where we can, but not to the expense necessarily of reducing quality of life. So any aim to increase survival using conventional treatments has to be balanced by improving quality of life. And I truly believe that many of our systems such as Ayurvedic medicine, Western herbal techniques, traditional Chinese medicine, mind-body techniques, massage, aroma therapy -- you name it -- depending on the individual, many of these dramatically improve the side effects of conventional treatment. And I'm surprised, you know, that we haven't paid much more attention. I mean, the talk this morning was just heartbreaking, when the lady this morning was saying that she wasn't getting anything at all to allay her fears and anxiety prior to surgery. I just find that hard to -- I mean, obviously it does happen. And it's so sad, when there are such simple -- I mean, apart from conventional therapy such as using benzodiazapene, of course, there are so many other simple things that can be used. ---- philosophy translated, as I showed you, into what -- modern tumor phraseology -- translated into a clinical trial, which was positive. So we really do have to listen quite clearly to what Chinese philosophy has to tell us: Look at it scientifically, and then put these techniques into clinical trials. Because I think there's an awful lot of new ways of thinking that can benefit us. I think we've run out of conventional -- you know, we've gone down the molecular biology route, but what are we finding when we go down the molecular biology route? We actually find that many of the herbs that we're using nowadays are actually working in ways that we're discovering by molecular biology. In other words, we're going back to our roots, literally, our natural roots and our stems and our flowers and actually looking at them using our modern molecular technology and finding that we have a whole host of extremely useful agents, which you would never have found in a hundred years by designer techniques. So let's look at natural products and then use them wisely and evaluate them appropriately, first in the laboratory and then in clinical trials. There's a whole lot of herbs I've got here and there's no point in going through them individually. There's probably at least several hundred Chinese herbs now which are being evaluated in laboratory. But what we do know from current techniques is that many of these herbs have interactions, as we see here, with the neuropeptides, they can affect the blood vessel formation, they can have effects on gene expression. So there's a lot of laboratory information coming out now. Ginkgo biloba is a particularly increasing one. It increases blood flow. And although that may sound paradoxical, one aspect that is important in radiation treatment is getting increased oxygen content into your tumor, which tends to sensitize the tumor more. So ginkgo biloba could actually potentially sensitize a tumor to radiation treatment. Can that occur? Well, there was one animal study done, which actually showed that when you gave ginkgo biloba to animals which had transplanted fibrosarcoma tumors in, it actually sensitized these tumors more to the radiation than those who didn't actually have it. And it seemed to be through a mechanism of increasing oxygenation of the tumor. However, as we now know, you should also be very cautious if your patients are taking ginkgo biloba and having radiation, because it also sensitized the normal

tissues and caused an increased radiation reaction. PC SPES has received a lot of publicity, a combination of both Chinese and some Western-type herbs. Again, the results are pretty clear. Prostate-specific antigen levels reduced. Animal studies showed positivity. When a study in the New England Journal of Medicine showed a correlation between PSA's being reduced and also prostate tumor shrinking, but at the same time noted one of the potential side effects was increased clotting. It does seem to have a mild ---- activity. It doesn't have any advantage over conventional hormone agents. I don't know, I think that's going to have to be evaluated. But what it does show is that some combinations of herbs do have quite powerful anti-cancer effects. But not surprising, with that come side effects which we should obviously be cautious about. And panax ginseng as multiple effects, but I'd just like to mention that panax ginseng has been utilized in an upcoming study by the Radiotherapy Oncology Group. Now, for those who don't know, the Radiotherapy Oncology Group is the biggest radiation oncology research group in North America and carries out most of the studies that are occurring in the clinics with radiation oncology. I was very excited to find out about 2 years ago, they do have a complementary medicine research section now and they have several studies in the offing -- of which one is panax ginseng, which is being utilized in this situation to see if it overcomes the fatigue that people often get with radiation. As many of you may know, fatigue is one of the more common symptoms that one gets in oncology and probably one of the more difficult symptoms to actually treat.

SPEAKER: Do you know ----

DR. SAGAR: It's panax ginseng ren shen . And I don't think it should be that, quite frankly. This particular ginseng is actually extremely good -- or most of the studies have shown it to be quite good in athletes. But personally, I think it should have been North American ginseng. The reason being is that this stimulates yang, and these patients already had too much yang. They should be yin-supplemented. So -- but they'd already decided that this was the preparation they were going to use, and when I got involved it was almost too late. Maybe I'll be the first person to write them a letter of criticism if we find any of these patients actually become more fatigued. Okay, I'm going to skip through these. There are -- now, if you want to really find out tons of detail -- it's all in your handout -- if you want to find out tons of detail, John Boik's book Natural Compounds and Cancer is the best source reference. He lists practically every known Chinese herb and the laboratory and clinical results.

SPEAKER: Wouldn't it usually ---- instead of panax in treating fatigue. ----

DR. SAGAR: Well, again, I think it's extremely yang. And for people who are already, if you like, burnt out and -- I think North American ginseng, which isn't really a true ginseng, of course, you could argue, but it's called North --

SPEAKER: ----

DR. SAGAR: Yes. I think what this illustrates is that there are a lot of debates on how different herbs should be -- Chinese medicine is complex, but what is important here if you're going to do a clinical trial, for goodness sake get everybody's point of view together before you decide on what herbs you're going to be utilizing. And get the opinion of both the Western scientists, as it

were, and the traditional Chinese medical practitioners. Because otherwise, why waste that money on a study which somebody is going to highly criticize whatever the results are going to be at the end of it.

SPEAKER: ---- North American ginseng?

DR. SAGAR: I can't remember offhand. It's in the book somewhere if you want to look it up. I can't remember the Latin name, sorry. I'd recognize it in a multiple-choice question.

SPEAKER: Does this increase the adrenal activity?

DR. SAGAR: Yeah, a lot of them do actually increase the cortisol levels, which can be paradoxical in the sense a lot of them also stimulate immunity as well. And again, this illustrates the complexity. Because, you know, if you normally stimulate cortisol levels, you'd expect your immunity to be suppressed. But they also have direct action, it would appear, on natural killer cells and T cells as well, which seems to boost those levels. The point is that the more you investigate these herbs in the laboratory, the more you look for, the more you get, the more questions, then, you get than answers. They have multiple biological effects, which makes them extremely complex to utilize. Which is why I know John Boik in his book has sort of criticized the multiplicity of using multiple herbs together, that he feels that this is potentially risky and also unpredictable. Having said that, it would appear the experience of many practitioners over thousands of years has shown this to be effective. So although that may not necessarily be true, I think we still have to evaluate these herbs as they were originally used; otherwise, we're really not going to get the answers that we require. Okay, green tea. Just to give you an illustration of how the Chinese practitioner might describe it, they would look at things like the taste is bittersweet, color green, it's a cooling agent. So if you're very yang, it's going to cool you down. So if you're a very hot-headed sort of person, very angry, you're not the sort of person that should be taking coffee and certainly not the sort of person that should be, in my opinion, taking panax ginseng or even Siberian ginseng. That's going to push your blood pressure up even more and it's going to make you even more hot-headed. What you really need is some cooling green tea, preferably of the decaffeinated type. And they would look at this as benefitting the spleen, the stomach, the heart, and the small intestine; promotes liver function to spread and harmonize chi , generates fluids, stops thirst, clears heat, eliminates toxins, dispels dampness, promotes urination, aids digestion, stops diarrhea, clears heart ----, raises the spirit. So just -- for those who have no touch with Chinese medicine, that's the sort of language that's used. And in that system, it's very understandable because it's a system which actually looks at patterns of energy information. Now, can this be translated into Western medicine? Well, yes, it can. Because when we start to look at these effects, we actually find they do actually have end effects, such as in heart disease, where they reduce cholesterol and reduce platelet clumping, but also have major anti-cancer effects which have been summarized in a number of publications ---- National Cancer Institute. So when we actually do the science on green tea, we find that we have another language akin to Chinese medicine but it's just translated into scientific language, such as reduces angiogenesis and increases apoptosis. So we all have our own languages, but the reality is that whichever system we're using, it seems to have a lot of benefits. One of the major activities in green tea is relative antioxidant activity. It contains a compound called epigallocatechin gallate, which is quite a strong antioxidant. This appears to be one of the major

agents that reduces the risk of cancer. That's EGCG. You can also see that red wine, which is next to it on the left, which contains resveratrol (?), has 50 percent of the antioxidant activity of green tea. I pointed this out to a woman in the audience one day, and she put up her hand and said, well, that doesn't matter, I just drink twice as much red wine. Actually, the green tea was looked at by something called ---- in 1999, in mice who had both spontaneous and transplanted tumors. And they found that the tumors actually shrunk down by using this extract of green tea called epigallocatechin gallate. Then they tried to take the amount of green tea used in these mice and rats and translate it into how many cups of green tea you would have to take as a human being. And of course, you know, that depends on how long you infuse it for in your preparation, but it's roughly three to five cups of green tea a day, was their estimate of what you should be taking to have the same effect. Now, what we do know -- and we alluded to this in the anti-angiogenesis drugs this morning -- is that, you know, if you're a vet and you're treating mice and rats, you're going to make a lot of money because every mouse or rat that comes to you you're going to cure. But unfortunately, the effects on humans don't seem to translate as effectively as they do into rodents. One of the mysteries of life.

SPEAKER: Did you say it's better to have it without the caffeine -- decaffeinated?

DR. SAGAR: Yes, because once you're drinking three to five cups of green tea a day, it's a pretty heavy caffeine load. The caffeine load is probably the same between black and green tea and almost as much as some coffees, sometimes even more. It depends on the preparation. It's variable. There are green tea extracts which are decaffeinated that you can take through capsule form now. One of the things about the caffeine also, it can gastritis and you get quite severe indigestion as well. So you're better -- if you're drinking a lot, you're probably better -- well, you are better off with the decaf, for sure.

SPEAKER: What's the problem with the caffeine?

DR. SAGAR: Well, it makes you very agitated. So you become sweaty, agitated, anxious, palpitations, gastritis, sore stomach.

SPEAKER: It's also ----

DR. SAGAR: Right, it has pharmacokinetic effects on the drug mechanism.

SPEAKER: ----

DR. SAGAR: There are some clinical studies, particularly from China, which show reduction of stomach cancer, which recently has been refuted. Again, as with many epidemiological studies, you find some studies come out positive and if somebody them, they're negative. Pancreatic and colorectal cancer, there's some evidence that green tea could help to reduce the incidence of that. Breast cancer was sort of evenly weighted. There were some papers that showed that it can reduce the incidence of breast cancer and others showed it made no difference. Personally, I think that the evidence for green tea -- and I've reviewed quite a few papers on the subject from the journal *Fact*, which concentrates on evidence-based research, generally the epidemiological studies show that green tea is generally very good for you, particularly if you take the caffeine

out. The evidence is particularly strong for cardiovascular disease in reducing strokes and heart disease. But at the same time, there's also a fair amount of information it could potentially reduce cancer as well.

SPEAKER: ----

DR. SAGAR: The insecticides, DDT?

SPEAKER: Yes.

DR. SAGAR: No. But, I mean, this is an issue which we can suggest the problem with any herbs and imports from countries which don't have insecticide controls, clearly there needs to be better quality assurance.

SPEAKER: ----

DR. SAGAR: Yeah, I mean, even though, talking about Mexico, a lot of -- it's something that needs to be revisited. As Jim Gordon mentioned, you know, we haven't taken an environmental focus, but certainly there needs to be a group of people taking an environmental focus in all this because it's clearly important.

SPEAKER: ---- added to it?

DR. SAGAR: No. No, it's naturally -- it's --

SPEAKER: ----

DR. SAGAR: You have to ask Confucius. No, seriously, that's what they say about it. But green tea -- I mean, I used to think that green tea didn't contain any caffeine in it, but when I actually looked at the evidence, it contains as much caffeine as black tea. And you have to literally decaffeinate it, you know, artificially. But the natural product contains caffeine.

SPEAKER: So is decaffeination ---- detrimental?

DR. SAGAR: No, I don't think it is because -- I can't give the -- I don't have any interest in this firm, but there is a firm recently, quite a rigorous pharmaceutical company, that makes green tea extract, and they've done a lot of pre-clinical and clinical studies using green tea extract, the EGC component. And they're finding that after processing it and concentrating it, you're getting the benefit. So that's -- at least it's quality assured.

SPEAKER: What's the name of the company?

DR. SAGAR: I can't -- I don't give company names because of the CME regulations.

SPEAKER: ---- boiling water, the tea degrades very fast ----

DR. SAGAR: Yes. But the trend is -- epidemiologically, if you look at cultures that drink tea -- and this includes black tea, in fact, not just green tea -- that the health benefits are high. There is definitely a reduced risk of heart attack and stroke and lower blood pressure, and there's some evidence now pointing in general to reduction of cancer as well. It's one of those things which I don't think is going to do most people any harm, as long as they watch the caffeine content, and along with things like exercise can only provide benefits. Even exercise can be dangerous, though, can't it -- if you go jogging along the highway. But, you know, everything -- in Chinese medicine, everything in balance.

SPEAKER: What would be the best resource to get information on all of these herbs?

DR. SAGAR: Well, as I said, I think the best resource currently is John Boik's book, *Natural Compounds and Cancer*. He spent literally -- he was here last year talking. He spent 2-1/2, 3 years compiling all this information into this huge book. It's really --

SPEAKER: I was going to mention, as far as the question about the DDT, in China they basically export herbs which are called GMP- certified, ---- manufacturing process. All ---- have to be actually a stricter -- higher quality than our import laws are. They're imported to Southeast Asia, to Japan, to Australia -- they have higher standards than we do. Also, you can get, with many different companies, an assay on your formula as to -- and also test to see what pesticides were tested for, et cetera. And any practitioner that you go see should be able to provide you with that information -- where they got their herbs and if they were tested. I just wanted to point that out.

DR. SAGAR: Thanks. For the sake of -- I'll just carry on, then come back to that later. For the sake of this talk, I don't want to go into soy because there's been such a lot of talk about soy and the controversies, particularly in breast cancer. But just to summarize, I think there's pretty good evidence that soy is a preventative agent in prostate cancer. It can also be a preventative agent in breast cancer, particularly if you're pre-menopausal. There's a controversy in post-menopausal women as to whether it potentially could increase the risk of breast cancer, but that controversy still has to be decided. I want to move on to a little bit about psychoimmunology. It must have been about 25 years ago there was a report in *JAMA*, one of the first reports on Chinese medicine ever to be mentioned in *JAMA* -- 25, 30 years ago now, I think -- where they actually the last one, the yin-yang of immunomodulation, how they were reporting that acupuncture and herbs could actually change the balance of immunocytes. And there was obviously a lot of skepticism around that. But we're starting to realize that through the mind-body information pathways, acupuncture and herbs can have quite profound effects on the quantity and quality of the blood cells. So acupuncture, there's a whole series of studies showing that acupuncture can increase T lymphocyte proliferation, the OK T-4, which ---- to helper cells, these are the fighting cells of the lymphocyte system are increased. And these are increased more than the other cells, which suppress immunity, called the suppressor cells. However, this really depends on the points you use. If you use other points, you can get the reverse occurring. And this has been pointed out specifically quite recently in a paper, that you can go either way with acupuncture and it depends which acupuncture points you use. So you've got to be very careful in your research. But these particular studies, which are from China, they're actually looking at increasing specifically the helper cells. Increasing natural killer cell activity -- those are the so-called suicide cells that

actually run into cancer cells and then explode and release all their enzymes to destroy them. They tend to be very non-specific cells not normally guided by specific immune responses. And studies in animals show that acupuncture can actually shrink down the growth of transplanted tumors in rodents, and this corresponds to an increase in the natural killer cell count. So it's interesting that acupuncture, we're now finding out, is a very subtle technique of actually changing the release of the neuropeptides, the messenger proteins in the blood which in turn influence our blood cells. And this is occurring through stimulation of specific points of the nervous system. And remember that the recent research shows that the nervous system has nerve pathways that run out into the spleen and into the bone marrow, and if you stimulate those nerves, you actually release these neuropeptides, which in turn can stimulate specific immune cells to actually respond and divide and increase their levels in the blood. These are done in your notes, but I just want to point out that out of those studies, a couple were randomized control trials in patients, a couple were in -- sorry, three were control trials in patients, one was a case report, and the other two were in animals. So clearly, these very interesting results. One of them was actually published in a well known neurobiology journal. But very clearly, we need to do more research here. When you think of the fact that if we're using expensive agents such as nupergen (?), eprex (?), and rethrocoedin (?) to stimulate our blood count, if you're having to have a needle stuck in you every day anyway, a much bigger needle than acupuncture, should we not at least evaluate the effects of daily acupuncture on our blood cell count? It may be more effective, it may work out more economically, it may not. But at least we should be looking at it. The point to the acupuncture, of course, is that if you're going to see an acupuncturist -- they're putting needles in you -- at the same time as they're stimulating your blood count, they can be doing a lot more, like reducing your fatigue or maybe reducing your nausea and vomiting, et cetera. So it could actually potentially work out more economically in the long run. I think that's always important when we look studies, when we look at -- is it effective, does it improve the quality of life, and is it economical? In your notes I've written some points that were actually used in these studies for increasing the blood count, but I won't go into the details of acupuncture points for this sort of audience. This just shows you somebody getting acupuncture. Bottom left-hand corner, they're actually getting acupuncture, they're connected to this box which provides the electrical stimulation to the needles. On the right side, for those of you who are not familiar with Chinese medicine, no, this patient hasn't caught on fire. This is perfectly normal. This is something called moxa. It's an herb which you can actually -- it's like a dough and you put it on the tip of the needles, you light it with a flame, and it will start to smolder. And it releases a very constant heat. So what you're doing is heating the needle up. The needle doesn't become really hot; it just becomes warm. But it's very constant heat. And it's a useful way of what we call tonifying that point. So instead of using an electrical stimulation or manual stimulation, you're using heat from moxa to do that. A lot of Chinese medicine is actually based around heating of the needles with moxa. Technologically there's nothing been found so far, as far as I am aware, that actually provides the same uniform heat as burning moxa. The only unfortunate side effect is that it does actually smell like marijuana, which means that a lot of practitioners that use it have had invasions of their clinic by the police. Okay, we talked about -- just to summarize this slide - - that chemotherapy in general causes a severe yin deficiency -- weakens the spleen, weakens the stomach. And that's translated into Western medicine by fatigue, sore mouth, difficulty swallowing, nausea, diarrhea. SPEAKER: ---- DR. SAGAR: Using herbs in addition to anti-cancer treatment for the reduction of side effects. Okay? In addition to, not instead of. Fu zheng herbs are a diverse group of herbs, but what they have in common generally is to increase

immunity and to increase the resilience of the mouth and the gastrointestinal tracts to the side effects of the chemotherapy or radiation treatment. And this just gives you, for those interested, the example of the Chinese herbs that are utilized. A study that was done in China, particularly one big study plus several smaller studies, randomized control trials, suggested that these particular agents increased the immune cell count, reduced the incidence of neutropenia as well between cycles of chemotherapy and therefore allowed the patients to complete their courses of chemotherapy. These studies need to be replicated. The other problems that were not clear as to what the interactions are with these herbs and the chemotherapy drugs, nobody really understands the kinetic interactions, how they affect the metabolism of the drugs. But I think that the preliminary results from China suggest a very worthy avenue of research. If we can actually reduce the side effects of chemotherapy and reduce the incidence of neutropenic episodes using these drugs, there may be some advantages over the conventional ways we're doing at the moment, such as nupergen.

SPEAKER: Is this any one of these, or is this ---- put it in a formula?

DR. SAGAR: There are formulas, combinations of herbs.

SPEAKER: In other words, using any one of these ---- --

DR. SAGAR: No, they're always used as combination. That would be the combination that was used in that particular clinical trial.

SPEAKER: And other formulas?

DR. SAGAR: There are other formulas as well, which gives you a very complex situation. It's like that study with radiation in nasopharyngeal cancer. They used a combination of I think it was about six or seven de-stagnation herbs together. They labeled that as a specific formula. There are others. When you're going to do a clinical trial, how do you know which formula to use? It's a big problem in research. We talked about that. And a big study reported in '93, looking at stomach cancer patients, again showed that there was a reduction in neutropenic episodes and gastrointestinal side effects when the fu zheng herbs were given in addition to the chemotherapy compared to the placebo group. So the evidence is potential. It's not established. It's not something that we should rush into. But it's something that we could be looking at for clinical trials. Okay, now to come to symptom control. The other subjects we looked at were great avenues for research and still quite controversial. Symptom control, I think, is much clearer. Acupuncture and electrical stimulation of acupuncture points, I think, have great potential for reducing the side effects of treatment. There are different ways of doing it. I still think the best -- most effective way is with acupuncture needles and probably with electro- stimulation of those needles. However, having said that, it can be inconvenient to deliver acupuncture that way. Particularly, for example, with something like nausea and vomiting, you don't want to necessarily give acupuncture every day. As we see, there are other ways of giving it. If you do a meta-analysis of acupuncture for chronic pain, there is statistical evidence that there is a good effect of acupuncture in reducing pain. My personal experience in oncology is that you usually need morphine or other pain medications as well as acupuncture, but it does allow you to reduce the dose and therefore it does allow you to reduce the side effects. It's particularly good, actually

we've found, for patients who've got neuropathic pain you add in acupuncture to the morphine. This was published in the Cochrane database. It's the leading meta-analysis database. And this particular meta-analysis showed that acupuncture, particularly given as electro-acupuncture significantly, across a number of studies, reduced low back pain. So there's increasing evidence coming out that acupuncture is very effective for pain. And as I said, the sort of pain that I found it particularly useful is neuropathic pain, where you get a compression of a nerve route, for example, by a metastasis. Adding that to morphine -- neuropathic pain I found useful, but there have been studies recently that have shown acupuncture hasn't been so useful. The thing about acupuncture is that the side effects are so minimal that it's -- you've got nothing to lose by trying it. You should give it at least -- give it three to four times a weeks for at least 2 weeks to decide whether it's going to be effective or not. Acupuncture often does not work straight away. It usually takes like a week to 2 weeks to build up its effect. And in my own experience, not necessarily supported by studies but my own experience, I've certainly found patients who have post-surgical discomfort, such as after head and neck surgery or indeed after breast cancer surgery, who've had auxiliary node dissection, and patients have got muscular pain or weakness in the muscles secondary to compression of nerves during surgery, I've found that acupuncture is extremely effective in reducing that pain and strengthening muscles. After radiation treatment, some patients get spasm in the jaw muscle, called trismus, where they get fibrosis formed in the jaw muscle. And acupuncture has been useful in helping these patients, along with exercise, to overcome that contracture. And also, acupuncture's been found to be quite useful for healing ulcers, particularly ischemic ulcers, which can occur sometimes after radiation treatment, or patients who are bedridden for a long time. And that, again, as we showed earlier, is probably due to increasing the blood profusion of the skin around the ulcer.

SPEAKER: ----

DR. SAGAR: It's like that but much worse. The master muscle, your chewing muscle, becomes shortened and contracted so that you can hardly open your mouth. So it's very difficult to feed yourself or to talk. So that's for ulcers. You can refer to this in your handout. These are some points used for trismus, which is the spasm of the master muscle. Acupuncture -- nausea and vomiting, there's tons of evidence, it's down there in your handout, including some very good blinded clinical studies that say that acupuncture reduces nausea and vomiting. I just want to summarize one study published in JAMA last year, a very conclusive study that showed that adjunctive electro-acupuncture -- notice it's electro acupuncture -- was more effective in controlling emesis than ---- or antiemetic drugs alone. The most effective combination in reducing nausea and vomiting is a combination of electro-acupuncture, often used in pericardium 6, which is on the wrist, and stomach 36, which is on the leg, and adding that to your conventional antiemetic agent. Sometimes it can work alone, but what's the point? There are still a lot of patients who, after giving them conventional treatment with conventional antiemetic agents, still have nausea and vomiting. And I've certainly found out giving acupuncture to those patients can be very effective.

SPEAKER: ----

DR. SAGAR: Stomach 36 and pericardium 6. This is a wonderful device. It's called a relief band. It is actually available in the United States now. It's been through quite extensive studies.

It's FDA-approved now for chemotherapy, but only by prescription, as far as I understand. It's an electrical stimulation device which you wear over pericardium 6. It self-locates; in other words, when you reach the point it lights up the light to make sure you're in the right place, and then you can set it to stimulate -- the patient can set it to stimulate themselves whenever they want. It's got good studies behind it and seems to work. I don't think any clinic should be without one, quite honestly.

SPEAKER: ----

DR. SAGAR: Well, you can put it wherever you want, but the FDA doesn't necessarily approve it.

SPEAKER: ----

DR. SAGAR: The previous model -- I don't know about -- how much the new one is. The previous model was \$200 Canadian, so that's, what, about \$130 U.S. I would say the best use would be why don't clinics have them and just lease them out or just lend them out during the chemotherapy? They're not that expensive when you look at the price of antiemetic drugs. Ginger as well can be effective as an antiemetic agent. The biggest problem we have at the moment, I think, in oncology, one of the biggest problems apart from cancer resistance is -- as a side effect, anyway -- is fatigue. Fatigue has been so under-recognized. There are multiple approaches to fatigue, but I think that Chinese medicine has a few approaches that can be utilized. One is acupuncture. There are certain points that can be utilized. The lady here mentioned spleen 6 just now. There are multiple other points that can be tonified to help fatigue. And there's particularly a protocol that we were looking at in Toronto, a chronic fatigue protocol with a number of points, which you can, if you're interested in acupuncture, you can look at, to stimulate fatigue. It's been proven to be quite effective in the chronic fatigue syndrome, so we were hoping it would be just as effective in oncology fatigue. But you know, the philosophy of Chinese medicine is not just to do one thing. So it wouldn't just be acupuncture. It would probably be acupuncture plus maybe an herb for fatigue, and also, most important, as we would agree in Western medicine, exercises, and the TCM-type exercises such as chi gong, maybe not so much tai chi, but certainly chi gong can be very useful exercises in actually helping to overcome fatigue. Just another combination of points that may help in fatigue designed by Norman Sheely, who's actually a neurosurgeon, who takes an interest in pain control. And that's referenced in the handout. I'm going to skip through because we're running out of time. Cordyceps sinensis -- this is a drug which may be used fully in fatigue. It's certainly used in athletes. Again, we need to look at that in oncology. But cordyceps sinensis is now marketed in a purified form. And I just want to mention our own study, which we present in 2 weeks' time in ASTRO in San Francisco. We wanted to confirm the Swedish results on xerostomia, which is the dry mouth caused by radiation treatment. We also wanted to generalize it, because we felt that it may be challenging for many patients to actually see an acupuncturist. But if we can actually find the best of three combinations of points that were actually used in Chinese medicine, that we can generalize -- and I know this is going at the principles of TCM, but we just wanted to see whether we could generalize this because most patients would not be able to see a TCM practitioner. So before going into randomized control trial, we thought we better go the same way as you would a drug -- that is, take these three combinations of points, randomize them, and

see whether there any one of those combinations was better than any other. So there wasn't actually a sham control; that would be the next step. And because we felt acupuncture needles, we needed experts to do that, we trained a nurse to actually put specific electrodes from electrical stimulating apparatus called a codatron, which is like a transcutaneous electrical device only it mimics more the ---- you get with acupuncture. And we trained her to use these particular points, randomized patients into three groups, and for -- they actually came three times a week for 6 weeks, had 2 weeks off and then came back again for another 6 weeks. These are the points that were used, and there's more details in the handout. Actually, this is the wrong slide here, but I'll just finish our study. What we actually found in the end was that one specific combination was better than the others, but that all combinations of points actually increased the base line salivation. So all combinations were effective, but one particular group of points was more effective than the other. So we really confirm what they found in the Swedish study. The acupuncture can be used as a technique to overcome xerostomia, dry mouth. Now, this study was a study done in 20 palliative care patients, where they're used in the palliative care context -- patients at home in the community. You had problems with dry mouth due to drugs and due to oncology treatments. And they assessed the patients for quality of life with a visual analog scale, and it showed that their quality of life improved after using acupuncture to correct the dryness of their mouth. This was our study. This is the machine we used, which is called a codatron machine. It was developed by Bruce Pomerantz (?), who's one of the leading laboratory researchers in acupuncture in the University of Toronto. The beauty about it is that each one of those leads coming out goes to an acupuncture point, but it actually stimulates that point for let's say 30 seconds, and then unpredictably -- you don't know where the machine's going to go next -- we go to the other point, and then unpredictably to the other point. The reason for that is if you use standardized transcutaneous nerve stimulation, you find you get tolerance, you build up a tolerance to the treatment within a very short period of time. By randomizing the stimulation, in a sense it sort of tricks the body to not know when the next stimulation's coming, and it actually stops you building up tolerance. So the codatron is utilized, number one, at a low frequency -- because low frequency has the greatest of long-term effects in acupuncture compared to high frequency. And number two, it is used unpredictably, jumping between point to point, so that you don't get this tolerance or adaptation to the stimulation.

SPEAKER: How much does that cost?

DR. SAGAR: How much is the machine? The machine's about a couple of thousand Canadian dollars. What's that, about \$1,200 U.S. But the way they do it, the company leases the machine out and it's, Canadian dollars, I think it's something like \$100 a month for a patient. And insurance companies were paying for it when used in pain -- it's mainly for pain control. But once we got these results -- and by the way, we have no affiliation with this company at all. We approached them due to scientific interest and they very kindly did actually allow us to use the machine. But we have no affiliation with the company. But the machines are leased out. I'm not sure about the availability in the U.S., but I expect they're available, or at least the equivalent.

SPEAKER: ----

DR. SAGAR: It's being published -- it is published in the ASTRO, the Association of Therapeutic Radiation Oncology proceedings for the upcoming meeting in 2 weeks' time. So it's --

SPEAKER: ----

DR. SAGAR: If you go to the ASTRO web site, I'm sure they've published the proceedings. We will be publishing eventually in full-paper form, but at the moment it's an abstract. And the other one, I think I've got the reference there, but anyway you can look it up as the Swedish study, which is the Karl Lindsken, which is Blom, et al. And there are various other case observations. --- London looked at acupuncture for shortness of breath in patients with lung cancer. There's been a case report of relieving a spasm on the esophagus of someone with esophageal obstruction. We published in fact -- this isn't our paper -- we published a paper recently on termination of hiccupping, intractable hiccupping, with acupuncture.

SPEAKER: What points were you using?

DR. SAGAR: We used stomach points.

SPEAKER: Which ones?

DR. SAGAR: I can't remember. I'll tell you later. And then, in the last year, there's also this very interesting study of people getting hot flashes with prostate cancer treatment, showing quite clearly that the acupuncture reduces the hot flashes and it certainly seems to ---- breast cancer patients ---- who have early menopause. Soy as well, in addition to acupuncture, helps hot flashes. But this study which was done in Australia recently showed that Chinese herbs for hot flashes didn't seem to have any effect. But there were certain criticisms of that study. So from my perspective, certainly for treating hot flashes, acupuncture can be a very powerful treatment. Soy can be helpful where indicated. Chinese herbs may have an effect, but haven't been demonstrated so far in a good randomized control trial. Has anybody seen Alex Gray's pictures before, Sacred Mirrors? Oh, well. If you want to treat yourself, if you're really into energy work, this is a great artist. This has got nothing to do with Chinese medicine, by the way. No, Alex Gray has painted these wonderful pictures. He actually started training as a medical student, and paints on beautiful, conventional, material anatomy straight out of Gray's Anatomy. But he's put on top of these pictures the way he sees the human soul as an energy field. He's actually published in a book called Sacred Mirrors his pictures, and there's a Web site. If you look up on Google or Yahoo Alex Gray and Sacred Mirrors, you'll find a Web site which gives some of his pictures as well. But it's really just to illustrate that what I've learned from Chinese medicine, and I started off looking at Chinese medicine, what I've learned really is that the human being is more than a material mass of protein, that literally is an energy system. And that's only my latest interest in the research is actually how do we measure this energy system, how do we evaluate it? So by going through the process, the Chinese medicine has allowed me, being very conventional, to actually see the human being more than I saw the human being at medical school. Chinese medicine can be utilized to treat depression. As we've heard a number of times in many talks, depression occurs in anywhere between 20 to 30 percent of patients. Antidepressants -- and Jim Gordon would disagree with me here, we've had this discussion -- antidepressants can be

important, but there are many other techniques. There have been several studies that show that acupuncture can reverse depression and can work sometimes quite rapidly, particularly if done with certain exercises, such as chi gong. I personally think that if you're severely depressed, the combination of acupuncture and a standard antidepressant is probably the most useful way to go. If you've got marked depression, then a combination of exercise and acupuncture by themselves can be appropriate. But always involve, in my opinion, involve a psycho-oncologist or a psychiatrist, because it can be more complex than that. But certainly, several studies that show that acupuncture can reduce anxiety and acupuncture can improve depression. And chi gong -- this is Kenneth Kine on the right, who works and is published from -- he lives in Boulder, Colorado, a really nice gentleman who's studied chi gong for a long time. Does the energy flow correspond to a specific physiological process? They've studied people who are doing chi gong, who have this sort of sensation of energy flow, this tingling rush along their arms and their legs, and when you actually measure what's going on, you do actually see electrical physiological changes occurring during the movements. Which, interestingly, seem to correspond not to nerve pathways, but correspond exactly to the meridian pathways. This is one of our nurses giving therapeutic touch. And this is the way I think we're going, and I've think we've learned this from Ayurvedic and Chinese medicine. I think these are models of healing. I think we can learn a lot technologically from these models, such as pharmacology, such as the way our nervous systems can work with acupuncture. But what we're beginning to learn is this concept of energy information systems and several studies recently showing that we can affect each other's physiology through non-local effects, possibly through in training each other's electromagnetic fields -- work done particularly at the Heart Mass (?) Organization, which is in California -- Boulder, California, showing that we can train people that we're close to using the electromagnetic patterns of our hearts. That's another subject, but in Chinese medicine intentionality to heal has always been extremely important. And part of the healing process may be this transfer of energy through electromagnetic fields. And to finish off -- of course, acupuncture has proven to be effective because has anybody in this room ever seen a sick porcupine? Oh, you have a question.

SPEAKER: Is there any study that shows that only acupuncture has ----?

DR. SAGAR: Has there been any study that shows that acupuncture alone can shrink down a tumor? No, there hasn't been any specific studies, but I have heard anecdotal reports. We actually were interested in looking at that. What we were particularly interested in is modulation of blood flow to the tumor using acupuncture. We did some preliminary studies and our initial studies, we couldn't demonstrate any change in blood flow. We were using a Doppler device and we couldn't demonstrate it. It may be the methodology that we're using that was not appropriate. Acupuncture -- you see, the problem is once you get to tumors, the blood supply of the tumor is totally separate from the normal control mechanisms that are normally in the body. So if you're still at the acupuncture point, you may not actually be neurologically connected to the blood supply to that tumor. But it's an interesting question, and we were actually looking at that.

SPEAKER: ----

DR. SAGAR: I don't think we could ever suggest -- I mean, obviously the risk that you worry about is the infection, because the lymphatics may be damaged and you're more likely to

introduce bacteria potentially, like Streptococcus. But the reality is that we do use acupuncture for people who've got swollen arms in breast cancer to reduce the edema. So I don't think it's actually a contraindication, no.

SPEAKER: ----

DR. SAGAR: Yeah, we do -- we're actually doing a study on lymphodema, yes. Well, you've got to be careful, obviously.

SPEAKER: ---- reverse with the edema ----

DR. SAGAR: Well, nobody's done any good studies on that, but theoretically I don't see why not. It would --

SPEAKER: ----

DR. SAGAR: I mean, when you think about it, if you're stimulating -- if you're raising, for example, you're raising cortisone levels, just as an example, if you're pushing cortisone levels up, you might expect some of your immune cells to go down. So, yeah, I think --

SPEAKER: ---- stimulate the immune system ----

DR. SAGAR: I think there's a lot we don't understand, but it's quite clear that you can go both ways and that some of the publications have been selective.

SPEAKER: ----

SPEAKER: Where do you find a Chinese herbalist? Because if they look at your tongue and they feel your pulse, that's what -- medical doctors don't do that. And American practitioners don't do that. Where do you find these people? ---- if they can feel your pulse and look at your tongue and prescribe something for you ---- one up on other people.

DR. SAGAR: Absolutely. And the project that we're trying to get funding for at the moment is to actually analyze the pulse using an electrical transducer to try and get more scientific data on exactly what's going on there. I mean, there's something in it for sure. But there's been very little evaluation scientifically in the literature. No, I agree with you. It's not an excuse, in my opinion, for not taking a history. But I agree they may be quite powerful techniques for providing further diagnostic information. But let's be honest now. How many times nowadays do you actually get a proper examination done before the CAT scan or the MRI is done? They usually say go and get your CAT scan or MRI first, and by that time the information's already been biased towards the technology result.

SPEAKER: ---- Chinese herbalist?

SPEAKER: ---- acupuncture ----

SPEAKER: You could access traditional Chinese medicine through ---- physicians who have been treating with traditional Chinese medicine as well.

DR. SAGAR: The Web site you can try -- I mean, there's obviously many schools, but if you go to acupuncture.com -- I'm just giving it because it's easy to remember -- acupuncture.com has got a lot of information about acupuncture. Many of them are herbalists as well. And they also give you a list of schools and colleges and licensing boards and things like that. And lists practitioners in different cities in the States.

SPEAKER: It seems like most of the herbs you've talked about have anti---- properties. What do you do with a patient who has cancer, but on the other hand they're ---- --

DR. SAGAR: If they're ----? I think you have to be cautious. I mean, certainly if your platelets were less than 50, I think you'd have to be very cautious. I think it's always important -- the biggest message I'd like to give, it's always important that all health care practitioners work closely together and communicate with each other, because clearly a lot of these herbs can exacerbate problems, particularly if you have low platelet counts, and certainly if you're on Coumadin, for example. But many of them have effects on many drugs, from the point of view of inducing liver enzymes. People are going to take these herbs whatever you say. Therefore, in my opinion it's important that we be receptive to it, understanding, we give the facts, and we communicate between all of us, so that if problems do arise we all know what's going on. The last thing you want to have is somebody who starts bleeding, and then you find out after they stop bleeding that they've been taking an herb that potentially can cause that.

SPEAKER: ---- in your process, do you have ---- where you have -- are you getting ----

DR. SAGAR: The way I'd like to see it go is that everybody goes into research study and we have a tumor board with a practitioner coming in and we work together. At the moment, I don't push Chinese medicine. I discuss it with my patients if they wish to discuss it. Many bring it up spontaneously. And if they do want to do Chinese medicine, I tell them what I know. And we carefully monitor what they're on to make sure that there aren't interactions and make sure there's good communication between myself and the practitioner.

SPEAKER: ----

DR. SAGAR: Either phone calling or writing each other notes. The person that I recommend I know very well, and she's also trained as a radiation therapist so she knows both Western oncology plus Chinese medicine. Often as not, she'll be the first person to recommend not giving a Chinese herb even though that's what she practices, because she realizes there may be problems.

SPEAKER: ----

DR. SAGAR: Once you've got John Boik's book, you don't need the bible.

SPEAKER: What's the name of the book?

DR. SAGAR: Cancer and Natural Compounds.

SPEAKER: ----

DR. SAGAR: Yes, because it's been done in a scientific fashion. It's been done through our Research, Epidemiology Statistics and Health Services Unit, and it's been randomized appropriately and quality assured and all the rest of it.

SPEAKER: Are you seeing more curiosity, more interest --

DR. SAGAR: Yes, definitely. Yes.

SPEAKER: Are there any counterparts in the States that are ----?

DR. SAGAR: Oh, yeah, there are lots of -- I mean, if you come to this meeting, there's lots of units in various -- there's lots of complementary medicine units and centers being set up much more than Canada in the U.S.

SPEAKER: ---- Chinese medicine --

DR. SAGAR: Yeah. Oh, definitely, yeah. I'm probably one of the first radiation oncologists to be looking at this, but there certainly several others now in the U.S., particularly in the radiotherapy oncology group. So, yeah, there's a -- I would say in the last 5 years, there's a huge growth in interest amongst conventional practitioners.

SPEAKER: How often do you have to repeat the acupuncture to get the ---- effect?

DR. SAGAR: I usually say -- I mean, first of all, it should be done frequently, so on a daily basis -- at least three times if not five times during the week, for 2 weeks. Having said that, something like nausea and vomiting just a single point, pericardium 6, often as not within half an hour completely resolves, somebody with a headache after half an hour to an hour a couple of points, completely resolved. It depends on the condition. If it's something like neuropathic pain, you have to go on for at least a couple of weeks to ascertain when it's going to work. If it's something like acute nausea and vomiting, then you can terminate just with one session.

SPEAKER: How do you define the end point to the therapy?

DR. SAGAR: I think you have to take an arbitrary number of treatments. It's like with a drug. I suppose a drug, to a certain extent you can rely on kinetics. But I usually say 2 weeks at the most. If it's not working after 2 weeks -- Having said that, something like xerostomia, dry mouth, you literally have to go on for about 12 weeks. But that was assessed by previous Phase I experience by the centers.

SPEAKER: ---- Is there a clearing house ----

DR. SAGAR: I think you need to contact the local -- there are a lot of local hospitals now, and university centers have departments of complementary medicine. I think --

SPEAKER: ----

DR. SAGAR: Well, the answer is there's no clearing house simply because at the moment the practice is not recognized as the essence of our practice by our licensing colleges. But having said that, if research is going to be done on this -- and, you know, most of this should still be in the research context. However, I'm not going to say not to give acupuncture, for example, with its minimal side effects if somebody wants to try it. But I'd rather seen it being done in a clinical trial if it's not proven. But you're right, there is no uniformity. And that's really why Jim Gordon was suggesting today in his talk there needs to be uniformity provided so that everybody can access it. And that's why your own government is actually working to encourage that. At the moment, it really depends where you live and who you know. Okay, well, thank you for coming. You've been a wonderful audience.

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