ADL – Daryl Teague

It is my great privilege and I would remark that this is the third of the symposiums we've done and this particular session is providing a clinical perspective of introducing patient blood management to hospitals. So we've had various clinicians and honest, Daryl, they've bagged the surgeons the whole way along, each of them. Daryl is quite unique, as a surgeon in taking an interest in patient blood management, so we're very lucky to have him and he's been a key contributor to the patient blood management guidelines. Daryl's an orthopaedic surgeon at Royal Adelaide and Burnside Hospitals. He's the co-head of orthopaedic surgery unit at Royal Adelaide Hospital and a visiting consultant orthopaedic surgeon at Burnside War Memorial Hospital. He's currently a member of the Australian Red Cross Blood Service Advisory Commitment. His experience and techniques to minimise and salve peri operative blood loss and orthopaedic surgery including arthroplasty of the hip and knee with special interest in haemophiliac joint disorders, computer aided knee and adult orthopaedic trauma management. He has been involved in a number of surgical assistance voluntary projects to various countries including Thailand, Cambodia and Papua New Guinea and as a fellow of the Australian Orthopaedic Association Mr Teague was their representative on the patient blood management guidelines Module 1 and Module 2 Clinical Consumer Reference Groups. And from the National Blood Authority's point of view he is a rare beast being a champion of patient blood management as a surgeon. Thanks very much for your time, Daryl and please make him welcome.

Well that's a very kind introduction. As a big sort of person you won't be able to see me behind the lectern but I hope that you can direct your attention to what's going up there. The first thing I would like to do is to give credibility to what I'm saying is that I was forced to review my blood management for my patients because my son married a haematologist and our Sunday lunches became a review session for practice and I found that I didn't have best practice. And I agree so much with what Michael said. The priority of what we should be doing as clinicians is working out the safest path to take our patient down. All of us know that medicine has its inherent dangers. Some of the inherent dangers are brought about by disease that our patients suffers, some of them by the therapy that we afflict upon them and even others by the therapist who unthinkingly doesn't have the best practice policy. So that's what I had to think about.

Just think back to this common conversation, it's a game of blame and the surgeon causes the bleeding that the anaesthetist is demanded to control the situation. The aim of this paper is to follow what we have back there on the pillar 1, pillar 2, pillar 3 and if you follow these pillars your own pillow will be a lot nicer to lie on at night. We have the opportunity to fend off problems preoperatively and to identify the risk areas for our patient. And then there are lots of special techniques. And again, doing haemophiliac joint surgery is a challenge to negotiate a path of safety for that patient. And then there's the revised thinking about the post operative care. Are we talking the best thing? And how wonderful

what that micro vascular film that we saw about sludging? It reminded me of the traffic coming through here this morning getting through the city. So why all the fuss about blood? Everybody respects blood. It's the life force, it has spiritual and religious respect across all ethical groups, across ethnic groups, across our whole world. We know it's an oxygen transport mechanism and it requires other organs to maintain that function. But what happens to our patient? Now this man has got gynaecomastia and that reflects the fact that he has a clinical problem and doesn't break down his oestrogen and that clinical problem is in his liver and it makes us aware of if you've got gynaecomastia there's going to be other problems that his liver's going to be displaying other than just an abnormal anatomical form. Ladies with gynaecomastia don't have exactly the same problems. Now liver cirrhosis can go on to give cholestatic jaundice and Vitamin K absorption is reduced and if Vitamin K deficiency then that's made evident by coagulation defects. And in Adelaide where the television channels used to be 2, 7, 9 and 10, we used to call them the TV factors and fibrinogen as well and this can be treated by Vitamin K. So we can do something for this patient to enhance their ability to coagulate their blood when challenged. What about people who come in with kidney problems? We know that there is a severity of hemorrhagic status proportional to plasma urea concentration. We also know that there's a low starting haemoglobin that these people don't have the same erythropoiesis drive and therefore they tend, with chronic renal disease have low haemoglobins to start with. There may be things that we have to do like give them Erythropoietin and other haematinics and to better their renal function as much as we can. These people also have a reduced platelet function, so they're going to bleed more, they start with a lower haemoglobin, we're in trouble very quickly in the game. Thank God for your haematologist who can hover nearby over your challenge patient. I have a lot of haematologist friends and I'm pleased to say that a few of them are here today and they are great in being able to lead my patient into the dangers of surgery and supplement their factors and make me aware of the fact that even haemophiliac patients who we give factor VIII to sometimes that won't even be effective because these poor people have had so much different factor VIII over the years that they develop antibodies to it.

And so there are other techniques that need it. But after we do haemophiliac surgery we really supplement their factors for about 14 days to get mature control of bleeding until healing has gone ahead. Then there are patients who arrive on a variety of drugs and they challenge us as well. Anti inflammatory drugs, the non steroidal anti inflammatory drugs have an effect on producing bleeding and it's my practice to stop these for seven days at least before the surgery. Heparin which is such a good friend for some patients and such a bad enemy for some surgeons needs to be respected and looked it but thankfully that's got a relatively slow life therapeutically and if we stop it then we can get on with it. Now even antibiotics of penicillin and the Cefazolins what people call 'inaudible' and things like this, the orthopaedic drugs, they produce their own problems with bleeding. When we look at the arthroplasty population we see a lot of people who have had their stent put in and they're on Clopidogrel and Clopidogrel or Plavix that's producing a reduced clotting risk for that patient also will suffer a reduced clotting protection when we go ahead to operate on them. And it's not just blood loss where they're going to bleed and become anaemic, it's blood that gets into the wrong places, it's blood that gets into a joint that subsequently can be at a higher risk of infection or a higher risk of producing intra articular fibrosis and therefore giving a pathetic outcome, where instead of bending their knee to 110 degrees

they bend their knee to 75 degrees because it's all clagged up with coagulated blood that then goes on to fibrose. And then there are things like Dextrin and beta blockers and I have physicians who help me out with these things to get us around them. So the definite things like Warfarin and Heparin and low molecular weight Heparins, the Clexane and 'Enoxaparin', these drugs are designed to interfere with the coagulation. But luckily we can stop these and what we do with them is to stop them sufficiently so that we get into a safe zone for a short time of the surgery and then reintroduce a control where it's absolutely necessary. So these are the drugs that worry us. But it's important and it's important for your hospital preadmission clinic, it's important for your surgeon and it's important that your patient information highlights these things because it might be missed. You ask the patient "are you on Clopidogrel" and the patient says "no, I'm not on Clopidogrel" because they call it Plavix or it may be that some other of these drugs is given another name, it's such a pathetic thing that Warfarin is disguised in so many guises and it could be missed with a terrible outcome. And then there are the things that people take like fish oil which is now a very well established anti inflammatory effect that helps arthritic patients and then there's garlic oil. I give my patients garlic oil because it acts to reduce coetaneous staphylococcal colonisation. If you take garlic oil regularly for six weeks it reduces your staphylococcal count on your skin. And one of the things I don't welcome into my surgical world is the staphylococcas. But it does, if you take lots of it, if you have a patient who says "damn, I forgot to take my garlic oil for the last two weeks I'll take 14 the day before the operation" then they'll have a problem. So they have to be warned of these things and they can aggravate bleeding. So there are emergency things that my anaesthetist and physicians are very clever and my haematologist may be called upon to help me with these things. But it's not a one off thing, it's a continuing observation and continuing testing, continuing awareness of the risks of these things. And there are going to be times when the absolute necessity is going to be there because the patient hasn't had a chance to go to a preadmission clinic. So what about your platelet count? Now we know that platelets are the things that produce a web of blood cells that initiates a control of bleeding locally at vessel injury. But if we have few platelets then that web's not going to be as efficient. But we're happy, I'm happy as an orthopaedic surgeon if the patient's platelet count is more than 100,000 but if it's below that I get my haematologist in and it may be that we need to boost their platelet count. People who have had chemotherapy may well be lacking in platelets. And people who have secondary malignancy in their bone marrow may have problems with producing platelets. And people who have had mylofibrosis will similarly. And then there are the situations with disseminated intra vascular coagulation and hypersplenism and bacterial counts, the septicaemic patient may be at risk than the viremic patient. So what do I like to do? Well I like to see my patients sufficiently early if possible to review their blood counts, to look at their liver function, to look at their renal function and then many of these people I'll be putting on iron because I want to maximise their iron stores and what we see is the patient who comes in with a haemoglobin of 124 after taking a course of oral iron will build their haemoglobin up to 142 by the time they actually get to their surgery and so that these people will start off higher and we know that they're all going to drop about 30 grams during the procedure, if they drop from 142 down to 112 it's better than dropping from 102 down to 72. So give orange juice, it increases the absorption. If you take milk within two hours it blocks it. And so the idea is to help it get to the blood not to the bowel. So what about this fellow, this fellow didn't come to the preadmission clinic six weeks before and he had an

altercation, he's a chef and there was an unhappy diner whose steak wasn't done sufficiently well and he arrives at the hospital like that, complaining of retrosternal pain. Now we know and you know that if we take that out and even where it is it's going to be causing a great deal of harm. We know from the profile of that particular kitchen utensil that it probably goes all the way back to his spine and there is a lot of red and blue structures on the anatomy book that lie in that area apart from the oesophagus and a few things like that. So if we take that out it's going to bleed. I remember a chap who was a pilot in a plane who had been shot and he had wounds that came in through the bottom right area of the chest and out through the back of his shoulder blade. And we opened up that guy's chest quickly, he had virtually no blood pressure, he was talking, he was talking as we opened up his chest and as the anaesthetist was putting numerous venous cannula in and we scooped out of his chest about two litres of blood which were then put immediately into a hard plastic normal saline container and was run back in and filtered back into that person. And he had bullets that had gone through the back of his left atrium. And that's a situation that is frightening, absolutely horrid, it caused the death of that person. But this is the sort of thing that can happen. And sometimes we have a retrievable situation, you may be able to get around these things. The leg wound, these wounds are the things that arrive by helicopter from the region of Murray Bridge on the highway where people roll over and have their legs smashed to smithereens. They lose blood at the place. We stop the bleeding and then we re-explore these things. This is unplanned trauma surgery made a lot more difficult by the fact that our retrieval is so much better. So when we get into the operating theatre what techniques do we have to reduce this red flow of carnage. Well we have hypotensive surgery. And my anaesthetic colleagues are excellent. We do the majority of our planned arthoplasty surgery under spinal anaesthesia, we drop their blood pressure. We know that a 40 millimetre drop in blood pressure will decrease the blood loss by 70% and there's no danger with circulation dividal structures. Now this ought to be written on every anaesthetic machine throughout the whole country and it ought to be indelibly given to our patients. Patients benefit from spinal anaesthesia. What can I do? Well before the operation if I'm doing a hip replacement I infiltrate, I mark the wound with my indelible pen and through a sterile clean area I infiltrate with a long spinal needle into the hip wound that I plan to go into. And it's injected into that plane with one in 100,000 adrenalin in saline and that reduces the blood loss. When I make my incision there is less bleeding or the bleeding that is there is easily identified and easily controlled with diathermy. As the patient's going off to sleep we give them intravenous tranexamic acid and we know that that will help stabilise clot. And in the people that we do use it it's a good outcome and every now and again due to an anaesthetic problem it's not given and we know that that's different. So we have peri operative haemostasis, we know that if we put pressure on an area that we can get these things to stop bleeding and we can identify. We have things like the argon beam coagulator which is very very helpful, I use it on my haemophiliac patients. Tourniquets, I use a tourniquet at 250 millimetres of mercury and I exsanguinate the limb when I'm doing knee surgery with an esmark. Tranexamic acid is the one that we use of all of those things. We know that if we lose lots of blood then we may need blood but we prefer to use plasma expanders, we can get blood quite quickly these days, we don't have to get lambs tocome in and have transfusions. We have a big volume transfusion and you'll see the module 1 of the blood management program, it was up there. And again, when you've got major bleeding have your haematologist, we no longer use autologous

transfusion. I introduced it to orthopaedic clinical use in Adelaide in 1985 and I remember going to the blood bank to give a lecture on it in Perry Street. We don't use it anymore because it's costly, complicated and it still has the dangers. We don't use normovolaemic haemodilution either but some people do, it's not practiced in Adelaide and this means that at the time of surgery draining some blood off, replacing it with salines that if they do bleed they bleed a dilute blood and we give them back their blood again. I don't use it. We do use peri operative blood salvage techniques and the fifth module coming out is one on intraoperative cell salvage and I'm very pleased to have been part of that program as well. The ICS document will be towards automated cell salvage and we think that washed salvaged blood concentrated re-suspended and re-infused is safest. This is the old Royal Adelaide operating theatre and you can see where the students sat but around the edge of the operating table there's a little gutter and there's a downpipe. This is the first use of sterile blood drainage that we could find in Adelaide but it was taken out and put on the hospital rose garden. Now we have things like bellovac that we use and constavac and these systems are a closed sterile system filtering blood, post operatively from a drain in a wound and it can be used. Now I don't use these things again because we stop all the bleeding and I don't put a drain in my hip and I don't put a drain in my knees anymore. But it has to be maintained in a very strict 'inaudible' thing. So what's the worry? If we give a blood transfusion, we've heard about expense but most patients will say "well I've been paying my taxes for the last 50 years if there's an expense I think I deserve the best". But if we tell them that there are people who have an allergic reaction, you may be allergic to shellfish and the donor that you got the blood from might've had a big meal of prawns the day before he gave the donation, infection's always a possibility, we don't have a perfect system. There are situations where viral diseases can be transferred albeit very, very unlikely. Immunomodulation is a real thing, people who have blood transfusions are more likely to have an infection in arthroplastic surgery, this is documented. There are people who might be given the wrong blood group by wrong labelling. They might be the wrong patient. You might have two patients called David Jones in the hospital at the time. There is transfusion related acute lung injury and that's a problem and there's now one that's called tragi which is gut injury and there's the sludging that's been shown. They are the relative risks and really, we drive around the roads of Adelaide at more risk than those figures but they are there. Even when we use the low molecular weight after surgery there is a danger of increasing bleeding and there are therefore ways that we best use it where we delay till the morning after surgery before it's used. In the post op monitoring I check my haemoglobin of the patient 48-72 hours, they continue with their iron, we use the lower triggers, a healthy patient and I would be reviewing the patient and seeing if they have problems at Hb of 70 grams or below. Transfusion of compromised patient, people who've got bad lung, bad heart, a problem, it may be that they are transfused if they drop below 100 but again, only if they're in trouble. And we supplement their oxygen. So the management of surgical blood loss is at three stages, it's before the operation by selecting and supplementing the patient's needs, it's during the operation by being clever and it's post operatively again having a sensible idea that blood is not the cure all. But there's a team of people who work together and I really feel supported by those people with those capital letters there because they're great friends of mine. And then when you've got nothing else to do some night get on the Google machine and always remember that the bottle of red that's best is the bottle of red that comes from this place that you can enjoy at the end of a hard

day rather than the bottle of red that you inflict on your patient. Thank you very much.

Thanks, Daryl. Questions? I'd say there'd be a thousand questions.

Thanks, Leigh. You know my question already, Daryl, it's about the role of the patient and patient awareness. Thank you. A reminder was that how do we actually get the surgeons to change their practice? Now surgeons are fixed, they've got concrete ideas, you can see how many are here today. And they are, they're very concrete people, they don't want to change. But when I say to my patients and I go through the risks of this procedure and it's got blood transfusion and I say "we do everything we can to prevent you from having a blood transfusion" they all say "thank you, doctor, I don't want to have a blood transfusion". So the knowledge is getting out there to the patients somehow but we need to get that knowledge to the surgeon. Now luckily, this place is full of beautiful young women and there's one thing that a surgeon will listen to and it's that you are trained, you are scientifically accredited now we've all got it and you've got to say to these guys "there's no such thing as a top up transfusion because you're putting your patient at risk". Thank you. Can I just ask why you don't use acute normovolaemic haemodilution? It has a risk of infection, it's the sterility of the thing being done, it puts some people temporarily at risk if you're not balancing the maintenance of their blood volume levels. So if you're taking out 100 ml you've got to have 100 ml going in etc, etc, got to do it. And if you ask me how many of my hip arthroplasty patients and how many of my knee arthroplasty patients have I transfused in the last 12 months, zero, all right? I'm not a Jehovah's Witness but the Jehovah's Witnesses come to me because they know that they're not going to get a transfusion but they hopefully think that the same practice of treating everyone as though they were a Jehovah's Witness is going to work. Now there will be someone who needs a transfusion occasionally, there will be someone. The other day I had a Jehovah's Witness thalassemic 84 year old lady who had hips like square blocks in a box, right and we did her first one, she had a haemoglobin of 89 and we dropped it down to about 68 and then we did the second one and we got her haemoglobin up to about 104, we dropped it down to about 90. And I asked her son the other day how she was getting on, he said "well she's flown back to Calabria to see her sister". Now that's a win for that lady, her life is a win and we do that without using that. I just think it's something that I don't want to go into, yeah, okay. But it's a good question. Thank you for asking it. Have you got anything to say about the merits of providing information available to surgeons? You said that they can be a challenging group to get through to, just in terms of making information available about their different practices and their different transfusion rates. I keep presenting at scientific meetings and I'm presenting at the orthopaedic one in a week's time at the National Orthopaedic meeting in Darwin, I think the best thing to do is to make it part of the check list in your preadmission clinic review of the patient. What blood tests have you had done? How do we know that you're working well? If you've got signs of liver problems or signs, these should be highlighted back from the preadmission clinic just the same as if they did a preadmission ECG and it showed Q waves or whatever. Those things should come back from the preadmission clinic and say "this patient is at danger" or "why isn't this patient

being given iron, she's got low ferritin and low haemoglobin" or whatever. And it might be that those people are then reviewed. If the surgeon doesn't feel up to it then he should have a friendly physician who does that.

Unfortunately, we're going to have to bring the questions to a close. Are you here around lunch, Daryl?

Yeah.

So please, if you've got a question you didn't

want to ask in the public forum please ask

Daryl at that stage. Thank you.