

BULLETIN
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Ultrasound in Medicine**

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"Citius, Altius, Fortius": The Sydney Olympics seem to have touched most of us in this region in some way. The efforts of the participants, both athletes and volunteers, blew away virtually all of the negative perceptions leading up to the Games and Australia may well have undergone a lasting identity shift. Nowadays athletes are often described as professionals but it is interesting to reflect on what that really means. Ten years ago David Penington wrote a superb outline of his ideas about what defines a profession, specifically those in the medical profession. His article is adapted and reprinted in this issue and is highly recommended reading for those who identify themselves as health professionals.

The prominent role of musculoskeletal ultrasound in sports medicine in this country was clearly a highlight of the medical services provided at the Olympic Polyclinic. The interview with Dr Jock Anderson, the director of the Polyclinic, makes fascinating reading and Neil Simmons' article on shoulder interventional ultrasound illustrates how this field has developed as a therapeutic adjunct.

Success in any area is achieved only with the right mix of work, skill and vision (and occasionally good fortune) and George Kossoff outlines how this applied to the origins of medical ultrasound in Australia, specifically to research and development. It is fitting that the article appears in this issue with a message from our new President, Stan Barnett, who is heavily committed to research in ultrasound. Stan also has contributed a thoughtful summary of the issues surrounding "prenatal home videos".

Gold, silver and bronze "medal winners" from the recent excellent Annual Scientific Meeting in Auckland are announced and the generous corporate supporters of these "medals" are once again to be thanked.

Robert N Gibson
Editor

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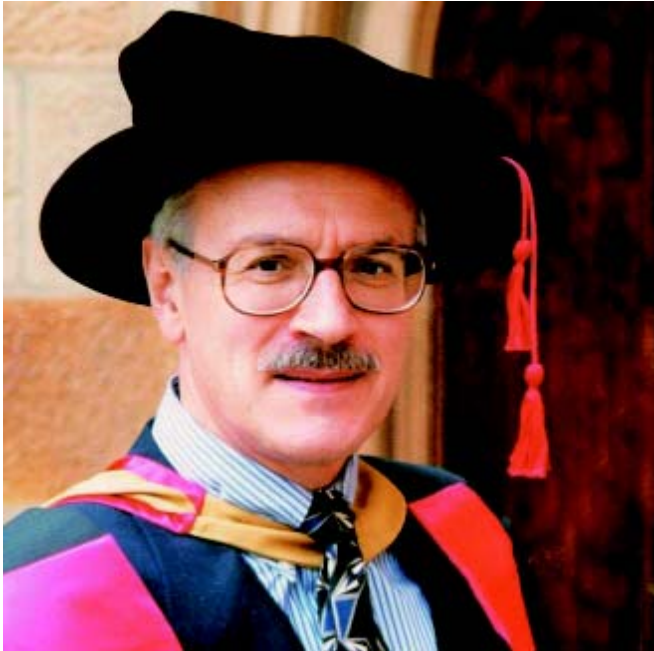
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President's Message



For those ASUM members who may not know me, I have been working in ultrasound research since I first joined the Commonwealth Acoustic Laboratory in Sydney, way back in 1970, prior to the formation of ASUM. The recent loss of the Ultrasonics Laboratory as an identifiable research entity is an unfortunate consequence of modern economic rationalisation. The ultrasonics research effort of that well-known laboratory has been dissipated into different areas within CSIRO. (Perhaps, I might outline my perspective of the history of the Ultrasonics Laboratory, in a subsequent article.) I am Chair of the ASUM Safety Committee and Vice-Chair of the WFUMB Safety Committee. My primary research interest is in evaluating the effects of ultrasound interaction with biological tissue and the development of effective standards for the safe use of ultrasound in medicine.

It is with some trepidation that I take over the reigns of leading ASUM into the new millennium. Andrew Ngu has served as an excellent President and worked with quiet efficiency. In fact, it was largely a result of Andrew's calm and persuasive influence that I now find myself in this position. Andrew has worked, seemingly, tirelessly as President following years of service as Councillor. I look forward to working with him as Past-President, and to benefiting from his experience.

Nowadays, we all live in an era of considerable and continuing change. It used to be said that the only certainties in life were death and taxes. With the introduction of GST, even taxes have become uncertain! We are, indeed fortunate to be part of a world of rapidly developing technology. The exponential increases in applications in IT have changed the way we conduct our professional and domestic life. For users of ultrasound equipment this has increased the scope of applications while also creating some uncertainty about the

risk and benefits of new and developing medical applications. Professional organisations, including ASUM, need to continually adjust to these changes brought about by technological and sociological development. ASUM provides valuable educational services and also has an opportunity to develop into the pre-eminent centre of excellence for medical ultrasound practice within Australasia. However, in doing so, it is essential that the ASUM takes careful note of the requirements of its members and that it adjusts to the needs of the medical community in general. To this end, I would encourage ASUM members to communicate their opinions, and concerns, to the Council. The Bulletin also offers an excellent medium through which to channel new ideas.

I wish to thank the retiring councillors for their contributions. All have willingly given their time and energy for the sake of continuing a viable ultrasound society. Sonographer representatives Jane Fonda and Roy Manning will be replaced by Alison Lee Tannock and Peter Murfett. Kim Smith will retire as associate representative. Meanwhile, Rick Dowling, Dave Carpenter and Maurice Molan have agreed to continue in office for another term. David Rigby will continue as our corporate members representative. Mary Young will continue her term as honorary Secretary and will be supported by Kaye Griffiths as assistant Secretary.

I am sorry that two very experienced committee chairs have retired after years of dedicated service to ASUM; Rob Gibson steps down as Chair of the Education Committee, and Jim Syme has retired his position as Chair of DDU Board. We are indebted to both for their Herculean efforts. During my relatively short period of office as President-Elect, I have become aware of the size of the task ahead. There are many changes on the horizon. I support Andrew Ngu's initiative to explore opportunities to liaise with ultrasound societies in SE Asia. It is entirely appropriate that ASUM should widen its scope and become part of the Asian and the international scene.

We are facing an era of change in policy, structure and philosophy. ASUM has grown in size and diversified in interests and activities. We need to ensure that we capture the opportunities and develop for the benefit of the wider community. This is where the leaders of ASUM have particular responsibility. I am sure that there is a positive and productive future for ASUM, given the continued generous support of hard-working and enthusiastic individuals. The pursuit of excellence is a fine objective, but it needs to be supported by a dedicated team. I look forward to the challenge of leading ASUM towards this goal. The continued support of our industry representatives is both essential and appreciated. I look forward to working together with all members including medical, sonographer and associate members.

**Dr Stan Barnett PhD
President**

Interventional shoulder ultrasound

Dr D N Simmons, Radiologist, Dr Jones & Partners, Adelaide SA

ABSTRACT

Apart from aspiration of calcific deposits in tendons, the most common indications for interventional ultrasound around the shoulder are injection of the subdeltoid bursa, injection of the glenohumeral joint, injection of the acromioclavicular joint, and injection of the biceps tendon sheath. Less common indications include injection of scapulothoracic bursae, ganglia in the suprascapular notch and biopsy of soft tissue swellings. The author's techniques for the most common procedures are described in this article.

Subdeltoid Bursa

Thickening of the subdeltoid bursal walls with catching of the thickened bursa on abduction and/or forward flexion is very common, especially in the 30–50 age group. If this causes significant symptoms and/or mechanical impingement, injection of the bursa often provides relief. This may be temporary but up to three injections can be performed without any significant risk, as long as the injection is into the subdeltoid bursa. One of the many advantages ultrasound guided injection of the bursa has over a clinical “blind” injection is that the material is delivered exactly to the point of inflammation. If the injection relieves the patient’s symptoms then it is obvious that this is the site of the problem. A failed “blind” injection fails to resolve any questions as doubt remains as to whether the injection was in the correct position. A “blind” injection may also cause significant damage to the supraspinatus tendon (Figures 1 and 2).

For almost all procedures, the patient can either be seated or supine. Vasovagal attacks occur in approximately 5–10% of patients who are seated. If the patient is very anxious or gives a history of previous problems with injections, it is better that they are supine during the procedure. The equipment most commonly used is shown in Figure 3.

I use a 38 mm long 25 gauge needle via a lateral approach, in the plane of the anterior supraspinatus tendon just anterior to the acromion. The bursal space is usually clearly seen in this position (Figure 4). If not, scan around the region to obtain the best view of the space. When the image is similar to Figure 4, I mark the skin lateral to the transducer in the line of the probe (Figure 5). The transducer is removed and the end of the skin mark is wiped with an alcohol swab. The needle is inserted through the swabbed region and pushed medially with a slight downwards inclination in the line of the mark on the skin (Figure 6). When the needle hits the supraspinatus tendon there is an increase in resistance. At this stage I check the position of the needle sonographically (Figure 7). Remember that the needle is inclined relative to the skin, so the transducer may need to be heel-toed at its medial end to demonstrate

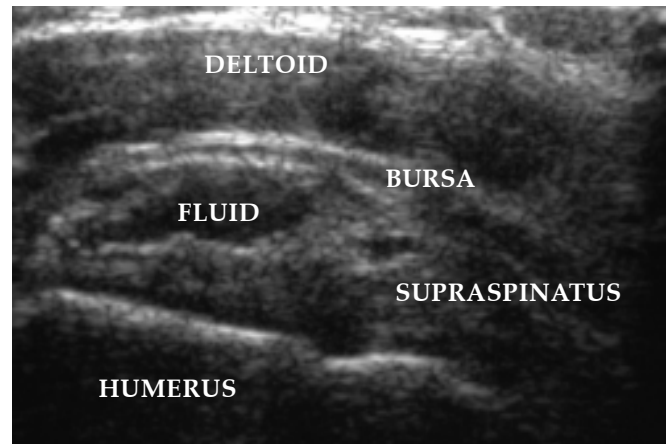


Figure 1 A “blind” bursal injection was performed by a GP two weeks before this scan. The image shows swelling and distension of the supraspinatus tendon. Compare it with the normal supraspinatus tendon on the opposite shoulder (Figure 2 below).

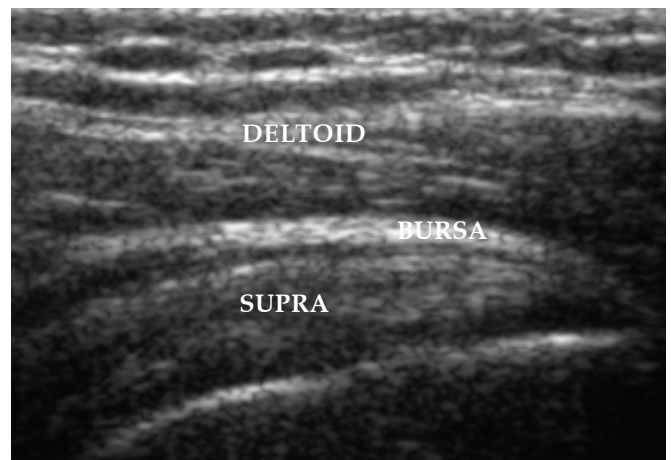


Figure 2



Figure 3 Most commonly used equipment.

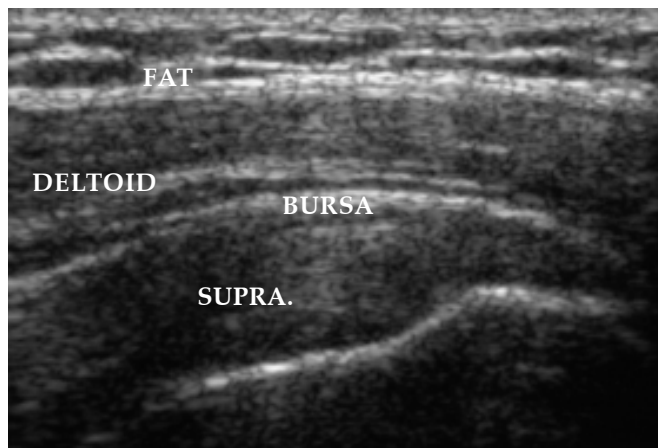


Figure 4 Longitudinal scan of the anterior supraspinatus.



Figure 5 Position of the transducer for Figure 4 and the line drawn on the skin.

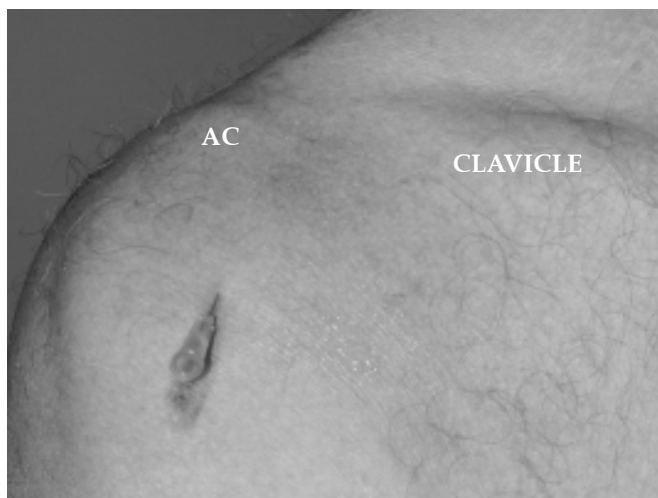


Figure 6 Needle position and orientation for bursal injection.

the needle shaft and tip (eliminating anisotropy.) I prefer to inject local anaesthetic initially, in case the needle tip is not in the bursa. If the needle is in the tendon local anaesthetic causes less damage to the tendon than the mixture of local anaesthetic and steroid. Once the tip is positioned in the bursa, I disconnect the syringe, draw up the steroid and finish the injection. This technique eliminates any risk of injection of steroid into the supraspinatus which can lead to partial thickness tears. A non-Luer lock syringe makes it easier to disconnect the syringe. Usually 3–4 ml of long acting local anaesthetic and 1 ml of Celestone Chronodose or similar steroid are used. At the end of the examination I usually scan over the distended bursa to check for the presence of adhesions or loose bodies and also manipulate the arm to disperse the material through the bursa. Occasionally the bursal fluid demonstrates previously unrecognised supraspinatus tears.

Glenohumeral Joint

Injections of this joint are usually undertaken in patients with frozen shoulder and/or bicipital tendonitis. Gadolinium can be injected for patients having MR arthrograms. Aspiration of fluid from the glenohumeral joint for analysis may also be performed.

Although the aetiology of frozen shoulder is controversial, there is evidence that intra-articular steroid injections provide some relief. In cases of bicipital tendonitis, injection of the glenohumeral joint is an effective way of delivering steroid to the synovial sheath around the biceps, without the danger of injecting the tendon itself, as the bicipital sheath communicates with the glenohumeral joint.

Although there are different techniques (1, 2), I inject the joint from a posterior approach, using a 25 gauge needle. The injection is made immediately beneath the spine of the scapula just lateral to the glenoid labrum (the infraspinatus tendon view- Figures 8 and 9). The needle is inserted "blind" until it hits the humeral head, which gives a characteristic abrupt halt to the progress of the needle (Figure 10). I then scan the area whilst the needle is jiggled slightly (figure 11). Local anaesthetic is then injected. A few tiny bubbles of air in the injected material are usually seen as sharply reflective foci moving within the joint space. Once the position is confirmed, the appropriate volume of material is injected (Figure 12). I use 10 ml long acting local anaesthetic, 10 ml Saline and 2 ml Celestone Chronodose for frozen shoulder and 10 ml local anaesthetic and 2 ml Celestone Chronodose for bicipital tendonitis. 15 ml of Gadolinium gives good distension without rupture for MR arthrograms. For joint aspiration (Figure 13), a 19 gauge needle is preferred as the aspirated material is often quite thick. Scanning over the bicipital groove as the material is injected will demonstrate progressive distension of the bicipital sheath by the fluid. This technique is simpler and quicker than injection under fluoroscopic control. It is also easier than an anterior approach, as the joint is closer to the skin surface.

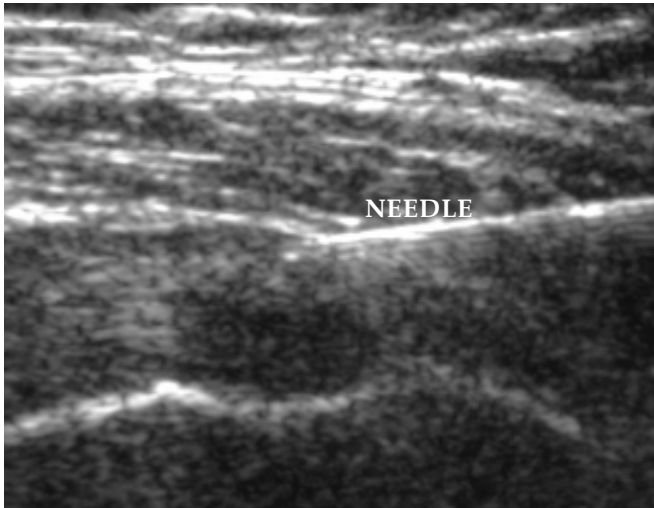


Figure 7 The needle tip in the bursa, outlined by anaesthetic.



Figure 10 Needle position and orientation for glenohumeral joint puncture.

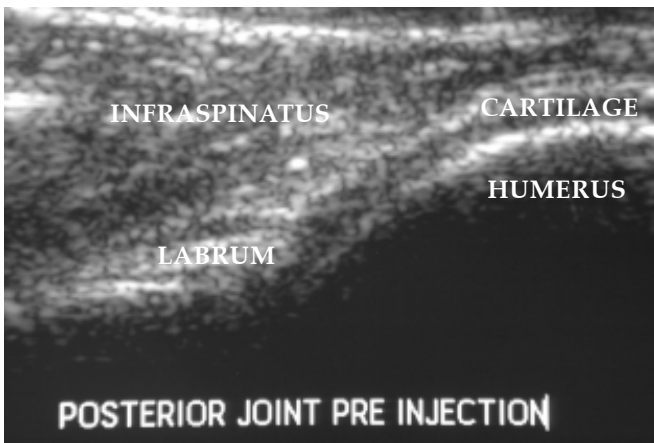


Figure 8 Longitudinal scan of the posterior glenohumeral joint.

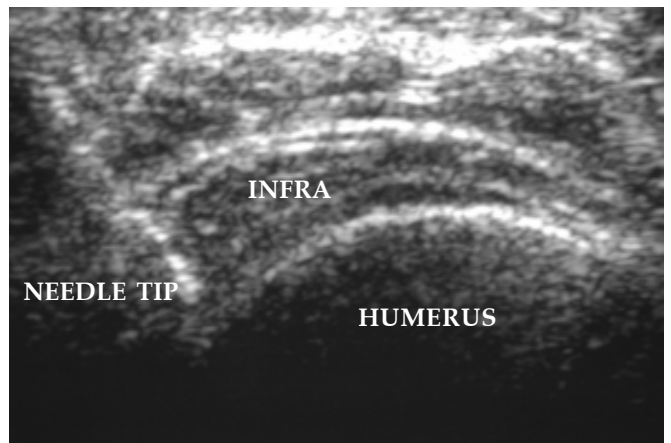


Figure 11 The needle tip touching the posterior humeral head just lateral to the glenoid labrum.

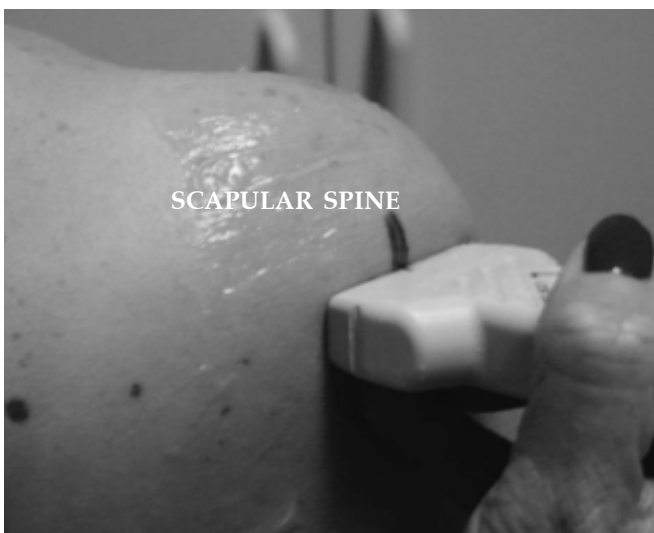


Figure 9 Position of the transducer for Figure 8 and the dots in the middle of the transducer.

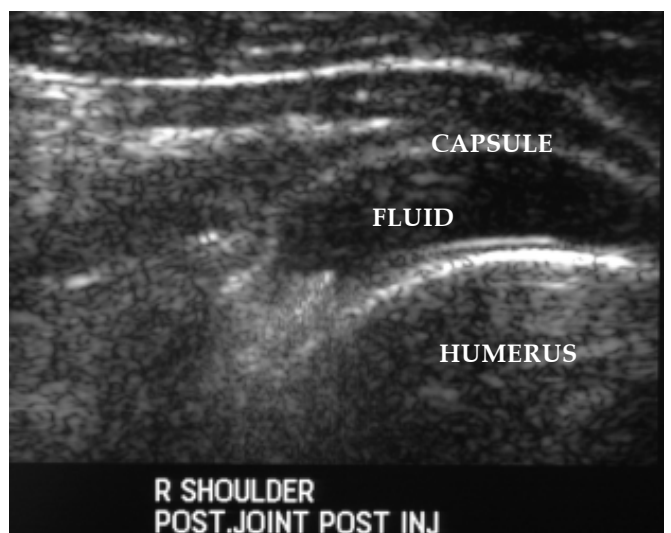


Figure 12 Elevation of the joint capsule post injection.

Interventional Shoulder Ultrasound

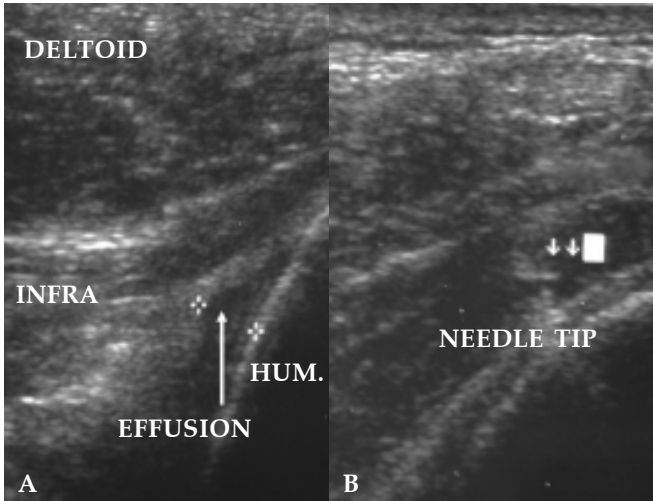


Figure 13 A patient in intensive care with septicaemia and a sore shoulder had the joint fluid (A) aspirated under ultrasound control (B). Culture was negative.



Figure 16 Four dots on another patient. The needle is inserted vertically in the centre of the dots.

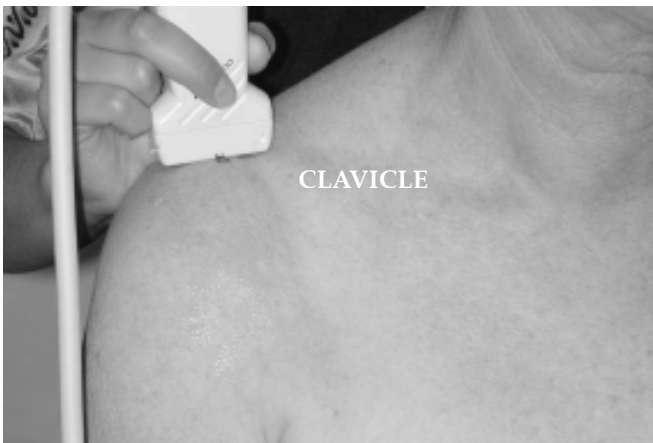


Figure 14 The transducer positioned along the line of the AC joint, with the joint capsule in the middle of the screen. Dots on each side of the middle of the transducer.

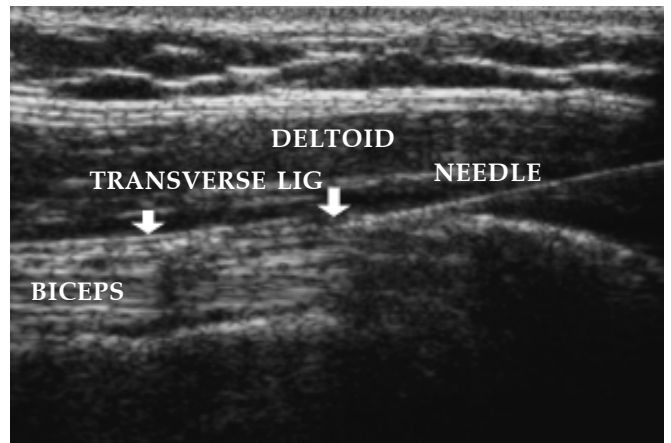


Figure 17 Longitudinal scan of the biceps (proximal to the right) showing the needle tip just beneath the transverse ligament and superficial to the tendon.

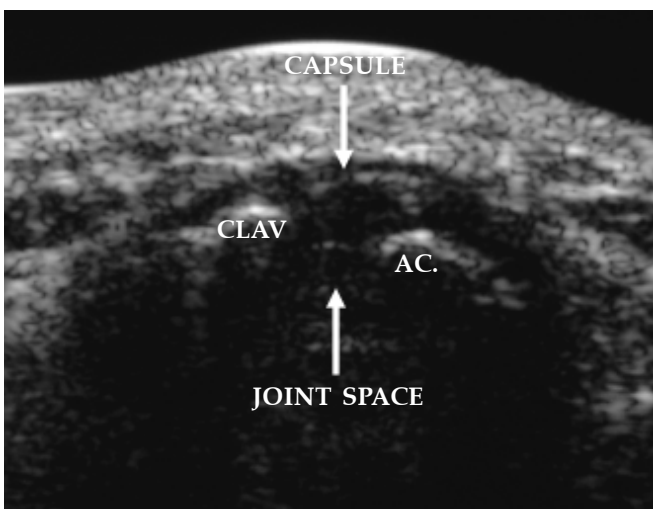


Figure 15 The image seen on scanning as shown in Figure 14.

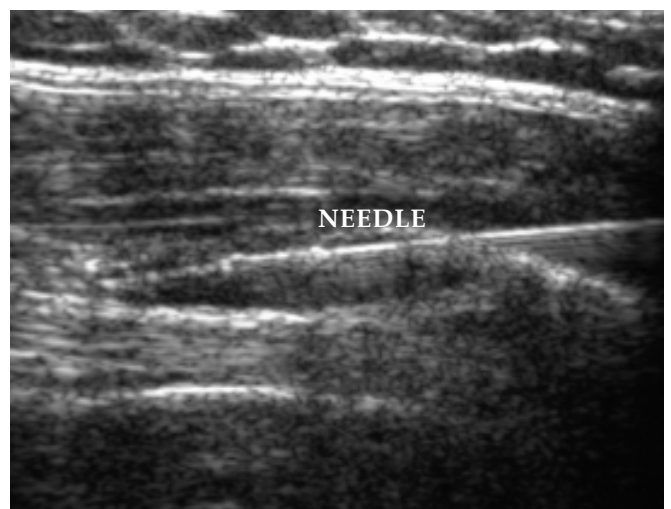


Figure 18 Progressive distension of the biceps tendon sheath.

Acromioclavicular Joint

In a significant percentage of cases pathology of the acromioclavicular (AC) joint is either the main cause of the symptoms around the shoulder joint or contributory. An injection of local anaesthetic +/- steroid will determine if the joint is contributing to the patient's symptoms. Injection of the AC joint itself is performed from a superior approach, again using a 25 gauge needle. This technique is useful in patients in whom the joint is not palpable (the obese and those with large superior osteophytes/ossicles.) I scan the joint along the line of the clavicle (Figure 14) and place the transducer so that the joint space is in the middle of the screen (Figure 15). I mark the patient's skin on either side of the middle of the transducer. I repeat the process with the transducer at right angles to the joint capsule and the capsule in the middle of the screen. The transducer is withdrawn, the centre of the 4 dots is swabbed (Figure 16) and the needle inserted into this space, directed vertically downwards. The position is checked by scanning in the first position, whilst the needle is jiggled. The tip can usually be seen moving up and down within the joint capsule. The joint usually accepts no more than 1 ml of fluid.

Biceps Tendon Sheath

The position of the bicipital groove is marked on the skin by a longitudinal line. A 25 gauge needle is inserted approximately 1 cm proximal to the upper part of the line, angled relatively superficially and pointing distally. The groove is scanned longitudinally as the needle is inserted.

The needle should be clearly seen, especially if the distal end of the transducer is slightly "heel-toed" (Figure 17). If there is difficulty in locating the needle, scanning transversely just distal to the needle point insertion should determine its position and it can be adjusted accordingly. Once the needle tip pierces the transverse ligament of the groove, I inject a little local anaesthetic to help distend the tendon sheath, making it easy to confirm that the needle tip is not in the tendon. I then inject 1-2 ml of local anaesthetic and 1 ml of Celestone Chronodose (Figure 18). Any extra fluid that is injected flows back into the glenohumeral joint, with which the bicipital tendon sheath communicates.

CONCLUSION

Ultrasound guided intervention around the shoulder is a rapidly growing technique which is relatively easy, has few complications, is quick and often provides gratifyingly instantaneous relief.

Acknowledgement

I would like to thank the clerical staff at Dr Jones and partners and my son Nicholas for their help in preparing this article.

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2. Valls R and Melloni P. Sonographic Guidance of Needle Position for MR Arthrography of the Shoulder. AJR 1997; 169:845-847.

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How research into medical ultrasound began in Australia

George Kossoff AO, FTSE, DScEng, (Retired) Former Head, Ultrasonics Laboratory, Division of Telecommunications and Industrial Physics, CSIRO, Sydney

ABSTRACT

In 1955, the National Health and Medical Research Council set up an Ultrasonics Committee to inquire into the control and use of ultrasound physiotherapy equipment. The Director of the Commonwealth Acoustic Laboratories (CAL) was appointed Chairman of this Committee. In 1958 the Chairman recommended that, in view of developments internationally in medical ultrasound, the Commonwealth Acoustic Laboratories should undertake research into this field in Australia. An Ultrasonic Research Section was established in the Laboratories in March 1959, and research into medical ultrasound began at that time. This review describes the events leading to the establishment of the Ultrasonics Committee, the activity of the Committee between 1955 and 1958, and the research undertaken by the Ultrasonic Research Section of the Commonwealth Acoustic Laboratories until 1963 when the Ultrasonics Committee of the NHMRC was discontinued and the control of the research transferred to the Commonwealth Acoustic Laboratories.

INTRODUCTION

Research into medical ultrasound in Australia began in 1959, nine years after the first publication on "the use of ultrasonic pulses to detect soft tissue density changes (1)". Much of the credit for the early entry by Australia into this field belongs to Mr. Norman Murray, the Director of the Commonwealth Acoustic Laboratories (CAL). Murray recognised the contributions that medical ultrasound could make to clinical practice. Using his position as Chairman of the Ultrasonics Committee of the National Health and Medical Research Council (NHMRC) he established that year an Ultrasonic Research Section in the Laboratories to undertake research into this application. He also recognised that the Laboratories would benefit by having the research into ultrasound technology guided by input from the medical profession. He therefore set up a structure, similar to one already in place in audiology research within the Laboratories, whereby scientists had the primary responsibility for the research and clinicians were appointed as medical consultants to the Laboratories. In this way the research was conducted in an interdisciplinary manner with no restrictions on areas in which participants could make contributions. He also adopted the policy that the developed equipment was to be evaluated in hospitals to determine the clinical usefulness of the new technology.

This review describes the events that led to the establishment of CAL and of the Ultrasonics Committee of the NHMRC, the work of this Committee between 1955 and 1958, and the research undertaken by the Ultrasonics Research Section of CAL from 1959 to 1963. The Ultrasonics Committee of the NHMRC was disbanded that year and control over the research transferred to CAL.

Events leading to the establishment of the Commonwealth Acoustic Laboratories (CAL)

Two of the main problems in acoustics facing the Armed Services during World War II were communication between personnel under conditions of loud noise and the harmful effect of noise from guns. The Services turned to the NHMRC for assistance with a request to fund research and to recruit civilian scientists to do it.

At that time the National Standards Laboratories (now the CSIRO) had no laboratory facilities for acoustic research. Because much of the work was to be of physiological nature, Dr John C Eccles, then Director of the Kanematsu Memorial Institute of Pathology, Sydney Hospital, recommended in 1943 that the NHMRC establish an Acoustic Testing Laboratory to undertake this research in that hospital (2). Mr Norman Murray, shown in Figure 1, was seconded from the Post Master General's Department to be the engineer in charge of the project. The following year the Laboratory was renamed the Acoustic Research Laboratory and transferred to the Medical School, Sydney University.



Figure 1 Norman Murray, Foundation Director of the Commonwealth Acoustic Laboratories, 1947-1967.

Following the War the Laboratory began to undertake research into civilian problems in acoustics, in particular the rehabilitation of deafened ex-servicemen through the design and provision of a standard hearing aid. Attention was also given to the problems of a large group of children with congenital deafness resulting from an epidemic of maternal rubella in 1940/41.

In 1946, the NHMRC decided that it was no longer justified in financing these civilian activities and recommended that the Laboratory be taken over by the Commonwealth Department of Health. Cabinet agreed to this proposal and the transfer was effected on the 1st of January 1947, the name of the Laboratory being changed to the Commonwealth Acoustic Laboratories (CAL).

The functions of the Laboratories were significantly expanded in the establishment process. The rehabilitation program was enlarged with the Laboratories given responsibility to provide hearing services to all deafened ex-servicemen and to all school children in Australia. Its service activities were also extended to permit investigations of effects of noise in industry.

Early investigations into ultrasound by CAL

In the early fifties, with the rapid expansion in use of jet and propjet aircraft, the Royal Australian Air Force requested CAL to undertake investigations into possible effects on its personnel by noise generated by these airplanes and to recommend appropriate hearing protection procedures. Although it was appreciated that the main energy in this noise was in the audible frequency range, concern was also expressed about possible effects from energy in the ultrasound frequency ranges *ie* above 20 kHz.

The energy and frequency distribution of noise from jet and propeller aircraft was determined using high frequency microphones capable of measuring air-borne acoustic energy at frequencies up to 60 kHz. It was found that the ultrasound component of the noise was small and for personnel to suffer a hearing loss from ultrasound they would have to stand so close to the engines that they would be hurt either by the exhaust or by the propeller. A precedent had been however established that the Laboratories were the appropriate authority to request assistance on matters relating into effects of ultrasound on personnel.

Ultrasonics Committee of the NHMRC 1955-1958

The Ultrasonics Committee was established at the meeting of the NHMRC held on 19th and 20th of May 1955. The brief of the Committee, as specified in the letter from Dr AJ Metcalfe, the Chairman of the NHMRC, to Norman Murray, was "to inquire into the control of the sale and use of ultrasonic therapy apparatus". The membership of the Committee consisted of Dr. Gordon Smith and Dr BG Wade, both specialists in physical medicine, and of Norman Murray as Chairman.

The initial meeting of the Ultrasonic Committee was held shortly after at the Acoustic Laboratories. The general field of work was surveyed and the minutes state that the Committee considered that its brief was "to oversee the use of ultrasonic apparatus for diagnosis and therapy and of industrial equipment". Consideration was also to be given to possible misuse of this equipment. The Committee considered the control of sale of this equipment and concluded that it would only be possible in relation to specific physical characteristics of the equipment. The common factor was the need to establish standards for

measurement of acoustic output of the equipment. The Chairman was requested to investigate this aspect to be discussed at the next meeting.

The second meeting of the Committee was held in October 1955. The Committee discussed the ultrasonic therapy paper presented at the Australian Medical Congress, BMA, held in Sydney in August of that year, in particular "the possible misuse in regard to the gravid uterus such as to procure abortion". Standards for measurement of acoustic output from physiotherapy equipment were again discussed, and the Committee recommended that the Acoustic Laboratories be asked to set up appropriate measurement facilities. The NHMRC accepted this recommendation in December 1955 and requested the Acoustic Laboratories undertake "the setting up of apparatus for determination of standards and methods of measurement and dosage". Norman Murray accepted this task in February 1956 as "an extension of our present work in ultrasonic measurements in air and our use of ultrasonic therapy in investigating its benefits in otological use".

The Committee next reported to the NHMRC in May 1958. The report states that the Acoustic Laboratories had purchased calibration equipment to measure the acoustic power output from physiotherapy equipment and that the Laboratories were following the activities of the International Electricity Commission (IEC) regarding the adoption of an international standard for measurement of dosage. The report also states that the Laboratories intended to commence research into "the use of ultrasonics in the alleviation and reduction of deafness and hearing defects". This was reference to the development in the use of ultrasound for treatment of Meniere's disease, whereby ultrasonic irradiation of the vestibular system was claimed to alleviate attacks of vertigo while preserving hearing.

Norman Murray was also keeping a close watch on developments in medical ultrasound. In the report he also refers to two new major applications, the use of strongly focused ultrasound for "destruction of nerve centres for treatment of Parkinson's disease" and the diagnostic use of "reflected ultrasound to detect and determine nature of breast tumours". The report concludes with the recommendation "that the work has developed to such an extent that it justifies the full-time attention of a first class research physicist on the Acoustic Laboratories staff".

The Committee issued a relatively short report to the NHMRC in November 1958. The report describes a change in the membership of the Committee with Dr TW Burgess, President of the NSW Physiotherapists Registration Board, replacing Dr BG Wade who resigned due to ill-health. The report discusses the concern by the Physiotherapists Registration Board regarding the use of ultrasound physiotherapy equipment by unqualified people and the action by the NSW Minister of Health to prevent this misuse. The report concludes by mentioning the work of "two British doctors and a research engineer who had developed a device, using ultrasound reflection methods, to avoid unborn children from being exposed to possible danger from X-ray radiation".

Establishment of the Ultrasonic Research Section of CAL

At its Council meeting in November 1958 the NHMRC endorsed Norman Murray's recommendation that CAL should have a full-time scientist undertake research into medical ultrasound. Having obtained this endorsement, he approached the Commonwealth Department of Health in December 1958 for funding to allow CAL to establish a small Ultrasonic Research Section. To his delight he obtained approval for this action the last week in February 1959. He immediately contacted the Head of the Faculty of Electrical Engineering at the University of Sydney for names of undergraduates enrolled in the Honours degree. He wanted to identify from this list suitable applicants for the position, the urgency of his action being prompted by the fact that the results of the graduations were to be announced the following week.

The results of the graduations were announced the first week in March, and Norman Murray approached me that week inviting me to set up and head the Ultrasonics Research Section. I had at that time considered taking up an offer of appointment as a nuclear scientist at the Atomic Energy Commission. Norm Murray persuaded me to accept his invitation on the basis of his description of Medical Ultrasound as a field in the early stages of development when it would be easier to make a meaningful contribution. As there was no one in the Laboratories with experience in ultrasound I was to report directly to him as a Section Head. In recognition of this responsibility my appointment would be at a grade higher than that normally offered to a raw graduate. In other words he made me an offer which I just could not refuse, and I commenced duties with the Commonwealth Acoustic Laboratories on the 10th of March 1959.

My brief was

- a) to establish calibration facilities to measure the acoustic output from physiotherapy equipment,
- b) to initiate research into the ultrasonic treatment of Meniere's disease in collaboration with the ENT consultants to the Laboratories, and
- c) to identify key areas of expertise in technology required for diagnostic applications.

I was allocated a reasonable budget to allow purchase and construction of equipment to undertake measurements at ultrasonic frequencies, a technical officer to assist in the construction of the equipment, and the generous use of library facilities. The annual salary and operating budget for the Section the first year was four thousand pounds.

Investigations by the Ultrasonics Research Section of CAL 1959-1963

Calibration Facilities for Measurement of Acoustic Output

The first task that I undertook on my appointment was to evaluate existing international standards for measurement of acoustic output at ultrasonic frequencies. The International Electrotechnical Commission (IEC) had just released a draft of a proposed standard that I adopted for

measurement of total acoustic power output. The technique used a Cartesian float method which has proven to be remarkably age resistant and is still used occasionally by the Laboratory for quick, first cut assessment of power output in the 1-10 Watt range. The intensity distribution was measured by a densitometric evaluation of the degree of starch-iodine reaction on starch coated plastic film which I developed for the application (3). The method was accepted as an Australian standard for measurement of output from physiotherapy equipment and we used it over the years to measure the output from a number of physiotherapy equipment installations in public hospitals and in private practices. Not surprisingly we found that most units were out of calibration and the acoustic output indicated by the meter on the machine bore little relationship to the emitted power.

The experience we acquired in this project proved to be highly useful when we began to measure the acoustic output from diagnostic equipment. We were probably the first laboratory in the world to do so and as a result were able to influence the development of existing international standards in this application.

Ultrasonic Treatment of Meniere's Disease

The audiologists at the Commonwealth Acoustic Laboratories had several on-going research projects with the ENT consultants to the Laboratories. It was natural therefore that Murray also wanted the Ultrasonic Research Section to investigate with them the ultrasonic treatment of Meniere's disease, particularly as the technique was said to be able to alleviate the attacks of vertigo while preserving patients' hearing.

The major proponents of the techniques were otologists in Europe and particularly in Italy. Murray visited some of these otologists and proceeded to purchase the main Italian unit developed for this application. A program was set up between the Laboratories and Dr Horrie Eizenberg, a senior otologist at St. Vincent's Hospital, Sydney, who had recently observed this operation being performed in Italy. Dr Albert Khan, a consultant otologist to the Laboratories was to assist with the first procedures and participate in the program. In the Ultrasonics Committee Report of October 1960 to the NHMRC Murray recommended that, because the work in otology had become a major project, Dr Albert Khan be appointed to the Ultrasonics Committee.

The Italian equipment was awkward to use and frequently drifted out of calibration. I was therefore invited to attend the operations to assist with technical matters and to bring expertise in ultrasound should that prove to be necessary. The irradiation alleviated the attacks of vertigo in the two patients treated with the equipment. Unfortunately the treatment also caused medium-term facial paralysis which we attributed to the heating of the ultrasonic probe reaching the facial nerve which lies in close proximity to the irradiated semi-circular canal.

We proceeded to design new equipment for the application which was first used clinically in March 1962. The ultrasonic probe was miniaturised while the use of a more efficient coupling approach avoided the issue of

selfheating. The equipment was transistorised and reduced to the size of a standard telephone. The safety and efficiency of the instrument encouraged otologists to use the technique on patients with less severe symptoms and quickly we were able to obtain results on a large number of patients (4). Our publications attracted international attention and requests for purchase of equipment locally and from overseas. The Commonwealth Department of Health gave free the rights for the manufacture of the ultrasonic Meniere's generator and the instrument we developed for the measurement of nystagmus to the Watson Victor Co. The company proceeded to sell, primarily overseas, over one hundred units of each type in the next several years.

Research into Diagnostic Ultrasound

The CAL/RHW Obstetric Program

In July 1959 the NHMRC, at its meeting in Canberra, discussed the use of X-rays in general and in particular their use in pregnancy. The meeting was attended by Professor Bruce Mayes, Professor of Obstetrics at the University of Sydney, and Norman Murray, who attended as an observer. After the meeting Murray suggested to Mayes that they should hold a meeting in Sydney to discuss the possible use of ultrasound as a replacement for some obstetric examinations. The proposed meeting was held on 7th September 1959 at the Queen Elizabeth II Research Institute for Mothers and Infants at the University of Sydney. Norman Murray brought me along while Bruce Mayes invited Dr. William Garrett to attend. Murray brought with him the original 1958 publication by Ian Donald (5) and a reprint of the 1955 Douglas Howry classical paper (6) of B-mode water delay studies that clearly showed fascial and bony interfaces in cross-sectional views of limbs and the neck. The conclusion of the meeting was that if that could be done for limbs and the neck, it should be possible to do the same for the larger late-term uterus. Accordingly, a research liaison was established between the respective institutions. It was agreed that the Commonwealth Acoustic Laboratories would fund the research. I was given the responsibility for the budget and the technology developments while Bill Garrett was to be responsible for the medical aspects. This was in keeping with the structure that existed in the audiology research program in the Laboratories, where scientists had the responsibility for the research and the ENT clinicians were appointed as medical consultants to the Laboratories. In keeping with this policy Norman Murray appointed Bill Garrett as consultant to the Laboratories to the Ultrasonics program and we established weekly meetings at CAL to maintain close contact. These meetings were later extended to all those working in association with the Ultrasonics Research Section and were a source of first class feedback and education to all present.

Bill Garrett had returned twelve months earlier to Sydney to take up a research and teaching post at the newly opened QEII Institute as a part-time lecturer and, in December 1958, he was appointed to the Honorary Staff of the Royal Hospital for Women then in Paddington. Norman Murray also held the policy that any equipment developed by the

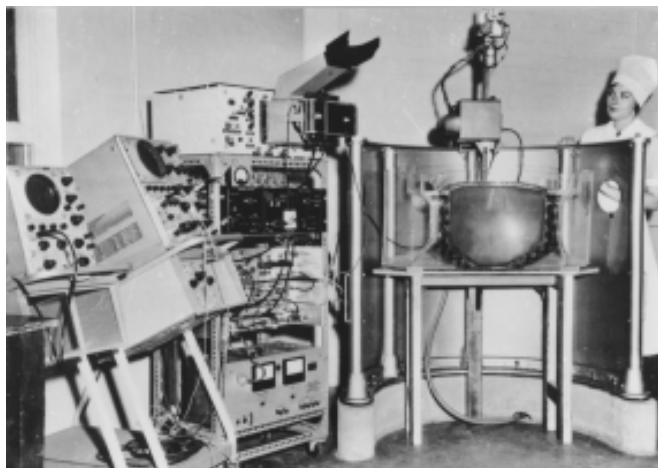
Laboratories had to undergo thorough testing on patients in a hospital environment to determine the clinical usefulness. It was agreed therefore that the equipment would be installed and evaluated at the Royal Hospital for Women.

The images obtained by Howry were clearly superior to those published by Donald. We attributed this partially to the water delay method of coupling used by Howry. For this reason we opted to use the water delay method in our investigations.

Because not much was known about the safety of ultrasound in obstetrics we also agreed that it would be appropriate for us to undertake a pilot study on safety. As we did not have access to diagnostic ultrasound equipment, we used the physiotherapy machine purchased by CAL for its calibration work to irradiate pregnant mice. The research was conducted using the animal house facilities at the QEII Institute. We irradiated about one hundred mice and compared the number of deliveries in the exposed versus a similar control group. The study, which was completed by mid 1960, showed that there was no statistical difference in the number of progenies in the two groups and we were happy to proceed with the research. It was also becoming obvious that the obstetrics program was a major undertaking. In recognition Murray recommended, in his report to the Council in May 1960, that Dr William Garrett be added to the NHMRC Ultrasonic Committee .

In September 1960 Murray obtained approval from the Commonwealth Department of Health to employ a second scientist in the Ultrasonic Research Section. Dave Robinson was at that time working for the Postmaster General's Department (the precursor to Telstra) and was dispatched by his Divisional Engineer to the Commonwealth Acoustic Laboratories to measure the performance of microphones. To Dave's surprise he was summoned to Norm Murray's office and was told that there were two jobs available at the Laboratories, one in electroacoustics and the other in ultrasonics. Dave Robinson elected to accept the position in ultrasonics for the same reasons I had done eighteen months previously. He had never heard of ultrasound and reasoned that not many others had either, and therefore it was a field where you could make your own possibilities.

Upon Dave's commencement we split the work into two areas of responsibility. I continued my involvement in the transducer design and also had time to pursue my other briefs into standards and research into the surgical treatment of Meniere's disease. Dave's responsibility was to finish the development of the prototype echoscope completing the design and construction of the electronics and the mechanical scanner. The equipment was completed and installed at the Royal Hospital for Women in May 1962. I was away at that time attending my first international meeting on medical ultrasound in the United States. Fortunately Dave was able to send images to me in time for my presentation (7). To our surprise and delight, they were as good as, if not better than any other shown at



the meeting. The prototype scanner installed at the Royal Hospital for Women and an example of one of the echograms that I presented at the meeting are shown in Figures 2 and 3.



Figure 3 An obstetric echogram obtained in May 1962 showing the fetal spine and limbs.

The CAL/RPA Ophthalmology Program

The October 1960 Report from the Ultrasonic Committee to the NHMRC informed the Council that, following discussions with the President and the Vice-President of the Ophthalmological Society of Australia, investigations would begin to develop an ophthalmic echoscope for intra and retrobulbar investigations in conjunction with Dr Herbert Hughes, an ophthalmic surgeon at the Royal Prince Alfred Hospital. As this program was to be a major project, the report recommended that Dr Herbert Hughes be added to the Ultrasonics Committee.

The first ophthalmic echograms were obtained in 1963 and a limited number of patients were examined initially at the Laboratories and subsequently at the Royal Prince

Alfred Hospital. It was not however until 1966, when Mike Dadd joined the Ultrasonic Research Section, that this program achieved appropriate momentum leading to the setting up of regularly scheduled clinical examinations in 1968 (8).

The CAL/RNS Breast Program

Being aware of the work by Wild on the ultrasonic examination of the breast, Murray held a series of meetings with the NSW State Cancer Council and hospitals in Sydney regarding the setting up of a program for the ultrasonic examination of the breast.

In a letter to Dr R Richards in December 1961, the Secretary of the NHMRC, he referred to discussions with Drs Freeborn and Ingram of the Royal North Shore and the intent by the Laboratories to carry out research into this application at that hospital. The March 1963 Report from the Committee advised the Council that an echoscope to undertake breast examinations had been designed and was being built with intent to be installed at the Royal North Shore Hospital. Professor Tom Reeve was appointed clinical consultant to the project later that year.

Jack Jellins joined the Ultrasonic Research Section in 1965 as scientist responsible for the technology in this program. The equipment was installed at that hospital in 1966 but it was not until 1969 after the implementation of grey scale on this equipment that we began to issue clinical reports on the results of the examinations (9).

CAL Takes Responsibility for Research into Medical Ultrasound

By 1963 the Ultrasonic Research Section of CAL was no longer involved in any research into physiotherapy applications and the active members of the Ultrasonic Committee of the NHMRC were the clinical consultants to CAL on the Meniere's and the diagnostic ultrasound projects. Murray felt that the NHMRC Committee had successfully completed its task in assisting the setting up of investigations into medical ultrasound and its overseeing role was no longer necessary.

The Report sent by the Ultrasonic Committee to the NHMRC in March 1963 which described the activities in physical therapy, industrial ultrasonics, otology, obstetrics, ophthalmology and breast cancer had the following conclusion-

"It will be seen that the number of areas opened up and which we consider we need to make contributions is becoming very great. The Ultrasonics Committee is not so much a committee of experts in ultrasonics as a committee of medical specialists who are co-operating with CAL in ultrasound research. If the committee extended in similar way it would become very large, causing difficulty bringing it together.

The Ultrasonic Research Section consists of three scientists and several technicians. We propose to add another scientist and a physiologist to the group. The Section is a permanent one under the Department of Health. We are now in a position to undertake any investigation that might be referred to me in my capacity

as Director of CAL.

It seems, therefore, that the Committee has carried out its function of investigating the use of ultrasonics in medicine generally, and in initiating for the Council the setting up of investigations that might be useful.

It was considered, therefore, that the Committee might well terminate these activities as a Committee under the NHMRC. This aspect was discussed at the meeting and all members were unanimous in this view. It is therefore recommended that the Ultrasonics Committee be discontinued."

The NHMRC accepted the recommendation to close the Ultrasonics Committee and from that date CAL took full responsibility for the management of research into medical ultrasound.

CONCLUSION

Research into medical ultrasound in Australia began because of the vision of Norman Murray who recognised from the outset the contributions that this technology could make to patient care. He was responsible for setting up the research projects undertaken by the Ultrasonic Research Section and all of us mentioned in this review are most grateful to him for introducing us to medical ultrasound.

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Essential reading for anyone involved in the practice of Echocardiography!

"Echocardiography: The Normal Examination and Echocardiographic Measurements" is promising to become an indispensable learning tool for cardiac sonographers. More than just a "How To" guide, this text endeavours to explain the theories behind everyday methods and calculations with easy-to-read text and many diagrams which help to unravel some of the mysteries surrounding echocardiography.

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Author, **Bonita Anderson**, is the Senior Cardiac Sonographer in the Echocardiography Department of the Prince Charles Hospital in Brisbane. An Accredited Medical Sonographer, Bonita holds a Diploma in Medical Ultrasonography (Cardiac), a Master of Applied Science (Medical Ultrasound) and has been actively involved in the education and assessment of cardiac sonographers for many years. This publication is the culmination of a career in echocardiography spanning over 15 years.

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Prenatal home videos: What are the concerns?

Stanley B Barnett, PhD, Chair of ASUM Safety Committee

The appropriateness of selling prenatal images or videos to parents-to-be is an important issue of debate that encompasses a range of clinical, medico-legal and safety considerations. The commercial aspect of so-called non-medical uses of diagnostic ultrasound has caused a strong reaction in the USA from both the FDA regulatory body and the American Institute of Ultrasound in Medicine (AIUM). In fact, the AIUM is so concerned it has been a topic of discussion in many meetings of the AIUM Bioeffects Committee in recent years. The problem originated in the USA with some operators (not necessarily accredited as ultrasound diagnosticians) offering images and home videos for sale.

AIUM POSITION

The AIUM has responded by advising members of its concern through the publication of a forthright official statement;

"The AIUM advocates the responsible use of diagnostic ultrasound. The AIUM strongly discourages the non-medical use of ultrasound for psychosocial or entertainment purposes. The use of either two-dimensional (2D) or three-dimensional (3D) ultrasound to only view the fetus, obtain a picture of the fetus or determine the fetal gender without a medical indication is inappropriate and contrary to responsible medical practice. Although there are no confirmed biological effects on patients caused by exposures from present diagnostic ultrasound instruments, the possibility exists that such biological effects may be identified in the future. Thus ultrasound should be used in a prudent manner to provide medical benefit to the patient."

It is interesting that the AIUM has adopted a precautionary approach to this issue.

This developing situation of so-called non-medical use has not escaped the notice of most national ultrasound societies, however, they are yet to establish firm guidelines or policy based on safety issues. The topic has not been addressed in any way by the World Federation for Ultrasound in Medicine and Biology (WFUMB), nor has it been discussed in any WFUMB safety symposia. ASUM has not established a policy on non-medical applications of ultrasound.

In the UK there has been a practice in hospital departments of selling images of the fetus to prospective parents. The British Medical Ultrasound Society (BMUS) is similar in size to ASUM and is actively involved in education, training and safety issues. It regularly publishes articles and tutorials on ultrasound safety. In recent years the BMUS Annual Conference has highlighted bioeffects and safety matters in plenary sessions. Indeed, I was fortunate to be invited to address

the annual conference in a plenary session on "Good Practice" during the 1999 conference in Glasgow. More recently, the BMUS Bulletin featured a number of articles on ultrasound scanning for home videos, under the category of "Current Controversies: The Issue of Prenatal Home Video Production and the Acquisition and Retention of Hard Copy Images" (BMUS, 2000). A number of view-points were expressed that make interesting reading. For the benefit of ASUM members who may have difficulty accessing copies of the BMUS Bulletin, the following is a summary of the salient features.

The opening article prepared by Julie Walter, Chair of Scientific & Education Committee, gave guidance on the BMUS position regarding the acquisition of hard copy images for medical reasons. This is a rather less controversial subject than that of prenatal home video production for entertainment purposes. Opinions were obtained from six professionals in various specialties. Of these, two allowed videos (publisher and obstetrician) one was prepared to allow videos subject to controls (safety issues), and three were opposed to the sale of home videos (psychologist, radiologist and legal opinion).

BMUS POSITION

"In the light of the soundings obtained, BMUS cannot commend the practice of recording ultrasound examinations of the fetus onto videotape for sale to the parents. Those Departments that do choose to undertake this practice must be aware that other than transient enjoyment for the parents and monetary gain for the department, all other benefits are disputed. There are substantial pitfalls and extra work involved. The sale of such videos without the necessary funds and mechanisms for dealing with extra counselling and complaints is inadvisable."

SUMMARY OF BMUS MEMBER OPINIONS

What Psychological Benefits?

Catherine Baillie, a psychologist, argued against a Report of the RCOG Working Party on Ultrasound Screening for Fetal Abnormality (1997) that suggested that, "advantages exist to women being allowed to see their baby on the ultrasound screen in terms of a more positive attitude to the pregnancy and increased reassurance". In contrast, Baillie concluded from her (Baillie et al. 1997) and other published evidence that:

- *"There is no empirical evidence to support the hypothesis that seeing the baby precipitates attachment.*
- *Lessened anxiety and stress following an ultrasound*

exam is likely to simply be an artefact of increased anxiety in anticipation of the procedure.

- *No randomised controlled trial has shown significantly improved health behaviours (in parents) attributable to visualisation of the fetus."*

Baillie argued that whilst there have been numerous anecdotal accounts of ultrasound examinations precipitating feelings of attachment, empirical studies have failed to demonstrate differences in maternal-fetal attachment between scanned and unscanned "low risk" pregnant women (Kemp and Page 1987; Heidrich and Cranley 1989). Therefore, she recommended that practitioners and decision-makers should "avoid over-interpreting enjoyment of a procedure as evidence of its therapeutic powers". Hence, there is no evidence that video sales would improve parental bonding with the fetus. Baillie concluded with a warning of the potential to do harm from psychological consequences of abnormal screening results permanently recorded on home videos.

Selling Prenatal Videos

Jim Thornton (Reader in O&G) presented the opinion that, as parents like seeing their baby on the ultrasound screen, and as they are willing to pay for such pictures, there are no overriding reasons to prevent the process. However, he did warn that such videos probably would be used as evidence in any future negligence claims. Therefore, he contends that the NHS should charge the true cost of the extra work associated with producing the video plus the costs of any counselling and negligence claims which might result.

The use of Ultrasound Scanning for Prenatal Videos

Trish Chudleigh gave an opinion as a publisher. She took an interesting perspective on international policy based on safety guidelines that does not prescribe a safe duration of exposure for clinically indicated ultrasound examinations. She argues that the most important factor for the potential risk to the fetus is the length of time that ultrasound exposures are increased to "enable videotaping for the parents' pleasure" (In fact, while it is an important factor, it is not necessarily the most critical).

Two types of ultrasound examinations that are not clinically indicated are, the increased time during fetal screening to make video recording for parents, and those for education and the acquisition of practical scanning skills. Therefore, Chudleigh suggests, any decision (eg by BMUS Council) that prolonging exposure time for parental pleasure should be discouraged on safety grounds should equally be applied to the use of prolonged ultrasound for training.

Argument against Commercial Videoing

Delia Martinez, radiologist, made an issue of the fact that an ultrasound scan is primarily a screening test and that the economics of the test is still under debate. Martinez feels that the introduction of commercial

production of a video for entertainment will undermine the medical justification of the ultrasound scan. She also argued that "issuing a video for purchase is unnecessary pressure on the sonographer to perform another task".

Home Video Production: Safety Issues

Francis Duck, medical physicist writing on behalf of the BMUS Safety Group, gave a balanced perspective on safety aspects. Francis pointed to the lack of knowledge about the response of embryological and fetal tissue to ultrasound and the fact that bioeffect mechanisms may exist which are not properly understood (this is the basis of the AIUM objection to non-medical use). He noted;

"Epidemiological data which suggest a possible gender-specific association between handedness and ultrasound exposure in utero give some support to such a view. Under these conditions, considerations of safety depend primarily on judgments of benefit. If the only legitimate benefit from ultrasound scanning is seen to be that arising from a diagnostic clinical purpose, then caution on safety issues suggests that home video production is not an appropriate use for the equipment. If on the other hand, other benefits are thought to be appropriate, including psychosocial, educational and financial ones, then it is possible to accept a wider use of ultrasound imaging."

Francis also makes the important point that, given the sensitivity of the developing embryo to physical damage, scanning during the first trimester should be restricted to that with a clear clinical purpose. This would disallow scanning for reasons of education or parental pleasure. Later in pregnancy, Francis advises that "safety should be managed by appropriate attention to acoustic output."

Medico-Legal aspects of Video Recordings

Hylton Meire, consultant radiologist, started his article by warning of the increasing incidence of legal claims against medical professionals in obstetric ultrasound. He made the point that, in law, all medical and paramedical personnel owe their patients a "duty of care", to ensure that they do not knowingly do anything that might put the patient at risk of harm. He points out that many advisory bodies recommend the application of the ALARA (As Low As Reasonably Achievable) principle, ie where acoustic output and duration of exposure are minimised to that required to obtain diagnostic information. Prolonged exposure for the purpose of making a home video is inconsistent with such advice. He argued against the notion that parental bonding with the fetus is improved in any way by later viewing of a video at home. On the legal issues, Dr Meire advises that civil legal cases for negligence are decided "on the basis of probability" and not on absolute proof of improper scan or increased risk. He concludes that:

"It is difficult to see any supportable justification in medicine or law for prolonging an ultrasound scan in order to make a profit from selling a video recording of

Prenatal home videos

an obstetric ultrasound scan, however altruistic the objectives of the fund raising.

It is possible to propose a number of arguments that could be used in law to indicate that it is not accepted normal practice to do this and that it is contrary to the advice of at least one major internationally reputed body (his reference to AIUM statement). A judge may well look unfavourably on these facts if given the opportunity to do so!"

Soundings on the Issue

Mike Weston, consultant radiologist, summarised the opinions gathered by categorising responses into classes of potential benefit (For), versus potential harm (Against), associated with the sale of videos of antenatal ultrasound examinations.

For:

- Entertainment
- Income generation
- Parental bonding (this is disputed)
- It is illogical to deny parents home videos on the grounds of exposure time when training members of staff also increases exposure time.
- Parents are permitted to take other much greater risks with their children (such as smoking) so it is reasonable to let them decide whether to take the risk of extending a scan to obtain a video recording.

Against:

- Time
- Safety during the first trimester
- Incongruent with aims of a screening or diagnostic examination.
- Parents often misunderstand the purpose of their scan. Providing videos makes it more likely they will not heed its diagnostic purpose.
- Hidden costs, such as increased counselling.
- Medico-legal risks
- There is a potential for psychological harm as well as benefit.
- Poor parents may claim it is unfair that they cannot afford the video and that it should be provided free to allow equality of care.

This subject will, no doubt, continue to challenge the concept of appropriate use of diagnostic ultrasound. It may be difficult to argue convincingly from a safety standpoint against extending a standard medically indicated scan for the time required to produce an additional image on video, provided the normal safe procedures are followed. However, proper risk assessment should always take some account of the unknown. We cannot assume that the absence of data is evidence of absolute safety. The risk should always be balanced against the benefits of the procedure. It is

appropriate to conclude with the current, draft safety guidelines prepared by the BMUS specifically for this subject.

SAFETY RECOMMENDATIONS (BMUS)

Safety recommendations for the possible use of ultrasound scanning for the production of home videos.

- *Scanning specifically for home video purposes should not be carried out during the first trimester of pregnancy.*

Furthermore, clinical scans during the first trimester should not be prolonged for the purposes of home video production.

- *The BMUS guidelines for the safe use of diagnostic ultrasound should be followed.*
- *Scanning should be carried out using equipment which displays real-time safety indices. The bone thermal index (TIB) should always be less than 0.5, and the mechanical index (MI) should always be less than 0.3.*
- *Equipment without on-screen safety indices should only be used if independent measurements have demonstrated that it operates within the safety limits set in the BMUS Safety Guidelines for non-diagnostic use of ultrasound scanners.*
- *Operation of ultrasound equipment should be restricted to fully trained staff, who are knowledgeable about the safe use and the potential hazards of ultrasound (BMUS Safety Guidelines).*

It would be an interesting and worthwhile exercise to canvas local opinion from ASUM members on this important and topical issue. Perhaps members might be encouraged to respond via letter to the Editor? This offers a fertile area of debate on a topic which will continue to develop.

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Reflections on being a medical professional in the year 2000

Adapted from an article by David Penington when Vice-Chancellor, The University of Melbourne (MJA 1990 153 242-245)

This article is adapted from an article published by Professor David Penington in MJA 1990 153 241-245. The issues canvassed in relation to medical professionals are, if anything, more relevant now than when published ten years ago. Many of the principles discussed in relation to the meaning of being a professional are fundamental components of the whole range of behaviours that define societies and communities as civilized. To understand their background, their value and their potential fragility is most important for the long established sections of the medical profession and for the newer members such as sonographers. The comments made in relation to commercialization of the profession are especially poignant today as corporate bodies and their shareholders acquire an increasing influence on the delivery of healthcare to the community which has regarded the medical profession as being a profession with its attendant values. - Editor

The evolution of a profession

The origin of the term, from the Latin, 'profiteor' was to 'declare publicly', to 'freely own', to 'avow or profess'. Whilst the word profession in English usage is noted in 1633 to mean any occupation, by the fourth edition of Johnson's Dictionary (1773), it was stated to have a narrower sense of learned profession - "particularly used of divinity, physic and law".

The emergence of recognised professional bodies in western cultures came from different backgrounds in respect of the church, the law and medicine but the early organisational structures of medicine in recent centuries stem to a considerable degree from the trade guilds until they found a home, or at least established roots, in the universities and other seats of learning. Yet even by that time, medicine had a long tradition of ethics, of a commitment to a body of knowledge and custom carefully passed down over more than two millennia.

The great names of Andreas Versalius whose book "On the Structure of the Human Body" in 1543 was to revolutionise the understanding of anatomy, of William Harvey whose classic "De Modu Cordis" in 1628 not only established a new understanding of the heart and circulation, but established the basis of experimental medicine. These were giants in the history of the profession's commitment to knowledge on which our practice has developed. Marcello Malpighi's primitive microscope established the existence of capillaries later in the same century, long after Harvey postulated their existence and Leeuwenhoek's outstanding development of microscopical technique established the existence of

cells and of bacteria. Returning to the clinicians, Edward Jenner's acute clinical observations on protection against smallpox from cowpox infection was a giant step forward in the closing years of the 18th century. Another remarkable advance from a clinician was the invention by Rene Laennec of the simple stethoscope and his treatise on auscultation in 1819. All of these were contributions to knowledge by people who saw themselves as members of the profession, sharing their knowledge with others for the good of patients, long before the day of Pasteur, Virchow or Ehrlich, who came much more from the mainstream of science or medical science. However, the interaction between scientist and physician itself has a long history.

The medical school of Versalius at Padua had a commitment to explore knowledge for its own sake and Harvey, a successful medical practitioner in London, drew heavily on the work of the scholars of Padua. Both Malpighi and Leeuwenhoek applied the results of techniques of grinding lenses to the study of tissues by microscopy to find answers to the speculations of people like Harvey. Even at that time, our body of knowledge was only advanced by close interaction between practitioners of the art, concerned to understand the diseases of their patients and the moving edge of science and technology. The explosion of medical knowledge during the 19th and early 20th century has become a veritable volcanic eruption of knowledge in the past thirty years, with the successful assault on the genetic code, the unravelling of the mysteries of RNA and DNA, of protein production, of tissue receptors and humoral regulation, the advent of genetic engineering, the burgeoning science of pharmacology, the new imaging technology and so many other advances. But yet, the principles of what comprises the profession, of what motivates it and with whom it must interact have changed remarkably little.

What makes a profession and why do we have problems?

Let me take you back to 400 BC to the Charter of Hippocrates. It contains many of the elements from which come both our strengths and our vulnerability.

Hippocrates' "oath" sets out many principles. Whilst some have changed in degree, the underlying ethic shines clear after more than 2000 years. The profession was a brotherhood of people committed by a common bond. Above all, the bond was that of an ethic of service to the sick and maintenance of health, a placing of the

interests of the patient before those of the practitioner, so that the perpetration of 'mischief or corruption', or the taking of sexual advantage, would be a total breach of the code. The practitioner would only associate with those "bound by a stipulation and oath according to the law of medicine" - those breaching the code would be rejected. Another very important sentiment is the commitment to teaching, together with the respect for teachers which goes with the respect for the body of knowledge, all of which is central to the practice of the profession.

The literature of studies of professions abounds with attempts at definition, most of which fall far short and reflect the prejudices of the authors. One which comes close as a succinct description, is that by Peter Wright of the High Court of Ontario in 1951:

"A profession is a self disciplined group of individuals who hold themselves out to the public as possessing a special skill derived from training or education and who are prepared to exercise that skill primarily in the interests of others".

The United Kingdom Monopolies Commission Report on the Professions in 1970 went further:

"Practitioners apply a specialised skill enabling them to offer a specialised service;

The skill has been acquired by intellectual and practical training in a well-defined area of study;

The service calls for a high degree of detachment and integrity on the part of the practitioner in exercising his personal judgement on behalf of his client;

The service involves direct, personal and fiduciary relations with the client;

The practitioners collectively have a particular sense of responsibility for maintaining the competence and integrity of the occupation as a whole;

The practitioners tend or are required to avoid certain methods of attracting business;

The practitioners are organised in bodies which, with or without State intervention, are concerned to provide machinery for testing competence and regulating standards of competence and conduct."

I have myself sought to distill the propositions which matter into six concise statements:

1. A commitment of service based on a body of knowledge and skills "owned" by the profession.
2. A commitment to maintain standards of service as a body of professionals through self-regulation, an important sub-set of which is the maintenance of ethical standards.
3. A willingness to exclude from practice of the profession, even if jeopardising his or her livelihood - a person who does not meet these high standards.

4. A commitment to pass on to others the knowledge, skills and ethical commitments through teaching. A corollary of this principle is respect for knowledge, for teachers and for teaching.
5. A commitment to expand that body of knowledge entailing scholarship and research.
6. A right to an adequate standard of living for the practitioner and his or her family, if the above principles are honoured.

Why, if we honour these principles should our profession so regularly be under attack? The answer is to be found in those very principles in that a profession is, by its nature, an elite, a group apart, who have a body of knowledge and skills which others need, who stand by their reputation on the quality of service they can provide, who place their own professional code above other mores of society in that they cannot be "bought" or "traded" where others wish them to act against principles which matter. These very characteristics which earn respect on the part of those who owe gratitude for the service provided are the same characteristics which engender envy and resentment from those who would belittle the profession.

Relationship with governments?

A politician many years ago gave me profound advice, pointing out that governments respond to public opinion and seldom lead it. If one wishes to change government policy, one must first gain strong support from the public. Envy, fear or resentment of professions will inevitably be reflected in attempts at government regulation in a democratic society. Insofar as professions regulate themselves effectively, guided primarily by the commitment of service, governments are likely to defer to them because of the difficulty of maintaining and regulating standards without the support and assistance of the professions. Where a profession is perceived, with any justice, as placing preoccupation with its own financial status ahead of the commitment to service or failing in its responsibility to regulate the quality of its service, then inevitably government will intervene.

For medicine in Australia, yet a further factor emerges. For many years the commitment to service ahead of financial gain led to the tradition of providing for all, according to need, and charging according to ability to pay. However, the development of a more egalitarian society and of the insurance ethic in many walks of life led, from the late 1920s, to propositions for universal health insurance in this country. The first such proposition was developed by a politician who was also a doctor - Earl Page - on the conservative side of politics. It was to take many years before it became a reality. In one form or other, government support for costs of health care is a feature of every developed western society.

Despite every desire on the part of some to see the clock turn back to a situation of total professional

autonomy with self-regulation of fees, and provision of services according to needs, the profession can no longer expect to be allowed a totally free reign. We have to learn to live effectively with government and to make the interface work. This entails looking jointly with government at the difficult issues of containing public expenditure on health, whilst at the same time seeking to protect our necessary independence as professionals, to do the best for our patients and to preserve their rights as well as our own.

One of our innate problems in handling health policy issues is that as professionals our whole orientation is to the individual patient rather than being able, with ease, to translate to the analysis of a health care system as a whole - the brief of the politician. But yet the relationship of one to the other is vital and integral. Unless we have a capacity, as a profession, to plan on the global scale, as well as for the individual, and unless we understand the relationship between the two, we leave ourselves open to total control by those who do not understand the care of the sick. Inevitable clashes of values will produce conflict and possibly even disaster.

In the present political climate in Australia, most of those who analyse health care for the politicians come from two backgrounds, economics and sociology. Both have legitimate claims and both must be considered.

Firstly, the senior public servants are primarily economists whose whole orientation is that of the "market economy". Even in 1951, Peter Wright (High Court of Ontario) wrote:

"The modern age is a commercial age. Its values are measured in money ... In the field of labour there is one cry: What do we get in money or money's worth? ... The future of a profession depends today on how its members face this arid and pervasive assessment of a man's life work. If in the secret hearts of its members they know that they pursue their profession not for what they get out of it but first for the service of others, it can be a true profession. The sincerity of the fellow workers in a profession is the best security for its status".

For the economists, concern about costs and fees is right, natural and inevitable. But yet they must understand that this is not a market economy governed by advertising and fee competition because as pointed out by the OECD in 1985 in "Competition, Policy and the Professions":

"The use of fee schedules seeks to ensure that competition amongst professionals will be on quality alone".

This is very different from the principles which govern the trade in commodities, but the economist must be warned against attacking the profession as being, by definition, a dangerous cartel. They should be reminded of the statement by the United Kingdom Monopolies Commission in 1970 in amplification of

the personal and fiduciary relations with the client, that the community cannot have it both ways. If clients wish to rely on the fiduciary obligations of the professionals, to provide the best possible standard of service in their interests, using the knowledge which is available to the profession, they must accept the loss of competition which would, itself, endanger fiduciary behaviour.

We must seek to solve our economists' problem for them by devising means by which costs can be contained in general terms with, for reasons of equity, only a limited cost to the patient. In the face of such a charge, the professional has a responsibility to contain costs in the patient's interests in all situations of discretionary provision of care. Limited costs, or "co-payments" as they are termed, affect not only the attitude of the patient but the attitude of the provider in caring for the interests of the patient.

Application of this principle throughout our health care system, even where the co-payment costs may be relatively small, encourages responsible decision-making in the use and provision of services. Where costs are recognised and the patient bears some part, there are incentives to contain the costs. This allows freer use of resources in those situations where the patient may not be in a position to judge the need for expenditure or indeed, may not be in a position to pay.

In general terms it must be conceded that major hospitals are in themselves large corporations with complex management structures and we cannot object to incentives for efficient use of public funds and the incentives introduced by competition. The danger sign, however, is when we see decisions over health care for individuals being placed in non-medical hands.

The other great source of pressure on our system comes from those in the community with value systems derived from the world of sociology with its preoccupation with equality. Quotations from writers on this side of the debate are seldom concise and abound with images of people being disadvantaged by those in possession of knowledge and skills. This set of values seeks to give control of the professions to its clients or consumers. The sociological assumptions are that people, as individuals or as a class, will act in their own interests rather than in the interests of others and therefore must be subject to control through political measures.

Even within the law, we must acknowledge that our professional ethic is embraced by the legal concept of fiduciary duty - people in positions like doctors, priests, lawyers etc are expected to behave in "*uberrima fides*" - "the utmost good faith" - in other words, to put the interests of the client ahead of their own personal interests. The sociologist seldom trusts that this will occur. All of the pressures of the sociology value systems, to which many politicians subscribe, are to identify the professions as anti-egalitarian.

What are the present problems which we must face?

The profession must, in my view, rediscover all its commitments. We must learn the new language of monitoring the quality of health care in both private clinical practice and institutional settings, and back the development of measures which can contain costs and use resources where they can be most effectively used. To do so, we must become much more intimately involved in hospital management, learn to take part in planning health care systems with a knowledge of the literature and to understand the successes and mistakes in other countries. All of these must be achieved with speed so that we work with our political masters in shaping policies, rather than waiting until profound errors have been made, and new structures established with which we have great difficulty.

The profession has, through the centuries, been subject to pressures and even onslaughts but nonetheless, the perception by most in the community is that their own doctor is a person they trust and respect, whether this be a family practitioner or a specialist in almost any field. Trust between doctor and patient depends on a personal relationship of a very special kind and this is at the centre of what our profession is about. It is the starting point from which we must build.

When the profession as a whole is seen by the community to be concerned primarily with financial reward, then the attitude of trust begins to be eroded. As community attitudes change, politicians are under increasing pressure from

economic rationalists on the one side, and those who accept the mores of the sociologist on the other. Battles over governments' handling of medical insurance, however inevitable these battles were, have contributed to a negative image of the profession. It is vital that we recover this ground.

In general, I believe there is a strong need for the profession to concentrate planning and resources in four areas if it is to be able to take the initiative. These may be summarised as follows:

- health insurance and public hospital services planning;
- special health issues;
- professional issues;
- public relations and professional image.

Many of us have spent our careers dealing with individual patients and do not find it easy to adjust to these large scale planning issues. Yet that gap must be bridged. The large scale organisation must deal with the individual and we must understand that interface. Furthermore, we must understand that professional services will never be effectively delivered in the value system of free market economics. Patients cannot put a price on the value of the various service which they need, but rather the practitioner must be the guardian of the patients' interests and their trust in making appropriate judgements within a reasonable economic framework. The interests of the profession legitimately include safeguarding adequate incomes and conditions of employment for that large section employed by public or private institutions or by government. This must continue to be looked after, but it must be seen in the broader context.

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Interview with Dr Jock Anderson, Director of the Olympic and Paralympic Polyclinic Sydney 2000

Merilyn Denning



Dr Anderson you were the Director of the Polyclinic at the 27th Olympiad. How did you become involved?

I was approached over three years ago and asked to consider volunteering for the position of Director of Diagnostic Imaging for the Olympic and Paralympic Games. I was very excited about being asked and it didn't take me long to make a decision. I enjoy teaching and writing and I thought that this was a unique opportunity to do an exciting job and at the same time obtain teaching and writing material.

The project was described to me as having various stages. Initially there would be planning and then equipping and staffing. Finally, the service had to be administered during the period of the Games.

What is your background?

I have had a long association with sports medicine and sports medicine imaging. As a radiologist, I have enjoyed a close association with the Australian College of Sports Physicians and have become an Honorary Fellow of that College in recognition of teaching over many years. I have enjoyed sports medicine and developed a subspeciality within musculoskeletal imaging.

What facilities and services were offered at the Polyclinic?

Atlanta had some problems in the delivery of their diagnostic imaging services. My counterpart in Atlanta warned me of these problems, and this allowed

preventative planning. Instead of outsourcing images to the local hospitals using teleradiology, a comprehensive service was created on site to increase efficiency and to encourage integration with the clinical side of sports medicine. Consequently, a large staff of volunteers with a variety of necessary skills was brought together to help supply this service.

The modalities offered were general radiography, CT, MRI and two rooms of Ultrasound. A mobile machine proved helpful on the occasions when a very sick patient came to casualty. The department was digital, with plain films digitised using Kodak's computed radiography system. A PACS system allowed the images to be archived, ensuring that there were no lost films and enabling the images to be rapidly moved around the department for reporting or just for review. The service was largely filmless, although hard copy was supplied where ongoing treatment was likely to be needed when the athlete returned home.

The concept of encouraging the clinicians to come to the department and discuss a clinical problem with us was a great success. Two rooms were set aside for these discussions. These rooms, so-called interview rooms, were in constant use. 90% of the athletes come from 11 countries, so the remaining 180 odd countries had small teams often without a team doctor. We were able to help these small countries by having a sports physician sit in on these conferences, giving advice on management strategies.

How many staff were involved in the Polyclinic?

Altogether we had one hundred and twenty seven people to cover both the Olympics and Paralympics. There were thirty-eight radiologists, sixty radiographers, eleven nursing sisters, eight typists and the balance were porters and couriers.

Many of the staff came from interstate with two coming across from New Zealand. We have a national musculoskeletal imaging group (called AMSIG) and many radiologists came from this group. I phoned a number of the members who I thought might be interested in coming and helping and I had an amazing 100% acceptance, even from radiologists living in Adelaide and Perth. One of the group dropped out at a later time.

What was a typical day?

A typical day started at about 6 am, preparing to open the doors at 7 am. We offered services from 7 am until

11 pm for plain radiography, MRI from 8 am until 10 pm, ultrasound from 8am to 8pm and CT from 9am until 9pm. Initially there were Directors' meetings at 6.30 am, although as the Games progressed these were fortunately changed to 9.30 am. At the height of the Games, we would open the door in the morning to find a few eager customers waiting to come in before 7 am. Then later, at the beginning of track and field competition, we would find it difficult closing the doors at night with athletes wanting attention after competition.

During the week before competition and the two weeks of the Games it was extremely busy and it was wonderful to see how well the staff worked as a team, particularly considering that these people were complete strangers. For the most part we were also using equipment that we hadn't seen before. Everyone rolled their sleeves up and got the job done. I feel this was because the work was voluntary and people were there because they wanted to be.

How many cases per day – including ultrasound numbers?

The service commenced on the 1st September with four patients seen on the first day. We were keen at that time to grab anyone who would have an examination, so that we could test our systems. Team officials made up a large proportion of the patients in the initial stages, usually presenting with old injuries of little immediate clinical significance. During the first week our days filled up as more and more athletes moved into the village. MRI was very popular and quickly became fully booked one day ahead. An example of patient numbers at this early stage would be September 8th, at the end of the first week, when we had thirty-four patients (fifty-one examinations).

During the second week, the village was now full with a population of over 25,000. The atmosphere was electric as we became significantly busier. We averaged 72 patients a day during this week.

The first week of competition was dominated by swimming and final preparation for track and field. The numbers continued to increase, averaging 87 patients per day during this week.

The final week remained busy with an average of 93 examinations per day. In total we had 1,410 patients with 1,985 examinations, of that 835 were plain films, with 535 ultrasound, 400 MRI and 178 CT.

The most common injuries were muscle tears, Achilles tendinoses, stress fractures, and low back pain with the majority of the patients examined having disc protrusions. Most elite athletes had brought overuse injuries into the Games with them.

The focus for this interview is on ultrasound – what role did ultrasound play?

In Australia, ultrasound is used extensively for

musculoskeletal imaging, as the majority of injuries involve soft tissue structures. In some countries, such as in the United States, ultrasound is not commonly used and there is a relative dependency on MRI for soft tissue imaging. Consequently, it was sometimes difficult to persuade the referring doctor to let us use ultrasound, even though, in our hands, we considered this to be the easier and more accurate modality. This was usually overcome by inviting the doctor to come and watch the procedure and if there were any questions unanswered at the conclusion of the examination, I promised that we would do an MRI. Not once did we have to do an MRI and the doctor was completely won over on those occasions when it was appropriate to offer and perform intervention to help the patient train or compete.

The majority of the 535 examinations were performed for muscle tears and Achilles tendinoses. The use of ultrasound for intervention was popular. Athletes crippled by Achilles tendinosis were able to perform at their full potential following an injection of local anaesthetic into the paratenon and fat pad in front of the tendon. The injection was repeated within 2½ hours of each race as the athlete progressed through each round of competition. It would then be exciting watching the athlete perform on TV, knowing that we had made a contribution.

How many machines were used and were they fully occupied?

During the height of the Games both ultrasound rooms were fairly heavily booked. We had two ATL 5000 machines and these produced excellent images. The acceptance of ultrasound increased as the Games progressed.

Were any unusual scans requested?

The village was like any town, with the usual indications for ultrasound. We had everything from gallstones, a testicular tumour, appendicitis and even 3 obstetric ultrasounds.

Were the types of injuries you found similar to your previous experience with sports medicine – if not, how did they differ?

No. The injuries that we encountered in the Olympic athletes differed from those seen in our sports medicine imaging practice. Overuse injuries are extremely common at this level of training and most athletes that we saw had pre-existing injury. We were often asked to image these injuries to monitor their appearance for signs of reactivation or progression. The reason for the vast number of muscle tears is unclear, but many athletes would have evidence of old tears, half healed tears and at the same time present with new injury. It would seem that a biomechanist should play a more prominent role in technique and training schedules.

Did any aspects of the whole experience surprise/delight/disappoint you?

The whole experience has been extremely exciting. I think that we will all appreciate the experience more when we look back in a month or so. This is being written halfway through the Paralympics and those of us that have been living here and working everyday are fairly dazed and weary. Now, as I am preparing my report for the IOC, I am able to recall many great experiences and cases from the Olympics, which had become blurred. The Paralympics is a further new experience. It will all take a while to synthesize the experience.

My job as Director involved a lot of unexpected facets. I was involved in daily VIP tours through the imaging facility for the sponsors. I have done a lot of interviews and a lot of PR work. I guess one of the most pleasing features was that the imaging department became the second home for a lot of the teams' doctors. The Canadians, British, US and New Zealanders in particular spent time in the department each day, talking to us about cases with respect to possible intervention or further imaging that might help solve a problem. We developed friendships and I hope these associations continue. Perhaps they will, perhaps they won't, but we have had a wonderful experience working with these people.

How do you think ultrasound is placed in the diagnosis and management of sports injuries and elite athletes?

I believe that the standard of ultrasound in the diagnosis of sports injuries is of world standard and judging from the comments of doctors from other countries, we may well be leaders in this field. Ultrasound is undoubtedly an outstanding modality

for these conditions and I am sure that we have left a lasting impression on many international doctors.

You are also directing the Polyclinic for the Paralympics. Do you expect any differences between the two clinics?

Yes, I am continuing as Director for the Paralympics. The obvious difference is that we are looking after 4,000 Paralympians compared to 12,000 Olympic athletes. So far the Paralympics have been very quiet medically. The atmosphere is entirely different and all the competitors and staff appear to be extremely happy. A bus ride through the Paralympic village is like a comedy show, it is a great atmosphere.

It is a little early to judge the injuries, but at this early stage, they are probably going to be significantly different. Shoulder injuries are common in the wheelchair athletes and a few fractures have occurred from falling out of wheelchairs. We don't have anywhere near the workload of the Olympics and we are doing about 30 patients per day. It is proving to be a gentle way



to recover from the stress and strain of the Olympics.

New Members July-September 2000

ASSOCIATE MEMBERS

Melissa Bell	SA
Margaret Christie	WA
Elizabeth Clark	ACT
Michael Curley	QLD
Shanitha Govender	NZ
Carly Jenkins	QLD
Sally Lind	SA
John Lyons	NSW
Tania O'Connell	NZ
Igor Sablyak	NZ
Deborah Steinhardt	QLD
Gillian Straznicki	SA
Scott Sullivan	NSW
Wynne Sum	NSW
Marina Woods	VIC

FULL MEMBERS

Michael Baker	NZ
Diana Balog	NZ
Cheryl Burford	SA
Stephen Busby	VIC
Christina Clee	NZ
Jodie Gallagher	QLD
Deepak Haikerwal	VIC
John Harding-Smith	NSW
John Higgins	VIC
Sofie Piessens	VIC
David Robinson	NSW
Andrew Taylor	VIC

TRAINEE MEMBER

Susan Walker	VIC
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Book reviews

Title: Echocardiography: The Normal Examination and Echocardiographic Measurements
Author: Bonita Anderson
Publisher: MGA Graphics
Cost: \$A104.50

This is an excellent book that has been written to fill a void, which has existed for too long amongst texts on echocardiography. In the process of its creation, sole author Bonita Anderson, has made a superlative effort and achieved an admirable result. The book focuses on the practical aspects of modern echocardiography, paying valuable attention to the performance of the optimal examination and to the proper acquisition and interpretation of M-Mode, B-Mode, colour Doppler and spectral Doppler measurements. More recent indices that are slowly gaining ground in clinical practice, such as colour flow propagation and tissue Doppler imaging, have been included. By intention, it differs from other major textbooks, of echocardiography by not elaborating on pathological conditions but referring to them only through the abnormal measurements that they produce. Rather than being a weakness, the omission strengthens the value of the book as a useful reference source for the technical and practical aspects of technique. Comprising 249 A4 sized pages, 14 chapters, and 13 appendices, this publication is not a mere handbook, but a thoroughly researched text, richly referenced and beautifully illustrated. According to the preface, the book has been directed at the cardiac sonographer. The quality, depth and thoroughness of the work, however, justify a recommendation that extends to all medical and paramedical practitioners of echocardiography. Although the novice will benefit most, even those with experience will find useful information to consolidate existing knowledge. Hopefully, the book will achieve the popularity and wide acceptance that it deserves and contribute to improved standards of echocardiography in this country and abroad.

Christopher Choong

Title: Echocardiography for the Neonatologist
Edited by Skinner J, Alverson D, Hunter S
Publisher: Churchill Livingstone
Year: 2000
ISBN 0 443 054 800
Approx Cost: \$A131.60

The inevitable expanding roles for echocardiography, as a tool for evaluation of cardiovascular physiology, is now reaching to "normal" neonatal assessment. In this demanding Paediatric sub-speciality, disruption of

neonatal cardiovascular physiology by "normal" communications such as the ductus arteriosus and foramen ovale, together with the challenges of the transitional circulation, can impact significantly on patient management and prognosis.

This book brings together an overview of echocardiographic technical, anatomic and physiological data that can be of use in the assessment of the newborn without heart disease. Much of the material is available in standard echocardiography texts, and well known to paediatric echocardiographers, however, this presentation provides some of this information in a more concise, and in many respects, more palatable format for the novice.

As is inevitably the case with a multi author text, the quality and readability of the individual chapters varies, as does the layout of the information. The better chapters such as those dealing with normal Doppler ultrasound, assessment of valve gradient, and evaluation of pulmonary artery pressure, clearly outline the technique required but, also importantly, highlight pitfalls and artefacts in technique and interpretation.

The chapter on "standard views" and "logically.....scanning" is helpful. There is, however, little to help the novice understand strategies for recording of complete studies and issues relating to documentation. This may also become increasingly important if the technique is used by staff for clinical purposes rather than research.

The sections dealing with congenital heart disease are necessarily brief. In fact the authors go to some lengths to caution the reader/neonatologist that the book is not designed to train the reader for the evaluation of congenital heart disease, however, these sections of the book provide a useful guide to delimiting the limited neonatal physiological study.

There is reference throughout the book to issues of transitional physiology of the newborn. This issue is critical to the age-related interpretation of studies. A chapter on this topic might be usefully considered for future editions.

The role of cardiac ultrasound evaluation in day to day neonatal management is not yet clear. The potential to provide valuable physiological information for the assessment of therapies, certainly on a trial basis, would seem clear. Neonatal cardiac ultrasound evaluation often presents the most challenging of echocardiographic evaluations, needing to deal with not only the potential of congenital heart disease (which inevitably requires the involvement of a paediatric cardiologist), but also the challenges of a transitional circulation of often the most tiny and fragile of patients. This text provides useful insights into a new application, although the practitioner will need to exercise care to avoid the pitfalls of the separate territory of congenital heart disease.

Dr Gary Sholler, Director

Adolph Basser Cardiac Institute

Title: Pocket Protocols for Ultrasound Scanning
Editor: Betty Bates Tempkin
Publisher: WB Saunders
Published: 1999
ISBN 0-7216-6881-X
Approx cost: \$A94.95

This 681 page spiral bound, flip page book is designed to be placed on top of an ultrasound machine for ease of reference during scanning. Although called a "Pocket Reference" one would need a very large pocket to carry this around! The aim is to provide a practical reference for the series of ultrasound images required for documentation in a range of examinations. Gray-scale ultrasound images are accompanied by schematics to aid identification of relevant anatomy. The book is obviously designed as a companion to another text by the same editor *Ultrasound Scanning: Principles and Protocols, 2nd Edition*.

Over half the book is devoted to abdominal scanning with separate sections on "Required images for full abdominal studies" and "Required images for limited abdominal studies". There is considerable overlap and repetitiveness in these sections. Other sections deal with "required images" for: gynecological studies, obstetric studies, prostate, scrotum, thyroid and parathyroid glands, breast, neonatal brain, abdominal Doppler and color flow, cerebrovascular duplex scanning, peripheral arterial and venous duplex scanning, adult heart and pediatric heart.

The vascular and cardiac sections seem out of place with the more basic emphasis of the other sections. The vascular sections do not include images and are simply a listing of images that should be documented. As the book is presumably aimed at the novice I'm not sure how useful this section would be. Similarly given the complexity of many examinations, particularly cardiac, I find this more simplified approach a bit disturbing. The editor does make the point though in the introduction that "these references are just that. They do not include or endorse the exclusion of the necessary pre-requisites for accomplished scanning skills."

The text is written for the American situation and makes occasional reference to images that must be included in order to meet billing and accreditation requirements. This may not suit in the Australian situation and where departments and practices already have established protocols this may cause confusion with student sonographers. Some of the protocols do not appear to meet the standards as published by ASUM, for example the measurement of the nuchal skin fold at the mid-trimester scan is "not always routinely performed but should be considered in patients over the age of 35 or when a lower-than-normal serum AFP has been detected". Similarly the (single) view of the fetal cardiac outflow tracts is "optional" and scanning of the veins of the calf in a peripheral venous study appears to be considered not warranted.

The schematics accompanying the gray-scale images would be useful for students and novice sonographers however this material is available in other texts by the same

editor. I find it difficult to recommend this text for the Australian situation and believe that anyone looking to buy ultrasound texts would be better to look at other titles by the same editor.

Margo Harkness
Senior Lecturer in Medical Ultrasound
Queensland University of Technology

Title: Textbook of Fetal Abnormalities
Editors: Peter Twining, JM McHugo & DW Pilling
Publisher: Churchill Livingstone
Year: 2000
ISBN 0-443-053294
Approx cost: \$A417.00

Publication of a textbook on the subject of fetal abnormalities, and the role of ultrasound in their detection, is a difficult task. Not only is there rapid change occurring in the technology available to image the foetus, but also there are rapid changes in the understanding of the genetic and physiological basis of abnormal human development. This textbook, however, has succeeded in combining the disciplines of genetics, embryology, fetal therapy and psychology into a volume that is very easy to read, and is very well illustrated with both classic and rare images.

The book begins with an important article on safety of ultrasound, that concludes with a statement that ultrasound has a "very low risk:benefit ratio". The next chapter on the routine morphology scan is important for the tables of sensitivity for the diagnosis in organ systems. Following chapters are systematic reviews of the organ systems. These include sections on embryology (expressed in understandable terms and with clear line drawings), as well as a most valuable section on pitfalls and artefacts. In each chapter there are many invaluable summary tables, which can be a rapid aid in diagnosis. Each chapter has a comprehensive list of references, containing most of the important papers on the subjects, up to late 1998.

Detailed chapters on multiple pregnancy and disorders of amniotic fluid, membranes and placenta as well as the rarer problems of non-immune hydrops and fetal arrhythmia provide the reader with access to a wide range of problems from those seen on a daily basis to the "once in a lifetime" events.

Perhaps the chapter that should be required reading for every one involved in obstetric ultrasound was written by Lenore Abramsky, on aspects of counselling patients both before a prenatal test and after the diagnosis of a fetal anomaly. If this chapter does not change the way most of us practice, it will at least make us question our current performance.

At \$A417, this book is not cheap. It is however an invaluable reference for anyone, from the beginner to the expert, involved in obstetric ultrasound. It would be worth the price, if not for our bedside, at least for all departments where obstetric ultrasound is performed. It has been used almost on a daily basis since it was available to our department.

Gary Pritchard MB BS FRACOG DDU

Which obstetric measurement charts does ASUM recommend?

Cheryl Bass MBChB, FRANZCR
Chair, Standards of Practice Committee

In the absence of accepted Australian standards for most fetal measurement (other than BPD) the ASUM Statement on "Normal Fetal Measurements" recommends a set of charts which were considered to be the best available. The ASUM adopted these as an "interim" measure in 1996.

In February 1999 Susan Campbell-Westerway submitted new fetal charts to the ASUM for consideration. They were formulated for her Master's thesis at Sydney University. The figures were the result of a three-year study of 3,800 pregnancies and 11,600 measurements of fetal parameters. 26 practices were involved with the project. To give you an example, the Campbell-Westerway charts measured the CRL of 228 fetuses between 5 and 10 weeks and these fetuses were again measured at subsequent stages in their gestation whereas the Robinson CRL chart is based on 30 pregnancies.

The Campbell-Westerway Charts for OFD, HC, AC, CRL and humeral length are statistically different to those in regular use. This is not surprising when it is realised that many of the original charts were based on data obtained using Static B scanners or first generation real time scanners without electronic measuring facilities. The differences in the CRL results are significant before 7 weeks. The HC measurements are statistically different at a number of gestations and the AC measurements at most gestations. The humeral measurements showed differences of up to 3mm for some gestations. The Campbell-Westerway Charts confirm the accuracy of the 1989 BPD Charts currently recommended by ASUM and, surprisingly to some, the new charts show a close correlation with the Hadlock graph for FL. It is recommended that all the new charts are adopted to allow uniformity.

The ASUM Council was unwilling to consider accepting the new charts until they had been subjected to the rigour of peer scrutiny. Consequently, the 1999 Executive Committee of ASUM asked Sue to get her work published in a peer review journal and asked for further evaluation of her statistical methods. Since then the work has been published in the ANZJOG* and she has had her statistical analysis extensively reviewed by Dr R

Heard of Sydney University, who independently reanalysed her figures and verified the accuracy of her statistical work.

So here we have a huge study using over 11,600 measurements collected from diverse ethnic, social and economic groups within Australia to which rigorous statistical analysis has been applied. The chart has been published under the ASUM logo. So what's the problem? Why haven't ASUM adopted the Campbell-Westerway charts as the official standard? The acceptance of the charts is a first step in the process. The Standards of Practice Committee is in the process of drafting changes to the Policies and Statements for consideration by the Council. Until this is done and the proposed amendments to the standards are accepted by the Council, the fate of the charts remains in limbo and the 1996 "interim" policy remains the official ASUM standard. It is up to the discretion of individual members to decide whether they will start using the charts now or wait until due process has been observed. As these charts have already been accepted by the Council as well as by the majority of the O&G advisers I anticipate that the Campbell-Westerway charts will become ASUM policy. The Bulletin will keep you informed of the outcome.

As with any new policy, there will be the supporters and the detractors. The ASUM can only recommend that if and when the Campbell-Westerway charts become ASUM policy you give full consideration to using them. This will allow uniformity across Australia, which is particularly valuable in this era of an itinerant and doctor-shopping population. The referring clinician will find it much easier to interpret measurements in relation to fetal gestation and growth knowing that reported values are based on a single set of charts.

A copy of the charts is included with this Bulletin.

*Westerway SC. Ultrasound Fetal Measurements - new Australian standards for the new millennium. Aust NZ J Obstet Gynaecol August 2000, 40: 3: 297 - 302.

Summary of changes to the Medicare Benefits Schedule relevant to ultrasound - 1 November 2000

This summary has been prepared by ASUM from material published at www.health.gov.au/pubs/mbs, to alert members to relevant changes in the Medicare Benefits Schedule (MBS). It may not be a comprehensive summary. For an understanding of the changes, readers are advised to refer to the MBS which can be viewed online at www.health.gov.au/pubs/mbs. Section DIH (ultrasound) of the explanatory notes for the Diagnostic Imaging Services can be viewed at www.health.gov.au/pubs/mbs/mbs6/catego11.htm.

Some members have contacted ASUM expressing concern with elements of these changes. Members wishing to contribute to any ASUM response to provisions contained in the MBS should write to Stephen Bird (Chair of the Sonographer Affairs Committee) or Fergus Scott (Chair of the Medical Affairs Committee) at 2/181 High St, Willoughby, NSW 2068, Australia Fax 61 2 9958 8002.

Sonographer Accreditation

Formal requirements for sonographers performing services on behalf of medical practitioners are being introduced. This statement appears in the "Summary of Changes" at www.health.gov.au/pubs/mbs/mbs6/summaryo.htm, but there is no explanation in the notes.

Rural or Pre-Existing Practices Exemptions

From 1 January 2001, general practitioners providing specialist-type (R-type) diagnostic imaging services will be required to participate in a continuing medical education and quality assurance program in order to continue to be eligible for Medicare benefits for these services. This statement appears in the "Summary of Changes" at www.health.gov.au/pubs/mbs/mbs6/summaryo.htm, but there is no explanation in the notes.

Cardiac Ultrasound (DIH1)

A new item (55116) has been introduced for stress echocardiography examinations. Items 55102 and 55105 have been deleted. Minor amendments have been implemented to items 55112 and 55118 in order to reflect current clinical practice.

Ultrasound Cross-Sectional Echography (DIH2)

Items 55028 to 55052, 55700 to 55774, and 55800 to 55850
As a rule, benefit is payable once only for ultrasonic examination at the one attendance, irrespective of the areas involved. Where there is a short time between one ultrasound and the next, benefits will be payable for one service only. Where more than one ultrasound service is rendered on the one occasion and the additional service relates to a non-contiguous body area, benefits greater than the single rate may be payable.

Musculoskeletal Ultrasound (DIH3)

Items 55800 to 55850

The existing items (55050 to 55053) have been deleted and a new ultrasound subgroup created (subgroup 6) containing 26 new items.

Ultrasound of one or more musculoskeletal areas is payable only once, irrespective the number of regions scanned.

Where it is necessary for one or more views of the opposite limb to be taken for comparison purposes, benefits are payable for the sonographic examination of one limb only.

Items 55800 to 55850 only apply to an ultrasound service performed using an ultrasound system which has available on-site a transducer capable of operation at, at least, 7.5 megahertz.

Medicare Benefits are only payable for a musculoskeletal ultrasound service performed by or on behalf of a medical practitioner where the medical practitioner responsible for the conduct and report of the examination personally attends during the provision of the scan and personally examines the patient. Services that are performed because of medical necessity in a remote location are exempt from this requirement.

Routine Ultrasonic Scanning (DIH4)

Medicare benefits are not attracted for routine ultrasonic screening associated with the termination of pregnancy.

Investigations of Vascular Disease (DIH5)

Common vascular ultrasound items are included together with the common combinations. The fees include components for interpretation of the results and provision of the report which must be performed by a medical practitioner. Where it is clinically necessary to perform studies on a patient on successive days in the same week, two studies are allowed in the working week. Restrictions apply to some items.

Professional Supervision Requirements (DIH6)

These have been clarified and amended to require the same level of supervision for referred services performed on behalf of eligible non-specialist practitioners as applies to services performed on behalf of specialists and consultant physicians.

Urological - Transrectal Ultrasound (DIH7)

Items 55600 and 55603. Benefits for these items are attracted only where the ultrasound service is personally performed by a medical practitioner and the equipment used meets specifications; and the patient was assessed

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prior to the service by a medical practitioner recognised in one or more of the specialties specified, not more than 60 days prior to the ultrasound service.

Item 55300 provides for the service where rendered by a medical practitioner who did not assess the patient, whereas Item 55603 provides for the service where rendered by a medical practitioner who did assess the patient.

Obstetric and Gynaecological Ultrasound (DIH8)

The obstetric and gynaecological ultrasound items have been restructured and placed in a separate ultrasound subgroup.

Medicare benefits are not payable for more than 3 items of NR-type ultrasound services in Subgroup 5 of Group I1 (ultrasound) that are performed on the same patient in any 1 pregnancy.

New items for multiple pregnancies have been

introduced. Item 55058, ultrasound of umbilical blood flow has been moved to the obstetric and gynaecological subgroup as item 55729. The requirements for items 55712 and 55715 have also been clarified.

Ultrasound Scan of Pelvis or Abdomen, Pregnancy Related (DIH9)

Item 55728

This item provides for situations where a patient with a clinical condition not listed in items 55718, 55721, 55723 and 55725 requires a post 22 week ultrasound, and specifies how the claim should be lodged with Medicare

Obstetric Ultrasound and Non-Metropolitan Providers (DIH10 & DIH11)

Items 55712, 55721 and 55728

This defines the non-metropolitan areas and specifies referral procedures for a practitioner who has obstetric privileges at a non-metropolitan Hospital.

ASUM Council

Mary Young DMU AMS, Honorary Secretary

A somewhat weary band of Councillors met at the end of a successful Scientific Meeting at the Carlton Hotel Auckland, with 14 councillors and 2 invitees in attendance. There were 11 apologies.

New business included the Treasurer's Report, which has been published in its entirety in the Annual Report. New accounting and investing strategies have resulted in increased profits which have been earmarked for a new initiative for ASUM, a proposal to establish a Research Foundation to offer substantial grants to ASUM Members for suitable research projects relating to diagnostic medical ultrasound. The first grants are to be made in 2002. More information on this foundation will be made available shortly.

Stan Barnett, the President Elect, outlined some of the problems in the current Council structure and some suggestions to make Council more efficient in carrying out its duties with honorary and voluntary Council members. Dave Carpenter suggested that the Past President's Committee, could assist with advice on Council dilemmas.

Fergus Scott, as convenor of ASUM 2001, reported that plans were well underway for the meeting in Sydney. However, some difficulties were anticipated, resulting from Sue Butterworth's resignation, as some negotiations were still in progress. It was decided to investigate the appointment of a professional conference organiser for this meeting with a view to extending any appointment to future Annual Scientific meetings if the arrangement proves satisfactory.

There were six successful candidates for the DDU, with two more passing their exams, but needing to fulfil their hours of training. Christian Wriedt is to be the new Chairman of the DDU Board, and Andrew Ngu thanked Jim Syme for his many years of dedicated service in that role.

DMU exams are to commence next week for both Part I and Part II. Good luck to all of the candidates!

Cheryl Bass, Chair of the Standards of Practice Committee, asked that a Health Department recommendation, regarding infection control, be reviewed. This recommendation requires the use of glutaraldehyde as the standard disinfection method for TV probes, where ASUM includes sodium hypochlorite (Milton) solutions.

AVUAB reported that the issue of indemnity needs to be resolved with the government as soon as possible to keep this initiative viable.

Stan Barnett reported from the Safety Committee that there is a move in the USA from manufacturers to remove FDA limits, i.e. preset machine settings, leaving ultrasound exposures to the operator's discretion. Stan noted that there would be medico-legal implications if these proposals go ahead.

There were 28 applications for full membership, 104 applications for associate membership, 9 applications for trainee membership and one application for corresponding membership. We welcome all of these new members to ASUM.

On behalf of the corporate members, David Rigby thanked the organisers of ASUM 2000, the meeting of the corporate members have voted it a very successful meeting.

Andrew Ngu announced the results of the recent Council Elections, welcoming the new and returning Councillors and thanking those retiring Councillors for their years of dedication and hard work.

The meeting closed at 4.00 as Councillors fled to pack and catch the plane home, with a fond farewell to Auckland, New Zealand.

13th Annual Conference IPDS July 2000 Taiwan “Life in the Amniotic Ocean”

Stan Barnett ASUM President



Since 1988 the International Perinatal Doppler Society (IPDS) has held its annual meeting in various countries around the globe. It is invariably attended by a group of enthusiastic and dedicated ultrasound specialists, with a core group of international experts. The scientific organising committee has identified ultrasound safety as a key issue, and I am fortunate to have been invited to participate in three recent meetings. On this occasion I was invited to present a paper on “*Doppler In Early Pregnancy: Safety Issues and Risk Factors*” in a plenary session that was organised as a symposium on Doppler in early pregnancy. I was also given the responsibility to chair a working group to prepare guidelines specifically for the safe use of Perinatal Doppler ultrasound. I hope that the linkage that I have established can be extended to create an international liaison with ASUM.

“Life in the Amniotic Ocean” was the theme of the 13th annual conference of the IPDS, July 2000 in Taiwan. The conference was organised under the auspices of the Taiwan Society of Perinatology, with supervision by the Department of Health and the National Science Council. The scientific program covered a wide range of topics presented by 43 invited speakers from 16 countries, including 16 speakers from Taiwan. The venue was the impressive high-technology Taipei International Convention Centre. The conference was opened by the

country’s newly elected Vice President, Annette Lu, amid a throng of media attention including eight television networks. Ms Lu gave an inspiring introductory speech about aspiring to the pinnacle of success and related her own extraordinary achievement (for women in China) to that which might be achieved in specialty medical ultrasound organisations.

Following the official opening of the conference by various local dignitaries, including the President of the Chang Gung hospital, the scientific session began with Dr Dev Maulik (Winthrop University Hospital, NY) providing a critical appraisal of the practical effectiveness of current and developing techniques, particularly with reference to actual demonstrated clinical benefit. (He also alluded to potential safety issues). A summary of Dr Maulik’s presentation is; that despite anecdotal opinions that commonly used pulsed Doppler techniques are beneficial, the findings from reviews and meta-analyses of approximately 21,000 patients demonstrated only a trend, without statistical significance, for improved outcome from umbilical artery examinations. However, when used in a structured protocol in high risk populations the outcome of the procedure was an approximately 30% reduction in perinatal death. Maulik also reported on a recent publication of a preliminary study that (McCowan AJOG 2000) suggested that more frequent Doppler monitoring leads to more intervention, but no difference in outcome. The conclusion that pulsed Doppler umbilical artery examination leads to no significant differences in morbidity and mortality in low risk patients was reinforced by Richard Jaffe (New York Presbyterian Hospital, NY). This was an interesting start to a conference of specialists dedicated to the use of Doppler in obstetrics.

An expected series of presentations from Kurjak and Kupesic failed to materialise due to last minute cancellations. Japanese and Taiwanese speakers graciously, and expertly, filled the gaps with presentations prepared on laptop computers during the conference.

Some concern was voiced over the use of biometric data to evaluate fetal development in the absence of other indicators, such as umbilical artery Doppler. Christoph Brezinka (Chair, Standing Committee Medico-Legal Affairs, Austrian Society of Ob/Gyn) gave an interesting overview of malpractice and liability aspects of Doppler in fetal monitoring. He suggested that the trend, in the USA, to rely solely on biometry for fetal dating in late 2nd and 3rd trimesters made diagnosticians vulnerable to legal claims if the IUGR was missed. Speaking as an expert witness for Europe, he suggested that failure to confirm fetal age (and exclude IUGR) would be considered malpractice. He

emphasised the importance of maintaining good records, without which lawsuits cannot be effectively defended.

There were a number of presentations on the role of the *ductus venosus*, following on from the pioneering work of Torvid Kiserud (Bergen University hospital, Norway) who is a regular participant at the IPDS annual conference. The *ductus venosus* is a small vessel in the fetal liver that connects the umbilical vein and the inferior vena cava. It functions to direct approximately half the volume of oxygenated placental blood to the fetal coronary arteries and brain by directing blood via the right atrium through the *foramen ovale* to the left atrium of the fetal heart. Kiserud described in detail the haemodynamics of *ductus venosus* and umbilical vein junction, whereby small changes in pressure in the umbilical artery produce measurable significant difference in flow through the *ductus venosus* into the liver instead of the right atrium.

Doppler in First Trimester

There were some presentations on the developing use of Doppler in first trimester of pregnancy, generally with unconvincing efficacy. Alexandra Matias (University Hospital Porto, Portugal) presented a study that looked for a correlation between abnormal flow in the *ductus venosus* (DV) and results of nuchal translucency screening for cardiac defects. Doppler waveforms were obtained in the DV of 505 high-risk pregnancies at 11–12 weeks (prior to chorionic villus sampling for chromosome karyotype). Whilst there was an association between abnormal flow in the DV (defined as absence or reversal of flow during atrial contraction) and abnormal karyotypes, the sensitivity of the test was 80%. However, approximately 10% of cases that reported abnormal DV flow had normal karyotype, while most had cardiac defects. Matias suggested that adoption of evaluation of DV flow between 10-14 weeks gestation together with nuchal translucency measurement as a second level screening test could reduce the false positive rates that occur with the alternative, and invasive, chromosome sampling techniques.

Presentations by the local conference organiser (Prof T'sang T'ang Hsieh, Chairman of the Department of Obstetrics & Gynaecology, Chang Gung Memorial Hospital, Taipei and Secretary General of the Federation of Asia-Oceania Perinatal Society) included an assessment of the relationship between umbilical artery pulsatility index (PI) and fetal nuchal translucency (NT). Results of studies on 495 pregnancies found that between 11 and 13 weeks gestation:

- (a) Umbilical artery PI declined and NT thickness increased.
- (b) There was no association between PI and NT.

T'sang T'ang Hsei *et al* concluded that fetoplacental vascular resistance did not correlate with fetal nuchal translucency thickness, and that nuchal translucency is superior to umbilical artery pulsatility index as a marker for detection of trisomy 21 and 18.

There was a strong local contingent in attendance at the conference. A presentation by Li (Department of Electrical

Engineering, National Taiwan University) discussed technical problems with harmonic imaging caused by interactions with echo-contrast material, including the effects of radiation pressure on direction of flow. An interesting passing comment was that he felt that tissue harmonic imaging is restricted by the current FDA intensity limit.

Fetal Brain 3-D Imaging

Ritsuko Pooh (Kagawa, Japan) gave a number of presentations on transvaginal Doppler visualisation of fetal brain circulation, including an interesting study on 3-D colour/power Doppler on fetuses at 20-30 weeks of gestation. The transvaginal approach to cephalic presenting fetuses allowed intracranial scanning through the sonolucent windows of the fontanelles and sagittal suture. Dr Pooh was aware of potential safety issues and reported that the thermal index (TI) never exceeded a value of 1.5. She also advised that dwell time for Doppler acquisition was approximately 25 seconds. However, there was no information on the total scan time required to obtain the best images for the presentation. Completely symmetrical 3-D imaging of fetal circulation was successfully obtained in only approximately 10% of cases.

Issues of Concern

There was keen interest in the safety issues relating to the use of Doppler ultrasound in perinatal medicine. Some presenters were aware of the need for a cautious approach, however few had clear understanding of the meaning of the output display values seen on some equipment. This is hardly surprising considering that the experts are somewhat vague. Unfortunately, there are very little reliable data on which to base definitive conclusions about safety of ultrasound interaction with the embryo in first trimester examinations. This lack of information is reflected in many of the safety guidelines published by various international ultrasound organisations that simply recommend use of the ALARA Principle. However, it is difficult to sustain an argument to prevent the use of ultrasound when it is undertaken in compliance with relevant safety guidelines and where a clear medical benefit is expected. The ASUM Safety Committee is working together with international agencies to develop some practical guidelines based on more quantitative values.

Two other topics that created lively discussion at the IPDS 2000 were:

- (a) The extent of variability in Doppler measurements between different ultrasound equipment.
- (b) The concept that higher acoustic output does not, necessarily, give better diagnostic information in Doppler applications.

About 10 years ago I participated in a standards workshop of the International Electro-technical Commission, where the subject of limited reproducibility of spectral Doppler data was a concern. I was surprised to hear at this IPDS conference that this continues to be perceived as a significant problem amongst expert users of Doppler ultrasound technology. Nevertheless, it offers an interesting research challenge to develop a test system (laboratory/animal/clinical) that explores both of these

Reports

questions in a controlled manner. The apparently loose to non-existent programs for continuing QA evaluations may become an important issue for international standards, as well as for local standards of practice.

These matters have some medico-legal implications, particularly from the aspect of record-keeping. The situation may be exacerbated if the current move by the National Electrical Manufacturers Association (NEMA) in the USA is successful in abolishing FDA regulatory limits. As long as the FDA imposes a "safe" upper limit on maximum acoustic output from ultrasound diagnostic equipment it would be difficult to sustain a case that the user endangered a fetus, provided appropriate safety guidelines were followed. If regulatory intensity limits are

removed the user would presumably be totally responsible for ensuring safe application and acoustic exposure. While there is no requirement to retain data on images regarding the output display information (MI or TI), the issue of record-keeping becomes problematic.

The International Perinatal Doppler Society is a relatively small group of dedicated specialists that functions efficiently and which seems to be sustained by enthusiasm and a refreshingly critical approach to the real benefits, and potential risk, of ultrasound applications. On this occasion the conference was somewhat upstaged by the gracious hospitality of our Taiwanese hosts and the displays of skill and beauty by spectacular Chinese acrobats and traditional dancers. The delegates were also treated to musical virtuosity in fine performances by the highly



acclaimed Physicians Chamber Orchestra. Music is considered most important, and it is said in Taiwan that, "The physician cures with fervent love for human life. With the sound of music, he comforts and enlightens people's hearts as well."

Annual Scientific Meeting 2000 - Auckland

Margo Harkness

The 30th Annual Scientific Meeting of the Australasian Society for Ultrasound in Medicine, ASUM 2000 was held in Auckland, New Zealand from 25-27th August 2000. Congratulations and thanks to Graham Parry and his team for an excellent meeting.

Over 400 delegates enjoyed a very full, varied, interesting and, at times, highly entertaining scientific program. An excellent range of invited speakers, including both the overseas faculty and the Australasian faculty, provided plenty of variety, stimulation and "take home" messages. The scientific program was well supplemented with a very high standard of proffered papers and posters, and the technical exhibition. The corporate sponsors again were very generous with prizes for both paper and poster presentations. A listing of the prize winners for ASUM 2000 is included in this edition. Congratulations to all presenters and prize winners.

As is the tradition with the ASUM Annual Scientific Meeting, the social program was a major highlight enjoyed by all. The novel program format allowed many delegates to enjoy an afternoon on the water for some no doubt well-deserved rest and relaxation. The Conference Dinner was most enjoyable with an excellent range of food and wine and a great band.

ASUM 2000 was a most enjoyable conference and as anyone who has ever been on an organising committee knows, none of this happens by magic. Many people contribute many hours of hard work over a long period of time to bring all elements together. To Graham Parry and his Convening Committee, to the Corporate Sponsors, the ASUM staff and all contributors thank you for a job well done.

ASUM Annual General Meeting 2000

Margaret Amis

The Annual General Meeting of the ASUM was held on Tuesday 17th October 2000 at the Mercy Hospital, Melbourne in conjunction with the Victorian Branch meeting. It was attended by 43 members. The entire Executive Council attended, including; Andrew Ngu, Stan Barnett, Mary Young, Maurice Molan, Fergus Scott, Kaye Griffiths, Stephen Bird (standing-in for Pru Pratten).

Andrew Ngu chaired the meeting and presented a brief summary of issues relating to education being provided by the ASUM office as well as that being provided by each branch. It was emphasised that members must let ASUM know what they want as well as what they thought of each education activity that they attend. It was announced that the Sonography Registry is underway and that it is anticipated that the Government will sign the required documentation on 1 November thus ensuring that registration will be mandatory in one year's time. The issue of subscriptions was also addressed. Subscriptions have not been increased for this financial year; it is the intent of executive to keep the subscription rate at the current level for as long as possible. Dr Ngu also thanked everyone for their support and particularly the office bearers and ASUM office staff for all their work.

Andrew Ngu emphasised that it was the intention of the current Executive Council to take a leading and pro-active role in ASUM issues to ensure that the needs of the membership were considered. His words were that we intend to make ASUM "more user-friendly".

Maurice Molan, gave the Treasurer's report, being pleased to report an operating profit for the last financial year. The budget was carefully reviewed by Council and the Finance Committee who recommended that the subscriptions for this financial year not be increased. Dr Molan said that "any profits should be seen as a means not an end and that the Society was now in a good position to invest more of



its

Andrew Ngu, immediate past President

resources into furthering ultrasound practice and research in Australia and New Zealand".

At the conclusion of the meeting Andrew Ngu introduced Dr Stan Barnett as the new President of ASUM for the period 2000-2002.

Due to sudden ill health, Pru Pratten was unable to attend and has arranged for Stephen Bird to act in her place on the Executive Council and as the Chair of the Sonographer Affairs Committee.

Letter to the Editor

On Saturday 14th October I attended an OSCE exam prep organised by Beth Williams in Christchurch, NZ. I would just like to let your Education Committee know what a wonderful chance it was, and that Beth and her team had put in many hours of preparation to make it as close to the real thing as they could. There were 32 stations with an even mixture of physics, obstetrics and general ultrasound. There were 6 of us there from the South Island and Wellington area and we all felt completely blown away by the effort put in for us. These people are doing a great job and Beth's enthusiasm is infectious!!!

Regards
Pat Shanks

DDU examination results

Dr Russell Troedson passed Part II examinations held in May-June 2000. The editor apologises for the omission of Dr Troedson's name from the results published in the August 2000 *Bulletin*.

ASUM 2000 Prize Winners

In Touch with Tomorrow **TOSHIBA**

GIULIA FRANCO POSTER

Clinical or Technical Research

First
\$3000

Damien Armstrong
"Diagnosis of significant patent ductus arteriosus in preterm infants using renal arterial Doppler resistive index"

Second
\$500

Kirsten Black
"Prenatal detection of cleft lip and palate: An audit of ultrasound diagnosis at the Royal Women's Hospital in Melbourne"



Best Sonographer's Research Presentation

\$1250

Winkle Yung
"Routine or selective carotid duplex screening prior to coronary artery bypass grafting"



Best Clinical Presentation

\$1000

Lino Piotto
"The sonographic signs of intestinal malrotation and volvulus"



Best Research Presentation

\$1500

Jenifer Kidd
"Duplex Ultrasound detection of Endoleaks: Follow-up after endoluminal grafting"



MEDITRON

Young Investigator Award

\$500 to winner plus \$500 to department where work was performed

Greg Duncombe
"Fetal Thyrotoxicosis: A case report"



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An application for accreditation of this program by the Australasian Sonographer Accreditation Registry (ASAR) has been submitted.

To obtain an information package (including application form) contact

Elizabeth Stein Phone 61 7 3864 2595
Email : e.stein@qut.edu.au

For specific course information contact

Pam Rowntree Phone 61 7 3864 2346
Email : p.rowntree@qut.edu.au

or

Margo Harkness Phone 61 7 3864 2490
Email: m.harkness@qut.edu.au

* subject to final approval



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Location: Brisbane, Queensland
When: Monday 9 July - Saturday 14 July 2001
Who: The Centre for Medical and Health Physics, QUT in association with Advanced Technology Laboratories (ATL) and The Prince Charles Hospital Echocardiography Laboratory.

For further information or to obtain registration brochures for the above courses, please contact

Margo Harkness
Telephone 61 7 3864 2490
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Australian Sonographers Association 8th National Conference 4th, 5th and 6th May 2001 ~ Sheraton Perth Hotel

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Registration brochures will be available in December.

Consider presenting a paper or poster as great prizes will be on offer.

If you require further information, please contact:

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Email the Course Co-ordinator at lombardo@rmit.edu

Extra information available at our website: <http://www.rmit.edu.au/>

*Some block attendance on campus is required.

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LOOKING FORWARD TO 2001

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**Commencing 19th February 2001
by Distance Education**

8 subjects, 2 years part-time study. For graduates of a Degree program in Radiography and Medical Imaging or equivalent. A degree in related areas will be considered. Applicants with ultrasound qualifications may apply for subject exemptions. Applicants without a degree but employed full time in ultrasound should apply.

Enquiries and applications to:
Administrative Officer
Department of Radiography & Medical Imaging
PO Box 64 Monash University VIC 3800 Australia
Phone: +61 3 9905 1212 Fax: +61 3 9905 8149

Course Director:
Email: Beverley.McFarlane@med.monash.edu.au
www.med.monash.edu.au/BRadMedImag/courses/

AMERICAN HOSPITAL DUBAI

The American Hospital is located in the cosmopolitan city of Dubai in the United Arab Emirates. It is a private modern facility which opened in 1996. We are staffed by a multi-national team and currently have a requirement for an:

ULTRASONOGRAPHER

The ideal candidate must have five years post graduate experience with recent clinical experience at least two years in **ALL** areas of U/S imaging as well as specialized experience with guided biopsies/aspirations and amniocentesis studies. A current license from a Western country is essential.

Prior experience/knowledge of the Middle East an advantage.

Please apply in writing to the Director of Human Resources, American Hospital Dubai, PO Box 5566, Dubai, United Arab Emirates:

Fax: 971-4-336-0068, e-mail: hr@ahdubai.com

Website: <http://www.ahdubai.com>

The American Hospital achieved Joint Commission International Accreditation this year, the first and only hospital to gain accreditation in the Middle East.

SONOGRAPHERS

Junior and Senior Sonographers are required by the Riverina Medical Imaging Group (RMIG) Ultrasound Service. The mission of RMIG is:

*To strive for excellence in the delivery of medical imaging services
throughout the Greater Murray Health Region*

So RMIG is looking for trained sonographers who are either willing to learn to, or are able to be accountable for providing quality patient care, timely and accurate ultrasound scans and be an effective and responsible member of RMIG.

The RMIG Ultrasound Service provides a wide range of ultrasound services in Wagga Wagga, Griffith and surrounding towns. Generous salary, entitlements and working conditions will be negotiated, depending on your knowledge, skill and level of agreed accountability. It is expected that you, like all sonographers and trainees, become a member of the ultrasound team, which is accountable for sonography and some management tasks. Training can be provided not only in sonography tasks, but also team and management tasks.

Wagga Wagga is a regional city that lies halfway between Sydney and Melbourne with regular daily flights to and from both cities. It is within easy driving distance of the NSW and Victorian ski fields. Griffith is a smaller town which has a rich Italian and farming cultural heritage.

Please send a letter of application and curriculum vitae to Mrs Lyn Chapman, Riverina Medical Imaging Group, PO Box 5576, Wagga Wagga NSW 2650.

For further confidential information please contact Ms Carol Obst or Dr Nick Stephenson on 61 2 6925 3733

Townsville General Hospital Imaging Units

Townsville General Hospital is the region's tertiary referral centre for all areas of health management. The hospital is the trauma referral centre for North Queensland and is fully supported by tertiary intensive, coronary, cardiac surgery, oncology, hyperbaric units and obstetrics and gynaecology and neonates ICU. All 'core' medical services are provided. A full range of clinical support facilities is available as are fully functional general and specialists outpatient facilities. Under-graduate and post-graduate education is supported. The Imaging Department is well equipped and will move to a totally new hospital in 2001.

RADIOGRAPHER/SONOGRAPHER: Medical Imaging Unit, Townsville General Hospital, Townsville Health Service District. Remuneration value up to: \$57,394 (PO3) **VRN:** 00/09/12. **Duties/Abilities:** All general ultrasound plus specialist imaging in one or more areas - Musculoskeletal; Vascular; Obstetrics and Gynaecology and Neonates.

RADIOGRAPHER TRAINING IN ULTRASOUND. Medical Imaging Unit, Townsville General Hospital, Townsville Health Service District. Remuneration value up to: \$57,394 p.a. (PO2/PO3) **VRN:** 00/09/13. **Duties/Abilities:** Applicants wishing to undertake/complete an accredited post graduate Ultrasound course. The successful applicant will fill a vacancy in our ongoing training program in ultrasound

Enquiries: Sonja Brennan (07) 4781 9233 or Gary Kershaw (07) 4781 9243

Application Kit: (07) 4781 9459

ROYAL ADELAIDE HOSPITAL

STATE OF THE ART IMAGING EMERGENCY RADIOLOGY - EMERGENCY ULTRASOUND 20-21 JANUARY 2001

The annual State of the Art Imaging Conference is held in Adelaide, South Australia. The year 2001 topic is **'Emergency Radiology – Emergency Ultrasound' with a Military & Sporting Theme.**

This 2 day Radiology Conference will be of interest to radiologists and radiographers, all personnel involved in emergency medicine (emergency, retrieval and ICU clinicians and other staff), and members of the military forces and emergency services.

For further information you are invited to visit our website at <http://www.stateofheartimaging.com.au> or contact Dr S Le P Langlois, or Susie Lazzaro, Department of Radiology, Royal Adelaide Hospital, North Tce, Adelaide SA 5000
Ph: 61 8 8222 5145 Fax: 61 8 8222 5964

ASUM Vascular Workshop 2001 23-24 June St Vincents Hospital Melbourne

Convenor: Dr John Vrazas

Featuring live scanning workshops
International and prominent Australian
faculty including

Ken Rholl

Joseph Polack

Additional information and a
registration brochure will be included
with the February 2001 Bulletin and on
ASUM's website at www.asum.com.au

Please note: The dates have been changed
since the August Bulletin to avoid clashing
with the ASA meeting in Perth.

DDU 2001 EXAMINATION DATES AND FEES

Please note that there will be only one DDU Part I examination from 2001 onwards.

Part I Examination Fee

A\$385.00 (includes GST) for ASUM Members
A\$660.00 (includes GST) for Non members

Part II Examination Fee

A\$660.00 (includes GST) for ASUM Members
A\$935.00 (includes GST) for Non members

Part II Casebook Fee

A\$275.00 (includes GST)

Fees quoted above are from 1 July 2000 and may be subject to change.

PLEASE NOTE THE FOLLOWING INFORMATION PERTAINING TO THE NEXT EXAMINATIONS

2001 Part I

Part I written examination will be held on 21 May 2001
*Closing date for applications 26 March 2001

2001 Part II

Casebooks for 2001 Part II DDU Examination must be submitted by 22 January 2001 and accompanied by the prescribed fee of \$275.00 for all participants.

Part II written examination will be held on 21 May 2001
*Closing date for applications 26 March 2001

For applicants who pass the Part II written exam the Part II oral examination will be held on 16 June 2001 in Sydney.

Oral Examination for Cardiology candidates will be held in Melbourne on a date to be determined.

***NB** Applications received after the closing date will not be accepted.

For a copy of the latest DDU handbook, DDU application forms and further information regarding DDU, please contact ASUM on 61 2 9958 0317

For ASUM membership application forms and further information regarding membership, please contact ASUM on 61 2 9958 7655

ASUM VICTORIA BRANCH EVENING SCIENTIFIC MEETINGS

Dates to remember

20 March	O & G
15 May	Upper Abdomen
19 July	Combined with RANZCR
September	To be arranged
27 November	Combined ASA case

ASUM QUEENSLAND EDUCATION PROGRAM FOR 2001

ASUM Queensland Branch will be conducting a series of Vascular meetings throughout the year. Each meeting will be hosted by a different practice and notices will be sent out with the date and venue for each meeting. Most meetings will be held on a Tuesday evening at 6pm.

The proposed dates and host for a series of vascular meetings are as follows.

March	Queensland Vascular Diagnostics
May	Southern X-ray Clinics
July	Mater Public
September	RBH
November	Queensland X-ray

A DMU Tutorial day will be held in June but the program will interest all members - not just DMU candidates.

The AGM will be held early in August. The format is yet to be decided.

If you would like to receive meeting notices for any of these meetings, please advise Roslyn Savage of your email address or an appropriate fax number.

Email: markros@powerup.com.au
Fax: 61 7 3881 2464

Videotape Lending Scheme Collection

First release of tapes from the 30th Annual Scientific Meeting

Following the very successful Annual Scientific Meeting in Auckland, ASUM is pleased to release five titles into the Videotape Lending Scheme. These are the first of a series of videotapes compiled from sessions presented at the meeting. They cover General, Plenary and Obstetric and Gynaecology topics.

Transplant Sonography: hepatic and renal - (Andrew Little)
Ultrasound in portal hypertension (Rob Gibson)

Ultrasound in the assessment of fibroids (Victor Hurley)
Vascular interventional techniques involving the uterus - the role of ultrasound assessment (David Rogers)
Ultrasound guided uterine biopsy (Vic Hurley)

Novel fetal imaging methods (Nick Fisk)
The nuchal thickness assessment (Vic Hurley)

Non immune hydrops - obtaining a diagnosis (Janet Vaughan)
Congenital diaphragmatic hernia: prediction of outcome (Alistair Roberts)

Diagnosis of focal hepatic lesions (Rob Gibson)
Thyroid and parathyroid ultrasound - current applications (Rodger Colbert)

Rodger Colbert, Rob Gibson, Vic Hurley, Andrew Little, Alistair Roberts, David Rogers and Janet Vaughan are representative of the very fine Australasian Faculty presenting at the meeting. The third tape also features Professor Nicholas Fisk, Obstetrician and Gynaecologist, one of the invited international speakers. Professor Fisk trained as an obstetrician in Sydney and South Africa before moving to the UK in 1986. He works at the Imperial College School of Medicine, based at Queen Charlotte's Hospital in London, where he runs a sub-specialty service and training program in fetal medicine.

Multiple copies of the five videotapes are available through the Videotape Lending Scheme. The latest catalogue with order form is inserted into this issue of the Bulletin.

DMU - 2001

Parts I and II Written exam - 25 August 2001

Closing date for exemption - 27 April 2001

Closing date for applications - 1 June 2001

FEES (inclusive of GST)

ASUM Members	Non Members
Part I A\$385.00	Part I A\$660.00
Part II A\$660.00	Part II A\$ 935.00

The 2001 DMU Handbook will be available on 1 February 2001

For further information contact: DMU Coordinator
ASUM 2/181 High St Willoughby NSW 2068
Australia

Phone: 61 2 9958 0317, Fax: 61 2 9958 8002

Email: dmu@asum.com.au

The DMU information on the ASUM website is currently being updated and includes information

ASUM Victoria Branch

Ultrasound Lecture Series 2001

This Lecture Series has been prepared to help ultrasound trainees **prepare for the ASUM DMU Lectures**, for registrars in training and for those who would like a broad update in a particular area of ultrasound.

The series will run from February to July 2001, commencing with the module on Physics related to Ultrasound Practice. The first lecture will be given by Neil Liddell on the evening of Wednesday 7th February.

This year we will run the remainder of the modules on Saturdays (once per month, on average) with all of the lecturers presenting on the appropriate topic on the same day. The format (as has been used previously) is to allow participants who are not stationed in the metropolitan area the opportunity to attend the series.

Timetable details are still being finalised and will be published with the registration form when complete. In the meantime, for further information or queries on pre-registration, please call as listed below.

Dr Geoff Matthews, ASUM Lecture Series Co-ordinator,
150 Lennox Street, Richmond Vic 3121

Phone: 61 3 9427 1169 Fax: 61 3 9428 6635

Email: matthews@austin.unimelb.edu.au

Invitation for proposals for the 2001 Chris Kohlenberg Teaching Fellowships

(Sponsored by Disonics GE)

The Chris Kohlenberg Teaching Fellowship was established by ASUM in association with Disonics GE to increase the opportunity for members outside the main centres to have access to quality educational opportunities. It has been awarded twice in 1998 and once in 1999 to provide educational opportunities for members in Regional areas of New Zealand, Queensland and New South Wales. For 2001, Disonics GE has increased the number of Teaching Fellowships to two annually.

The Chris Kohlenberg Teaching Fellowship is awarded to a member of ASUM on the basis of demonstrated knowledge, background and teaching ability. The Fellow is appointed by the Education Committee which considers nominations from committees, branches and members of ASUM. The Teaching Fellow will conduct workshops and meetings primarily (but not exclusively) in Australia or New Zealand centres that would not normally host scientific meetings. In addition the Teaching Fellow will be available to conduct workshops in hospital ultrasound departments during the day.

Members wishing to nominate for the Fellowship should provide details of their background and experience which qualifies them for appointment as the Chris Kohlenberg Teaching Fellow.

Branches wishing to propose programs for the Teaching Fellow should, in the first instance, contact Keith Henderson ph 61 2 99586200 fax 61 2 99588002 email khenderson@asum.com.au

Nominations and proposals should be addressed to: The Education Officer ASUM 2/181 High St Willoughby 2068 Australia.

ASUM DMU Preparation Courses February/March 2001 Coordinator: Keith Henderson

- DMU Part I Preparation Course (General and Obstetric, Vascular, Cardiac)
University of NSW, Sydney 7-11 February 2001
- DMU Part II Preparation Course (General and Obstetric, Vascular, Cardiac)
University of NSW, Sydney 7-11 February 2001
- DMU Part II Preparation Course (General and Obstetric)
The Royal Melbourne Hospital, Melbourne 28 February to 4 March 2001

The DMU Part I Preparation Course is an intensive course to assist candidates' preparation for DMU Part I examination. The program includes lectures, laboratory sessions and tutorials for general and obstetric, vascular and cardiac specialties. The venue is the University of New South Wales, Sydney. If insufficient registrations are received, ASUM reserves the right to cancel the course and refund the course fees.

The DMU Part II Preparation Courses are interactive programs designed to assist candidate's preparation for the DMU Part II examination. Each program will comprise lectures, tutorials, workshops, film reading and a trial OSCE. Separate programs exist for general and obstetric, vascular and cardiac specialties. If insufficient registrations are received for any one speciality, ASUM reserves the right to cancel that program and refund the course fees.

Places in the Part II courses are strictly limited and will be allocated as applications are received, with priority being given to ASUM members.

Registration brochures are included with this issue of the *Bulletin* and on ASUM's website: <http://www.asum.com.au>



Beresford Buttery Overseas Traineeship

Since its foundation more than a century ago, Diasonics GE has constantly been at the forefront of research and technical innovation, with Diasonics GE Medical Systems today being recognised as a world leader in the supply of diagnostic imaging systems.

It is with great pride that Diasonics GE has the opportunity to offer an annual traineeship in the field of obstetric and gynaecological ultrasound, in memory of Beresford Buttery FRACOG, DDU, COGUS who made an inestimable contribution to his profession.

The award will cover attendance at an appropriate educational program at the Thomas Jefferson Research and Education Institute in Philadelphia and will include tuition fees, economy airfare and accommodation for the duration of the course (usually 4 days).

The award will be made to applicants:

1. who seek to further develop their skills and experience in obstetric and gynaecological ultrasound
2. have as a minimum qualification Part 1 of the DDU or DMU (or equivalent) or have been awarded the DDU or DMU (or equivalent) within the last 5 years (since 31 December 1995)
3. have been a financial member of ASUM for a minimum of 12 months prior to the closing date

Applications should include:

- ◆ a *curriculum vitae*
- ◆ details of current employment
- ◆ testimonials from two referees in support of the application including contact address and telephone number
- ◆ an outline of professional goals and objectives
- ◆ an indication of benefit from award of the Traineeship

The successful applicant is asked to provide a written report on return from the course at Thomas Jefferson Research and Education Institute.

Applications addressing the criteria should be forwarded by **Friday 29 June 2001** to:

Diasonics GE Beresford Buttery Overseas Traineeship
c/- ASUM
2/181 High Street
Willoughby NSW 2068 Australia

Ultrasound Events

Mon 20 Nov 2000 DDU Examinations. Part I Examination. *Venue:* Various. *Contact:* DDU Co-ordinator, ASUM, 2/181 High Street, Willoughby, NSW, 2068. Ph: 61 2 9958 7655; Fx: 61 2 9958 8002; Email: asum@asum.com.au

Mon 27 Nov 2000 ASUM Victorian Branch Scientific Meeting. Combined ASUM/ASA case presentation night. *Contact:* Mark Brooks, Ph: 61 3 9496 5431; Fx: 61 3 9459 2817

Tue 5 Dec 2000 - 3 days BMUS 32nd Annual Scientific Meeting and Exhibition 2000. *Venue:* Devonshire Park Centre, Eastbourne, Sussex. *Contact:* BMUS, 36 Portland Place, London W1N 3DG, UK. Ph: 44 20 7636 3714; Fx: 44 20 7323 2175; Email: secretariat@bmus.org Website: www.bmus.org

Sat 20 Jan 2001 State of the Art Imaging Conference. 'Emergency Radiology - Emergency Ultrasound' with a Military & Olympic Theme. *Venue:* Adelaide, South Australia. *Contact:* Dr S Le P Langlois, Department of Radiology, Royal Adelaide Hospital, North Tce, Adelaide SA 5000, Ph: 61 8 8222 5145; Fx: 61 8 8222 5964; Email: suziel@adelaide.on.net

Mon 22 Jan 2001 DDU Part II Examination. Deadline for submissions of Casebooks. *Contact:* DDU Co-ordinator. ASUM, 2/181 High Street, Willoughby, NSW, 2068. Ph: 61 2 9958 7655; Ph: 61 2 9958 8002; Email: asum@asum.com.au

Wed 7 Feb 2001 - 5 days DMU Preparation Courses. Part I and Part II General and Obstetric, Vascular and Cardiac. *Venue:* Central Lecture Block, University of New South Wales, Kensington, Sydney. *Contact:* ASUM, 2/181 High Street, Willoughby, NSW, 2068. Ph: 61 2 9958 6200; Ph: 61 2 9958 8002; Email: education@asum.com.au

Wed 28 Feb 2001 - 5 days DMU Preparation Course. Part II General and Obstetric. *Venue:* The Royal Melbourne Hospital, Melbourne. *Contact:* ASUM, 2/181 High Street, Willoughby, NSW, 2068. Ph: 61 2 9958 6200; Ph: 61 2 9958 8002; Email: education@asum.com.au

March 2001 ASUM Queensland Education Program. Vascular Meeting. *Venue:* Queensland Vascular Diagnostics. *Contact:* Roslyn Savage, Email: markros@powerup.com.au; Fx: 61 7 3881 2464

Sun 11 Mar 2001 AIUM 2001. *Venue:* Orlando, Florida. *Contact:* AIUM's Prof. Dev. Dept., Suite 100, 14750 Sweitzer Lane, Laurel, MD 20707-5906. Ph: 1 301 498 4100; Fx: 1 301 498 4450; Email: conv_edu@aium.org Web site: www.aium.org

Wed 21 Mar 2001 - 5 days AIR Brisbane 2001. *Venue:* Brisbane Convention Centre. *Contact:* Brisbane 2001, PO Box 1, Royal Brisbane Hospital, Brisbane, QLD, 4029. Website: <http://www.giant.netconnect.com.au/AIR/default.htm>

Mon 26 Mar 2001 Applications close DDU Part I and Part II Examination. *Contact:* DDU Co-ordinator. ASUM, 2/181 High Street, Willoughby, NSW, 2068. Ph: 61 2 9958 7655; Ph: 61 2 9958 8002; Email: asum@asum.com.au

Wed 18 Apr 2001 - 3 days XVII International Congress "The Fetus as a Patient". *Venue:* The Dusit Resort Pattaya, Pattaya City, Chonburi, Thailand. *Contact:* C/o Suphavit Muttamara, MD., RTCOG, 8th Floor, 2, Soi Soonvijai, New Petchburi Road, Bangkok, Bangkok 10320, Thailand. Ph: 66 2 716 5721/716 5722; Fx: 66 2 716 5720.

Thu 19 Apr 2001 14th Congress of the International Perinatal Doppler Society. *Venue:* Spier Estate, Stellenbosch,

South Africa. *Contact:* Sune van Rooyen or Liezel Horn, Congress Department, PO Box 19063, Tygerberg 7505, South Africa. Ph: 27 21 938 9238/9245; Fx: 27 21 933 2649; Email: SDK1@GERGA.SUN.AC.ZA or LH@GERGA.SUN.AC.ZA

Fri 27 Apr 2001 DMU Examinations. Closing date for application for an exemption. *Contact:* DMU Co-ordinator, ASUM, 2/181 High Street, Willoughby, NSW, 2068. Ph: 61 2 9958 7655; Fx: 61 2 9958 8002; Email: dmu@asum.com.au

May 2001 ASUM Queensland Education Program. Vascular Meeting. *Venue:* Southern X-ray Clinics. *Contact:* Roslyn Savage, Email: markros@powerup.com.au; Fx: 61 7 3881 2464.

Fri 4 May 2001 - 3 days ASA 2001 - A Sound Odyssey. 8th Annual National Conference of ASA. *Venue:* Sheraton Perth Hotel. *Contact:* Conference Secretariat, ASA, PO Box 709, Cheltenham, VIC, 3192. Email: enquiries@A-S-A.com.au

Sat 6 May 2001 - 6 days Euroson School on 3D Ultrasound Imaging Eurodop 2001 / 5th Ultrasound Angiography Conference. *Venue:* Princesa Sofia-Intercontinental Hotel, Barcelona, Spain. *Contact:* HITEC, Dept. of Imaging, Hammersmith Hospital, 150 Du Cane Road, London W12 OHM, UK. Fx: 44 20 8383 1610; Email: hitec@hhnt.org

Wed 9 May 2001 - 3 days 3rd International Congress on Vascular Ultrasound and Magnetic Resonance. *Venue:* Amsterdam, The Netherlands. *Contact:* Mediscon, PO Box 113, NL-5660 AC Amsterdam, The Netherlands.

Sun 20 May 2001 - 3 days 5th World Congress of Echocardiography and Vascular Ultrasound. *Venue:* International Convention Center Seoul, South Korea. *Contact:* Organising Secretariat: International Society of Cardiovascular Ultrasound, PO Box 323, Gardendale, AL 35071 USA, Ph: 205 934 8256; Fx: 205 934 6747; Email: lindyc@uab.edu

Mon 21 May 2001 DDU Part I and II Written Examination. *Contact:* DDU Co-ordinator. ASUM, 2/181 High Street, Willoughby, NSW, 2068. Ph: 61 2 9958 7655; Fx: 61 2 9958 8002; Email: asum@asum.com.au

Fri 1 Jun 2001 DMU Examinations. Closing date for Part I and Part II Examinations. *Contact:* DMU Co-ordinator, ASUM, 2/181 High Street, Willoughby, NSW, 2068. Ph: 61 2 9958 7655; Fx: 61 2 9958 8002; Email: dmu@asum.com.au

Sat 16 Jun 2001 DDU Part II Examination. Oral Examinations except Cardiology candidates. *Venue:* Sydney except Cardiology candidates. Cardiology candidates will be examined in Melbourne on a date to be determined. *Contact:* DDU Co-ordinator. ASUM, 2/181 High Street, Willoughby, NSW, 2068. Ph: 61 2 9958 7655; Fx: 61 2 9958 8002; Email: asum@asum.com.au

Sat 23-24 June 2001 - 2 days ASUM Vascular Ultrasound Workshop 2001. *Venue:* St Vincent's Hospital, Melbourne. *Contact:* ASUM, 2/181 High St, Willoughby, NSW, 2068. Ph: 61 2 9958 7655. Fax: 61 2 9958 8002 Email: asum@asum.com.au

Tue 26 Jun 2001 Sixth Annual Symposium on Contrast Echocardiography. *Venue:* Sheraton Seattle Hotel and Towers, Seattle, Washington. *Contact:* ATL Learning Centre; Website: www.atl.com or Email: ATL-Bothell.learning-center@Philips.com

July 2001 ASUM Queensland Education Program. Vascular Meeting. *Venue:* Mater Public. *Contact:* Roslyn Savage, Email: markros@powerup.com.au; Fx: 61 7 3881 2464

Wed 4 Jul 2001 - 4 days 10th International Congress on Twin Studies. *Venue:* Imperial College, London, United Kingdom. *Contact:* Congress Secretariat, 51 Westmoreland Road, London SW13 9RZ, UK. Fx: 44 20 82874427; Email: jwgowing@netcomuk.co.uk

Thu 12 Jul 2001 - 4 days NZASUM 2001. New Zealand Branch Annual Scientific Meeting. *Venue:* Millennium Hotel, Queenstown. *Contact:* Mike Heath; Email: m_lheath@xtra.co.nz

Sun 5 Aug 2001 - 4 days CSANZ - 49th Annual Scientific Meeting. *Venue:* Auckland, New Zealand. *Contact:* Organising Secretariat: The Conference Company, PO Box 90-040, Auckland. Ph: 64 9 360 1240; Fx: 64 9 360 1242; Email: infor@tcc.co.nz

Sat 25 Aug 2001 DMU Examinations. Part I and Part II written examinations. *Contact:* DMU Co-ordinator, ASUM, 2/181 High Street, Willoughby, NSW, 2068. Ph: 61 2 9958 7655; Fx: 61 2 9958 8002; Email: dmu@asum.com.au

September 2001 ASUM Queensland Education Program. Vascular Meeting. *Venue:* RBH. *Contact:* Roslyn Savage, Email: markros@powerup.com.au; Fx: 61 7 3881 2464.

Fri 7 Sep 2001 ASUM 2001-Annual Scientific Meeting. *Venue:* Darling Harbour Convention Centre, Sydney. *Contact:* ASUM, 2/181 High Street, Willoughby NSW 2068. Ph: 61 2 9958 7655; Fx: 61 2 9958 8002; Email: asum@asum.com.au

Tue 23 Oct 2001 11th World Congress on Ultrasound in Obstetrics and Gynecology. *Venue:* Melbourne, Australia. *Contact:* Andrew Ngu, c/- ISUOG, 3rd fl., Lanesborough

Wing, St George's Hospital Medical School, Cranmer Terrace, London SW17 ORE, UK. Ph: 44 20 8725 2505; Fx: 44 20 8725 0212 Email: johnson@sghms.ac.uk

Tue 23 Oct 2001 - 4 days Congress of the Asian Fed. of Soc. for Ultrasound in Medicine and Biology. *Venue:* The Shangri-La Hotel, Kuala Lumpur, Malaysia. *Contact:* Mrs Janet Low, Executive Secretary, Department of Radiology, University of Malaya, Medical Centre, 59100 Kuala Lumpur, Malaysia. Ph: 60 3 750 2069; Fx: 60 3 758 1973; Email: janetl@medicine.med.um.edu.my

Fri 26 Oct 2001 - 3 days Annual Meeting Society of Radiologists in Ultrasound. *Venue:* Inter-Continental Hotel, New Orleans, LA, USA. *Contact:* Susan Roberts, Administrative Director, 44211 Slatestone Court, Leesburg, VA 20176-5109, USA. Ph: 1 703 858 9210; Fx: 1 703 729 4839; Email: info@sru.org

November 2001 ASUM Queensland Education Program. Vascular Meeting. *Venue:* Queensland X-ray. *Contact:* Roslyn Savage, Email: markros@powerup.com.au; Fx: 61 7 3881 2464.

Tue 27 Nov 2001 ASUM Victorian Branch Scientific Meeting. Combined ASUM/ASA case presentation night. *Contact:* Mark Brooks, Ph: 61 3 9496 5431; Fx: 61 3 9459 2817

Tue 11 Dec 2001 - 4 days EUROSON 2001 and 33rd BMUS Annual Scientific Meeting. *Venue:* EICC, Edinburgh, Scotland. *Contact:* BMUS, 36 Portland Place, London WIN 3DG, UK. Ph: 44 20 7636 3714; Fx: 44 20 7323 2175; Email: euroson@bmus.org; Website: www.bmus.org

Dr Gregory Bruce Davison (1947 - 2000)

Gregory Bruce Davison died on 15 June 2000 at the Western General Hospital, Edinburgh, his tragic diagnosis of cancer having been made only nine months earlier.



Greg was one of the grandfathers of ultrasound in the obstetric community and achieved recognition through his focus upon patient service and patient care which was provided through his outstanding technical skills in diagnostic ultrasound.

Greg was born in New South Wales on 17 July 1947. He studied medicine at Sydney University graduating in 1970 and completed his intern year at the Royal Prince Alfred Hospital. He was invited to stay a further year as Senior House Officer in 1971. He next moved overseas to Ailesbury and spent two years at the Stoke Manderville Hospital. In 1974, he took up a position as Registrar at the prestigious John Radcliff Hospital in Oxford. His next move was Glasgow, the place where Greg

first developed his life-long interest in ultrasound, for it was here that he made contact with Professor Ian Donald, the doyen of obstetric ultrasound. After two years, Greg and Caroline moved to Melbourne where Greg took up the position as Second Assistant at the Royal Women's Hospital. Later he was to become one of the pioneers in establishing an obstetric ultrasound service in Melbourne.

Over the next ten years, Greg practised both obstetrics and ultrasound but as technical innovations in ultrasound developed with great speed, Greg gravitated towards it. By 1985, he was in full time ultrasound practice and opened rooms at Mulgrave. His innovative approach to obstetric sonography, his obsession to fine detail, his expert knowledge of fetal cardiology and enthusiasm for teaching travelled far and wide. In particular, he was one of the first if not the first in Australia to develop the area of fetal cardiology and recognise its importance. Greg believed firmly in himself and commanded great respect from sonologists, obstetricians, gynaecologists, general practitioners and sonographers alike.

Greg was equally revered and loved by his patients. He will be remembered as a kind, thoughtful and caring man.

Greg is sadly missed by us all, especially by his wife, Caroline and family, Arabella, Prue, Melanie, Angus and Rosamund. Time will hopefully ease the feelings of pain and anguish, and treasured memories will hopefully fill the gap left by this very sad loss.

Simon Meagher

Council Members

President

Stan Barnett, NSW

Immediate Past President

Andrew Ngu, Vic

Honorary Secretary

Mary Young, Vic

Assistant Honorary Secretary

Kaye Griffiths, NSW

Honorary Treasurer

Maurice Molan, Vic

Medical Councillors

Matthew Andrews, Vic

Roger Davies, SA

Rick Dowling, Vic

George Larcos, NSW

Neil Orr, Qld

David Rogers, NZ

Fergus Scott, NSW

Scientific Councillor

Dave Carpenter, NSW

Sonographer Councillors

Stephen Bird, SA

Jane Fonda, NSW

Janine Horton, WA

Roy Manning, SA

Pru Pratten, Vic

Co-opted

Gary Sholler, NSW – Cardiac

Charles Fisher, NSW - Vascular

Branches (not represented)

Rob Jones, Tas

Iain Duncan – ACT

Associate Members' Representative

Kim Smith, WA

Corporate Members' Representative

David Rigby, NSW

Ex-Officio

James Syme, Vic – Chairman, DDU, NSW

Jill Clarke – Chairman, DMU

Executive Committee

Andrew Ngu, Vic

Maurice Molan, Vic

Mary Young, Vic

Fergus Scott, NSW

Stephen Bird, SA

Kay Griffiths, NSW

Committee and Board Chairmen

DDU Board - Chris Wriedt, Vic

DMU Board - Jill Clarke, NSW

Education Committee - Dave Rogers, NZ

Marketing Committee - Luke Fay, NSW

Medical Affairs Committee - Fergus Scott, NSW

Safety Committee - Stan Barnett, NSW

Scientific Meetings Committee - Rick Dowling, Vic

Sonographer Affairs Committee - Stephen Bird, SA

Standards of Practice Committee - Cheryl Bass, Vic

Corporate Members

Acuson P/L (*Acuson*)

Andrew Hartmann 02 9201 7777

Agfa-Gevaert Ltd (*Scopix, Matrix Images, Digital Memories*)

David Chambers 03 9264 7711

Agilent Technologies (*Hewlett Packard*)

Beverley Jacobson 02 9805 6223

ATL Ultrasound (*ATL, ADR*)

Alwyn Reynolds 02 9452 6666

Australian Medical Couches (*Couch Manufacturer*)

Ros Russell 03 9589 3242

Central Data Networks (*Teleradiology/Computer Networks*)

Robert Zanier 02 4276 2501

Diasonics GE P/L (*Logia*)

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Guidelines for authors

Authors are invited to submit papers for publication in the following categories. Final responsibility for accepting a paper lies with the Editor, and the right is reserved to introduce changes necessary to ensure conformity with the editorial standards of the *Bulletin*.

ORIGINAL RESEARCH

Manuscripts will be subject to expert referee prior to acceptance for publication. Manuscripts will be accepted on the understanding that they are contributed solely to the *Bulletin*.

QUIZ CASES

A case study presented as a quiz, involving no more than three or four images and a paragraph briefly summarising the clinical history as it was known at the time. It will pose two or three questions, and a short explanation.

CASE REPORTS

Case reports are more substantial presentations resembling short scientific papers which illustrate new information, or a new or important aspect of established knowledge.

FEATURE ARTICLES

Feature articles are original papers, or articles reviewing significant areas in ultrasound and will normally be illustrated with relevant images and line drawings. Feature articles are commissioned by the Editor who will indicate the size and scope of the article.

FORUM ARTICLES

Members are invited to contribute short articles expressing their observations, opinions and ideas. Forum articles should not normally exceed 1000 words in length. They will not be refereed but will be subject to editorial approval.

CALENDAR ITEMS

Organisers of meetings and educational events relevant to medical ultrasound are invited to submit details for publication in the *Bulletin*. Each listing must contain: activity title, dates, venue, organising body and contact details including name, address, phone number, facsimile number (where available) and email address (where available). Notices will not usually be accepted for courses run by commercial organisations.

CORPORATE NEWS

Corporate members are invited to publish news about the company, including structural changes, staff movements and product developments. Each corporate member may submit one article of about 200 words annually. Logos, illustrations and tables cannot be published in this section.

FORMAT

Manuscripts

Manuscripts should be submitted in triplicate in print and on PC formatted diskette as MS Word documents.

- Font size: maximum 12, minimum 10
- Double spacing for all pages
- Each manuscript should have the following components: Title page, abstract, text, references, tables, legends for illustrations.
- Title Page should include the following:

- ❖ Title of manuscript, the full names of the authors listed in order of their contribution to the work, the department or practice from which the work originated, and their position.
- ❖ Corresponding author's name, contact address, contact telephone number and facsimile number (where available) for correspondence.

- Abbreviations may be used after being first written in full with abbreviation in parentheses
- Relevant references should be cited using the Vancouver style, numbered according to the sequence of citation in the text, and listed in numerical order in the bibliography.

Vancouver style format should be used.

Examples of Vancouver style:

1. In-text citation: ...as documented in previous studies (1-3). Note: Not superscript
2. Journal article: Britten J, Golding RH, Cooperberg PL. Sludge balls to gall stones. *J Ultrasound Med* 1984;3:81-84
3. Book: Strunk W Jr, White EB. The elements of style. (3rd ed.) New York: Macmillan, 1979
4. Book section: Kriegshauser JS, Carroll BA. The urinary tract. In: Rumack CM, Wilson SR, Charboneau JW, eds. *Diagnostic Ultrasound*. St Louis, 1991: 209-260

Abstract

All manuscripts for Feature Articles and Original Research must include an abstract not exceeding 200 words, which describes the scope, major findings and principal conclusions. The abstract should be meaningful without reference to the main text. Up to 8 key words should be listed at the end of the abstract to assist in indexing.

Images

Images may be submitted as hard copy (in triplicate) or in digital format. All images sent must have all personal and hospital or practice identifiers removed. **Please do not embed images in text. Separate images are required for publication purposes.**

Hard copy images should be presented as glossy print or original film. Any labelling should be entered on the front of the glossy print using removable labels (eg Letraset). On the back of the print include the authors name, figure number and a directional arrow indicating the top of the print.

Digitised graphics should be supplied on PC formatted 3.5" diskette, which must be clearly labelled with the author's name and the names of the image files. TIFF files are preferred.

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