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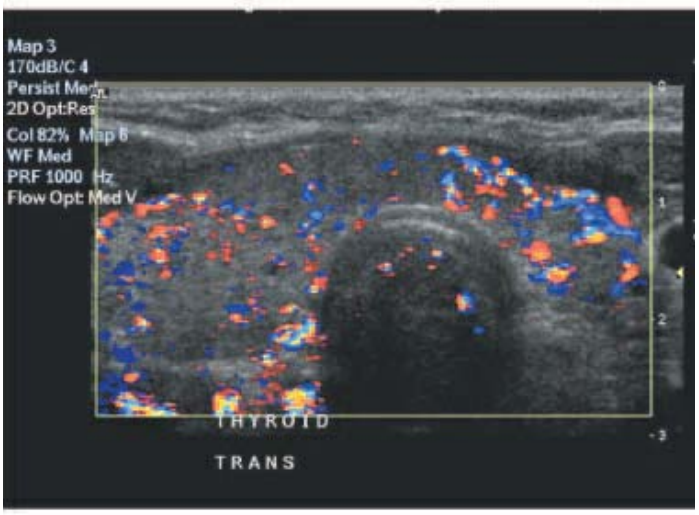
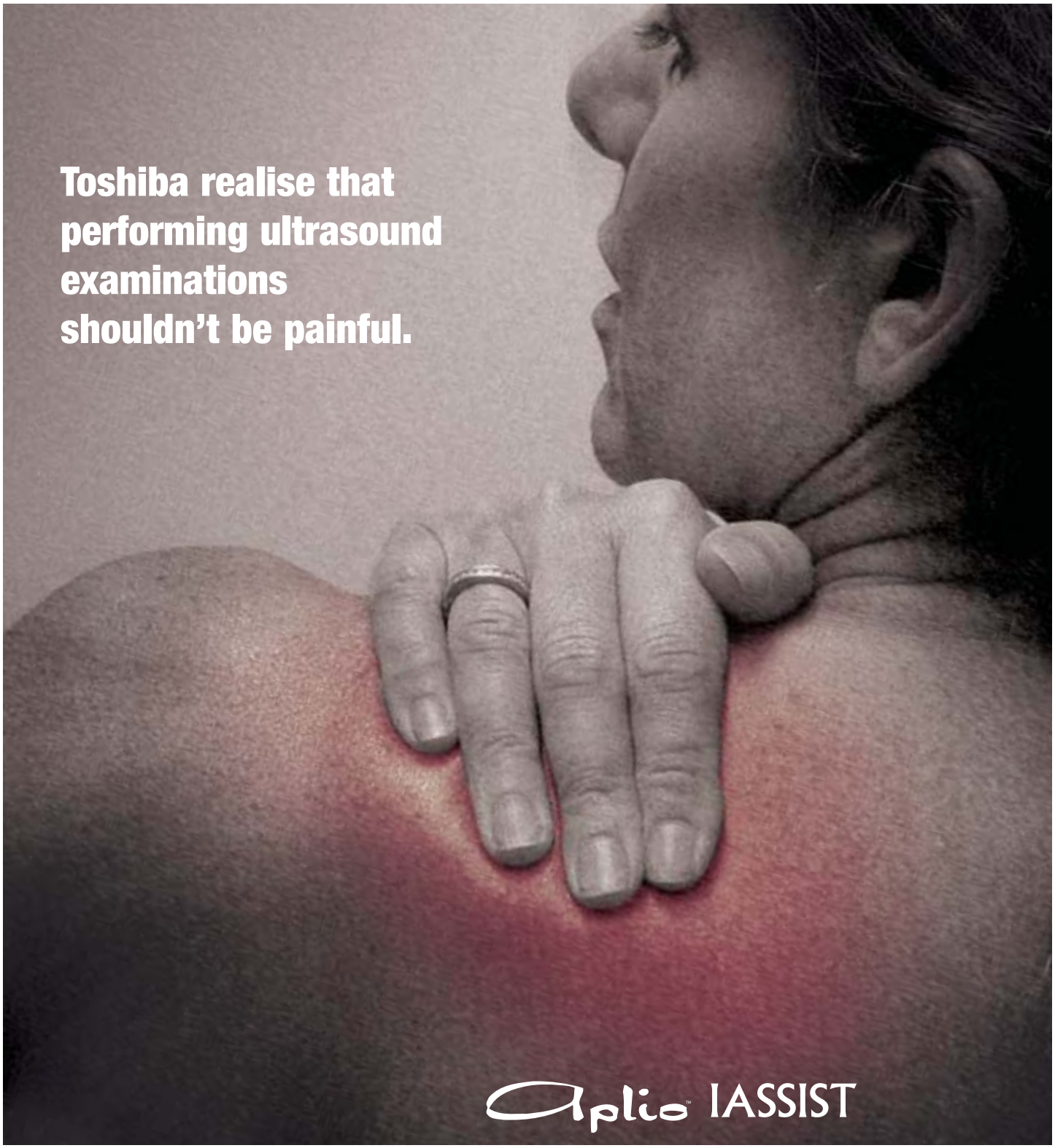
Australasian Society for Ultrasound in Medicine

ULTRASOUND BULLETIN

Annual report included with this issue
Notice of ASUM AGM
25 September 2004
ASUM Annual Scientific Meeting
23–26 September 2004
Kuala Lumpur 2004 Asia-Link Meeting
5–6 November 2004
ASUM Multidisciplinary Workshop
17–19 March 2005



- First trimester ultrasound and serum screening
- Measuring head engagement
- Amiodarone induced thyrotoxicosis
- The role of ultrasound in evaluating patients with RLQ pain
- An historical look at ultrasound
- Proforma sonographer observations



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Australasian Society for Ultrasound in Medicine

ULTRASOUND BULLETIN

ASUM Ultrasound Bulletin 2004 August 7: 3

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Editorial contributions
Original research, case reports, quiz cases, short articles, meeting reports and calendar information are invited and should be addressed to The Editor and sent to ASUM at the address below
Membership and general enquiries
should be directed to ASUM at the address below

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Notes from the Editor

The ASUM Council has decided to substantially enhance the scope of ultrasound research in Australasia. While the clinical standards of practice in Australia and New Zealand are extremely high, the output of scientific studies and reports in the area of clinical and basic scientific ultrasound research lags well behind in comparison.

With advances such as tissue harmonic imaging, 3-D imaging, tissue elasticity imaging and improvements in digital post processing, ultrasound is at the forefront of non-invasive health care. Australian and New Zealand ultrasound researchers should be working to advance our understanding of appropriate and cost effective applications for this technology.

ASUM Council has set a target of $A1 million for the ASUM Research Fund to enable the funding of a number of significant locally based research projects over the upcoming five-year period. Results from these projects will be targeted for presentation at WUFMB 2009 in Sydney.

To this end, the Research and Grants Committee of ASUM has been substantially revamped, with detailed guidelines now established and approved by Council for the process of allocation and supervision of research grant monies. Preference will be given to projects that are particularly pertinent to Australian and New Zealand disease and treatment patterns.

All applications will be awarded on a competitive basis, with scientific merit, financial accountability and successful project completion being core requirements.

ASUM has already allocated or forward committed funds to meet almost half the target amount. Our commercial colleagues are now being asked to contribute in a substantial way achieving this target.

This is a unique ASUM initiative to significantly influence the pattern of ultrasound research in Australia and New Zealand. Your contribution is invited.

Roger Davies
ASUM Bulletin Editor

CORRECTION MAY 2004 ISSUE. PAGE 39. The report on the Chris Kohlenberg Travelling Fellowship 2003 was submitted by Jenifer Kidd.

President's message

Dr Glenn McNally

Roger Davies and Keith Henderson have as usual produced an *Ultrasound Bulletin* with an excellent array of articles and information. Kaye Griffiths has produced an excellent historical article following on from the issue of a set of stamps by Australia Post to do with innovation. Ultrasound has been recognised within this set of five stamps as being a major innovation substantially developed within Australia. This reminds all of us of the tremendous debt of gratitude that we owe to pioneers of this technology, many of whom have been significantly involved with ASUM over the years. Once again some proforma sonographer's observations sheets are contained within this issue. These are designed to promote discussion and provide assistance. They do not constitute standards of practice statement, however, we hope to produce a series for general use by our members.

Research and grants guidelines

A statement is provided by the Research and Grants Committee regarding guidelines and submission for research projects. I urge everybody to carefully read this statement and support the activities of the Committee.

ASUM 2004

The Sydney 2004 Annual Scientific Meeting is almost upon us. An excellent scientific and social program has been organised and I look forward to meeting many of you at the Star City Casino Complex, Darling Harbour between 23 and 26 September.

Completion of presidential term

As I near the completion of my term as ASUM President I am pleased to report to you that the Society is in excellent shape, both financially and in terms of the range and scope of its activities.

The Council has operated in a most efficient and effective manner over the past year. This is in no small part due to the changed structure consequent upon the new Constitution adopted now over two years ago. All Councillors are actively engaged in at least one Committee and usually several other projects that ASUM is involved with. This has, of course, created a greater burden for each individual and I would like to acknowledge their great efforts over the last year and thank them on behalf of all members of our Society. The Council has received great support from our CEO, Dr Caroline Hong, and all staff within the office, Keith Henderson, James Hamilton, Iris Hui, Marie Cawood, Judy Vickress and Chris Phippen.

DMU and DDU

Both the DDU and DMU are functioning well. There are of course improvements that can be made to each, and both the DDU and DMU Boards of Examiners are continually working with both the DDU Development and Medical Affairs Committee and DMU Advisory and Sonographer Affairs Committee. The numbers of candidates for both DDU and DMU remain high and general candidate satisfaction is also high. I would like to thank all Board members and examiners for DDU and DMU for their efforts in ensuring that the high standards of practice in existence in Australia and New Zealand are maintained. In particular I would like to thank the Chair of each Board of Examiners – Dr Chris Wriedt and Mrs Roslyn Savage.

The project of developing education modules for clinicians performing self referred, focused ultrasound examination has almost been completed. I would like to thank Mike Dadd for his work in producing an online physics/instrumentation module for this project. This program of education will become firmly established in the next 12 months.

Quality improvement

ASUM is becoming increasingly involved with quality improvement activity. The Society has been invited to participate in the RANZCR/NATA Quality Assurance Program and has canvassed these matters with representatives from the Commonwealth Department of Health and Ageing.

Our Research and Grants Committee has produced Guidelines and an Invitation of Submissions with a view to providing, in the near term, some limited funding for research projects. Some of these projects will involve quality assurance/quality improvement. Our overall target remains to have $A1 million in this fund to support substantial projects over the long term.

The Education Committee launched the Ultrasound Clinical Handbook in February this year. The culmination of three years' work, this handbook is now available as a resource to assist members in their daily professional lives.

ASUM Asia Link Program

The first Asia Link Program joint Scientific Meeting was held in Bangkok in November 2003. Both ASUM and MUST regarded the meeting as a great success in terms of the provision of education to a large number of Thai medical practitioners involved in the provision of diagnostic ultrasound services. A small number of ASUM members attended and I

Australasian Society for Ultrasound in Medicine

ASUM Meetings 2004
Australasian Society for Ultrasound in Medicine

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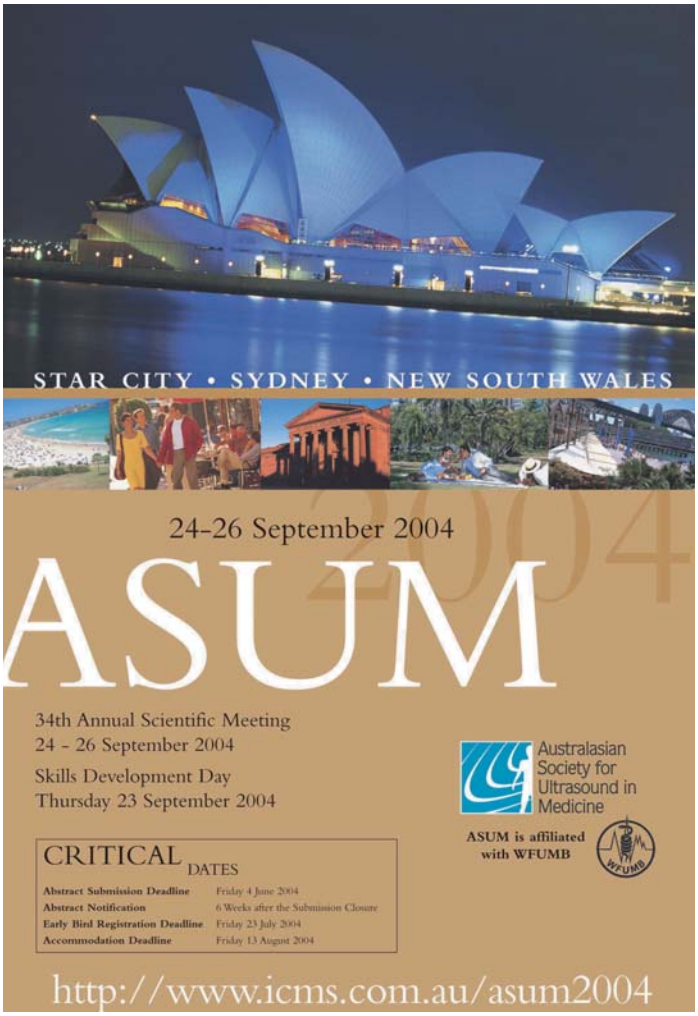
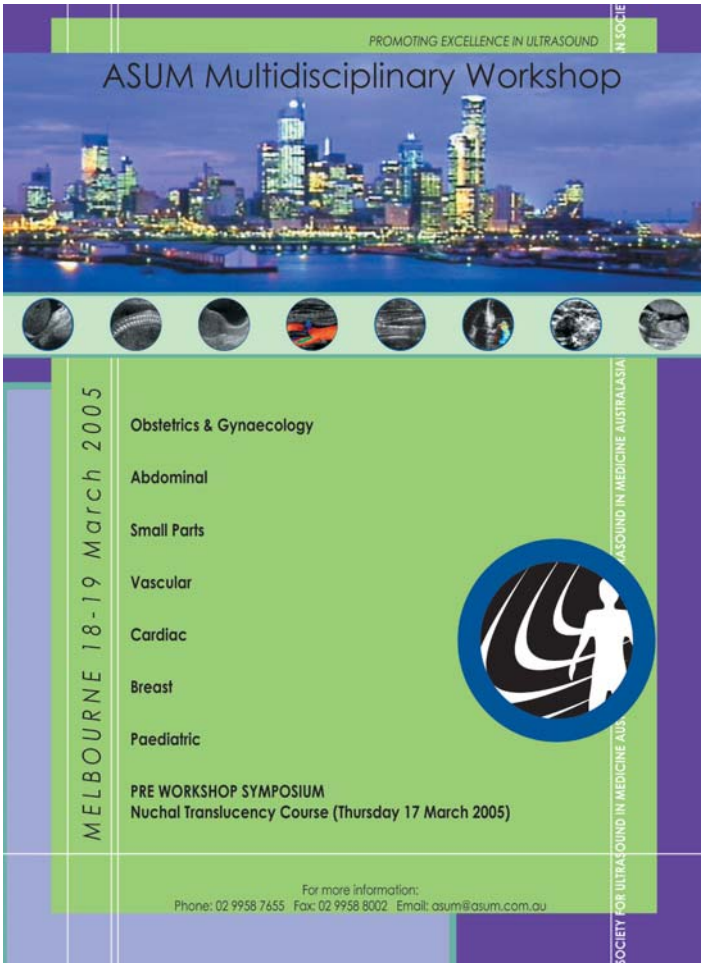
See the ASUM web site www.asum.com.au for the latest updates on ASUM meetings.





would ask that members consider attending future meetings, the next being in Kuala Lumpur in November 2004. Future meetings are planned for Indonesia, Thailand, China, the Philippines and India. ASUM's future will see increasing links with other societies within Asia which I believe will provide substantial benefits to our Society.

A product of the ASUM Asia Link Program has been the signing of a Memorandum of Understanding with Vision College in Malaysia. This is a private sector educational institute which is introducing sonographer education and training to the South East Asia region. ASUM is providing education support in terms of curriculum and education and will administer the examination process. The first intake of students is planned for early 2005. I believe ASUM can be proud of its role in attempting to better establish the role of diagnostic medical sonography in the region.

Sale of ASUM premises

During the past year Council resolved to sell the property at 2/181 High Street, Willoughby which has functioned as the office for over 10 years. The decision to sell was based in the main on the changed requirements of the secretariat in terms of office space and function. The property was sold in May this year, realising an excellent price. The Society is currently leasing the same space and it is anticipated that a new office location will be found in the next 12 to 24 months.

WFUMB 2009 meeting

Preliminary work has begun on the WFUMB 2009 meeting to be held in Sydney. I would urge all ASUM members to consider attending the WFUMB 2006 in Seoul, Korea. An excellent scientific and cultural program is promised. The Korean organising committee is exceptionally well organised and busy and will undoubtedly deliver an excellent meeting.

Corporate members

ASUM's relationship with our corporate partners is critically important for both our Society and all of our individual members. Technology continually improves allowing for improved diagnostic capability.

We all thank manufacturers for continuing to invest in this technology and provide us with greater diagnostic capability. We also thank them for supporting other activities of the Society not directly related to meetings and trade displays such as the provision of prizes and travelling scholarships from which our members derive such great benefits.

ASUM meetings

Our own meetings in the last year have been well attended and have provided very high standards in education for our members. In particularly I would like to thank Dr Jane Dickinson and her organising committee for the 2003 Annual Scientific Meeting held in Perth, and also Mrs Roslyn Savage for the 2004 Multidisciplinary Workshop at the Gold Coast. These meetings are mammoth logistic exercises requiring a great effort from many people and I thank all of our members for their efforts.

Once again I would like to thank the many members of ASUM who have provided support to me over the past two years. I know you will all join me in wishing Dr David Rogers all the best for his term as ASUM President. I know he will receive great support from you.

My family will hopefully be happy to see more of me and to Sophie, Dominic, Susannah and Eloise my eternal love and gratitude.

Best wishes
Dr Glenn McNally
President ASUM
Email: president@asum.com.au

NOTICE OF ANNUAL GENERAL MEETING 2004

The 2004 Annual General Meeting of the Australasian Society for Ultrasound in Medicine will be held at the Star City Hotel, 80 Pyrmont Street, Sydney on SATURDAY 25 SEPTEMBER 2004 at 10.30. Please look out for signage on the day for the meeting room.

BUSINESS

1 MINUTES of the Annual General Meeting of 6 September 2003
2. ANNUAL REPORTS
2.1 President
2.2 Honorary Secretary
2.3 Honorary Treasurer
3 FINANCIAL REPORT for the year ended 30 June 2004
4 ANNUAL SUBSCRIPTIONS for the year 2005–2006 as recommended by Council:

Medical/Scientific/Sonographer members	$308.00	($297.00 if paid by 30 June 2005)
Associate members	$242.00	($231.00 if paid by 30 June 2005)
Trainee members	$242.00	($231.00 if paid by 30 June 2005)
Retired members	$104.50	($99.00 if paid by 30 June 2005)
Corporate	$1155.00	($1100.00 if paid by 30 June 2005)
(incl 10% GST for resident Australian members only)		
Corresponding members – ordinary	$195.00	($185.00 if paid by 30 June 2005)
Corresponding members – associate	$147.00	($140.00 if paid by 30 June 2005)

5 ELECTION for 2004–2005 COUNCIL
6 LIFE MEMBER, HONORARY FELLOW, HONORARY MEMBER
7 GENERAL BUSINESS

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Dr Caroline Hong
Chief Executive Officer

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CEO's message

Dr Caroline Hong

A copy of the ASUM Annual Report for the period 1 July 2003 to 30 June 2004 financial year is circulated to all full members of the Society with this issue of the *Ultrasound Bulletin*. The Notice of the AGM is also included. The meeting will be held on Saturday 25 September 2004 at Star City Sydney.

The Society has received two nominations for the two vacant positions of Medical/Scientist Councillors. As such there will be no election and the two nominees will be declared elected at the meeting.

At this meeting, Dr Glenn McNally will finish his term of two years as President of ASUM. Dr David Rogers, currently President Elect, will take over as President. I take this opportunity to express my sincere thanks and appreciation for the opportunity to work with and serve Dr Glenn McNally. I have enjoyed my role as CEO immensely during his term. Glenn gave willingly of his time and expertise to the Society and has been a constant source of inspiration to everyone who valued hard work.

His jovial temperament and sense of humour also made him very popular among the staff at the Secretariat and all those who had the opportunity to work with him on Council, Executive, committees and various activities within ASUM.

ASUM building

The search for new premises for the ASUM Secretariat Office in Sydney has begun. The transition from being owners to being tenants was relatively smooth with minimal disruption to services and functions. The money from the sale of the ASUM building is now invested in short term deposit as approved by Council, to be used for the purchase of the new premises. We have up to three years to plan the purchase and move to new premises better suited to accommodate the increasing and changing needs of the Society.

Diploma of Diagnostic Ultrasound – examinations

The DDU Examinations are now completed this year. This year saw an increase in the number of Part 1 candidates.

ASUM is grateful to Dr Chris Wriedt, the DDU Board of Examiners, the volunteer examiners and Marie Cawood for coordinating the examinations held in Sydney, Melbourne, Auckland and Perth. ASUM congratulates the successful candidates. The list is published elsewhere in this issue.

ASUM representatives Dr Glenn McNally, Dr Caroline Hong and Dr Stan Barnett met with representatives from the Indonesian Society for Ultrasound in medicine (ISUM) at AFSUMB 2004 in Utsunomiya

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Dr CV Vanjani of IFUMB (India) proposing collaboration with ASUM representatives at AFSUMB 2004 in Utsunomya

Diploma of Medical Ultrasonography examinations

At the time of writing, preparations for the DMU examinations are almost complete for the 2004 DMU Part I and Part II, which commence on Saturday 31 July. The written examinations will be conducted throughout Australia and New Zealand using 33 venues. This year we have 112 candidates sitting for Part I and 114 candidates sitting for the Part II. Ninety-nine practical examinations will be conducted from August to October, utilising the volunteer services of 57 Practical Examiners.

This year will also see simultaneous OSCE and Oral examinations being held on Saturday 16 October for cardiac and vascular candidates (cardiac in Brisbane and Melbourne and vascular in Sydney) and on Saturday 23 October for obstetric and general candidates (obstetric in Sydney and general in Christchurch, Perth and Sydney.) Enquiries should be directed to James Hamilton, DMU Coordinator email dmu@asum.com.au or call +61 2 9958 7655.

Ultrasound Imaging 1976

ASUM is grateful to Australia Post for giving us permission to reproduce the image of the stamp depicting 'Ultrasound Imaging 1976' in the Australian Innovations Stamp series. This stamp is one of a set of five. The other Australian innovations include the Black Box Flight Recorder 1961, Racecam TV Sport Coverage 1979, Baby Safety Capsule 1984 and Polymer Banknotes 1988. These stamps were designed by Mike Heine, to raise the profile of these Austarlian innovations that can be found all around the world. Members wishing to obtain the single stamp, First Day Cover, Stamp Pack or Maximum cards are advised to contact your local post office anywhere in Australia or email mailorder@auspost.com.au

ASUM Research and Grants

We are proud to advise that we now have $A250,000 in the Research and Grants fund, having started with nothing in 2001. These funds have been generated mainly from the surplus of successful meetings in the last two years. We are also grateful to those members who have donated to ASUM towards this fund. ASUM aims to accumulate at least $A1 million for the fund to be sustainable to fund research and grants to members and worthy projects.

DMU (Asia)

Recently, the Executive Director of Vision College, Mr Wee Loong Lee visited the ASUM office in Sydney and met with several ASUM representatives to advance the planning of the College and the intake of DMU (Asia) students. It has been decided that the first intake will take place in January 2005. The ASUM Council has also nominated medical and sonographer members to be involved on the Advisory Panel and Board of Examiners for DMU (Asia) of the College. ASUM is also assisting Vision College in its recruitment process for a DMU Sonographer Lecturer to be based in Kuala Lumpur.

AFSUMB 2004 in Utsunomiya Japan

Dr Stan Barnett, Dr Glenn McNally and I attended the Congress of the Asian Federation Societies for Ultrasound in Medicine and Biology held in Utsunomiya, Japan in May this year. The Congress, which was convened by Prof Itoh, provided an interesting program for all.

While in Japan, we were privileged to be hosted by Dr Hiroki Watanabe, Immediate Past President of WFUMB, in Kyoto at his home with his family. We also visited the Toshiba Medical Systems factory at Nasu where we spent an informative day with the Toshiba team.

Dr Kittipong Vairojanavong completed his term as President of AFSUMB at the General Assembly and Prof Byung Ihn Choi was elected as the new President. We had many opportunities to meet and establish key contacts and networks for ASUM relating to the ASUM Asia Link Program and the WFUMB 2009 Congress. The presence of representatives of the India Federation and the Indonesian Society meant that the Congress was also an opportunity for us to establish friendships and encourage delegates from Japan and Asia to visit Australia in the future to attend our ASUM meetings.

ASUM NZ meeting

There are about 200 members in the New Zealand Branch of ASUM. The recent annual NZ Branch meeting attracted about 130 people to Rydges Hotel in Christchurch 24–26 June.

ASUM would like to thank Rex de Ryke, Convenor of the ASUM NZ 2004, Jo Mullen and the local Organising Committee for creating such a successful, interesting and fun meeting. The dinner, which was held at the Antartic Centre, also gave delegates a unique experience during the conference. The ASUM Council meeting was held at the same venue on 25 June 2004. All Councillors also attended the scientific meeting and the AGM of the ASUM NZ Branch. Many delegates from New Zealand commented that it was good for them to have the opportunity to meet and speak with Council members at their meeting.

Coming soon . . . ASUM ASM 2004

Registrations are coming in steadily for the 2004 ASM to be held at Star City Sydney from 23–26 September. All exhibition booths are also already sold, indicating good progress for this meeting. I urge all members to register early to avoid disappointment, especially with the limited Skills Day program.

There are always cheap Internet airfares to Sydney if you plan your travel arrangements early enough. Sydney will be at its best in September, with beautiful blue skies, sunshine and flowers in full bloom.

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Pre- and post-tours to the Hunter Valley, Blue Mountains and Shoalhaven are also all within reach for short stayers. Bondi Beach, Palm Beach, Manly Beach – we have them all within easy reach of the city. So, get your act together and plan to be in Sydney from 23–26 September. A registration brochure is enclosed with this Bulletin. You can also register online on at www.icms.com.au/asum 2004 or see our web site www.asum.com.au for details.

ASUM 2004 Asia Link Malaysia 5–6 November 2004

All the planning is in place for this meeting, which will be a golden opportunity for members to combine learning with leisure. Malaysia is becoming increasingly popular as a destination for meetings and conventions, with great shopping, beautiful island resorts and ecotourism.

The meeting will be held at the Sheraton Imperial Hotel right in the centre of Kuala Lumpur. Booking directly with Malaysian Airlines as indicated on the registration form will give you eligibility to travel at the discounted rate negotiated for travellers from Australia and New Zealand.

A registration brochure is enclosed with this Bulletin. Also see our web site www.asum.com.au for details.

Toshiba Medical ultrasound division hosted ASUM representatives at Nasu in Japan during AFSUMB 2004 meeting

ASUM meetings and WFUMB 2009 World Congress promotion

Members presenting lectures overseas or locally are welcome to contact the Secretariat for images of ASUM meetings and WFUMB 2009 Congress to include in your presentation. Help promote your society locally and internationally every time you speak or lecture at a meeting. Email asum@asum.com.au

2005 diary dates

Mark these dates in your diary for the four annual major meetings in 2005

ASUM Multidisiciplinary Workshop 2005
Melbourne Convention Centre
18–19 March 2005.

ASUM New Zealand 2005
Wellington Convention Centre
29–31 July 2005, joint with RANZCR NZ Branch.

ASUM Annual Scientific Meeting 2005 Adelaide from 29 September to 2 October 2005.

ASUM Asia Link Thailand
Bangkok 3–4 November 2005.

Dr Caroline Hong
Chief Executive Officer
Email carolinehong@asum.com.au

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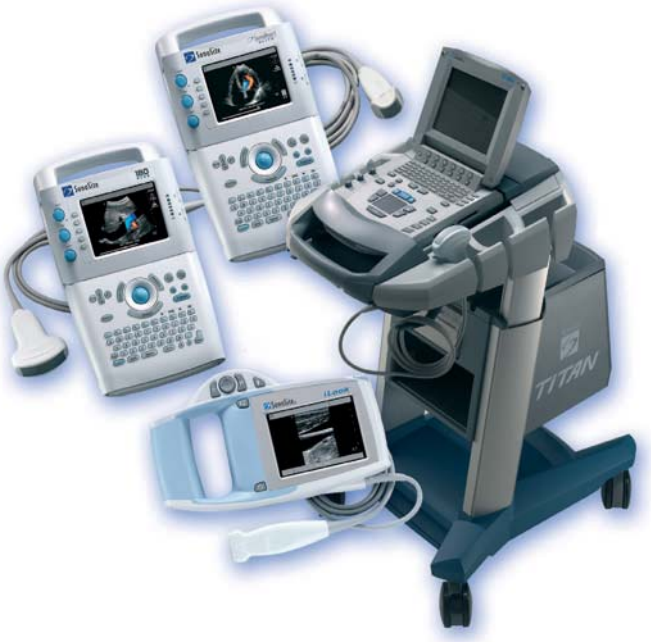

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Greg Brand is a 25 year senior management veteran of the ultrasound industry and is the managing director of SonoSite Australasia.

Shelley Thomson is SonoSite's clinical marketing manager for Australasia. She has over 14 years experience in the ultrasound industry and, similarly to Greg, is widely-known through past positions with ATL and with Philips.

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How much do women know about first trimester ultrasound and serum screening?

RJ Benzie, N Kennedy, R Martin, B Mein, F Miceli, R Thavaravy and A Webb

Introduction

Antenatal screening for Down Syndrome is widely accepted by Australian pregnant women who prefer the earliest possible screening test. But concern has been expressed about the lack of information possessed by women having ultrasound in early pregnancy[1–8].

At our institution first trimester nuchal translucency screening was started in 1999 and serum PAPP-A and βHCG screening added in 2001. To date 4570 women have been screened. In the last year of testing, there has been a 50% increase in uptake by our patients.

All women are counselled before the scan by midwives, general practitioners or specialists. In spite of this it seemed that womens' knowledge of first trimester ultrasound and screening for Down Syndrome was incomplete. To gain a better understanding of this, we undertook the present study.

Method

A questionnaire was devised and given to 400 consecutive patients attending the Christopher Kohlenberg Department of Perinatal Ultrasound for first trimester Down Syndrome screening. It was completed before either the scan or the blood collection were performed.

The 25 questions pertained to knowledge about:

a Safety
b The process of ultrasound scanning
c What a first trimester scan can show
d Down Syndrome screening

The project was given approval by the Ethics Committee of Wentworth Area Health Service. It began on 6 January 2003 and the 400th questionnaire was completed on 29April 2003.

	% of women
Unsure of ultrasound safety	18
Unsure if this is routine	50
Had not been told by caregiver of safety	30

Table 1 Knowledge of safety issues

Correspondence to
RJ Benzie
Christopher Kohlenberg Department Of Perinatal Ultrasound
Nepean Hospital
University Of Sydney
Penrith, NSW 2750
Australia
tel +61 2 4734 3163
email benzier@wahs.nsw.gov,.au

Knowledge of the scanning procedure was poor	% of women anwering yes
Aware of what to expect when being scanned	52
Knew they could refuse a scan	64
Aware that the examination was done by the abdominal route	56
Knew who does the examination	61
Aware of medical involvement in reporting	76

Table 2 Knowledge of the ultrasound process

Results

Questions on safety of first trimester ultrasound

- 18% did not know if ultrasound was safe at this time of pregnancy
- 52% thought such a scan was 'routine'
- 30% indicated they had not been told that first trimester ultrasound was safe.

Discussion

It is a concern that over half of the women in our sample thought the first trimester screening scan was 'routine'. It was also noted in the second trimester screening study of Al-Jader et al[1]. from Wales where most women thought it was routine.

In spite of our patients being referred by health care providers, more than half did not know what to expect when being scanned (Table 2). Indeed, the lack of knowledge of the ultrasound process was astonishing and suggests caregivers take for granted that patients have more information than they do.

Table 3 indicates that there needs to be more information available to patients about what a first trimester scan can show. The fact that 86% of women believed that Down Syndrome could be diagnosed by a first trimester scan is troubling. That almost half believed spina bifida could be diagnosed at that scan is equally troubling.

Although Table 4 indicates that the majority of women thought they had enough information, clearly they did not. With regards to Down Syndrome screening Table 5 reveals that 38% of women did not know they were to have a blood test as part of the screen. Almost half were unaware they could refuse the blood test.

Knowledge of what a first trimester ultrasound may reveal was incomplete

	% of women answering	
	Yes	Don't know
Ultrasound will tell me if baby has a problem	85	7
Scan will tell me if baby is right size	71	21
If more than one operator involved this means there is a problem	10	54
Ultrasound will tell if baby's organs present	42	45
Some abnormalities can be diagnosed even this early	85	14
It is possible to diagnose Down Syndrome by this scan	86	9
Twins can be diagnosed today	89	9
Spina bifida can be diagnosed today	46	49
The scan will tell me when baby is due	83	12
The scan today will tell me the baby's sex	7	37

Table 3 What a first trimester scan can show

	% of women answering	
	Yes	Don't know
Did you have enough information to decide whether or not to have an ultrasound?	86	9
Should everyone have routine ultrasound in early pregnancy?	70	20
If anything is wrong on the scan should people be informed of their choices?	98	1

Table 4 Opinions

While only one-third indicated they knew much about Down Syndrome, surprisingly only 30% answered that they would like to have had more information on Down Syndrome, suggesting that the attitude to screening is one of compliance to a routine. Al-Jader et al.[1] also comment on this behaviour.

Only 74% of our patients were aware further testing was available in the case of a problem with the scan.

Pearson chi-square test was done after cross-tabulation between all questions and the referral source. This revealed that, except for two questions relating to issues of how the scan is done and what medical personnel involvement there is, regardless of the referring caregiver, knowledge was lacking across all referral categories.

	% of women answering yes
Did you know you were to have a blood test for Down Syndrome?	62
Did you know you could refuse the blood test?	48
Do you know much about Down Syndrome?	34
Would you like to have had more information on Down Syndrome?	30
Were you aware that further testing is available if there is a problem on today's scan?	74

Table 5 Questions relating to information about Down Syndrome screening

Referred by	% of women
Midwife	11.5
Family doctor	63.4
Specialist	25.4

Table 6 Referral source

Conclusion

Results of our analysis of 400 women attending for the first trimester serum screen and nuchal translucency scan reveal a major lack of knowledge of almost all aspects of the procedure.

We need to do more to inform caregivers and women attending for first trimester screening, so that they can make truly informed choices.

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Measuring head engagement: a blinded comparison of abdominal palpation, vaginal examination and two ultrasound methods

Hans Peter Dietz and Valeria Lanzarone

Engagement	n	mean	StDe	v-------+---------+---------+------
1/5 above	12	2.21	16.71	(----*-----)
2/5	20	-0.16	10.06	(---*---)
3/5	29	-11.43	12.81	(--*---)
4/5	26	-16.02	13.35	(--*---)
5/5	6	-29.28	21.95	(------*-------)
				-------+---------+---------+-------
				-30 -15 0

Table 1 ANOVA graph of abdominal head palpation versus translabial ultrasound determination of head engagement (blinded, using Method B); n = 93, p < 0.001.

Introduction

Head engagement in late pregnancy can be assessed by translabial ultrasound and has recently been shown to be predictive of delivery mode[1]. In this study we attempted to validate the new method by comparing ultrasound measurements of head engagement with abdominal and vaginal palpation of the station of the fetal head in late pregnancy.

Methods

In a prospective clinical study, 93 nulliparous women between 36 and 40 weeks' gestation were assessed by translabial ultrasound, abdominal palpation of the fetal head and vaginal examination (n = 79) after bladder emptying. Assessors were blinded against each other's findings, obtained within the same hour. Ultrasound was performed by placing a curved array transducer on the perineum. Two methods (A and B), see Figure 1, were used for evaluation. For Method A, we employed a line through the inferoposterior symphyseal margin, parallel to the incident beam, as reference, similar to a technique used for pelvic floor imaging[2]. For Method B, the line of reference was a line vertical to the central axis of the symphysis pubis, placed through the symphyseal margin. Both ultrasound methods were then compared to findings obtained on abdominal and vaginal palpation of the fetal head.

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Results

Translabial ultrasound of head engagement correlated strongly with abdominal palpation expressed as fifths above the brim (methods A, p = 0.01 and B p < 0.001 on ANOVA) see Table 1.

With regard to Bishop scores, there was a weak

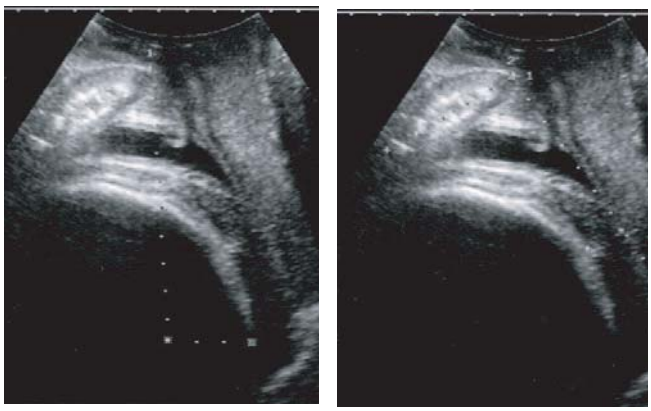

Figure 1 Determination of fetal head engagement by translabial ultrasound. Method A (left) utilises the inferoposterior margin as point of reference, Method B (right) employs a line at 90 degrees to the central axis of the symphysis pubis

Station	n	Mean	StDev	--+---------+---------+--------
-3 or higher	25	-19.64	18.02	(--*--)
-2	31	-11.45	11.68	(-*--)
-1	18	-1.88	9.82	(--*--)
0	3	3.57	13.74	(-------*-------)
1	2	26.15	15.77	(---------*---------)
				--+---------+---------+-------
				-25 0 25

Table 2 ANOVA graph of vaginal palpation of station versus translabial ultrasound determination of head engagement (blinded, using Method B); n = 79, p < 0.001.

but significant correlation with head engagement on ultrasound ($r = 0.382$, $p < 0.001$). Vaginal assessment of station relative to the ischial spines was also significantly associated with head engagement on ultrasound (Method A, $p = 0.03$, and Method B, $p = 0.001$ for ANOVA), see Table 2.

Conclusions

Quantification of head engagement by translabial ultrasound is straightforward and poses no technical difficulties. Measurements correlate well with both abdominal head palpation and vaginal assessment of station relative to the ischial spines.

Correlations between ultrasound measurements and clinical assessment were higher for a method using the central axis of the symphysis pubis for reference. We are now undertaking a prospective study to assess the predictive value of these techniques for intrapartum events.

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Amiodarone induced thyrotoxicosis

BJ Simmons, JF Spurway and RP Davies

Introduction

The thyroid consists of right and left lobes located lateral to the cervical trachea and bounded postero-laterally by the carotid arteries and internal jugular veins. The lobes are connected in the midline by a thin isthmus that lies anterior to the trachea. The thyroid is an endocrine gland that synthesises, stores and secretes thyroid hormones that are used in the maintenance of normal body metabolism, growth and development. It uses blood-borne iodine to manufacture two thyroid hormones: thyroxine (T4) and triiodothyronine (T3). These hormones are stored in the thyroid until required.

When thyroid stimulating hormone (TSH) is released by the pituitary gland, in response to a releasing factor produced by the hypothalamus, the thyroid produces thyroxine (T4). In contrast, only a small amount of triiodothyronine (T3) is actually produced by the thyroid itself. The majority is created in body tissues from the thyroxine that the thyroid has produced. T4 exists in greater quantities than T3 but T3 has a greater effect on metabolism.

Thyrotoxicosis

Thyrotoxicosis or hyperthyroidism is a hypermetabolic syndrome caused by an excess of circulating free thyroxine and free triiodothyronine, or both.

It is a common condition affecting about 2% of women and 0.2% of men. It is characterised by weight loss but increased appetite. The patient is also weak but hyperkinetic, nervous, irritable and emotionally labile. There is also heat intolerance, a fine tremor, tachycardia and increased cardiac output. Grave's disease accounts for 80% of cases of hyperthyroidism[1].

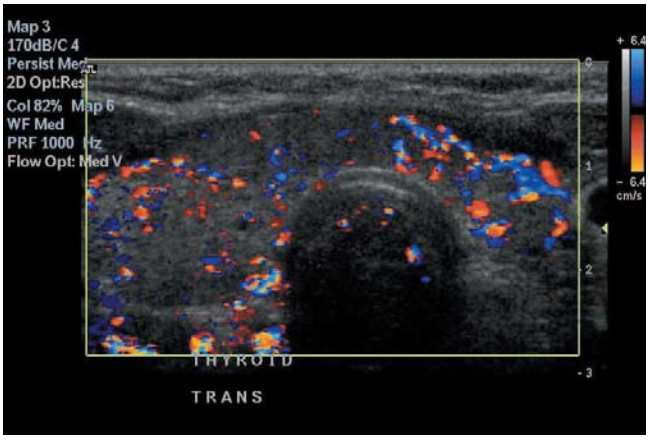

Figure 1 Transverse image of the thyroid showing markedly increased vascularity on colour Doppler typical of Type I AIT

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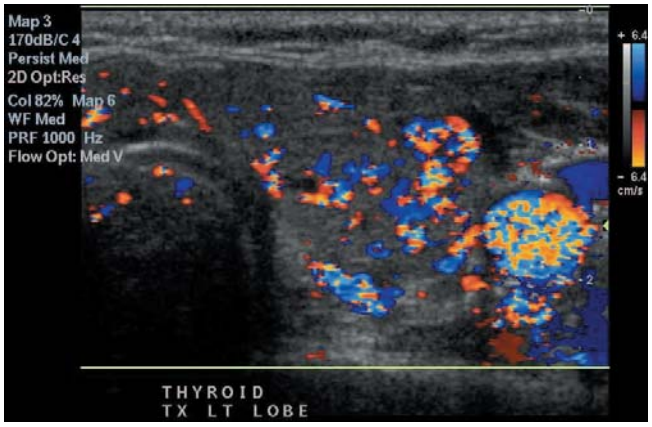

Figure 2 Transverse image of the left thyroid lobe showing the homogenous distribution of increased vascularity typical of Type I AIT

Rarely, hyperthyroidism results from the influx of a large dose of iodine in a patient with a large non-toxic goitre, which can then synthesize excessive quantities of thyroid hormones. This is known as the Jod-Basedow phenomenon[1]. A non-toxic nodular goitre is the most common lesion in thyroid pathology and reflects compensatory hyperplasia in the context of absolute or relative iodine deficiency.

Amiodarone and thyroid function

Amiodarone is a benzofuranic-derivative, iodine-rich medication commonly used for the treatment of tachyarrhythmias and, to a lesser extent, of ischemic heart disease[2]. Each amiodarone tablet contains a considerable amount of iodine, which is utilised by the thyroid gland for synthesis of thyroid hormones.

The high iodine content of amiodarone causes thyroid dysfunction[4] and reduces the conversion of T4 to T3. This raises the levels of T4 and lowers levels of T3 – a common finding on biochemical studies of patients on amiodarone[3].

In 14–18% of amiodarone treated patients, there is overt thyroid dysfunction[4], either amiodarone-induced thyrotoxicosis (AIT) or amiodarone-induced hypothyroidism (AIH). Both AIT and AIH may develop either in apparently normal thyroid glands or in glands with pre-existing, clinically silent abnormalities.

Amiodarone-associated hyperthyroidism or Amiodarone-induced thyrotoxicosis (AIT) is generally subdivided into two types, an iodine-induced hyperthyroid condition (Type I AIT), and a destructive form of thyroiditis (Type II AIT). Mixed forms also exist.

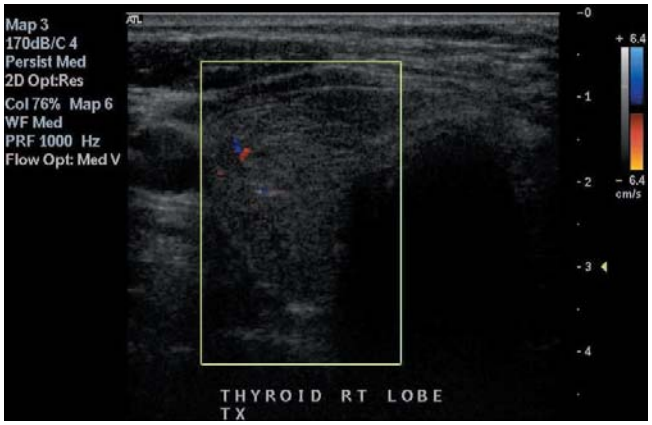

Figure 3 Transverse image of the right thyroid lobe showing decrease vascularity on colour Doppler within a normal thyroid gland typical of Type II AIT

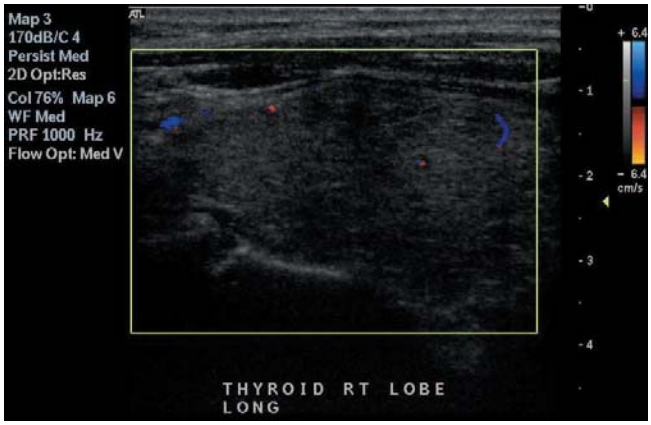

Figure 4 Longitudinal image of the right thyroid lobe showing decrease vascularity on power Doppler within a normal thyroid gland typical of Type II AIT

Treatment of amiodarone induced thyroid dysfunction

An under active thyroid gland following amiodarone therapy (AIH) is generally simple to treat with thyroid hormone.

Hyperthyroidism in patients taking amiodarone is more problematic than hypothyroidism and can be quite severe. Patients may have accumulated considerable stores of thyroid hormone due to the high iodine content of the amiodarone. These stores may be liberated during the course of amiodarone-induced hyperthyroidism. Furthermore, amiodarone is fat-soluble and will remain in fat cells for possibly months after the medication is discontinued. Type II AIT can be particularly severe and may require treatment with glucocorticoids[5] as the most useful therapeutic option. In type I AIT the main medical treatment consists of the simultaneous administration of thioamides and potassium perchlorate.

Many patients with amiodarone-associated hyperthyroidism will have an illness that resembles thyroiditis, with an initial hyperthyroid phase that resolves, followed by a hypothyroid phase. In some cases, the damaged thyroid will gradually repair itself and thyroid function will return to normal. In other instances, the hypothyroidism may be permanent, and treatment with thyroid hormone may be indicated.

Although thyroid function generally returns to normal once amiodarone is discontinued, it must be recognised that for some patients this is not an option as amiodarone is the only medication that successfully controls their irregular heart arrhythmias, which at times can be life threatening.

For most patients with heart disease, it is prudent to normalise thyroid function as hypothyroidism may affect heart muscle function and drug metabolism. Thyroidectomy can be performed in cases resistant to medical therapy.

Ultrasound appearances of AIT

Types I and II amiodarone-induced thyrotoxicosis can be readily distinguished by their ultrasound appearances.

Type I AIT occurs in an abnormal thyroid gland that on colour or power Doppler has a mild to markedly increased vascularity that may present with a patchy or homogenous distribution (Figures 1 and 2). The markedly increased vascularity of Type I AIT is similar to the 'thyroid storm' of Grave's disease[6,7].

Type II AIT occurs in a relatively normal appearing gland and tends to have very reduced or absent flow patterns on colour or power Doppler (Figures 3 and 4)[6,7].

Conclusion

Amiodarone is an iodine rich cardiac medication used for the treatment of tachyarrhythmia and ischemic heart disease. Amiodarone may cause thyroid dysfunction in the form of hypothyroidism or hyperthyroidism. The latter (AIT) is more clinically significant and can be divided into Type I and Type II.

B mode, power and colour Doppler of the thyroid gland allow the easy differentiation of Amiodarone-induced thyrotoxicosis. In Type I AIT the thyroid gland is abnormal on B mode and hypervascular. Type II AIT classically presents as a normal thyroid gland on B mode with reduced or absent vascularity on power or colour Doppler.

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What is the role of ultrasound in evaluating patients with right lower quadrant pain?

John P McGahan

Introduction

Evaluation of acute right lower quadrant (RLQ) pain has undergone an evolution over the past decade. Previously, evaluation focused on history, physical examination, and laboratory results. Plain radiographics were utilised in select patients while the use of sonography was limited to patients with possible pelvic aetiologies of pain. More recently, sonography and computerised tomography (CT) have played a larger role in evaluation of these patients, while much of the attention in evaluation of RLQ pain is to diagnose or exclude appendicitis. A list of diagnostic consideration for RLQ pain may be divided into the 3 'G's': gastrointestinal, gynaecological and genitourinary (Table 1). Much of the focus of this manuscript will be on evaluation of patients with possible appendicitis.

Why image possible appendicitis?

It is necessary to decide why we would need to use imaging to evaluate patients with RLQ pain suspected of acute appendicitis. In most patients with classical findings of appendicitis, imaging is not necessary. Imaging may delay operation and thus increase the possibility of developing complications of acute appendicitis, such as perforation. However, in many cases the diagnosis of acute appendicitis is not so straightforward, thus the differential becomes quite large (Table 1). Prior to use of imaging, it was common practice to perform appendectomies on a number of patients who had a normal appendix. This is a so-called false-positive laparotomy. The rate of false-positive laparotomy has been traditionally accepted as approximately 20%. Therefore one out of five patients with suspected acute appendicitis had in fact a normal appendix at operation. However, with imaging, the false positive rate was dropped to 6% or less in a number of studies[1,2]. In addition to this advantage, imaging can reduce intervention time thus reducing potential complications, procrastination induced expenses, and medical costs[3]. Finally, imaging is obviously important in establishing correct diagnosis. For instance, in a series by Poortman, 41 of 199 patients (21%) with suspected acute appendicitis has an alternative diagnosis at surgery[4]. This was nearly equally divided into gynaecologic and gastrointestinal aetiologies (Table 2).

Gastrointestinal
a Appendicitis
b Mesenteric lymphadenitis
c Tumour
d Gastroenteritis
e Right segmental omental infarction
f Liver abscess
g Acute cholelithiasis
Gynecological
a Ovarian cyst
b Ectopic pregnancy
c Salpingitis
d Ovarian torsion
e Endometriosis
f Degenerating fibroids
Genitourinary
a Urolithiasis
b Tumor
c Abscess

Table 1 Right lower quadrant pain diagnostic considerations

Acute appendicitis: alternative diagnosis made at surgery in 41 patients

Diagnosis	No. of patients	Therapy
Gynaecologic		
Ovarian cyst	6	Conservative
Corpus luteum	6	Conservative
Adnexal teratoma	1	Resection
Epidermoid cyst	1	Resection
Morgagnian cyst	2	Resection
Gynaecologic endometriosis or PID	6	Conservative
Total gynaecologic diagnosis	22	
Gastrointestinal diagnosis		
Diverticulitis	3	Sigmoid resection
Crohn's disease	2	Ileocecal resection
Infarcted omentum	3	Resection
Malignant cecal tumor	3	Hemicolectomy
Adhesions	2	Adhesiolysis
Cholecystitis	1	Cholecystectomy
Meckel's diverticulum	2	Diverticulectomy
Doudenal ulcer	1	Conservative
Mesenteric adenitis	2	Conservative
Total gastrointestinal diagnosis	19	
Total diagnosis	41	

Table 2 With permission from reference 4

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Subject	Ultrasound	CT
Cost	$$	$$$
Radiation	None	High
Thin patient	Excellent	Fair
Heavy patient	Poor	Excellent
Female–pelvic pain	Excellent	Good
Preparation	None	IV
Invasive	None	Contrast
Operator dependence	High	Minimal

Table 3 Comparison of CT vs. sonography

Why not image with CT in all patients?

In reviewing the imaging literature there is generally reported increased sensitivity of CT compared to ultrasound in evaluation of patients with suspected acute appendicitis. For instance in an early manuscript by Baltazar, he reported sensitivity of CT to be 90%, compared to the sensitivity of sonography of 76% in diagnosing acute appendicitis[5]. Others have shown a general increased sensitivity of CT compared to ultrasound in diagnosing appendicitis. However in a recent article by Poortman the sensitivity of CT and sonography were approximately equal at 76% and 79% respectively[4]. This study was reported using non-contrast CT while others would favour use of iodinated contrast enhanced CT. Furthermore, in select patients populations with ultrasound performed by individuals with experiences in appendicular sonogaphy, there are very high reported sensitivities of ultrasound in diagnosing appendicitis. Baldisserotto demonstrates sensitivity and specificity of combined compression and non-compression sonography to be 98.5% and 98.2% respectively[6]. This was in a paediatric population with patient ages from 6 months to 12 years. Therefore there are advantages of either sonography or CT. Some of these are listed in Table 3.

In reviewing Table 3, there is little doubt whenever possible sonography should be used over CT. The disadvantages of CT include its expense and the high radiation dose. Radiation dose is especially problematic in the paediatric population. However, a major disadvantage of sonography is the limited ability of ultrasound to be used in the adult patient, especially those who are over-weight or obese. This unfortunately includes a large segment of the population in the United States. Thus, this segment of the population is best examined by CT. Finally operator dependence is a major factor in utilising CT over ultrasound. While CT technique is automated and nearly 'fool proof', the same cannot be said about sonography. Precise technique must be used when performing ultrasound to evaluate the RLQ for possible appendicitis. 'Practice makes perfect' and if the examiner only performs a right lower quadrant ultrasound once a month, the advantage goes to CT. Therefore sonography should ideally be used in the initial evaluation of the pediatric patient, in females of childbearing age and the thin males, depending on any other prior considerations. On occasion, both CT and ultrasound may be used.

What are the sonographic techniques?

While there are many variations of techniques for evaluation of the patient with RLQ pain, I prefer initial use of a screening ultrasound followed by graded compression sonography. The initial screening exam is performed with a sector scanner (3–5 MHz) to get the 'lay of the land'. It is important not to focus only on diagnosis of appendicitis, but to remember the 3 'G's' (Table 1). A 4 MHz sector probe will be helpful to diagnosis genitourinary and aetiologies such as nephrolithiasis or renal obstruction. A sector probe can also diagnose some gynaecological abnormalities including possible ovarian pathology, such as a haemorrhagic cyst (Table 2). Thus, scanning should include a brief evaluation from the right upper quadrant to the pelvis, patients with possible renal obstruction or cholecystitis may be diagnosed with a sector probe (Table 1, 2). Also, gynaecological abnormalities such as ovarian cysts may be visualised.

Graded compression should include use of a linear array or curved linear array probe with a frequency from 6 to 9 MHz. I find that starting at the common femoral vessels and scanning cephalad is useful. It is important to have moderate probe pressure to compress the lumen of normal bowel. Also important is to observe peristalsis, which identifies a structure as a loop of bowel, other than the appendix.

A 3-5 MHz sector scanner is not appropriate for examining the appendix. A 3-4 MHz sector scanner does not allow significant resolution to identify the characteristic features of the bowel or appendix. It is also important when using a high-resolution linear array probe to concentrate on visualisation of structures just deep to the abdominal musculature. The proper focal zone should be used and the area of interest should be magnified to demonstrate the region of interest. In thin or paediatric patients the appendix is usually superficial and therefore the focal zone should be kept at no greater than 3–4 cm. Self-localisation of pain by the patient is important. Ask the patient, where their pain is located and concentrate on that region. I find localisation of the region of pain with the ultrasound probe is very important. This is analogous to an ultrasound Murphy's sign in the gallbladder. Pain should direct the exam to the area of tenderness, where the abnormality may be located.

Finally, in females, if a diagnosis is not made by the general survey exam or the compression technique, endovaginal sonography may be useful[7]. This may be helpful to diagnose an inflamed appendix located in the pelvis or gynecological etiologies of pain. Because gynecological abnormalities are often a cause of RLQ pain, endovaginal sonography should always be performed whenever possible.

Appendicitis – ultrasound findings

Major

- > 6mm
- Thick wall
- Noncompressable
- Fluid filled
- Blind ending
- Tubular

Others

- Appendolith
- Circumferential color
- Echogenic mesentery
- Free fluid

Table 4 Appendicitis – ultrasound findings

What are sonographic findings of acute appendicitis?

Helpful sonographic findings in diagnosing acute appendicitis include a blind ending, non-compressible, fluid filed tubular structure with a diameter greater than 6 mm (Table 4). In addition, whenever even small amounts of free fluid are noted in the right lower quadrant, this should raise the suspicion of a possible pathological process including appendicitis. Free fluid and increased mesenteric echogencity may occur later in the course of appendicitis. The increased echogencity of the mesentery can be easily overlooked. This is similar to the mesenteric stranding identified on CT. Finally, increased color flow may be seen in the wall of the appendix, however this finding is lost with gangrenous appendicitis.

Perforated appendix

If the diagnosis of appendicitis is overlooked, acute appendicitis may progress to gangrenous appendicitis. Sonographic features of gangrenous appendicitis include increasing echogenicity of the mesentery, free fluid in the right lower quadrant and eventual loss of the appendicular color flow. Eventually the appendix may rupture. The inflammation may be walled off in the right lower quadrant as a focal abscess. In other situations fluid may spread through the abdomen, but most commonly spreading into the pelvis. An appendicitis abscess sonographically appears as a thick-walled fluid filled structure. There may be a 'dirty' shadow if air is present in the abscess.

Interventional ultrasound

Sonography can be used to guide drainage of complications of appendicitis. For instance, ultrasound can be used to guide drainage of RLQ appendiceal abscess. Commonly, we are called upon to drain fluid collections in the pelvis that are complications of acute appendicitis, including pelvic abscess. These pelvic abscesses may be drained via the transrectal route. Complete aspiration alone has been curative in many pelvic abscesses[8]. Catheters may be placed using combined sonography and fluoroscopy using the guide wire exchange technique. Alternatively, the trocar technique with a small diameter catheter has been advocated some authors[9]. Cure rate of transrectal on endovaginal drainage of pelvic abscesses is greater than 85%[8,9].

What are the alternative diagnoses to consider?

Differential diagnoses for RLQ pain are listed in Table 1[10].While review of all these diagnosis is beyond the scope of the manuscript at least one diagnosis need to be mentioned briefly. Mesenteric adenitis is one diagnosis that is easily confused with appendicitis in children. Mesenteric adenitis may be secondary to a diffuse gastrointestinal inflammatory process and perhaps should be correctly called mesenteric adenitis-enteritis. The sonographic hallmark of this entity is enlarged mesenteric nodes (approximately 1 cm), which are both tender and hypervascular. Remember that these inflamed mesenteric nodes reflect gastrointestinal inflammation. The appendix is not usually involved with mesenteric adenitis, which is most commonly a self-limiting process. Mesenteric adenitis may be associated with hypervascularity of the surround mesentery or inflammation and thickening of the terminal ileum. This diagnosis should be kept in mind when examining the pediatric patient with RLQ pain. Other diagnosis must be considered in patients with right lower quadrant pain. Some gastrointestinal aetiologies may not be diagnosed by sonography (Table 2). However, most gynaecological aetiologies of RLQ pain may be identified by sonography. This can include anything from a ruptured or hemorrhagic ovarian cyst to an ovarian abscess from pelvic inflammatory disease. Therefore, in female patients, an endovaginal scan should almost always be used.

Summary

In most patients with RLQ pain no imaging is required. Patients with classic signs and symptoms of acute appendicitis require surgical intervention. In those patients with an equivocal diagnosis, image may be useful, both CT and sonography may be used. Sonography should be used in initial imaging of the paediatric patient, reproductive age females and the thin male. Sonograpahic techniques should include initial use of a 3–5 MHz sector transducer to evaluate for alternative aetiologies of the RLQ pain (Table 1). Grade compression sonograpahy using 5-9 MHz linear or curved linear transducer should be used for the appendix. Acute appendix is diagnosed on sonograpahy as a blind ending, non-compressible tubular structure greater than 6 mm in diameter (Table 4). Sonography may also be used to diagnose and guide treatment of complicated appendicitis, including appendiceal abscesses.

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ASUM Ultrasound Bulletin 2004 August 7:3: 22–26

An historical look at ultrasound as an Australian innovation on the occasion of the ultrasound stamp issued by Australia Post – 18 May 2004

Kaye A Griffiths

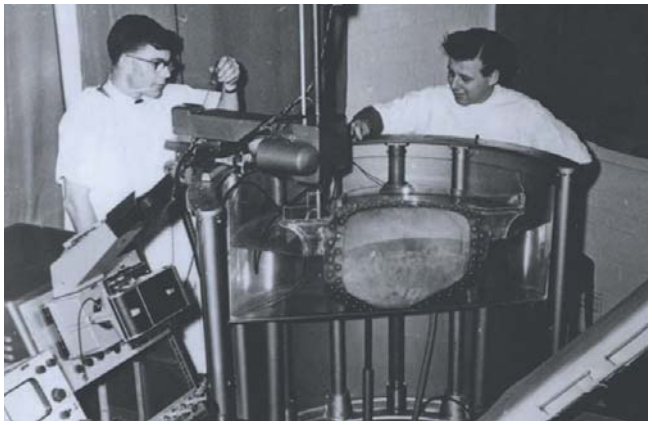

Figure 1a CAL MKI Abdominal echoscope, under construction. Left David Robinson, right George Kossoff

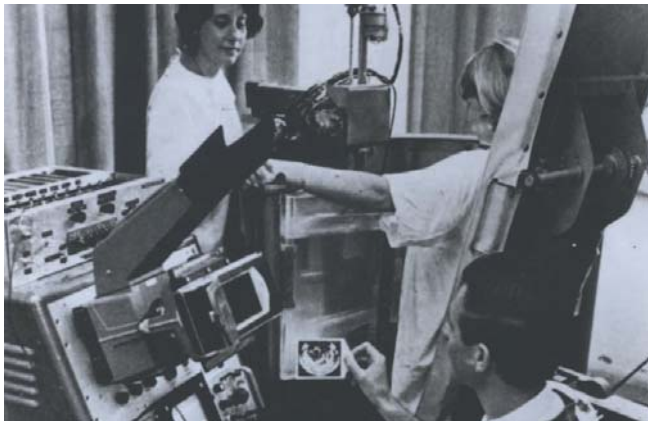

Figure 1b Obstetrics ultrasound examination. Foreground, George Radovanovich DMU, Background, Patricia Horton, midwife

18 May 2004 – Australia Post issued stamps recognising five Australian Innovations, and featured these innovations to illustrate and celebrate the spirit and culture of Australian innovation[1]. This stamp issue suggests that, while 'they may not be Australia's best known innovations, they are now part of everyday life, not just in Australia, but around the world'. One of the five, 'Ultrasound Imaging 1976', recognised that 'George Kossoff and colleagues at the Ultrasonics Institute (then part of the Commonwealth Health Department, later transferred to the CSIRO) pioneered the use of ultrasound in medical diagnosis. They made a technical breakthrough called 'grey scale ultrasound', which enabled them to produce images of much greater clarity and detail. It was an important step leading to the widespread adoption of ultrasound throughout the world'. The aim of this article is to provide a brief outline of that period, including presentation of some historical images.

The Ultrasonics Institute and its precursor, the Ultrasonics Research Section of the National Acoustics Laboratory, played an internationally recognised role in the development of medical uses of ultrasound. The Institute commenced in 1959, with George Kossoff as director and Dr William Garrett, obstetrician – Royal Hospital for Women, Paddington, Sydney, providing clinical advice. Its objectives were to conduct research in medical ultrasound to create a centre of technical expertise in the field and also to set up joint research programs with suitable organisations for the clinical evaluation of newly developed techniques. Within 10 years of its formation, the Institute had established dialogue with other medical fields in Sydney (1960 – Dr Herbert L Hughes, ophthalmologist, Royal Prince Alfred Hospital, Camperdown; 1964 – Prof Thomas S Reeve, surgeon, Royal North Shore Hospital, St Leonards; Prof Dennis E Wilken, cardiologist, Prince Henry Hospital, Little Bay). It was unique in its field in several respects:

Projects were initiated by a nucleus of engineers and physicists rather than clinicians. Despite the emphasis on clinical evaluation, technical advances were the heart of the Institute's work.

It enjoyed a stability of scientific and technical staff throughout its history.

This group of technical experts had close working collaborations with a variety of medical specialists with a complementary research interest who had clinical appointments at teaching hospitals in Sydney.

By 1969, the basic considerations of grey scale scanning were formulated, and all the echoscopes were modified to operate in this mode.

Grey scale imaging was introduced into the abdominal

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(obstetrics), eye and breast ultrasound machines by 1970 following innovations in signal processing, image recording and transducer resolution. Imaging was initially obtained by a time-exposed film, the 'open shutter' technique, which was suitable for mechanically driven scanners, giving even and repeatable scan patterns. Following later technological development of the analog and digital scan converter, the technique could be installed in manually driven contact scanners, which became commercially available by 1974.

Obstetrics

In 1961, the first machine was constructed by Kossoff and David Robinson (CAL MK I Abdominal Echoscope). It consisted of a trolley running on a circular track, and performed compound scan motions, arc sector in the horizontal plane and linear sector in the vertical plane, through a water bath. The transducer was a 2.5MHz, 25 mm weakly focused disc. The original electronics were built entirely of vacuum tubes, and used a Hughes Tonotron storage tube for image display. The patient stood on an angled stretcher and her abdomen was brought into contact with the flexible window on the wall of the coupling tank (Figure 1). On 11 May 1962, the first Australian obstetrics examination was performed at the Royal Hospital for Women, Paddington, Sydney – David E Robinson, engineer and William J Garrett, obstetrician. Only one week later on 18 May, the examination showed that the fetus could clearly be displayed and that some echoes were seen within the fetal boundary (Figure 2). Examples of this work were presented by George Kossoff at a symposium, held at the University of Illinois, USA in June 1962, and were acknowledged as state-of-the-art for their time. It was the first step in establishing the international reputation of the Ultrasonics Institute.

A second and upgraded echoscope (MKII) was installed at Paddington in 1967 and became the focus of obstetrics research. The grey scale technique display for signal processing was incorporated into the scanner in 1970. This led to the first display of the soft tissue internal contents of the fetus and placenta, allowing the accurate distinction between liquid and solid tissues and their localisation (Figure 3).

A large aperture, eight element dynamically-focused annular array transducer was incorporated in 1973. Operating at 2MHz, it was 130 mm in diameter with a mechanical focus of 260 mm, used weak focus on transmission and full dynamic focus on reception. The beamwidth of 4 mm was significantly less than the fixed focus transducer. It improved image quality dramatically, as seen in comparative images of the fetal chest (Figure 4). Experience gained with this scanner formed the basis for the design and development of the UI Octoson in 1974.

The UI Octoson prototype was devised to overcome the issues of scanning a transducer over a long mechanical path, and began clinical trails at the Royal Hospital for Women in 1974, under the direction of David Carpenter and George Radovanovich. It used eight transducers on a circular arm, supported on a gantry operating inside a water tank and operated in longitudinal, transverse and oblique planes with automatic position incrementing. The eight transducers, which were mechanically linked, scanned simultaneously, but operated as independent ultrasonic transmitters and receivers. A full scan (8 transducers) took approximately 4 seconds, during which time about 500 ultrasonic lines of sight were obtained from each transducer.

The machine was set up similar to a water bed, with most examinations performed with the patient lying prone on a polythene membrane (Figure 5). It was excellent for its primary purpose, examination of the pregnant uterus. It was also exceptional for examining neonates who needed no

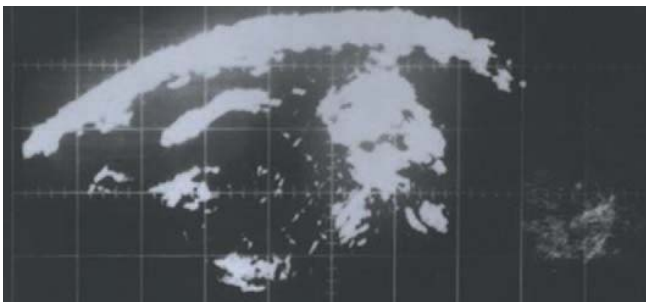


Figure 2 1962 obstetrics scan through fetal trunk, with the spine – defined by the 'pyramid' echoes to the left of the circular structure

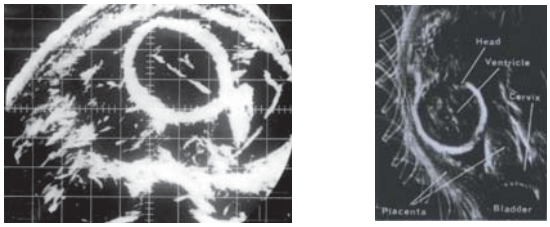


Figure 3c and Figure 3d Comparison of bistable and grey scale images of the fetal head (3c – CAL MK1; and 3d – CAL Contact Scanners). In Figure 3c, only 'specular' echoes within the head are seen, however in Figure 3d 'diffuse' reflectors display some brain anatomy and the placental location

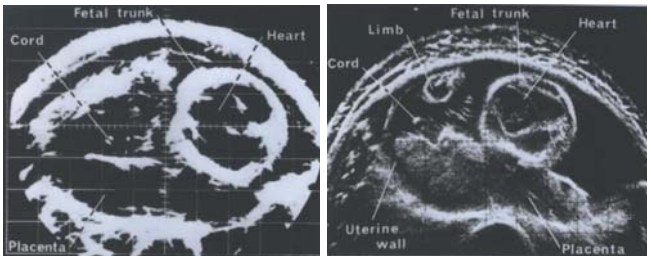


Figure 3a and Figure 3b (circa 1962–72) Comparison of bistable and grey scale images at the level of the fetal chest. Note the introduction of 'diffuse' reflectors allows delineation of the fetal lungs and also gives texture to the placenta

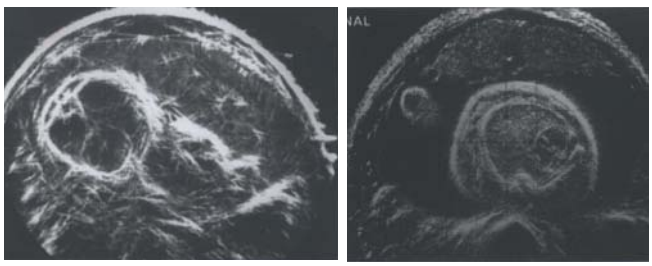


Figure 4a and Figure 4b Figure 4a comparison of grey scale ultrasound of the fixed focus transducer and, Figure 4b annular array transducer at the level of the fetal chest with improved image resolution

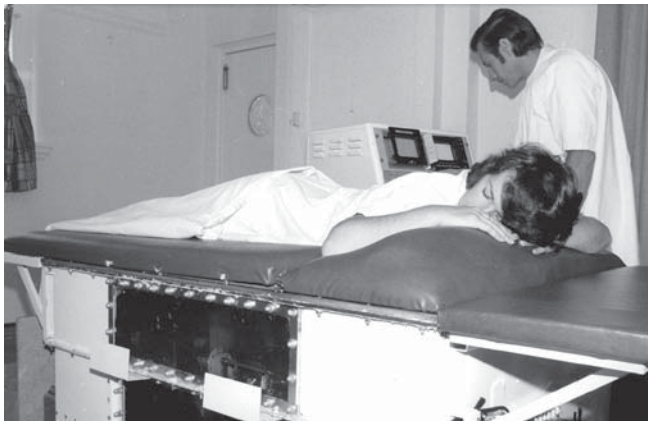


Figure 5 UI Octoson. Eight transducers encased within a water bath, allowing the patient to easily lie on a plastic membrane.

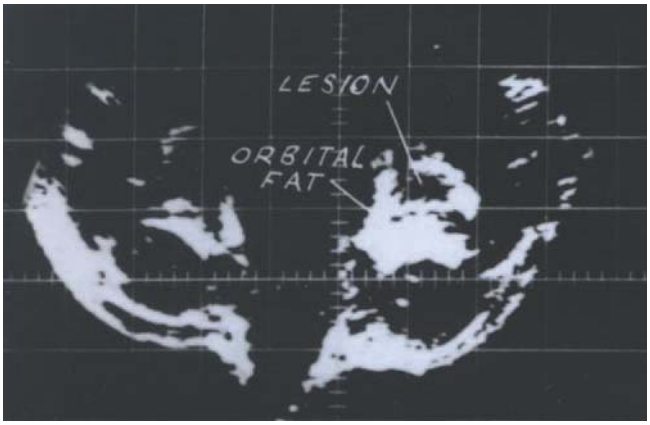


Figure 7a Bistable image of the eye identifying the anterior and posterior chambers and a retrobulbar tumour.

Figure 6 CAL Eye echoscope with patient coupling on the right and recording equipment on the left.

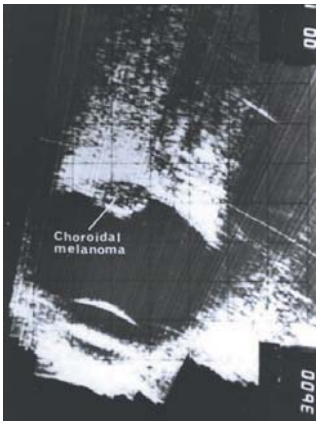


Figure 7b Grey scale shows an anterior chamber lesion with improved ability to demonstrate the anatomy and lesion dimensions.

sedation, and also for scanning the breast, which, for the first time could be scanned in the longitudinal and oblique planes. The UI Octoson was manufactured by Ausonics Pty Ltd, in Australia, and over 200 were sold world-wide between 1976 and 1985.

Ophthalmology

1964 saw the installation of the first ophthalmic echoscope at the Royal Prince Alfred Hospital Camperdown, Sydney – CN Liu (later Michael J Dadd), engineers; Herbert (Bill) L Hughes, ophthalmologist. The machine used a weakly-focused 8MHz transducer with a 20dB beamwidth of approximately 2.5 mm, and both eyes were examined in one pass, using compound scanning (Figure 6). The clinical emphasis was on the retrobulbar space. This machine was the first to have grey scale signal processing in 1969, and the technology was first described in 1971.

In 1972 a high resolution, grey scale machine with an 8MHz, 36 mm diameter highly focused transducer with a 20dB beamwidth of 1 mm was installed. It was motor driven and able to scan in both compound and simple modes. Each eye was separately examined, with the focal region optimised to the area of interest, leading to the examination and interpretation of pathologies in both the anterior and posterior chambers of the eye (Figure 7).

This machine was later further converted to allow imaging of the anterior neck, with clinical consultation provided by Dr Ernie Crocker, physician.

Breast

The first breast echoscope was installed at the Royal North Shore Hospital, St Leonards, Sydney in 1966 – Jack Jellins, engineer; Thomas S Reeve, surgeon. This machine, with a medium focused 4MHz transducer with 2 mm lateral resolution, could image in compound, linear and sector modes.

The breast presented coupling problems which were dealt with in different ways in successive machines (Figure 8). Initially, the patient laid supine with the transducer in a large water bag lowered onto her chest. However, the weight of the water resulted in tissue distortion and patient discomfort. The final modification to the machine saw the patient positioned prone with the breasts dependent in the water tank, while the transducer scanned from below.

Importantly, one of the first grey scale findings was the low internal echo amplitude of cancers, contrary to previous publications in which the high echoes from surrounding tissues had been reported as cancer.

This group documented a comprehensive range of primary diagnostic criteria including – disruption of architecture, internal echo content, boundary detail, central shadowing/enhancement, refractive edge shadowing and shape – for differentiating breast lesions.

Because the breast maintained its natural shape, secondary characteristics – distortion of skin outline, skin involvement, thickened Cooper's ligaments and attachments to surrounding tissues were added. Again the natural breast shape allowed the documentation of the breast appearance with parity and changes with aging.

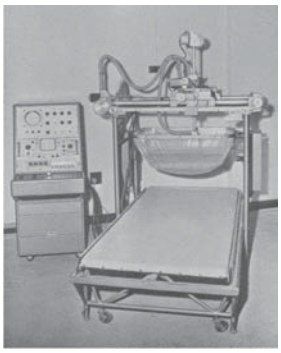


Figure 8a MKI breast echoscope (closed bag)

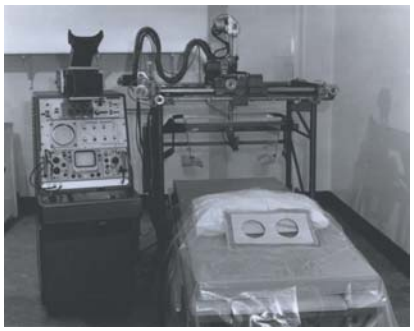


Figure 8c MKII breast (grey scale) echoscope with breast drape, which was adhered to the patient's chest wall

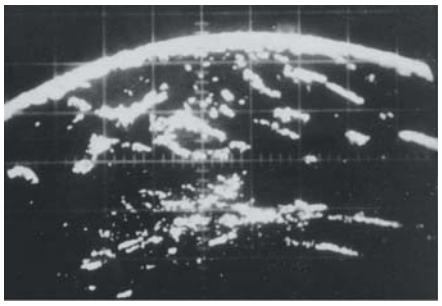


Figure 8b Note distortion of the breast by the weight of the water and only bistable tissue differentiation

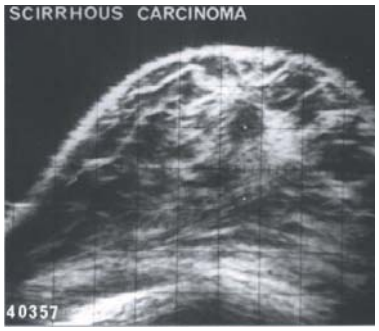


Figure 8d MKII breast (grey scale) echoscope 5mm brest cancer with thickened Coopers ligaments and skin flattening

This machine was also modified, in 1974, to study the thyroid and the scrotum, again in consultation with Thomas Reeve.

Paediatric brain

With the recognition of the intracranial structures of the fetus, in 1972 attempts were made to study the intracranial structures in the newborn and older children, at the Royal Hospital for Women, again with William Garrett's consultation. A manually operated contact scanner, originally built in 1967, to investigate the differences between water delay and contact imaging was employed (Figure 9). The success of the method was critically dependent on the technique, as the grey scale images were captured on time-exposed film and perfectly even scans were necessary.

To scan with this machine (which was also used in obstetrics and abdominal examinations) each cross section, be it in early or late pregnancy, a panoramic image of an abdomen or the smaller target of a child's head, had to be scanned in 17 seconds. The sonographers' training in contact scanning techniques was undertaken by scanning in rhythm with a metronome and timed by a stopwatch until the technique was mastered! The development of the analog scan converter, thankfully relaxed the method. An ultrasound atlas of the brain structures was derived and development of this technique resulted in the cessation of pneumoenchephalography in 1974 (Figure 10).

In 1977, in a paper he presented by invitation, during the AIUM meeting in Dallas, USA, marking the 25th anniversary of cross-sectional echography, George Kossoff said of grey scale echography " . . . it is probably the transformation of the schematic sections that used to be obtained with bistable equipment to images that resemble anatomical sections that has played the greatest role in its acceptance . . .".

"Grey scale ultrasound imaging, an Australian innovation that is part of everyday life, not just in Australia, but around the world" has been recognised, 42 years-to-the-day from the capture of those inspiring images which were presented internationally the following month, by issue of this stamp! How precious is that?

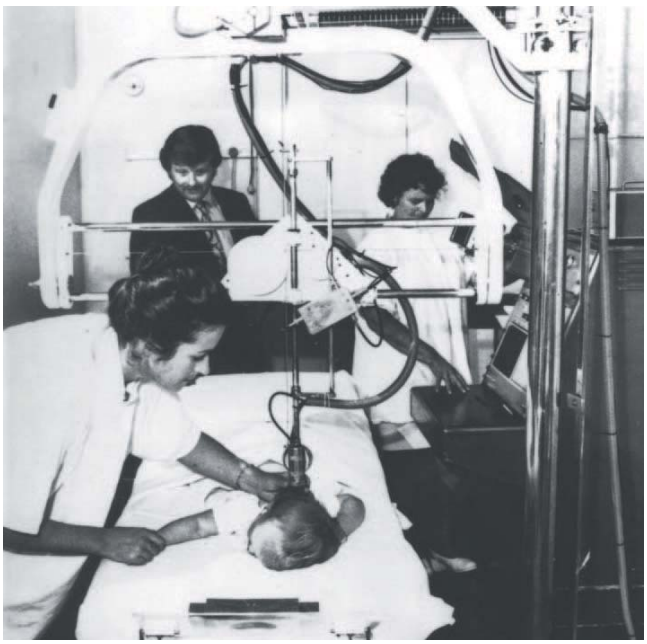


Figure 9 CAL contact echoscope and paediatric brain examination, 1973. Left: Kaye Griffiths, centre: George Kossoff, right: Margaret Tabbrett.

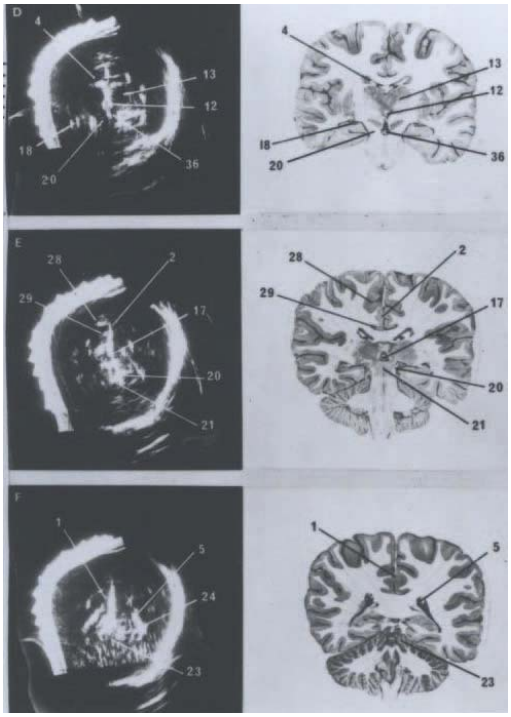


Figure 10a Left, grey scale images comparison of ultrasound anatomy with Echelscheimer's Brain Atlas (1972)

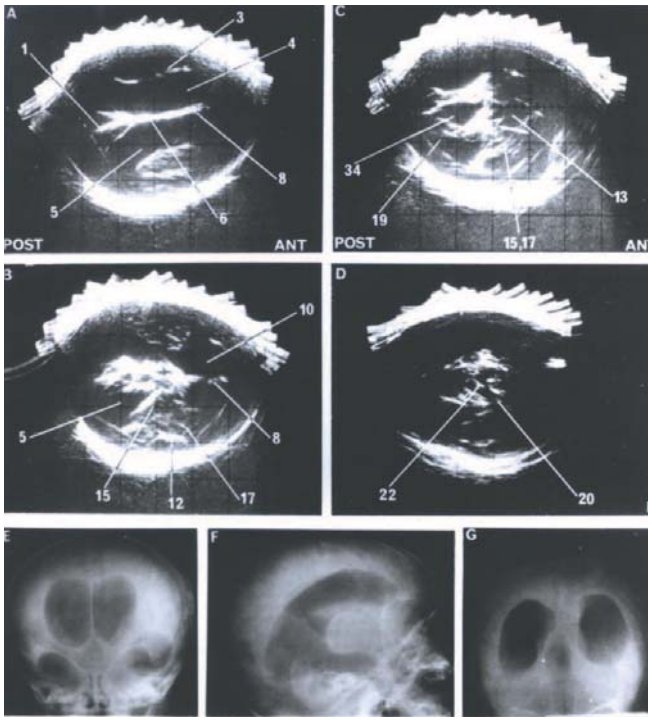


Figure 10b comparison of grey scale ultrasound enchephalography with pneumoencephalography (1974)

References

1 Australia Post's other Innovations Black Box Flight Recorder 1962; Raecam TV Sport Coverage 1979; Baby Safety Capsule 1984: Polymer Banknotes 1988. Australian Innovations Stamps designed by Mike Heine.
2 Diagnostic Ultrasound – the view from down under. JCU 1978; 6 (3): 144–149.

Imaging Service Obstetric U/S 5 to 7 weeks – Sonographer Observations

Proforma

Name		Notes
Date of birth (Age)		
Patient Number		
Episode Number		
Scan Location		

LM ...../...../.....	EDD (LMP) ...../...../.....	This scan Gest est .....w .....d	Parity (G) .....
Prev US ...../...../..... (....w....d)	EDD (US) ...../...../.....	Singleton ❒/ Multiple N	Fetus No. (P) .....

EARLY PREGNANCY	Viable IU preg ❒ FHR ..... bpm	Non-viable IU preg ❒	Re-scan in 7–10 days ❒ *(F.Pole < 6mm, no FH seen, MSD < 2cm)*

Comment on viability	

Mean Sac Diameter Calculation

Diameter 1 =	..... mm
Diameter 2 =	..... mm
Diameter 3 =	..... mm
Mean =	..... /3 = ... mm

CRL	
..... mm	= ..... w ..... d
Yolk Sac n = < 5mm	❒

Pelvis

Uterus	Fibroid Y / N	Other finding:
Right ovary	Corpus luteum Y / N	Adnexal mass Y/N
Lefy ovary	Corpus luteum Y / N	Adnexal mass Y/N
Pouch of Douglas	Fluid Y / N	Comment:
Other comments:		

Scan Location		Reported by:	

Carotid Doppler Sonographer Observations

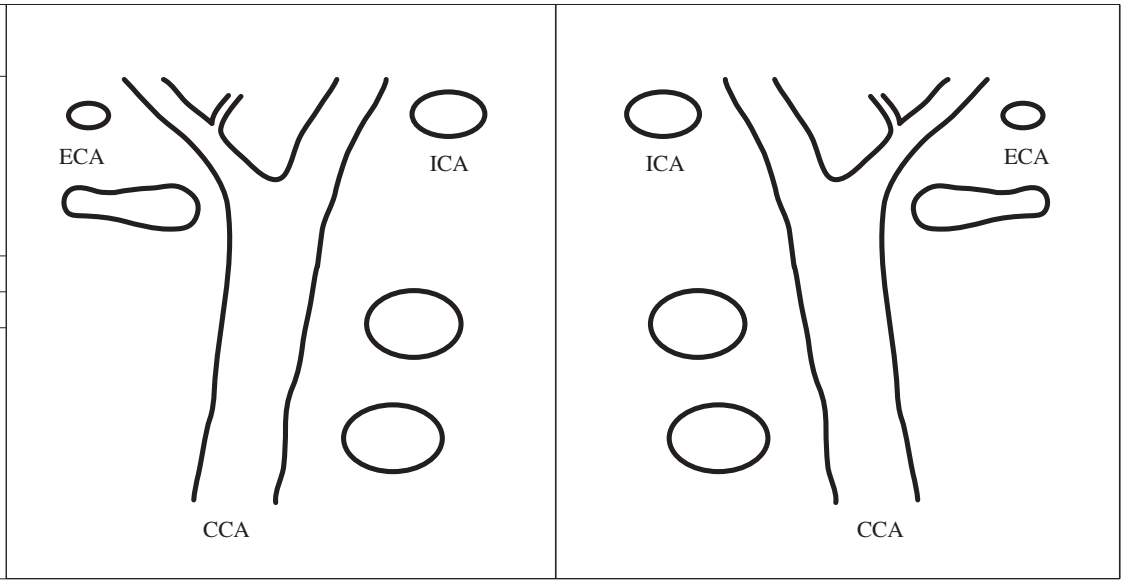
Proforma

Revised 2003 after Grant et al

NAME		
MRN		
CASE No.	Date...../...../.....	DOB...../...../.....

BIFURCATION		Normal		High		Low
TORTUOSITY		Minimal		Moderate		Good
TECHNICAL		Poor		Good		Excellent

Plaque Characteristics
Echogenic
Hypoechoic
Mixed
Calcified
Surface
Smooth
Irregular



VELOCITIES IN THE CAROTID SYSTEM

RIGHT		PSV (cm/s)	EDV (cm/s)
CCA	MID		
	DISTAL		
	BULB		
ECA	PROX		
	DISTAL		
ICA	PROX		
	MID		
	DISTAL		
ICA/CCA			
VERT			

LEFT		PSV (cm/s)	EDV (cm/s)
CCA	MID		
	DISTAL		
	BULB		
ECA	PROX		
	DISTAL		
ICA	PROX		
	MID		
	DISTAL		
ICA/CCA			
VERT			

GRADING OF INTERNAL CARTOID STENOSIS *(Edward GRANT et al. Radiology 2003, 229: 340-446)*

DIAMETER REDUCTION	**<50%**	**50-69%**	**>70%**	**Near Occlusion**	**Occlusion**
PSV	<125 cm/s	125-230 cm/s and visible plaque	>230 cm/s	>230 cm/s and visible markedly decreased lumen	No patent lumen and no flow on colour, spectral, or power Doppler.
EDV				>140 cm/s	
ICA/CCA			>4.0 supportive		

SONOGRAPHER
Date...../...../.....

Book reviews

Valvular Heart Disease Edition 2

Author Catherine M Otto
Publisher Saunders/Elsevier 2004
Cost Approx $A346.50

Dr Catherine Otto is an internationally recognised echocardiographer and author, renowned for her excellent general echocardiography reference 'Text Book of Clinical Echocardiography'. Her special expertise in valvular heart disease lends authority to this new, second edition of her major text book 'Valvular Heart Disease'.

This handsome, hard cover publication comprises 20 well-written chapters offering a comprehensive account of all the important aspects of valvular disease. The reader should be warned that this essentially is not an echocardiography text. While key information on the application of echocardiography is provided, including a chapter dedicated to this topic alone, the bulk of the content deals with the multiple facets valve disease presents, and helpfully addresses the often complex issues found in management .

Separate chapters cover epidemiology, pathology, diagnosis, haemodynamics, medical management and surgery, as well as the pathophysiology of individual valve lesions.

This edition includes two new chapters on valve disease in children and in pregnant women, not present in the previous 1999 publication.

The preface suggests that the book is aimed at the various 'types of health professionals' involved in managing patients with valve disease. Given the depth and breadth of the information in the book, it would seem most suited to all cardiologists involved in patient care. It serves as a handy reference to the current status of the pathology, diagnosis and management of valvular heart disease today.

Dr Christopher Choong
Senior Staff Cardiologist
Director of Echocardiography
Royal North Shore Hospital

Ultrasound Secrets

Authors/Editors Vikram Dogra, Deborah J Rubens
Publisher Hanley & Belfus, Philadelphia PA 2004
ISBN 1-56053-594-6
Cost approx $A66.00
Available from Elsevier Australia.

This intriguingly titled book is the latest in the 'Secrets' series, a range of medical and surgical titles that include 'Radiology Secrets', 'Cardiac Imaging Secrets' and 'Interventional Radiology Secrets'.

Nearly 40 radiologists, sonographers and scientists have contributed to the volume, providing essential information on diagnosis, theory and practical insights into technical details.

The authors have adopted a question and answer format to address key diagnostic sonography concepts in an organ based format. The answers have been kept concise to concentrate a maximum amount of information, tips and memory aids – in other words – so called 'Secrets'. Bulleted lists and tables have been included for quick review.

The question and answer format is an effective approach as, by raising awareness of the problem at the onset, the information provided in that answer is better assimilated.

The book is soft covered, 15 x 23 cm, 444 pages and is surprisingly compact, given the range of topics covered. It contains eight sections, covering ultrasound physics, obstetrics, gynaecology, general abdomen, organ transplant evaluation, small parts sonography, paediatric sonography and vascular sonography. These are further divided into chapters, eg. for gynaecology:

Pelvis sonography
Benign and malignant adnexal lesions
Ovarian torsion
Sonohysterography

Each chapter opens with the indications for a scan, technical points regarding patient preparation, positioning, hard copy documentation, measurements, and some very useful instruction on image optimisation and problem solving.

Following a brief revision of normal anatomy, pathology, some pathophysiology and the ultrasound appearances of that pathology are described. Each chapter concludes with a comprehensive bibliography.

The chapters are extensively illustrated. Where the ultrasound appearances of particular anatomical features and pathology are described, an image generally accompanies the text.

The authors have also included images from other modalities, so that, for example, the appearances of an adnexal mass can be compared on CT and ultrasound, or a reconstructed magnetic resonance angiogram of a transplant renal artery stenosis can be compared with a Duplex Doppler.

As useful as it is to know how to produce and interpret diagnostic examinations, the authors have addressed the issue of the limitation of ultrasound in certain settings. For instance, with regard to the difficulty of detecting HCCs in the cirrhotic liver, they explain why the detection rate is disappointingly low, and indicate which modalities in their view (CT and MRI) have a more satisfactory detection rate.

These chapters each provide a logical framework for the work-up of a patient.

The images, particularly those in the O & G and abdominal chapters are of a very high quality. However I found some of the breast pathology images were quite coarse and grainy, having been taken with 7.5 MHz transducers rather than the high frequency transducers currently available.

A table of colour plates of ultrasound artefacts, soft tissue masses and vascular structures has been included.

I see this book as a day-to-day reference source rather than a principal learning text for the student sonologist and sonographer. This is because of the brevity of the answers. Students in the initial learning phase might be better served by the more expanded

answers and explanations of ultrasound principles of physics, technique, anatomy and pathology found in specialised texts. Having pointed that out, the concise answers mean that the reader does not have to wade through lengthy paragraphs to get to the pertinent information.

In taking on the range of topics from first trimester scanning to liver, renal and pancreatic transplant evaluation, the authors have set themselves an ambitious task and have succeeded admirably.

The vascular section is extensive, covering amongst other subjects, DVT, carotid Doppler, abdominal aortic aneurysms, renal artery Doppler, portal vein Doppler haemodialysis graft and fistulas.

There is, however, no chapter on leg artery Doppler and this might be a useful inclusion in later editions. That minor point aside, this is a tremendously informative book and is destined to become one of the most well thumbed in our reference section.

Judy Lees GDU AMS
The Royal Melbourne Hospital

Doppler Ultrasound in Gynaecology and Obstetrics

Authors/Editors C Sohn, HJ Voigt, K Vetter
Publisher Theime 2004
Cost $A228.00

Doppler ultrasound has been the most exciting clinical tool introduced in Obstetrics and Gynaecology in the last few years.

It has allowed the study of haemodynamics of the blood supply of the fetal placental unit – and in various fetal organs in obstetrics and in the blood supply for the ovaries and uterus in gynaecology.

The clinical usage in some areas is well established whilst in others it is in its investigative and research phase.

The three authors of this book have extensive experience in this field and they are sharing their extensive knowledge through the book.

The contents are exhaustive. The chapters are divided into 'Basic concepts' where the basic physics of Doppler ultrasound are explained together with the normal physiological changes of the fetal-placental unit being outlined. In the other section 'Obstetric application of Doppler ultrasound' the role, indications and applications in various obstetrics situations are outlined. In the 'Advanced topics in obstetrics and gynaecology Doppler ultrasound', the advantages and clinical significance are discussed.

Each chapter is well written, illustrated and contains a step-by-step approach to assess the subject matter. Each ends with a conclusion and with an interpretation of its clinical significance in clinical practices. There are chapters exploring new areas where Doppler ultrasound might be useful.

The book is very well written and beautifully illustrated with B-mode and colour Doppler pictures side-by-side.

It is a good text book for beginners and advanced practitioners. It certainly will be a very good reference book for any obstetrics and gynaecology department.

Dr Andrew Ngu
The Royal Melbourne Hospital

DMU practical examiners training and accreditation days

ASUM Council has appointed the Australian Institute of Ultrasound (AIU) to provide two courses per year for three years to train and accredit DMU Practical Examiners. These courses will be held in conjunction with the Multidisciplinary Workshops and the ASUM Scientific Meetings.

Numbers are strictly limited for each DMU Practical Examiner Training and Accreditation Day. In the first instance, the DMU Board of Examiners will offer places for the training program on the basis of immediate DMU Practical Examination requirements.

Examination preparation course replaces DDU/DMU prep course

ASUM is incorporating the DDU/DMU prep courses with the Multidisciplinary Workshops.

In 2005, examination preparation courses will be run in conjunction with the Multidisciplinary Workshops. It is proposed that the examination preparation courses will present physics on the Wednesday and Thursday. Specialised Seminars (anatomy, physiology, pathology and instrumentation, with appropriate Q&A sessions) will be incorporated into the Multidisciplinary Workshop program on Friday and Saturday. This may extend into Sunday. The content of these courses is based upon the published syllabi. Examination preparation courses in 2005 will run from Wednesday 6th March to Sunday 20th March.

Details will be published online in the DDU/DMU section of the ASUM website http://www.asum.com.au

MOSIPP POINTS IMPORTANT INFORMATION

Due to ASAR's requirements, sonographers using MOSIPP will have to have all points entered by 31 December 2004. ASAR has advised that points entered after this will not be accepted.

Mark your calendar

3rd Annual ASUM Multidisciplinary Workshop Melbourne 17–19 March 2005

Interactive Workshop program in general ultrasound, obstetric ultrasound, gynaecological ultrasound, vascular ultrasound, cardiac ultrasound, breast ultrasound, FMF nuchal translucency course.

Ultrasound featured in Australian Innovations stamps set

The message of innovation is circulating on Australia's mail, via Australia Post's new 'Australian Innovations' stamps. The stamps feature five Australian innovations that have had a significant impact on our everyday lives, not just in Australia, but all over the world. The five inventions featured on the stamps are:

The Black Box flight recorder

Invented in 1961, by Dave Warren at the Aeronautical Research Laboratory in Melbourne. Warren designed the prototype device that today is used in every large commercial aeroplane to record cockpit voices and flight data.

Fact: Did you know that the black box is actually bright orange?

Ultrasound imaging technology

Ultrasound scans are used to reveal the size, position and even the sex of an unborn baby. This technology provided a much safer method for expectant mothers.*

Fact: Before ultrasound scans were invented, harmful x-rays were used to gather information on unborn babies [*Greyscale ultrasound technology invented in 1969 in Australia].

Racecam TV sport coverage

Revolutionising the way we view sporting events today, the Racecam transmits sound and pictures from almost any position. First introduced in 1979 at the Bathurst 1000 car race, this driver's eye view gave the general public a new perspective of the adrenaline filled racing circuit.

Fact: Due to the success of Racecam, there are now many adaptations of this technology, including stumpcam for cricket.

Baby safety capsule

The capsule consists of a bassinette inside a base, kept in place by a car seat belt, which safely cradles the baby. During an accident, a release mechanism is triggered allowing the bassinette to rotate, keeping the baby more upright and distributing forces uniformly over its small body.

Fact: There was no specific protection for the safe transportation of babies until the invention of the Baby Safety Capsule in 1984.

Polymer banknotes

Australia leads the world in polymer banknote technology, which has been very successful in the reduction of note forgery, due to the added security features incorporated into each note. Features such as a distinctive transparent window, shadow images, embossed printing and the use of special inks all make counterfeiters very wary indeed.

Fact: When polymer banknotes are replaced, they are recycled into a variety of everyday plastics.

The series of five stamps and associated stamp products are available at participating Australia Post outlets.

DDU exam results

The following were successful in the examinations held in May 2004

Part I

Thushari Alahakoon NSW
Neil Athayde NSW
Terry Chang NSW,
Rebecca Chalmers Vic
Roderick Chua NSW
Louise Creati Vic
Phurb Dorji NZ
Rob Edwards NSW
Anthony Freeman NSW
Steven Grant NZ
Janine Haran NSW
Christopher Hengel Vic
Po-Yun Huang NSW
Ravi Huilgol NSW
Lubomyr Lemech NSW
Chhaya Mehrotra NZ
Allison Newey NSW
Arnold Ng NSW,
Bernice Ng WA
Abdullah Omari NSW
Nicole Organ NZ
Francis Ponnuthurai Vic
Faraz Shakibaie NSW
John Shirley NSW
Kevin Tay NSW

Part II

Socrates Angelides NSW
Andrea Barkhall-Thomas Vic
Paul Gould Vic
Monica Pahuja Vic
John Roberts NSW
Sally Rodrigues SA
Sheryle Rogerson Vic,
Mark Teoh Vic

ASUM 2004 Sydney 23–26 September: draft program

Skills Development Day Thursday 23 September

8.30–5.00 Nuchal translucency course
9.30–4.10 ASUM 2004 Skills Development Workshop

	Room 1	Room 2	Room 3	Room 4	Room 5
9.30–10.30	Shoulder Peter Coombs	Doppler principles Roger Gent	Liver revisited Jane Bates	The neck explored Lynette Hassall	Gynaecology – abnormal bleeding Phillipa Ramsay
10.40–11.40	Paediatric hips and spine Roger Gent	Wrist and hand John Korber	Aorta and illiacs Kathy Carter	1st trimester examination Vanessa Picham	Testes Bob McDonald
11.50–12.50	Infertility investigation Vanessa Pincham	Appendix Stephen Bird	Wrist and hand John Korber	Upper limbarteries and veins Virginia Makeham	Paediatric urinary tract Kristina Prelog
Lunch	**Lunch**	**Lunch**	**Lunch**	**Lunch**	**Lunch**
2.00–3.00	Breast – combined mammographic & ultrasound assessment Louise Smalley	Thigh & calf muscles Rob McGregor	The practical fetal heart Veronica Hanrahan	Elbow and knee Lisa Briggs	Abdominal Doppler Stephen Bird
3.10–4.10	Chronic venous insufficiency Debbie Coghlan	Fetal growth Ann Quinton	Ovarian veins Peter Coombs	Hernia and groin assessment Robyn Tantau	Ankle Rob McGregor
Drinks	**Drinks**	**Drinks**	**Drinks**	**Drinks**	**Drinks**

FACULTY DINNER 19.00–22.00

Friday 24 September

Registration 07.30–09.00
SESSION 1 Plenary session 09.00–11.00

General I

09.00–09.10	Opening address	Glenn McNally
09.10–10.00	First trimester fetal malformations	Simon Meagher
10.00–10.30	Variations in the quality of ultrasound examinations in an unregulated market	Paula Woletz
10.30–11.00	Recent technical advances in ultrasound	Michel Claudon

MORNING TEA 11.00–11.30 OPENING OF TRADE AND EXHIBIT HALL

SESSION 2 Categorical session 11.30–13.00

O&G

11.30–12.00	Aneuploidy risk in pregnancy: an evidence based approach	Harris Finberg
12.00–12.30	Clinical value of 3D/4D	Ron Benzie
12.30–13.00	Prenatal imagining and postnatal imaging: limitations of prenatal imaging, discussion of MRI, and need for postnatal confirmation of abnormalities	Rita Teale

Vascular

11.30–12.00	The changing role of non-invasive vascular studies and how they impact on decision making	Phil Walker
12.00–12.30	Imaging the carotid artery after open and endovascular procedures	Kathleen Carter
12.30–13.00	The importance of graft surveillance in lower extremity bypass	Bernard Bourke

General

11.30–11.50	FAST scan – Where it has been, where it is going	John McGahan
11.50–12.15	US in acute inflammatory bowel diseases	Giovanni Cerri
12.15–12.40	Ultrasound contrast agents in routine clinical practice	Jane Bates
12.40–13.00	Echocardiography: who, what and when	Rob Philips

LUNCH 13.00–14.00

SESSION 3 Concurrent sessions 14.00–15.30

Quality issues I Practice

14.00–14.15	Quality issues in ultrasound	Matthew Andrews
14.15–14.35	Sonography practice – changing roles and responsibilities.	Chris Sheedy
14.35–14.50	Role extension for sonographers	Robyn Tantau
15.50–15.05	Results/recommendations from AIUM's compact/hand-held ultrasound forum (Spring 2004)	Paula Woletz
15.05–15.20	Professional/sonographer issues relating to QI	Jane Bates
15.20–15.30	Education and QI	Keith Henderson

Free papers

14.00–14.15	Individual and group learning curves for ultrasound fetal biometry measurements	Sarath Weerasinghe
14.15–14.30	Imaging the bush:innovative educational resources for rural and remote doctors in obstetric ultrasound	Dan Manahan
14.30–14.45	Weight estimation and diagnosis of macrosomia: a mathematical model	Max Mongelli
14.45–15.00	Ultrasound detection of non-palpable Implanon	Sofie Piessens and Amanda Sampson
15.00–15.15	The work practices of sonographers performing nuchal translucency measurements	Tania Griffiths
15.15–15.30	Accurate estimation of gestational age in late pregnancy	Max Mongelli

Paediatric I

14.00–14.30	Ultrasonography in the neonatal nursery	Rita Teale
14.30–15.00	Paediatric eye	Amanda Crowe
15.00–15.30	Contrast study for hepatic sonography	Michel Claudon

AFTERNOON TEA 15.30–16.00

SESSION 4 Concurrent sessions 16.00–17.30

Quality issues II Accreditation

16.00–16.15	RNZCR.NATA accreditation program	Laurence Lau
16.15–16.30	AIUM accreditation and quality improvement findings from a case control study	Paula Woletz
16.30–16.45	ICAVL – the effect of an accreditation body in improving practice standards	Kathy Carter
16.45–17.00	Quality issue	Chris Sheedy
17.00–17.30	Panel discussion	Chris Sheedy, Paula Woletz, Kathy Carter, Lawrence Lau, Matthew Andrews.

Free papers

16.00–16.15	Ultrasound and haematological assessment of devices for deep vein thrombosis prophylaxis	John Woodcock
16.15–16.30	Ultrasound detection of arterial neovascularisation in recanalising venous thrombus: a new diagnostic sign	Kathryn Busch
16.30–16.45	The determination of fetal head engagement by clinical examination and translabial ultrasound	Valeria Lanzarone
16.45–17.00	Posterior compartment descent on 2D and 3D pelvic floor ultrasound	Hans Peter Dietz
17.00–17.15	Volume contrast imaging: clinical applications in obstetrics and gynaecology	Teresa Clapham
17.15–17.30	Neonatal brain	Jane Fonda

Paediatric II

16.00–16.30	An embryologic approach to spinal ultrasonography.	Rita Teale
16.30–17.00	Doppler and the paediatric kidney	Michel Claudon
17.00–17.30	Sonography of intussusception with a lead point.	Albert Lam

COCKTAIL PARTY 18.00 (Exhibition Hall)

Saturday 25 September 2004

Registration 07.30–08.30

SESSION 5 Categorical sessions 08.30–10.00

Echocardiography		
0830–09.30	Understanding the stress echo examination Designing a digital echo lab – tricks and traps	Dominic Leung
09.30–10.00	Intracardiac echo – indications, advantages and limitations	Cathy West
O&G		
08.30–09.00	Decision cascade: what form of twinning event has occurred	Harris Finberg
09.00–09.30	Skeletal dysplasias	Rita Teele
09.30–10.00	Simple obstetric measurements	John McGahan
MSK		
08.30–09.00	Ankle and foot	Martin Sullivan
09.00–09.30	Ankle and foot	Neil Simmons
09.30–10.00	Ankle and foot	Rob McGregor
Vascular		
08.30–09.00	Emerging issues in venous disease	Phil Walker
09.00–09.30	Investigation of chronic venous insufficiency: What test When?	Andrew Lennox
09.30–10.00	Impact of new technologies in the diagnosis of vascular disease	Andrew Csillag

MEETING OF OUTGOING COUNCIL 09.00–10.30

ASUM ANNUAL GENERAL MEETING 10.00–1200

MORNING TEA 10.00–10.30

SESSION 6 Categorical sessions 10.30–12.00

Echocardiography		
10.30–12.00	Haemodynamics – calculations and applications	Bonita Anderson
Vascular		
10.30–11.00	Ultrasound in vascular emergencies	Giovanni Cerri
11.00–11.30	Role of duplex in mesenteric arterial disease – a review	Andrew Lennox
11.30–12.00	Obtaining accurate renal artery duplex exams	Kathleen Carter
O&G		
10.30–11.00	What you should know when examining the fetal heart	John McGahan
11.00–11.30	Monochorionic twins: diagnosis,problems and pathophysiology	Harris Finberg
11.30–12.00	Prediction of pregnancy outcomes by mid trimester uterine artery doppler	Jae Sung Cho

Manufacturers' Showcase session

10.30–12.00 Includes live scanning and demonstration of latest functions aand products
Programmed by convenor in collaboration with the Platinum Sponsor, Toshiba

Free papers		
10.30–10.45	Ouch! Now what do I do?	Val Gregory
10.45–11.00	Paediatric ocular ultrasound	Amanda Crowe
11.00–11.15	Defining the risk of unplanned operative delivery	Hans Peter Dietz
11.15–11.30	The placenta is more than an edge! – confined placental mosaicism	Teresa Clapham
11.30–11.45	Agenesis of the corpus callosum in the fetus	Elizabeth Graham
11.45–12.00	Volume ultrasound of the pelvic floor in the assessment of puborectalis muscle and levator hiatus	Hans Peter Dietz

MEETING OF INCOMING COUNCIL 11.00–12.30

LUNCH 12.00–13.00

SESSION 7 Concurrent sessions 13.00–14.30

O&G		
13.00–13.30	Evaluation of the cervix	Harris Finberg
13.30–14.10	Ectopic pregnancy: current management concepts	Simon Meagher
14.10–14.30	Significance of uterine artery Doppler velocimetry during third trimester	Jae Sung Cho
Musculoskeletal		
13.00–13.30	Shoulder	Rob McGregor
13.30–14.00	Shoulder	Neil Simmons
14.00–14.30	Ultrasound assessment of the elbow	Stephen Bird

Manufacturers' Showcase Session

13.00–13.40	Includes live scanning and demonstration of latest functions & products. Programmed by convenor in collaboration with GE, a Gold Sponsor.	
13.50–14.30	Includes live scanning & demonstration of latest functions & products. Programmed by convenor in collaboration with Philips, a Gold Sponsor	

Echocardiography

13.00–13.30	Strain, strain rate and DTI	Brian Haluska
13.30–14.00	Diastolic heart failure	Liza Thomas
14.00–14.30	Echo assessment and interpretation of diastolic function	Rob Phillips

AFTERNOON TEA 14.30–15.00

SESSION 8 Categorical sessions 15.00–16.30

Echocardiography

15.00–16.00	Aortic valve	Sidney Lo
16.00–16.30	Mitral valve evaluation	Rob Phillips

Muscoloskeletal

15.00–15.40	Interventional	Rob McGregor
15.40–16.15	Interventional	Dr Neil Simmons
16.15–16.30	Relevance of nerve measurements in the diagnosis of entrapment syndromes	Lisa Briggs

Vascular IV

15.00–15.30	Maximising the value of vascular ultrasound reports – what the clinician wants to know?	Phil Walker
15.30–16.00	Duplex follow-up of endovascular aortic stent grafts	Kathleen Carter
16.00–16.30	Evaluation of TIPS – an update	Roger Davies

AFTERNOON TEA 14.30–15.00

Free papers IV

15.00–15.15	Injection of urokinase to improve ultrasound-guided therapy for ovarian endometriosis cyst	Jing Zhang
15.15–15.30	The changes in umbilical artery Dopplers after steroid administration in placental insufficiency	Vasundhara Kaushik
15.30–15.45	Detrusor muscle thickness in young nulligravid women	Hans Peter Dietz
15.45–16.00	Ultrasound assessment of the post partum ulterus	Rebecca Deans
16.00–16.30	Lateral cerebral ventricular measurement: a new perspective	Vanessa Pincham
16.30–17.00	Detecting fetal Down syndrome in a general pregnant population using mid-trimester sonographic markers	Philip Schluter

Sunday 26 September

Registration 08.30–11.15

Plenary session 11.00–11.30

General

09.00–09.30	Misuse of ultrasound for entertainment in the United States	Paula Woletz
09.30–10.00	The placenta including the umbilical cord insertion	Harris Finberg
10.00–10.30	The umbilical cord revisited	Ron Benzie
10.30–11.00	UI/UL plenary lecture: a personal view of the history of paediatric ultrasonography	Rita Teale

Sunday Brunch 11.00–11.30

Plenary session 11.30–12.45

General

11.30–12.00	Doppler applications in urology and nephrology	Christian Nolsøe
12.00–12.30	Radiofrequency ablation guided by sonography	John McGahan
12.30–12.40	Valedictory	

E3 Policy and Guidelines ASUM Research and Grants Committee

Adopted by Council on 7 March 2004

1 INTRODUCTION

The ASUM Research and Grants Committee (RGC) policies and procedures are set out to establish the principles governing research projects sponsored by ASUM. This document is intended to help the new investigator apply for and manage any research grant, as well as the ASUM administration overseeing the process. The manual is available both in hard copy and on the Web (www.asum.com.au/open/policies.htm). Changes and updates may occur where Council considers and makes decisions on RGC matters. It is suggested that applicants and grant holders use the Web document as the primary reference since it will be updated on a regular basis. It will be possible to download the manual from the Web if a current hard copy is needed. The Education Officer in the ASUM Secretariat will be responsible for providing assistance and information to applicants and grant holders, in regard to questions concerning the administration of sponsored projects. The name of the Education Officers, their e-mail address, and contact details are listed in Appendix 1. They also can be reached at tel 02 9958 6200.

This guide discusses in detail the policies and procedures of the RGC. However since sponsored project administration may involve other bodies and institutions, sections are included which touch upon the functions and responsibilities of other entities.

The material in this manual is organised in a temporal sequence – from preparing the application, through submission and pre-award administration, to post-award administration and close-out.

Additional information on the fundamental principles governing sponsored projects should be sought from any other body involved directly or indirectly in any application or sponsored project.

2 GENERAL INFORMATION

2.1 Types of Sponsored Projects

Sponsored projects fall into two general categories – grants, and individual fellowships. While the distinction between these categories is generally clear-cut, it is sometimes blurred when dealing with other sponsored project funding sources.

2.1.1 Grants

A grant supports an activity in which the investigator and the sponsoring institution are the primary beneficiaries. The granting agency (ASUM) plays no active role in managing or directing the project and the investigator and institution have considerable discretionary powers with respect to both scientific direction and budgetary flexibility. This funding mechanism is the one most commonly used by agencies which fund biomedical research. Grants may be awarded for different activities.

Some of the most common are:

2.1.1.1 Research

Research grants are financial awards provided to support investigation or experimentation aimed at the discovery and interpretation of facts or the development, application, or revision of theories. Most research grants are awarded to support a single research or project. These are what are commonly called 'traditional' research grants. However, the ASUM RGC and some other agencies also award research grants which involve multiple projects and cores (centralised services and/or facilities). These grants which, are called 'program project' or 'centre' grants, are developed around a central theme and generally are based upon a multidisciplinary approach to the problem. In addition, research grants may also be awarded for special purposes such as to support new investigators, renovate animal facilities, provide research travel funds, fund research conferences, or provide specialised equipment or facilities.

Some sponsoring institutions, do not allow individuals in a training capacity (as opposed to an employee) to be funded on this type of grant. Graduate Research Assistants and Post-doctoral Research Scientists are employees and are therefore allowed to be paid on a research grant; Graduate Students and Post-doctoral Fellows are trainees and are not allowed to be paid on a research grant. However, they can be listed on the grant in an unpaid role. Some non-government sponsoring agencies allow trainee (graduate students or fellows) funding on grants. However, in order to maintain the distinction between training and research grants for government accounting purposes, and between employees and trainees, the ASUM RGC will only allow trainees to be paid from research grants under certain circumstances. The agency announcement must clearly indicate that the award is, in part, intended to support a training mission and the grant proposal and budget can be tailored to distinguish research from training.

2.1.1.2 'Individual' Fellowships

Fellowships are provided to or on behalf of a specific individual for training that will enhance the individual's level of competence. Fellowships are available for individuals with varying degrees of experience. Fellowships provide either salary or stipend support and a minimal allowance for additional expenses (including tuition). The principal difference between a fellowship and a training grant is that the former is awarded for a specific individual and the latter is awarded for the training of unnamed individuals.

2.1.1.3 'Fee for Service' Subcontracts

These agreements are similar to service grants in that they are awarded to perform work in which there is limited intellectual or program involvement such as performing laboratory tests or hiring a firm to conduct interviews. A good rule of thumb in deciding if a subcontract is 'fee for service' or a research subcontract is to consider whether you would name the individual performing the work as an author on a paper resulting from the research

2.1.1.4 Cooperative Agreements

A cooperative agreement is similar to a grant except that the degree of involvement by the awarding agency is greater. It is frequently used for government-sponsored, multi-centre, clinical trials or for research areas where the government has funded multiple grants that require cooperative effort to either achieve program goals or to avoid duplication. Administrative rules governing cooperative agreements are similar to those governing grants. However, program officials monitor progress more closely; can strongly suggest research direction; mandate inter-institutional cooperation; and/or adjust funding depending upon progress or program needs. Where specifically directed by ASUM Council, the RGC may seek to use this funding mechanism.

3 PREPARING THE APPLICATION

3.1 Who May Submit an Application?

The principal investigator (the individual submitting the application) on a research, training, or service proposal must be an officer of a body (the 'sponsoring institution') participating in the medical applications of Ultrasound with a formal appointment and employment arrangement.

The principal investigator or project director of a sponsored project must assume full administrative, fiscal, and scientific responsibility for the conduct of the project.

Visiting, supernumerary, or part-time officers of research or instruction may be principal investigators on research grants in exceptional circumstances. In these instances, the Dean/Chairman/Director of the employing body or Imaging service must write a letter to the Chairman of the ASUM RGC requesting a waiver of the policy. The waiver letter, in addition to confirming the researcher's qualifications and the reasons why an exception to the general rule should be considered, must state that the Dean/Chairman/Director of the sponsoring institution is will-

ing to accept full administrative and fiscal responsibility for the project. It should also state that the individual will have a suitable appointment at the employing body for the duration of the current project period of the grant, assuming it is awarded. Sufficient time should be allowed to ensure that the request can be reviewed before the proposal has to be submitted. It should not be assumed that approval will be automatically granted.

Annual salaries utilised on proposals for visiting, supernumerary, or part-time officers should be based on the full-time equivalent salary of that individual.

An emeritus faculty member may serve as a principal investigator on a sponsored project only with the written permission of the Departmental Chairman, the Dean, the Vice Chancellor or equivalent officer of the sponsoring institution/University. This requirement applies whether the faculty member is currently emeritus or will assume that title at some point during the project period.

The letter requesting approval should indicate what the individual's duties will be after becoming emeritus and the space and resources that will be available for the conduct of the research. Annual salary calculations will be based upon the salary at the time of retirement together with standard institutional salary escalations.

Post-doctoral Fellows and Graduate Students can submit fellowship applications if an appropriate faculty member is willing to serve as a mentor.

Wherever applicable, the applicant must comply with all relevant sponsoring institution policies including the 'Policy on Externally Funded Research and Instruction' and the 'Statement on Conflict of Interest'. Special conflict of interest and misconduct of science policies may apply to members of the sponsoring institution. It remains the responsibility of the sponsoring institution at all times to ensure compliance with applicable policies.

3.2 Types of Applications

Applications for grants, contracts, or cooperative agreements can differ depending upon whether they are for new, competing continuation (or renewal) or non-competitive proposals.

3.2.1 New Applications

These applications are for new projects that must compete against all other new or renewal applications. Within this category, proposals can be submitted in response to the general mandate of ASUM or in response to a special announcement from ASUM. In the case of a grant or cooperative agreement, the special announcement is often either an RFA (Request for Application) or an Ongoing Program Announcement (PA). In the case of a contract, the special announcement is called an RFP (Request for Proposal). Proposals submitted under the contract mechanism which are not in response to an RFP are considered 'unsolicited'.

Typically, an application submitted in response to an RFA or an RFP has to compete with only those proposals submitted in response to that particular announcement. Those submitted in response to an Ongoing Program Announcement typically have to compete with the general pool but may receive special consideration for funding. Proposals submitted in response to RFAs (grants) or RFPs (contracts) are typically reviewed separately and compete for a pool of money which has been committed for this particular research program.

New applications are generally for several years or budget periods. While budget periods are typically of one year duration, depending upon the agency, the announcement, and the nature of the program, they can extend for a greater or lesser period of time. The total period of time for which the agency indicates that it will award funds for the project is called the project period.

For new applications, a grace period of three months is given after the submission date in order for the investigator to obtain necessary human subject, animal, biohazard, etc. clearance from the sponsoring institution. Please check your sponsoring institution guidelines to determine if a grace period is offered. In all cases, it is required that such approvals be in place prior to the start of funding and be maintained during the research period of performance.

3.2.2 Competing Continuation or Renewal

Competing continuation proposals (also called renewal proposals) are applications that are submitted to obtain funds to continue a project beyond the currently funded project period. This proposal has to compete to receive the additional funding against other new and renewal applications.

For competing applications the sponsoring institution may not allow a grace period after the submission deadline date in order for the investigator to obtain extensions of the necessary human subject, animal, biohazard, etc. clearance. Specific application guidelines should be checked to determine if a grace period is offered. In all cases, it is expected that such approvals must be in place prior to the start of funding and must be maintained for the research period of performance.

3.2.3 Resubmission or Amended Applications

Not infrequently, new proposals or renewal applications are not approved for funding. In many cases, the investigator chooses to modify the proposal based upon the reviewers' comments and submit it again. These proposals are called amended applications or resubmissions. If, in the case of a rejected renewal, the investigator has funds remaining in the current budget period, he/she can frequently request a no cost extension of the end date of the grant. During this period, the amended application is prepared, submitted, reviewed, and hopefully, awarded for funding. Occasionally, ASUM GRC may provide a funded extension to cover the interim period. This is more likely to occur in the case of a multi-project grant such as a centre grant.

3.2.4 Non-competing Continuation

After a project is approved, the funds are often awarded on a yearly basis even though the GRC indicates that it plans to support the research for several years. Each year (or budget period) throughout the project period, a non-competing continuation application or progress report must be submitted to receive the additional funds which have been committed or 'obligated'. These applications do not compete for the funds and are typically only reviewed by the program officer at the agency. It is very rare for a non-competing continuation to not be funded.

For non-competing applications, some agencies (e.g. Public Health Service), may require that certain approvals such as those concerning human subjects be in place prior to the submission of the proposal. Please check specific agency policies. In all cases, it is expected that such approvals must be received prior to the start of funding.

3.2.5 Supplemental Applications, Extensions and No Fund Extensions

A supplemental application is a request for an increase in support for the expansion of a project or to meet unforeseen administrative costs (e.g. an increase in animal care costs). An extension is to fund the research for an additional period, generally of short duration.

Depending on the nature of the request and the agency, supplemental applications or extensions are considered either competitive or non-competitive (administrative). If the former, the application receives a regular review; if the latter, the request is reviewed by GRC administrative staff.

A 'no fund extension' is a request to the GRC for additional time to complete the research without requesting additional funds. All extensions for awards must be approved by the GRC.

3.2.6 Transfer of an Ongoing Sponsored Project

Policies governing the transfer on-going sponsored projects vary from one sponsoring institution to another and by type of project. It is best to consult with the RGC concerning its particular requirements.

Transference of Public Health Service grants requires submissions on the part of both institutions - the relinquishment of the grant by the original institution and the acceptance of the grant by the other. The relinquishing institution must complete a relinquishment form indicating (a) the date of relinquishment, (b) the estimated amount of funding to be transferred, and (c) equipment purchased on that grant which will be transferred. The new sponsoring institution must send the RGC (a) a new grant face page, (b) budget and justification, (c) a statement concerning any changes in program direction, (d) new 'resources and environment' and 'other' support pages, and (e) a new checklist. The investigator also will be required to submit an Internal Cover Sheet (See 4.5.) and a list of all equipment being transferred the incoming sponsoring institution to the Office of RGC. If any of the work involves human subjects, animal subjects, radioactive materials, recombinant DNA and/or biohazards, approvals must be obtained from the appropriate offices. If the budget period at the old institution was longer than six months old, the RGC has the option of starting the grant at the new institution at the start of the next budget period. However, this rarely occurs. Similarly, the RGC is not required to transfer grants during an extension period.

3.3 How to Obtain Information on Funding Sources

Each agency and foundation has its own guidelines, policies, and application forms. The Project Officer who handles this matter in the applicant's sponsoring institution is the first point of contact to assist you in obtaining information. If this avenue is not available ASUM GRC will help you obtain the necessary information and applications from other agencies.

Most approaches to commercial sources of funding are made via personal contact. If you have a project which is suitable for commercial funding, ASUM GRC will endeavour to provide you with assistance. If you are interested in participating in clinical trials, the sponsoring institution Ethics Committee secretariat is the starting point for developing an application and funding plan.

3.4 How to Write an Application

Several sources are available from the Office of the RGC to help a researcher prepare a proposal. If received early enough, the ASUM Project Officer RGC maybe able to also provide helpful comments on the budget, budget justification, and other issues pertinent to providing the general information required in the application.

Those new to proposal writing should keep the following in mind:

- Be sure to follow funding source guidelines and tailor your abstract, hypothesis, and specific aims to highlight the ASUM's area of interest. Keep in mind how the fun der reaches funding decisions.
- Try to have the application reviewed by an experienced investigator, preferably one who has had success with the potential funding source.
- Make sure the scope of the work and the budget is in line with the size of a typical award from the RGC.
- The following are some of the most common causes for rejection:
- The hypothesis is poorly defined or too diffuse.
- The research problem is unlikely to provide new information, is unimaginative, or is overly ambitious for the project period.
- The experimental design has inappropriate controls either in composition, number, or characteristics.
- The methodology is questionable, unsuited, or defective.
- Alternative approaches to potential problems are not addressed.
- The data collection procedures have a confused design, use inappropriate instruments, or poor timing.
- The data management and analysis are vague or unlikely to provide accurate and clear-cut results.

3.5 Special Approvals and Sign-offs

The RGC requires various approvals or sign-offs to be obtained prior to the submission of any government or non-government sponsored project. These approvals can be related to the use of other schools'/departments'/institutes'/centres' or institutions' personnel, space, equipment, or facilities. They can be necessary if there are space renovation or special insurance requirements. Similarly, the involvement of human subjects, vertebrate animals, radioactive materials, recombinant DNA, or biohazards may require the principal investigator to obtain approvals prior to or immediately following the submission of a research proposal. If you are unsure of what approvals or sign-offs may be necessary, please contact the RGC Project Officer. Obtaining these approvals and sign-offs can be time consuming and if not obtained in a timely fashion, may lead to a delay in the submission of your proposal.

3.5.1 Preliminary Proposals and Letters of Intent

A preliminary proposal typically is a letter sent to the RGC in which the investigator presents a brief outline of planned work to determine if the agency is interested in receiving a detailed application. A letter of this type does not require approval and sign-off by the sponsoring institution as long as it is short in length (one to two pages) and does not contain budgetary detail or a commitment of the part of the institution. A statement that provides a single figure, bottom-line budgetary estimate is acceptable. Please be aware that ASUM does not view these letters as binding with respect to budget, personnel, or facilities. The CEO, ASUM would appreciate receiving a copy of such letters as a courtesy.

A letter of intent generally is requested by RGC when trying to determine the number of applicants there may be in response to a program announcement. It also helps the RGC make a preliminary determination as to the number and type of reviewers that will be necessary for proposal review. This letter generally does not contain any budgetary information and is generally non-binding. A letter of intent does not require sign-off by the sponsoring institution unless such a sign-off is requested by the RGC.

3.5.2 Schools, Departments, Centres, or Institutes

The approval and signature of the head of principal investigator's administrative unit must be obtained in all circumstances in the case of the Schools of Medicine, Public Health, Nursing, and Dental and Oral Surgery. The signature(s) from the administrative unit(s) supporting the investigator's salary and providing the space for the research project are required. The approvals and signatures of the appropriate deans/chairmen/directors or their authorised representatives are required on the Internal Cover Sheet (see 4.6) for projects which involve either the personnel, space, equipment, or facilities of administrative units other than that of the principal investigator. These signatures must be obtained prior to submission of a sponsored project proposal. RGC suggests that duplicate copies of the cover sheet be sent to the various administrative units so that several signatures can be obtained simultaneously. The RGC will also accept 'e-mail approvals' and faxed approvals. Approvals transmitted verbally to the office are not acceptable unless followed by a written, e-mail, or faxed approval.

Signatory approvals are not required for submission of non-competing proposals except when there are substantive program or budgetary changes from the previous year. In those circumstances, the signature of the head of your primary administrative unit and that of any other affected units is required

3.5.3 Facilities, Renovations, and Space

Most applications require a description of the facilities available to

the project. If additional space is required for the project, the issue should be discussed with your departmental/institute/centre administrator and dean/chairman/director as soon as possible. The dean/chairman/director or administrator is required to 'sign-off' on the Internal Cover Sheet accompanying the proposal indicating that he/she agrees with the facilities statement. Similarly, use of central core facilities or equipment must first be approved by the director of that facility.

If the project requires the rental of space, the matter must first be discussed with your dean/chairman/director and must be approved by the sponsoring institution.

If renovations or new construction is required to conduct the project, the matter should be discussed with your administrator or dean/chairman/director and a feasibility study and price quotation must be obtained. Renovations unless of a minor nature are unlikely to receive approval from RGC.

3.5.4 Research Involving Special Liabilities or Requiring Insurance

If a project poses special liabilities, special insurance coverage must be confirmed prior to approval. For projects which involve potential liability risk to the sponsoring institution, it may also be necessary to obtain the approval of the sponsoring institution after discussions with the sponsoring institution's Risk Management Office.

3.5.5 Research Involving Human Subjects

The sponsoring institution's Human Ethics Committee must approve all research proposals involving human subjects. No human subject research is allowable on a project if Ethics Committee approval has lapsed or has not been obtained. Failure to have current approval may lead to a project account number being suspended or not issued until approval is obtained.

Since the protocol review procedure involves review at the sponsoring institution level, any investigator contemplating research involving human subjects should submit a protocol as soon as possible. All protocol approvals are for the applicable period only. An approved protocol can be used for more than one proposal if the aims and methodology are the same.

3.5.6 Research Involving Animals

All proposals involving vertebrate animals must be approved by the sponsoring institution's Animal Ethics Committee or equivalent body. This requires that protocols concerning the utilisation of animals must be submitted prior to application to RGC. As part of the approval process, all personnel listed on the protocol must have completed a certification course on the basic principles underlying the humane care and use of laboratory animals.

RGC allows a grace period of 60 days from the time of submission for renewal proposals. No grace period is allowed for non-competing continuations. An approved protocol can be used for more than one proposal if the aims and methodology are the same.

No sponsored project involving animals shall be conducted without a protocol having a current approval. No animals shall be housed, or survival surgery (animals are alive after the operation) performed, in a facility which is not approved. Failure to have current approval may lead to a project account number being suspended or not issued until approval is obtained.

All animals must be housed in facilities that are approved by, or are part of, the sponsoring institution. If a project is planned which utilises large numbers of animals or an unusual species, or requires special handling or facilities, the handling facility should be consulted to ensure that the requirements can be accommodated. This is especially important for investigators who have not previously housed animals.

3.5.7 Research Involving Hazardous Materials

The relevant sponsoring institution resource should be consulted for information on chemical, biological, and fire safety, industrial hygiene, regulatory compliance, and other occupational health concerns. The applicant must be aware of regulatory obligations such as responding to emergencies involving hazardous materials; investigating environmental health concerns; and assessing the efficiency of safety devices and other engineering controls.

3.6 Preparing the Budget

In preparing the budget for an application, two factors should be carefully considered: (1) the needs of the project, and (2) the funding limitations imposed by the RGC (either explicit or customary). The requested amount should not be so small as to preclude successful completion of the stated goals nor so large that the RGC will not seriously consider funding the proposal. A project should be tailored to fit the constraints imposed by aims of ASUM. Any questions concerning budgetary matters can be discussed with the RGC project officer. In many cases, the Project Officer can provide you with information concerning the size of previous proposals submitted to the RGC by investigators and the amount of funds actually awarded.

There will be no routine escalation for future years. In determining the total for each budget year, applicants should first consider the direct cost of the entire project period. Well-justified modular increments or decrements in the total direct costs for any year of the project that reflect substantial changes in expected future activities may be requested. For example, purchase of major equipment in the first year may justify a higher overall budget in the first, but not in succeeding years'.

The RGC Review Group will evaluate the budget on the basis of a general, expert estimate of the total effort and resources required to carry out the proposed research, rather than on the basis of detailed categorical costs. Reviewers also may comment on the requested budget without making specific recommendations. Additional budget information will be requested only under special circumstances. Every attempt will be made to fund these grants at a level at or close to the recommended total direct costs.

For Consortium/Contractual costs, provide an estimate of total costs (direct plus facilities and administrative) for each year, each rounded to the nearest $100. List the individuals/organisations with which consortium or contractual arrangements have been made, the percent effort of key personnel, and the role on the project. Indicate whether the collaborating institution is foreign or domestic. The total cost for a consortium/ contractual arrangement is included in the overall requested direct cost amount.

3.6.1 Cost-Sharing

Cost-sharing on a proposal is when you state in your proposal that you are planning to subsidise the budget of the proposal with funds from another source. This can take several forms. When the RGC requires the sponsoring institution to share a proportion of the total cost of the project or when certain costs are 'capped', this is considered cost-sharing.

Cost-sharing can also occur when you reduce your proposal costs to increase your competitiveness, e.g., not requesting full compensation for personnel effort. It also occurs when a portion of the expenses to conduct the sponsored project will be coming from other sources. Any funds which are offered as cost-sharing are considered part of the institution's obligation if the proposal is awarded.

Both the RGC (and the sponsoring institution) will expect that specific funding sources be identified to fund the cost-sharing portions. This will allow for the clear identification of expenditures supporting the project.

3.6.2 Personnel

The sponsoring institution's administrator or investigator should carefully include personnel who fulfil the needs of the project with

respect to experience and expertise, and effort. Each individual should be listed separately by name and title – either university title, (at the time of the award) or, for some agencies, the research-related title. If a position is to be filled by someone who is not currently employed, that position should be listed as 'to be named' or 'tbn' together with the position title. If an individual is going to be promoted prior to or at the start of an award, the title and salary should reflect the appropriate title and salary. The signature of the head of the sponsoring institution administrative unit or the authorised representative will be accepted as verification of the title and salary. It will also be accepted as verification of a new hire.

3.6.2.1 Effort

The effort of professional and support personnel should be listed in accordance with sponsoring institution policy. If the investigator has administrative and/or teaching duties, this effort should be considered when deciding how much effort is available for research.

Principal Investigators cannot be listed on an 'as needed' basis without permission from the Chairman of the RGC. Project Directors of an individual project in a multi-project program can be listed on an 'as needed' basis if they devote less than 1% of time to the project.

All effort of administrative and clerical staff should normally be treated as indirect costs. However, direct charging of these costs may be appropriate where a major project or activity explicitly budgets for administrative or clerical services.

For example, this might be appropriate for projects whose principal focus is the preparation and production of manuals and large reports, books, and manuscripts. Also, consideration will be given to projects that are geographically inaccessible to normal departmental administrative services; and individual projects requiring project-specific database management, individualised graphics or manuscript preparation; human or animal protocol and/or other project-specific regulatory protocols; and multiple project-related investigator coordination and communications.

These examples are not exhaustive nor are they intended to imply that direct charging would always be appropriate for the situations described above. Where direct charges for administrative and clerical salaries are made, care must be exercised to fully justify the charges in the proposal. Care also must be exercised to assure that costs incurred for the same purpose in like circumstances are consistently treated.

3.6.2.2 Compensation

It is a requirement of the RGC that investigators indicate where full compensation for the effort of any of the personnel listed in the proposal is sought. Hence, if an individual is listed at 20% effort, 20% of the sponsoring institution salary may be requested in the proposal. However, cost sharing or alternate allocation of these costs is recommended where appropriate. For example, where:

1. The sponsoring institution agency's specific written policy does not allow such payments.
2. If the individual is receiving a fellowship or career award which precludes requesting salary on other grant applications.
3. If the individual is participating in a sponsored project in which his/her effort is duplicative of effort being funded by another sponsored project - for example, if two awards are supporting sections of the same project.

3.6.2.3 Fringe Benefits

Fringe benefits will not normally be funded in applications assessed by RGC.

3.6.2.4 Part-time, Casual, and Work-Study

Sponsoring institution employees who are paid participants must be listed as 'personnel' on project proposals. Sponsoring institution employees who will not be paid as part of a project may be listed as unpaid 'personnel', unpaid consultants, or can indicate the extent of their participation by submitting letters of collaboration.

Casual employees can be listed on sponsored projects.

3.6.2.5 Graduate Student Researchers

Graduate students should not be listed on research grant applications for stipends where their trainee status precludes such payments. They can be listed in an unpaid role. Graduate research assistants and post-doctoral research scientists are considered employees and can be paid from research grants.

3.6.2.6 Foreign Nationals and Residents

Only Australian or New Zealand citizens, and foreign nationals who possess permanent residence status may submit applications for RGC sponsorship.

3.6.2.7 Alterations and Renovations

Alterations and renovations are defined as work required to change the configuration of installed equipment or alter interior arrangements of an existing facility so that it may be more effectively utilised. Limited costs may be included in a Grant application.

3.6.2.8 Consultants, Consulting Fees, and Honoraria

The primary investigator may include costs for consultant services when factors such as timing, costs, qualifications or the nature of the service to be rendered make it more beneficial for such services to be acquired outside of the project rather than to be performed by the investigators. A consultant is defined as a firm or individual with whom the sponsoring institution enters into a Consultant Service Contract for a specialised type of service. The contract is for the primary purpose of obtaining the benefit of the consultant's knowledge, skills, or expertise. It contains a scope of work which clearly defines the goods or services being procured and addresses the needs of the user. This can be done either through performance specifications or through a description of the tasks to be performed. Honoraria (for example, for Advisory Board participation) and human subject reimbursement are exempt and not considered consultants.

3.6.3 Equipment

Equipment is defined as an item having a unit value of $2000 as well as a useful life of two or more years. It is important to adhere to this definition when preparing sponsored project budgets. For items such as computers with varying component parts, the unit value is the sum of the cost of the base unit and its components at the time of the acquisition of the base unit.

Equipment is further categorised as 'special purpose' or 'general purpose'. Special purpose equipment is usually considered to be items which only can be used for research. General purpose equipment has utility which is not limited to research.

It is important that each item of equipment being requested is clearly identified and priced (including shipping and installation) in the proposal. (If possible, specific manufacturers and model numbers should be used.) However, the investigator has the discretion to utilise more general listings. If a piece of equipment requires major installation renovations, the proposal is unlikely to be approved. The cost of the renovation must be included in the budget unless otherwise already the subject of approval and committed funding.

3.6.4 Supplies

Supplies, animals, and expendable equipment (property which does not meet the definition of equipment, see 3.6.2.5) fall into this category. Major cost items in this category should be itemised - for example: animals, glassware, animal care costs, tissue culture media, radioisotopes, antibodies, etc. Costing should be based

upon either experience or actual price quotations. However, the investigator has the discretion to utilise more general listings.

3.6.5 Travel

Travel costs should be divided into two categories: domestic travel and foreign travel. Funds can be requested for travel to scientific meetings, to collaborating laboratories, and for consultation with the funding agency or with colleagues concerning project research.

The basic policy governing travel expense reimbursement is that an individual travelling on University business should be reimbursed for actual cost. It is required that each trip requested in the budget should be specifically identified as to location and length of stay. Per diem, travel, and registration expenses should be itemised. Trips approved as part of the awarded budget do not require further approval. Some sponsoring institutions require prior approval for travel interstate or to foreign countries.

3.6.6 Patient Costs

Patient care costs are allowable for routine and ancillary medical services required as part of the research protocol. However specialised tests not done in a hospital laboratory or a licensed, commercial testing laboratory are not considered patient care costs and must be included under 'Other Direct Costs'. Reimbursement of personal expenses such as patient travel, patient honoraria, consulting physician fees, etc. is not allowable in this category. Priority is given to peer reviewed research.

3.6.7 Other Direct Costs

This category is used to delineate costs not specified in any other category. Examples would be animal care costs, specialised tests, central computer charges, shop charges, core facility charges, publication costs, copying and telephone charges, maintenance contracts, service agreements, payments to volunteers or patients, patient travel, student tuition charges, student health and computer fees, seminar costs, typing services, etc. In certain circumstances, space rental, the rental of equipment, and the purchase of insurance may be also allowable. Costs associated with radioactive waste, chemical, and bio-hazardous materials disposal are currently not treated as direct costs. These costs are recovered as part of our indirect costs.

To determine the costs of this section, it is best to itemise each cost. Since many of these costs are incurred in the general operation of the laboratory, it should be kept in mind that only that proportion of the total cost that is related to this specific proposal should be included.

3.6.8 Research Subcontracts or Consortium Agreements

This category in a proposal budget is set aside for the summary of the budgets from secondary participants. If it has been decided that a subcontractual or consortium agreement will be established with another institution, the administrator and/or investigator should establish a working relationship with their counterpart as soon as possible. This individual will be required to submit for inclusion in the proposal: (1) a budget approved by his/her institution; (2) a letter from an authorised official indicating that they are willing to participate in a consortium/subcontractual arrangement if funding is approved; (3) a statement of work or the 'research plan'; and (4) a statement concerning the facilities and resources available for the project. These statements can either be a separate section of the proposal or incorporated into the proposal as a whole depending upon the wishes of the principal and participating investigators. In addition, for many sponsoring agencies, information on 'other support' and on various approvals or assurances, so-called 'checklist' pages will also be required. As a general rule, the information requested of the primary institution 'flows down'; that is, anything requested of the prime institution is generally also requested from the subcontractor.

3.6.9 Indirect Costs

Indirect costs are costs which are real costs associated with doing research but are difficult to quantify with respect to any given project. For example, heat, maintenance, building depreciation, administrative expenses, and library use. Funds received as indirect costs are reimbursement for funds expended for central and departmental administration, buildings and grounds, and library costs.

Indirect costs should not generally be included. In rare cases, RGC will not include the indirect cost reimbursement request as part of the application budget but reimburse the institution separately.

3.6.10 Future Year Budgets

If the proposal requests more than one year of support, RGC will require a separate budget for each year. Each budget category can be developed in two different ways. If the costs in a given category differ in any of the subsequent years (e.g., unusual salary increases, programmatic changes, additional equipment needs, etc.) either a detailed breakdown should be provided or a detailed explanation given in the budget justification. Cost estimates should incorporate either actual prices or cost-of-living increases. An RGC administrator not familiar with the research may have the final say as to the extent of future years' budgets reductions so justifications are important. (RGC requires that such changes be marked with an asterisk.)

If the costs in the future years' budgets are essentially the same, an alternative approach is to apply a simple escalation factor to the category. Please indicate any escalation factors that are being utilised.

3.6.11 Budget Justification

The budget justification is an important section in any proposal. It should be used not only to state why an item costs what it does, but to indicate how it relates to the research plan. The information should be sufficiently detailed to address all concerns with respect to cost and need. In general, explanations should be more detailed for competing than for non-competing applications.

Key points with regard to the budget justification include:

Additional budget information will be requested only under special circumstances. All necessary detail should be included in the submission to allow a decision to be made on that basis.

For consortium/contractual costs, provide an estimate of total costs (direct plus facilities and administrative) for each year, each rounded to the nearest $100. List the individuals/organisations with which consortium or contractual arrangements have been made, the percent effort of key personnel, and the role on the project. Indicate whether the collaborating institution is foreign or domestic. The total cost for a consortium/ contractual arrangement is included in the overall requested modular direct cost amount.

3.6.11.1 Personnel

Each person's role in accomplishing the specific aims of the proposal should be adequately discussed. Particular emphasis should be given to the justification of technical positions and positions listed as 'to be named'.

If an application is a competing or non-competing renewal, changes in personnel effort should be noted and justified. Salary and fringe benefit escalation rates for future years should also be noted.

Remember: If you include clerical and administrative personnel as part of your budget in a proposal, special care must be given to justify their positions with respect to the specific goals of the project.

3.6.11.2 Alterations and Renovations

If a large scale alteration or renovation is planned, it is appropriate to incorporate its significance to the research into the body of the

proposal. When this is done, it should also be synopsised and referenced in the budget justification. Less significant alterations and renovations should be fully discussed in the justification. It is often helpful to provide a written cost estimate for the renovation and 'before and after' line diagrams.

3.6.11.3 Consultants and Honoraria

The justification should include an explanation as to why the individual is crucial to the project and what the consultant specifically will do. The reasons for the number and length of the trips should also be stated. If the amount requested is large, the cost must be itemised with respect to fees, travel, and other expenses.

3.6.11.4 Equipment

Each item should be justified in detail. If a portion of the cost of an item is to be charged elsewhere, this should be stated. If you wish to purchase a particularly expensive model, an explanation should be given as to why that particular model is crucial. If the item might reasonably be expected to be already available to the investigator, care should be taken to explain the need for another – i.e. over utilisation, age of current equipment, new laboratory, etc. In the case of contracts, it is required to provide a written cost estimate.

3.6.11.5 Supplies

Brief explanations are generally acceptable unless the cost of a particular item 'stands out'. These items should have separate justifications. Such items as animals, radioactive supplies, and tissue culture supplies are often justified individually. If a supply budget is relatively large with respect to the total proposal budget, it is also useful to 'breakout' the costs and justifications of categories of supply items.

3.6.11.6 Travel

The travel justification should include who will be going on the trip, the destination, and the purpose of the trip. The number of trips and the length of stay for each should also be expressed. Many contracts require more detailed information such as how the cost of the various travel components (tickets, hotel rooms, cab fares, etc.) were determined.

3.6.11.7 Patient Costs

The need for these costs is often fully explained in the research protocols and should be referenced. The cost of each type of test should be itemised. If these costs vary in future years due to recruitment, drop-out, changes in lengths of stay, study phases, or types of testing, it is useful to provide a referenced table with this information. In most cases, the professional fee for test interpretation should not be included if these qualified individuals are being requested in the personnel category of the budget. If professional interpretation fees are to be charged, they should be thoroughly justified. In some cases, it is also useful to provide information on the total cost per patient per phase of the study. Information on how the various scientific phases relate to the budget periods is also useful if not provided elsewhere.

3.6.11.8 Consortium/Subcontracts

These costs do have to be justified unless the sponsoring institution has submitted its own budget justification with its budget. However, the reasons why a consortium/contract is necessary or desirable should be carefully spelled out either here or in the body of the proposal.

3.6.11.9 Other

The justifications in this section should be developed using the same principles as those for the 'supply' category. Costs which are being shared with other proposals should be identified. If costs are included which appear general in nature, such as copying or publication costs, indicate why they are necessary with respect to the particular proposal.

3.7 Other Support

Many agencies including ASUM RGC require information concerning sponsored projects that the investigators in the proposal are planning, have pending, or have been awarded. The following information is typically requested:

1. title of the proposal,
2. sponsoring agency and grant number,
3. effort of the investigator,
4. budget and project periods,
5. amount of funds available to the investigator for the budget and project period,
6. a brief (several sentence) description of the project,
7. a statement concerning the relationship of the award in question and the current proposal and whether any scientific or budgetary overlap exits, and
8. a plan for rectifying any scientific or budgetary overlap.

3.8 Resources and Environment

This section of a proposal typically is concerned with the resources and environment which directly impact the work described in the proposal.

If it is felt that a reviewer might question the availability of certain specialised equipment or other resources, this should be discussed here (and in the body of the text, if appropriate). Proximity to supporting collaborators, availability of shared core facilities, and a discussion of how ASUM promotes intellectual stimulation in your scientific area can be discussed, if desired.

3.9 Miscellaneous Information/Documentation Requested by Agencies

Given the number of agencies that support biomedical research, it is not unusual that an investigator or administrator might come across a proposal requirement that is unfamiliar. Please contact the RGC Project Officer / Education Manager concerning such requirements.

4 APPLICATION SUBMISSION PROCEDURES

All sponsored project proposals must be reviewed and approved by the RGC. All sponsored project proposals are submitted through the ASUM secretariat.

1. The RGC is authorised to submit, negotiate, and sign all sponsored project agreements for ASUM after ratification by ASUM Council. In addition, RGC provides assistance in identifying funding sources and in preparing sponsored project proposals. With the exception of commercial proposals and government and non-government clinical trials, RGC acts as a liaison between ASUM the sponsoring institution. In all cases, it is charged with the responsibility of ensuring that the terms of the award are fulfilled. RGC also has responsibility for those aspects of post-award administration which do not involve financial accounting.
2. Other functions of the RGC include maintenance of the computerised proposed project system for ASUM, establishment of ASUM sponsored projects, budget monitoring, identification and dis semination of funding opportunities, fostering grantsmanship, and coordinating educational efforts to promote the proper conduct of science.

5 POST-AWARD ADMINISTRATION

5.1 Office of the Administrative Officer, RGC

The Administrative Office, (AO, RGC) is responsible for administrative aspects of the post-award administration of sponsored projects.

5.2 Issuing a Consortium or Subcontractual Agreement

If a proposal approved by ASUM contains a subcontract, (AO, RGC) prepares a subcontractual agreement and submits it to the investigator for review. After review and comment, it is sent to the sponsoring institution for review and signature by their institutional official. Once signed by that institution, it is re-reviewed by the AO, RGC for any changes. If the changes are substantial, it may be sent back to the investigator for re-review. If satisfactory, the investigator prepares a Contract Purchase (CP) requisition which the AO, RGC will forward to ASUM secretariat. Once the CP is issued, the subcontractor may start billing ASUM for services. The investigator is responsible for approving all payments. In addition, most subcontracts will contain a clause stating that ASUM will withhold 10% of the funds pending receipt of any final reports or 'deliverables'. It is the responsibility of the investigator to inform (AO, RGC) when those funds can be released. If at any time, the subcontractor's performance is not satisfactory, the AO, RGC should be notified immediately. For a complete copy of the procedures and samples of a subcontract and a CP requisition, please contact the AO, RGC.

Please note that if a new subcontractual agreement (as opposed to an amendment) must be issued for each year of a project, the subcontract from the prior year must be 'closed out' before a new subcontract is issued.

5.3 Rebudgeting of Funds

Rebudgeting is the utilisation of funds in a way that differs from that proposed in the budget approved by the RGC. Approval of rebudgeting of funds on a sponsored project is the prerogative of the RGC. In some instances, specified rebudgeting authorisations may be granted to the institution or to the investigators by RGC. If the rebudgeting approval rests with the sponsoring institution, the investigator should write a letter to RGC, countersigned by the Dean/Chairman/Director or Administrator, indicating:

1 which category to withdraw funds from;
2 which category to add funds to;
3 why the transfer of funds is needed;
4 why funds can be taken from that particular category; and
5 how the need relates to the project.

5.4 Role of the Principal Investigator in Budget Monitoring

Although the Principal Investigator may delegate responsibility for handling the day to day financial administration of a grant or a contract (e.g. bookkeeping, ordering supplies, processing payroll) to others within the department or unit, the Principal Investigator must exercise appropriate oversight of the overall finances of the project. This is necessary in order to ensure:

1 that personnel charges to the grant or contract are consistent with the effort expended by those engaged in the work funded by the project,
2 that other than personnel expenses are appropriately charged and allocated to the sponsored project,
3 that charges to the grant or contract do not exceed the funds awarded,
4 that the charges allocated to the project are in compliance with federal and University policies and procedures, and
5 that if significant rebudgeting occurs (25% rebudgeting of direct costs) which may result in an impact on the scientific program proposed in the awarded application, it is reported to the RGC.

5.5 Patents and Inventions

Inventions developed utilising the resources and activities of ASUM are a potential resource of great value to the public. Unless agreed to the contrary or required by Statute ASUM retains title to inventions developed or reduced to practice under sponsored projects.

Sponsored personnel must inform ASUM of any potential inventions. The inventor will be required to complete an invention disclosure form which will help RGC decide if ASUM will develop the invention or allow the inventor to retain title. It is the responsibility of the principal investigator to notify the sponsoring institution of any inventions and to keep them apprised of any patent development.

5.6 Human Subject and Animal Assurances, Radiation Safety, Conduct of Science, and Conflict of Interest Policies

Investigators conducting either animal or human subject research are required to have their protocols approved by the appropriate committees and kept current. They must be renewed annually. All individuals wishing to be principal investigators of protocols are encouraged to undertake appropriate 'Human Subjects in Research' study. In addition, all researchers utilizing animals are required to have training in handling animals. All laboratories in which animals are utilised are subject to inspection.

Conflict of Interest declarations should be completed annually or more frequently as the situation warrants.

Investigators planning to use radioactive materials are required to submit protocols for approval to the relevant Radiation Safety Committee. In addition, they must participate in a course given by the Radiation Safety Office, be listed as radiation users, and obtain badges necessary to measure exposure to radioactivity.

5.7 Extensions

5.7.1 No Fund Extensions

No fund extensions are utilised when additional time is required to adequately fulfil the obligations of an award. Requests for this extension should be addressed to the RGC, signed by the investigator and countersigned by the dean/chairman/director. The letter should state the reason for the request and the amount of additional time needed, and should be received by the RGC office before the expiration of the budget period in question. If approved by RGC, the letter will be countersigned and forwarded to the sponsoring institution.

RGC has the authority to issue one extension for up to twelve months as long as the agency is notified within 10 days of the end of the project period. A form is available in RGC to request this extension. If a second extension is need, it must be requested from the ASUM council.

Where an investigator receives funding for the renewal of a project with a project start date which occurs before the end of the no cost extension, the RGC should be immediately informed, requesting that the extension be terminated as of the start date of the renewal. The end date for the no-cost extension will be adjusted so that the overlap is eliminated.

5.7.2 Funded Extensions

In most cases, agencies require that requests for extensions with funds be submitted as competitive applications or supplements (depending upon whether the extension is for the whole project or one segment). However under certain circumstances, a letter explaining the circumstances and countersigned by the Dean/Chairman/Director and OGC is sufficient to obtain an administrative supplement.

5.8 Changes in Key Personnel, Substantial Changes in the Effort of Key Personnel, or Changes in Program Direction

ASUM require that the RGC is notified at least 30 days prior to any anticipated change which will have a major impact on the sponsored project. The notification should be in writing and countersigned by the dean/chairman/director of the sponsoring institution. If the investigator believes that this change might be sensitive in nature, it is best to discuss it with RGC personnel prior to writing the letter.

Reductions in the effort of key personnel or re-budgeting of more than 25%, in aggregate, of the direct costs of an award will be construed as a program change.

5.9 Transfer, Sale, Discard, or Theft of Equipment

ASUM requires state that the title of equipment purchased on a sponsored project vests in ASUM after the project is completed. However, some sponsoring institutions state that equipment purchased by the investigator remains the property of the sponsoring institution. Similarly, some contracts or subcontractual agreements indicate that equipment purchased with funds from the agreement is the property of the sponsoring institution. If any question arises concerning ownership, ASUM will provide the necessary policy information.

5.9.1 Transfer of Equipment

ASUM may permit an investigator to transfer equipment to the sponsoring institution, even if the title resides with ASUM. This is often the case when the equipment is essential for the continued conduct of the sponsored research. However, if a piece of equipment is shared with other investigators or is necessary for the conduct of on-going research which will remain at the sponsoring institution, it is possible that permission may not be granted. Equipment, which was purchased on an active grant, after release is granted by ASUM, may be transferred by the principal investigator to another institution.

If an investigator wishes to transfer equipment to another institution, the matter should be discussed with his/her dean/chairman/director. A request for the transfer of equipment should be submitted to the RGC. Once it is signed by the investigator and the dean/chairman/director, the RGC Chairman will review and countersign the request and forward a copy to the AO, RGC, the investigator, and the dean/chairman/director.

Equipment being transferred to the sponsoring institution must be removed from the equipment inventory system of ASUM. Acknowledgment will be sent by AO, RGC to the investigator and the appropriate dean/chairman/director.

5.9.2 Sale or Discarding of Equipment

The procedure and guiding principle for the sale or discard of equipment is basically the same as for the transfer of equipment. However, prior to equipment being discarded or sold, a notice at no cost may be placed in the ASUM Bulletin describing the item and the terms under which it is available. The dissemination of this information provides other members of the ASUM community with the opportunity to obtain equipment which might be useful to their projects either for free or at a reasonable price.

If equipment is sold, the investigator must deposit the funds in an account which is dedicated to research support. A copy of the sales receipt should be forwarded to RGC.

5.9.3 Theft of Equipment

The theft of equipment should be reported to the ASUM Office. The AO, RGC should ensure that the item is removed from the ASUM inventory by submitting advice in writing after having it countersigned by the dean/chairman/director and forwarding it to the ASUM secretariat. A confirmation copy of the form will be returned to the investigator.

6 CLOSE-OUT

6.1 Transfer to Another Institution or Early Project Termination

If an investigator wishes to leave the sponsoring institution and transfer a sponsored project to a new institution, he/she must consult with the RGC and the sponsoring institution concerning the correct procedure. In general, the sponsoring institution would have to agree in writing to relinquish the project and provide an estimate of the funds remaining in the budget.

This is followed at a later date by the Financial Status Report which provides the final accounting and may lead to an adjustment in the new institution's Notice of Grant Award. The new institution would have to indicate in writing that it is willing to accept the project. The investigator will be required to write a progress report and indicate how the change would affect the resources available for the conduct of the project. Some agencies do not allow the transfer of projects awarded under special funding mechanisms. If an investigator wishes to terminate a project prior to the official termination date, a letter countersigned by the dean/chairman/director should be forwarded to the RGC. ASUM requires the submission of a final progress report and a financial statement indicating whether any funds remain. ASUM also requires a final invention statement.

Acknowledgement

ASUM thanks Dr R Davies, Chairman of the ASUM Research and Grants Committee, for developing this policy

ASUM wishes to acknowledge the source document from which the text of this guide was derived, at http://cpmcnet.columbia.edu/research/manual/ogcm2598.htm

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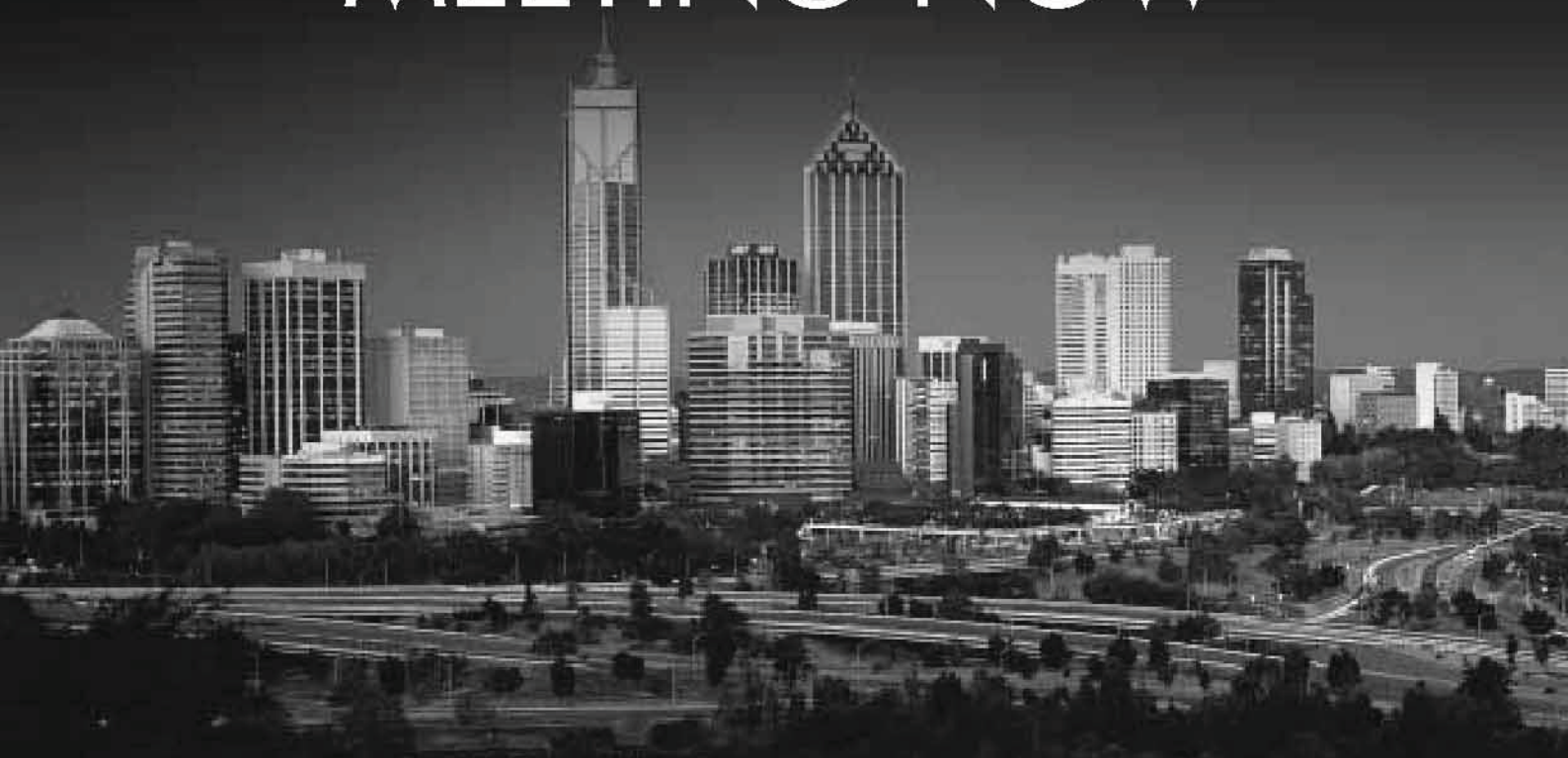

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email drigby@toshiba-tap.com

SonoSite opens ANZ direct subsidiary

SonoSite began as a division of ATL Ultrasound (now Philips) in February 1995, when the United States Department of Defence awarded ATL a grant to develop a highly portable ultrasound device to diagnose victims of severe trauma for use on the battlefield or in disaster areas. ATL spun-off SonoSite as a public company in April 1998.

The company has achieved significant technological advances with its hand-carried systems. Using proprietary, highly-miniaturised, architecture SonoSite has significantly reduced system size while maintaining high performance and image quality.

SonoSite is a New York Stock Exchange listed company, with headquarters in Seattle. It has an extensive sales and support network throughout the USA, and direct subsidiary operations in the United Kingdom, France, Germany, Spain, Canada, Japan and now Australia/New Zealand.

Recognising that mature medical markets, like Australia and New Zealand, need highly-focused specialised suppliers, SonoSite Australasia Pty Ltd has been established as a factory-owned subsidiary.

SonoSite has appointed Mr Greg Brand, a 25-year veteran of the ultrasound industry, to the position of managing director of the new subsidiary company. He is widely known as the former managing director of ATL Australasia, as the regional VP for ATL Asia Pacific, and most recently as the managing director of Philips Medical Australasia.

Greg is assisted by Ms Shelley Thomson, another veteran of ATL and Philips, in the position of clinical marketing manager. Shelley, who is widely respected for her clinical, marketing and business skills, will develop training and educational resources and assist the marketing efforts of SonoSite's existing distribution partner in Australasia – InSight Oceania Pty Ltd.

SonoSite's Australasian headquarters is located in Frenchs Forest, Sydney, and may be contacted toll-free on tel 1300 663 516, NZ 0800 888 204 or visit www.sonosite.com

2004

Mon 2 Aug 2004 ASUM ACT Branch Meeting
Mary Robertson presenting "Foetal Hearts"
Venue: Conference Room, Medical Imaging, The Canberra Hospital (5.30pm)

Sun 15 Aug 2004 ASUM WA Travelling Giulia Franco Teaching Fellowship Workshop (sponsored by Toshiba)
Venue: TBA, Bunbury, Western Australia
Contact: Elvie Haluszkiewicz or Marilyn Zelesco Ph: +61 8 9224 7076

Tue 17 Aug 2004 ASUM WA Travelling Giulia Franco Teaching Fellowship Workshop (sponsored by Toshiba)
Venue: KRH, Kalgoorlie, Western Australia
Contact: Elvie Haluszkiewicz or Marilyn Zelesco Ph: +61 8 9224 7076

Wed 18 Aug 2004. ASUM WA Branch Meeting – Travelling Giulia Franco Teaching Fellowship "DVT Research Topic" (sponsored by Toshiba)
Venue: RPH, Western Australia
Contact: Elvie Haluszkiewicz or Marilyn Zelesco Ph: +61 8 9224 7076

Thu 19 Aug 2004. ASUM WA Travelling Giulia Franco Teaching Fellowship - Tutorial for Part II Candidates (sponsored by Toshiba)
Venue: RPH, Western Australia
Contact: Elvie Haluszkiewicz or Marilyn Zelesco Ph: +61 8 9224 7076

Sat 21 Aug 2004. ASUM WA Travelling Giulia Franco Teaching Fellowship Workshop (sponsored by Toshiba)
Venue: TBA, Broome, Western Australia
Contact: Elvie Haluszkiewicz or Marilyn Zelesco Ph: +61 8 9224 7076

Aug – Oct. DMU Part II Practical Examinations
Contact: James Hamilton, DMU Coordinator, Ph: +61 2 9958 0317, Fax: +61 2 9958 8002, Email: dmu@asu**m.com.au**

Tue 31 Aug 2004 – 4 days. 14th World Congress on Ultrasound in Obstetrics and Gynecology.
Venue: Stockholm, Sweden
Contact: Ms S Johnson, Ex. Dir. ISUOG, 3rd Fl, Lanesborough Wing, St Georges Hospital Medical School, Cranmer Terrace, London SW 17 ORE, UK.
Ph: +44 20 8725 2505; Fax: +44 20 8725 0212; Email: johnson@sghms.ac.uk

Sat 4 Sep 2004 – 5 days.
ASUM–ANZSVS 2004. See ASUM website: www.asum.com.au
Venue: Rotorua, New Zealand
Contact: Dr David Ferrar email: vascular@clear.net.nz

Wed 8 Sep 2004. Western Australia Branch Meeting
Venue: Radiology Tutorial Room, Radiology Department, RPH, WA
Contact: Elvie Haluszkiewicz or Marilyn Zelesco Ph: +61 8 9224 7076

Sat 11 Sep 2004. ASUM ACT Branch Meeting.
Peter Byrnes presenting "TBA"
Venue: Conference Room, John James Hospital (9.00am)

Sat 11 Sep 2004 – 2 Days. Weekend Workshop
Venue: Bruce Hunt Lecture Theatre, RPH, WA
Contact: Elvie Haluszkiewicz or Marilyn Zelesco Ph: +61 8 9224 7076

Tue 14 Sep 2004 ASUM Victorian Branch Meeting.
Dr Rick Ussher – "Making all aspects of the IT Age Work for You"
Venue: Mercy Hospital for Women, 126 Clarendon St, East Melbourne, VIC

Thu 23 Sep 2004 – 4 days. ASUM 2004. 34th Annual Scientific Meeting of the Australasian Society for Ultrasound in Medicine
Venue: Star City, Sydney, Australia.
Contact: ASUM, 2/181 High Street, Willoughby, NSW, 2068.
Ph: +61 2 9958 7655; Fax: +61 2 9958 8002; Email: asum@asum.com.au

Thu 14 – 16 Oct 2004 – 2.5 days. Echo Australia 2004 Conference
Contact: Linda Rattray, Conference Organiser, Echo Australia 2004 Ph: 61 2 9846 4735 Fax: 61 2 9846 4002. Email: Echo.Australia2004@ge.com Website: www.gemedical.com.au

Sat 16 Oct 2004 DMU Part II Objective & Standardised Clinical Examinations (OSCEs) and Oral Examinations – Cardiac
Contact: James Hamilton, DMU Coordinator, Ph: +61 2 9958 0317, Fax: +61 2 9958 8002, Email: dmu@asum.com.au

Sat 16 Oct 2004 DMU Part II Objective & Standardised Clinical Examinations (OSCEs) and Oral Examinations – Vascular
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Sat 23 Oct 2004 DMU Part II Objective & Standardised Clinical Examinations (OSCEs) and Oral Examinations – General
Contact: James Hamilton, DMU Coordinator, Ph: +61 2 9958 0317, Fax: +61 2 9958 8002, Email: dmu@asum.com.au

Sat 23 Oct 2004 DMU Part II Objective & Standardised Clinical Examinations (OSCEs) and Oral Examinations – Obstetric
Contact: James Hamilton, DMU Coordinator, Ph: +61 2 9958 0317, Fax: +61 2 9958 8002, Email: dmu@asum.com.au

Wed 27 Oct 2004 – 4 Days. ASUM ACT Branch Meeting – Travelling Chris Kohlenberg Teaching Fellowship, Dr Gary Scholler presenting "Foetal Hearts"
Venue: Various
Contact: TBA

Fri 5 Nov 2004 – 2 days. ASUM Asia Link Program: Joint meeting in Malaysia.
Registration information will be available from April 2004 on www.asum.com.au
Venue: Kuala Lumpur, Malaysia
Contact: To register your interest in attending this meeting as a delegate or as a sponsor, please Email carolinehong@asum.com.au

Tue 16 Nov 2004. ASUM/ASA Case Presentation Evening – Victorian Branch
Venue: TBA, Victoria

\Mon 22 Nov 2004. ASUM WA Branch Christmas Meeting – Dr R Hart "Ultrasound In Space"
Venue: Lamonts, East Perth, Western Australia
Contact: Elvie Haluszkiewicz or Marilyn Zelesco Ph: +61 8 9224 7076

Wed 8 Dec 2004 – 3 days. 36th BMUS Annual Scientific Meeting and Exhibition
Venue: Manchester, UK
Contact: The British Medical Ultrasound Society, Ph: +44 (0) 20 7636 3714, email: secretariat@bmus.org

2005
Mon 31 Jan 2005. Applications due for ASAR Student Status
Contact: James Hamilton, DMU Coordinator, Ph: +61 2 9958 0317, Fax: +61 2 9958 8002, Email: dmu@asum.com.au

Mon 31 Jan 2005. DMU Exemption Applications due.
Contact: James Hamilton, DMU Coordinator, Ph: +61 2 9958 0317, Fax: +61 2 9958 8002, Email: dmu@asum.com.au

Wed 2 Feb 2005 – 5 days. DMU Prep Course
Contact: James Hamilton, DMU Coordinator, Ph: +61 2 9958 0317, Fax: +61 2 9958 8002, Email: dmu@asum.com.au

Tue 1 Mar 2005. DMU Part I and Part II Application Deadline
Contact: James Hamilton, DMU Coordinator, Ph: +61 2 9958 0317, Fax: +61 2 9958 8002, Email: dmu@asum.com.au

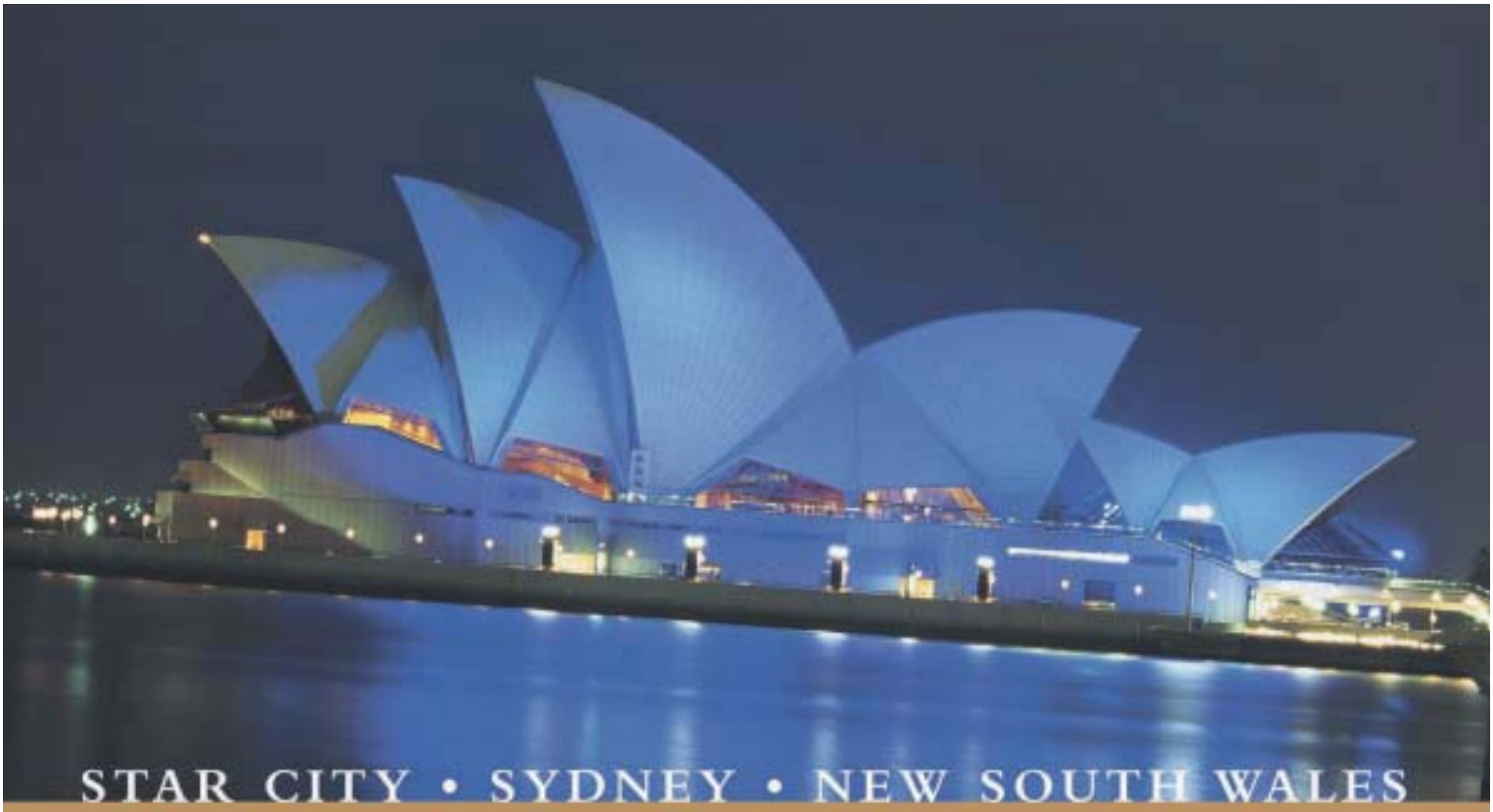
Thu 17 Mar 2005. Nuchal Translucency Course (Tentative)
Contact: ASUM, 2/181 High Street, Willoughby, NSW, 2068.
Ph: +61 2 9958 7655; Fax: +61 2 9958 8002; Email: education@asum.com.au

Fri 18 Mar 2005 – 2 days. ASUM Multidisciplinary Workshop involving interactive programs in Obstetric, Gynaecological, Musculoskeletal, Vascular, Cardiac, Small Parts and Breast Ultrasound
Contact: ASUM, 2/181 High Street, Willoughby, NSW, 2068.
Ph: +61 2 9958 7655; Fax: +61 2 9958 8002; Email: education@asum.com.au

Fri 18 Mar 2005 – 2 days. ASUM Vascular Symposium held in conjunction with the ASUM Multidisciplinary Workshop
Contact: ASUM, 2/181 High Street, Willoughby, NSW, 2068.
Ph: +61 2 9958 7655; Fax: +61 2 9958 8002; Email: education@asum.com.au

Thu 31 Mar 2005. DMU Examination Applications
Contact: James Hamilton, DMU Coordinator, Ph: +61 2 9958 0317, Fax: +61 2 9958 8002, Email: dmu@asum.com.au

Sun 19 Jun 2005 – 3 days. 2005 AIUM Annual Convention.
Venue: Walt Disney World Swan and Dolphin, Orlando, FL USA.
Contact: Brenda Kinney, AIUM, Ph: 1-301-498-4100; E-mail: bkinney@aium.org; Website: www.aium.org



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24 - 26 September 2004

Skills Development Day
Thursday 23 September 2004

Australasian Society for Ultrasound in Medicine

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CRITICAL DATES

Abstract Submission Deadline	Friday 4 June 2004
Abstract Notification	6 Weeks after the Submission Closure
Early Bird Registration Deadline	Friday 23 July 2004
Accommodation Deadline	Friday 13 August 2004

http://www.icms.com.au/asum2004

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