LETTERS

Energy levels for biphasic defibrillation

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TO THE EDITOR: With the increasing availability of biphasic defibrillators for use in both the manual and shock-advisory modes, considerable confusion has developed as to the appropriate energy levels to be used with these devices. This confusion has arisen partly because of differing recommendations from manufacturers, partly as a result of limited clinical evidence and partly because of the clinical availability of both monophasic and biphasic defibrillators. The differences between these waveforms are the way energy is delivered. Biphasic energy is delivered in two directions, whereas monophasic energies are delivered in one direction.

Recommendations of the International Liaison Committee on Resuscitation state that biphasic energies less than or equal to 200 J are as efficacious as escalating higher-energy monophasic shocks.[1] Lower-energy biphasic shocks cause less myocardial injury and post-resuscitation myocardial dysfunction, and so potentially improve the likelihood of survival.[2] Faced with the lack of data with respect to biphasic energy levels, the Australian Resuscitation Council makes the following recommendations:

1. When using manual biphasic defibrillators, energy levels of 150 J should be used for defibrillating ventricular fibrillation and pulseless ventricular tachycardia in adults.

The basis of this recommendation is as follows: one randomised controlled trial in people in out-of-hospital ventricular fibrillation compared monophasic and biphasic shocks delivered by automated external defibrillators (AEDs).[3,4] This study showed that 150 J biphasic shocks achieved higher rates of defibrillation and return of spontaneous circulation than higher-energy (200 J/200 J/360 J) escalating monophasic shocks. No differences were observed in the proportion of patients discharged from hospital.

As clinical superiority of one particular biphasic waveform over another has yet to be demonstrated, it is appropriate to recommend this single energy level to achieve a consistent approach.

2. Biphasic energy levels of 1–2 J/kg should be used for defibrillating ventricular fibrillation and pulseless ventricular tachycardia in children.

The basis of this recommendation is as follows: extrapolation from adult data, supported by studies in "child" and "infant" animal models, suggests that the dose for biphasic shocks in children should be 1–2 J/kg (about half the monophasic dose). Higher doses (up to 4 J/kg) are not likely to be harmful and are more efficacious than equivalent monophasic shocks.[5] Biphasic shocks may be delivered in a fixed dose of 50 J by an AED.

The use of AEDs in children less than 1 year of age is not recommended, as in this situation these devices are unable to differentiate between shockable and non-shockable rhythms (eg, ventricular fibrillation v pulseless electrical activity).

Energy levels for AEDs when used in automatic mode have been pre-set by the manufacturer, and do not require an energy level to be set by the user.

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Tasmania: doing its wee bit for iodine nutrition

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TO THE EDITOR: Tasmania has been recognised for many years as an area of endemic iodine deficiency.[1] According to the World Health Organization, populations are considered iodine sufficient if population median urinary iodine (UI) levels exceed 100 mg/L, with less than 10% of the UI levels below 50 mg/L.[2] Two random surveys (1998–99 and 2000–01) of Tasmanian school children aged 4–14 years suggest mild iodine deficiency. Median UI levels were 75 μg/L and 77 μg/L, with 13% and 21%, respectively, of the UI levels below 50 μg/L.[3]

In response to these findings, an iodine supplementation program was introduced in October 2001. Tasmanian bakeries were encouraged to switch to using iodised salt in place of regular salt. The program is voluntary, with participating bakeries asked to sign a memorandum of understanding. Industry advice suggests that bakeries that

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There should be no more than 5 references. The reference list should not include anything that has not been published or accepted for publication. Reference details must be complete, including: names and initials for up to 4 authors, or 3 authors et al if there are more than 4 (see mja.com.au/public/information/uniform.html#refs for how to cite references other than journal articles).

have signed the memorandum produce about 80% of the bread available for consumption in Tasmania.

The Tasmanian Iodine Monitoring Program commenced in July 2002. Its objectives are to determine the effect of iodine supplementation of bread on the general population and on high-risk groups, and to identify any negative health effects associated with the program.

Preliminary results from the monitoring are encouraging. Children were selected using a random cluster sampling approach. The sampling frame included all Grade 4 classes in all government, Catholic and independent schools in Tasmania. To date, 148 urine samples have been collected, with results from 124 available (test completion rate, 84%). The median UI level from the preliminary results is 97 μg/L (95% CI, 90–109 μg/L), with 10.5% below 50 μg/L. Ongoing monitoring will provide a more rigorous evaluation of the effects of the iodine supplementation program.

Early indications suggest the supplementation program may be achieving its goal of improving the iodine status of the Tasmanian population. The monitoring program will continue for the next 4 years, with regular surveys to detect any changes in the population's iodine status. It will be challenging to retain the ongoing participation of the bread industry if, in the future, there is increased reliance on premixed and ready-to-bake products from outside Tasmania. Maintaining bread supplementation in Tasmania would then require cooperation from interstate suppliers to ensure iodine supplemention of these premixes and ready-to-bake products. Given that recent research has shown mild iodine deficiency in other parts of Australia and New Zealand, perhaps it is time for a bi-national solution to the problem.[4,5]

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Leprosy transmission in the Kimberley, Western Australia: still a reality in 21st-century Australia

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TO THE EDITOR: The World Health Organization has established the Global Alliance for the Elimination of Leprosy, which aims to eliminate leprosy from every country by 2005.[1] Elimination is defined as reducing the disease prevalence to below one case per 10 000 population. Australia has met this goal. Nevertheless, leprosy transmission still occurs in parts of Australia.

Between 1986 and 2002, 28 new cases of leprosy were notified to the Kimberley Public Health Unit (KPHU). All patients except one were Indigenous. At diagnosis their ages ranged from 8 to 63 years. In several recent cases, diagnosis was delayed despite multiple presentations to primary healthcare staff and medical specialists. Eleven patients (39%), including the most recently diagnosed case, had multibacillary disease (WHO classifies leprosy as paucibacillary [< 6 skin lesions with no bacilli on skin smears] or multibacillary [≥ 6 skin lesions and/or positive skin smears][2]). People with multibacillary leprosy can transmit the disease. This epidemiological pattern is also seen in Australia's Northern Territory, where a third of the 236 new cases of leprosy between 1970 and 1997 were multibacillary.[3] In leprosy-endemic countries, the proportion of cases that are multibacillary ranges from 32% in Guinea to 84% in Egypt.[4] The long incubation period of leprosy (usually 2–5 years, but possibly decades) makes it likely that new cases will occur in Australia over the next few decades.

Management of patients in the Kimberley region is challenging, not only because of remoteness, patient mobility and the prolonged treatment and follow-up required, but because adverse reactions to leprosy treatment are common, and may occur weeks to months after starting therapy with antileprotic agents. With all presentations of leprosy, the KPHU informs patients and relevant health professionals about these reactions, including how to recognise them and where to seek specialist advice. The region's frequent turnover of healthcare professionals and its increasing reliance on short-term and overseas-trained doctors makes this a time-consuming undertaking.

With increasing movement of people into and out of leprosy-endemic areas like the Kimberley, or leprosy-endemic countries, Indigenous Australians who have not yet been exposed to leprosy may now be at greater risk of encountering and acquiring the disease. In addition, Indigenous Australians from leprosy-endemic areas may develop symptoms of leprosy when they are no longer in leprosy-endemic areas, and may attend health professionals unfamiliar with leprosy, resulting in delayed diagnosis.[5]

In the 21st century, the medical community still needs to be alert to the possibility of leprosy in patients with chronic dermatological or neurological conditions, and needs to enquire about exposure to leprosy (eg, living in a leprosy-endemic area, history of leprosy in relatives — both by blood and by marriage). Otherwise, we will fail to diagnose and appropriately manage this disease, risking further outbreaks of leprosy in Indigenous Australian populations.

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Computerised asthma action plans

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TO THE EDITOR: The recent study by Wilson,[1] and its accompanying editorial by Walters and colleagues,[2] highlight a number of issues about written asthma action plans (AAPs).

The utility of AAPs is controversial. However, a number of points are more certain:

- AAPs will achieve nothing unless they are part of a comprehensive program of therapy, patient education and review.
- AAPs must be individualised, and must cover several aspects of self-management, including ongoing maintenance therapy and future acute episode treatment (including the current episode if this has triggered the patient's attendance).
- AAPs cannot improve patient care if doctors don't take the time and effort to write them, and if patients don't have them available at the time of need, particularly during acute episodes.

AAPs are a useful communication tool, and an aid in consistency of care, provided patients and all their doctors have up-to-date copies of the same plan.

To help with the complex and time-consuming task of producing customised AAPs, we developed a computerised AAP generator which runs in a standard web browser. Individualised AAPs are produced with minimal typing and a few mouse clicks in less than 45 seconds. All plans have sections for future acute episodes. Sections for preventer medications and the current episode only appear when selected. All asthma medications currently available in Australia are selectable from drop-down menus, and these lists are updated regularly. There are several prompts to encourage best-practice care.

Enough copies are produced for the family, school, kindergarten, child minder, grandparents, general practitioner, and hospital notes.

The AAP generator was made available on the Royal Children's Hospital intranet in July 1999. This intranet version logs, in detail, all use of the plan and the recommended therapies, without any patient identification. About 19 500 plans have been generated since.

We have not formally evaluated this system, but we do know, from informal feedback and from our records showing that many of them have used it hundreds of times each, that our staff find it useful.

AAPs are only a part of the "education package" required for patients with asthma. If it is quick and easy to generate good AAPs, it is to be hoped this will encourage doctors to produce them, while also giving them more time to concentrate on the explanation and discussion of care.

The AAP generator is available for free download from our website (www.rch.org.au/clinicalguide/asthmaPlanRequest.php).

Acknowledgements: Members of the RCH Asthma Strategy Group (Daryl Efron, Emma Gilbert, Ray Gornall, Claire Harris, Gill Kainey, Andrew Kemp, John Massie, Frank Oberklaid, Colin Powell, Colin Robertson, Susan Sawyer, Mimi Tang, Thirza Titchen, Melissa Wake, Simon Young), Giles Bates (Paediatric Fellow) and Marina Norio (Web author), all of whom contributed to the concept and design of the plan.

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Mirtazapine-induced hyponatraemia

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TO THE EDITOR: I wish to report hyponatraemia in a patient commencing therapy with mirtazapine — this is the first such report from Australia.

An 86-year-old widow with depression had had a previous episode of hyponatraemia while taking venlafaxine. Anticipating the possibility of further hyponatraemia, I prescribed mirtazapine 15 mg nightly — half the recommended starting dose. At this time, she was also taking amiodarone, gliclazide, L-thyroxine, irbesartan with hydrochlorothiazide, alendronate, omeprazole, atorvastatin and zolpidem.

Her baseline serum sodium level was 135 mmol/L (normal range [NR], 135–149 mmol/L), but 4 days later it had fallen to 130 mmol/L, with serum osmolality of 294 mosmol/kg (NR, 280–295 mosmol/kg), urine osmolality of 398 mosmol/kg (NR, 50–1200 mosmol/kg), spot urine sodium concentration of 42 mmol/L, and plasma antidiuretic hormone (ADH) level of 0.7 pmol/L (NR, 0.1–7.0 pmol/L). Mirtazapine therapy was stopped after a further 2 days, and 10 days later her serum sodium level was 134 mmol/L, serum osmolality 296 mosmol/kg, urine osmolality 419 mosmol/kg and spot urine sodium concentration 27 mmol/L. Her plasma glucose level varied from 7.4 mmol/L to 9.2 mmol/L (NR, 3.4–5.4 mmol/L). Her condition was subsequently stabilised on mianserin (20 mg nightly) without electrolyte abnormalities.

There are 12 reports worldwide of hyponatraemia due to mirtazapine (manufacturer's data "on file"). This antidepressant inhibits α_2 auto- and heteroreceptors, blocks 5-HT_2 and 5-HT_3 receptors, and acts via noradrenergic and 5-HT_{1A} receptors. The mechanism of hyponatraemia is thought to be via α_1 or serotonergic stimulation of ADH, but other possible causes include increased osmoreceptor sensitivity, reduced renal ability to conserve salt and water in the elderly, enhanced renal action of ADH[1] and reduced metabolism of the antidepressant. There is no known interaction between mirtazapine and amiodarone or irbesartan or thiazides to account for hyponatraemia.

This patient had risk factors — she was elderly, female, was taking diuretics and had had hyponatraemia with another antidepressant medication. As in previously reported cases the ADH level was not elevated, although the syndrome of inappropriate ADH secretion (SIADH) is not always accompanied by raised ADH levels.[2]

Hyponatraemia is seen more often these days because of greater awareness, the increasing proportion of elderly people in the population and the trend towards polypharmacy in the elderly. Many drugs have the potential to produce SIADH; one report has indicated that almost all antidepressants are implicated.[3]

Amitriptyline-induced hyponatraemia was first described in 1974, and a recent retrospective study of elderly patients found an incidence of 32% with selec-

tive serotonin reuptake inhibitors and an unusually high 71% with venlafaxine.[4]

In the face of an increasingly common phenomenon, I recommend that patients aged over 65 years should have baseline measurements of electrolyte levels before starting therapy with an antidepressant, and that these should be repeated 2–7 days later to detect possible hyponatraemia and initiate treatment.

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New contraceptive choices across reproductive life

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TO THE EDITOR: In a recent article by Foran,[1] information provided on the new Essure (Conceptus, Inc) permanent birth control or sterilisation method was inaccurate in several respects.

Firstly, Foran stated, incorrectly, that the Essure method is performed laparoscopically (it is actually a hysteroscopic method). This is a significant error, as one of the unique advantages of this method is the *avoidance* of incisional surgery, particularly laparoscopy and a general anaesthetic. This hysteroscopic procedure is well tolerated and can be performed with minimal or no sedation, followed by a rapid postprocedure recovery and early return to normal activity.[2,3]

Secondly, the failure rate in terms of postprocedure pregnancy is much less than the 0.6% quoted by Foran. To date, no pregnancies have been recorded in Phase II[2] or Phase III[3] multicentre, prospective, single-arm clinical trials conducted according to US Food and Drug Administration guidelines between 1998 and 2003. To date, no pregnancies have occurred in women relying on this intratubal microinsert during a combined 15 635 women-months of follow-up. The effectiveness rate for pregnancy prevention after 2 years of follow-up is 100% (95% CI, 99.5%–100%).

Thirdly, it is not a titanium insert. The metal used in the outer dynamic coil is a nickel–titanium alloy commonly known by the trade name Nitinol.

Fourthly, the adverse effects claimed (infection, bleeding) are misleading and incorrect. No infections within the uterus, tubes or pelvis have been recorded, and abnormal bleeding is not a feature of this form of sterilisation.[2,3]

Essure is the first hysteroscopic method of female sterilisation to gain regulatory approval for clinical use (in November 2002). This method of sterilisation offers women the choice of a less invasive, safe and reliable choice of sterilisation in the future.

Competing interests: John Kerin is a clinical research investigator and consultant and holds an equity position in Conceptus Inc.

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IN REPLY: Mea culpa! Essure is, of course, a hysteroscopic rather than a laparoscopic method of female sterilisation and is described so in the text of the article. I apologise for not picking up this error while checking the proofs. Kerin is also correct in pointing out that Essure is made not from pure titanium but from a titanium alloy. The possible adverse effects, though rare, are listed among a number of others in the manufacturer's information brochure.[1]

I am always extremely wary of ascribing a 100% effectiveness rate to any contraceptive method. Since Essure has been used so far on only small numbers of women, the figure I quoted was the upper limit of the failure rate in world literature for female sterilisation procedures.[2] Although initial experience indicates that the eventual success rate should be very close to 100%, Kerin's quoted 95% CI suggests that, at present, we can only promise potential Essure users a better than 99.5% effectiveness rate (ie, a failure rate quite close to the figure I used).

I consider Essure to be an excellent new method of permanent contraception, and apologise if my article gave any other impression. I am certain that Australian women and their doctors will increasingly consider it an option in the future.

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Update on treatment of menstrual disorders

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TO THE EDITOR: In their recent article on treatment of menstrual disorders, Hickey and Farquhar described three case scenarios to highlight alternative treatments for menstrual disorders.[1]

In Patient 1, a 39-year-old woman with dysfunctional uterine bleeding, the authors preferentially treated the patient with the levonorgestrel-releasing intrauterine system (20 μg per 24 h). Unfortunately, this device is available through the Pharmaceutical Benefits Scheme only for contraception, not treatment of menorrhagia. It would be difficult to explain to the government its use in this woman, who, according to the history, had had laparoscopic sterilisation. As a new intrauterine system has to be inserted every 5 years, and has a failure rate of 20% after 1 year, a 39-year-old woman would need at least another two inserted to control dysfunctional bleeding.

The optimum method of management would have been simple vaginal hysterectomy. This was not mentioned in the article, which contrasted the intrauterine system only with abdominal hysterectomy. The authors also claimed that "cost–benefit analysis showed that [the intrauterine system] Mirena was three times cheaper than hysterectomy". This

analysis should include the cost of three Mirenas ($260 each), insertion, doctors' visits for Pap smears for 30 years, tampons and pads. Is this cheaper? After all, hysterectomy means no periods, pain, pregnancies, Pap smears or pads.

What is wrong with vaginal hysterectomy? The fact that the woman had had three caesarean sections and laparoscopic sterilisation was not a contraindication.[2]

Patient 2, a 45-year-old woman with menorrhagia and small fibroids, could also have been managed with vaginal hysterectomy.[3] There is no evidence that hysteroscopic resection of fibroids in a multiple-fibroid uterus, as recommended by the authors, will improve menorrhagia. They also state that an alternative technique, embolisation, has been "widely used". This technique is experimental and, as they state, "has been associated with serious side effects, such as infection, bowel obstruction and loss of ovarian function", as well as death.[4]

In our quest for management innovations for women with dysfunctional bleeding, we should decide whether the new technique is better than the gold standard, hysterectomy. As hysterectomy can be vaginal, laparoscopic with vaginal assistance, totally laparoscopic, or abdominal, one cannot just use the word "hysterectomy", one must specify. Studies reveal that the vaginal approach is superior.[2,5]

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IN REPLY: Eizenberg is correct in stating that the levonorgestrel-releasing intrauterine system Mirena is currently licensed as a contraceptive in Australia and not explicitly for treatment of menstrual disorders. He is also correct in stating that vaginal hysterectomy would be a management option for Cases 1 and 2 in our article.[1]

However, the purpose of our article was to explore newer options in management of menstrual disorders. This does not mean that "traditional" therapies such as hysterectomy are to be overlooked or superseded, and we did not attempt to compare the new therapies with hysterectomy. Dysfunctional uterine bleeding, although disruptive, is a benign condition, and treatment is symptomatic. We believe that women should be aware of all available therapeutic options, including hysterectomy, so that they can reach an informed decision.

1. Hickey M, Farquhar CM. Update on treatment of menstrual disorders. *Med J Aust* 2003; 178: 625-629. ❑

Latrodectism: a prospective cohort study of bites by formally identified redback spiders

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TO THE EDITOR: In their study on the effectiveness of antivenom for redback spider bite, Isbister and Gray cast doubt on the current method of administering antivenom intramuscularly.[1]

Any study on the outcome of treating bites by venomous animals is limited by factors beyond the control of the investigator. These include the variability of the venom content in the animal's venom apparatus, uncertainty regarding how much and where venom has been injected, and the delay before treatment.

Between 1955 and 1957, I dissected the venom glands of 590 redback spiders for the production of antivenom.[2] The yield of freeze dried venom per spider varied from 0.08 mg to 0.32 mg. Based on these findings, and to allow for dilution of antivenom by body fluids, "it was considered that 500 units of antivenene would constitute a suitable *initial* dose for the treatment of a bite by *L. hasseltii*".[3] This amount of antivenom will neutralise 5 mg of venom *in vitro*, and the antivenom is still issued in this strength by CSL Ltd.

No fatalities have occurred from redback spider bite since antivenom became available in 1956,[4] and reports from doctors have confirmed its efficacy and safety.[5] If symptoms persist after the initial dose, or if diagnosis has been delayed, the initial dose of 500 units may have to be repeated. As Banham et al have wisely stated "treatment should be titrated against response".[6]

Because of the risk of anaphylaxis, intramuscular injection, which has stood the test of time, is safer than the intravenous route.

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IN REPLY: We thank Wiener for his comments on our study. Although we challenge the use of intramuscular redback spider antivenom (RBS AV) in the article, we only suggested that the use of intramuscular antivenom needs review and that randomised controlled trials comparing intravenous and intramuscular RBS AV should be undertaken. Two such trials, in Western Australia and Newcastle, are currently in progress.

There are no pharmacokinetic studies of RBS AV, but studies of other antivenoms suggest that the intramuscular route is less effective.[1] In Tunisia, the intramuscular use of scorpion antivenom, which is also an $F(ab')_2$ antivenom, similar to RBS AV, has been questioned for similar reasons.[2,3] Studies in a rabbit model demonstrated that intramuscular antivenom induced only partial and delayed neutralisation of circulating toxins.[3] More importantly, in a study of scorpion stings of children, the intramuscular administration of

antivenom had far less effect on plasma venom concentrations and patient recovery times.[2]

We do not dispute that repeated doses of antivenom may be required, but the implication that only an initial dose was used in our study is incorrect. Half of the treated patients required repeat doses (6 ampoules in one patient). In a recent series of four patients with redback spider bites, intramuscular antivenom was ineffective, even though three patients received two or three ampoules. Subsequent intravenous antivenom was effective in all cases.[4] There is no evidence that appropriately administered intravenous RBS AV (diluted in 200 mL of normal saline, over 20–30 minutes) is less safe than intramuscular antivenom. There is insufficient reason to prevent the use of intravenous antivenom if it is shown to be more effective than intramuscular antivenom. Although it is too early to change recommendations for the administration of RBS AV, it is essential that controlled trials be done.

1. Riviere G, Choumet V, Audebert F, et al. Effect of antivenom on venom pharmacokinetics in experimentally envenomed rabbits: toward an optimization of antivenom therapy. *J Pharmacol Exp Ther* 1997; 281: 1-8.
2. Krifi MN, Amri F, Kharrat H, El Ayeb M. Evaluation of antivenom therapy in children severely envenomed by *Androctonus australis garzonii* (Aag) and *Buthus occitanus tunetanus* (Bot) scorpions. *Toxicon* 1999; 37: 1627-1634.
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Breast self-examination: be alert but not alarmed?

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TO THE EDITOR: I read with interest the position paper on breast self-examination by Crossing and Manaszewicz.[1]

I would like to point out an error of fact. The New South Wales Breast Cancer Institute (NSW BCI) has been promoting breast self-examination for many years.

As a practising clinician, every month I see several women who have found small breast cancers using instructions from an old *New Idea* shower card or similar information.

The position of the NSW BCI, which is stated clearly on our website, is as follows:

- Women should consider an annual breast examination by their general practitioner, particularly when they attend for a Pap test or a blood pressure check.
- Mammography should be performed at least every 2 years, particularly for women over 50 years, and earlier for women with a family history of breast cancer.
- Women should practise regular breast self-examination (BSE). Information about BSE can be obtained from GPs and the BCI has produced a fact sheet (www.bci.org.au/public/guides/g8bse.htm).
- BSE costs nothing and, in our opinion, does more good than harm. However, BSE should be combined with regular mammography and an examination by a GP.
- For a woman with a family history of breast cancer, or who has been diagnosed with breast cancer, BSE can be helpful in finding disease.
- Mammography is only about 95% reliable. BSE complements mammography.

Certain types of breast cancer are often difficult to diagnose with mammography, for example "lobular" cancer, and BSE may help in finding such cancers.

No evidence has been published that would justify a change in this position.

1. Crossing S, Manaszewicz R. Breast self examination: be alert but not alarmed? *Med J Aust* 2003; 178: 646-647. ❑

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