

## ON QUALITY

One of the sub-plots of 1997 for *Bandolier* was the issue of quality. People we talked to sometimes mused on quality past - things used to be better, we don't appreciate quality so much, and, from time to time, told us some frankly horrifying stories of where quality was overlooked or ignored. Yet in twelve issues we managed to fill pages based predominantly on some really high quality stuff, like the soaring practical applications of evidence and knowledge like getting pain relief after day case surgery (*Bandolier* 40). And the increase in good systematic reviews and meta-analyses is astounding. Whereas a few years ago they had to be mined from the literature, it seems these days impossible to move without tripping over half a dozen.

### Quality in EBH

Evidence-based healthcare is all about quality. Quality in searching to find the studies addressing a particular question, in applying appropriate quality filters to ensure only unbiased studies are included, in distilling the information into knowledge and making the knowledge understandable and useful with NNTs or likelihood ratios. There is another quality step as well, when the knowledge is combined with a practitioner's education and experience, knowledge of a patient, and the values of people and society to make sensible decisions.

But quality comes in different forms. Quality assurance is making sure not only that the right things get done, but that wrong things don't. In clinical practice, audit is a shield of quality.

### Diagnostic imaging

Mistakes matter (like this one from the ITV commentary on the Varsity match), and will always happen. In clinical biochemistry, where quality assurance has become part of everyday working, there is a rich literature on mistakes. So this month we summarise some evidence on how often these mistakes, or blunders, can occur. Mostly they are simple errors of mislabelling inside or outside the laboratory, and about 3 results in a 1000 may be blunders.

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*The views expressed in Bandolier are those of the authors, and are not necessarily those of the NHSE Anglia & Oxford*

Analytical errors occur much less frequently, at about 0.4 in 1000. But there is an important lesson from Australia, in which a survey showed that on average 11% (or 110 in 1000) of external quality assurance samples were outside the norm. How so? Probably because there is no constraint on laboratories there to be inside the norm. No carrot and no stick.

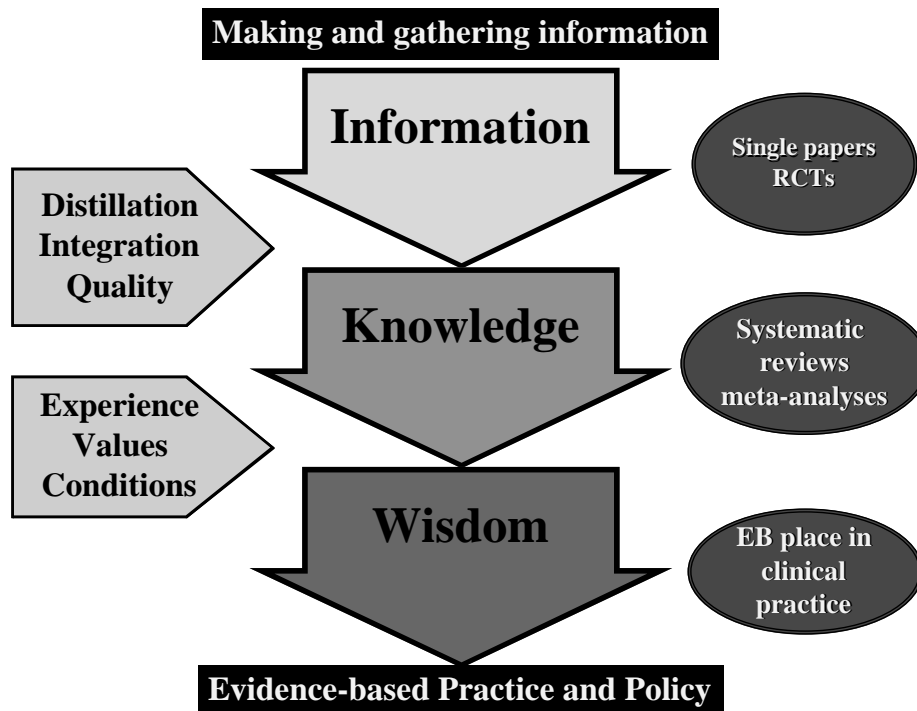
But finding good criteria and sticking to them can make dramatic improvements in performance. *Bandolier* revisits the histological diagnosis of melanoma, and finds reports of great improvements in agreement between pathologists when criteria are agreed, and then used.

### New for '98

*Bandolier* is trying to take up the quality theme in 1998 for its Internet pages. These have been the print pages written in hyper-text. But some of the many thousands of users in the UK and overseas (200,000 visits a month) think that we could do better.

So we are using some of our precious resources to try to do better. It will take some

months to organise, but we hope to carry reviews with the clinical bottom line at the top, and with simple summaries of the evidence from reviews in a reasonably standard format. The Internet version is free, so potential sponsors (public or private) might like to get in touch.



## Risky business

Some favourable comments on the method of risk presentation that appeared in *Bandolier* 45, with requests for more of the same. But this is tricky territory and more mining of good quality risk data is needed. One thought is for an international risk data exchange on the Internet from *Bandolier's* home pages. Is there anyone out there who has or knows of information, or where to get it? And again, because this is new territory, anyone know of how this might be funded?

## And finally

There have been request for *Bandolier* to make a slide set available. It is possible for that to be done as a downloadable PowerPoint file from the Internet. But again it's work. So would anyone be interested?

## STATINS

*Bandolier* has had many requests to do something more on statins since we originally reported on the 4S study (*Bandolier* 15). An overview of randomised trials from JAMA [1], which gives more information than that published in the original trials, makes that possible. It is also timely to think of where we are with statins when advertisements in major medical journals tells us that they are so good that trialists have had to stop the trials. The evidence for these claims will be presented at some time, so assessing where we are now is probably a good idea.

## The studies

The systematic review looked for randomised trials which involved:

- ◆ statin drugs alone used to reduce lipid levels rather than multifactorial interventions including another type of cholesterol-lowering drug
- ◆ inclusion of data on deaths and / or strokes

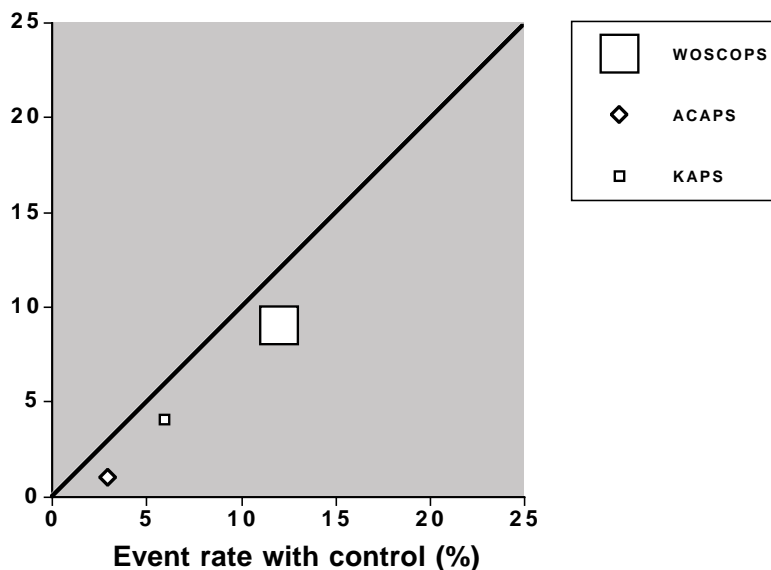
They found 16 such studies. The researchers wrote to authors of the original studies and are able to give information on fatal and nonfatal strokes and myocardial infarction not always given in the original reports. But some of the studies were small and short. So *Bandolier* has examined the 13 studies which had over 100 patients in any treatment group, and which were of at least 6 months duration.

## Outcomes

As you might imagine, there are lots of different outcomes (death from any cause, fatal and nonfatal strokes and MI to name the most important). There are also lots of analyses using all sorts of complicated statistics which give *Bandolier* a headache. So to make

## PRIMARY PREVENTION

### Event rate with statin (%)



### Statins in primary prevention (7961 patients, mean 4.6 years)

Event	NNT (95% CI)
All cause death	107 (58 to 617)
All strokes	330 (123 to no benefit)
All CHD	48 (32 to 95)
All strokes plus all CHD	42 (28 to 80)
All death plus nonfatal stroke plus nonfatal MI	35 (24 to 63)

things simpler, *Bandolier* has invented a new kind of outcome - the "all bad things that could happen" outcome.

This consists of deaths from any cause plus nonfatal stroke plus nonfatal MI. This may seem a bit simplistic, but has the distinct advantage that it gives lots of events and can give an overall NNT for "all bad things".

## Results

### Primary prevention

Three trials examined statins for primary prevention, two using pravastatin and one lovastatin. They involved 7,961 patients treated for an average of 4.6 years, and heavily weighted by the WOSCOPS trial. The NNTs are shown in the Table, and the "all bad things" in the L'Abbé plot.

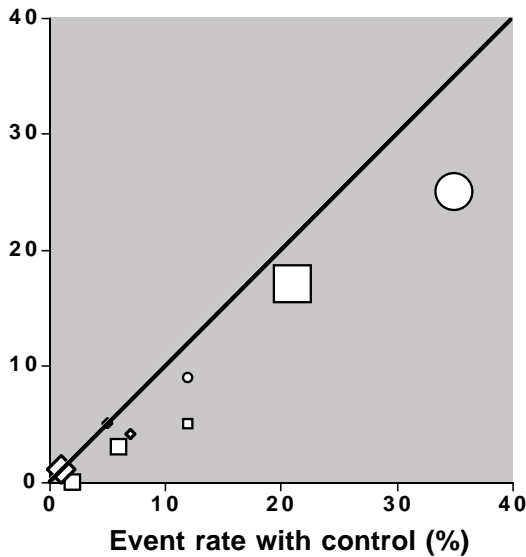
The three trials were all in the segment of the plot where statin was effective. The "all bad things" NNT was 35 (24 to 63). This means that 35 people have to be treated with a statin for 4.6 years to prevent a bad thing (death, stroke or heart attack) happening in one of them.

### Secondary prevention

Ten trials examined statins for secondary prevention, two using simvastatin, four pravastatin and four lovastatin. They involved 20,589 patients treated for an average of 2.9 years, and heavily weighted by the 4S, CARE and EXCEL trials. The NNTs are shown in the Table, and the "all bad things" in the L'Abbé plot.

## SECONDARY PREVENTION

Event rate with statin (%)



Statins in secondary prevention  
(20589 patients, mean 2.9 years)

Event	NNT (95% CI)
All cause death	33 (28 to 42)
All strokes	71 (55 to 98)
All CHD	14 (13 to 16)
All strokes plus all CHD	12 (11 to 14)
All death plus nonfatal stroke plus nonfatal MI	11 (10 to 13)

The trials were predominantly in the segment of the plot where statin was effective. The “all bad things” NNT was 11 (10 to 13). This means that 11 people have to be treated with a statin for 2.9 years to prevent a bad thing (death, stroke or heart attack) happening in one of them.

Of course, this is a summation across all trials, with three different drugs, with different rates of events with controls reflecting different populations and durations of the trials. It is possible to do an analysis by drug, and this is also presented. Direct comparability is not possible, though.

With lovastatin, although over 9,000 people have been in trials, the trials were only for one year on average, and with low numbers of events. So the NNT is high at 187.

Statins compared in secondary prevention

Statin	Number	Duration (years)	Total patient years	Events with controls (%)	NNT (95%CI)
Lovastatin	9,250	1	9,250	2	187 (86 - no benefit)
Pravastatin	6,514	3.7	24,102	15	27 (19 - 51)
Simvastatin	4,825	5.3	25,573	33	10 (9 - 15)

With pravastatin over 6,500 people were involved with trials going on for nearly four years on average. The number of events with controls was 15% and the NNT was 27.

With simvastatin, just under 5,000 people were studied, but for over five years. there was a large number of events with controls (33%), and the NNT was low at 10.

### Adverse effects

The systematic review found no evidence for any increased risk in non-stroke mortality, nor any significant risk of cancer over control.

### Comment

Many groups are seeking to produce guidance for clinicians on the use of statins. That guidance is best founded on solid evidence, and the best evidence comes from quality systematic reviews. There is an excellent example of using systematic reviews in practice guidelines which is worth reading [2].

The evidence is conclusive: statins work, and work well. Key questions being asked include which patient and which statin. many answers to these and other questions will be driven by cost influences. Perhaps they ought to be driven by the weight of evidence as well - evidence which will change as more studies report, and as other evidence from audit and elsewhere becomes available. When it does, and if it changes the picture, then guidance can change with it.

### Cost effectiveness

This always seem to be the bogeyman of cholesterol-lowering, whatever the intervention used. A systematic review of the cost-effectiveness literature is a good place to start looking for advice [3].

The problem is, as the authors tell us, is that while there is general agreement among the

studies, there is high sensitivity to the assumptions used, especially in screening strategies. The major conclusions were:

- ◆ Cost effectiveness of primary prevention with cholesterol-lowering drugs is extremely variable, depending on age at start of treatment and risk profile.
- ◆ Pharmacological intervention is least cost-effective in the young and the elderly.
- ◆ Cost-effectiveness improves when treatment is targeted at high risk individuals.
- ◆ Statins are more cost-effective at reducing cholesterol-related coronary events than other interventions.

#### References:

- 1 PR Hebert, JM Gaziano, KS Chan, CH Hennekens. Cholesterol lowering with statin drugs, risk of stroke, and total mortality. *JAMA* 1997 278: 313-21.
- 2 DJ Cook, NL Greengold, AG Ellrodt, SR Weingarten. The relationship between systematic reviews and practice guidelines. *Annals of Internal medicine* 1997 127: 210-6.
- 3 S Morris, A McGuire, J Caro, D Pettitt. Strategies for the management of hypercholesterolaemia: a systematic review of the cost-effectiveness literature. *Journal of Health Service Research and Policy* 1997 2: 231-50.

## BOOK REVIEW

And when did you last see your father? Blake Morrison. Granta £6.99. ISBN 01 401 407 43.

Your indoor games editor has found a book which charms, which is real and which makes you think. The title comes from the 1873 painting by WF Yeames.

The book is about the final illness of a northern (Colne) GP, written by his son. Mother too was a GP. But the book isn't really about the illness, it's about his life. It's about a hands-on GP, a powerful personality, seen through his son's eyes at different ages.

There is a beautiful depiction of childhood embarrassment, when father decides to jump the queue at Oulton Park by waving his medical colours and the children have to slither with embarrassment under the back seat. There is the delight of father knows best, here played on the DIY stage. There is the ambiguity of another woman in the father's life. Above all there is the serious meat of the end of a life, and how the different family members behave. All written with whatever is the opposite of schmaltz. Read, identify and enjoy.

### DIARY NOTE

The *Bandolier* conference on Chlamydia will take place on March 27, 1998, at the Wellcome Institute in London. Details can be obtained from Eileen Neail, preferably by fax on 01865 226978.

## PSA AND BONE SCANS

Some time ago *Bandolier* drew attention to the use of serum PSA concentrations to avoid necessity of bone scans in men with prostate cancer. If the PSA was below a certain level (10 to 20  $\mu\text{g/L}$ ) then men did not have bone secondaries, so an unpleasant and costly diagnostic procedure could be avoided by using a simple test.

But that intervention was US in origin, so it is comforting to find a UK study which comes up with the same finding [1].

### Study

This was a study of all patients referred for a bone scan over 18 months. They had to have prostate cancer, bone scan and PSA with 4 weeks of each other, bone scan findings were unequivocal or confirmed by other imaging methods and no treatment was started before tests were done.

### Results

Information on 98 men was available. No man with a serum PSA of 20  $\mu\text{g/L}$  or below had a positive bone scan. The results were essentially identical to previous (if larger) US studies.

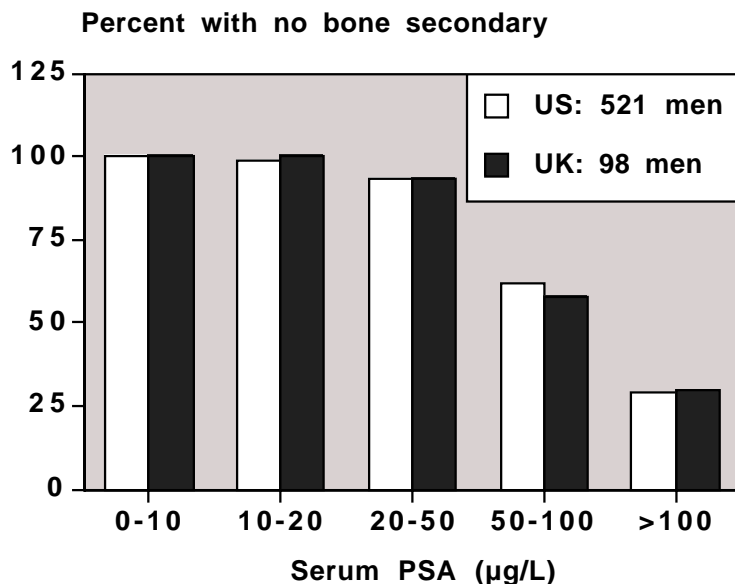
### Comment

The selective omission of a bone scan in men with prostate cancer and a PSA of less than 20  $\mu\text{g/L}$  at diagnosis could save over £1 million a year in the UK. Not a massive saving, but every little helps, and it does stop unnecessary interventions involving radiation exposure.

#### Reference:

- 1 PM Kemp, GA Maguire, NJ Bird. Which patients with prostatic carcinoma require a staging bone scan? *British Journal of Urology* 1997 79: 611-4.

### PSA <20 $\mu\text{g/L}$ predicts no bone secondary in prostate cancer



# VAGINAL DOUCHING

*Bandolier* was asked if there was any evidence connecting vaginal douching to impaired women's health. So we did a quick search on PubMed (an essential Internet searching tool because it has papers yet to appear on MEDLINE - <http://www4.ncbi.nlm.nih.gov:80/PubMed/>) and found a recent meta-analysis on just this topic [1]. We also found an interesting relic - a pewter vaginal syringe from about 1800 - demonstrating that vaginal douching has a long history.

## Search

The primary search used only MEDLINE and used only papers in the English language. To be included the papers had to address vaginal douching and association with pelvic inflammatory disease (PID), ectopic pregnancy or cervical cancer. The published relative risks adjusted for confounding factors were combined for meta-analysis (though confusingly the figures in the paper call them odds ratios!). Unfortunately the raw data were not given, so we can give you no numbers needed to harm.

## Prevalence of vaginal douching

US data indicate that 37% of US women of reproductive age (15 to 44 years) douche regularly, about half at least once a week. One third of white women do so, and two thirds of black women. There was also an association between more frequent douching and lower socio-economic status, especially in white women.

Other data suggest that douching is predominantly done with commercial preparations (50%), while another 30% use a home preparation of vinegar and water, 10% use water alone and 10% use other preparations. Douching is predominantly done for hygiene or to prevent or self-treat infection.



## Pelvic inflammatory disease

PID has an estimated cumulative incidence of 10% up to 45 years of age. Women who douche have a 73% increased risk while those who douche at least once a week have a risk increased by about four fold.

## Ectopic pregnancy

Women who douche have a 76% increased risk while those who use commercial preparations have a risk increased by about four fold.

## Cervical cancer

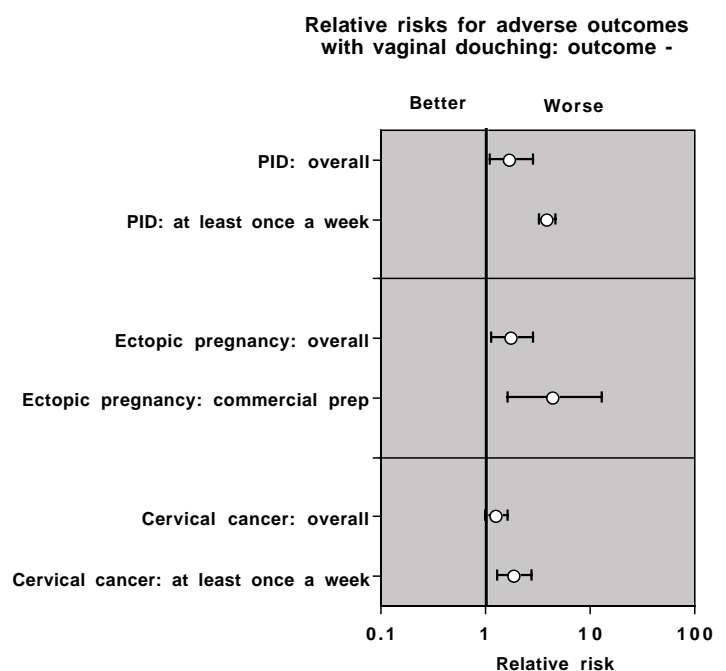
Overall, women who douche have no significantly increased risk of cervical cancer. But those who douche at least once a week have a significantly increased risk of about 86%.

## Comment

A useful review and analysis, spoiled by restricting the searching only to English language papers, but a good place for others to start a more thorough review. It seems to have taken confounding factors properly into account, especially that of social class. There is also a useful discussion of the place of douching. It may be that when performed at an appropriate time in the menstrual cycle (not around ovulation), and infrequently, it may not be harmful. But the message from these authors is that vaginal douching is unnecessary in routine feminine hygiene.

### References:

- 1 J Zhang, G Thomas, E Leybovich. Vaginal douching and adverse health effects: a meta-analysis. American Journal of Public Health 1997 87: 1201-11.



# BLUNDERS

A dictionary definition of a blunder is “a gross mistake”. As a verb it is also defined as “to mismanage”. Because we live in an imperfect world, we expect blunders to occur. How we feel about them depends - if *we* make them they are less of blunder than if someone else makes them. If the battery in our new car fails on trip to the supermarket we might be less cross than if it fails in the middle of torrential rain in the middle of one of those empty bits of Wales or Scotland or on a bad day on the M25.

But most of us would accept that while blunders do occur, we should take every reasonable step to see that they do not. *Bandolier* was speaking with a group of GPs about diagnostic tests, and was surprised to learn that none of them were aware of blunder rates in tests, which in the past have been said to occur at about 1%. So we thought we would see what the literature said about blunders, and found some interesting papers in clinical biochemistry.

## Defining a blunder

You know one when you see one, so some true-life examples:

- ◆ A high drug level is reported in Mrs X. But Mrs X isn't taking that drug and didn't have a blood sample taken! It is discovered that actually the sample was from Mr Y, but that the wrong labels were used on sample and request form.
- ◆ An imaging report says there is an abdominal mass in a patient sent for a head and neck scan (wrong report).
- ◆ Five patients are all reported to have very high prolactin levels. It turns out that they were all analysed together, and that the first had so much prolactin that it resulted in significant carry-over into the next four specimens.
- ◆ A new computer system is installed which fails to recognise results with three integers - only two. So a result of 123 is reported as 23.

These examples point out the areas where blunders can occur - in ordering tests, in the analysis stage and in transcribing and mis-reporting errors. Errors may be picked up by the laboratory, or those receiving the results, and, importantly, by external quality control schemes.

## Transcription error rates on pathology request forms [5]

Details	Error rate (%)		
	Best laboratory	Median laboratory	Worst laboratory
Patient identification	0	1.0	9
Patient sex and age	0	2.0	17
Patient ward or address	0	2.5	9
Tests requested	0	2.5	15
Requesting doctor identification	0	1.5	17

## Analytical errors

A study of 220,000 individual clinical chemistry results obtained in methods comparison studies in the USA compared each result with its replicate [1]. It found 98 examples where replicates were  $\geq 7$  standard deviations from the expected value and an additional 360 in which the difference was 4 to 6 standard deviations from the expected result.

This gives a crude error rate of 0.045% at the 7 SD level and 0.081% at the 4 SD level. That is, less than 1 analytical blunder per 1000 analyses. But of these, only nine results were sufficiently different to be judged as likely to influence patient care.

An influential Scottish study [2] came to similar conclusions for analytical blunders. In a study over three time periods involving almost 300,000 results the analytical blunder rate was 0.034%. But the total blunder rate, including ward, sample handling, reporting and clerical errors produced a total blunder rate 10 times higher at 0.3%. The blunder rate for external quality assessment samples was 0.2%.

Similar results (an overall rate of about 0.3% of results) resulted from an English study in two clinical biochemistry laboratories over one year involving 248,000 samples and 997,000 results [3]. The two laboratories had blunder rates for external quality assessment samples of 0.5% and 0.2% per analyte and 1.7% and 0.7% per sample respectively [4].

## An Australian perspective

In 1994 14 laboratories from all over Australia participated in a study to examine laboratory errors [5]. Each randomly selected 100 hand-written pathology request forms, and they scored the number of transcription errors, defined as any instance where the data on individual request forms were not identical to the data entered into the laboratory's computer system. Laboratories also scored the total number of quality assurance samples analysed and the proportion of results that lay outside the allowable limits of error of the programme.

Transcription errors varied widely. While most laboratories clustered around median error rates of 1% to 3%, at least two laboratories were more than 2 standard deviations above the mean error rate, as the box shows.

Analytical errors from one cycle of analysis in 1993 and 1994 occurred in up to 26% of analytical results, and were above 10% in eight of the 14 laboratories.

The combined error rates (transcription plus analytical) were calculated as being up to 46% in the worst performing laboratory. One laboratory had more than 95% of error-free results, while six of the 14 laboratories had better than 80% of error free results.

## The primary care perspective

All of the above, of course, examines the problem of blunders in laboratory testing principally from the laboratory perspective. But what about the consumers - do they see blunders? In the USA 124 primary care physicians in 49 practices participated in a prospective study in which they reported problems over a six month period [6]

They reported 180 problems, of which just over a quarter were judged to have an effect on patient care. The crude result was 1.1 problems per 1000 patient visits (or about 0.1%). But not all patient visits result in a sample being taken for analysis. A good estimate was that about one-third of all visits to these practices resulted in a blood sample being taken for laboratory analysis. So the best estimate of problems with laboratory testing in primary care in the USA is 3.4 per 1000 visits, or 0.34% - a figure remarkably similar to these found in the two UK laboratory studies. Analytical errors were only about 10% of the total, at 0.044%.

## Comment

Lest any of *Bandolier's* clinical biochemistry friends think that we are picking on them specifically, it is worth pointing out that clinical biochemistry has long been in the van of quality assessment and quality improvement. That is why we have so much data!

There is some consistency in the findings. Overall, the rate of blunders seems to be pretty constant at about 0.3% of results (3 per 1000), and the analytical error is perhaps 0.04% (less than 1 per 1000). So blunders do happen in the best regulated systems, so if a result looks wrong, it is probably worth checking. And there will be blunders that never get picked up. If Mrs A's sample for thyroxine is mixed up with Mrs B's, and both are normal, who could tell?

The Khoury study [5] sticks out like a sore thumb, and it is hard to understand how such high rates of analytical error are allowed in quality assurance schemes (though perhaps *Bandolier* is missing something). Perhaps, as the paper comments, the fact that there is no minimum standard of performance which laboratories are required to maintain is an important negative influence on overall performance. In the UK there are (or perhaps were is a better description because this may be under threat) mechanisms whereby poorly performing laboratories were given help and advice. This meant that no laboratory could perform poorly on one test, or on many tests, consistently.

Even so there is a clear message from this important study. In the same circumstances some laboratories do brilliantly, while some are awful. The equipment, the funding, and people probably don't differ by much. But management and leadership can make a huge difference to quality of service.

### References:

- 1 DL Witte, SA VanNess, DS Angstadt, BJ Pennell. Errors, mistakes, blunders, outliers, or unacceptable results: how many? *Clinical Chemistry* 1997 43: 1352-6.
- 2 AM Chambers, J Elder, D O'Reilly. The blunder-rate in a clinical biochemistry service. *Annals of Clinical Biochemistry* 1986 23: 470-3.
- 3 R Lapworth, TK Teal. Laboratory blunders revisited. *Annals of Clinical Biochemistry* 1994 31: 391.
- 4 R Lapworth, TK Teal. Laboratory blunders revisited. *Annals of Clinical Biochemistry* 1994 31: 78-84.
- 5 M Khoury, L Burnett, MA Mackay. Error rates in Australian chemical pathology laboratories. *Medical Journal of Australia* 1996 165: 128-130.
- 6 PA Nutting, DS Main, PM Fischer et al. Problems in laboratory testing in primary care. *JAMA* 1996 275: 635-9.

## BANDOLIER 2ND ANNUAL

The second *Bandolier* volume of collected issues (21 - 34) is available by sending a cheque for £14 made out to **Oxfordshire Health**, to: Mrs Eileen Neail, *Bandolier*, Pain Relief, The Churchill, Headington, Oxford OX3 7LJ

The only way you can get this collector's item is to send a cheque with order. Overseas orders (£18) and credit card sales can be made through Hayward Medical Communication Ltd. Contact Angie Stagg on +44 1638 751517 (fax) or hayward.newmarket@dial.pipex.com (email).

## Summary of results

### Blunder rates (% of results or samples)

Reference	Analytical	Overall	Comment
White et al [1]	0.05	n/a	Results
Chambers et al [2]	0.04	0.30	Results
Lapworth & Teal [3,4]	0.35	0.30	Analytical on QA samples
Khoury et al [5]	11.40	n/a	QA samples outside limits
Nutting et al [6]	0.04	0.34	Samples

# DIAGNOSING MELANOMA

*Bandolier* was criticised for featuring a US study showing inconsistency between histopathologists expert in the diagnosis of melanoma. It was pointed out that the cases were difficult, and that the inconstancy may not represent the norm for the diagnosis of melanoma. Finding evidence for that conclusion has not been easy, but there is an interesting literature and debate on how to make the histological diagnosis of melanoma better.

## CRC Melanoma Pathology Panel

This was a study of 95 sections from pigmented lesions, including equal proportions of benign naevi and primary malignant melanoma, of which half were selected with Breslow thickness <0.76 mm. These were sent to a panel of seven pathologists with a major interest in melanoma plus a dermatopathologist also with a major interest in melanoma.

Slides were sent to panel members before and particularly after a series of meetings to clarify the understanding and use of terms used in making a diagnosis. A series of carefully worded definitions were made for severe nuclear atypia, intraepidermal architectural atypia, an invasive component of radial growth phase, a vertical growth phase or component, mitotic count, regression and established regression.

In a detailed paper with many results the highlights were these:

- ◆ The level of agreement improved after discussion and re-definition of criteria of several features.
- ◆ A high level of agreement was obtained for an overall benign or malignant diagnosis (kappa = 0.77).
- ◆ Use of more specific diagnostic terms with three or four levels of diagnosis resulted in lower levels of agreement.
- ◆ The agreement for individual pathologists reviewing the same slide at different times was high at over 80% for any one, and over 90% on average.

## Nationwide survey

One hundred and forty eight UK pathologists participated in two circulations. In the first circulation of 20 slides no standardised diagnostic criteria were used and the kappa was 0.45 for three categories - benign naevi with no atypia, benign naevi with atypia and melanoma. The same panel as in the CRC study had a kappa of 0.75.

A second survey used 25 slides (19 from the first circulation and six new ones) and used diagnostic criteria of benign, melanocytic intraepidermal neoplasia with or without microinvasion, and melanoma with vertical growth phase.

Using these criteria the agreement for pathologists and the panel was the same with a kappa of 0.68.

## Comment

Both these important papers demonstrate that good agreement can be obtained by the use of standardised criteria. But with melanoma there are always going to be difficult cases where even the experts have problems in making a diagnosis, and where they may disagree.

The main lesson is that discussion and quality assessment is not just for special occasions, but may have to be for ever. The Dutch now have a system where pathologists faced with a difficult case can refer it to one of three experts, who can then refer to two more if the first expert also finds difficulty

in making the diagnosis. In a stimulating and thoughtful editorial [3], Mark Cook speaks of the difficulties in continuous quality improvement and in providing the best possible diagnostic service for melanoma. He

points out that it will be difficult, and expensive (though how much more expensive than making the wrong diagnosis is not dwelt upon). Just because something is difficult doesn't mean it shouldn't be attempted.

### References:

- 1 MG Cook, TJ Clarke, S Humphreys et al. The evaluation of diagnostic and prognostic criteria and the terminology of thin cutaneous malignant melanoma by the CRC Melanoma Pathology Panel. *Histopathology* 1996 28: 497-512.
- 2 MG Cook, TJ Clarke, S Humphreys et al. A nationwide survey of observer variation in the diagnosis of thin cutaneous malignant melanoma including the MIN terminology. *Journal of Clinical Pathology* 1997 50: 202-5.
- 3 MG Cook. Diagnostic discord with melanoma. *Journal of Pathology* 1997 182: 247-9.

## Kappa

