J. Paediatr. Child Health (2002) **38**, 501–506

Fate of abstracts published in the proceedings of the first annual Perinatal Society of Australia and New Zealand Congress in 1997

MW DAVIES,[1–3] KR DUNSTER,[2] CE EAST[2] and BE LINGWOOD[2]

[1]*Grantley Stable Neonatal Unit and* [2]*Perinatal Research Centre, Royal Women's Hospital and* [3]*Department of Paediatrics & Child Health, University of Queensland, Brisbane, Queensland, Australia*

Objectives: To examine the fate of research presented at the first annual Perinatal Society of Australia and New Zealand (PSANZ) Congress in 1997, by determining: the rate of publication in peer-reviewed biomedical journals; publication rate by discipline; journals in which work was published; concordance for aims, conclusions, authors and number of study subjects; and time from presentation to publication.

Methods: A *MEDLINE* search was conducted for any publication in a peer-reviewed journal resulting from a publishable abstract from the proceedings of the first annual PSANZ Congress in 1997. Searching was completed 42 months post-congress. The concordance of aims, conclusions, authors and number of subjects between abstract and published paper was determined.

Results: There were 172 publishable abstracts in the proceedings of the PSANZ Congress in 1997, and 78 (45%) were published as 83 articles. Basic sciences had the highest publication rate (67%) and midwifery the lowest (20%). Articles were published in 41 journals, with one-third of the articles in three paediatric journals. There was a match with aims in 75%, and with conclusions in 65%. There were 47/77 with the same number of subjects, 20/77 with more and 10/77 with fewer. There were 22 articles with one author added, 12 had more than one author added, 11 had one author removed and five had more than one author removed. Median time-to-publication was 18 months (interquartile range 9–26 months).

Conclusions: A publication rate of 45% is comparable to other conferences. Basic science and neonatology had the highest publication rates. There were considerable differences between abstract and published article in terms of aims, conclusions, number of subjects and authors.

Key words: abstracts; clinical conference; congresses; journal article; scientific societies.

If the ultimate goal of research is to answer questions then the subsequent goal is to have the answers published in the peer-reviewed literature. Publication in peer-reviewed journals allows not only expert critical appraisal, but the widest dissemination of research output. While presentation at scientific meetings is highly desirable to pass on knowledge gained through research, it cannot hope to equal the extent of dissemination possible through publication in scientific journals. Furthermore, research only available in abstract form may be unreliable and incomplete. An abstract has constraints of space that usually lead to a less detailed description of methods and results, therefore, hampering critical appraisal of the validity of the results and the conclusions drawn from them.[1] The conduct of perinatal research and the dissemination of its findings are no exception.

The Perinatal Society of Australia and New Zealand (PSANZ) holds a yearly scientific meeting focusing on biomedical research in the field of perinatology. The fate of research presented at the PSANZ Congress is unknown. The present study investigated the fate of abstracts of original research from the proceedings of the first annual PSANZ Congress in 1997,[2] with the aim of determining: (i) the rate of publication in peer-reviewed biomedical journals; (ii) publication rate by discipline; (iii) in which journals work presented to the PSANZ Congress is being published; (iv) whether the aims and conclusions of studies presented to the PSANZ Congress match those in the final publication; (v) whether the authors of studies presented to the PSANZ Congress match those in the final publication; (vi) whether the number of subjects in studies presented to the PSANZ Congress match those in the final publication; and (vii) the length of time taken from presentation to the PSANZ Congress to final publication.

METHODS

Abstracts from the proceedings of the first annual PSANZ Congress in 1997 were examined. Initially, abstracts were classified as either: (i) publishable (original) research; or (ii) a review-type presentation. Publishable research was defined as an abstract containing clear methods and results. Abstracts were classified by MWD and KRD independently and differences resolved by consensus. Those classified as publishable were included in the present study. Abstracts

Correspondence: Dr MW Davies, Department of Neonatology, Royal Women's Hospital, Butterfield Street, Herston, Brisbane, Qld 4029, Australia. Fax: +61 7 3636 5259; email: mwdavies@ozemail.com.au

Accepted for publication 17 January 2002.

were independently classified into disciplines by CEE and BEL (who were blinded to any other results) and differences resolved by consensus. The disciplines were: basic science, midwifery, neonatal nursing, neonatology, obstetrics, other perinatal. These discipline groups are those chosen by the PSANZ to categorize membership and are the same as those used by the PSANZ when abstracts are first submitted to the Congress for consideration.

A *MEDLINE* (PubMed) search was conducted to find any publication in a peer-reviewed journal resulting from a publishable PSANZ abstract, by searching for authors in the order as published in the abstract. *MEDLINE* was chosen as it is the most readily accessible source of biomedical literature available. Final searching was completed in October 2000, 42 months after the PSANZ Congress in 1997. A journal article was determined to be the same study as the abstract by examining the authors, subjects, number of study subjects, methods and results. The PubMed abstract of the published article was examined to determine the journal of publication, authors, time-to-publication (from March 1997), and concordance of number of subjects, aims and conclusions. The full journal article was obtained if there was insufficient information in the PubMed abstract.

The concordance of aims and conclusions between the abstract and the published paper was determined, considering only the primary aim and conclusion. To be considered concordant, the primary aim or conclusion in the abstract and the paper must have the same meaning, regardless of wording. If the abstract represented only a small part of the published study, and the primary aims and conclusions were different, the aims and conclusions were considered discordant.

Impact factors (for 1999) were noted for each journal of publication for each article published. The journal *Impact Factor* (Journal Citation Reports, Institute for Scientific Information, Philadelphia, Pennsylvania, USA) is a measure of the frequency with which the 'average article' in a journal has been cited in a particular year. The impact factor evaluates a journal's relative importance, especially when compared to others in the same field. The impact factor is calculated by dividing the number of current citations to articles published in the two previous years by the total number of articles published in the two previous years.

Statistical analyses were performed using SAS (Version 7.00; SAS Institute, Cary, NC, USA) and GRAPHPAD PRISM (Version 3.02; GraphPad Software, San Diego, CA, USA). Descriptive statistics were calculated, including relative rates and 95% confidence intervals where appropriate. Differences in proportions were compared using the χ^2 test.

Following presentation of the present study,[3] and subsequent discussion at the fifth annual PSANZ Congress in March 2001, the Cumulative Index to Nursing and Allied Health Literature (CINAHL) database was searched in the same manner as the *MEDLINE* database, for all publishable abstracts from the neonatal nursing and midwifery disciplines.

RESULTS

Overall, there were 193 abstracts printed in the *Proceedings of the First Annual Congress of the Perinatal Society of Australia and New Zealand*: 144 oral (75%) and 49 poster (25%).[2] There were 172/193 (89%) classified as publishable: 125/144 oral (87%) and 47/49 poster (96%), the proportion of abstracts classified as publishable did not differ by presentation type (χ^2 test $P = 0.0768$).

There were 78/172 (45%) publishable abstracts published as 83 articles: 67/125 (54%) of oral and 11/47 (23%) of poster presentations. The relative rate of publication by presentation type was 2.3 (95% CI 1.3–3.9; χ^2 test $P = 0.0004$). That is, an abstract was 2.3-fold more likely to have been published if presented as an oral presentation.

The proportions of abstracts published by discipline are shown in Table 1. Basic sciences had the highest proportion of abstracts published and midwifery the lowest. The additional search of the CINAHL database for abstracts from the neonatal nursing and midwifery disciplines did not find any extra published articles in peer-reviewed journals. The seven published articles from obstetrics had the highest mean impact factor (3.53); midwifery articles had the lowest mean impact factor (0.42).

Articles were published in 41 journals. The top three journals (with over one-third of papers) were paediatric journals: 10 articles were published in *Archives of Diseases in Childhood* (impact factor 1.52); nine in *Journal of Paediatrics and Child Health* (impact factor 0.46) and nine in *Pediatric Research* (impact factor 2.67). Only 11% were published in the official journal of the PSANZ (*Journal of Paediatrics and Child Health*); although only *Archives of Diseases in Childhood* had more published articles. Only 14/83 (17%) articles were published in Australian journals. The next most common journals

Table 1 Publication rate and mean impact factor by discipline

Category	Publishable abstracts	Published articles, *n* (%)	Mean impact factor
Basic science	45	30 (67)	2.64
Neonatology	56	23 (41)	1.52
Neonatal nursing	7	2 (29)	0.99
Obstetrics	25	7 (28)	3.53
Midwifery	5	1 (20)	0.42
Other perinatal	34	15 (44)	2.18

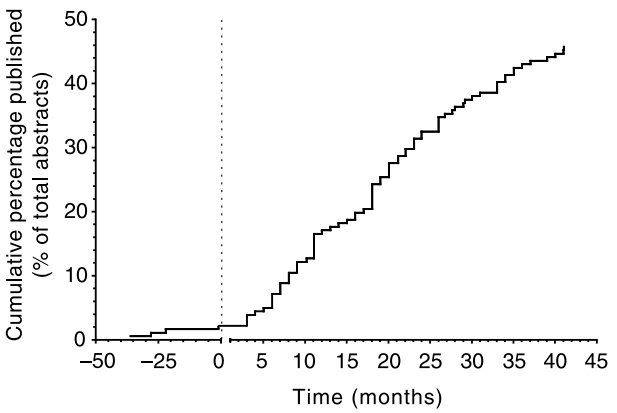

Fig. 1 The cumulative proportion of abstracts, out of the total number of publishable abstracts, at time of final publication in a peer-reviewed journal. Time zero is the time of the first annual Perinatal Society of Australia and New Zealand (PSANZ) Congress in 1997.

(number of articles, impact factors) were: *American Journal of Physiology* (5, 3.49); *British Journal of Obstetrics & Gynaecology* (4, 2.66); *Medical Journal of Australia* (3, 1.97); *American Journal of Medical Genetics* (2, 2.48); *American Journal of Obstetrics & Gynecology* (2, 2.40); *Australian & New Zealand Journal Obstetrics & Gynaecology* (2, 0.42); *Birth* (2, not listed); *British Medical Journal* (2, 5.14); *Journal of Applied Physiology* (2, 2.08); *Journal of Maternal & Fetal Medicine* (2, not listed); and *Journal of Pediatrics* (2, 3.22). There was one article published in each of 27 other journals.

Of the 83 published papers, there was matching of the primary aim in 75% and matching of the main conclusion in 65% (there was no instance where the conclusion had been reversed). Matching of the number of subjects could be determined in 77 of the 83 published papers. There were 47/77 (61%) with the same number of subjects, 20/77 (26%) had more subjects and 10/77 (13%) had fewer. There were 22 articles with one author added, six had two authors added and five had three authors added. Eleven articles had one author removed, one had two authors removed, three had three authors removed and one had five authors removed. Only 34/83 abstract–publication pairs (41%) had completely matching authors.

The Kaplan–Meier plot of time from the PSANZ Congress to publication is shown in Fig. 1. Time from the PSANZ Congress to publication ranged from 36 months before to

Table 2 Previous studies and their publication rates and time-to-publication by conference discipline

Subject	Society country of origin	Conference year	Per cent published	Months to publication	
				Median	Mean[†]
Surgical biology[4]	UK	1972	56.9	–	–
Cardiology[5]	USA	1975–1976	49.6	14	–
Oncology[6]	USA	1977–1980	51.2	11.5	–
Anaesthetics[7]	USA	1979–1980	41.9	–	8.2
Anaesthetics[7]	USA	1978	30.2	–	12.5
Paediatrics[8]	USA	1976–1978	49.0	–	20
Paediatrics[8]	USA	1976–1978	53.9	–	23.1
Paediatrics[8]	USA	1979–1980	46.5	–	12.9
Paediatrics[8]	USA	1979–1980	43.8	–	16.7
Perinatology[9]	UK	1940–1984	36.4	–	–
Dental research[10]	USA	1983–1984	22.9	–	–
Toxicology[11]	USA	1984 & 1986	35.7	12	19
Ophthalmology[12]	USA	1984	64.0	–	13
Oncology[1]	USA	1984	77.8	–	22.8
Anaesthetics[13]	International	1985	50.2	–	–
Ophthalmology[14]	USA	1985	57.0	–	19.4
Ophthalmology[15]	USA	1988–1989	65.6	–	–
Family medicine[16]	USA	1987–1988	47.6	–	–
Cardiology[17]	USA	1992	30.0	–	23 ± 10
Basic science[17]	USA	1992	28.0	–	19 ± 11
Gastroenterology[17]	USA	1992	42.0	–	26 ± 11
Neurology[17]	USA	1992	41.0	–	23 ± 11
Hand surgery[18]	USA	1990–1992	47.9	–	–
Burn research[19]	USA	1990	26.2	–	–
Orthopaedics[20]	USA	1990–1992	45.6	–	20
Cystic fibrosis[21]	International	1965–1995	32.0	18	–
Orthopaedics[22]	USA	1990–1995	59.6	–	16
Emergency medicine[23]	USA	1991	43.5	–	18
Orthopaedics[24]	USA	1991–1993	52.1	20	–
Orthopaedics[25]	USA	1993	43.8	–	–
Oncology surgery[25]	USA	1992–1993	66.1	–	–
Social medicine[26]	UK	1996	50.6	–	–
Radiology[27]	USA	1993	37.0	–	15
Radiology[27]	USA	1993	33.0	–	15
Diabetes[28]	Europe	1992	48.8	–	–
Diabetes[28]	USA	1992	53.5	–	–
Diabetes[28]	Australia	1990	25.8	–	–
Spine orthopaedics[29]	USA	1990–1992	40.4	–	–
Spine orthopaedics[29]	USA	1991–1993	47.1	–	–
Spine orthopaedics[29]	USA	1991–1993	45.4	–	–
Paediatric orthopaedics[30]	USA	1991–1994	54.1	29	–
Paediatrics[31]	UK	1996	52.1	–	–
Paediatrics[31]	UK	1996	77.5	12	–
Perinatology[3]	Australia	1997	45.3	18	–

[†]Values are mean ± SD where appropriate.

41 months after the congress (at 42 months post-congress). Median time-to-publication was 18 months after the congress (interquartile range 9–26 months).

DISCUSSION

At 42 months post-congress, it was determined that 45% of abstracts of original research presented at the PSANZ Congress in 1997 were published in peer-reviewed biomedical journals. Studies assessing the publication rate of research presented at scientific meetings are summarized in Table 2.[1,4–31] The median publication rate for the studies in Table 2 is 47% (interquartile range 39–53%), which is a similar rate to the proportion found in the present study. Some of the studies from the upper quartile had higher publication rates because they considered non-peer-reviewed journals,[1] studied oral or plenary session presentations only,[22,30,31] studied randomized controlled trials only,[15] or sent questionnaires to authors of abstracts, potentially finding more publications in more obscure or non-indexed journals.[1,22] However, there were also higher rates in studies that had similar methodologies to that of the present study.[4,8,12,25,28]

Two similar studies examined the likelihood of publication by presentation type and both found a greater publication rate for research presented orally as opposed to poster presentations.[12,14] These different rates may represent the perception among researchers and conference organizers that better quality, more significant research should be presented as an oral presentation rather than a poster. This premise may not hold true for all conferences or future PSANZ congresses.

In the present study, basic science had a far higher publication rate than all other disciplines, which is consistent with other studies,[14,20] except burn research where basic science papers have lower publication rates.[19] The present study found that neonatology ranked second by publication rate, while obstetrics, with a relatively poor publication rate, fared better with a higher mean impact factor for the journals.

If conferences are convened to disseminate work in progress, to facilitate discussion and to test evolving hypotheses,[11,32] then a publication rate of 45% is very good. A publication rate of 45% is comparable to most other biomedical disciplines; however, the question remains: what happened to the other 55% of abstracts? It has been suggested that research without adequate dissemination of results is not ethical and some consider it to be scientific misconduct.[33] If research work presented at a PSANZ Congress represents a summary of the current perinatal research in Australia and New Zealand and if 55% remains unpublished, then this information is effectively lost. It is difficult to know whether the responsibility for correcting this situation lies with individual researchers, the PSANZ, the conference organizers (and scientific committee), or the journals targeted by authors.

Poor publication rates may be due to:

- Research of insufficient quality for peer-reviewed journals.[1,32]
- A lack of time on the part of investigators.[1,15,34,35]
- Researcher inertia/apathy.[1,36]
- Conference presentations being partial/preliminary results, results of work in progress, or comprising a small part of a larger study.[1,15,32]
- Trainees having moved on.[37]
- Perceptions that the work may not be important enough for a wider audience.[34]
- Publication bias towards studies with positive or significant results.[1,15,19,23,26,38]
- 'Trouble with coauthors'.[34]
- 'Not worth the trouble'.[34]
- 'Other papers with similar findings'.[34]
- The primary author not having a PhD or MD.[19]
- The research group not being affiliated with a university.[5,19]
- Poor (or absent) presentation of statistics with results in abstract.[19]

Perhaps the rate of publication found in the present study is because the study was carried out too soon after the PSANZ Congress. A median time-to-publication of 18 months is comparable to the time-to-publication shown by other studies (Table 2), which have assessed time-to-publication at 54 months (4.5 years) or beyond. Out of these studies, there are a few showing that, of all articles published by 54 months, 86–92% are published by 42 months,[13,20,24,30] but the overwhelming majority of these studies have shown that more than 94% are published by 42 months.[12,13,18,20–22,24] A delay of more than 3.5 years is unacceptable and, if publication is going to occur, it should be in a far more timely fashion.[36]

Why the delay in the publishing of articles? Is the process of manuscript submission to a journal, peer-review and editorial decision making too lengthy?[36] A study examining time-to-publication of randomized efficacy trials found that the median time-to-publication was 0.8 years after submission (interquartile range 0.6–1.4 years).[39] Many of the reasons for failure to publish may also be leading to a long lag time between presentation and publication, especially 'lack of time' and researcher inertia/apathy. There is evidence to suggest that researchers submit to journals with high impact factors first and, if rejected, will re-submit to journals with lower impact factors.[5] This would certainly lengthen time-to-publication.

The number of articles published in Australian journals was found to be low, as was the proportion published in the journal of the PSANZ, the *Journal of Paediatrics and Child Health.* Authors may choose to submit elsewhere in order to be published in journals with higher impact factors,[5,40] rather than choosing a journal where the message reaches the most appropriate audience. Australian journals have relatively lower impact factors than their counterparts in Europe and the USA. The editor of the *Archives of Diseases in Childhood* (the journal of the Royal College of Paediatrics and Child Health in the UK) is certainly of the opinion that *Archives of Diseases in Childhood* should be the journal of first choice for members and fellows of the Royal College of Paediatrics and Child Health when submitting their work for publication.[40] Are the editors of the *Journal of Paediatrics and Child Health* of the same opinion? Another important factor is the length of time it takes to publish an article after it is submitted and journals certainly have a role to play in making this time as short as possible.

It was found that a change of authorship occurred quite often, with only 41% of published articles having the same authors as the congress abstracts. This compares with other studies showing a range of 42–70% of papers having the same authors.[10,25,41] In a study of phase 3 clinical trials, De Bellefeuille *et al.* demonstrated that only 11% of papers had the same number of authors at publication.[1] A change in authorship between conference presentation and publication might be due to the inclusion of an additional author if there is further analysis of data involving another investigator, or the removal of an author if their involvement in manuscript

preparation is below the standards set for authorship by peer-reviewed journals. If a trainee or researcher has left a research group by the time the work is finally prepared and submitted for publication, they should still be an author on the final paper. The unacceptable practice of 'honorary' or 'gift' authorship, for either the conference abstract or the final article, is also prevalent,[42] and may explain differences in authorship between abstract and publication. Should standards for authorship be the same for conference abstracts and publications?

The present study found that only 61% of articles had the same number of subjects in abstracts and publications and other studies have found discordance rates ranging from 6 to 88%.[1,10,25,41] The addition of more study subjects implies that the conference presentation represented partial/preliminary results, results of work in progress, or may have reported a small part of a larger study. A reduction in the number of subjects might imply that some were excluded following a more detailed analysis of the data in the preparation of research for publication. It is to be hoped that the number of subjects is not being altered because some of the data do not support anticipated or hoped for results; however, this possibility cannot be excluded. This possibility is disconcerting considering the degree of discordance seen between the conclusions stated in the abstract and those stated in the publication. In the present study, a change was found in the primary conclusion in 35% of publications. Other studies have described differences in conclusions between abstract and publication of 4–38%.[1,10,25,41] Some of these differences might be due to a change in the emphasis of the research, given that the primary aim matched in only 75% of cases. The only other study that has examined aim concordance found matching aims in 70% of cases.[10] The degree of matching may also be influenced by the subjective nature of the assessment process.

In summary, 45% of publishable abstracts from the PSANZ Congress in 1997 resulted in published journal articles in peer-reviewed journals. The topic groups basic science and neonatology had the highest proportion of abstracts published. There was considerable discordance between abstract and article by aims, conclusions, number of subjects and authors.

ACKNOWLEDGEMENTS

We thank G Healy and M Gunning for their help.

REFERENCES

1 De Bellefeuille C, Morrison CA, Tannock IF. The fate of abstracts submitted to a cancer meeting: factors which influence presentation and subsequent publication. *Ann. Oncol.* 1992; **3**: 187–91.

2 Perinatal Society of Australia and New Zealand. *Proceedings of the First Annual Congress of the Perinatal Society of Australia and New Zealand, March 16–20, 1997, Fremantle, Australia.* Perinatal Society of Australia and New Zealand, Sydney, 1997.

3 Davies MW, Dunster KR, East CE, Lingwood BE. The fate of abstracts published in the Proceedings of the First Annual PSANZ Congress in 1997. *Proceedings of the 5th Annual Congress of the Perinatal Society of Australia and New Zealand, March 13–16, 2001, Canberra, Australia.* Perinatal Society of Australia and New Zealand, Sydney, 2001; 82.

4 Dudley HA. Surgical research: master or servant. *Am. J. Surg.* 1978; **135**: 458–60.

5 Goldman L, Loscalzo A. Fate of cardiology research originally published in abstract form. *N. Engl. J. Med.* 1980; **303**: 255–9.

6 Maxwell MB. Published or perished: what becomes of papers presented at oncology nursing society congresses? *Oncol. Nurs. Forum* 1981; **8**: 73–4.

7 Meranze J, Ellison N, Greenhow DE. Publications resulting from anesthesia meeting abstracts. *Anesth. Analg.* 1982; **61**: 445–8.

8 McCormick MC, Holmes JH. Publication of research presented at the pediatric meetings. Change in selection. *Am. J. Dis. Child.* 1985; **139**: 122–6.

9 Chalmers I, Adams M, Dickersin K *et al.* A cohort study of summary reports of controlled trials. *JAMA* 1990; **263**: 1401–5.

10 Corry AM. A survey of the publication history of randomly selected IADR/AADR abstracts presented in 1983 and 1984. *J. Dent. Res.* 1990; **69**: 1453–5.

11 Gorman RL, Oderda GM. Publication of presented abstracts at annual scientific meetings. a measure of quality?. *Vet. Hum. Toxicol.* 1990; **32**: 470–72.

12 Juzych MS, Shin DH, Coffey JB, Parrow KA, Tsai CS, Briggs KS. Pattern of publication of ophthalmic abstracts in peer-reviewed journals. *Ophthalmology* 1991; **98**: 553–6.

13 Yentis SM, Campbell FA, Lerman J. Publication of abstracts presented at anaesthesia meetings. *Can. J. Anaesth.* 1993; **40**: 632–4.

14 Juzych MS, Shin DH, Coffey J, Juzych L, Shin D. Whatever happened to abstracts from different sections of the association for research in vision and ophthalmology?. *Invest. Ophthalmol. Vis. Sci.* 1993; **34**: 1879–82.

15 Scherer RW, Dickersin K, Langenberg P. Full publication of results initially presented in abstracts. A meta-analysis. [Published erratum appears in *JAMA* 1994; **272**: 1410]. *JAMA* 1994; **272**: 158–62.

16 Elder NC, Blake RL Jr. Publication patterns of presentations at the Society of Teachers of Family Medicine and North American Primary Care Research Group annual meetings. *Fam. Med.* 1994; **26**: 352–5.

17 Liu L, Danziger RS. Fate of conference abstracts [Letter]. *Nature* 1996; **383**: 20.

18 Gavazza JB, Foulkes GD, Meals RA. Publication pattern of papers presented at the American Society for Surgery of the Hand annual meeting. *J. Hand Surg. [Am.]* 1996; **21**: 742–5.

19 Landry VL. The publication outcome for the papers presented at the 1990 ABA conference. *J. Burn Care Rehabil.* 1996; **17**: 23A–26A.

20 Hamlet WP, Fletcher A, Meals RA. Publication patterns of papers presented at the Annual Meeting of The American Academy of Orthopaedic Surgeons. *J. Bone Joint Surg. Am.* 1997; **79**: 1138–43.

21 Cheng K, Preston C, Ashby D, O'Hea U, Smyth RL. Time to publication as full reports of abstracts of randomized controlled trials in cystic fibrosis. *Pediatr. Pulmonol.* 1998; **26**: 101–5.

22 Nguyen V, Tornetta P, Bkaric M III. Publication rates for the scientific sessions of the OTA. Orthopaedic Trauma Association. *J. Orthop. Trauma* 1998; **12**: 457–9.

23 Callaham ML, Wears RL, Weber EJ, Barton C, Young G. Positive-outcome bias and other limitations in the outcome of research abstracts submitted to a scientific meeting. [Published erratum appears in JAMA 1998; **280**: 1232]. *JAMA* 1998; **280**: 254–7.

24 Daluiski A, Kuhns CA, Jackson KR, Lieberman JR. Publication rate of abstracts presented at the annual meeting of the Orthopaedic Research Society. *J. Orthop. Res.* 1998; **16**: 645–9.

25 Murrey DB, Wright RW, Seiler JG, Day TE III, Schwartz HS. Publication rates of abstracts presented at the 1993 annual Academy meeting. *Clin. Orthop.* 1999; **359**: 247–53.

26 Petticrew M, Gilbody S, Song F. Lost information? The fate of papers presented at the 40th society for Social Medicine Conference. *J. Epidemiol. Community Health* 1999; **53**: 442–3.

27 Marx WF, Cloft HJ, Do HM, Kallmes DF. The fate of neuroradiologic abstracts presented at national meetings in 1993: rate of subsequent publication in peer-reviewed, indexed journals. *AJNR Am. J. Neuroradiol.* 1999; **20**: 1173–7.

28 Payne C. Publication of abstracts presented at diabetes meetings [Letter]. *Diabetes Care* 1999; **22**: 362.

29 Wang JC, Yoo S, Delamarter RB. The publication rates of presentations at major Spine Specialty Society meetings (NASS, SRS, ISSLS). *Spine* 1999; **24**: 425–7.
30 Jackson KR, Daluiski A, Kay RM. Publication of abstracts, submitted to the annual meeting of the Pediatric Orthopaedic Society of North America. *J. Pediatr. Orthop.* 2000; **20**: 2–6.
31 Riordan FA. Do presenters to paediatric meetings get their work published? *Arch. Dis. Child.* 2000; **83**: 524–6.
32 Relman AS. News reports of medical meetings: how reliable are abstracts? *N. Engl. J. Med.* 1980; **303**: 277–8.
33 Chalmers I. Underreporting research is scientific misconduct. *JAMA* 1990; **263**: 1405–8.
34 Weber EJ, Callaham ML, Wears RL, Barton C, Young G. Unpublished research from a medical specialty meeting: why investigators fail to publish. *JAMA* 1998; **280**: 257–9.
35 Dickersin K, Min YI. NIH clinical trials and publication bias. *Online J. Curr. Clin. Trials* [serial online]. 1993: Doc no. 50. Available from: http://http://www.oclc.org/firstsearch/
36 Helfet DL. The scientific sessions at the OTA annual meeting [Editorial]. *J. Orthop. Trauma* 1998; **12**: 456.
37 Spector S. Fate of research originally published in abstract. *N. Engl. J. Med.* 1980; **303**: 1370.
38 Dickersin K, Min YI, Meinert CL. Factors influencing publication of research results. Follow-up of applications, submitted to two institutional review boards. *JAMA* 1992; **267**: 374–8.
39 Ioannidis JPA. Effect of the statistical significance of results on the time to completion and publication of randomized efficacy trials. *JAMA* 1998; **279**: 281–6.
40 Marcovitch H. Recommendations for using MMR vaccine in children allergic to egg should be consistent [Editorial comment]. *Arch. Dis. Child.* 2000; **83**: 278.
41 Weintraub WH. Are published manuscripts representative of the surgical meeting abstracts? An objective appraisal. *J. Pediatr. Surg.* 1987; **22**: 11–13.
42 Flanagin A, Carey LA, Fontanarosa PB *et al.* Prevalence of articles with honorary authors and ghost authors in peer-reviewed medical journals. *JAMA* 1998; **280**: 222–4.