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AN ANALYSIS OF TOXICOLOGY AND MEDICAL JOURNAL CONFLICT-OF-INTEREST POLICES

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Basic science and medical journals are increasingly requiring authors to disclose financial interests they have in the subject matter of contributed articles and letters. A comparison of journal conflict-of-interest (COI) policies can provide insight into published reports of low compliance rates and inconsistencies in disclosures by the same author found in different journals. The objective of this article is to compare the criteria, specificity, and scope of COI polices in toxicology and medical journals. We studied the COI policies of 47 toxicology and 180 medical journals catalogued in Ulrich's International Periodicals Directory for criteria of competing interests, types of submissions covered, monetary or time thresholds for reporting, and penalties for violations. Indicators were constructed for rating policy specificity, author discretion, and policy scope.

Written COI policies were found in 87% if the toxicology and 84% of the medical journals; 15% and 28% of the toxicology and medical journals, respectively, were explicit about the type of content covered by the policy; 20% and 29%, respectively, included a monetary threshold for reporting purposes; the level of author discretion for reporting COIs was found to be high in 46% of the toxicology and 41% of the medical journals respectively. The level of specificity for more than 75% of the written journal COI policies for both fields was minimal or practically nil, and the scope of more than 80% of the policies was minimal to narrow. Lack of specificity, high author discretion, and restricted scope were found to be prevalent among COI policies of toxicology and medical journals.

Keywords: *conflict of interest, journal policies, journals, medical journals, toxicology journals*

Introduction

About a quarter of a century ago, medical journals began asking authors to disclose any financial interests they had related to the

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subject matter of articles submitted for publication. In 1984, the *New England Journal of Medicine*, under the editorship of Arnold Relman, was the first journal to introduce such a policy (Relman, 1984). A year later, the *Journal of the American Medical Association* "requested authors to disclose financial interests related to the subject matter of their research" (Knoll and Lundberg, 1985; DeAngelis et al., 2003). The journal *Science* introduced its first Conflict of Interest (COI) policy in 1992 (Koshland, 1992), while the journal *Nature*, and all journals under the Nature Publishing Group, held off until 2001 before introducing its policy (Campbell, 2001; Anand, 2001). In 1993, the International Committee of Medical Journal Editors, consisting of the editors of a dozen leading international medical journals, recommended that authors and editors disclose financial associations that pose a COI (International Committee, 1993). Throughout the 1990s, an increasing number of journals in medicine, biomedical sciences, chemistry, and public health included COI policies in the "Instructions to Authors." The Council of Science Editors has recommended that "journals should require disclosure of all COIs from everyone involved in the publication process . . ." (Council, 2009).

A few studies estimated the number of journals that adopted COI policies. From a 1997 survey of 1251 medical journals, Glass reported that as many as 34% overall and 46% of U.S. medical journals with a circulation of over 1,000 reported that they had COI policies for contributing authors (Glass, 1997). Krimsky and Rothenberg analyzed a sample of 1,396 science and biomedical journals published in 1997 based on the *Journal Citation Report* indicators "times cited" and "impact factor," and found that 15.8% had written COI policies (Krimsky and Rothenberg, 2001). McCrary et al. (2000) reported that 43% of 47 basic science and medical journals with high immediacy impact rankings had policies for the disclosure of COIs. Ancker and Flanagin (2007) surveyed 84 high-impact, peer-reviewed journals across disciplines in 2007, and found that 33% had published COI policies, while in a survey of editors of those journals 80% reported as having such policies. Cooper et al. (2006) surveyed 91 journals in primary care, general medicine, and surgery, and reported that 93% had written COI policies. Several studies examined the efficacy of journal COI policies. One found inconsistencies among authors who reported their competing interests to

different journals (Weinfurt et al., 2008). Two others found a lack of compliance among reviewers and authors in disclosing financial interests (Farthing, 2006; Goozner, 2004). Studies of journal adoption of COI policies have used different sample selection criteria (e.g., impact factor, immediacy factor, circulation; medicine versus science and medicine), and thus we cannot draw any quantitative conclusions about adoption rates over time, although the trend beginning in the 1990s is toward greater adoption.

In order to understand whether the emerging trend of transparency for competing interests is gaining saliency among scientific and medical journals, we examined the written COI policies and analyzed the degree to which they are specific and unambiguous in requesting information. Krimsky and Rothenberg conjectured that extremely low disclosure rates could, in large part, be due to journal policies that are confusing, ambiguous, or that leave too much to the discretion of the author (Krimsky and Rothenberg, 2001).

Objectives

This study examines written COI policies of journals and how they are presented to authors, including their specificity (whether they stipulate monetary thresholds, time considerations, nonfinancial competing interests, and sanctions for violations of the policy), their scope or comprehensiveness, and the reporting latitude they afford to authors. We compare journal criteria for COI disclosures in toxicology/environmental journals to three groups of medical journals classified by *Ulrich's 2007 International Periodicals Directory*. Building on past studies of COI reporting criteria used by journals, we created a flow diagram (Fig. 1) to serve as the template for analyzing journal policies.

Our hypothesis is that the lack of specificity and limited scope of journal COI policies, which affords authors considerable discretion in reporting COIs, is prevalent among toxicology/environment and medical journals. If this is true, it can explain inconsistencies in reporting COIs and low author compliance with journal COI policies as reported by Weinfurt et al. (2008).

Ulrich's Guide (2007) → Journal Categories → Toxicology & Environmental Safety; Medical Sciences, Internal Medicine; Medical Sciences, Oncology; Medical Sciences, Experimental Medicine and Laboratory Techniques. → Screen for Country, English Language, Periodical, Active, Peer Reviewed. Results: Toxicology/Environmental (n = 47); Internal Medicine (n = 6); Oncology (n = 126); Experimental Medicine (n = 48) → **Query on COI Policy**: Toxicology (n = 47); Medical (n = 180) [Yes, No] Results: Toxicology (n = 41); Medical (n = 152)→ **Types of Conflict Targeted for Disclosure** [financial (other than funding); employment affiliation, funding, nonfinancial, not specified] → **Types of Content Policy Applies to** [specified, not specified] → **Monetary Threshold** [specified, not specified] → **Time Consideration** [specified, not specified] → **Penalties for Violation** [yes, no] → **Who Discloses** [Editor, Reviewer, Author, Other, not specified] → **Editor Discloses to** [Reader, Author, Reviewers, Senior Editorial Staff, not specified] → **Reviewer Discloses to** [Readers. Authors, Editors, not specified] → **Author Discloses to** [Editors, Reviewers, Readers, Other, not specified] → **Disclosure to the Reader** [Mandatory, Editor's Discretion, Editor-Author Discussion, Other, not specified] → **Policy Applies to which Authors** [Corresponding only, All Authors, not specified] → **Type of Review Process** [Single Blind, Double Blind, Open, not specified] → **Level of Author Discretion** [Low, Medium, High] → **Specificity of Policy** [Practically Nil, Minimum. Modest, High] → **Scope of Policy** [Narrow, Minimal, Modest, Comprehensive

FIGURE 1 Flow chart of journal COI study data compiled in FileMake 9.

Methods

Study Sample

We selected journals from *Ulrich's 2007 Periodicals Directory* in four categories: Toxicology and Environmental Safety (hereafter Toxicology) (n = 48); Medical Sciences-Internal Medicine (hereafter, Internal Medicine) (n = 11); Medical Sciences-Oncology (hereafter Oncology) (n = 146), and Medical Sciences—Experimental Medicine and Laboratory Techniques (hereafter Experimental Medicine) (n = 59). These subfields were selected because of their visibility regarding author COI (Thacker, 2006). Only those journals that were printed in the English language, active, peer reviewed, and published in the United States, the United

Kingdom, or Canada were chosen for the study. After eliminating journals that did not meet our criteria, because they were no longer published, were published as an irregular monograph series, or could not be accessed on the Internet or in hard copy any where in the Boston Metropolitan area, we were left with Toxicology ($n = 47$); Internal Medicine ($n = 6$); Oncology ($n = 126$), and Experimental Medicine ($n = 48$).

Data Sources

These journals were examined on their Internet sites and, if needed, in paper copy, to ascertain their policies on author, editor, and reviewer COI disclosure requirements. Each journal was put through a series of screening questions and coded by ES. The coding was checked by SK. Any disagreements was resolved by a third party. For purposes of analysis, the medical journals and toxicology journals are clustered separately: Toxicology ($n = 47$); Medical ($n = 180$).

Indicator of Author Discretion

The answers to most of the questions in our survey were easily obtained from the journal's published COI policy. However, for three questions, we developed indicators from primary data. We constructed qualitative indicators for *Level of Author Discretion*, *Level of Specificity*, and the *Scope of the COI Policy* for each journal. *Author Discretion* (*low*, *medium*, or *high*) was a subjective determination of the relative interpretive latitude that is afforded to the submitting authors with regard to COI disclosure. It is interpreted from the policy language based on whether the policy implies mandatory disclosure and includes sufficient detail (e.g., company names, dates, and financial information). Policies that gave significant interpretive autonomy to submitting authors, such as those that allow authors only "to report anything they felt would embarrass them if it became known" were coded *high* on *Author Discretion*. In this example, the imprecise nature of the policy language and lack of additional direction gives significant discretion to the author—what may embarrass one author may not seem worth disclosing to another.

Alternatively, a policy rated *low* for *Author Discretion* offers very little or no interpretive freedom to the author(s), such as

those that require authors to complete a detailed disclosure form as a condition of submission. By establishing three categories for *Level of Author Discretion*, this study does not presume that author discretion exists in clearly demarcated classes. Rather a continuum of phraseology was observed that could be organized into two extremes and a middle ground.

Indicator of Policy Specificity

We also constructed an indicator of *Policy Specificity* consisting of four levels: *practically none*, *minimal*, *modest*, and *highly specified*. The survey consisted of eleven queries related to the COI disclosure policy such as *Types of Content Policy Applies to* and *Monetary Threshold* (see Fig. 1). Each query has two or more possible responses, one of which is *unspecified*. If *unspecified* is checked, no other choice is selected. A point system was designed for rating *Policy Specificity*. Journals earned either zero or one point for each one of the eleven queries related to the content of the COI disclosure policy; in other words, no more than one point could be earned in each category. If the response category *unspecified* was checked, the query received zero points; if *unspecified* was not checked, the category received one point. As an example, all journals that identified at least one area of potential COI in the query *Types of Conflict Targeted for Disclosure* would receive one point if *employment affiliation* was singled-out but would still only receive one point if other categories such as *funding* were also checked. (However, as explained below, the latter response would earn more than one point for *Policy Scope*.) Alternatively, if the query on *Monetary Threshold* received a response of *unspecified*, it would garner zero points.

The levels of specificity were assigned to four bins of equal point range between 1 to 12: *practically no specificity* (1–3 points), *minimal specificity* (4–6 points), *modest specificity* (7–9 points), and *highly specified* (10–12 points). Points were compiled and corresponding indicators of COI policy specificity were assigned for each journal policy.

Indicator of Policy Scope

The *Scope* of a journal's COI policy was rated by a method similar to the one used for rating *Specificity*. In this case, however, the

journal received one point for *each* subcategory (listed within the query) that was cited in the journal's COI policy statement. For example, consider the query *Author Discloses to* (*editor, reviewer, reader, not specified*)." If the journal requires disclosure to the editor and the reader, but not the reviewer, two points were awarded. If disclosure is required for all three (broader scope), then the journal was awarded three points. As with the indicator for *Policy Specificity*, four levels were assigned to *Policy Scope* with bins of equal numerical range: *narrow scope* (1–5 points), *minimal scope* (6–10 points), *modest scope* (11–15), and *comprehensive* (16–20 points).

Author Discretion, *Policy Specificity*, and *Policy Scope* are conceptually related, but subtle and important distinctions between these concepts allow us to detect the nuances of policies that might otherwise appear similar. *Specificity* captures the extent to which a COI policy touches on various potential areas of competing interests. *Scope* reveals the range of interests incorporated into the disclosure as well as the actors who become involved in its implementation. *Author Discretion* arises from the language of the policy and reflects the interpretive autonomy (broad or narrow) afforded to submitting authors based on the types of competing interests addressed, the level of detail required, and whether the policy uses mandatory language.

Methodological Notes

Certain assumptions were made in the coding of journals. If policies require that COI disclosures appear in the text of the published article, we assume that both readers and reviewers will see the disclosure. If the author's disclosure is made to the editor in a separate correspondence, we did not assume readers and reviewers would see this information, thus, we would need explicit information to conclude that COI disclosure to the reader is *mandatory* rather than *at the editor's discretion* or after *editor/author discussion*. Therefore, disclosure under separate correspondence would be coded as *not specified* for the query, "*Is Author Disclosure to the Reader Mandatory?*"

If a journal refers to a publisher's policy (or some other organization) on COI, but lists its own policy and does not state that authors must follow the publisher's policy, we used the journal's

stated policy. However, if the journal has no stated policy but refers to the COI policy of the publisher or some other organization, then we used the policy to which the journal refers unless its language is tentative or it refers to the publisher's policy as a reference or guideline.

If the journal's general instructions require authors to comply with the International Committee of Medical Journal Editors (ICMJE) guidelines for article submission and the journal also lists its own COI policy, but the journal COI policy does not explicitly refer authors to the ICMJE guidelines on COI, only the journal's policy on COI is used. If the journal has no special section on COI, and it states that authors *must* conform to the ICJME guidelines for article submission, then the ICJME guidelines would be accepted as the default. The journal's policy language must be explicit that no submission will be accepted unless it follows the ICMJE guidelines, including the COI component.

Results

Our survey showed that a much higher ratio of journals had incorporated written COI policies in 2007 than was found in prior surveys. Of the 47 toxicology journals and 180 medical journals 87% and 84%, respectively, had written COI policies. Requirements to disclose nonfinancial competing interests were found in 49% ($n = 41$) of the toxicology journals and 37% ($n = 152$) of the medical journals (see Table 1).

Nearly all the toxicology journals (95%; $n = 41$) and the medical journals (95%; $n = 152$) designated some specific types of interests they wanted authors to disclose (e.g., equity, speakers bureau, advisory board). But the medical journals (28%; $n = 152$) were far more likely than the toxicology journals (15%; $n = 41$) to specify the types of content to which the policy applies (e.g., original data, review articles, letters, etc). Far fewer than half the toxicology (20%; $n = 41$) and medical journals (29%; $n = 152$) with COI policies specify a monetary threshold for author disclosure. Similarly, only 20% of the toxicology journals ($n = 41$) and 16% of the medical journals ($n = 152$) included time considerations for the authors' disclosures of financial interests. Authors use their own discretion of cutoff times when nothing is stated in the policy.

TABLE 1 COI Policies in Toxicology and Medical Journals

Policy components	Toxicology journals $N = 47$		Medical journals $N = 180$	
Has a written COI policy	41/47	87%	152/180	84%
Requires disclosure for nonfinancial interests	20/41	49%	56/152	37%
Types of interest to be disclosed are specified (e.g.,honoraria, consultant, equity)	39/41	95%	145/152	95%
Types of content to which the policy applies are specified (e.g., original data; review articles, commentaries, letters, book reviews)	6/41	15%	42/152	28%
Specifies a monetary threshold	8/41	20%	44/152	29%
Specifies time considerations for reporting	8/41	20%	25/152	16%
Specifies penalties or sanctions for violators	2/41	5%	13/152	9%
Requires disclosure of authors' COI to reviewers	27/41	66%	80/152	53%
Mandatory disclosure of authors' COI to readers	19/41	46%	65/152	43%

Financial disclosures in cover letters cannot be assumed to be seen by reviewers or readers. In some journals, editors retain discretion over whether to publish the COIs they receive in private correspondence. In our survey, 66% of toxicology journals (n = 41) and 53% of medical journals (n = 152), respectively, require that reviewers see author COI disclosures.

Some journal editors discuss the COI disclosures with the authors and decide collaboratively what to publish in the article. Other editors publish whatever the author discloses or an abbreviated form of the disclosure. We found 46% of the toxicology journals (n = 41) and 43% of the medical journals (n = 152) require in their written guidelines mandatory disclosure of all author COIs to readers (Table 1). This is consistent with Cooper et al. (2005, 1248) who reported "The COI information that is collected by journals is often not published" (Ancker, 2007), and Hussain and Smith (2001) who found a mere 1.4% of 3,642 articles published in leading medical journals between 1989 and 1999 that contained declarations of author competing interests.

The range of discretion given to authors for reporting COI information can explain inconsistencies across journals when authors report their financial interests. A journal policy that states "authors should report any relationship that would embarrass them were it to become public knowledge" may be interpreted differently by different individuals. We found that nearly half of both the toxicology and medical journals had a high level of author discretion in reporting COIs (46%; $n = 41$) and 41% $n = 152$, respectively). Very few journals in toxicology (5%; $n = 41$) and in medicine (8%; $n = 152$) had sufficient specificity to reduce a broad interpretative latitude taken by authors in reporting their competing interests (Table 2). Author discretion, as a conceptual matter, correlates inversely with policy specificity. One would expect the interpretive latitude of the authors to increase as the policy becomes less specific. Based on our indicator of specificity, 88% ($n = 41$) of the toxicology journals and 76% ($n = 152$) of the medical journals had *minimal* or *practically no specificity* in describing what needs to be reported for selected submissions (Table 3).

The *Scope* of the COI policy is a measure of how many issues it includes under its disclosure requirement. A policy that includes disclosure for original articles, reviews, and letters has a greater scope than one that only applies to original articles. Based on a maximum point range of 20, 34% ($n = 41$) of the toxicology journals were classified as having a *narrow scope*

TABLE 2 Level of Author Discretion

Level of author discretion	Toxicology ($n = 41$)		Medical ($n = 152$)	
Low	2/41	5%	12/152	8 %
Medium	20/41	49%	78/152	51%
High	19/41	46%	62/152	41%

TABLE 3 Level of Specificity of COI Policy

Level of specificity	Toxicology ($n = 41$)		Medical ($n = 152$)	
Practically none (1–3)	4/41	10%	15/152	10%
Minimal (4–6)	32/41	78%	101/152	66%
Modest (7–9)	3/41	7%	28/152	18%
Highly specified (10–12)	2/41	5%	8/152	5%

TABLE 4 Scope of COI Policy

Scope Indicator	Toxicology (n = 41)		Medical (n = 152)	
Narrow (1–5)	14/41	34%	60/152	39%
Minimal (6–10)	24/41	59%	73/152	48%
Modest (11–15)	3/41	7%	19/152	13%
Comprehensive (16–20)	0/41	0%	0/152	0%

(1–5 points) and 59% (n = 41) had a *minimal scope* (6–10 points). The medical journals had a similar range: 39% (n = 152) were classified as having a *narrow scope*; and 48% (n = 152) had a minimal scope. None of the medical or toxicology journals reached *comprehensive scope* (16–20 points), but 3 journals in toxicology and 19 medical journals were rated as having *modest scope* (see Table 4).

Limitations

The journals were surveyed during 2008. Even as the year progressed, some journals had changed their policies. We attempted to capture changes in journal policy by rechecking the journals several times. It is possible that changes were made after the research team made its last observation. In our coding of journal policies, we had to make certain inferences based on what was said or omitted from the written policies. We based these inferences on a consistent set of criteria. What we coded as *not specified* in the written policy could be something that was clarified in the correspondence between the editor and the author on such issues as whether the COI disclosure is ordinarily published with the article.

Our selection of the medical journals came from three categories in Ulrich's Directory (Table 5). While those categories included 180 journals, some of the leading medical journals were not on those lists. A similar study based on circulation or impact factors would generate a different list of journals resulting in different statistics.

Discussion

From this study we learned that more than three quarters of the toxicology and medical journals we studied had written COI policies, a significant rise from a decade ago (Table 1). In

TABLE 5 List of Journals Surveyed

A S A I O Journal
Acta Oncologica
Acute Medicine
Alternatives to Laboratory Animals
American Journal of Clinical Oncology: Cancer Clinical Trials
American Journal of Emergency Medicine
Annals of Clinical and Laboratory Science
Annals of Internal Medicine
Annals of Oncology
Annals of Surgical Oncology
Annual Review of Pharmacology and Toxicology
Anthrozoos: A Multidisciplinary Journal of the Interactions of People and Animals
Anti-Cancer Drugs: International Journal on Anti-Cancer Agents
Antimicrobial Agents and Chemotherapy
Applied Immunohistochemistry and Molecular Morphology
Applied Nursing Research
Applied Radiation and Isotopes
Archives of Environmental Contamination and Toxicology
Archives of Internal Medicine
Archives of Pathology and Laboratory Medicine
Artificial Cells, Blood Substitutes, and Biotechnology
Artificial Organs: Replacement, Recovery, and Regeneration
B M C Cancer
Basic and Clinical Pharmacology and Toxicology
Biofouling: The Journal of Bioadhesion and Biofilm Research
Birth Defects Research. Part A: Clinical and Molecular Teratology
Bone Marrow Transplantation
Brachytherapy
Brain Pathology
Breast Cancer Research (Online Edition)
Breast Cancer Research and Treatment
British Journal of Biomedical Science
British Journal of Cancer
Bulletin of Environmental Contamination and Toxicology
C A: A Cancer Journal for Clinicians
Canadian Journal of Cardiology
Cancer
Cancer and Metastasis Reviews
Cancer Biology and Therapy
Cancer Biotherapy and Radiopharmaceuticals
Cancer Cell
Cancer Cell International
Cancer Control: Journal of the Moffitt Cancer Center

(Continued)

TABLE 5 *(Continued)*

Cancer Detection and Prevention
Cancer Epidemiology, Biomarkers, and Prevention
Cancer Gene Therapy
Cancer Genetics and Cytogenetics*
Cancer Investigation
Cancer Nursing: An International Journal for Cancer Care
Cancer Research
Cancer Treatment Reviews
Carcinogenesis
Cell Death and Differentiation
Chemical Research in Toxicology
Chemosphere
Chronic Diseases in Canada
Clinical Advances in Hematology and Oncology
Clinical Breast Cancer
Clinical Cancer Research
Clinical Chemistry (Washington, DC): International Journal of Molecular Diagnostics and Laboratory Medicine
Clinical Colorectal Cancer
Clinical Genitourinary Cancer: Prostate, Kidney, and Bladder
Clinical Journal of Oncology Nursing
Clinical Laboratory Science
Clinical Leadership and Management Review
Clinical Leukemia
Clinical Lymphoma and Myeloma
Clinical Oncology
Clinical Radiology
Clinics in Laboratory Medicine
Community Oncology
Comparative Biochemistry and Physiology. Part C: Toxicology and Pharmacology*
Comparative Clinical Pathology (Print Edition)
Comparative Medicine (Memphis)
Contemporary Clinical Trials
Critical Reviews in Oncogenesis
Critical Reviews in Toxicology
Current Medical Literature. Breast Cancer
Current Medical Literature. Colorectal Cancer
Current Medical Literature. Leukaemia and Lymphoma
Current Medical Literature. Lung Cancer
Current Oncology (Toronto)
Current Problems in Cancer
Cutaneous and Ocular Toxicology
Dermatologic Surgery
Diagnostic and Therapeutic Endoscopy

(Continued)

TABLE 5 *(Continued)*

Drug and Chemical Toxicology: An International Journal for Rapid Communication
Ecotoxicology
Ecotoxicology and Environmental Safety
Environmental and Molecular Mutagenesis
Environmental Toxicology (Print Edition): An International Journal; [Formerly Environmental Toxicology and Water Quality]
Environmental Toxicology and Chemistry
European Journal of Cancer
European Journal of Cancer Care
European Journal of Cancer Prevention
European Journal of Gynecological Oncology
European Journal of Oncology Nursing
European Journal of Surgical Oncology
Experimental Biology and Medicine (Maywood)
Expert Review of Anticancer Therapy: An Essential Contribution to Decision Making in Cancer Care
Fetal and Pediatric Pathology (Print Edition)
Food and Chemical Toxicology
Future Oncology
Genes, Chromosomes, and Cancer
Helicobacter (http://www.blackwellpublishing.com/submit.asp?ref = 1083-4389&site = 1)
Hem/Onc Today: Clinical News in Hematology and Oncology
Hematology/Oncology Clinics of North America
Hematology Oncology News and Issues: Balancing Economics and Quality in Cancer Care
Histopathology
HIV Clinical Trials
Human and Experimental Toxicology: An International Journal
I L A R Journal
Inhalation Toxicology
Instrumentation Science and Technology
International Journal of Cancer
International Journal of Cancer Prevention
International Journal of Cancer Research
International Journal of Cosmetic Science
International Journal of Gastrointestinal Cancer
International Journal of Gynecological Cancer
International Journal of Hyperthermia
International Journal of Radiation Biology
International Journal of Surgical Pathology
International Journal of Technology Assessment in Health Care
International Journal of Toxicology
Journal of Analytical Toxicology

(Continued)

TABLE 5 *(Continued)*

Journal of Applied Animal Welfare Science
Journal of Applied Toxicology
Journal of Cancer Education
Journal of Cancer Epidemiology (Formerly Molecular and Translational Cancer Epidemiology)
Journal of Carcinogenesis
Journal of Chemical Health and Safety
Journal of Clinical Laboratory Analysis
Journal of Clinical Oncology
Journal of Environmental Pathology, Toxicology, and Oncology
Journal of Environmental Science and Health. Part C: Environmental Carcinogenesis and Ecotoxicology Reviews
Journal of Experimental Therapeutics and Oncology
Journal of Experimental Zoology. Part A: Ecological Genetics and Physiology (Print Edition)
Journal of General Internal Medicine
Journal of Hazardous Substance Research
Journal of Internal Medicine: From Genes to Molecules to Patients!
Journal of Neuro-Oncology
Journal of Oncology Pharmacy Practice
Journal of Pediatric Hematology/Oncology
Journal of Pediatric Oncology Nursing
Journal of Pharmacological and Toxicological Methods
Journal of Psychosocial Oncology
Journal of Surgical Oncology
Journal of the American Association for Laboratory Animal Science
Journal of the National Comprehensive Cancer Network
Journal of the Society for Integrative Oncology
Journal of Toxicology and Environmental Health. Part A
Journal of Toxicology and Environmental Health. Part B: Critical Reviews
Lab Animal
Laboratory Animals
Laboratory Investigation
Laboratory Medicine
Leukemia
Leukemia and Lymphoma
Leukemia Research
Lymphatic Research and Biology
Medical Oncology: A Leading Journal in Clinical Oncology
Melanoma Research: An International Journal of Rapid Communications of Basic and Clinical Research in Melanoma
Microsurgery
Molecular and Cellular Probes
Molecular Cancer

(Continued)

TABLE 5 *(Continued)*

Molecular Cancer Research
Molecular Cancer Therapeutics
Molecular Carcinogenesis
National Cancer Institute. Journal (Print Edition)
Nature Clinical Practice Oncology
Nature Reviews. Cancer
NeoPlasia
Neuro-Oncology
Neuroscience Imaging
Neurotoxicology and Teratology
Nurse Researcher
Nutrition and Cancer: An International Journal
Oncogene: Including Oncogene Reviews
Oncology
Oncology Exchange: The Journal for Canadian Cancer Professionals
Oncology Nursing Forum
Oncology Research
Oral Oncology
P L o S Clinical Trials
Packaging, Transport, Storage, and Security of Radioactive Material
Particle and Fibre Toxicology
Pediatric Blood and Cancer
Pediatric Hematology and Oncology
Peritoneal Dialysis International
Pharmacology and Therapeutics
Pharmacology, Biochemistry, and Behavior
Point of Care: The Journal of Near-Patient Testing and Technology
Prostate Cancer and Prostatic Diseases
Psycho-Oncology: Journal of the Psychological, Social, and Behavioral Dimensions of Cancer
Radiation Therapist
Regulatory Toxicology and Pharmacology
Sarcoma
Scandinavian Journal of Clinical and Laboratory Investigation
Seminars in Cancer Biology
Seminars in Oncology
Seminars in Radiation Oncology
Surgical Oncology
Technology in Cancer Research and Treatment
The Cancer Journal
The Internet Journal of Laboratory Medicine
The Lancet Oncology
The Oncologist
The Pain Clinic

(Continued)

TABLE 5 *(Continued)*

The Prostate
Therapy: Open Access in Clinical Medicine
Toxicologic Pathology
Toxicological and Environmental Chemistry
Toxicological Sciences
Toxicology and Applied Pharmacology: For Those Working in the Fields of Toxicology, Pharmacology, Biochemistry, Nutrition, Veterinary Medicine
Toxicology and Industrial Health: An International Journal
Toxicology in Vitro
Toxicology Mechanisms and Methods
Toxicon
Toxin Reviews
Translational Research: The Journal of Laboratory and Clinical Medicine
Transplantation Proceedings
Trends in Pharmacological Sciences
Ultrastructural Pathology
Urologic Oncology: Seminars and Original Investigations
Veterinary and Comparative Oncology
World Journal of Surgical Oncology

comparison to medical journals, toxicology journals were relative latecomers in their adoption of COI disclosure requirements. Nevertheless, both groups of journals had comparable scores for most of our survey parameters. The exceptions were that a greater number of toxicology journals had policies that request the disclosure of author nonfinancial interests and require disclosure of author COIs to reviewers. In 2004, Purchase (2004) called upon toxicology journals to broaden their definition of COI to include nonfinancial interests. In our study we found 49% (n = 41) of the toxicology journal COI policies, as compared to 37% (n = 152) of medical journal COI policies, included nonfinancial interests. However, defining the scope of nonfinancial interests can be problematic because there is no consensus on the criterion.

The *Level of Specificity* on what should be reported was quite low for both groups of journals. Low specificity in the policy language suggests that author discretion would be high. While *Author Discretion* in our survey was found to be *high* in 41–46% of the journals surveyed, *Specificity* was found to be *minimal* or *practically nil* in 75–88% of the journals. The linkage between *Author Discretion* and *Policy Specificity* was not as tight as we might have expected. One possible interpretation is that the general

language communicated to the authors projects a different expectation of their responsibility to disclose their competing interests than what is communicated by the details of the policy.

Weinfurt et al. (2008) in their study of author COI disclosure in the biomedical literature found problems with compliance and discovered inconsistencies in author disclosure statements. They suggest that the problems are due to journal policies and author behavior (Weinfurt et al., 2008). Our study raises the question of whether author compliance and the consistency of reporting would be improved if journals provided greater specificity in their COI policies and left less latitude for author discretion about what should be disclosed. Among the categories where COI policy improvements might be warranted and which deserve further study include: monetary threshold, dates within which COI relationships are relevant, types of content applicable, whether reviewers get to see the disclosure, and whether there are sanctions for people who fail to comply. While specificity and scope of policies were limited for most of the journals in our survey, several professional societies stood out in our analysis as supporting journals with the most specific and comprehensive policies on COI, such as the American Chemical Society, the American Association of Cancer Research, and the American Society for Clinical Oncology. Readers can compare their COI polices with a recent model COI disclosure policy for journals developed by "The Scientific Integrity Project" of the Center for Science and the Public Interest (2009).

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