Timeliness and content of retraction notices for publications by a single research group

Andrew Grey[a], 0000-0002-7803-0096
Alison Avenell[b], 0000-0003-4813-5628
Mark Bolland[a], ORCID 0000-0003-0465-2674

a, Department of Medicine, University of Auckland
b, Health Services Research Unit, University of Aberdeen

Correspondence to:

Andrew Grey
a.grey@auckland.ac.nz
+6499234423

Word Count: 3752
Figures: 4
Tables: 1
Boxes: 1
Supplementary figures: 1
Supplementary appendix: 1
Supplementary tables: 1

Abstract

Publications of expressions of concern and retractions should be timely, accurate and comprehensive. We assessed these characteristics for 292 publications by a research group about which we submitted concerns about publication integrity to 77 journals and 29 publishers between March 2013 and February 2020. By October 2020, 115 publications were corrected (3), had expressions of concern (18), or were retracted (94). The median (95% CI) time from submission of concerns to the first journal correction was 22.1(18.2-26.9*)* months: this did not diminish by year of submission of concerns, varied between publishers, and was shorter for journals with higher impact factors. 84 publications of original research were retracted. The median (range) proportion of concerns raised with the journal that were mentioned in the ensuing retraction notices was 9.5% (2-49). At least 75% of retraction notices included the suggested content for 7/9, 3/9 and 3/16 items in the Committee for Publication Ethics and Retraction Watch minimum and optimal recommended formats, respectively. Thus, assessment of concerns about publication integrity was delayed and incomplete. Adherence to recommended content of retraction notices was moderate at best. Strategies are needed to improve the efficiency, accuracy and transparency of processes for resolving concerns about publication integrity.

Keywords: Publication integrity, retraction, expression of concern, academic publishing

Introduction

The integrity of published biomedical literature is critical to accurate and efficient scientific progress and clinical care. Restoring and/or maintaining publication integrity sometimes involves retracting publications. Retraction of a publication is recommended by the Committee of Publication Ethics (COPE) when it is found to be unreliable, unethical, duplicate, plagiarized, infringe copyright, or subject to compromised peer review or undisclosed competing interest(s) (Committee on Publication Ethics), but there is wide variation in approaches taken by publishing and scientific bodies (Teixeira da Silva and Dobránszki 2017). When a publication is retracted, readers are best served by a retraction notice that sets out the process(es), timeframe and reasons for the action, is quickly visible to all end-users and provides reassurance that other potentially affected publications are being assessed. Although recommendations for the content of retraction notices from COPE and Retraction Watch overlap in some items, they vary in others (Committee on Publication Ethics , Retraction Watch) (Box).

Research on publication integrity has increased in recent years. In parallel with overarching concerns (The Editors 2019a, Ellis 2015, Rennie 2010), attention has focused on permissive manuscript submission processes (Miyakawa 2020), inconsistent, opaque and inadequate publisher and institutional assessments (Grey, Avenell, et al. 2020, Grey et al. 2019, Gunsalus, Marcus, and Oransky 2018), and the impact of unreliable publications (Avenell et al. 2019). However, research on the accuracy, timeliness and quality of retraction processes and notices is limited. Even in cases of known researcher misconduct, defined as fabrication, falsification, or plagiarism, or of known unethical conduct, retraction of affected publications is incomplete (McHugh and Yentis 2019, Drimer-Batca, Iaccarino, and Fine 2019, Elia, Wager, and Tramer 2014), and the simple recommendations made by COPE for content of retraction notices are not always followed (McHugh and Yentis 2019, Moylan and Kowalczuk 2016).

Because it is uncommon for the processes leading to correction and/or retraction that are undertaken by journals and publishers to be reported, uncertainties exist as to the relationship between the concerns raised with journals and the reasons for retraction contained in the published notice, and in the length of time it takes from the first notification of concerns to public notification of corrective action. In the current work, we set out to address these uncertainties. Since March 2013, we have notified journals and publishers of concerns about the integrity of almost 300 publications by a group of researchers, more than 100 of which have been subjected to expressions of concern or retraction to date. The concerns we raised have been wide-ranging, including implausible and impossible results, failure of randomization, text duplication, unethical research, authorship misconduct, and implausible productivity (Bolland et al. 2016). In 2016, data fabrication in some studies was acknowledged (Gross 2016). Because we took a systematic approach to collating and submitting the concerns, using a publication integrity checklist (Grey, Bolland, et al. 2020), and our submissions were responsible for all but a few of the retractions, we had the opportunity to analyze the timeliness of publication correction/retraction, and the content of retraction notices in relation both to the concerns raised with the journal and to recommended formats. We have not previously reported on these aspects of the assessment and resolution of concerns about the integrity of publications by the research group in question.

Materials and Methods

Collation of submissions of concerns about publication integrity

From saved email correspondence, we collated the concerns about integrity of publications by the research group led by Yoshihiro Sato and Jun Iwamoto which we had raised with journals and/or publishers, beginning in March 2013. For each publication, we recorded the date of the first submission of our concerns. For 25/33 publications included in our systematic review (Bolland et al. 2016), the editor of *Neurology* informed us that the journal had notified the editors of the evidence for compromised integrity in the fall of 2016 (R Gross, personal communication); the other 8 publications had already been retracted. For these 25 publications we recorded the date of our submission of concerns as 30 September 2016, and we coded the concerns as those reported in the systematic review, which was published in November 2016 (Bolland et al. 2016). The Supplementary table contains an example of the format we used to notify concerns to journals.

One investigator (AG) categorized the concerns raised with the journals using the REAPPRAISED checklist for publication integrity (Grey, Bolland, et al. 2020). The checklist consists of 11 integrity domains: research governance, ethics, authorship, productivity, plagiarism, research conduct, analyses and methods, image manipulation, statistics and data, errors, and data duplication and reporting. A second investigator (AA) checked data extraction and categorizations. The investigators reached consensus in the event of disagreement.

We reviewed email responses we received from journals and publishers about the concerns we raised and recorded whether any included information that assuaged any specific concern raised by us. We also recorded whether any journals and publishers indicated they had already commenced assessment of the publication(s) in question before receiving our initial email.

Collation of journal correction notices

We collated correction notices (a composite of corrections, expressions of concern (EoC) and retraction notices up until 1 October 2020 for publications by the research group led by Yoshihiro Sato and Jun Iwamoto. We identified these notices by internet searches using author name(s) as search terms, or from communication with the publishing journal. We used the Retraction Watch database of retractions (http://retractiondatabase.org), which is searchable by investigator name, to verify complete ascertainment of correction notices. For each notice, we recorded type of source publication, dates of online and print publication, journal name, journal impact factor, name of publisher, and whether our research group had notified concerns to the journal. We downloaded full text versions of each notice for content analysis.

Analyses

i. *Timing of journal notices of concern about publication integrity*

For this analysis, we included all publications about which we had raised concerns to the journal of publication. We calculated the time to first correction, being the number of months between our first submission of concerns to the journal and the first journal online notice of concern about publication integrity, using October 1 2020 as the date of censure. In pre-

specified subgroups analyses, we determined the relationship between time to first correction and year of submission of concerns, type of study, publisher, and impact factor of retracting journal. For the publisher subgroup analysis, we excluded publishers with fewer than 10 affected publications. For the type of study subgroup analysis, we excluded the 2 corrigenda. Median time to first correction was estimated using the Kaplan-Meier method. We used log-rank analysis to assess differences between subgroups in time to first correction. Analyses were performed using Prism v8.2.1 (GraphPad Software, San Diego, CA), and $P<0.05$ was considered statistically significant.

ii. *Content of retraction notices*

For these analyses, we included all retraction notices for publications of original research about which we had raised concerns with the journal of publication. We focused on retraction notices because expressions of concern are often published as 'placeholder' notices. We excluded retractions of reviews and meta-analyses because the concerns notified were always about the inclusion of retracted publications; we excluded letters and corrigenda because they were always linked to retracted publications.

One investigator (AG) coded the content of the retraction notices using the REAPPRAISED checklist. A second investigator (AA) reviewed the coding and disagreements were resolved by consensus. We then compared the publication integrity concerns that were raised with the journals of publication with those reported in the retraction notices.

Then, one investigator (AG) coded the content of each retraction notice according to each relevant comparator (COPE guideline, Retraction Watch guidelines for minimal and optimal content). Each of the COPE recommendations and the Retraction Watch minimal set of recommendations includes 9 items; the Retraction Watch optimal set of recommendations includes 16 items (Box). In each instance, a second investigator (AA) reviewed the coding and disagreements were resolved by consensus. We compared the content of the retraction notices with each of the recommended formats.

We wrote a protocol for the study, which is available upon request to the corresponding author.

Results

Figure 1 sets out the process of collation of study documents. Between 4 March 2013 and 14 February 2020, our group notified journals and/or publishers of concerns about the integrity of 292 publications by the research group led by Yoshihiro Sato and Jun Iwamoto, that were published in 77 journals by 29 publishers (Appendix). This set of documents, which was comprised of 203 original research publications (57 preclinical, 45 clinical randomized trials, 101 non-randomized clinical studies), 40 reviews or meta-analyses, 11 letters, 36 case reports and 2 corrigenda, was assessed for time from submission of concerns to first journal correction notice. By 1 October 2020, 115 of the 292 (39%) publications had a correction notice: a retraction notice (n=99), an expression of concern (n=13), or a correction (n=3). The first journal notice was a retraction for 94 publications, an expression of concern in 18, and a correction in 3.

Of the 115 publications about which our group raised concerns that had a correction notice, 90 reported original research. Eighty-four of those 90 publications had been retracted by 1 October 2020. The 84 publications were spread among 29 journals and 16 publishers, and comprised 27 human randomized trials, 36 human non-randomized studies and 21 animal randomized trials. This dataset was assessed for the content of retraction notices.

Timing of first correction notices

Figure 2 shows the time to first correction (retraction, expression of concern or correction) for the 292 publications about which our group submitted integrity concerns. The median (95% CI) time to first correction notice was 22.1 (18.2-26.9) months: only 25% had a published correction notice within 12 months of journal notification.

Supplementary Figure 1 shows the time to first correction curves for these publications, according to the pre-specified subgroups. There were significant differences between subgroups in all analyses. Time to first correction increased as time passed from the initial submission of concerns (March 2013) or the first publication of a correction notice (May 2015)(top left panel). Median times to first correction were 10 months, 17 months, 19 months and 15 months for notifications in 2013-2015, 2016, 2017 and 2018, respectively. Letters were corrected promptly (median time to first correction 6 months), and case reports rarely corrected (2/36, median time to first correction not evaluable) (top right panel). Median times to first correction were 25 and 27 months for publications of preclinical studies and clinical (human) randomized studies, respectively. These were almost twice as long as the median times to first correction for publications of non-randomized clinical studies (15 months) and reviews and meta-analyses (14 months). Median time to first correction was evaluable for only 2 publishers, Wiley (14 months) and Wolters Klouwer (11 months) (bottom left panel). Among the other publishers with more than 10 affected publications, correction notices have been published for 0% (Keio University of Medicine), 7% (Kurume University), 8% (Dove Press), 22% (Springer Nature), 26% (Elsevier), and 42% (Yonsei University College of Medicine) of affected publications. Journals with higher impact factors (>4, Science Citation Reports) published correction notices more quickly than those with lower or no impact factor (bottom right panel).

Content of retraction notices

Figure 3 sets out the concerns we raised with journals about publications of original research and those mentioned in retraction notices, by category in the REAPPRAISED checklist. Concerns from all but 1 of the 11 categories in the checklist were communicated to the journals of publication for at least 33% of retracted papers, but only 1 category, authorship, was mentioned in more than 33% of the retraction notices. For the 10 categories for which concerns were raised, the median (range) proportion of concerns raised with the journal that were mentioned in the retraction notices was 9.5% (2-49%). For only 4 categories, authorship, ethics, plagiarism and duplicate data and reporting, was the proportion of concerns raised with the journal that were mentioned in the retraction notices greater than 10%. Concerns about mathematically impossible or implausible data, and data errors, were frequently raised (82% and 69% of publications respectively) but rarely addressed in retraction notices (7% and 1%, respectively). The Supplementary table contains an example of a retraction notice which did not report the nature or details of concerns that had been raised.

In no instance did the correspondence from a journal to us address and assuage a specific concern we had raised.

Alignment of retraction notices with recommended standards

Figure 4 shows the proportions of retraction notices whose content aligned with the recommendations from COPE (top) and Retraction Watch (bottom). For the COPE recommendations, we were unable to evaluate the criterion of prompt publication because we did not know the dates on which decisions to retract were made. Overall, alignment with the evaluable COPE recommendations was moderately high, with >75% of notices containing the recommended information for 7/9 items. It was not clear who was retracting the paper in 22/84 (26%) notices. Although all retraction notices stated a reason for retraction, only 10/84 (12%) notices were factual, in that they accurately reported the scope and extent of concerns raised about the paper. Euphemistic and non-specific language was common in descriptions of the reasons for retraction (Table 1).

For the Retraction Watch recommendations, we were unable to fully evaluate the criterion of swift communication to indexes because we did not know the date on which decisions to retract were made. However, 14% (12/83) of retraction notices in PubMed-indexed journals were not found in PubMed on 1 December 2020. The criterion of statements about recent replications was not applicable to the papers we assessed. Overall, alignment with the evaluable Retraction Watch recommendations was lower than that for the COPE recommendations, particularly for the optimal format. In the minimum and optimal sets of Retraction Watch recommendations, >75% of notices contained the recommended information for 3/9 items, and 3/16 items, respectively. Fewer than 20% of retraction notices contained the recommended information for 9/16 evaluable items in the optimal Retraction Watch set.

Discussion

The current analysis focused on two important aspects of the process of correcting the scientific literature when publication integrity is compromised, timeliness and informativeness. This large set of correction notices was deficient in each aspect.

A strength of the current work is that we knew exactly what concerns had been raised, and when, about a large set of publications (292 papers, 77 journals and 29 publishers) from a single research group. Because we had raised concerns about the integrity of each publication, we were able to calculate the time between raising concerns and corrective action. We found that a median of nearly 2 years elapsed before a correction was published, despite our requests for updates in the interim. This 2 year interval may be conservative because as time progressed from the first notification of concerns in March 2013, knowledge of the case increased in the public domain, via correction notices, academic publications (Bolland et al. 2016, Bolland et al. 2018, Grey et al. 2018, Grey et al. 2019, Grey, Avenell, et al. 2020, Grey, Bolland, and Avenell 2019), blogs (Retraction Watch 2021a), and news stories (Kupferschmidt 2018), and within academic publishing, as a growing number of journals and publishers were affected. It is therefore possible that some journals and/or publishers began assessing concerns in advance of our notification. However, this was not apparent in our email exchanges with the publishers and journals.

There exists no recommended time frame for flagging investigations in process by expressions of concern or within which concerns about publication integrity should be resolved, but the interests of the general public and scientific community are best served by rapid, efficient processes. Comparisons between the Sato/Iwamoto case and others that preceded it by several years are difficult, but prolonged times to retraction have been reported in the face of established misconduct and institutional recommendations, as for publications by Joachim Boldt, Scott Reuben and Yoshitaka Fujii (Retraction Watch 2021b, McHugh and Yentis 2019). The current analyses, which demonstrate a large number of publications by the Sato/Iwamoto group whose integrity has been questioned but not resolved, suggest that publisher processes to correct the literature in a timely fashion have not improved. Rapid correction of publications is possible: 64 publications in the current dataset were retracted within 12 months of notification of concerns, and 121 Covid-19 publications have been retracted since the pandemic commenced in early 2020. Delays in public notification of concerns about publication integrity have undesirable consequences for patients, clinicians and the research community (Avenell et al. 2019). We found no evidence that the time to first correction of affected publications became shorter as knowledge of the case increased. If anything, the obverse applied. This finding suggests that, contrary to COPE recommendations (Committee on Publication Ethics), there may have been limited information sharing between affected publishers and journals. Our specific enquiries to some journals suggested that was the case. It was apparent that journals published by the same publisher did not necessarily work together. If that is correct, a more collaborative effort by affected journals and publishers would likely have produced more timely resolution of the integrity concerns.

There were notable differences between publishers in time to first correction – this might reflect differences in resources applied, in priority assigned, or in experience or expertise of relevant staff members. The former possibility is supported by the finding that journals with higher impact factors, which likely have greater resources, corrected their papers more quickly than those with lower impact factors.

We found that most of the retraction notices for publications about which we raised integrity concerns did not mention most of those concerns. It is unlikely that this discrepancy occurred because the concerns were assuaged during the assessment processes, as in no instance did a journal or publisher indicate in its correspondence with us or in the retraction note that a specific concern had been resolved. For only 4 categories - authorship, ethics, plagiarism and duplicate reporting – was the submitted concern mentioned in more than 20% of retraction notices. Concerns about impossible or implausible data or data errors were rarely addressed. Thus, readers of the retraction notices were commonly deprived of knowledge of the nature and scope of concerns about the affected publications. This finding has several implications. First, it reinforces the opacity of the process of correcting the literature: notices which are neither comprehensive nor accurate do not serve the best interests of readers. For example, readers might be more likely to dismiss the results of a retracted paper if they are made aware of concerns about data or methodological irregularities than if they are only apprised of authorship transgressions. Second, it implies that some transgressions are either considered by journals and publishers to be more influential than others, and/or more easily investigated, whilst others may not have been assessed at all. Third, it reinforces the inconsistency of the process of correcting the literature. For example, it has been publicly known for more than 3 years that Drs Sato and Iwamoto engaged in reciprocal gift authorship (Grey et al. 2018), for more than 2 years that ethical oversight of their work was absent or in doubt (The Editors 2019b), and for more than 18 months that their work featured duplicate data reporting (Grey, Avenell, et al. 2020). In each instance, publishers and journals were aware of these problems even earlier. Yet many publications which are affected by the same concerns remain uncorrected. For example, as at 1/12/2019 Scopus identified 135 publications co-authored by Drs Sato and Iwamoto, only 67 of which were retracted by October 1 2020.

The content of the retraction notices usually met the recommendations by COPE. This is perhaps not surprising, given the pre-eminence of COPE guidance to assist journals and publishers in addressing concerns about publication integrity, and the limited detail suggested in the COPE recommendations. Nonetheless, more than 25% of notices did not clarify who was retracting the paper, and only 12% included enough information about the nature and scope of the concerns about the publication to be regarded as factual. The reason(s) given for retraction rarely matched the potential reasons for retraction derived from the concerns raised, and were often couched in euphemistic and/or non-specific terms. Thus, although a reason for retraction was provided in all notices, there was very frequently failure to address or acknowledge most of the concerns, which therefore remain invisible to readers. The recommendations made by Retraction Watch are more numerous and stringent: fewer than 1 in 5 retraction notices included content that addressed more than half of the evaluable criteria in the optimal Retraction Watch recommendations. Notably, in no instance did a retraction notice report the date when the concerns were first raised, nor whether other papers by the same authors were affected. Fewer than 10% of notices fully identified which aspects of the paper were affected by concerns. The consequence of these numerous deficiencies in the retraction notices is that readers were not informed of the true extent and specific details of the problems with the integrity of the publications.

The current findings reinforce concerns about the inefficiency, inaccuracy, incompleteness and opacity of systems for ensuring publication integrity. While science espouses rigour, consistency and transparency, the mechanisms to provide quality control of scientific publications currently fail to achieve these goals. Improvements are possible. Transparent reporting of the timelines of assessing and resolving concerns, including the reason(s) for delays, should be the norm. The roles, expertise and conflicts of interest of participants in the

assessment process should be reported. Open and full reporting of the nature and scope of concerns, of the explanations provided by respondents for each concern, and of the decisions made to resolve concerns, should also be required. These changes would align the process of maintaining publication integrity with that of open peer review during manuscript submission, which is already embedded in academic publishing. COPE should revise its recommendations for content of retraction notices to assist achievement of these goals, and audit the practices of its member journals. We suggest that retraction notices should include the content suggested by Retraction Watch, itemize each of the specific concerns raised about a publication, and provide a response to each which either assuages or affirms the concern. The timelines for each part of the process should be reported. In combination with more frequent scrutiny of raw data (Carlisle 2020) and the application of independent expertise to the assessment of publication integrity concerns (Bolland et al. 2020), these changes would assist key stakeholders who rely on a robust literature, such as scientists, clinicians and patients.

Conflicts of Interest: None of the authors has a conflict of interest to disclose

Ethical approval: Not applicable

Contributorship: All authors designed the research. AG and AA collated and coded the data. AG performed the analyses. AG drafted the paper. All authors critically reviewed and improved it. AG is the guarantor for the article. All authors had access to all the data. AG takes responsibility for the integrity of the data and the accuracy of the data analysis**.**

Funding: The study received no specific funding. MB is the recipient of an HRC Clinical Practitioner Fellowship. The Health Services Research Unit is funded by the Chief Scientist Office of the Scottish Government Health and Social Care Directorates. The authors are independent of the HRC. The HRC had no role in study design, the collection, analysis, and interpretation of data, the writing of the article, or the decision to submit it for publication.

Transparency statement: AG affirms that the manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned have been explained

Data availability: Study data are either available in the public domain or can be obtained from the lead author upon reasonable request.

References

Avenell, A., F. Stewart, A. Grey, G. Gamble, and M. Bolland. 2019. "An Investigation into the Impact and Implications of Published Papers from Retracted Research: Systematic Search of Affected Literature." *BMJ Open* 9:e031909.

Bolland, M.J., A. Avenell, G. D. Gamble, S. Buranyi, and A. Grey. 2018. "A Randomised Investigation of Journal Responses to Academic and Journalist Enquiry About Possible Scientific Misconduct." *BMC Res Notes* 11 (1):521.

Bolland, M.J., A. Avenell, G. D. Gamble, and A. Grey. 2016. "Systematic Review and Statistical Analysis of the Integrity of 33 Randomized Controlled Trials." *Neurology* 87:2391-2402.

Bolland, M.J., A. Grey, A. Avenell, and A. A. Klein. 2020. "Correcting the Scientific Record- a Broken System?" *Accountability in Research* https://doi.org/10.1080/08989621.2020.1852938.

Carlisle, J. B. 2020. "False Individual Patient Data and Zombie Randomised Controlled Trials Submitted to Anaesthesia." *Anaesthesia* https://doi.org/10.1111/anae.15263.

Committee on Publication Ethics. "Retraction Guidelines." Accessed November 2020. Available from https://publicationethics.org/node/19896.

Committee on Publication Ethics. "Sharing of Information among Editors-in-Chief Regarding Possible Misconduct." *https://publicationethics.org/resources/guidelines-new/sharing-information-among-editors-chief-regarding-possible-misconduct*. Accessed December 1 2020.

Drimer-Batca, D., J. M Iaccarino, and A. Fine. 2019. "Status of Retraction Notices for Biomedical Publications Associated with Research Misconduct." *Research Ethics* 15 (2):1-5.

Elia, N., E. Wager, and M. R. Tramer. 2014. "Fate of Articles That Warranted Retraction Due to Ethical Concerns: A Descriptive Cross-Sectional Study." *PLoS One* 9 (1):e85846.

Ellis, L. M. 2015. "The Erosion of Research Integrity: The Need for Culture Change." *Lancet Oncol* 16 (7):752-4.

Grey, A., M.J. Bolland, A. Avenell, A.A. Klein, and C. K. Gunsalus. 2020. "Check for Publication Integrity before Misconduct." *Nature* 577:167-9.

Grey, A., A. Avenell, G. Gamble, and M. Bolland. 2018. "Concerns About the Integrity of Sato Et al. Am J Med. 2005;118:1250-1255." *Am J Med* 131 (3):e107-e108.

Grey, A., A. Avenell, G. Gamble, and M. Bolland. 2020. "Assessing and Raising Concerns About Duplicate Publication, Authorship Transgressions and Data Errors in a Body of Preclinical Research." *Science Engineering and Ethics* 26:2069-96.

Grey, A., M. Bolland, and A. Avenell. 2019. "Evaluating Ethics Oversight During Assessment of Research Integrity." *Research Integrity and Peer Review* 4 (1):22.

Grey, A., M. Bolland, G. Gamble, and A. Avenell. 2019. "Quality of Reports of Investigations of Research Integrity by Academic Institutions." *Research Integrity and Peer Review* 4 (1):3.

Gross, R. A. 2016. "Statistics and the Detection of Scientific Misconduct." *Neurology* 87 (23):2388.

Gunsalus, C. K., A. R. Marcus, and I. Oransky. 2018. "Institutional Research Misconduct Reports Need More Credibility." *JAMA* 319 (13):1315-6.

Kupferschmidt, K. 2018. "Tide of Lies." *Science* 361 (6403):636-641.

McHugh, U. M., and S. M. Yentis. 2019. "An Analysis of Retractions of Papers Authored by Scott Reuben, Joachim Boldt and Yoshitaka Fujii." *Anaesthesia* 74:17-21.

Miyakawa, T. 2020. "No Raw Data, No Science: Another Possible Source of the Reproducibility Crisis." *Molecular Brain* 13 (1):24.

Moylan, E.C, and M. K. Kowalczuk. 2016. "Why Articles Are Retracted: A Retrospective Cross-Sectional Study of Retraction Notices at Biomed Central." *BMJ Open* 6 (11):e012047.
Rennie, D. 2010. "Integrity in Scientific Publishing." *Health Services Research* 45 (3):885-96.
Retraction Watch. "What Should an Ideal Retraction Notice Look Like?"Accessed November 2020. Available from https://retractionwatch.com/2015/05/21/what-should-an-ideal-retraction-notice-look-like/.
Retraction Watch. 2021a. Accessed 13 April 2021. Available from https://retractionwatch.com/?s=yoshihiro+sato.
Retraction Watch. 2021b. "Anesthesiologist Loses 50 More Papers in 12 Months." Accessed 13 April 2021. Available from https://retractionwatch.com/2021/04/09/anesthesiologist-loses-50-more-papers-in-12-months/.
Teixeira da Silva, J. A., and J. Dobránszki. 2017. "Notices and Policies for Retractions, Expressions of Concern, Errata and Corrigenda: Their Importance, Content, and Context." *Science and Engineering Ethics* 23 (2):521-554.
The Editors. 2019a. "Research Integrity: Time for Global Action." *The Lancet* 394 (10213):1965.
The Editors. 2019b. "Retraction To: Vitamin D Deficiency and Osteopenia in the Hemiplegic Limbs of Stroke Patients." *Stroke* 50 (8):e246-e246.

Table 1. Examples of euphemistic or non-specific language used to describe reason for retraction

Terminology	Number of retraction notices (%)
“scientific misconduct” “research misconduct”	30 (36)
“integrity of the data” “concerns about data integrity” “a few/some inconsistencies about data integrity” “concerns about the underlying data” “inaccuracies in the data” “concerns about the data presented”	24 (29)
"some (parts of their) contents were published in other journals/elsewhere” “a number of issues related to data duplication” “salami publishing” “implausible reporting of the same measurements…in different manuscripts” “reused” “some of the cohorts were published elsewhere” “overlap of data”	20 (24)
“integrity of these studies/the research” “fraudulent” “many discrepancies”	7 (8)
“misconduct over authorship” “malpractice due to inappropriate authorship”	5 (6)

Box. Recommendations for content of retraction notices

COPE guidelines[a]	Retraction Watch recommendations[b]
Be linked to the retracted article wherever possible (ie, in all online versions) Clearly identify the retracted article (eg, by including the title and authors in the retraction heading or citing the retracted article) Be clearly identified as a retraction (ie, distinct from other types of correction or comment) Be published promptly to minimise harmful effectsc Be freely available to all readers (ie, not behind access barriers or available only to subscribers) State who is retracting the article State the reason(s) for retraction Be objective, factual and avoid inflammatory language	**Bare Minimum** Include the reason for retraction, in clear, unambiguous language that differentiates misconduct from honest error Indicate which aspects of the paper are affected (i.e. which specific data or conclusions are invalid) Indicate who initiated the retraction and which authors agreed to the retraction Be linked prominently from all versions of the abstract Be freely available (not paywalled) Be communicated swiftly to indexes (eg PubMed, Thomson Scientific's Web of Knowledge)[c] Be marked clearly as a retraction, rather than erratum or corrigendum Indicate when the retraction notice was published (to differentiate this date clearly from when the original paper was published) **Optimal** Indicate when the journal was first alerted to potential problems Indicate whether there was an institutional investigation, and if so, the result Indicate whether other papers by the same group will be affected Only include statements about more recent replications if these have been validated by a third partyd Avoid euphemisms (eg for plagiarism) Indicate whether the authors will be sanctioned by the journal Indicate whether any lawsuits have been filed regarding the case

a, https://publicationethics.org/node/19896
b, http://retractionwatch.com/2015/05/21/what-should-an-ideal-retraction-notice-look-like/
c, not evaluable in the current analyses
d, not applicable to the current analyses

Figure Legends

Figure 1. Collation of documents for analyses of time to first correction and content of retraction notices

Figure 2. Time to first correction of publications co-authored by Yoshihiro Sato and Jun Iwamoto. The dotted lines are 95% confidence intervals

Figure 3. Percentage of retracted publications (n=84) for which concerns were raised with journals (dark bars) and for which concerns were mentioned in the retraction notices (open bars), categorized according to the REAPPRAISED publication integrity checklist(Grey, Bolland, et al. 2020).Categories of concerns are, from left to right on the x axis, **R**, research governance; **E**, ethics; **A,** authorship; **P**, productivity; **P**, plagiarism; **R**, research conduct; **A**, analyses and methods; **I**, image manipulation; **S**, statistics and data; **E**, errors; **D**, data duplication and reporting.

Figure 4. Alignment of content of retraction notices (n=84) with recommendations by Committee for Publication Ethics (COPE) and Retraction Watch (minimum and optimal formats). Horizontal bars show the percentage of retraction notices that met the indicated criterion

Supplementary Figure. Time to first correction of publications co-authored by Yoshihiro Sato and Jun Iwamoto, according to year of submission of concerns to journal (top left), type of study (top right), publisher (bottom left) and impact factor of journal (bottom right).

Supplementary table. Example of concerns about publication integrity raised with a journal and the corresponding retraction notice

Concerns notified to journal	Retraction Notice
Re: Sato Y, Honda Y, Iwamoto J. Long-term oral anticoagulation therapy and the risk of hip fracture in patients with previous hemispheric infarction and nonrheumatic atrial fibrillation. Cerebrovasc. Dis. 2010;29(1):73-78 We write to raise concerns about the integrity of the above paper, because of authorship misconduct, uncertain funding support, uncertain ethical oversight, and implausible recruitment and study conduct. We raise these concerns in the context of wide-ranging and frequent instances of misconduct or compromised integrity in publications by authors Yoshihiro Sato and Jun Iwamoto, which have led to the retraction of > 50 publications, including 1 in *Cerebrovasc Dis*. Various types of misconduct have been reported by members of this group of researchers, including data fabrication, data duplication, self-plagiarism and inappropriate assignation of authorship. In regard to the above paper, our concerns are: ***Governance*** The protocol of the study was 'approved by the Human Investigation Committee of the Mitate Hospital'. It is probable that such a committee never existed – the only research said to have been approved by this committee was that by Dr Sato and colleagues, and to our knowledge none of the investigating journals and institutions has obtained documentary evidence that the committee exists. In the Methods section it is stated that patients 'were prohibited from taking any other drugs that could affect bone metabolism'. This is surely unethical, especially as during follow-up 17 participants suffered hip fractures. No funding is reported for a 5 year study of 177 patients with serious co-morbidity. ***Authorship*** Statements by both Dr Sato and Dr Iwamoto (each is attached) acknowledge that neither was involved in research published by the other between 2002 and late 2013. Honorary authorship is one of the reasons provided for several retractions of papers by these authors. Dr Honda was an honorary author on several retracted papers. ***Study conduct*** 187 participants were seen every 4 weeks for 5 years, a total of 12,155 study visits, an average of 9 study visits each day. Only 2 investigators were based at Mitate Hospital, so each must have been seeing 4-5 participants every day for 5 years, just for this study. This workload is implausibly high. ***Implausible biochemical testing*** Several biochemical tests performed during the study, such as serum 25OHD, osteocalcin (bone Gla protein, BGP), undercarboxylated osteocalcin, are not part of routine practice and require specialised laboratory facilities that are extremely unlikely to be available at a hospital the size of Mitate Hospital. No analytic laboratory is identified in the paper, and no funding is reported that would support this costly exercise. ***Text duplication*** Using software designed to identify text similarity (http://splat.cs.arizona.edu/), we observed that 26% of sentences in the Introduction and Discussion sections of the *Cerebrovasc Dis* paper shared at least 50% of the words with sentences in the same sections of a paper published by the same group in *Stroke* more than 10 years earlier: **Sato Y, Honda Y, Kunoh H, Oizumi K. Long-term oral anticoagulation reduces bone mass in patients with previous hemispheric infarction and nonrheumatic atrial fibrillation. *Stroke.* 1997;28(12):2390-2394** ***Data errors***	"We wish to retract the paper entitled "Long-Term Oral Anticoagulation Therapy and the Risk of Hip Fracture in Patients with Previous Hemispheric Infarction and Nonrheumatic Atrial Fibrillation" [Cerebrovasc Dis 2010;29:73–78] by Y. Sato, Y. Honda and I. Jun as a result of concerns about data integrity and scientific misconduct which have been brought to our attention."[1]

On page 74 the non-warfarin/untreated group is reported to include 103 patients, whereas baseline data for 93 patients are reported in table 1 and 2. The text on p75 says 10 participants in the untreated group withdrew, so that 83 completed the study. These data are clearly incompatible.

Impossible data

In Table 3 the numbers of participants in the table headings do not agree with those in the footnote: 89 at 3 years versus 78 at 3 years, 83 at 5 years versus 70 at 5 years.

The calculated percentage changes in Table 3 do not consistently agree with those calculated from the differences between the values in Table 2 and 3, even allowing for missing data (see marked differences in red below). It is also striking, and highly implausible, that the 3y and 5y percentage changes for ucOC in the untreated group exactly match those for the BGP data in the same group: 4.7 SEM 1.4 and 4.9 SEM 1.2.

	3y in paper	**3y calculated**	**5y in paper**	**5y calculated**
ucOC				
Untreated	+4.7%	+23.3%	+4.9%	+39.5%
Treated	+2.3%	+2.3%	+4.6%	+4.6%
BGP				
Untreated	+4.7%	+41.7%	+4.9%	+62.5%
Treated	-8.3%	-16.7%	-7.7%	-22.2%
25-OHD				
Untreated	-18.2%	-18.6%	-28.8%	-29.7%
Treated	-19.4%	-19.6%	-29.5%	-29.2%

1. Retraction Statement. *Cerebrovasc Dis* 2019;47:311

Appendix - Publications by Yoshihiro Sato and Jun Iwamoto about which concerns were raised about publication integrity

A. Corrected by journal

i. Retracted

a. Original Research

1. Iwamoto J, Sato Y, Matsumoto H. Vitamin K2 improves femoral bone strength without altering bone mineral density in gastrectomized rats. J Nutr Sci Vitaminol 2014:60; 71-77
2. Iwamoto J, Takada T, Sato Y, Matsumoto H. Effect of risedronate on speed of sound in postmenopausal women with osteoporosis. World J Orthop 2013:4;316-322
3. Iwamoto J, Sato Y, Matsumoto H. Chair rising time is longer in postmenopausal women with history of nonvertebral fracture. J Musculoskelet Neuronal Interact 2013:13;227-234
4 .Iwamoto J, Sato, Y, Uzawa M, Matsumoto H. Three-year outcome of alendronate treatment in older Japanese women with osteoporosis. Rheum Rep 2012:4;46-50
5. Iwamoto J, Sato Y, Takeda T, Matsumoto H. Whole body vibration exercise improves body balance and walking velocity in postmenopausal osteoporotic women treated with alendronate: Galileo and alendronate intervention trail (GAIT). J Musculoskelet Neuronal Interact 2012:12;136-143
6. Iwamoto J, Sato Y, Uzawa M, Takeda T, Matsumoto H. Three-year experience with alendronate treatment in postmenopausal osteoporotic Japanese women with or without renal dysfunction: A retrospective study. Drugs Aging 2012:29;133-142
7. Iwamoto, J, Sato, Y, Takeda T, Matsumoto H. Analysis of stress fractures in athletes based on our clinical experience. World J Orthop 2011:2;7-12
8. Sato Y, Iwamoto J, Honda Y. Once-weekly risedronate for prevention of hip fracture in women with Parkinson's disease: A randomised controlled trial. J Neurol Neurosurg Psychiatry 2011:82;1390-1393
9. Iwamoto J, Sato, Y, Uzawa M, Takeda T, Matsumoto, H. Three-year experience with alendronate treatment in postmenopausal osteoporotic Japanese women with or without type 2 diabetes. Diab Res Clin Pract 2011:93;166-173
10. Sato Y, Iwamoto J, Honda Y. Amelioration of osteoporosis and hypovitaminosis D by sunlight exposure in Parkinson's disease. Parkinsonism Relat Dis 2011:17;22-26
11. Sato Y, Iwamoto J, Honda Y. An open-label trial comparing alendronate and alphacalcidol in reducing falls and hip fractures in disabled stroke patients. J Stroke Cerebrovasc Dis 2011:20;41-46
12. Iwamoto, J, Sato, Y, Takeda T, Matsumoto H. Return to sports activity by athletes after treatment of spondylolysis. World J Orthop 2010:1;26-30
13. Sato Y, Honda Y, Umeno K, Hayashida N, Iwamoto J, Takeda T, Matsumoto H. The prevention of hip fracture with menatetrenone and risedronate plus calcium supplementation in elderly patients with Alzheimer disease: A randomized controlled trial. Kurume Med J 2010:57;117-124
14. Sato Y, Iwamoto, J, Honda Y. Beneficial effect of etidronate therapy in chronically hospitalized, disabled patients with stroke. J Stroke Cerebrovasc Dis 2010:19;198-203
15. Sato, Y, Honda Y, Iwamoto J. Long-term oral anticoagulation therapy and the risk of hip fracture in patients with previous hemispheric infarction and nonrheumatic atrial fibrillation. Cerebrovasc Dis 2009:29;73-78
16. Iwamoto J, Matsumoto H, Takeda T, Sato Y, Yeh JK. Comparison of the effect of vitamin K2 and risedronate on trabecular bone in glucocorticoid-treated rats: A bone histomorphometry study. Yonsei Med J 2009:50;189-194
17. Iwamoto J, Matsumoto H, Takeda T, Sato Y, Xu E, Yeh JK. Effects of alendronate and alfacalcidol on the femoral bone mass and bone strength in orchidectomized rats. Chin J Physiol 2008:51;331-337
18. Iwamoto J, Seki A, Takeda T, Yamada H, Sato Y, Yeh JK. Effects of combined administration of alfacalcidol and risedronate on cancellous and cortical bone mass of the tibia in glucocorticoid-treated young rats. Chin J Physiol 2008:51;121-128
19. Iwamoto J, Sato Y, Uzawa M, Takeda T, Matsumoto H. Comparison of effects of alendronate and raloxifene on lumbar bone mineral density, bone turnover, and lipid metabolism in elderly women with osteoporosis. Yonsei Med J 2008:49;119-128
20. Iwamoto J, Takeda T, Matsumoto H, Sato Y, Yeh JK. Beneficial effects of combined administration of alendronate and alfacalcidol on cancellous bone mass of the tibia in orchidectomized rats: A bone histomorphometry study. J Nutr Sci Vitaminol 2008:54;11-17

21. Iwamoto J, Seki, A, Takeda T, Yamada H, Sato Y, Yeh JK. Effects of alfacalcidol on cancellous and cortical bone mass in rats treated with glucocorticoid: A bone histomorphometry study. J Nutr Sci Vitaminol 2007:53;191-197
22. Iwamoto J, Takeda T, Sato Y, Yeh JK. Additive effect of vitamin K2 and risedronate on long bone mass in hypophysectomized young rats. Exp Anim 2007:56;103-110
23. Sato Y, Honda Y, Iwamoto J. Risedronate and ergocalciferol prevent hip fracture in elderly men with Parkinson disease. Neurology 2007:68;911-915
24. Iwamoto J, Seki A, Takeda T, Sato Y, Yamada H, Yeh JK. Effect of risedronate on the cortical and cancellous bone mass and mechanical properties in ovariectomized rats: A comparison with the effects of alfacalcidol. J Nutr Sci Vitaminol 2006:52;393-401
25. Iwamoto J, Takeda T, Sato Y, Shen C-L, Yeh JK. Beneficial effect of pretreatment and treatment continuation with risedronate and vitamin K2 on cancellous bone loss after ovariectomy in rats: A bone histomorphometry study. J Nutr Sci Vitaminol 2006:52;307-315
26. Sato Y, Honda Y, Asoh T, Iwamoto J. Longitudinal study of bone and calcium metabolism and fracture incidence in spinocerebellar degeneration. Eur Neurol 2006:56;155-161
27. Iwamoto J, Takeda T, Sato Y, Shen C-L, Yeh JK. Effect of pre- and post-surgery treatment with risedronate on trabecular bone loss in ovariectomized rats. Exp Anim 2006:55;457-466
28. Sato Y, Honda Y, Iwamoto J. Etidronate for fracture prevention in amyotrophic lateral sclerosis: A randomized controlled trial. Bone 2006:39;1080-1086
29. Iwamoto J, Seki A, Takeda T, Sato Y, Yamada H, Yeh JK. Comparative effects of alendronate and alfacalcidol on cancellous and cortical bone mass and bone mechanical properties in ovariectomized rats. Exp Anim 2006:55;357-367
30. Iwamoto J, Seki A, Takeda T, Sato Y, Yamada H, Yeh JK. Therapeutic effect of risedronate on cancellous and cortical bone in ovariectomized osteopenic rats: A comparison with the effects of alfacalcidol. Exp Anim 2006:55;333-342
31. Iwamoto J, Seki A, Takeda T, Sato Y, Yamada H, Shen C-L, Yeh JK. Preventive effects of risedronate and calcitriol on cancellous osteopenia in rats treated with high-dose glucocorticoid. Exp Anim 2006:55;349-355
32. Iwamoto J, Seki A, Takeda T, Sato Y, Yamada H, Shen C-L, Yeh JK. Comparative effects of risedronate and calcitriol on cancellous bone in rats with glucocorticoid-induced osteopenia. J Nutr Sci Vitaminol 2006:52;21-27
33. Iwamoto J, Seki A, Takeda T, Sato Y, Yamada H, Yeh JK. Comparative therapeutic effects of alendronate and alfacalcidol on cancellous and cortical bone mass and mechanical properties in ovariectomized osteopenic rats. J Nutr Sci Vitaminol 2006:52;1-8
34. Sato Y, Honda Y, Iwamoto J, Kanoko T, Satoh K. Abnormal bone and calcium metabolism in immobilized Parkinson's disease patients. Move Dis 2005:20;1598-1603
35. Iwamoto, J., Takeda, T., Sato, Y., Uzawa, M. Comparison of effect of treatment with etidronate and alendronate on lumbar bone mineral density in elderly women with osteoporosis. Yonsei Med J 2005:46;750-758
36. Sato Y, Iwamoto J, Kanoko T, Satoh K. Homocysteine as a predictive factor for hip fracture in elderly women with Parkinson's disease. Am J Med 2005:118;1250-1255
37. Sato, Y., Honda, Y., Asoh, T., Iwamoto, J., Kanoko, T., Satoh, K. Cardiac involvement in malignant syndrome in Parkinson's disease. Eur Neurol 2005: 54; 88-92
38. Iwamoto J, Yeh JK, Takeda, T., Sato, Y. Comparative effects of vitamin K and vitamin D supplementation on calcium balance in young rats fed normal or low calcium diets. Journal of Nutr Sci Vitaminol 2005:51;211-215
39. Sato, Y., Iwamoto, J., Kanoko, T., Satoh, K. Negative myoglobin staining in hemiplegic muscle of acute stroke patients predicts functional recovery. Am J Phys Med Rehabil 2005:84;692-699
40. Sato Y, Iwamoto J, Kanoko T, Satoh K. Low-dose vitamin D prevents muscular atrophy and reduces falls and hip fractures in women after stroke: A randomized controlled trial. Cerebrovasc Dis 2005:20;187-192
41. Sato Y, Kanoko T, Satoh K, Iwamoto J. The prevention of hip fracture with risedronate and ergocalciferol plus calcium supplementation in elderly women with Alzheimer disease: A randomized controlled trial. Arch Intern Med 2005:165;1737-1742
42. Sato Y, Iwamoto, J, Kanoko T, Satoh K. Risedronate sodium therapy for prevention of hip fracture in men 65 years or older after stroke. Arch Intern Med 2005:165;1743-1748
43. Iwamoto J, Takeda T, Sato Y, Uzawa M. Effect of whole-body vibration exercise on lumbar bone mineral density, bone turnover, and chronic back pain in post-menopausal osteoporotic women treated with alendronate. Aging Clin Exp Res 2005:17;157-163
44. Sato Y, Iwamoto J, Kanoko T, Satoh K. Amelioration of osteoporosis and hypovitaminosis D by sunlight exposure in hospitalized, elderly women with Alzheimer's disease: A randomized controlled trial. J Bone Min Res 2005:20;1327-1333

45. Iwamoto J, Yeh JK, Takeda T, Sato Y. Effects of vitamin K2 administration on calcium balance and bone mass in young rats fed normal or low calcium diet. Horm Res 2005:63;211-219
46. Sato Y, Honda Y, Iwamoto J, Kanoko T, Satoh K. Homocysteine as a predictive factor for hip fracture in stroke patients. Bone 2005:36;721-726
47. Sato Y, Honda Y, Hayashida N, Iwamoto J, Kanoko T, Satoh K. Vitamin K deficiency and osteopenia in elderly women with Alzheimer's disease. Arch Phys Med Rehabil 2005:86;576-581
48. Sato Y, Iwamoto J, Kanoko T, Satoh K. Risedronate therapy for prevention of hip fracture after stroke in elderly women. Neurology 2005:64;811-816
49. Sato Y, Honda Y, Iwamoto J, Kanoko T, Satoh K. Effect of folate and mecobalamin on hip fractures in patients with stroke: A randomized controlled trial. JAMA 2005:293;1082-1088
50. Sato Y, Kanoko T, Satoh K, Iwamoto J. Menatetrenone and vitamin D2 with calcium supplements prevent nonvertebral fracture in elderly women with Alzheimer's disease. Bone 2005:36;61-68
51. Iwamoto J, Takeda T, Sato Y, Yeh JK. Response of cortical and cancellous bones to mild calcium deficiency in young growing female rats: A bone histomorphometry study. Exp Anim 2004:53;347-354
52. Iwamoto J, Yeh JK, Takeda T, Sato Y. Effects of Vitamin D supplementation on calcium balance and bone growth in young rats fed normal or low calcium diet. Horm Res 2004:61;293-299
53. Iwamoto J, Takeda T, Ichimura S, Sato Y, Yeh JK. Differential effect of vitamin K and vitamin D supplementation on bone mass in young rats fed normal or low calcium diet. Yonsei Med J 2004:45;314-324
54. Sato Y, Kaji M, Honda Y, Hayashida N, Iwamoto J, Kanoko T, Satoh K. Abnormal calcium homeostasis in disabled stroke patients with low 25-hydroxyvitamin D. Bone 2004:34;710-715
55. Sato Y, Kanoko T, Yasuda H, Satoh K, Iwamoto J. Beneficial effect of etidronate therapy in immobilized hip fracture patients. Am J Phys Med Rehabil 2004:83;298-303
56. Iwamoto J, Takeda T, Ichimura S. Urinary cross-linked N-telopeptides of type I collagen levels in patients with rheumatoid arthritis. Calcif Tissue Int 2003:72;491-497
57. Sato, Y, Metoki N, Iwamoto J, Satoh K. Amelioration of osteoporosis and hypovitaminosis D by sunlight exposure in stroke patients. Neurology 2003:61;338-342
58. Sato Y, Asoh T, Metoki N, Satoh K. Efficacy of methylprednisolone pulse therapy on neuroleptic malignant syndrome in Parkinson's disease. J Neurol Neurosurg Psychiatry 2003:74;574-576
59. Sato Y, Kaji M, Metoki N, Satoh K, Iwamoto J. Does compensatory hyperparathyroidism predispose to ischemic stroke? Neurology 2003:60;626-629
60. Iwamoto J, Takeda T, Ichimura S. Forearm bone mineral density in postmenopausal women with rheumatoid arthritis. Calcif Tissue Int 2002:70;1-8
61. Sato Y, Honda Y, Kaji M, Asoh T, Hosokawa K, Kondo I, Satoh K. Amelioration of osteoporosis by menatetrenone in elderly female Parkinson's disease patients with vitamin D deficiency. Bone 2002:31;114-118
62. Sato Y, Kaji, M., Tsuru T, Satoh K, Kondo I. Vitamin K deficiency and osteopenia in vitamin D-deficient elderly women with Parkinson’s disease. Arch Phys Med Rehabil 2002:83;86-91
63. Sato Y, Inose M, Higuchi I, Higuchi F, Kondo I. Changes in the supporting muscles of the fractured hip in elderly women. Bone 2002:30;325-330
64. Sato Y, Kondo I, Ishida S, Motooka H, Takayama K, Tomita Y, Maeda H, Satoh K. Decreased bone mass and increased bone turnover with valproate therapy in adults with epilepsy. Neurology 2001:57;445-449
65. Sato Y, Asoh T, Kondo I, Satoh K. Vitamin D deficiency and risk of hip fractures among disabled elderly stroke patients. Stroke 2001:32;1673-1677
66. Sato Y, Kuno H, Kaji M, Tsuru T, Saruwatari N, Oizumi K. Serum β2-microglobulin reflects increased bone resorption in immobilized stroke patients. Am J Phys Med Rehabil 2001:80;19-24
67. Iwamoto, J., Yeh, J.K., Aloia, J.F. Effect of deconditioning on cortical and cancellous bone growth in the exercise trained young rats. J Bone Mineral Res 2000:15;1842-1849
68. Sato Y, Asoh T, Kaji M, Oizumi K. Beneficial effect of intermittent cyclical etidronate therapy in hemiplegic patients following an acute stroke. J Bone Min Res 2000:15;2487-2494
69. Sato Y, Oizumi K, Kuno H, Kaji M. Effect of immobilization upon renal synthesis of 1,25-dihydroxyvitamin D in disabled elderly stroke patients. Bone 1999:24;271-275
70. Sato Y, Manabe S, Kuno H, Oizumi K. Amelioration of osteopenia and hypovitaminosis D by 1α-hydroxyvitamin D3 in elderly patients with Parkinson's disease. J Neurol Neurosurg Psych 1999:66;64-68
71. Sato Y, Kuno H, Asoh T, Honda Y, Oizumi K. Effect of immobilization on vitamin D status and bone mass in chronically hospitalized disabled stroke patients. Age Ageing 1999:28;265-269
72. Sato, Y, Kaji, M, Tsuru T, Oizumi K. Carpal tunnel syndrome involving unaffected limbs of stroke patients. Stroke 1999:30;414-418
73. Sato Y, Kuno H, Kaji M, Saruwatari N, Oizumi K. Effect of ipriflavone on bone in elderly hemiplegic stroke patients with hypovitaminosis D. Am J Phys Med Rehabil 1999:78;457-463
74. Sato Y, Tsuru T, Oizumi K, Kaji M. Vitamin K deficiency and osteopenia in disuse-affected limbs of vitamin D-deficient elderly stroke patients. Am J Phys Med Rehabil 1999:78;317-322

75. Sato Y, Asoh T, Oizumi K. High prevalence of vitamin D deficiency and reduced bone mass in elderly women with Alzheimer's disease. Bone 1998:23;555-557
76. Sato Y, Kuno H, Kaji M, Ohshima Y, Asoh T, Oizumi K. Increased bone resorption during the first year after stroke. Stroke 1998:29;1373-1377
77. Sato Y, Honda Y, Kuno H, Oizumi K. Menatetrenone ameliorates osteopenia in disuse-affected limbs of vitamin D- and K-deficient stroke patients. Bone 1998:23;291-296
78. Sato Y, Fujimatsu Y, Honda Y, Kunoh H, Kikuyama M, Oizumi K. Accelerated bone remodeling in patients with poststroke hemiplegia. J Stroke Cerebrovasc Dis 1998:7;58-62
79. Sato Y, Honda Y, Kunoh H, Oizumi K. Long-term oral anticoagulation reduces bone mass in patients with previous hemispheric infarction and nonrheumatic atrial fibrillation. Stroke 1997:28;2390-2394
80. Sato Y, Honda Y, Asoh T, Kikuyam, M, Oizumi K. Hypovitaminosis D and decreased bone mineral density in amyotrophic lateral sclerosis. Eur Neurol 1997:37;225-229
81. Sato Y, Maruoka H, Oizumi K. Amelioration of hemiplegia-associated osteopenia more than 4 years after stroke by 1α-hydroxyvitamin D3 and calcium supplementation. Stroke 1997:28;736-739
82. Sato Y, Kikuyama M, Oizum, K. High prevalence of vitamin D deficiency and reduced bone mass in Parkinson's disease. Neurology 1997:49;1273-1278
83. Sato Y, Maruoka H, Honda Y, Asoh T, Fujimatsu Y, Oizumi K. Development of osteopenia in the hemiplegic finger in patients with stroke. Eur Neurol 1996:36;278-283
84. Sato Y, Maruoka H, Oizumi K, Kikuyama M. Vitamin D deficiency and osteopenia in the hemiplegic limbs of stroke patients. Stroke 1996:27;2183-2187

b. Reviews and meta-analyses

1. Iwamoto J, Takeda T, Matsumoto H, Sato Y. Strategy for prevention of hip fractures in patients with Parkinson's disease. World J Orthop 2012:3;137-141
2. Iwamoto J, Takeda T, Matsumoto H. Sunlight exposure is important for preventing hip fractures in patients with Alzheimer's disease, Parkinson's disease, or stroke. Acta Neurol Scand 2012:125;279-284
3. Iwamoto J, Sato Y, Takeda T, Matsumoto H. Efficacy of antiresorptive agents for preventing fractures in Japanese patients with an increased fracture risk: Review of the literature. Drugs Aging 2012:29;191-203
4. Iwamoto J, Sato Y, Takeda T, Matsumoto H. Effectiveness of exercise for osteoarthritis of the knee: A review of the literature. World J Orthop 2011:2;37-42
5. Iwamoto J, Takeda T, Matsumoto H. Efficacy of oral bisphosphonates for preventing hip fracture in disabled patients with neurological diseases: A meta-analysis of randomized controlled trials among the Japanese population. Curr Med Res Opin 2011:27;1141-1148
6. Iwamoto J, Matsumoto H, Takeda T. Efficacy of menatetrenone (vitamin k2) against non-vertebral and hip fractures in patients with neurological diseases: Meta-analysis of three randomized, controlled trials. Clin Drug Invest 2009:29;471-479
7. Iwamoto J, Matsumoto H, Takeda T. Efficacy of risedronate against hip fracture in patients with neurological diseases: A meta-analysis of randomized controlled trials. Curr Med Res Opin 2008:24;1379-1384
8. Sato Y. Abnormal bone and calcium metabolism in patients after stroke. Arch Phys Med Rehabil 2000:81;117-121
9. Iwamoto J, Sato Y. Strategy for prevention of hip fractures in patients with Alzheimer's disease. Gen Med 2013:1;114
10. Iwamoto J, Takeda T, Ichimura S. Combined treatment with vitamin K2 and bisphosphonate in postmenopausal women with osteoporosis. Yonsei Med J 2003:44;751-756
11. Iwamoto J, Sato Y, Tanaka K, Takeda T, Matsumoto H. Prevention of hip fractures by exposure to sunlight and pharmacotherapy in patients with Alzheimer's disease. Aging Clin Exp Res 2009:21;277-281

c. Letters

1. Sato Y, Iwamoto J, Kanoko T, Satoh K. Risedronate therapy for prevention of hip fracture after stroke in elderly women. Neurology 2005:65;1513-1514
2. Sato Y, Asoh T, Metoki, N, Satoh K. Efficacy of methyprednisolone pulse therapy on neuroleptic malignant syndrome in Parkinson's disease. J Neurol Neurosurg Psychiatry 2004:75;510-511
3. Sato Y, Kaji M, Saruwatari N, Oizumi K. Hemiosteoporosis following stroke: Importance of pathophysiologic understanding and histologic evidence Stroke 1999:30;1978-1979

d. Corrigenda

1. Sato Y, Honda Y, Kaji M, Asoh T, Hosokawa K, Kondo I, Satoh K. Corrigendum to "Amelioration of osteoporosis by menatetrenone in elderly female Parkinson's disease patients with vitamin D deficiency" [Bone 31 (2002) 114-118] (DOI:10.1016/S8756-3282(02)00783-4). Bone 2008:43;217

ii. Expression of concern

a. Original research

1. Iwamoto J, Sato Y, Matsumoto H. Influence of gastrectomy on cortical and cancellous bones in rats. Gastroenterol Res Pract 2013:doi 10.1155/2013/381616.
2. Iwamoto J, Sato Y, Uzawa M, Takeda T, Matsumoto H. Experience with alendronate treatment for four years among Japanese men with osteoporosis or osteopenia and clinical risk factors for fractures. Ther Clin Risk Manage 2010:6;593-600
3. Iwamoto J, Yeh JK, Aloia JF. Differential effect of treadmill exercise on three cancellous bone sites in the young growing rat. Bone 1999:24;163-169

b. Reviews and meta-analyses

1. Iwamoto J, Sato, Y, Takeda, T, Matsumoto H. Bone quality and vitamin K2 in type 2 diabetes: Review of preclinical and clinical studies. Nutr Rev 2011:69;162-167
2. Iwamoto J, Takeda T, Sato Y. Menatetrenone (vitamin K2) and bone quality in the treatment of postmenopausal osteoporosis. Nutri Rev 2006:64;509-517

c. Letters

1. Sato Y. In reply. Arch Intern Med 2007:167;514-515
2. Sato Y, Honda Y, Iwamoto J, Kanoko T, Satoh K. Inaccurate description of collaborating hospitals in a study of the effect of folate and mecobalamin on hip fractures after stroke. JAMA 2006:296;396
3. Sato Y, Kanoko T, Satoh K, Iwamoto J. In reply. Arch Intern Med 2006:166;1145
4. Sato Y, Iwamoto J, Kanoko T, Satoh K. Substandard studies or substandard "standard-of-care". J Bone Min Res 2006:21;492
5. Sato Y, Honda Y, Iwamoto J, Kanoko T, Satoh K. Folate and vitamin B12 for hip fracture prevention after stroke. JAMA 2005:294;792
6. Sato Y, Kaji M, Oizomi K, Cosman F. An alternative to vitamin D supplementation to prevent fractures in patients with MS. Neurology 1999:53;437

d. Case series

1. Sato Y, Honda Y, Maruoka H, Kunoh H, Oizumi K. Subdural hematoma following disappearance of orthostatic headache and pressure normalization in two patients with spontaneous intracranial hypotension. Cephalalgia 1998:18;60-63
2. Sato Y, Honda Y, Maruoka H, Fujimatsu Y, Oizumi K. Recurrence of spontaneous intracranial hypotension with subdural hematomas. Cephalalgia 1997:17;42-45

iii. Correction

a. Original research

1. Metoki N, Sato Y, Satoh K, Okumura K, Iwamoto J. Muscular atrophy in the hemiplegic thigh in patients after stroke. Am J Phys Med Rehabil 2003:82;862-865
2. Iwata M, Kondo I, Sato Y, Satoh K, Soma M, Tsushima E. An ankle-foot orthosis with inhibitor bar: Effect on hemiplegic gait. Arch Phys Med Rehabil 2003:84;924-927
3. Iwata M, Kondo I, Sato Y, Satoh K, Soma M, Bar-Or O. Prediction of reflex sympathetic dystrophy in hemiplegia by evaluation of hand edema. Arch Phys Med Rehabil 2002:83;1428-1431

B. Not corrected by journal

1. Hagino H, Endo N, Harada A, Iwamoto J, Mashiba, T, Mori, S, Ohtori S, Sakai A, Takada J, Yamamoto T. Survey of hip fractures in Japan: Recent trends in prevalence and treatment. J Orthop Sci 2017:22;909-914

2. Iwamoto J. A role of exercise and sports in the prevention of osteoporosis. Clin Calcium 2017:27;17-23
Iwamoto J, Seki A, Nango N. Influence of teriparatide and ibandronate on cortical bone in New Zealand white rabbits: A HR-QCT Study. Calcif Tiss Int 2016:99;535-542
3. Iwamoto J, Okano H, Furuya T, Urano T, Hasegawa M, Hirabayashi H, Kumakubo T, Makita K. Patient preference for monthly bisphosphonate versus weekly bisphosphonate in a cluster-randomized, open-label, crossover trial: Minodroate Alendronate/Risedronate Trial in Osteoporosis (MARTO). J Bone Mineral Metab 2016:34;201-208
4. Iwamoto J, Uzawa M. Experience with alendronate treatment for 7 years among Japanese men with osteoporosis or osteopenia and clinical risk factors for fractures. Clin Rheumatol 2016:35;205-212
5. Iwamoto J. Treatment of bone disease caused by gastrectomy. Clin Calcium 2015:25;1681-1688
6. Iwamoto J. Exercise and fall prevention. Skeletal adaptation to mechanical strain: a key role in osteoporosis. Osteoporos Orthop 2016: 0; 221-234
7. Iwamoto J, Takada T. Effect of minodronate on the speed of sound of the calcaneus in postmenopausal women with an increased risk of fractures: A clinical practice-based observational study. J Chin Med Assoc 2015:78;591-596
8. Iwamoto J, Seki A. Effect of combined teriparatide and monthly risedronate therapy on cancellous bone mass in orchidectomized rats: A bone histomorphometry study. Calc Tiss Int2015:97;23-31
9. Takakuwa M, Iwamoto J. Five-year experience with risedronate therapy for patients with increased fracture risk: A practice-based observational study. Biol Pharm Bull 2015:38;88-95
10. Iwamoto J, Seki A, Sato Y. Effect of intermittent administration of hPTH(1-34) on cortical bone geometry in rats treated with high-dose glucocorticoids. Chin J Physiol. 2014:57;231-237
11. Sumida, S, Iwamoto J, Uenishi K, Otani T. One-year changes in bone mineral density and bone turnover markers in premenopausal amateur runners: A prospective study. Keio J Med 2014:63;43-51
12. Iwamoto J, Takada T, Sato Y. Vitamin K nutritional status and undercarboxylated osteocalcin in postmenopausal osteoporotic women treated with bisphosphonates. Asia Pacific J Clin Nutr 2014:23;256-262
13. Iwamoto J. Vitamin K2 therapy for postmenopausal osteoporosis. Nutrients 2014:6;1971-1980
14. Iwamoto J, Seki A, Sato Y. Effect of combined teriparatide and monthly minodronic acid therapy on cancellous bone mass in ovariectomized rats: A bone histomorphometry study. Bone 2014:64;88-94
15. Osugi T, Iwamoto J, Yamazaki M, Takakuwa M. Effect of a combination of whole body vibration exercise and squat training on body balance, muscle power, and walking ability in the elderly. Ther Clin Risk Manage 2014:10;131-138
16. Iwamoto J, Sato Y. Eldecalcitol improves chair-rising time in postmenopausal osteoporotic women treated with bisphosphonates. Ther Clin Risk Manage 2014:10;51-59
17. Makita K, Okano H, Furuya T, Urano T, Hirabayashi H, Kumakubo T, Iwamoto J. Survey of the utility of once-monthly bisphosphonate treatment for improvement of medication adherence in osteoporosis patients in Japan. J Bone Min Metab 2014:33;55-60
18. Sato Y, Iwamoto J, Honda Y, Amano N. Vitamin D reduces falls and hip fractures in vascular Parkinsonism but not in Parkinson's disease. Ther Clin Risk Manage 2013:9;171-176
19. Iwamoto J, Sato Y, Uzawa M, Matsumoto H. Eleven years of experience with bisphosphonate plus alfacalcidol treatment in a man with osteogenesis imperfecta type I. Ther Clin Risk Manage 2013:9;1-7
20. Iwamoto J, Sato Y, Uzawa M, Matsumoto H. Five-year follow-up of a woman with pregnancy and lactation-associated osteoporosis and vertebral fractures. Ther Clin Risk Manage 2012:8;195-199
21. Iwamoto J, Takada T, Sato Y, Matsumoto H. Influence of treatment with alendronate on the speed of sound, an ultrasound parameter, of the calcaneus in postmenopausal Japanese women with osteoporosis: A clinical practice-based observational study. Ther Clin Risk Manage 2012:8;287-293
22. Iwamoto J. Effects of raloxifene on bone metabolism in hemodialysis patients. Int J Endocrinol Metab 2012:10;573-575
23. Iwamoto J, Yago K, Sato Y, Matsumoto,H. Teriparatide therapy for bisphosphonate-associated osteonecrosis of the jaw in an elderly Japanese woman with severe osteoporosis. Clin Drug Invest 2012:32;547-553
24. Takakuwa M, Iwamoto J. Elcatonin in combination with risedronate is more effective than risedronate alone for relieving back pain in postmenopausal women with osteoporosis. Biol Pharm Bull 2012:35;1159-1165
25. Yamashita F, Iwamoto J, Osugi T, Yamazaki M, Takakuwa M. Chair rising exercise is more effective than one-leg standing exercise in improving dynamic body balance: A randomized controlled trial. J Musculoskel Neuronal Interact 2012:12;74-79
26. Iwamoto J, Seki, A, Sato Y, Matsumoto H. Vitamin K2 improves renal function and increases femoral bone strength in rats with renal insufficiency. Calcif Tiss Int 2012:90;50-59
27. Takakuwa M, Iwamoto J, Itabashi K. Three-year experience with risedronate therapy for patients with an increased fracture risk: Assessment of proximal femoral bone density and geometry by DXA. Clin Drug Invest 2012:32;121-129

28. Iwamoto J. Effect of exercise on developing bone mass and cortical bone geometry. Clin Calcium 2011:21;1323-1328
29. Iwamoto J, Makita K, Sato Y, Takeda T, Matsumoto H. Alendronate is more effective than elcatonin in improving pain and quality of life in postmenopausal women with osteoporosis. Osteoporos Int 2011:22;2735-2742
30. Iwamoto J, Seki A, Sato Y, Matsumoto H, Takeda T, Yeh J.K. Effect of vitamin K2 on cortical and cancellous bone mass and hepatic lipids in rats with combined methionine-choline deficiency. Bone 2011:48;1015-1021
31. Iwamoto J, Seki A, Sato Y, Matsumoto H, Takeda T, Yeh JK. Vitamin K2 prevents hyperglycemia and cancellous osteopenia in rats with streptozotocin-induced type 1 diabetes. Calcif Tiss Int 2011:88;162-168
32. Sato Y, Iwamoto J, Honda Y. Vitamin D deficiency-induced vertebral fractures may cause stooped posture in Parkinson disease. Am J Phys Med Rehabil 2011:90;281-286
33. Takakuwa M, Iwamoto J, Konishi M, Zhou Q, Itabashi K. Risedronate improves proximal femur bone density and geometry in patients with osteoporosis or osteopenia and clinical risk factors of fractures: A practice-based observational study. J Bone Min Metab 2011:29;88-95
34. Iwamoto J, Matsumoto H, Takeda T, Sato Y, Yeh JK. Effects of vitamin K2 on cortical and cancellous bone mass, cortical osteocyte and lacunar system, and porosity in sciatic neurectomized rats. Calcif Tiss Int 2010:87;254-262
35. Iwamoto J, Sato Y, Takeda T, Matsumoto H. The return to sports activity after conservative or surgical treatment in athletes with lumbar disc herniation. Am J Phys Med Rehabil 2010: 89; 1030-1035
36. Sato Y. Dementia and fracture Clin Calcium 2010:20;1379-1384
37. Iwamoto J, Takeda T, Uenishi K, Ishida H, Sato Y, Matsumoto H. Urinary levels of cross-linked N-terminal telopeptide of type i collagen and nutritional status in Japanese professional baseball players. J Bone Min Metab 2010:28;540-546
38. Iwamoto J, Sato Y, Takeda T, Matsumoto H. Effectiveness of exercise in the treatment of lumbar spinal stenosis, knee osteoarthritis, and osteoporosis. Aging Clin Exp Res 2010:22;116-122
39. Iwamoto J. Effects of SERMs on bone health. Discrimination of SERMs from bisphosphonates in the treatment of postmenopausal osteoporosis. Clin Calcium 2010:20;396-407
40. Iwamoto J, Uzawa M, Sato Y, Takeda T, Matsumoto H. Effect of alendronate on bone mineral density and bone turnover markers in post-gastrectomy osteoporotic patients. J Bone Min Metab 2010:28;202-208
41. Iwamoto J, Seki A, Sato Y, Matsumoto H, Tadeda T, Yeh JK. Vitamin K2 promotes bone healing in a rat femoral osteotomy model with or without glucocorticoid treatment. Calcif Tiss Int 2010:86;234-241
42. Iwamoto J, Takeda, T, Sato Y, Matsumoto H. Effects of risedronate on osteoarthritis of the knee. Yonsei Med J 2010:51;164-170
43. Iwamoto J, Miyata A, Sato Y, Takeda T, Matsumoto H. Five-year alendronate treatment outcome in older postmenopausal Japanese women with osteoporosis or osteopenia and clinical risk factors for fractures. Therap Clin Risk Manage 2009:5;773-779
44. Iwamoto J, Sato Y, Uzawa M, Takeda T, Matsumoto H. Seven years' experience with alendronate in postmenopausal Japanese women with osteoporosis. Therap Clin Risk Manage 2010:6;201-206
45. Iwamoto J. Anti-fracture efficacy of vitamin K. Clin Calcium 2009:19;1805-1814
46. Iwamoto J, Miyata A, Sato Y, Takeda T, Matsumoto H. Factors affecting discontinuation of alendronate treatment in postmenopausal Japanese women with osteoporosis. J Chin Med Assoc 2009:72;619-624
47. Iwamoto J, Uzawa M, Sato Y, Takeda T, Matsumoto H. Effects of short-term combined treatment with alendronate and elcatonin on bone mineral density and bone turnover in postmenopausal women with osteoporosis. Therap Clin Risk Manage 2009:5;499-505
48. Iwamoto J, Sato Y, Uzawa M, Takeda T, Matsumoto H. Comparison of the effects of alendronate and alfacalcidol on hip bone mineral density and bone turnover in Japanese men having osteoporosis or osteopenia with clinical risk factors for fractures. Yonsei Med J 2009:50;474-481
49. Iwamoto J, Sato Y, Takeda T, Matsumoto H. Role of sport and exercise in the maintenance of female bone health. J Bone Min Metab 2009:27;530-537
50. Iwamoto, J, Seki A, Matsuura M, Sato Y, Takeda T, Matsumoto H, Yeh JK. Influence of ovariectomy on bone turnover and trabecular bone mass in mature cynomolgus monkeys. Yonsei Med J 2009:50;358-367
51. Iwamoto J, Suzuki H, Tanaka, K, Kumakubo T, Hirabayashi H, Miyazaki Y, Sato Y, Takeda T, Matsumoto H. Preventative effect of exercise against falls in the elderly: A randomized controlled trial. Osteoporos Int 2009:20;1233-1240
52. Iwamoto J, Takeda T, Sato Y, Matsumoto H. Radiographic abnormalities of the inferior pole of the patella in juvenile athletes. Keio J Med 2009:58;50-53
53. Iwamoto J, Sato Y, Takeda T, Matsumoto H. High-dose vitamin K supplementation reduces fracture incidence in postmenopausal women: a review of the literature. Nutr Res 2009:29;221-228

54. Iwamoto J, Takeda T, Sato Y, Matsumoto H. Retrospective case evaluation of gender differences in sports injuries in a Japanese sports medicine clinic. Gender Med 2008:5;405-414
55. Iwamoto, J., Sato, Y., Takeda, T., Matsumoto, H. Hip fracture protection by alendronate treatment in postmenopausal women with osteoporosis: A review of the literature. Clin Interv Aging 2008:3;483-489
56. Iwamoto J, Matsumoto H, Takeda T, Sato Y, Liu X, Yeh JK. Effects of vitamin K_2 and risedronate on bone formation and resorption, osteocyte lacunar system, and porosity in the cortical bone of glucocorticoid-treated rats. Calcif Tiss Int 2008:83;121-128
57. Ichimura S, Iwamoto J. Biochemical markers for bone turnover: Serum beta-CTX. Nippon Rinsho. Japan J Clin Med 2007:65 Suppl 9;237-244
58. Sato Y. Treatment and prevention of fractures in stroke patients. Nippon Rinsho. Japan J Clin Med 2007:65 Suppl 9;555-558
59. Iwamoto J, Takeda T, Ogawa K, Matsumoto H. Muscle strain of the subscapularis muscle: A case report. Keio J Med 2007:56;92-95
60. Iwamoto J, Takeda T, Sato Y. Effect of muscle strengthening exercises on the muscle strength in patients with osteoarthritis of the knee. Knee 2007:14;224-230
61. Kawanabe, K, Kawashima A, Sashimoto I, Takeda T, Sato Y, Iwamoto J. Effect of whole-body vibration exercise and muscle strengthening, balance, and walking exercises on walking ability in the elderly. Keio J Med 2007:56;28-33
62. Iwamoto J, Takeda T, Sato Y, Uzawa M. Comparison of the effect of alendronate on lumbar bone mineral density and bone turnover in men and postmenopausal women with osteoporosis. Clin Rheumatol 2007:26;161-167
63. Iwamoto J, Takeda T, Sato Y, Yeh JK. Effect of vitamin K2 and growth hormone on the long bones in hypophysectomized young rats: A bone histomorphometry study. J Bone Min Metab 2007:25;46-53
64. Sato Y. Immobilization and hip fracture. Clin Calcium 2006:16;1991-1998
65. Iwamoto, J, Takeda T, Sato Y, Yeh JK. Synergistic effect of vitamin K2 and prostaglandin E2 on cancellous bone mass in hypophysectomized young rats. Calc Tiss Int 2006:79;318-325
66. Iwamoto J, Takeda T, Sato Y, Wakano K. Short-term outcome of conservative treatment in athletes with symptomatic lumbar disc herniation. Am J Phys Med Rehabil 2006:85;667-674
67. Iwamoto J, Takeda T, Sato Y. Efficacy and safety of alendronate and risedronate for postmenopausal osteoporosis. Curr Med Res Opinion 2006:22;919-928
68. Iwamoto J, Takeda T, Sato Y. Role of vitamin K2 in the treatment of postmenopausal osteoporosis. Curr Drug Saf 2006:1;87-97
69. Iwamoto, J, Takeda T, Sato Y. Effects of vitamin K2 on the development of osteopenia in rats as the models of osteoporosis. Yonsei Med J 2006:47;157-166
70. Yoshida, H, Imaizumi T, Tanji K, Sakaki H, Metoki N, Sato Y, Wakabayashi K, Kimura H, Satoh K. Interleukin-1β enhances the angiotensin-induced expression of plasminogen activator inhibitor-1 through angiotensin receptor upregulation in human astrocytes. Brain Res 2006:1073-1074;38-47
71. Iwamoto J, Seki A, Takeda T, Sato Y, Yamada H. Effects of risedronate on femoral bone mineral density and bone strength in sciatic neurectomized young rats. J Bone Min Metab 2005:23;456-462
72. Iwamoto, J, Yeh JK, Schmidt A, Rowley E, Stanfield L, Takeda T, Sato M. Raloxifene and vitamin K2 combine to improve the femoral neck strength of ovariectomized rats. Calcif Tiss Int 2005:77;119-126
73. Iwamoto J, Takeda T, Sato Y. Prevention and treatment of corticosteroid-induced osteoporosis. Yonsei Med J 2005:46;456-463
74. Iwamoto, J, Takeda T, Sato Y. Efficacy of oral etidronate for skeletal diseases in Japan. Yonsei Med J 2005:46;313-320
75. Iwamoto J, Takeda T, Sato Y. Interventions to prevent bone loss in astronauts during space flight. Keio J Med 2005:54;55-59
76. Yoshida H, Imaizumi T, Tanji K, Sakaki H, Metoki N, Hatakeyama M, Yamashita K, Ishikawa A, Taima K, Sato Y, Kimura H, Satoh K. Platelet-activating factor enhances the expression of nerve growth factor in normal human astrocytes under hypoxia. Mol Brain Res 2005:133;95-101
77. Iwamoto J, Abe H, Tsukimura Y, Wakano K. Relationship between radiographic abnormalities of lumbar spine and incidence of low back pain in high school rugby players: A prospective study. Scand J Med Sci Sport 2005:15;163-168
78. Iwamoto J, Takeda T, Sato Y, Uzawa M. Early changes in urinary cross-linked N-terminal telopeptides of type I collagen level correlate with 1-year response of lumbar bone mineral density to alendronate in postmenopausal Japanese women with osteoporosis. J Bone Min Metab 2005:23;238-242
79. Iwamoto, J, Takeda T, Sato Y. Effect of treadmill exercise on bone mass in female rats. Exp Anim 2005:54;1-6
80. Sato Y, Honda Y, Iwamoto J, Kanoko T, Satoh K. Amelioration by mecobalamin of subclinical carpal tunnel syndrome involving unaffected limbs in stroke patients. J Neurol Sci 2005:231;13-18

81. Iwamoto J, Miltner O. Transient osteoporosis of the navicular bone in a runner. Arch Orthop Trauma Surg 2004:124;646
82. Iwamoto J, Takeda T, Sato Y, Uzawa M. Effects of alendronate on metacarpal and lumbar bone mineral density, bone resorption, and chronic back pain in postmenopausal women with osteoporosis. Clin Rheumatol 2004:23;383-389
83. Iwamoto J, Takeda T, Sato Y, Uzawa M. Determinants of one-year response of lumbar bone mineral density to alendronate treatment in elderly Japanese women with osteoporosis. Yonsei Med J 2004:45;676-682
84. Yamazaki S, Ichimura S, Iwamoto J, Takeda T, Toyama Y. Effect of walking exercise on bone metabolism in postmenopausal women with osteopenia/osteoporosis. J Bone Min Metab 2004:22;500-508
85. Sato Y, Kanoko T, Satoh K, Iwamoto J. Risk factors for hip fracture among elderly patients with Alzheimer's disease. J Neurol Sci 2004:223;107-112
86. Iwamoto J, Takeda T, Sato Y. Effects of vitamin K2 on osteoporosis. Curr Pharm Des 2004:10;2557-2576
87. Iwamoto J, Otaka Y, Kudo K, Takeda T, Uzawa M, Hirabayashi K. Efficacy of training program for ambulatory competence in elderly women. Keio J Med 2004:53;85-89
88. Iwamoto J, Abe H, Tsukimura Y, Wakano K. Relationship between radiographic abnormalities of lumbar spine and incidence of low back pain in high school and college football players: A prospective study. Am J Sport Med 2004:32;781-786
89. Iwamoto J, Takeda T, Ichimura S. Differential effect of short-term etidronate treatment on three cancellous bone sites in orchidectomized adult rats. Keio J Med 2004:53;12-17
90. Iwamoto J, Yeh JK, Takeda T, Ichimura S, Sato Y. Erratum: Comparative effects of vitamin K and vitamin D supplementation on development of osteopenia in calcium-deficient young rats (Bone (2003) 33 (557-566) DOI: 101016S8756328203002497). Bone 2004:34;589-590
91. Iwamoto J, Takeda T, Suda Y, Otani T, Matsumoto H. Conservative treatment of isolated posterior cruciate ligament injury in professional baseball players: A report of two cases. Knee 2004:11;41-44
92. Iwamoto J, Takeda T, Sato Y. Effect of treatment with alendronate in osteogenesis imperfecta type I: A case report. Keio J Med 2004:53;251-255
93. Iwamoto J, Takeda T, Wakano K. Returning athletes with severe low back pain and spondylolysis to original sporting activities with conservative treatment. Scand J Med Sci Sport 2004:14;346-351
94. Iwamoto J, Shimamura C, Takeda T, Abe H, Ichimura S, Sato Y, Toyama Y. Effects of treadmill exercise on bone mass, bone metabolism, and calciotropic hormones in young growing rats. J Bone Min Metab 2004:22;26-31
95. Yoshida H, Imaizumi T, Tanji, K, Sato Y, Satoh K. Platelet-activating factor enhances the expression of vascular endothelial growth factor in normal human astrocytes under hypoxia. International Congress Series 2003:1251;81-86
96. Sato Y, Kaji M, Tsuru T, Oizumi K. Risk factors for hip fracture among elderly patients with Parkinson's disease. International Congress Series 2003:1251;223-230
97. Iwamoto J, Takeda T, Ichimura S, Sato Y, Yeh JK. Comparative effects of orchidectomy and sciatic neurectomy on cortical and cancellous bone in young growing rats. J Bone Min Metab 2003:21;211-216
98. Iwamoto J, Takeda T, Ichimura S, Uzawa M. Comparative effects of treatment with etidronate and alendronate on bone resorption, back pain, and activities of daily living in elderly women with vertebral fractures. Keio J Med 2003:52;230-235
99. Iwamoto J, Matsu K, Takeda T, Ichimura S, Uzawa M. Effects of treatment with etidronate and alfacalcidol for osteogenesis imperfecta type I: A case report. J Orthoped Sci 2003:8;243-247
100. Iwamoto J, Takeda T, Ichimura S. Treatment with vitamin D3 and/or vitamin K2 for postmenopausal osteoporosis. Keio J Med 2003:52;147-150
101. Iwamoto J, Yeh JK, Takeda T, Ichimura S, Sato Y. Comparative effects of vitamin K and vitamin D supplementation on prevention of osteopenia in calcium-deficient young rats. Bone 2003:33;557-566
102. Iwamoto J, Yeh JK, Takeda T. Effect of vitamin K2 on cortical and cancellous bones in orchidectomized and/or sciatic neurectomized rats. J Bone Miner Res 2003:18;776-783
103. Iwamoto J, Takeda T, Ichimura S, Matsu K, Uzawa M. Effects of cyclical etidronate with alfacalcidol on lumbar bone mineral density, bone resorption, and back pain in postmenopausal women with osteoporosis. J Orthoped Sci 2003:8;532-537
104. Sato Y, Kaji M, Metoki N, Yoshida H, Satoh K. Coagulation-fibrinolysis abnormalities in patients receiving antiparkinsonian agents. J Neurol Sci 2003:212;55-58
105. Iwamoto J, Takeda T. Stress fractures in athletes: Review of 196 cases. J Orthoped Sci 2003:8;273-278
106. Soma M, Sato Y, Kondo I, Hosokawa K, Iwata M, Kogina H, Tsushima S, Narumi S, Hakamada K, Sasaki M. Rehabilitating patients after adult-to-adult living-related liver transplantation. Hirosaki Med J 2003:54;99-104
107. Iwamoto J, Takeda T, Ichimura S, Uzawa M. Early response to alendronate after treatment with etidronate in postmenopausal women with osteoporosis. Keio J Med 2003:52;113-119

108. Iwamoto, J, Takeda T, Yeh JK, Ichimura S, Toyama Y. Effect of vitamin K2 on cortical and cancellous bones in orchidectomized young rats. Maturitas 2003:44;19-27
109. Kondo I, Hosokawa K, Soma M, Iwata M, Sato Y, Iwasaki M, Rosenbaum P. Gross motor function classification system: Preliminary study for Japanese children. Am J Phys Med Rehabil 2003:82;116-121
110. Iwamoto J, Takeda T, Ichimura S. Increased bone resorption with decreased activity and increased recruitment of osteoblasts in osteogenesis imperfecta type I. J Bone Min Metab 2002:20;174-179
111. Yoshida H, Imaizumi T, Tanji K, Matsumiya T, Sakaki H, Kimura D, Cui X.-F, Kumagai M, Tamo W, Shibata T, Hatakeyama M, Sato Y, Satoh K. Platelet-activating factor enhances the expression of vascular endothelial growth factor in normal human astrocytes. Brain Res 2002:944;65-72
112. Sato Y, Kaji M, Kondo I, Yoshida H, Satoh K, Metoki N. Hyperhomocysteinemia in Japanese patients with convalescent stage ischemic stroke: Effect of combined therapy with folic acid and mecobalamine. J Neurol Sci 2002:202;65-68
113. Kaji M, Sato Y, Kunoh H, Watanabe A, Aizawa H, Oizumi K, Abe T. Antiphospholipid syndrome and multiple ischemic strokes in a patient with myasthenia gravis. Kurume Med J 2002:49;211-216
114. Iwamoto J, Takeda T, Ichimura S, Uzawa M. Effects of 5-year treatment with elcatonin and alfacalcidol on lumbar bone mineral density and the incidence of vertebral fractures in postmenopausal women with osteoporosis: A retrospective study. J Orthoped Sci 2002:7;637-643
115. Iwamoto J, Takeda T. Insufficiency fracture of the femoral neck during osteoporosis treatment: A case report. J Orthoped Sci 2002:7;707-712
116. Ichimura S, Iwamoto J. Biochemical basis of bone resorption markers. Nippon Rinsho. Japan J Clin Med 2002:60 Suppl 3;228-235
117. Shimamura C, Iwamoto J, Takeda T, Ichimura S, Abe H, Toyama Y. Effect of decreased physical activity on bone mass in exercise-trained young rats. J Orthoped Sci 2002:7;358-363
118. Moriyama, I, Iwamoto J, Takeda T, Toyama Y. Comparative effects of intermittent administration of human parathyroid hormone (1-34) on cancellous and cortical bone loss in tail-suspended and sciatic neurectomized young rats. J Orthoped Sci 2002:7;379-385
119. Iwamoto J, Takeda T, Ichimura S. Beneficial effect of etidronate on bone loss after cessation of exercise in postmenopausal osteoporotic women. Am J Phys Med Rehabil 2002:81;452-457
120. Iwamoto J, Takeda T, Ichimura S. Relationships among physical activity, metacarpal bone mass, and bone resorption marker in 70 healthy adult males. J Orthoped Sci 2002:7;6-11
121. Iwamoto J, Takeda T. Effect of surgical treatment on physical activity and bone resorption in patients with neurogenic intermittent claudication. J Orthoped Sci 2002:7;84-90
122. Iwamoto J, Takeda T, Ichimura S. Forearm bone mineral density in postmenopausal women with osteoarthritis of the knee. J Orthoped Sci 2002:7;19-25
123. Iwamoto J, Takeda T, Katsumata T, Tanaka T, Ichimura S, Toyama Y. Effect of etidronate on bone in orchidectomized and sciatic neurectomized adult rats. Bone 2002:30;360-367
124. Iwamoto J, Takeda T, Ichimura S. Transient relief of metastatic cancer bone pain by oral administration of etidronate. J Bone Miner Metab 2002:20;228-234
125. Iwamoto J, Takeda T, Ichimura S. Forearm bone mineral density in patients with rheumatoid arthritis. J Orthoped Sci 2002:7;528-534
126. Yoshida H, Imaizumi T, Kumagai M, Kimura K, Satoh C, Hanada N, Fujimoto K, Nishi N, Tanji K, Matsumiya T, Mori F, Cui X.-F, Tamo W, Shibata T, Takanashi S, Okumura K, Nakamura T, Wakabayashi K, Hirashima M, Sato Y, Satoh K. Interleukin-1β stimulates galectin-9 expression in human astrocytes. NeuroReport 2001:12;3755-3758
127. Iwamoto J, Takeda T, Ichimura S. Effect of menatetrenone on bone mineral density and incidence of vertebral fractures in postmenopausal women with osteoporosis: A comparison with the effect of etidronate. J Orthoped Sci 2001:6;487-492
128. Kaji M, Kuno H, Turu T, Sato Y, Oizumi K. Elevated serum myosin light chain I in influenza patients. Intern Med 2001:40;594-597
129. Sato Y, Kaji M, Tsuru T, Oizumi K. Risk factors for hip fracture among elderly patients with Parkinson's disease. J Neurol Sci 2001:182;89-93
130. Iwamoto J, Takeda T, Ichimura S. Effect of exercise training and detraining on bone mineral density in postmenopausal women with osteoporosis. J Orthoped Sci 2001:6;128-132
131. Iwamoto J, Takeda T, Ichimura S. Relationships between physical activity and metacarpal cortical bone mass and bone resorption in hemiplegic patients. J Orthoped Sci 2001:6;227-233
132. Iwamoto, J, Takeda T, Ichimura S. Effect of administration of lipoprostaglandin E1 on physical activity and bone resorption in patients with neurogenic intermittent claudication. J Orthoped Sci 2001:6;242-247
133. Sato Y, Kaji M, Higuchi F, Yanagida I, Oishi K, Oizumi K. Changes in bone and calcium metabolism following hip fracture in elderly patients. Osteoporos Int 2001:12;445-449

134. Sato Y, Kuno H, Kaji M, Etoh K, Oizumi K. Influence of immobilization upon calcium metabolism in the week following hemiplegic stroke. J Neurol Sci 2000:175;135-139
135. Iwamoto J, Takeda T, Ichimura S. Effect of combined administration of vitamin D3 and vitamin K2 on bone mineral density of the lumbar spine in postmenopausal women with osteoporosis. J Orthoped Sci 2000:5;546-551
136. Iwamoto J, Takeda T, Ichimura S, Tsukimura Y, Toyama Y. Age-related changes in cortical bone in men: Metacarpal bone mass measurement study. J Orthoped Sci 2000:5;4-9
137. Koga Y, Akita Y, Takane N, Sato Y, Kato H. Heterogeneous presentation in A3243G mutation in the mitochondrial tRNA(Leu(UUR)) gene. Arch Dis Child 2000:82;407-411
138. Koga Y, Koga A, Iwanaga R, Akita Y, Tubone J, Matsuishi T, Takane N, Sato Y, Kato H. Single-fiber analysis of mitochondrial A3243G mutation in four different phenotypes. Acta Neuropathol 2000:99;186-190
139. Sato Y, Nakagawa M, Higuchi I, Osame M, Naito E, Oizumi K. Mitochondrial myopathy and familial thiamine deficiency. Muscle Nerve 2000:23;1069-1075
140. Sato Y, Osabe S, Kuno H, Kaji M, Oizumi K. Rapid diagnosis of cryptococcal meningitis by microscopic examination of centrifuged cerebrospinal fluid sediment. J Neurol Sci 1999:164;72-75
141. Iwamoto J, Yeh JK, Aloia JF. Differential effect of treadmill exercise on three cancellous bone sites in the young growing rat. Bone 1999:24;163-169
142. Sato Y, Kuno H, Oizumi K. Histiocytic necrotizing lymphadenitis (Kikuchi's disease) with aseptic meningitis. J Neurol Sci 1999:163;187-191
143. Sato Y, Fujimatsu Y, Kikuyama M. Kaji M, Oizumi K. Letter to the editor. J Neurol Sci 1999:163;99-101
144. Iwamoto J, Tsukimura T, Takeda T. Bone mineral density of metatarsus in hemiplegic subjects. Am J Phys Med Rehabil 1999:78;202-207
145. Sato Y, Hachiya N, Kuno, H, Asoh T, Oizumi K. Cerebrospinal fluid atypical lymphocytes in Japanese encephalitis. J Neurol Sci 1998:160; 92-95
146. Iwamoto J, Takeda T, Otani T, Yabe Y. Effect of increased physical activity on bone mineral density in postmenopausal osteoporotic women. Keio J Med 1998:47;157-161
147. Iwamoto J, Takeda T, Ichimura S. Effects of moderate intensity exercise on tibial bone mass in mature ovariectomized rats: bone histomorphometry study. Keio J Med 1998:47;162-167
148. Sato Y, Fujimatsu Y, Kikuyama M, Kaji M, Oizumi K. Influence of immobilization on bone mass and bone metabolism in hemiplegic elderly patients with a long-standing stroke. J Neurol Sci 1998:156;205-210
149. Iwamoto J, Takeda T, Otani T, Yabe Y. Age-related changes in cortical bone in women: Metacarpal bone mass measurement study. J Orthoped Sci 1998:3;90-94
150. Iwamoto J, Takeda T, Ichimura S. Effects of exercise on bone mineral density in mature osteopenic rats. J Bone Miner Res 1998:13;1308-1317
151. Iwamoto J, Takeda, T, Ichimura S. Effect of exercise on tibial and lumbar vertebral bone mass in mature osteopenic rats: Bone histomorphometry study. J Orthoped Sci 1998:3;257-263
152. Sato Y, Honda Y, Inoue M, Ohta Y, Itoh,S, Oizumi K, Higuchi I. Lack of immunoreactivity for myoglobin in skeletal muscle of acute stroke patients. Kurume Med J 1996:43;249-257
153. Sato Y, Maruoka H, Honda Y, Hachiya N, Oizumi K, Oizumi K. Plasma concentrations of atrial natriuretic peptide in cardioembolic stroke with atrial fibrillation. Kurume Med J 1995:42;71-77
154. Iwamoto J. An experimental study of the effect of endurance on bone mineral density. J Japan Orthoped Assoc 1995:69
155. Honda, Y, Takeuchi N, Sato Y, Maruoka H, Higuchi I. Changes of type IV collagen 7S and fibronectin in a patient with isolated ACTH deficiency. Clin Neurol 1995:35;661-663
156. Honda, Y, Maruoka H, Sato Y, Inoue M, Sakata Y, Oizumi K. Phagocytic ability of polymorphonuclear cells and macrophage is not decreased in aged bed ridden patients. Kurume Med J 1994:41;149-154
157. Honda, Y, Ohshima Y, Honda E, Oizumi K, Takeuchi N, Sato Y. Acute myelopathy and cerebellar signs associated with uveitis with positive serum and cerebrospinal fluid antibodies to HTLV-I. Kurume Med J 1994:41;193-197
158. Sato Y, Matsunami M, Maruoka H, Honda Y, Inoue M, Oizumi K, Itoh A, Moriki Y. A seroepidemiological study of hepatitis C virus (HCV) in an area with a high prevalence of chronic liver disease in the Kyushu district of Japan. Kurume Med J 1994:41;41-50
159. Honda Y, Sato Y, Sato Y, Shingu M, Kaji M. Decrease of Leu7 positive cells in peripheral blood from patients with aseptic meningitis. Clin Neurol 1990:30;553-556
160. Sato, Y, Sato Y, Kakisako S, Honda Y, Kaji M. Cerebral embolism and hyperthyroidism. Kurume Med J 1989:36;23-27
161. Sato, Y, Sato Y, Mizoguchi K, Ohta Y, Kaji M. Morphological and immunological studies of cerebrospinal fluid lymphocytes in two cases of Japanese encephalitis. Clin Neurol 1987:27;167-171
162. Sato Y, Mizoguchi K, Sato Y, Nakashima Y, Hayashi T, Kaji M. Brainstem auditory evoked potentials in basilar artery occlusion. Kurume Med J 1986:33;107-111

163. Sato, Y, Mizoguchi, K, Sato Y, Ohkita Y, Kaji M. Anticoagulant and thrombolytic therapy for cerebral embolism of cardiac origin. Kurume Med J1986:33;89-95
164. Sato, Y, Mizoguchi K, Sato Y, Utsunomiya H, Hayashi T, Kaji M. A case of peptostreptococcal meningitis associated with subarachnoid hemorrhage and subdural hematoma. Brain Nerve 1986:38;469-473
165. Sato Y, Mizoguchi K, Fujito H, Ohta Y, Kaji M. Meningeal involvement of myeloma. Kurume Med J 1985:32;109-113
166. Sato, Y, Sato Y, Hayashi T, Shojima K, Kaji M. Cerebrospinal fluid ferritin in patients with central nervous system tumors. Kurume Med J 1985:32;229-235
167. Sato, Y, Mizoguchi K, Sato Y, Ohta Y, Hayashi T, Shingu M, Kaji M. Cerebrospinal fluid cytology using a cytocentrifuge in the early diagnosis of cause of meningitis. Kurume Med J 1985:32;99-108
168. Sato, Y, Maehara F, Utsunomiya H, Hayashi T, Moritaka K, Kaji M. Convergence and retraction nystagmus in hydrocephalus due to shunt malfunction. Kurume Med J 1983:30;125-128
169. Sato Y, Kido H, Kaji M, Okita N. Acute pan-dysautonomia with recovery in a patient with chronic renal failure treated by intermittent hemodialysis. Kurume Med J 1982:29;55-59
170. Sato Y, Kaji, M, Kaciyama S, Nagasawa K. Aortitis syndrome and hyperthyroidism: A case report and review of the Japanese literature. Kurume Med J 1980:27;113-117
171. Yeh JK, Niu Q, Evans JF, Iwamoto J, Aloia JF Effect of circular motion exercise on bone modeling and bone mass in young rats: an animal model of isometric exercise.. J Musculoskel Neuron Interact 2001:1;235-240
172. Iwamoto J, Takeda T, Ichimura S, Ushiku N. Effects of moderate running exercise on bone mass and bone metabolism in mature osteopenic rats. J Jpn Bone Morphom 1998:8;107-117
173. Iwamoto J, Matsumoto H, Takeda T, Sato Y, Uzawa M. A radiographic study on the associations of age and prevalence of vertebral fractures with abdominal aortic calcification in Japanese postmenopausal women and men. J Osteoporos 2010;2010:748380
174. Iwamoto J, Takeda T, Sato Y, Matusmoto H. Associations of serum leptin concentration with gender, fat mass, interleukins, and growth factors in patients with osteoarthritis of the knee. Rheumatol Rep 2010;2:e6.
175. Iwamoto J, Kono H, Uzawa M. Comparative effect of alendronate and teriparatide on bone mineral density and bone turnover among Japanese postmenopausal women with history of fragility fractures: A clinical practice-based observational study. Osteoporos Sarcopenia 2015;1:63-69.
176. Iwamoto J, Sato Y, Uzawa M, Takeda T. Matsumoto H. Seven years' experience with etidronate in a woman with anorexia nervosa and vertebral fractures. Ther Clin Risk Manag 2011;7:275-81.
177. Iwamoto J, Sato Y, Uzawa M, Takeda T, Matsumoto H. Three-year experience with combined treatment with alendronate and alfacalcidol in Japanese patients with severe bone loss and osteoporotic fracture. Ther Clin Risk Manag 2011;7:257-64.

Figure 1

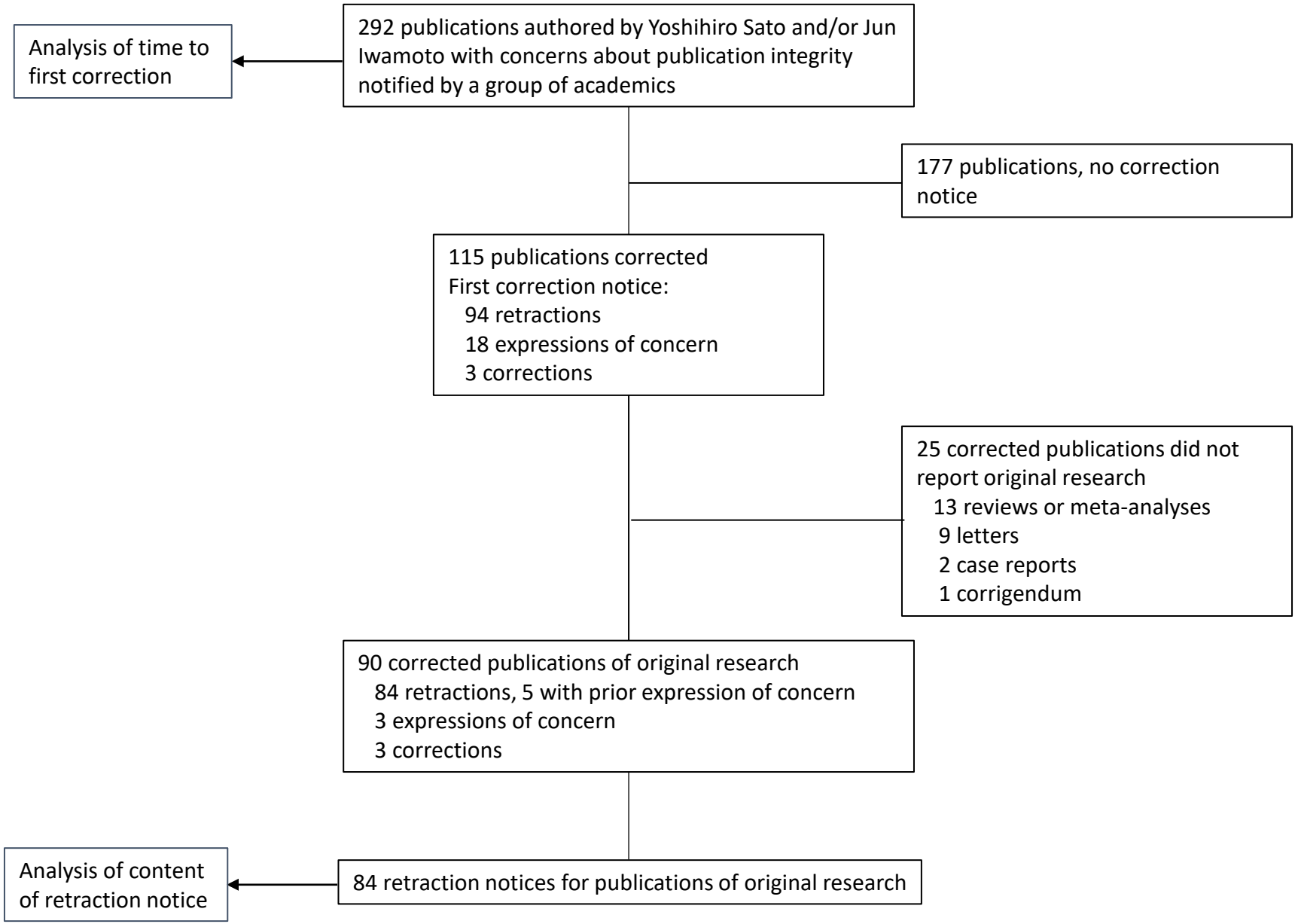

292 publications authored by Yoshihiro Sato and/or Jun Iwamoto with concerns about publication integrity notified by a group of academics
Analysis of time to first correction
177 publications, no correction notice
115 publications corrected
First correction notice:
94 retractions
18 expressions of concern
3 corrections
25 corrected publications did not report original research
13 reviews or meta-analyses
9 letters
2 case reports
1 corrigendum
90 corrected publications of original research
84 retractions, 5 with prior expression of concern
3 expressions of concern
3 corrections
84 retraction notices for publications of original research
Analysis of content of retraction notice

Figure 2

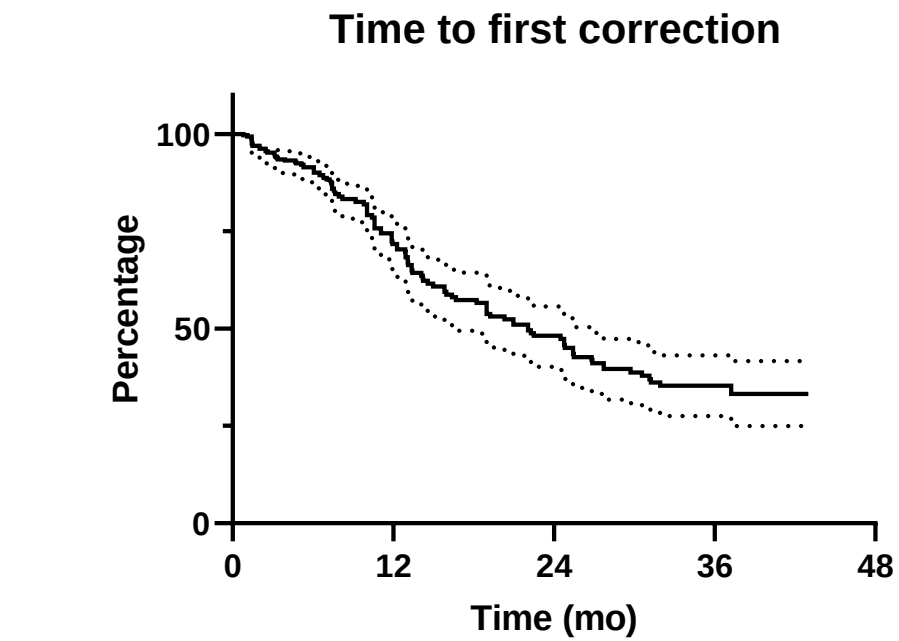

Time to first correction
Percentage
100
50
0
0
12
24
36
48
Time (mo)
Number at risk
292
107
65
22
Number of corrections
0
64
98
114

Figure 3

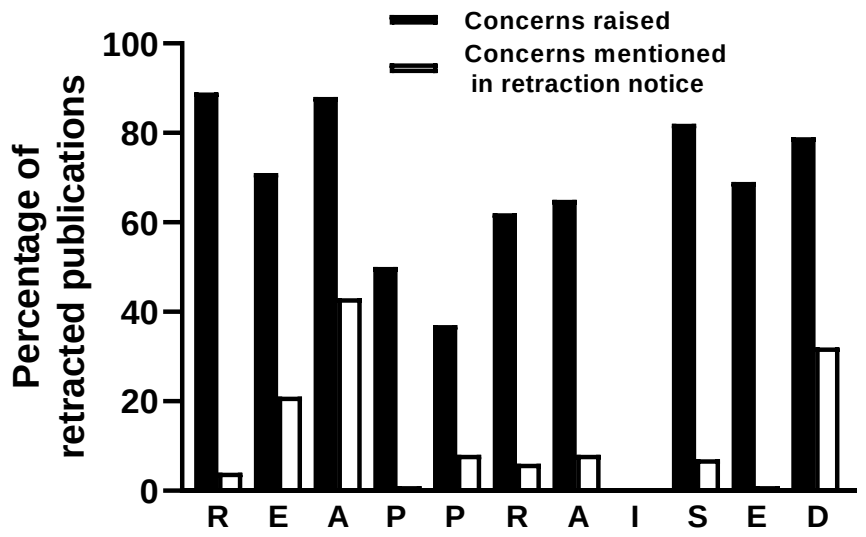
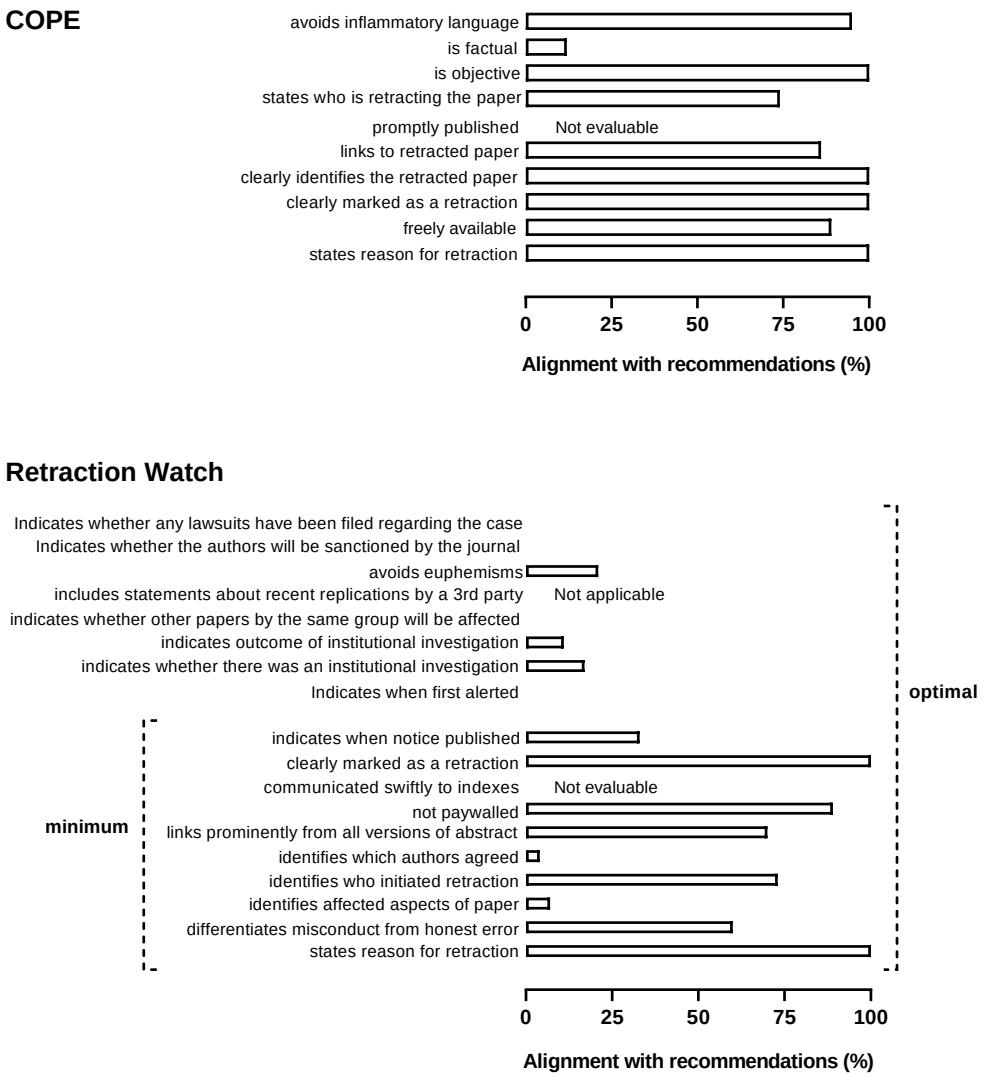
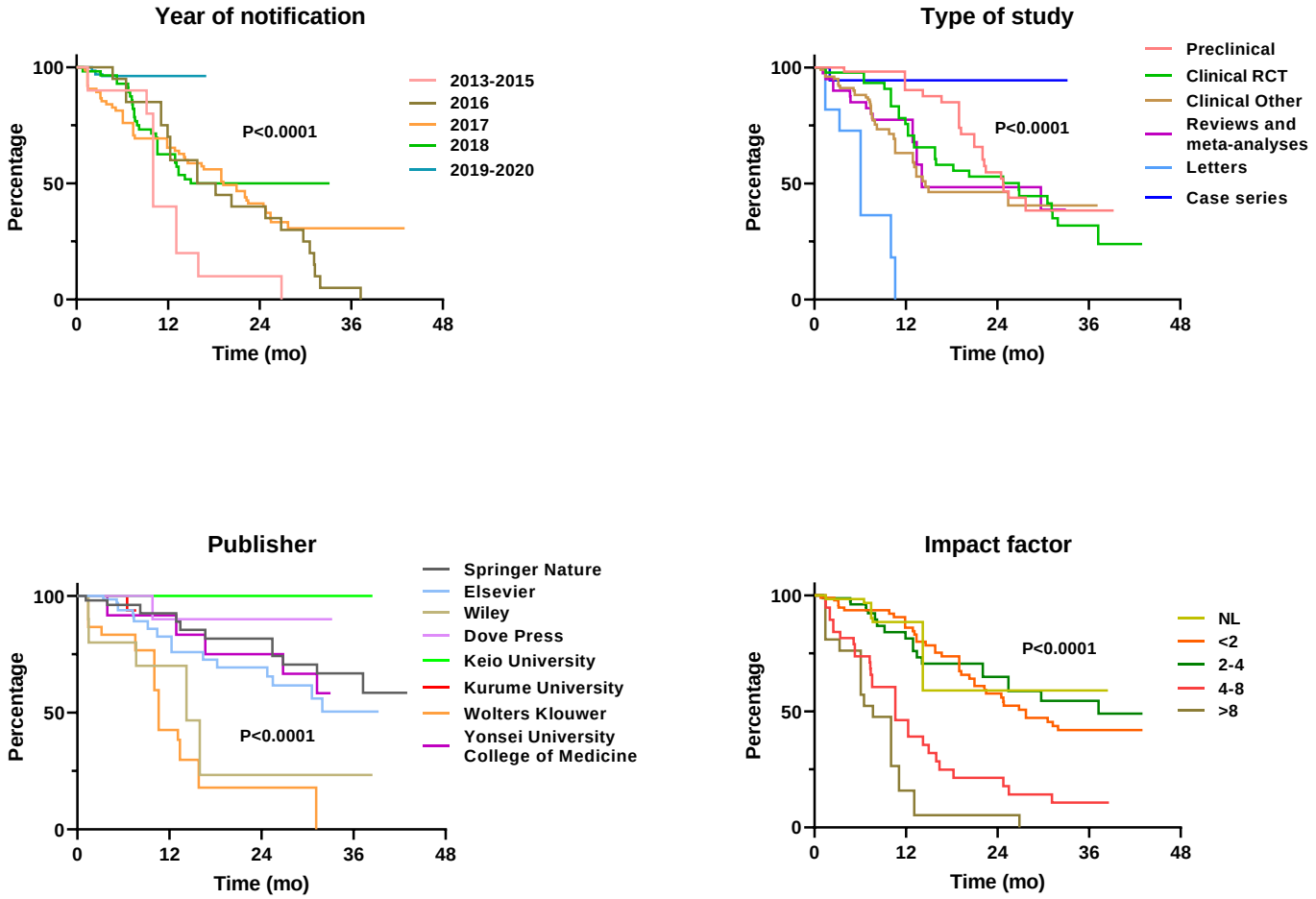

Concerns raised
Concerns mentioned in retraction notice
Percentage of retracted publications
100
80
60
40
20
0
R E A P P R A I S E D

Figure 4


COPE
avoids inflammatory language
is factual
is objective
states who is retracting the paper
promptly published
Not evaluable
links to retracted paper
clearly identifies the retracted paper
clearly marked as a retraction
freely available
states reason for retraction
0
25
50
75
100
Alignment with recommendations (%)
Retraction Watch
Indicates whether any lawsuits have been filed regarding the case
Indicates whether the authors will be sanctioned by the journal
avoids euphemisms
includes statements about recent replications by a 3rd party
Not applicable
indicates whether other papers by the same group will be affected
indicates outcome of institutional investigation
indicates whether there was an institutional investigation
Indicates when first alerted
optimal
minimum
indicates when notice published
clearly marked as a retraction
communicated swiftly to indexes
Not evaluable
not paywalled
links prominently from all versions of abstract
identifies which authors agreed
identifies who initiated retraction
identifies affected aspects of paper
differentiates misconduct from honest error
states reason for retraction
0
25
50
75
100
Alignment with recommendations (%)

Supplementary Figure



Time to first correction of publications co-authored by Yoshihiro Sato and Jun Iwamoto, according to year of submission of concerns to journal (top left), type of study (top right), publisher (bottom left) and impact factor of journal (bottom right).