

EDITORIAL

Further retractions of articles by Joachim Boldt

Hugh C. Hemmings Jr.^{1,*} and Steven L. Shafer²

¹Department of Anesthesiology, Weill Cornell Medicine, New York, NY, USA and ²Department of Anesthesiology, Stanford University School of Medicine, Palo Alto, CA, USA

*Corresponding author. E-mail: hchemmi@med.cornell.edu

The research fraud of Joachim Boldt initially appeared in a Notice of Retraction that appeared in the December 2010 issue of *Anesthesia & Analgesia*.¹ A subsequent review by Landesärztekammer Rheinland-Pfalz (LÄK-RLP), the State Medical Association of Rheinland-Pfalz, Germany, reviewed 74 papers authored by Boldt (Editors-in-Chief Statement regarding IRB Approval of Clinical Trials by Joachim Boldt. Available as Digital Supplement 1). Of these, 30 papers appeared to describe human

research conducted without IRB approval. A subsequent review of research by Klinikum Ludwigshafen, the institution where Boldt worked during much of his career, identified 16 manuscripts by Boldt for which the reviewers could not find evidence that the research had been conducted as published (https://www.kliilu.de/presse_termine/pressemitteilungen/pressearchiv/2012/hospital_presents_results_of_final_report_committee_completes_investigation_in_the_case_of_dr_boldt,

Table 1 Research articles published in the *British Journal of Anaesthesia* by Joachim Boldt from Justus Liebig University, Giessen, retracted for fraud.

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| Boldt J, Kling D, Zickmann B, Dapper F, Hempelmann G. Haemodynamic effects of the phosphodiesterase inhibitor enoximone in comparison with dobutamine in esmolol-treated cardiac surgery patients. <i>Br J Anaesth</i> 1990; 64 : 611–6 |
| Boldt J, Zickmann B, Herold C, Ballesteros M, Dapper F, Hempelmann G. Influence of hypertonic volume replacement on the microcirculation in cardiac surgery. <i>Br J Anaesth</i> 1991; 67 : 595–602 |
| Boldt J, Knothe C, Zickmann B, Ballesteros M, Russ W, Dapper F, Hempelmann G. The role of enoximone in cardiac surgery. <i>Br J Anaesth</i> 1992; 69 : 45–50 |
| Boldt J, Knothe C, Schindler E, Hammermann H, Dapper F, Hempelmann G. Volume replacement with hydroxyethyl starch solution in children. <i>Br J Anaesth</i> 1993; 70 : 661–5 |
| Boldt J, Knothe C, Zickmann B, Hammermann H, Stertman WA, Hempelmann G. Does correction of acidosis influence microcirculatory blood flow during cardiopulmonary bypass? <i>Br J Anaesth</i> 1993; 71 : 277–81 |
| Boldt J, Schindler E, Osmer C, Wittstock M, Stertman WA, Hempelmann G. Influence of different anticoagulation regimens on platelet function during cardiac surgery. <i>Br J Anaesth</i> 1994; 73 : 639–44 |
| Boldt J, Schindler E, Knothe C, Welters I, Stertman WA, Hempelmann G. Endothelial-related coagulation in cardiac surgery. <i>Br J Anaesth</i> 1995; 74 : 174–9 |
| Boldt J, Heesen M, Welters I, Padberg W, Martin K, Hempelmann G. Does the type of volume therapy influence endothelial-related coagulation in the critically ill? <i>Br J Anaesth</i> 1995; 75 : 740–6 |
| Boldt J, Papsdorf M, Uphus D, Müller M, Hempelmann G. Changes in regulators of the circulation in patients undergoing lung surgery. <i>Br J Anaesth</i> 1997; 79 : 733–9 |

Table 2 Review articles published in the *British Journal of Anaesthesia* by Joachim Boldt retracted for knowingly citing fraudulent work.

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| Boldt J. Volume replacement in the surgical patient—does the type of solution make a difference? <i>Br J Anaesth</i> 2000; 84 : 783–93 |
| Boldt J. The balanced concept of fluid resuscitation. <i>Br J Anaesth</i> 2007; 99 : 312–5 |
| Boldt J. Seven misconceptions regarding volume therapy strategies—and their correction. <i>Br J Anaesth</i> 2009; 103 : 147–51 |
| Boldt J. Use of albumin: an update. <i>Br J Anaesth</i> 2010; 104 : 276–84 |

Table 3 All papers by Joachim Boldt published in the *British Journal of Anaesthesia*.

| | Status | Comment |
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| Boldt J, Kling D, Zickmann B, Dapper F, Hempelmann G. Haemodynamic effects of the phosphodiesterase inhibitor enoximone in comparison with dobutamine in esmolol-treated cardiac surgery patients. <i>Br J Anaesth</i> 1990; 64 : 611–6 | Hereby retracted | From Justus Liebig University Giessen |
| Boldt J, Zickmann B, Herold C, Ballesteros M, Dapper F, Hempelmann G. Influence of hypertonic volume replacement on the microcirculation in cardiac surgery. <i>Br J Anaesth</i> 1991; 67 : 595–602 | Hereby retracted | From Justus Liebig University Giessen |
| Boldt J, Knothe C, Zickmann B, Ballesteros M, Russ W, Dapper F, Hempelmann G. The role of enoximone in cardiac surgery. <i>Br J Anaesth</i> 1992; 69 : 45–50 | Hereby retracted | From Justus Liebig University Giessen |
| Boldt J, Knothe C, Schindler E, Hammermann H, Dapper F, Hempelmann G. Volume replacement with hydroxyethyl starch solution in children. <i>Br J Anaesth</i> 1993; 70 : 661–5 | Hereby retracted | From Justus Liebig University Giessen |
| Boldt J, Knothe C, Zickmann B, Hammermann H, Stertman WA, Hempelmann G. Does correction of acidosis influence microcirculatory blood flow during cardiopulmonary bypass? <i>Br J Anaesth</i> 1993; 71 : 277–81 | Hereby retracted | From Justus Liebig University Giessen |
| Boldt J, Schindler E, Osmer C, Wittstock M, Stertman WA, Hempelmann G. Influence of different anticoagulation regimens on platelet function during cardiac surgery. <i>Br J Anaesth</i> 1994; 73 : 639–44 | Hereby retracted | From Justus Liebig University Giessen |
| Boldt J, Schindler E, Knothe C, Welters I, Stertman WA, Hempelmann G. Endothelial-related coagulation in cardiac surgery. <i>Br J Anaesth</i> 1995; 74 : 174–9 | Hereby retracted | From Justus Liebig University Giessen |
| Boldt J, Heesen M, Welters I, Padberg W, tin K, Hempelmann G. Does the type of volume therapy influence endothelial-related coagulation in the critically ill? <i>Br J Anaesth</i> 1995; 75 : 740–6 | Hereby retracted | From Justus Liebig University Giessen |
| Boldt J, Mueller M, Menges T, Papsdorf M, Hempelmann G. Influence of different volume therapy regimens on regulators of the circulation in the critically ill. <i>Br J Anaesth</i> 1996; 77 : 480–7. Retraction in: <i>Br J Anaesth</i> 2014; 112 : 397 | Previously retracted | From Justus Liebig University Giessen |
| Boldt J, Papsdorf M, Uphus D, Müller M, Hempelmann G. Changes in regulators of the circulation in patients undergoing lung surgery. <i>Br J Anaesth</i> 1997; 79 : 733–9 | Hereby retracted | From Justus Liebig University Giessen |
| Lehmann A, Faust K, Boldt J, Lang J, Thaler E, Werling C. Dynamic cardiomyoplasty in patients with end-stage heart failure: anaesthetic considerations. <i>Br J Anaesth</i> 1999; 82 : 140–3 | Not retracted | 2 case reports |
| Boldt J, Weber A, Mailer K, Papsdorf M, Schuster P. Acute normovolaemic haemodilution vs controlled hypotension for reducing the use of allogeneic blood in patients undergoing radical prostatectomy. <i>Br J Anaesth</i> 1999; 82 : 170–4. Retraction in: Reilly C. <i>Br J Anaesth</i> 2011; 107 : 116–7 | Previously retracted | From Justus Liebig University Giessen |
| Boldt J. Volume replacement in the surgical patient—does the type of solution make a difference? <i>Br J Anaesth</i> 2000; 84 : 783–93 | Hereby retracted | Review citing retracted papers |
| Hüttner I, Boldt J, Haisch G, Suttner S, Kumle B, Schulz H. Influence of different colloids on molecular markers of haemostasis and platelet function in patients undergoing major abdominal surgery. <i>Br J Anaesth</i> 2000; 85 : 417–23. Retraction in: Reilly C. <i>Br J Anaesth</i> 2011; 107 : 116–7 | Previously retracted | From Medicine Klinikum der Stadt Ludwigshafen |
| Boldt J, Hüttner I, Suttner S, Kumle B, Piper SN, Berchthold G. Changes of haemostasis in patients undergoing major abdominal surgery—is there a difference between elderly and younger patients? <i>Br J Anaesth</i> 2001; 87 : 435–40. Retraction in: Reilly C. <i>Br J Anaesth</i> 2011; 107 : 116–7 | Previously retracted | From Medicine Klinikum der Stadt Ludwigshafen |
| Suttner SW, Piper SN, Lang K, Hüttner I, Kumle B, Boldt J. Cerebral effects and blood sparing efficiency of sodium nitroprusside-induced hypotension alone and in combination with acute normovolaemic haemodilution. <i>Br J Anaesth</i> 2001; 87 : 699–705. Retraction in: Reilly C. <i>Br J Anaesth</i> 2011; 107 : 116–7 | Previously retracted | From Medicine Klinikum der Stadt Ludwigshafen |

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Table 3 Continued

| | Status | Comment |
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| Boldt J, Haisch G, Suttner S, Kumle B, Schellhaass A. Effects of a new modified, balanced hydroxyethyl starch preparation (Hextend) on measures of coagulation. <i>Br J Anaesth</i> 2002; 89 : 722–8. Retraction in: Reilly C. <i>Br J Anaesth</i> 2011; 107 : 116–7 | Previously retracted | From Medicine Klinikum der Stadt Ludwigshafen |
| Piper SN, Röhm KD, Boldt J, Faust KL, Maleck WH, Kranke P, Suttner SW. Inspired oxygen fraction of 0.8 compared with 0.4 does not further reduce postoperative nausea and vomiting in dolasetron-treated patients undergoing laparoscopic cholecystectomy. <i>Br J Anaesth</i> 2006; 97 : 647–53. Retraction in: Reilly C. <i>Br J Anaesth</i> 2011; 107 : 116–7 | Previously retracted | From Medicine Klinikum der Stadt Ludwigshafen |
| Mayer J, Boldt J, Schöllhorn T, Röhm KD, Mengistu AM, Suttner S. Semi-invasive monitoring of cardiac output by a new device using arterial pressure waveform analysis: a comparison with intermittent pulmonary artery thermodilution in patients undergoing cardiac surgery. <i>Br J Anaesth</i> 2007; 98 : 176–82. Retraction in: Reilly C. <i>Br J Anaesth</i> 2011; 107 : 116–7 | Previously retracted | From Medicine Klinikum der Stadt Ludwigshafen |
| Boldt J. The balanced concept of fluid resuscitation. <i>Br J Anaesth</i> 2007; 99 : 312–5 | Hereby retracted | Review citing retracted papers |
| Boldt J, Brosch Ch, Röhm K, Papsdorf M, Mengistu A. Comparison of the effects of gelatin and a modern hydroxyethyl starch solution on renal function and inflammatory response in elderly cardiac surgery patients. <i>Br J Anaesth</i> 2008; 100 : 457–64. Retraction in: Reilly C. <i>Br J Anaesth</i> 2011; 107 : 116–7 | Previously retracted | From Medicine Klinikum der Stadt Ludwigshafen |
| Boldt J, Suttner S, Brosch C, Lehmann A, Mengistu A. Influence on coagulation of a potato-derived hydroxethylstarch (HES 130/0.42) and a maize-derived hydroxethylstarch (HES 130/0.4) in patients undergoing cardiac surgery. <i>Br J Anaesth</i> 2009; 102 : 191–7. Retraction in: Reilly C. <i>Br J Anaesth</i> 2011; 107 : 116–7 | Previously retracted | From Medicine Klinikum der Stadt Ludwigshafen |
| Suttner S, Boldt J, Mengistu A, Lang K, Mayer J. Influence of continuous perioperative beta-blockade in combination with phosphodiesterase inhibition on haemodynamics and myocardial ischaemia in high-risk vascular surgery patients. <i>Br J Anaesth</i> 2009; 102 : 597–607. Retraction in: Reilly C. <i>Br J Anaesth</i> 2011; 107 : 116–7 | Previously retracted | From Medicine Klinikum der Stadt Ludwigshafen |
| Mayer J, Boldt J, Beschmann R, Stephan A, Suttner S. Uncalibrated arterial pressure waveform analysis for less-invasive cardiac output determination in obese patients undergoing cardiac surgery. <i>Br J Anaesth</i> 2009; 103 : 185–90. Retraction in: Reilly C. <i>Br J Anaesth</i> 2011; 107 : 116–7 | Previously retracted | From Medicine Klinikum der Stadt Ludwigshafen |
| Boldt J. Seven misconceptions regarding volume therapy strategies—and their correction. <i>Br J Anaesth</i> 2009; 103 : 147–51 | Hereby retracted | Review citing retracted papers |
| Boldt J. Use of albumin: an update. <i>Br J Anaesth</i> 2010; 104 : 276–84 | Hereby retracted | Review citing retracted papers |

accessed December 27, 2019. The report of the committee is available as Digital Supplement 2).

The *British Journal of Anaesthesia* recently learned of a final report reviewing the conduct of research conducted by Boldt under the auspices of Justus Liebig University Giessen (Mukherjee J. Statement on the scientific credibility of articles published by Joachim Boldt, formerly professor at Justus Liebig University (JLU), Giessen, Germany. Available as Digital Supplement 3). The authors of the report identified many inconsistencies in the data and publications conducted by Boldt at that university. Their report includes the following recommendation: 'In view of these inconsistencies and Dr Boldt's misconduct in this and many other aspects of scientific integrity, JLU recommends that journal editors retract all papers where Boldt is the responsible author even if there is no obvious indication of falsification'.

Based on this guidance, the *British Journal of Anaesthesia* hereby retracts all articles by Boldt describing research performed at Justus Liebig University Giessen that are published in the journal. These retracted papers appear in Table 1. Boldt published four review articles in the *British Journal of Anaesthesia*. These reviews knowingly cite his own fraudulent research, and we believe that review articles that knowingly cite fraudulent research also merit retraction. We are

therefore retracting these four review articles by Boldt as well. These retracted papers appear in Table 2.

Table 3 lists the articles published by Boldt in the *British Journal of Anaesthesia*. All but one of these are now retracted. The unimpeached paper is a case report by Lehmann and colleagues, for which Boldt is a coauthor. We do not have evidence that Boldt, one of several authors of this case report, fabricated the details about the case. Therefore, we are leaving this case report in the unimpeached medical literature.

Declarations of interest

HCH is editor-in-chief of the *British Journal of Anaesthesia*. SLS is a member of the editorial board of the *British Journal of Anaesthesia*.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.bja.2020.02.024>.

Reference

1. Shafer SL. Notice of retraction. *Anesth Analg* 2010; **111**: 1567