as having this complication depended upon the method of measurement. What was particularly striking was that there was no overlap between the groups defined by the two different methods. Hence, we do not know what our incidence of clinically important PONV is, should we use VAS75, PONVIS or both? Whatever the incidence, it occurs against the background of our best ever finding of 67% adherence to our PONV prophylaxis guidelines so, as we continue to audit this, it is important for us to have a reproducible method of measuring the incidence of severe PONV. Myles, Wengritzky and co-workers have made useful and important contributions to defining the severity of PONV. In clinical practice, we are never going to be able to eliminate PONV entirely and a more realistic hope will be to reduce the severity, such that the number of patients suffering enough to impair their recovery is minimized. We do however need to be able to capture these patients accurately, reliably, and reproducibly. Translating their findings to our in-patient population indicates that this important goal has not yet been reached.

Declaration of interest
None declared.

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Reply from the authors
Editor—We thank Dr Brampton and colleagues for their interest in our studies and applaud the Aberdeen Royal Infirmary (ARI) anaesthetic department’s audit practices. The most compelling observation of this audit was the moderately high incidence of any postoperative nausea and vomiting (PONV), but only a small proportion of this could be rated as clinically important. That is, most episodes of PONV are mild and often transient in nature. This reality can be likened to the presence of pain after ambulatory surgery, with most of it being well controlled and only of mild intensity. Why should we aim to eliminate PONV entirely, when it seems to not be a clinical problem for the majority of patients?

With respect to the different results obtained when using our two different PONV severity scales, we would recommend the 2012 version1 because our own experience was that the former scale was ambiguous for some clinicians and a sizeable proportion of patients. As outlined in our second publication,1 we chose to revise the PONV severity scale because of this ambiguity—we thus recommend the revised, simplified scale for future use. The validation cohort used in our original study included patients undergoing day stay and minor surgery.2

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Effects of an intraoperative infusion of 4% succinylated gelatine (Gelofusine) and 6% hydroxyethyl starch (Voluven) on blood volume

Editor—We read with interest the article comparing 4% succinylated gelatine and 6% hydroxyethyl starch (HES) and its findings that 6% HES produced a statistically significant greater increase in serum chloride concentration suggesting a tendency to produce hyperchloraemic acidosis in comparison with 4% succinylated gelatine, while the blood-volume expanding effects were not significantly different.1

The type of colloid used in the resuscitation of critically ill patients has been debated by clinicians for many years. However, the European Society of Intensive Care Medicine (ESICM) Task Force have advised in March 2012 against the use of HES in patients with severe sepsis or risk of acute kidney injury.2 Furthermore, the Scandinavian Starch for Severe Sepsis/Septic Shock Trial (6S) has shown there to be an increased 90 day mortality and increased risk of acute kidney injury requiring renal replacement therapy with 6% HES,3 and thus, we feel together with the results of the published article, there is now strong evidence to suggest we should not be using HES in critically ill patients.

Recently, the use of any colloid in the resuscitation of critically ill patients has been questioned, with a Cochrane Systematic Review concluding that there is currently no evidence from randomized control trials that shows a survival advantage with colloids of any kind vs crystalloids.4

In this time of debate over colloid use, we are however receiving increasing promotion of balanced gelatines, for example, isoplex, a 4% succinylated gelatine solution for infusion...
containing a balanced electrolyte system. The proposed benefit of colloids in balanced solutions and not in saline-based fluids is avoidance of clinically relevant hyperchloremic acidosis. However, as we have seen from the published article by Awad and colleagues, administration of 6% HES, and not the unbalanced 4% succinylated gelatine, was associated with a significant and sustained hyperchloremia and tendency to hyperchloremic acidosis. A recent review of balanced solutions vs isotonic saline fluids, including crystalloids and colloids, concluded that dilutional hyperchloremic acidosis is a side-effect, mainly observed after the administration of large volumes of isotonic saline as a crystalloid and not colloid and that there is a relative paucity of data documenting the detrimental effects of this acidosis. There is currently little published data on the effects of balanced colloid solutions on outcome and therefore until such time, their routine use is questionable.

Declration of interest

None declared.

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1 Awad S, Dharmavaram S, Waern CS, Dube MG, Lobo DN. Effects of an intraoperative infusion of 4% succinylated gelatine (Gelofusine) and 6% hydroxyethyl starch (Voluven) in blood volume. Br J Anaesth 2012; 109: 168 – 76
5 Beacon Pharmaceuticals. Achieve the right balance, ISOPLEX Product Details. Available from www.beaconpharma.co.uk/AAHIsoplex/ (accessed 20 August 2012)
doi:10.1093/bja/aet317

Haemodilution made difficult

Editor—I have read the BJA article comparing the effects of Gelofusine and Voluven on the blood volume (BV). The variations in BV were assessed by changes in haematocrit. As I have an interest in dilution kinetics, I inserted arbitrary data into the presented equations to see if they yield logical results. Unfortunately, that is not the case.

Suppose that we infuse a patient having a BV of 5 litres (BV0) with enough Gelofusine to decrease the haematocrit from 0.40 to 0.36. The second equation reading \( \Delta HCT \) is:

\[
100 \times (HCT_0 - HCT_t)/HCT_0 \quad \text{then gives} \quad 100 \times (0.40 - 0.36)/0.40 = 10\%.
\]

So far, so good.

The third equation is intended to convert \( \Delta HCT \) into the percentage increase in BV (\( \Delta BV \)). In my example, one would expect \( \Delta BV \) to be something in the range of 10%, or 0.5 litres. However, the equation reads

\[
\Delta BV = 100 \times BV_0 \times \Delta HCT/HCT_t
\]

which yields 100 \( \times 5 \times 0.1/0.36 \), that is, that the BV increases by 139%, or by almost 7 litres. With this result half-way through the math section, it is time to review the accuracy of all presented equations.

I find one minor error, one major error, and one ambiguity.

The minor error is introduced already in the first equation where BV0 is derived from anthropometric measures. The referred paper by Nadler and colleagues proposes different equations for males and females. The one used here is applicable for males only, although the number of females in the present study outnumbered the males by 3:1.

This major error is the conversion from the percentage increase in BV to the corresponding volume increase is made twice, both in the third and fourth equations. In fact, the third equation gives BV, instead of \( \Delta BV \), and the fourth equation is therefore superfluous.

The ambiguity is that \( \Delta HCT \) in the third equation must represent the absolute difference in haematocrit, that is, \( HCT_0 - HCT_t \), to make sense. However, the authors have already defined \( \Delta HCT \) as the relative difference in the second equation. This fooled me in my example. I perceive the percentage sign as a scaling factor, while the authors probably mean that \( \Delta HCT \), the absolute difference in the second equation. This fooled me in my example. I perceive the percentage sign as a scaling factor, while the authors probably mean that \( \Delta HCT \) is the absolute difference and that \( \Delta HCT/\% \) is the relative difference. If not, \( \Delta BV \) in the third equation (which is, in fact, BV0) is obtained by dividing \( HCT_0 - HCT_t \) by both HCT0 and HCTt while it should be divided only by HCTt.

The series of five equations is constructed so that any error will be perpetuated and affect the final result, which is \( \Delta BV \) (litre). The same set was recently used by the same group in another high-impact journal, the Annals of Surgery. Both articles refer to a previous work to support the accuracy of the equations used, but the critical conversion of \( \Delta HCT \) to \( \Delta BV \) is made differently there.

These mathematical problems suggest that authors, reviewers, editors, and/or journal statisticians should insert simple assumed data into equations to see if they yield logical results. The results must also be clear enough to preclude variability in interpretation. The results presented later in the cited papers show that the actual calculations have been carried out by following a course different from the one outlined in the Methods section.

Declaration of interest

R.G.H. is a researcher in the field of dilution kinetics.

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1 Awad S, Dharmavaram S, Waern CS, Dube MG, Lobo DN. Effects of an intraoperative infusion of 4% succinylated gelatine (Gelofusine) and