Reply from the authors

Editor—We thank Drs Kerry and Pouchet for their interest in our study. The chief goal of the study was to assess how revised cardiac risk index (RCRI) was related to non-cardiac morbidity, rather than to develop a new risk-scoring system per se. Comparison with previous RCRI studies is impossible due to their exclusive focus on reporting cardiac ischaemic complications rather than predefined, non-cardiac morbidities. Clearly, describing cardiac/cardiovascular outcomes in isolation from other complications only tells a small—and arguably less important—part of the perioperative clinical phenotype. Offering a systematic insight into how pre-operative cardiac morbidity relates to apparently unrelated non-cardiac postoperative morbidity also helps with planning interventional studies based on reducing postoperative morbidity (http://www.ucl.ac.uk/anaesthesia/trials). As identified by Drs Kerry and Pouchet, the original RCRI equated to a specific risk of major cardiovascular morbidity or death. In addition to ‘traditional’ RCRI factors, we explored minor pre-existing morbidities that have not been systematically considered before, although these are considered relevant by the ACC/AHA guidelines as evidenced by the statement: ‘The presence of multiple minor predictors might lead to a higher suspicion of CAD but is not incorporated into the recommendations for treatment’. Substantial data from the general medical literature suggest that such apparently minor findings (e.g. non-specific ECG abnormalities) are related to all-cause, cardiovascular death, or both. Regardless of how the score for the modified (mRCRI) >2 was achieved, a higher incidence of morbidity and prolonged length of stay was observed. In other words, apparently minor, common factors previously identified to be important in large-scale epidemiology studies were also related to increased perioperative morbidity.

Owing to the smaller numbers identified with an mRCRI >3, the predictive capability of the mRCRI system is unsurprisingly questionable. Notably, however, a substantially greater cohort of higher-risk patients found a similar relationship for patients with RCRI >3 and perioperative death/MI, suggesting a ‘threshold’ which was mirrored in our study.

Conflict of interest
None declared.

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Cold irrigating fluids during endoscopy

Editor—Dr Fonseca and colleagues have explored the effect of temperature on the fluidity of solutions used for irrigation of the bladder during endoscopy. They suggest, based on laboratory experiments, that cold solutions might be preferred since low temperature would cause less fluid absorption.

I hope that no researcher attempts to investigate this issue in patients. Cold solutions have already been tried in the early 1960s and caused a 20% incidence of surgical complications, mostly fluid absorption, during resection of bladder cancer. Clinicians generally refrain from cold solutions because they increase the thermal loss during endoscopy. Even modest hypothermia (1–2°C) makes the patient ‘feel cold’ and increases myocardial work and oxygen consumption due to vasocostriction and even shivering. Fluid absorption makes things even worse as it further lowers (in particular) the rectal temperature, even when prewarmed solutions are used. Fluid absorption occurs only during a minority of the time periods of surgery when the prerequisites for absorption are fulfilled, which consist of surgically opened veins and fluid pressure that exceeds the venous pressure. A sudden decrease in arterial pressure often occurs when absorption begins, which suggests that a haemodynamic change might initiate a ‘suctioning’ effect. Once started, fluid absorption does not stop until surgery ends.

I have two suggestions for those who want to limit fluid absorption as an issue. Both are safer than the use of cold irrigating fluid. The first is to stop using glycine 1.5%. In numerous studies in animals and humans, glycine 1.5% has been shown to cause more tissue damage and symptoms than alternative fluids. The second suggestion is to start monitoring fluid absorption with, for example,
ethanol. This method is cheap, works well, and was fully evaluated 15 yr ago but has, as with the bad safety profile for glycine 1.5%, largely been disregarded by the medical community. The bipolar resection technique is probably an improvement but the issue is poorly studied at present.

**Conflict of interest**

None declared.

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**Reply from the authors**

Editor—We thank Prof. Hahn for sharing his views on our paper and we agree that intravasation rate must be monitored. However, first and foremost, we are not asking surgeons to use cold irrigation/distension solutions/fluids (IRR SOL) for preventing fluid overload. Actually, we are suggesting avoiding the use of warm IRRSOL for preventing hypothermia, although there are no studies concerning risks and benefits. A specific study addressing changes in dynamic viscosity of IRRSOL to evaluate the influence of temperature on the actual intravasation rate during resection surgeries is clearly needed. Indeed, temperatures from 15°C to 25°C (for example) do not preclude identifying the role of fluid fluidity variation on clinical IRRSOL absorption while controlling other known variables such as hydrostatic pressure, irrigation flow, and types of surgery and tissue (fibroid, endometrium, uterine muscle, prostate, or bladder). Urological procedures are not only different per se, but also sex and age illustrate temperature-related concerns. Young patients may just feel uncomfortably cold, but elderly patients are more susceptible to significant consequences of hypothermia. A complex hysteroscopic myomectomy, for example, is not comparable with a large endometrial ablation. Thus, the risk of fluid overload tends to be higher in the former because of large vessels in the fibroid. Therefore, we should think about these conditions separately.

Fortunately, bipolar resection has become available in operative hysteroscopy in Brazil. Despite the main advantage of bipolar probes (using electrolyte IRRSOL), we need also to check fluid absorption continuously to avoid normonatraemic fluid overload.

Routinely, we use deep sedation or general anaesthesia even for monopolar resections of multiple fibroids and we can stop surgery before problems occur thanks to a simple and rigorous volumetric balance of IRRSOL (which is at room temperature).

Last but not least, we are not keen on using ethanol monitoring of fluid absorption; we think patients should not be unnecessarily awake during any surgery. Furthermore, when fluid absorption reaches 1000 ml of 1% IRRSOL, patients will have received an i.v. dose of 10 ml of 100% ethanol and monitoring of conscience will become unreliable. Ethanol may interact with benzodiazepines and other drugs.

**Conflict of interest**

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**Increase in endogenous erythropoietin synthesis through the normobaric oxygen paradox in cardiac surgery patients**

Editor—Exogenous erythropoietins (EPOs) are used worldwide to reduce allogenic blood transfusion exposure. However, their use can be associated with some serious adverse effects and has a significant economic impact on public health systems because of the high cost of these drugs.