consequences of the intra- and postoperative stress response which culminates in adverse in-hospital and long-term cardiac outcome. Thus, although we recognize that the importance of postoperative NT-proBNP determination in non-cardiac surgery was just recently published, the significance of the results of Cuthbertson and colleagues would have been further improved by a prolonged observation period and by additional postoperative BNP determinations.

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Editor—In reply to the interesting points made by Dr Mahla and colleagues, we agree with many of the statements made in their letter. However, the measurement of BNP in the postoperative period does not add any additional predictive power to preoperative BNP measurement in the prediction of these short-term outcomes such as early postoperative cardiac events (unpublished data from same cohort). Further, our work on the predictive power of BNP for medium term mortality is about to be published in the American Journal of Cardiology within the next 2 months. I am sure the respondents will find this paper interesting. Although we may have missed some of the postoperative cardiac events occurring in hospital in this cohort due to our timing of measurements, we feel that any significant events will be detected in medium term mortality analysis. As they state, other work suggests this is the case.

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2 Dernellis JM, Panaretou MP. Assessment of cardiac risk before noncardiac surgery: brain natriuretic peptide in 1590 patients. Heart 2006; 92: 1645–50

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In defence of early warning scores

Editor—Although we acknowledge the valuable recent contribution made in relation to physiological scoring by Duckitt and colleagues, it is with some concern that we read the final conclusions in the accompanying editorial. As co-developers of the first early warning scoring (EWS) system, based on aggregate weighted scoring of physiological variables, we must re-emphasize that EWS was designed solely to secure the timely presence of skilled clinical help by the bedside of those patients exhibiting physiological signs compatible with established or impending critical illness. The original EWS was not presented as a predictor of outcome. The overall clinical course for most critically ill patients is punctuated by multiple potential confounding influences making such attempts at final outcome prediction, on the basis of early routine standard bedside observations, an unrealistic expectation.

Although the medical emergency team (MET) calling criteria do represent a form of physiological tracking, they do not include the assignment of weighted numerical values to the degree of deviation of given physiological variables from agreed normal ranges, nor do they utilize any form of numerical score or score trigger value at which skilled help is summoned to the bedside. By the early 2000s, EWS had become synonymous with a wide range of variations from the original, including some non-aggregate weighted scoring systems. In order to address this particular ambiguity in terminology, the National Outreach Forum (NorF) adopted the phrase ‘Physiological Track and Trigger System’ in 2003. ‘Physiological Track and Trigger System’, as a descriptive, accommodates all systems which include calling criteria based on any form of physiological tracking, together with a threshold at which mandatory assistance is summoned.

Cuthbertson and Smith cite the recent publication by Gao and colleagues and quote the authors as concluding that ‘there was little evidence of reliability, validity and utility’ in relation to current scoring systems, and that the sensitivity of such systems was poor. Gao and colleagues based their conclusions on use of the composite outcome measure of death, admission to critical care, ‘do not attempt resuscitation’ or cardiopulmonary resuscitation. As far as we are aware, data available to these authors
afforded them no estimate of the number of patients whose clinical course was positively influenced through the use of EWS at ward level and who, as a result, were not admitted to critical care and did not suffer cardiac arrest or death. Application of the aforementioned composite end point describes final patient outcome, not only as a reflection of a given physiological track and trigger system, but also as a reflection of the nature of the accompanying response algorithm, in addition to all other confounding variations in subsequent clinical management.

The work currently underway by Smith and colleagues\(^8\) may lead to a greater degree of accuracy in the tracking of physiological parameters through the use of electronic data capture and analysis against a track and trigger algorithm. Although such electronic data capture helps offset human error in the calculation of physiology scores, the work in question is still in its developmental stage and the relevant practical tools are not likely to be available to the majority of healthcare professionals in even the near future.

Cuthbertson and Smith also imply that the routine application of physiological track and trigger scoring to all acute patients generates a significant additional workload. Work in the late 1990s confirmed that the application of an aggregate weighted scoring system, with calculation of a total score, took only 30 s to complete (personal communication). The time taken to complete an aggregate score is now significantly less with improved hard copy ward observation charts incorporating EWS principles in their primary design. Physiological track and trigger can be applied to all acute patients with minimal extra effort for significant potential gain.

Routine measurement of ‘basic observations’ to assist in assessment of the severity of a patient’s illness and their clinical progress has been a mainstay of medical and nursing practice for decades. Indeed, it has been a form of implicit physiological tracking but without an explicit ‘trigger’. EWS represents a simple refinement to the completion of basic observations by the assignment of weighted values to time honoured physiological variables according to their degree of deviation from the norm. A total score is then calculated and executive action initiated at an agreed trigger threshold. This trigger threshold is used to assist inexperienced nursing or medical staff in securing immediate, more experienced help. The process enables the implementation of prompt, appropriate customized management plans. These plans are often very simple in the early stages of physiological deterioration but at other times significantly more complex and resource intensive. Such tailored individual patient management clearly represents high-quality care.

It is notable that the National Institute for Clinical Excellence (NICE), in its recent (July 2007) definitive guidance on ‘Acutely ill patients in hospital’\(^9\) recommend, as a priority, that ‘physiological track and trigger systems should be used to monitor all patients in acute hospital settings’. This priority recommendation echoes an exactly similar priority recommendation made by the National Confidential Enquiry into Patient Outcome and Death (NCEPOD) in 2005 in their publication entitled ‘An Acute Problem’\(^10\). In many acute hospitals in England, the current use of track and trigger scoring systems facilitates the prompt summoning of skilled help to the bedside. We remain convinced that this process enables the ‘high-quality clinical assessment and judgement by appropriately skilled and experienced personnel’, as applauded by Cuthbertson and Smith in their closing comments, to be applied in a more timely fashion than might otherwise have been the case.

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Hiccusp during weaning from mechanical ventilation: the use of nefopam

Editor—We report the use of nefopam in two cases with severe hiccusp occurring during mechanical ventilation weaning in neurosurgical patients. The first patient was a 46-yr-old male admitted to intensive care after a subarachnoid haemorrhage with early generalized seizures requiring sedation and mechanical ventilation. Neurosurgical clipping was performed 24 h after arrival, and an intracranial