A New Look — Form Follows Function
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With this issue, we introduce a new look for the Journal. The new design reflects our continuing effort to improve many aspects of the Journal. This redesign was not undertaken lightly and required months of work by many people. Although aesthetics played a part, we strove in all changes to live by the maxim “form follows function.”

In the newly designed Journal, the pages are less crowded, and more distinctive headings have been added in order to facilitate navigation and improve readability. The page layout gives us greater flexibility in the presentation of complex tables and figures. The new typeface, a Dutch newspaper font called Quadraat, should increase reading speed; its design is based on the fruits of decades of research into legibility and readability. We have added shading to our tables so that reading data across multiple columns will be easier; we have also modified our figures and illustrations so that they will be clearer and more distinctive.

Some changes reflect shifts in emphasis. Since methods are critical to research, we have restored the Methods section to full-size type. We also wanted to demarcate more clearly where letters to the editor begin and end, so a new heading scheme was devised. To make the abstracts of articles more readable, each one is presented as the sole item on the opening page of the article. The introductory section “This Week in the Journal” has been redesigned to provide a succinct digest of the contents of each issue.

The cover of the Journal continues to display our most important asset — our editorial content. The primary change on the cover is a slightly altered layout for the table of contents. With this layout, a given feature, such as Perspective, Editorials, Images in Clinical Medicine, and Case Records of the Massachusetts General Hospital, will always appear in the same place on the cover. As a result, it will be easier to find a particular section or feature each week.

The new design is one of a series of ongoing improvements in the Journal that has included This Week in the Journal, the biweekly Clinical Practice articles, Perspective essays, the Weekly Continuing Medical Education Program, and a Web site with various new services for subscribers. At several stages during the design process, we asked some of our readers for guidance and opinions, which proved invaluable on many crucial points.

We remain committed to publishing the highest-quality research and reliable, authoritative review articles. The Journal’s traditions of editorial independence, content uninterrupted by commercial advertising, and academic rigor will continue to be strictly upheld. We welcome your thoughts about the new design and other changes in the Journal. If, after a few issues with this new look, you have ideas or opinions about how to enhance the design, usefulness, or readability of the Journal, please let us know.

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Progress in Research on Pulmonary-Artery Catheters
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Pulmonary-artery catheters are widely used in critically ill patients both for diagnosis and to guide therapy. According to current estimates, there are more than 1.2 million pulmonary-artery catheters
placed annually in the United States, with associated costs of over $2 billion. A layperson might assume that if a form of medical technology is so widely used, there must be clear-cut indications for its clinical use. Unfortunately, that would be an incorrect assumption. The indications for placement of a pulmonary-artery catheter, the interpretation of the data generated by the catheter, and the goals for therapy directed by it all remain to be clarified.

However, progress is being made toward a definition of the appropriate role of the pulmonary-artery catheter in clinical practice. In this issue of the Journal, Sandham and his colleagues in the Canadian Critical Care Clinical Trials Group report the results of a prospective, randomized, controlled clinical trial comparing therapy directed by a pulmonary-artery catheter with standard care in 1994 high-risk surgical patients. The patients randomly assigned to the catheter group had the catheter placed preoperatively, with specified treatment goals and priorities that had been developed by consensus among the investigators. In the standard-care group, there were no specified treatment goals. Placement of a central venous catheter was at the discretion of the treating physician; 77 percent of patients in this group had a central venous catheter placed. There was no significant difference in inhospital mortality between the groups (7.8 percent in the group with pulmonary-artery catheters vs. 7.7 percent in the standard-care group), but there was a significant increase in the incidence of pulmonary embolism in the catheter group (8 events vs. 0 events). More patients in the catheter group than in the standard-care group received inotropic agents, vasodilators, antihypertensive medication, packed red cells, and colloid, indicating that the study protocol resulted in differential treatment in the two groups.

These findings should affect patient care. They lend further credence to recent nonrandomized clinical studies involving patients during the perioperative period, including a meta-analysis of the literature and a prospective, observational study that also showed that pulmonary-artery catheters are not beneficial and that their use may be associated with increased morbidity. Thus, the routine insertion of pulmonary-artery catheters perioperatively in high-risk surgical patients is not warranted.

The history of the pulmonary-artery catheter illustrates how our enthusiasm for new technology led us to incorporate its use into daily practice with little, if any, of the rigorous review required for new pharmacologic therapies. From the time that pulmonary-artery catheterization was first performed in the mid-1940s until the early 1970s, pulmonary-artery catheters were used almost exclusively in catheterization laboratories to determine whether patients with cardiac disease (primarily congenital and valvular defects) were eligible for surgical intervention. The uses of the pulmonary-artery catheter expanded from diagnosis alone to include the direction of therapy when Swan and colleagues introduced the balloon-tipped catheter that could be inserted at the bedside. No clinical trials were conducted to determine whether patient outcomes were altered by the data derived from insertion of these catheters or the associated therapeutic interventions. Benefit was simply assumed.

However, this assumption was challenged when data from nonrandomized studies involving patients with acute myocardial infarction suggested that mortality among patients with a pulmonary-artery catheter was higher than that among patients without such a catheter. Although these findings raised serious questions about the use of these catheters, the studies were criticized for their design, particularly because patients in whom pulmonary-artery catheters were inserted may have been sicker than those in whom they were not used.

In the early 1990s, a randomized clinical trial of the use of pulmonary-artery catheters in critically ill patients was attempted by the Ontario Intensive Care Study Group. However, many physicians believed that it was unethical to withhold the insertion of a pulmonary-artery catheter in such patients, whereas others believed that it was unethical to insert one. Either way, these beliefs limited enrollment in the trial, and it could not be completed.

In 1996, Connors et al. published the results of an observational study involving 5735 critically ill medical and surgical patients; the authors concluded that pulmonary-artery catheters were associated with an increase in mortality. The response to that trial in the medical literature and the lay press clearly illustrated the state of chaos regarding the use of pulmonary-artery catheters. The responses ranged from consideration of a moratorium on the use of pulmonary-artery catheters to a recommendation for the rapid initiation of randomized clinical trials to study the use of these catheters in myriad clinical conditions. Fortunately, the end result of the discussions was the agreement that there was equipoise for clinical trials of the pulmonary-
artery catheter and there were several disease processes that warranted study.\textsuperscript{10,14} Concern was voiced, however, that it could be difficult to convince physicians to participate in the trials.\textsuperscript{12} This concern was allayed somewhat by the successful enrollment of 201 patients in a randomized, controlled trial of pulmonary-artery catheterization in critically ill patients.\textsuperscript{15} Although that trial was not large enough for its results to be conclusive, it served as a pilot study that demonstrated the feasibility of trials of pulmonary-artery catheterization in critically ill patients.\textsuperscript{12}

Sandham and colleagues have substantially furthered the progress in research in critical care with their current study. They have clearly demonstrated that physicians will allow their patients to be randomly assigned to either treatment group in a clinical trial that involves not only the insertion of a pulmonary-artery catheter, but also the implementation of therapy directed by that catheter. Furthermore, their study demonstrates the feasibility of conducting large, adequately powered, multicenter, controlled trials of pulmonary-artery catheterization. These accomplishments represent milestones in research in clinical critical care that would not have been possible less than two decades ago.

Whether the results of this trial extend to groups of patients other than the high-risk surgical patients who were studied is not known. The use of the pulmonary-artery catheter is currently being studied in patients with other clinical syndromes, including acute lung injury and congestive heart failure.\textsuperscript{14} The design and execution of these trials have enhanced our understanding of the complexity of studying a technology that is already so widely used in clinical practice. The determination of which clinical questions are important to ask and the designing of appropriate trials with which to answer those questions have led to debates that would not have been considered a decade ago. These debates represent the progress we have made in research related to critical care and the difficulty posed by the legacy of an over-enthusiastic embracing of technology without adequate assessment. I hope that we are learning from our experience.

From the University of Vermont College of Medicine, Burlington.


\textbf{The NEW ENGLAND JOURNAL of MEDICINE}

\textbf{\textit{\alpha_4 Integrins as Therapeutic Targets in Autoimmune Disease}}

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In this issue of the Journal, two groups of investigators report on clinical trials of natalizumab, a recombinant monoclonal antibody against $\alpha_4$ integrins, for the treatment of multiple sclerosis\textsuperscript{1} and Crohn’s disease.\textsuperscript{2} Miller et al. report that a group of patients with multiple sclerosis who received monthly injections of natalizumab had significantly fewer new inflammatory central nervous system lesions than the placebo group (a reduction of approximately 90 percent) and had approximately