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Impact Versus Impact Factor: Revisiting a Classic Article that was Never Cited

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Eighty-nine years ago, *Anesthesia & Analgesia* published an article by the eminent anesthesiologist and inventor Elmer I. McKesson entitled *The Reaction of Certain Circulatory Conditions to Anesthesia and Surgery*.¹ In the most recent piece of McKesson hagiography to appear in this journal,² he was remembered principally for his innovations in developing anesthetic delivery systems (including the oxygen-flush valve),³ for his unceasing advocacy on behalf of nitrous oxide anesthesia^{4–14} (administered in a percentage that undoubtedly required frequent use of said flush valve),³ and for his administrative skills in helping to found and preside as the first president of the International Anesthesia Research Society.¹⁵ It therefore may be surprising that in this classic work, he focused on none of these subjects.

Rather, McKesson's work had two major themes that remain as relevant today as they were in 1923. First, he would advocate for measuring the heart rate, respirations, and arterial blood pressure during anesthesia, and second he would offer an explanation of why such physiologic monitoring mattered.

Regarding the measurement of physiologic variables, he was fighting against the practice among his contemporaries of merely judging the subjective quality of the pulse and instead insisted on converting the vague notion of pulse quality into a numerical arterial blood pressure through the use of the recently developed sphygmomanometer. While McKesson's work came two decades after Cushing first introduced arterial blood pressure measurement to the American operating room,¹⁶ he offered an important addition to the discussion by way of the second major theme of his classic article, a description of the stages of intraoperative shock that demonstrated why determining the arterial blood pressure was useful for anesthesiologists in the first place, a theme that remains the subject of scholarly work in this journal to the present day.¹⁷

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McKesson argued that careful attention to trends in the arterial blood pressure and heart rate, along with knowledge of the patient's underlying cardiac disease, could be used to anticipate, grade, and tailor therapy for shock. His preferred treatment for shock, the administration of IV normal saline in an amount sufficient to restore the blood pressure to within 10% of its starting value, presaged the development of early goal-directed therapy that would re-emerge in the 21st century as a cornerstone of critical care for the septic patient.¹⁸

McKesson's work on intraoperative shock would feature prominently in *Gwathmey's Anesthesia*, James T. Gwathmey's contemporaneous textbook of anesthesia,¹⁹ in which McKesson argued that sphygmomanometry enabled the potentially lifesaving anticipation of hemodynamic collapse. Perhaps as a testament to the esteem with which McKesson was held, Gwathmey's textbook declared the official motto of the anesthetist to be not *vigilance*, but rather *anticipation*!

McKesson proceeded from his discussion of shock to suggest that careful patient monitoring should continue into the critical hours after emergence from anesthesia. He also recommended that morphine be administered in a dose titrated to its desired effect on an individual patient rather than by a predefined one-size-fits-all order. McKesson generalized this concept of drug titration to the conduct of the anesthetic as a whole, for which he argued that a light plane of anesthesia sufficient to accomplish the desired effect would lead to the safest possible anesthetic and a decrease in the incidence of intraoperative shock.

Eighty-nine years have passed since McKesson's innovative manuscript appeared in *Anesthesia & Analgesia*. For journal editors and academic professionals who take note of "impact factors," it is of interest to note that 89 years have also passed since his "classic article" was last referenced in this or any other medical journal. Given its foundational importance for the areas of patient safety and the interpretation of arterial blood pressure, we are certain that however many years should pass before McKesson's manuscript is again cited, its enduring importance will remain undiminished. Dr. Elmer McKesson's work provides a distinctive example of the statement "...the major achievements in surgery could not occur without the accompanying vision of pioneering anesthesiologists."³

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