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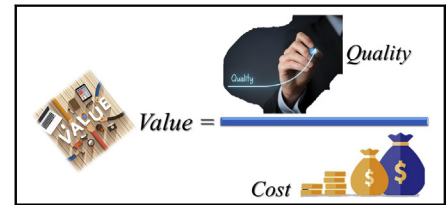
Commentary: Nothing but a toothbrush for beginning the reduction of the postoperative costs in thoracic surgery

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Kaga and colleagues¹ claim to have demonstrated that the oral management procedure they have initiated at the Kyorin University Hospital in Japan reduces both the development of postoperative pneumonia and severe Clavien–Dindo complications after lung resection. The innovative oral management practice consists of routine oral hygiene before hospital admission (including dental scaling, plaque removal with a toothbrush, denture cleaning, and an oral rinse) and stimulation of patients' oral mucosa as frequently as possible with a toothbrush. This retrospective study confirmed previous findings and resulted in a shorter postoperative length of hospital stay (8 days vs 9 days) in the oral versus nonoral management group.²

Before cardiac surgery, oral hygiene guidelines decreased the need for postoperative antibiotics, contributing to cost savings.³ It is also well known that nasopharynx and/or oropharynx perioperative decontamination could significantly reduce nosocomial infections. This procedure is a low-cost, readily controllable intervention that patients can administer at home before admission.⁴

The recent imperative to implement value-based health care worldwide has increased the emphasis on quality and



Value is ratio of what matters to patients to cost of attaining patient-relevant outcomes.

CENTRAL MESSAGE

Improving the efficiency of care delivery, preoperative optimization models, and perioperative care pathways could reduce the length of stay, decrease complications, and make value-based health care a reality.

cost in this sector. Achieving high value for patients is now recognized as the overarching goal of health care delivery if the value is intended as the ratio of what matters to patients to the cost of attaining such patient-relevant outcomes, as stated by the well-known value equation⁵:

$$\text{Value} = \frac{\text{Quality}}{\text{Cost}}$$

Whilst surgical complications are certainly outcomes to avoid from the patient's perspective, their impact on the hospital, and in general health care, expenditure is less documented, mainly owing to a lack of directness within hospital systems.⁶ Observational studies have shown that the number of lung cancer resections performed at a single center significantly impacts the long-term survival of patients.⁷ In the same manner, although not all care processes are inversely proportional to surgery volume, postoperative management could be affected by the center's experience. Therefore, referring patients to high-volume surgical units (with low complication rates) could limit cost while enhancing patients' outcomes.⁸

However, for equity of access reasons, efforts are needed toward cost-effective management of complications across all hospitals, regardless of their volume.⁹ Costs associated with inpatient care can increase because of combining effects. In addition, it is worth noting that many of the limitations examined in the study are proxy measures for the greater cost. Bearing this in mind, it may be more

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cost-effective to engage in management that aims to reduce complication rates broadly than targeting specific issues individually.⁶

In conclusion, understanding the reasons for these discrepancies will undoubtedly aid in the development of management and guidelines targeted at minimizing care and outcome heterogeneity across sites. Any method that reduces complication rates (preoperative, perioperative, or postoperative) could drastically decrease-related costs. This might be accomplished by using preoperative patient optimization models and perioperative care pathways that improve the efficiency of care delivery, hence reducing patient length of stay, boosting patient satisfaction, and decreasing complication rates—in other words, making value-based health care a reality.

References

1. Kaga A, Ikeda T, Tachibana K, Tanaka R, Kondo H, Kawabata T, et al. An innovative oral management procedure to reduce post operative complications. *J Thorac Cardiovasc Surg Open*. 2022;10:442-53.
2. Iwata E, Hasegawa T, Yamada SI, Kawashita Y, Yoshimatsu M, Mizutani T, et al. Effects of perioperative oral care on prevention of postoperative pneumonia after lung resection: multicenter retrospective study with propensity score matching analysis. *Surgery*. 2019;165:1003-7.
3. Pedersen PU, Tracey A, Sindby JE, Bjerrum M. Preoperative oral hygiene recommendation before open-heart surgery: patients' adherence and reduction of infections: a quality improvement study. *BMJ Open Qual*. 2019;8:e000512.
4. Pedersen PU, Larsen P, Hakonsen SJ. The effectiveness of systematic perioperative oral hygiene in reduction of postoperative respiratory tract infections after elective thoracic surgery in adults: a systematic review. *JBI Database Syst Rev Implement Rep*. 2016;14:140-73.
5. Porter ME. What is value in health care? *N Engl J Med*. 2010;363:2477-81.
6. Stokes SM, Scaife CL, Brooke BS, Glasgow RE, Mulvihill SJ, Finlayson SRG, et al. Hospital costs following surgical complications: a value-driven outcomes analysis of cost savings due to complication prevention. *Ann Surg*. 2022;275:e375-81.
7. Rea F, Ieva F, Pastorino U, Apolone G, Barni S, Merlino L, et al. Number of lung resections performed and long-term mortality rates of patients after lung cancer surgery: evidence from an Italian investigation. *Eur J Cardiothorac Surg*. 2020;58:70-7.
8. Ho V, Short MN, Aloia TA. Can postoperative process of care utilization or complication rates explain the volume–cost relationship for cancer surgery? *Surgery*. 2017;162:418-28.
9. Nathan H, Atonia CL, Bach PB, Elkin EB. Hospital volume, complications, and cost of cancer surgery in the elderly. *J Clin Oncol*. 2015;33:107-14.