Did the Rising Tide Float All Boats?

In the current volume of *The Journal*, Guttmann et al report the effect of a pediatric value-based purchasing intervention, one that introduced a pay-for-performance program that ran for 9 years in the province of Ontario, Canada.[1] The goal of this program was to improve the frequency with which 18-month-old children received developmental screening as part of an "enhanced" well-child visit compared with a standard one that does not include screening.

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The size of the payment offered by the pay-for-performance program was equal to the base payment for the well-visit, so presumably pediatricians could earn twice as much for the same visit if they included the developmental screening. Although being able to double the payment rate for a well-visit can sound like a substantial sum, these payments only apply to a single age group within a pediatrician's panel, and adding a developmental screening to a visit likely requires practice-level changes (eg, a way for patients complete the screening as part of the visit; additional visit time to review screening results and address positive or negative findings). In aggregate, the payment amount across a pediatrician's panel or practice is neither inconsequential nor likely represents the 10% of overall revenues typically thought necessary to create the desired practice-level effect.[2] Thus, the finding that the developmental screening rate rose about 2% per year from 40% to 60% over a 10-year period, a rate that is neither insignificant nor overwhelming, seems consistent with the size of the pay-for-performance payment.

Although this study does not have an experimental or quasi-experimental design that would help disentangle the effect of the pay-for-performance program from a secular trend, there have been very few pediatric additions to the value-based purchasing literature and this evaluation does have some important features.[3,4] For example, the fact that the intervention takes place in Canada allows for some contextual observations. Although Canada finances its healthcare system through a single-payer model and provides healthcare to all their citizens universally, it pays for the care via traditional fee-for-service, that is, by the number of visits, not their content. Thus, the primary type of incentive that Canadian pediatricians face is the same as those in the US—that of productivity. Adding developmental screening to a pediatric well-visit is one way for payers to begin signaling that the content of the visit is just as important as the quantity of it. As in the US, the pace at which pay-for-performance quality incentives are likely to proceed is at the pace that payers, practices, and pediatricians can measure care quality.

The pay-for-performance program also used a piece–rate approach, an approach that is thought to better reward quality improvement than achievement approaches do, because financial rewards are generated each time a patient receives the incentivized service instead of only if a pre-set target is achieved (which may differentially reward those already performing close to an absolute target).[2] Moreover, piece–rate program designs are posited to better support quality efforts that attempt to eliminate disparities as part of their quality improvement effort. The authors pursued the data linkages that allowed them to examine how frequently patients from socially vulnerable backgrounds may receive developmental screening and observed that living in the lowest neighborhood income quintile vs the greatest, in a rural area as opposed to an urban one, being from immigrant or refugee backgrounds vs not, or being born to teen mothers vs not were each independently associated with lower odds of receiving screening. Omissions could not be attributed to patients not attending their well-visits, because most did. However, the degree to which differences in developmental screening rates between those with and without social vulnerability was not obvious from the analyses presented. The number of years studied is quite long—likely the longest among the pediatric pay-for-performance programs evaluated (most available evaluations have tend to observe the postintervention period for 2 years or less)—long enough to make some observations about the potential effect of this pay-for-performance program on disparities.

For some time now, the imperative to improve quality has overshadowed rather than included the issue of disparities.[5] Stakeholders have continually preferred to hope that "the rising tide will float all boats," rather than to ascertain the degree to which quality incentives may have helped narrow disparities between socially vulnerable and well-resourced groups. One million toddlers and a decade later, it appears that Ontario will not know. For those interested in designing payment incentives that reward high-value care for all groups, knowing how disparities had changed is critical. Even if disparities could not be narrowed, it would be good to know that they had not widened. Instead, the field is left to continue to wonder, did the rising tide float all boats? Or just some and not others? ■

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New Insights into Platelet Dysfunction in Kawasaki Disease Using a Microfluidic Model of Thrombosis

In this volume of *The Journal*, Tsujii et al report their findings of platelet activation characteristics and the effect of antiplatelet therapy in 33 Japanese children with acute Kawasaki disease using a newly automated flow chamber system to evaluate platelet aggregate formation under high shear rates (1000 s^{-1} and 2000 s^{-1}) in a type I collagen-coated chip.[1]

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The study involved assessment of hirudin-anticoagulated room temperature whole blood samples taken immediately before, 1 week after, and 1 month after the initiation of treatment (intravenous immune globulin and either aspirin or flurbiprofen) for Kawasaki disease in 33 pediatric patients (range, 3-149 months of age; median, 27 months), compared with controls: 19 healthy adults (range, 20-40 years), 11 healthy children (range, 1-146 months; median, 26 months), and 5 febrile children (range, 7-116 months; median, 26 months) without Kawasaki disease. The change in pressure over time in the flow chamber and end points, such as elapsed time before the onset of platelet accumulation, were compared with clinical outcomes, particularly the development of coronary artery lesions.

Overall, the investigators demonstrated that the acute phase of Kawasaki disease was characterized by early onset and weak stability of platelet aggregates. However, no statistically significant differences were observed in time to onset of platelet accumulation between patients with acute Kawasaki disease and febrile child controls. Thus, platelet aggregation characteristics under a high shear condition in children with Kawasaki disease were not specific. Video microscopy confirmed the early initiation of platelet aggregation at 1 minute in patients with Kawasaki disease. However, after 7 minutes, the aggregates embolized, indicating weak stability.

Kawasaki disease may be associated with damage to the vascular endothelial cells, potentially resulting in morbidity and mortality via coronary thrombosis, myocardial infarction, and/or vascular aneurysms. Therefore, antiplatelet therapy with aspirin, aimed at subduing the acute phase of the disease, has been a mainstay of clinical therapy. This practice is based on limited platelet activation data from prior studies under static, no flow conditions. No relevant data exist for flow conditions in the clinical setting of Kawasaki disease. This study by Tsujii et al provides an important new method for the quantitative analysis of platelet aggregation under physiologically relevant shear stresses on thrombogenic surfaces.[1] The authors also demonstrated that patients with acute Kawasaki disease developed early and unstable platelet aggregates regardless of aspirin use, suggesting that this therapy may be unnecessary to decrease coronary artery lesion risk.

This study serves as an example of the potential usefulness of flow-based assays, particularly in microfluidic format that are clinically attractive owing to the small sample volume required along with high throughput capacity. These assays could reveal consistent patterns of hemostatic or thrombotic pathology, and have the potential to aid in assessing and monitoring patient-specific effects of coagulation-modifying therapies, specifically the platelet-based aspects of coagulation.[2,3] Indeed, these aspects have been evaluated in similar prior microfluidic studies with low-medium sized subject cohorts of subjects with von Willebrand disease (VWD). The same group that authored this study in Kawasaki disease, used their flow chamber to assess the clinical severity of type 1 VWD.[4] Similarly, Brazilek et al found that the platelet aggregation growth in a stenotic microfluidic device directly correlates with von Willebrand factor levels and could detect platelet aggregation defects associated with VWD subtypes with non-inferior, if not superior,

VWD von Willebrand disease

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