

## One study at a time

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At first glance, this study is about the association between sex and aspirin use on postoperative bleeding after repair of lower extremity fractures.<sup>1</sup> As one delves a little deeper, this is more than that. This paper is one of many steps of a long journey towards personalized medicine. Patient-centered, precision medicine, or personalized medicine is complex. It relies on evidence-based integration of biological sex, genomic data, and environmental factors to guide the therapy and prevention of disease in an individual.

The authors began this study looking at the impact of aspirin on postoperative bleeding in a heterogenous population and saw no difference until they performed their subgroup analysis.<sup>1</sup> One is left wondering what other studies have shown no differences and were not published because the authors failed to explore the subgroup analysis based on gender or other individual factors. As physicians, we face the challenge of treating patients based on a 'one-size-fits-all' approach to diagnosis, treatment, and prevention.<sup>2</sup> Many factors influence health at an individual level, such as baseline inflammation, percent body fat, or hormone levels. These often-overlooked factors impact the patient's responses to injury and therapies. As a first step, we must raise our game and continue to examine the differences between sexes.

The authors hypothesize the difference between the sexes may lie within the hormonal, anatomic, and physiological differences. Studies examining the differences between sexes in medicine are becoming more common, especially with platelets. Dr Coleman *et al* from Denver Health have shown male and female platelets behave differently in response to stimuli and impact hemostatic potential after injury.<sup>3</sup> Our understanding of the complexity of platelets is such that we can only begin to tease out the various proteins and complex interactions. Once we move beyond sex, the analyses will become quite complex. We will require artificial intelligence technology and data science to sift through the variables to make sense of them at the bedside.

In a 2015 article in the *Journal of Women's Health*, Miller *et al* pointed out that 'viewing patients through a sex and gender lens is the first step towards personalizing care.'<sup>4</sup> The future is very exciting. Articles such as this by Dr Fisher *et al*<sup>1</sup> build on Dr Miller's assertion and advance us closer to personalized healthcare. We are getting closer to personal healthcare, one study at a time.

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