Gratitude to the International Registry of Acute Aortic Dissection From the Aortic Community*

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In this issue of the Journal, Pape et al. (1) from the International Registry of Acute Aortic Dissection (IRAD) group analyzed trends in the presentation, diagnosis, and outcomes of aortic dissection over the 17-year history of IRAD. They found that the following occurred between 1999 and 2013:

- Clinical presentation of acute aortic dissection did not change.
- Use of computed tomography (CT) as the diagnostic modality increased.
- The role of chest x-rays in diagnosis of acute dissection diminished.
- Surgical results for type A and type B aortic dissection improved.
- Endovascular therapies were applied increasingly for type B dissection.
- Beta-blockers, angiotensin receptor blockers (ARBs), diuretics, and statins were prescribed more frequently at hospital discharge following acute aortic dissection.
- Hospital mortality improved for type A aortic dissection but not for type B.

The conception and implementation of the IRAD database and project in 1996, under the direction of Drs. Kim Eagle, Christophe Nienaber, and Eric Isselbacher, represented a brilliant brainchild that has contributed immensely to the advancement of care in management of aortic diseases. We identified 61 major scientific papers written by the IRAD group between 2000 and 2014 (Online Table 1). These publications have permitted us to “feel the elephant” that is aortic dissection. We consider the publications listed in Table 1 to be among the 10 most important contributions by IRAD.

In terms of the current paper on “trends” (1) over the lifetime of IRAD, we would like to make several observations.

The investigators pointed out that presenting signs and symptoms of aortic dissection did not change, but we would not have expected them to because that would require natural alterations in the biology of the disease—a process that could be expected to take millennia rather than over 2 decades.

The investigators seemed pleased that more beta-blockers, diuretics, and ARBs—and fewer vasodilators—are being used in the discharge regimens of patients treated for acute aortic dissection. However, the recent study by Lacro et al. (2) fell short of expectations with regard to the benefit of ARBs in Marfan’s syndrome. Our review of the impact of beta-blockers on patients with Marfan’s syndrome showed equivocal and unconvincing benefit (3,4). Therefore, we are not certain that the changes in medication patterns noted in the IRAD paper are of clear-cut benefit. The investigators likely had in mind the presumed benefit of anti-impulse therapy post-dissection, which we support.

As surgeons, we are very pleased by the decreased mortality for operations on acute type A and type B aortic dissections. It seems that advances in diagnosis and in surgical techniques are bearing fruit. Grafts...
The investigators indicate that one of their goals is “to improve the care of these patients worldwide,” and their hope is that information from their registry “be utilized to influence algorithms for diagnosis and treatment.” Undoubtedly, many of the IRAD investigations and publications have served this goal. However, we are hard-pressed to identify specific beneficial changes in practice that could be implemented on the basis of this particular paper on trends in aortic disease over the course of IRAD.

As wonderful as IRAD has been, the IRAD database method has limitations, which the investigators discuss frankly in this paper.

IRAD data are collected retrospectively, there is no core laboratory for image review, and the tertiary referral nature of the IRAD centers impairs its ability to be “representative of all patients with acute aortic dissection.”

IRAD information comes from a referral hospital basis rather than a community population basis, with consequent inherent potential for misleading statistics (5). One example is the “dissection paradox,” about which we have recently written (6). IRAD identified that many dissections occur at aortic diameters below accepted criteria for intervention (6). However, in mathematical terms, IRAD could see only the “numerator” of the dissection fraction and does not know the denominator at risk at each different size range (Figure 1A). Wisely, the IRAD group did not recommend any change in intervention criteria. We recently applied mathematical analysis to the IRAD data, with input of additional information on the percentage of the normal population with aortas in all size ranges (6). In other words, we approached the “denominator” at risk in the dissection fraction, as well as the dissected “numerator.” We confirmed that, although dissections do occur at small sizes, patients with large aortas are at a 6,000-fold higher risk of experiencing aortic dissection (Figure 1B). Thus, the dissection paradox is resolved by extra IRAD population base information, and traditional criteria for intervention are vindicated. Analysis of this paradox issue illustrates precisely the “hospital versus population” issues to which Nienaber, one of the IRAD founders, has insightfully called attention (5). It can be helpful to have population information in addition to knowledge of dissected patients only (5).

It is difficult or impossible to “drill down” to identify underlying causative factors for IRAD observations from data that are limited to the 290-item data form. For example, IRAD often does not know causes of death. Specifics of operative management also may be opaque to IRAD. Thus, single-center...
studies, in which data can be drilled as deeply as needed, still have an important role in the IRAD era. The diagnosis of Marfan’s syndrome is not always easy and may not be uniformly applied among all 28 centers in IRAD, and this has implications for conclusions based on the presence or absence of Marfan’s syndrome.

Long-term follow-up data are another issue with IRAD. We have the impression that such long-term data are not entirely and easily accessible via the IRAD system, which is focused on the initial hospital admission. If so, then this is another reason why single-institution studies remain relevant; late reoperations, complications or progression, late death are more easily discovered and documented.

Some observers might take issue with the strong industry support of IRAD. However, this funding has permitted the advancements that IRAD has made throughout the years and the sustenance of this collaborative scientific network.

We believe that we speak for the general “aortic community” in recognizing and applauding the extraordinary contributions to the understanding of aortic disease and the advancement of its care made by the IRAD program. This brilliant IRAD mechanism, along with the insight, wisdom, and diligent work of its members and staff, has shed tremendous light on the “silent killer” of aortic disease and the “great masquerader” represented by aortic dissection. We are indebted to IRAD for this extraordinary body of work, culminating in the present 17-year review paper in this issue of the Journal.

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REFERENCES
9. Moore AG, Eagle KA, Bruckman D, et al. Choice of computed tomography, transesophageal echocardiography, magnetic resonance imaging, and aortography in acute aortic dissection:


APPENDIX For a supplemental table and references, please see the online version of this article.