VIDEO 1. Fluoroscopy demonstrating the degenerated 21-mm Mitroflow prosthesis (LivaNova PLC, London, United Kingdom) and the valve-in-valve procedure with a 23-mm CoreValve prosthesis (Medtronic, Minneapolis, Minn). Video available at: [http://www.jtcvsonline.org/article/S0022-5223\(16\)31037-6/addons](http://www.jtcvsonline.org/article/S0022-5223(16)31037-6/addons).

EDITORIAL COMMENTARY

A leap of faith from association to causation

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One of the responsibilities in the oversight of medical academic journals is to occasionally draw the reader's attention to the clear criteria of disease causation. Causation and association are not the same, and the implications of the findings in the two areas are distinctly different in terms of our call to action. True causation mandates that there must be temporal association between the disease and the putative factor, as well as biologic plausibility and coherence whereby the relationship between the two agrees with our current knowledge of the natural history or biology of the disease.¹ The report in this issue of the *Journal* by Grubitzsch and colleagues² describes an interesting

Cause and effect in medicine.

Central Message

Readers must clearly distinguish between evidence of causation and association before changing practice, but this does not excuse them from the responsibility of being cautious when warned.

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relationship between the structural changes associated with a compromised valve-in-valve implantation and early valve degeneration with calcification of the leaflets. We cannot jump to conclusions on this matter, as we do not have consistency of the findings; regardless, it makes intuitive sense that distortion at the time of valve implantation will result in problems down the line. We know that turbulence begets calcification, which leads to a vicious cycle with deterioration a likely outcome. Distortion is a limitation of this technology, and its occurrence will compromise durability such that it will not come as a surprise to me that this will be a

common dialog. The pragmatic warning of Grubitzsch and colleagues² not to oversize should be heeded, and it is to be hoped that future registries will provide us guidance for the precise valve-in-valve choice with each degenerated bioprosthesis that we treat.

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