reverts to normal intraventricular conduction, then the presence of an anomalous pathway on the same side as the blocked bundle branch should be suspected."

In a paper published after Dr. Spurrell and his colleagues sent their paper to Circulation, I expressed the same point of view and used the same diagram as the one included in their figure 7. The reference is: SLAMA R, COUMEL P, BOURVAIN Y: Les syndromes de Wolff-Parkinson-White de type A, inapparents ou latents en rythme sinusal. Arch Mal Coeur 66: 639, 1973. More recently, Coumel and Attuel published another work about the same subject: COUMEL P, ATTUEL P: Reciprocating tachycardia in overt and latent preexcitation, influence of function bundle branch block on the rate of tachycardia. Eur J Cardiol 1: 423, 1974.

ROBERT SLAMA, M.D.
Hôpital Lariboisiere
75475 Paris Cedex 10, France

The authors reply:
To the Editor:
It is of satisfaction to us to know that our conclusions concerning the presence of bundle branch block during tachycardia in patients with accessory atrioventricular pathways have been supported by the independent work of a well respected group in France. The paper referred to was published after our paper was submitted to Circulation.

R. A. J. SPURRELL, M.D.
St. Bartholomew's Hospital
D. M. KRiKLER, M.D.
Hammersmith Hospital
E. SOWTON, M.D.
Guy's Hospital
London, England

Heparin and Arterial Thrombosis in Children
To the Editor:
"The use of heparinization to prevent arterial thrombosis after percutaneous cardiac catheterization in children" by Freed, Keane, and Rosenthal (Circulation 50: 565, 1974) was a carefully controlled study and deserves thoughtful consideration by cardiologists using percutaneous cardiac catheterization techniques in children.

As the authors state, the incidence of postcatheterization thrombosis requiring embolectomy in unheparinized patients in their series is higher than in other previously reported series and the authors suggest that others may have inadvertently heparinized their patients with heparin-containing flush solutions.

Approximately 3,000 consecutive percutaneous catheterizations in patients less than ten years of age, including 700 less than one year of age, have been performed at the Indiana University Medical Center during the past seven years. None underwent embolectomy. To determine whether inadvertent heparinization with heparinized flush solutions accounted for the absence of embolectomy, infused heparin was measured, and activated partial thromboplastin time (P.T.T.) was obtained before and after the catheterization procedure in ten consecutive patients. A mean of 0.36 mg/kg (range 0.14 = 0.50 mg/kg) of heparin (1 mg = 100 units) was administered. P.T.T. was increased from a mean of 33.6 (range 30–39) seconds at the beginning of catheterization to a mean of 43.1 (range 31–60) seconds at the completion of the catheterization. An increase, at least slight, in the P.T.T. was observed in each patient.

Amounts of heparin administered in the flush solution in these patients were approximately one-third of those advocated by the authors. These amounts resulted in P.T.T. in the normal range or elevated into the range of those observed in low-dose heparin administration. However, values were not those expected with full-dose heparinization. This sampling of our patients, although small, suggests that absence of embolectomy in our patients and perhaps the relatively low incidence reported in other series is not accounted for by full-dose heparinization. Amounts of heparin in flush solutions causing minimal to moderate increases in P.T.T. may provide some protection against arterial thrombosis. However, we believe that differences in details of technique, size of catheters, duration of procedure, and indications for embolectomy are more likely to be the important factors in the different frequency of embolectomy between series.

These comments do not detract from the authors' hypothesis that full-dose heparinization can protect against arterial thrombosis. The low frequency of embolectomy in our patients does not exclude the possibility of long-term damage to arteries. Controlled studies of effects of heparinization as presented by the authors are valuable and other studies of short and long term effects of percutaneous procedures on the condition of arteries are needed.

DONALD A. GHOD, M.D.
ROGER A. HURWITZ, M.D.
Indiana University Medical Center
Indianapolis, Indiana

References
1. GALLUS AS, HURSCH J, TUTTLE RJ, TREBILCOCK R, O'BRIEN SE, CARROLL JJ, MINDEN JH, HUDFRLKI SM: Small subcutaneous
D A Girod and R A Hurwitz

Circulation. 1975;51:1173-1174
doi: 10.1161/01.CIR.51.6.1173
Circulation is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
Copyright © 1975 American Heart Association, Inc. All rights reserved.
Print ISSN: 0009-7322. Online ISSN: 1524-4539

The online version of this article, along with updated information and services, is located on the World Wide Web at:
http://circ.ahajournals.org/content/51/6/1173.citation

Permissions: Requests for permissions to reproduce figures, tables, or portions of articles originally published in Circulation can be obtained via RightsLink, a service of the Copyright Clearance Center, not the Editorial Office. Once the online version of the published article for which permission is being requested is located, click Request Permissions in the middle column of the Web page under Services. Further information about this process is available in the Permissions and Rights Question and Answer document.

Reprints: Information about reprints can be found online at: http://www.lww.com/reprints

Subscriptions: Information about subscribing to Circulation is online at: http://circ.ahajournals.org//subscriptions/