

James T N. The connecting pathways between the sinus node and A-V node and between the right and the left atrium in the human heart.
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Gross anatomic and histologic examinations of 69 human hearts demonstrated three myocardial pathways connecting the sinus node to the AV node and one pathway between the right and left atria. These internodal and interatrial pathways have provided both a morphologic substrate useful to cardiac electrophysiologists (clinical and basic) as well as landmarks helpful to the cardiac surgeon [The SCJ® indicates that this paper has been cited in over 300 publications since 1963]

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For most of this century it was taught and believed that atrial conduction was syncytial in nature and followed no special pathway. However, around mid-century Hoffman and his colleagues demonstrated that certain atrial regions (other than the sinus node) behaved in a physiologically specialized fashion, while Moe and his associates showed that special pathways were utilized in arrhythmias such as atrial flutter; work of both groups has been recently summarized.^{1,2} During most of the 1960s I was conducting cardiovascular research at the Henry Ford Hospital with particular attention to the sinus node, AV node, and His

bundle, thus being in a position to examine also the gross and microscopic anatomy of that region of the heart present between the two nodes.

What I found consistently present in each of 69 human hearts is a set of three different pathways connecting the two nodes and one connecting the two atria. Although the posterior and middle internodal pathways correspond to ones earlier described by Thorel and Wenckebach, respectively, the anterior pathway had not previously been described; being the shortest, the anterior internodal pathway may be the most important of these three. All of the pathways contain abundant cells with morphologic specialization³ as well as ordinary cardiac myocytes. None of the pathways is composed exclusively of anatomically specialized cells, nor are such cells serially connected in an uninterrupted fashion. There is no shielding or isolation of the pathways.

Debate continues about whether or how the anatomic pathways may function in a physiologically specialized way,^{4,5} but there is general agreement that internodal and interatrial conduction takes place in the anatomic regions originally described, and that subsidiary atrial rhythms⁶ originate there as well. Both the historic background of this work and examples of its specific value to physicians and biomedical scientists have been reviewed recently.⁷ Knowing the morphologic substrate by which atrial conduction occurs and within which atrial rhythms (normal and abnormal) originate has proven useful to clinical cardiologists, electrocardiographers, electrophysiologists, and pharmacologists. This knowledge has also been helpful to cardiac surgeons, especially for planning where to place an atriotomy and how to perform reparative procedures with the least likelihood of producing clinically significant disturbances of cardiac rhythm or internodal conduction.

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