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UROLOGY BOARD REVIEW MANUAL

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Pediatric Ureteral Anomalies

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INTRODUCTION

Clinically significant ureteral anomalies often are identified in childhood in association with urinary tract infection (UTI), incontinence, renal stones, or renal insufficiency. Before birth, ureteral anomalies may be detected on fetal ultrasonography in association with hydronephrosis. A basic understanding of the normal embryology of the genitourinary tract, the pathophysiology of ureteral anomalies, the standard evaluation techniques, and the risks and benefits of various surgical options helps the urologist to determine the treatment approach that will likely yield the best results for a particular patient.

This manual begins with a discussion of the terminology used to describe ureteral anomalies and the normal embryology of the genitourinary tract. Issues relating to pathophysiology, patient evaluation, and surgical options are then highlighted through case-based discussions. The specific anomalies discussed in this review

are ureteroceles, ureteral duplications, ureteral ectopy, and ureteral reflux.

TERMINOLOGY

A standard set of definitions for ureteral anomalies has been established.¹ A *duplex (duplicated) system* refers to one kidney with two separate pelvicaliceal systems. If such a kidney (also called a *duplex kidney*) has one ureter extending from each of the two pelvicaliceal systems and the two ureters empty separately into the bladder, it is considered a *complete duplication*. However, a duplex system may also be *incomplete* (or *partial*). A *bifid system* is a form of incomplete duplication in which two ureters from a duplex kidney are joined at the ureteropelvic junction (*bifid pelvis*) or before emptying into the bladder (*bifid ureters*), forming a Y shape.

An *upper pole ureter* or a *lower pole ureter* refers to a ureter draining the upper or lower pole of a duplex kidney and draining into the bladder via the *upper pole orifice* or the