

# Renal Coloboma Syndrome

Subjects: Genetics & Heredity

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Renal coloboma syndrome (also known as papillorenal syndrome) is a condition that primarily affects kidney (renal) and eye development.

Keywords: genetic conditions

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## 1. Introduction

People with this condition typically have kidneys that are small and underdeveloped (hypoplastic), which can lead to end-stage renal disease (ESRD). This serious disease occurs when the kidneys are no longer able to filter fluids and waste products from the body effectively. It has been estimated that approximately ten percent of children with hypoplastic kidneys may have renal coloboma syndrome. The kidney problems can affect one or both kidneys.

Additionally, people with renal coloboma syndrome may have a malformation in the optic nerve, a structure that carries information from the eye to the brain. Optic nerve malformations are sometimes associated with a gap or hole (coloboma) in the light-sensitive tissue at the back of the eye (the retina). The vision problems caused by these abnormalities can vary depending on the size and location of the malformation. Some people have no visual problems, while others may have severely impaired vision.

Less common features of renal coloboma syndrome include backflow of urine from the bladder (vesicoureteral reflux), multiple kidney cysts, loose joints, and mild hearing loss.

## 2. Frequency

The prevalence of renal coloboma syndrome is unknown; at least 60 cases have been reported in the scientific literature.

## 3. Causes

Renal coloboma syndrome is caused by mutations in the *PAX2* gene. The *PAX2* gene provides instructions for making a protein that is involved in the early development of the eyes, ears, brain and spinal cord (central nervous system), kidneys, and genital tract. The *PAX2* protein attaches (binds) to specific regions of DNA and regulates the activity of other genes. On the basis of this role, the *PAX2* protein is called a transcription factor. After birth, the *PAX2* protein is thought to protect against cell death during periods of cellular stress.

Mutations in the *PAX2* gene lead to the production of a nonfunctional *PAX2* protein that is unable to aid in development, causing incomplete formation of certain tissues. Why the kidneys and eyes are specifically affected by *PAX2* gene mutations is unclear.

Approximately half of those affected with renal coloboma syndrome do not have an identified mutation in the *PAX2* gene. In these cases, the cause of the disorder is unknown.

### 3.1. The Gene Associated with Renal Coloboma Syndrome

- *PAX2*

## 4. Inheritance

This condition is inherited in an autosomal dominant pattern, which means one copy of the altered gene in each cell is sufficient to cause the disorder.

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## 5. Other Names for This Condition

- coloboma of optic nerve with renal disease
- coloboma-ureteral-renal syndrome
- ONCR
- optic coloboma, vesicoureteral reflux, and renal anomalies
- optic nerve coloboma renal syndrome
- papillorenal syndrome
- RCS
- renal-coloboma syndrome

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