

## How to Use the Mobile App

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### Reading Your eBooks

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## Apple (iOS) Navigation

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For iPad, tap the split screen icon and for iPhone, tap the bulleted list icon at the bottom left to view the Table of Contents and bookmarked pages.

See highlights and notes when tap the four-cube icon at the bottom right.

Swipe or tap along the bottom panel of pages or scroll up and down.

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- Open the Reader
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- Tap on the bookmark page
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Long-tap to highlight or add notes. You can drag over an area to determine what to highlight.

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Medical Genetics in Pediatric Practice

**Section 3: Genetic Testing**  
Chapter 10  
**Overview of Genetic Testing**  
Sarah L. Dugan, MD

**Introduction**  
Genetic abnormalities often underlie chronic medical conditions, which produce a substantial percentage of the workload in primary care. Improved diagnostic techniques, correspondingly improved diagnostic yield and increasingly primary care physicians (PCPs) are called on to initiate the diagnostic evaluation and to interpret complex genetic diagnoses. Understanding basic diagnostic techniques, their applications, and their limitations can increase the quality and efficiency of care.

Testing strategies covered in this chapter aim to detect 3 basic kinds of genetic disorders: genomic losses or gains, single-gene disorders, and epigenetic abnormalities. Although these categories overlap somewhat, they are useful for understanding diagnostic techniques and testing strategies. Metabolic testing (including mitochondrial testing and dried blood spot newborn screening) is covered in Chapters 7 and 17.

# Android (Google) Navigation

- Tap the back arrow to return to your Bookshelf.
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- Tap the file/gear icon for page view settings.
- Tap the pencil icon to add annotation/notes.

Tap the thumbnail view icon to navigate to pages by thumbnail preview

Tap the table of contents icon to view the Table of Contents, bookmarks or notes

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- Part 1. Pediatric Cardiology in the Office →
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Chapter 10. A New Murmur and Risk 71

**Figure 10.2.** Two-dimensional and color flow Doppler echocardiograms in the long-axis view. Panel A demonstrates a mild regurgitant jet (red jet) and PISA (color flow flow aliasing) (red jet) during diastole. In panel B (not shown), there is also mild PISA (color flow flow aliasing) (red jet) during diastole. L.A., left atrium; L.V., left ventricle; M.V., mitral valve.

Because of the fever, rash, arthralgia, prolonged PR interval (first degree heart block), and cardiac involvement, you suspect that rheumatic fever (RF) is the most likely diagnosis, and you order antistreptolysin O and antistreptolysin O titers, a rapid strep test, and a throat culture. The rapid strep test is negative. The initial antistreptolysin O titer is elevated.

**Treatment**

After fulfilling the Jones criteria (major criteria: carditis and erythema marginatum; minor criteria: fever, arthralgia, prolonged PR interval, and elevated acute phase reactant levels) and establishing a diagnosis of acute RF,

Box 10.1. Summary of Jones Criteria	
Major Criteria	Minor Criteria
Carditis (clinical or subclinical)	Fever
Polyarthralgia	Arthralgia
Chorea	Elevated acute phase reactant levels (erythrocyte sedimentation rate, C-reactive protein level)
Subcutaneous nodules	Prolonged PR interval on an electrocardiogram
Erythema marginatum	

Evidence of a preceding group A streptococcal infection

- Positive throat culture or rapid strep test
- Elevated or increasing antibody titer

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- Long-tap to highlight or add notes. You can drag over an area to determine what to highlight.
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**71 Challenging Cases in Pediatric Cardiology**

In consultation with your pediatric cardiologist, you begin treating the patient with rest and anti-inflammatory medications. The patient has moderate carditis and receives 2 mg/kg/d of prednisone, in addition to 500 mg of penicillin V 3 times per day.

**Discussion**

The presence of a new diastolic murmur is pathological and limits the diagnosis to RF, endocarditis, or systemic lupus erythematosus. There is no family history of rheumatologic conditions. Clinical findings suggest the patient has RF; however, his ill appearance and new murmur could indicate endocarditis. Carditis is present in approximately 30% to 70% of patients with RF and is associated with clinically significant long-term morbidity and mortality. In acute rheumatic carditis, most patients develop isolated mitral regurgitation. Approximately 25% of patients have aortic valve involvement in association with mitral regurgitation. Isolated aortic valvular regurgitation is uncommon. Valvular regurgitation can be caused by a combination of verrucous vegetations on the valve leaflets, valvular prolapse, annular dilatation, chordal elongation, and even flail leaflets. The vegetations associated with RF are often not visible at echocardiography, although the valve leaflets may appear thickened. Pericarditis also may develop in patients with acute RF.

The advent of color flow Doppler echocardiography has made possible the diagnosis of aortic valve regurgitation. The Jones criteria plus evidence of a preceding group A streptococcal (GAS) infection are needed to establish the diagnosis of RF recurrence. Also, the presence of chorea, without other symptoms, can establish the diagnosis of RF. Evaluating for a history of a recent GAS infection requires performing a rapid strep test, throat culture, and antibody testing. Elevated or increasing antibody titers are very reliable markers of a preceding GAS infection because the antibody response typically peaks at 1 to 4 weeks. Antistreptolysin O and antideoxyribonuclease B are the most commonly measured titers. More than 90% of patients with RF have a positive result in 1 titer when both are measured simultaneously.

Anti-inflammatory medications are the mainstay for treating acute RF to provide symptom relief; however, there is limited and conflicting evidence of their

**72 Challenging Cases in Pediatric Cardiology**

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The advent of color flow Doppler echocardiography has made possible the diagnosis of subclinical degrees of valvular regurgitation. Recent changes in the Jones criteria now provide guidance on diagnosing subclinical carditis by means of echocardiography alone (without physical findings). Evidence of carditis on an echocardiogram is now sufficient to establish the diagnosis, in the absence of other clinical evidence. A recurrent episode of RF in a patient without chronic rheumatic heart disease also requires fulfillment of the Jones criteria. However, in patients with chronic rheumatic heart disease, only 2 minor criteria plus evidence of a preceding group A streptococcal (GAS) infection are needed to establish the diagnosis of RF recurrence. Also, the presence of chorea, without other symptoms, can establish the diagnosis of RF. Evaluating for a history of a recent GAS infection requires performing a rapid strep test, throat culture, and antibody testing. Elevated or increasing antibody titers are very reliable markers of a preceding GAS infection because the antibody response typically peaks at 1 to 4 weeks. Antistreptolysin O and antideoxyribonuclease B are the most commonly measured titers. More than 90% of patients with RF have a positive result in 1 titer when both are measured simultaneously.

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