### Background
The Duke criteria represented a major advance in the diagnosis of infective endocarditis (IE) by formally incorporating echocardiographic findings into the diagnostic criteria for IE. The accuracy of the Duke criteria in making a definitive diagnosis of IE has not been examined. The purpose of this study was to examine the sensitivity and specificity of a definitive diagnosis of IE by Duke criteria for surgically treated patients who carry a diagnosis of IE.

### Methods
Patients with surgically treated IE episodes labeled with a diagnosis of IE were identified from the Cleveland Clinic Infective Endocarditis Registry and Cardiovascular Infections Registry. The sensitivity and specificity of a diagnosis of definitive IE using the elements of Duke criteria, other than valve histopathology or valve microbiology, was examined.

### Results
A total of 532 episodes of IE with adequate examination heart valves were identified in 519 patients. 494 episodes were IE, 38 were not.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Sensitivity (95% CI)</th>
<th>Specificity (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component</td>
<td>IE (n = 494)</td>
<td>Not IE (n = 38)</td>
</tr>
<tr>
<td>Major criteria</td>
<td>132 (67,87)</td>
<td>103 (67,87)</td>
</tr>
<tr>
<td>Major echocardiography findings</td>
<td>175 (71,87)</td>
<td>175 (71,87)</td>
</tr>
<tr>
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<td>34 (7)</td>
<td>3 (3)</td>
</tr>
</tbody>
</table>

### Conclusion
Among patients considered to have IE who undergo surgery, the Duke criteria are unable to provide a definitive diagnosis of IE in almost 30% of patients with IE in the absence of valve histopathology and valve microbiology findings, and about 1 in 4 patients that meet criteria for definite IE by Duke criteria do not have IE. In surgically treated patients, a definitive diagnosis of IE should be based on valve histopathological and microbiological criteria, not on Duke criteria.

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### Table: Findings on Diagnostic Testing

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### Figure 1: Sensitivity and Specificity of a Definite Diagnosis of IE by Duke Criteria Across Subgroups

- **Characteristics:**
  - Major criteria
  - Major echocardiography findings
  - Minor criteria

- **Findings:**
  - Sensitivity (95% CI)
  - Specificity (95% CI)

- **Subgroups:**
  - Age: (18,46), (46,67), (18,46), (27,67)
  - Sex: (18,46), (46,67), (18,46), (27,67)
  - Race: (18,46), (46,67), (18,46), (27,67)
  - Presence of prosthetic valve or ring: (18,46), (46,67), (18,46), (27,67)

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### Introduction
- The Duke criteria represented a major advance in the diagnosis of infective endocarditis (IE), and are now widely used.

- However, the accuracy of the Duke criteria in making a definitive diagnosis of IE has not been re-examined, especially in the absence of histopathological and microbiological examination values.

- The purpose of this study was to examine the sensitivity and specificity of a definitive diagnosis of IE by Duke criteria for surgically-treated patients who carry a diagnosis of IE.

### Methods
- **Surgically-treated IE episodes labeled with a diagnosis of IE were identified from the Cleveland Clinic Infective Endocarditis Registry and Cardiovascular Infections Registry.**
- **Episodes with adequately examined heart valves (histopathology, valve PCR, valve culture) were included.**
- **Definition of IE:**
  - **Acute inflammation OR presence of microorganisms on a valve on histopathological examination, OR positive valve PCR OR positive valve culture.** Positive valve PCR or culture was defined as at least two valve specimens positive for the same pathogen, or one valve specimen positive and at least one blood specimen positive for the same pathogen.
- **Definition of not IE:**
  - **Absence of acute inflammation AND absence of microorganisms on histopathological examination, AND negative valve PCR AND negative valve culture.**
- **Episodes that did not have adequate testing to allow evaluation of the above criteria were excluded.**
- **The sensitivity and specificity of a diagnosis of definite IE using Duke criteria in the absence of valve histopathology and valve microbiology findings, was examined.**

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