


## Editorial

# Organization and Functioning of a Multidisciplinary Team for the Diagnosis and Treatment of Infective Endocarditis: A 30-year Perspective (1985–2014)



## Organización y funcionamiento de un grupo multidisciplinario de diagnóstico y tratamiento de la endocarditis infecciosa: perspectiva de 30 años (1985–2014)

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## INTRODUCTION

Infective endocarditis (IE) is a rare disease that is difficult to diagnose, its treatment is complex and expensive, and mortality is high (around 20%). In the field of IE, the most recent changes are epidemiological and include an increased number of cases of IE in patients with prosthetic valves and intracardiac devices and in the population receiving health care, an increased number of cases of *Staphylococcus aureus* IE, and changes in antibiotic sensitivity patterns with a particular impact on vancomycin.<sup>1–3</sup> Infective endocarditis requires prolonged hospitalization and resource-intensive treatment because antibiotic therapy, intensive care, and surgical treatment form part of the therapeutic approach.

Between 40% and 50% of patients require surgical treatment in the acute phase. In the year when IE is diagnosed, mortality is 30% with or without intervention. Mortality is high among certain groups, such as patients with prosthetic valves and especially those with intracranial hemorrhage.<sup>4</sup>

Early diagnosis and treatment can improve outcomes. Low suspicion of IE can delay effective treatment and increase mortality.<sup>5</sup> In our experience, an appropriate therapeutic approach has a mean delay of 27 days when the patient is referred from another institution.

The treatment of IE is a paradigm of collaboration. Multidisciplinary teams (MDT) dedicated to IE have pioneered the organization of tertiary hospital care devoted to the disease.<sup>6,7</sup> In the last decade, the International Collaboration in Endocarditis group has had a strong impact on understanding IE.<sup>8</sup> The British Heart Valve Society has recommended the collaboration of specialists in valvular heart disease and IE<sup>9</sup> and recent reports have supported this model.<sup>10</sup>

This article describes recommendations for the organization of an IE-MDT from the perspective of 30 years' experience of the Working Group on Infective Endocarditis of the *Hospital Clínic de Barcelona* with the aim of making this experience useful to the Spanish National Health System.

## PRIOR CONSIDERATIONS

Infective endocarditis is a medical-surgical disease in which surgical treatment is a part of the therapeutic process rather than a result of the failure of medical treatment. The care of patients with IE should be offered by an MDT comprising specialists with shared interests.

## HISTORIC CONSIDERATIONS

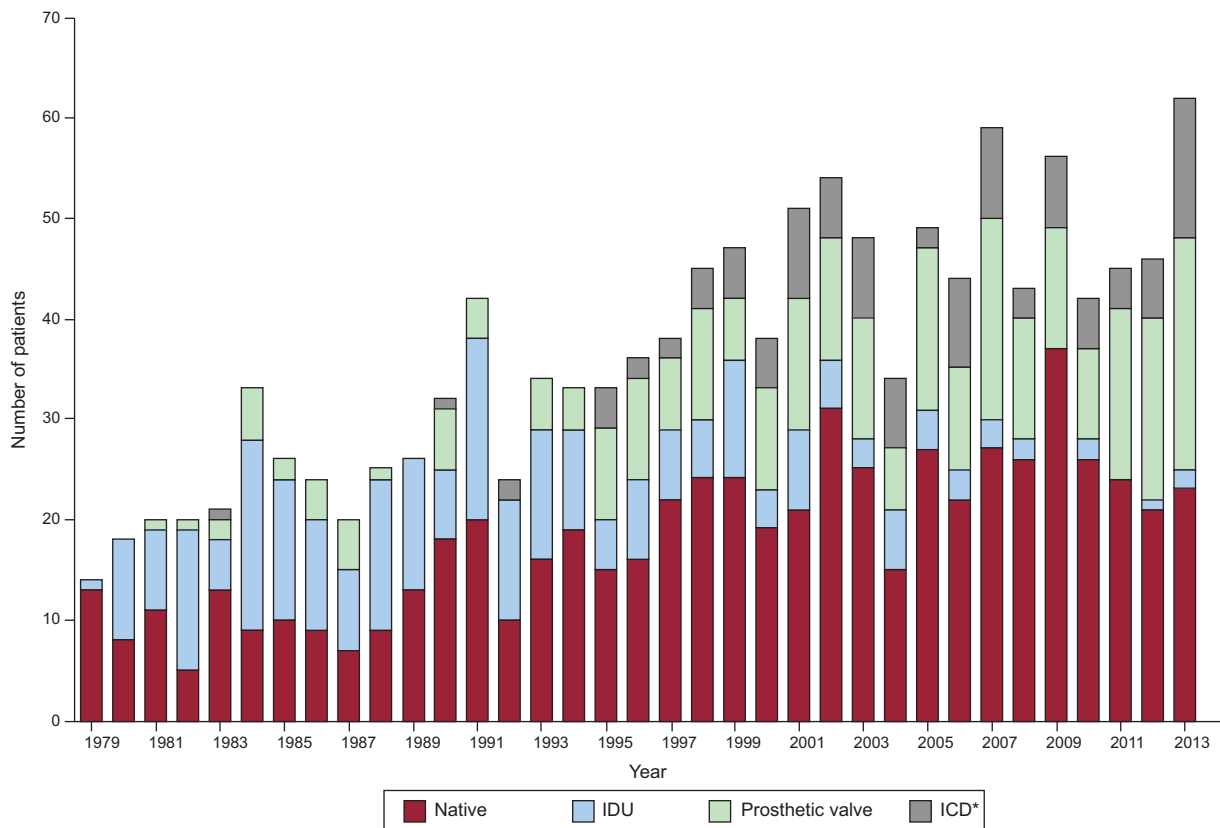
Since 1979, the organization and development of the Working Group on Infective Endocarditis of the *Hospital Clínic de Barcelona* has been paralleled by developments in infectious disease, cardiology, microbiology, pathology, and cardiovascular surgery services. **Figure 1** shows the annual distribution of cases of IE at our hospital since 1979 (1256 patients). Basic achievements have included the establishment of a database dedicated to IE, the commencement of the cardiovascular surgery service in 1979, the creation of a cardiovascular tissue bank (cryopreserved heart valves and arteries) in 1989, the introduction of transesophageal echocardiography in 1991, and the establishment of an electronic medical records system accessible through the hospital intranet in 1999.

Follow-up has been performed by specialists in infectious disease, cardiology, and cardiovascular surgery since 1986. The storage of pathogenic strains was organized at the microbiological biobank in 1993. The experimental endocarditis laboratory has been in operation since 1993, and the Working Group on Infective Endocarditis of the *Hospital Clínic de Barcelona* has maintained weekly meetings on IE since 1994.

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◊ The members of the Working Group on Infective Endocarditis of the *Hospital Clínic de Barcelona* are listed in the **Appendix**.



**Figure 1.** Annual distribution of cases of endocarditis in the *Hospital Clínic de Barcelona* since 1979. ICD, intracardiac devices; IDU, intravenous drug users. \*Pacemakers and defibrillators.

## STRUCTURE AND ORGANIZATION IN TERTIARY HOSPITALS

The benefits of an MDT are undeniable. Infective endocarditis should be treated in tertiary centers with an experienced cardiovascular surgery service.<sup>6</sup> An MDT should comprise:

- A specialist in infectious diseases.
- A microbiologist.
- A specialist in valvular heart disease.
- An echocardiologist with extensive experience in the interpretation of valvular disease.
- A cardiovascular surgeon.
- A specialist in pathology.
- A specialist in outpatient parenteral antibiotic treatment (OPAT).

Tertiary hospitals also have the following services available: anesthesiology and resuscitation, diagnostic imaging, nuclear medicine, nephrology, neurology, neurosurgery, orthopedics and traumatology, and hemotherapy and blood management. The complexity of IE justifies the use of tertiary care.

Accumulated experience suggests the need for a home-care team for the management and follow-up of OPAT.<sup>11</sup>

The infectious disease service analyzes daily blood cultures at the hospital. If the results of blood cultures are positive, the action to be taken will be decided by consensus with the service that ordered the test.

## Overview of the Process

The treatment process of patients with IE is complex and involves several steps that commence when there is diagnostic suspicion of IE. The initial index of suspicion should be high, since

the diagnosis of IE is often delayed due to the non-specificity of the symptoms.<sup>5</sup> The initial step is to contact the infectious disease service, once there is clinical suspicion of IE or when blood culture results are positive from samples sent to the microbiology laboratory for various reasons. Once there is suspicion of IE and the criteria for IE have been confirmed, the cardiology and cardiovascular surgery services are contacted to form a consensus on which antibiotic and cardiological therapy to administer and to establish the indications for and timing of surgical intervention if applicable. [Figure 2](#) shows this process.

Given that the process of treating IE is complex and involves an MDT, each case must be reviewed and policies for common action established. It is therefore recommended that the medical-surgical team hold weekly meetings to discuss patients who have been admitted, patients referred from other institutions, and patients attended in the emergency department. This meeting should confirm medical-surgical decisions and assess patients for OPAT. The team should also oversee the quality control process and analyze the postmortem study of any patients who died.

## STRUCTURE AND ORGANIZATION IN HOSPITALS WITHOUT SURGICAL SUPPORT

The care of patients with IE is often difficult and complex in hospitals without a dedicated cardiovascular surgery service. Interhospital collaboration is essential in order to facilitate patient transfer under the best possible clinical conditions.

## Overview of the Process

When a patient has suspected IE in a secondary hospital, the diagnosis and treatment should be confirmed by contacting the tertiary hospital and sending imaging (echocardiography, computed tomography) and microbiological materials. It is important

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