

GUEST EDITORS' PAGE



Chest Pain Unit Network in Germany

Its Effect on Patients With Acute Coronary Syndromes



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The fundamental goal of a chest pain unit (CPU) is to streamline the differential diagnosis of acute or newly symptomatic chest pain of unclear origin. Data from the United States (1) and the United Kingdom (2) demonstrated the superiority of CPUs over standard emergency department (ED) units. The establishment of CPUs reduced hospitalizations and costs (2) through better utilization of diagnostic and therapeutic procedures, and it improved patient satisfaction (3). Notwithstanding these positive experiences, Europeans have not been enthusiastic about CPUs. In 2002, the Spanish Society of Cardiology recommended that CPUs be set up in all EDs to provide a faster, more efficient care of patients with chest pain. In 2010, just 4 centers had been established, and the cardiology service was just running 1 clinic while the rest was left to EDs (4). In the United Kingdom, the formal development of CPUs has been mostly limited to trials, and it has progressed only in a rather disorganized way (5). To establish an efficient CPU network, the German Cardiac Society founded a task force in 2007, which developed in parallel a set of standard requirements and a nationwide certification program. The recommendations for standard requirements were published in 2008 (6), and in 2014, the criteria for the certification of CPUs were revised (7).

The most essential requirements are:

1. *Space*: at least 4 beds plus 1 additional bed/50000 inhabitants/region and integration into the hospital's emergency program.

2. *Personnel and techniques*: A cardiologist available onsite within 30 min; 24 h/day, 7 days/week, 52 weeks/year emergency laboratory with quantitative biomarker analysis onsite and results available within 45 to 60 min; transthoracic echocardiography available onsite and recorded within 30 min; cardiac catheterization laboratory with trained personnel onsite available 24 h/day, 7 days/week, 52 weeks/year; instruments and trained personnel for pacemaker and implantable cardioverter-defibrillator implantation available within 6 h; and access to transesophageal echocardiography and multislice computed tomography.
3. *Procedures*: Observation of national and international guidelines; stratification of patients using the GRACE score; and coronary angiography for high-risk patients (GRACE score >140) within 24 h, and for moderate- to low-risk patients within 72 h.
4. *Organization*: A CPU is integral part of a cardiology department or clinic that can provide invasive coronary therapy, and a cardiologist is responsible for its management.

CPUs are certified after onsite audition. As of January 2017, 254 CPUs have been certified, and 182 of them have been recertified after 3 years. The number of CPUs in Germany already exceeds by far that in the rest of Europe. The objective of the German Cardiac Society's initiative remains to achieve nationwide coverage through a network of certified CPUs. To meet this goal, it will ultimately be necessary to certify as many as 300 CPUs, whereas to date there are still significant regional differences in cardiology care. The goals of the German CPU accreditation program are similar to those of the Society of Chest Pain Centers, which merged in January 2016 with the American College of Cardiology (8).

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In 2009, the German CPU registry was established to study the quality of care in CPUs and to further improve the prognosis of patients with chest pain and a potential acute coronary syndrome (ACS). To date, almost 40,000 patients have been enrolled in this registry, and a number of papers have been derived and published from it. Thus far, the key messages are:

1. The median delay between the onset of chest pain and the first medical contact remains high.
2. Although performed only too rarely, a pre-hospital electrocardiography (ECG) facilitates the early diagnosis of an ST-segment elevation myocardial infarction (STEMI) in many patients.
3. As many as 76.6% of the patients admitted to a CPU received an ECG within 10 min, independently of their symptoms and final diagnosis (9).
4. Patients without and with ACS who presented to a CPU with elevated troponin levels and who did not undergo a revascularization procedure were more seriously ill and had a worse short-term outcome than patients undergoing immediate revascularization (10).
5. Patients who contacted a CPU as a self-referral were younger, were less severely ill, and had more noncoronary problems than those calling an emergency medical service; still, a high number (30%) of self-referral patients had an ACS (9).
6. Dyspnea is a common symptom in CPU patients and is associated with a 4-fold higher 3-month mortality, which is underestimated by established ACS risk scores (11).
7. Patients with a STEMI who are supposed to bypass the CPU and go directly into the catheterization laboratory represent a numerically significant

group because a pre-hospital ECG has not been recorded. Importantly, treatment of STEMI patients who present to a CPU is guideline-conforming, and their intrahospital mortality is low. The lack of a pre-hospital ECG and the admission by a general practitioner substantially delay critical time intervals, emphasizing that patients with symptoms suggestive of an ACS should contact the emergency medical system and not the general practitioner (12).

Thus, the registry indeed demonstrates that, with the implementation of the CPU network in Germany, the quality of diagnosis and treatment of patients with chest pain is improving, resulting in a better prognosis for patients with ACS (13) compared with patients in the ED.

The German Cardiac Society aims to extend the CPU concept to a European level, and it has already certified CPUs in Switzerland (Zürich and Lucerne) and Austria (Vienna). The criteria for certification have been translated into the English language and now permit international applications for a CPU certificate from the German Cardiac Society (14). Stimulated by the implementation of the CPU network in Germany and the publication of its certification criteria, the European Acute Cardiovascular Care Association has just presented a paper addressing the organization of CPUs for its eventual implementation throughout Europe (15).

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