Germany is establishing a countrywide network of chest pain units (CPUs) and within the next 2 years expects 200 units to be assessing patients who present with chest pain. Chest pain is 1 of the most common symptoms in EDs, comprising 5% to 20% of visits, though only 10% to 15% of these patients have acute coronary syndrome.

“The Primary Goal Is to Reduce the Time It Takes for a Patient Experiencing Symptoms of a Possible Heart Attack to See a Physician”
The first CPU was established in Frankfurt in 2003, with Heidelberg and Mainz following suit soon after. Then a certification scheme under the auspices of the German Society of Cardiology (GSC) was drawn up with a working group chaired by Thomas Münzel, MD, professor and head of cardiology at the University Hospital of Mainz, Germany, who set up the Mainz CPU in 2005 and is now driving the growth of the network across the whole country.

The idea to establish CPUs in Germany was primarily based on the success of chest pain centres in the United States, where, by 2004, some 1500 chest pain centres had been established. Professor Münzel says, “Several studies comparing the classic ED, or an ED with a closely associated CPU, revealed that the prognosis of patients with acute chest pain may be better when these patients are treated in the chest pain centre compared with the ED.” He says the evidence shows that the establishment of chest pain centres in the United States prevents the discharge of patients with an acute coronary syndrome and is cost saving due to the prevention of complications in patients with an acute myocardial infarction falsely discharged from the ED.

In Germany, through the GSC certification process to ensure that CPUs meet the necessary criteria, the goal has been to expand and regulate the network and to avoid other European countries’ less successful experiences in establishing CPUs. In the UK, progress in this area has been described as disorganised whereas in Spain—despite a recommendation in 2002 by the Cardiac Society of Spain to set up CPUs in all EDs to provide fast and efficient care for patients with chest pain—just 4 had been established by 2008, suggesting that Europe EDs are unenthusiastic about CPUs.1

Professor Münzel and his team at Mainz published articles on the CPU’s early success. After that, he was asked by the GSC to establish a specification requirement for having a CPU in Germany. To gain a certificate, a CPU must have access to a catheter laboratory and 4 interventionalists, 24-hour catheter laboratory readiness, 4 beds with monitors sited close to the ED and catheter laboratory, and facilities to perform stress tests such as ergometry or stress echo.

A CPU is funded like an ED and is typically equipped with a 12-lead electrocardiogram, blood pressure measurement, transthoracic echo, transoesophageal echo, monitor for supervising heart rhythm, ventilation device, analysis for laboratory value and biomarker of troponin I or T, external pacemaker and the ability to perform an exercise electrocardiogram or a stress echo after exclusion of acute myocardial infarction.2

In Germany, CPUs are distinct structural units staffed with nurses and cardiologists. They are located in private practices, city hospitals, and university hospitals, and, ideally they are positioned close to the ED and in the vicinity of a catheter laboratory. Patients are referred either by emergency physicians, private practitioners, cardiologists, or self-referral, which is becoming more important.

Professor Münzel says, “The fundamental goal is a protocol-driven, systematic approach to the management of patients with chest pain with commonly used guidelines. These strategies allow a rapid initiation of a crucial therapy in high-risk patients with an acute coronary syndrome requiring admission and also the stratification of a low-risk group of patients who can be safely discharged and managed as outpatients. The primary goal of establishing a CPU is to reduce the time it takes for a patient experiencing symptoms of a possible heart attack to see a physician, thus reducing the time to treatment in the critical early stages of an acute coronary syndrome.”

“We Can Prevent a Patient Being Sent Home Too Early or Needlessly Occupying a Coronary Care Unit Bed”
Professor Münzel explains the importance of providing specialised unit where doctors can better monitor patients when it is not clear whether they have myocardial ischaemia.

“With these measures, we hope to ensure that we can prevent a patient being sent home too early or needlessly occupying a coronary care unit bed,” he adds. Patients presenting at a CPU with acute chest pain and ST-segment elevation in a
12-lead electrocardiogram are admitted to the catheter laboratory directly without further diagnosis in the CPU. Those without an acute coronary syndrome, such as non-ST-elevation myocardial infarction and unstable angina, are monitored and their risk factors assessed, and they are either admitted to the catheter laboratory where necessary or discharged. On average a patient in this category can be discharged within 6 hours. Professor Münzel says, “It is important to find out who may develop a myocardial infarction and who will not. About 55% of all patients admitted to the CPU can be discharged—a number that is similar to data reported from the United States. From the 45% of the patients not being discharged, 50% are transferred for a diagnostic cath, and about 50% of those ultimately get a percutaneous coronary intervention.”

Chest pain leading to admission to the CPU may be typical or atypical. Professor Münzel says, “I believe that it is of utmost importance to inform people about atypical chest discomfort, which also may be an early sign of myocardial ischaemia to prevent time delays.” In Germany, it is common for patients to wait until the discomfort becomes painful enough to call the emergency 112 number, particularly if their symptoms are not typical. “It’s almost as if the chest pain has to stop one dead in one’s tracks and this is actually what happens,” he says. “This is why many of the 70 000 Germans each year lose their lives, and many of these deaths are clearly preventable.”

“We Expect to Have 60 to 80 Certified CPUs by the End of This Year, and About 200 by the End of Next Year”

The growth of CPUs in Germany is moving ahead rapidly. At present 10 CPUs have received GSC certification and a further 130 have applied for it. Professor Münzel says, “We expect to have 60 to 80 certified CPUs by the end of this year, and about 200 by the end of next year.” With Professor Münzel heading the working group responsible for the certification process, 54 cardiologists currently perform the audits in clinics applying for certification. Other members of the working group responsible for the certification process and deciding whether a clinic receives the CPU certificate based on the audit report are Raimund Erbel, MD, from Essen; Evangelos Giannitsis, MD, from Heidelberg; Harald Mudra, MD, from Munich; Ralf Zahn, MD, from Mannheim; Harald Darius, MD, from Berlin; Michael Buerke, MD, from Halle; and Winfried Haerer, MD, from Ulm. The initiative also receives strong support from the past GSC president, Gerd Heusch, MD, FRCP.

The CPU in Mainz has shown early benefits to patients and is proving cost-effective, reflecting findings from the United States and the United Kingdom.2 Professor Münzel says that the situation in Mainz is unique because all the city’s hospitals, private cardiologists, and private practitioners acknowledge that if a patient has chest pain, the only place to be assessed is the CPU at the university hospital. This has led to the number of patients growing steadily from 751 in 2005 to 1960 in 2008. Professor Münzel comments, “An important advantage of a CPU is that patients, in which a myocardial infarction is excluded due to negative biomarker screening (negative echo or lack of ECG changes), also get an exercise test and are discharged with a complete diagnostic workup so that the practitioner does not have to perform additional diagnostic tests.”

An analysis of patients at the Mainz CPU patients also demonstrates that the average time before discharge of a patient with acute coronary syndrome in a CPU is shorter than that of a patient with the same diagnosis treated in the ED—6.4 hours compared with 11.6 hours. Similarly, for patients receiving a catheter, the average time until discharge dropped substantially from 3.2 days to 2.4 days. Articles on the impact of CPUs are rare at present, but some are due for publication in the near future.

Within the next 2 years the GSC will certify between 150 and 200 CPUs. The aim is to establish a network of 300, which the working group believes will be adequate to cover the whole of Germany. Based on the success of the CPU programme in Germany a wider goal is now emerging—to encourage the structured establishment of CPUs across other regions of Europe.

References

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