

## New data on cardiovascular interventions in China reported

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During the Fifth Chinese Cardiovascular Intervention Forum new data on cardiovascular interventions was reported. The meeting, which is jointly sponsored by Chinese Medical Association, Chinese College of Cardiovascular Physicians, Chinese Society of Cardiology, and Chinese Medical Foundation, took place from March 1-3, 2012 in Nanning, the capital of the Guangxi Zhuang Autonomous Region in southern China.

In July 2009 the Chinese Ministry of Health initiated a national registry, mandating reporting of all invasive interventions for the treatment of cardiovascular disease (including coronary heart disease, arrhythmia, congenital heart disease) online in a real-time manner. "Up to now, data for the past three years have been available," says Prof. Huo Yong, chairman of the forum and an expert from the Peking University First Hospital.

#### Coronary intervention

According to Prof. Huo, the reported cases of percutaneous coronary intervention (PCI) include the data from the Ministry of Health Cardiovascular Intervention Online Registry, data from Military Health Systems, and additional cases verified and reported by the Provincial Quality Control Centers (*Table 1*).

As shown in *Table 1*, the utilization rate of drug-eluting stents (DES) during coronary intervention remains high. Quality assessment of the applied techniques has shown that the PCI-related mortality is reasonably low, with a low and further declining incidence of severe complications. Almost 90% of patients undergoing PCI were patients with acute coronary syndrome. PCI in patients with ST segment elevation myocardial infarction (STEMI) are highly appropriate, but the

data demonstrates that only about one third of STEMI patients received PCI, indicating that the utilisation of this technique is still insufficient. "However, six provincial quality control centers have not yet reported the data in 2011, which might affect the accuracy of the final results," noted Prof. Huo.

He summarized that "Quality control has been developed into an effective tool in recent years and has played a key role in the standardization of coronary intervention in China".

#### Arrhythmia intervention

Prof. Zhang Shu from the Fuwai Cardiovascular Hospital, Chinese Academy of Medical Sciences, described the status quo of arrhythmia intervention in mainland China. The data shown in *Table 2* reflects the results of National Registry data (but excludes the Military Health Systems).

The number of pacemaker/ICD implantations are increasing steadily. However, there is still a gap when compared with western countries, especially in terms of the application of implantable cardioverter-defibrillator (ICD) and cardiac resynchronization therapy (CRT). This may be explained by the following factors: Financial constraints from the healthcare insurance & reimbursement systems; limited knowledge of patients about these new treatments; and relatively small number of medical practitioners. Interestingly, compared with ICD, CRT treatment has shown a faster development despite being introduced in China relatively late, likely because it can improve the symptoms of heart failure. The total number of CRT implants reached 1,822 in 2011, an 18.8% increase compared to the previous year. Similar to ICD implantation, hospitals with a

**Table 1** Coronary Intervention in Mainland China from 2009 to 2011

	2009	2010	2011
Total cases (increased by)	228,380	284,936 (24.8%)	332,992 (16.9%)
Average number of stents	1.45	1.62	1.67
Utilization rate of drug-eluting stents	95.90%	93.30%	91.40%
Vascular access			
Femoral artery	35.00%	48.17%	23.44%
Radial artery	64.63%	51.51%	76.12%
Quality assessment			
Mortality	0.33%	0.31%	0.30%
Complications (intra- and post-operative)	0.80%	0.70%	0.70%
Number of STEMI cases	52,467	64,693	81,288
Percentage of STEMI patients directly underwent PCI	29.8%	30.7%	30.4%
Online omission rate	13.2%	10.6%	3.10%

**Table 2** Arrhythmia intervention in mainland China from 2009 to 2011

	2009	2010	2011
Pacemaker			
Total implants (increased by)	33,614	38,768 (15.3%)	42,986 (10.9%)
Number of implants per one million persons (mainland China/Europe)	25/947	29/951	32/-*
Complications (before discharge)	41 (0.12%)	47 (0.12%)	51 (0.12%)
Mortality	7 (0.02%)	4 (0.1%)	4 (0.093%)
ICD			
Total implants (increased by)	736	1027 (39.5%)	1228 (19.6%)
Number of implants per one million persons (mainland China/Europe)	1/149	1/158	1/-*
Complications	3 (0.41%)	0 (0)	3 (0.224%)
Mortality	1 (0.14%)	1 (0.1%)	0 (0)
Catheter ablation			
Total implants (increased by)	45,363	54,559 (20.3%)	63,355 (16.1%)
Ventricular fibrillation ablation (increased by)	4,996	7308 (46.3%)	9856 (34.9%)
Complications	160 (0.35%)	182 (0.33%)	180 (0.28%)
Mortality	3 (0.01%)	7 (0.01%)	3 (0.0%)

number of CRT procedures smaller than 10 per year accounted for 84.5% in 2011. Because a high number of implantation increases positive results, specialized hospitals should provide this service, and the Ministry of Health will strengthen its administration in this regard. The indication for these procedures shows no significant difference between China and other countries.

### Intervention for congenital heart disease

Prof. Jiang Shi-liang from the Fuwai Cardiovascular Hospital, Chinese Academy of Medical Sciences presented data about interventions in congenital heart disease (*Table 3*) The results are based on data from the Ministry of Health Quality Control Center for Congenital Heart Disease Intervention and exclude data

**Table 3** Intervention for Congenital Heart Disease in Mainland China from 2009 to 2011

	2009	2010	2011
Total case number	16,045	18,671	22,967
Interventional procedure			
Atrial septal defect (ASD)	5,527 (36.98%)	6,793 (36.43%)	8,089 (41.38%)
Patent ductus arteriosus (PDA)	4,705 (31.48%)	5,466 (29.31%)	4,075 (20.84%)
Ventricular septal defect (VSD)	3,521 (23.56%)	4,252 (22.80%)	5,474 (28.00%)
Percutaneous balloon mitral valvuloplasty (PBPV)	603 (4.03%)	680 (3.65%)	905(4.63%)
Quality assessment			
Success rate	97.24%	97.67%	98.11%
Severe complications	0.20%	0.17%	0.12%
Mortality	0.03%	0.05%	0.02%

from the Military Health systems.

Advances in the equipment and technique have dramatically increased the success rate of these interventions, expanded the indications, and reduced the rate of complications. For example, ventricular septal defect (VSD) occlusion devices now have larger horizontal but smaller vertical dimensions in order to reduce severe complications such as third-degree atrioventricular (AV) block. At the same time, the waist diameter has been increased and strengthened, with an attempt to reduce severe complications caused by the compression of the device. The improvements in patent ductus arteriosus (PDA) occlusion devices include the

re-design of angles and shapes to suit its applications for different PDA. To further lower detrimental interaction between blood components and the device, surface coating with ceramics/parylene and absorbable occlusion devices have also been developed. Furthermore, the smaller-diameter introduction catheters reduce vascular complications during insertion, especially in pediatric patients.

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