

## Percutaneous Coronary Intervention: The Trends and Development

MUHAMMED KASHIF SHAIKH, SYED ZULFIQUAR ALI SHAH, ISHRAT BIBI, TAHIRA JUNEJO, SYED JAHANGHIR, AYESHA FAROOQ

*Liaquat University of Medical and Health Sciences (LUMHS) Jamshoro*

*Correspondence to Dr. Syed Zulfiqar Ali Shah, Email: zulfikar229@hotmail.com*

Ischemic heart disease causes mortality and disability worldwide. At the turn of the 21<sup>st</sup> century, shifting demographics have made it a serious issue in emerging nations. In high-income nations, the prevalence of coronary artery disease (CAD) is reducing due to increased government expenditure on awareness, education, disease knowledge, and treatment techniques<sup>1</sup>.

Andreas Gruentzig's 1976 coronary balloon angioplasty launched interventional cardiology. Technological advances, enhanced accomplishment, and fewer complications made this new technique a most common method of coronary revascularization, surpassing CABG<sup>2</sup>. Percutaneous coronary intervention (PCI) was retitled after coronary angioplasty tools expanded over time. Interventional cardiology has evolved less in the last 10 years than in the preceding 25, which were driven by technology, but we now know how to use PCI optimally. "What we should do" ruled this time. Peripheral vascular and structural cardiovascular disease interventions have grown and may dominate the future. Interventional cardiology's future will be discussed alongside recent practice changes<sup>3,4</sup>.

The cardiac catheterization volume decline is multifactorial. Better prevention efforts, medical care, and secondary prevention for existing illness have lowered heart disease risk<sup>5</sup>. Since 1980, cardiovascular disease (CVD) deaths have dropped 30%, demonstrating disease prevalence reduction. Due to revascularization volume drop, CABG cardiac catheterization operation rates have fallen more than PCI<sup>6</sup>. PCI has replaced surgery in most revascularization cases. CABG is only referred for the most complex CAD. PCI volume fell less than CABG because more acute coronary syndrome patients received PCI<sup>7</sup>. Myocardial infarction has dropped 60% since 1970. PCI referrals for myocardial infarction patients have increased despite the population decline. PCI volume is lowest in unstable angina and PCIs accounted for 20% of all PCIs in 2006, but declined 26% by 2009. PCI for other indications dropped 10%. The COURAGE trial's cautious stable angina therapy produced this drop.

Many training programs now provide peripheral vascular interventional lab training. Drug-eluting stents and intravascular imaging have increased success and reduced problems<sup>8</sup>. Industry expects 8% peripheral intervention growth over four years. Interventional cardiology will grow most in structural heart disease over the next decade.

Despite poor prevalence estimates, aortic and mitral valve disease is rising. Interventional cardiology will change in 10 years. As the population ages, interventionists will perform more coronary interventions. Peripheral interventions may increase more than coronary, but valvular heart disease interventions will grow the most. New imaging technology is likely<sup>9</sup>. Future interventionists will need skills beyond coronary interventions and a different interventional lab. Many training programs are adapting quickly to these changes<sup>10</sup>.

Complex coronary intervention increasingly requires customizing. The patient's clinical history, anatomy, or

technology are complex. Besides balancing despite rising desire for minimally invasive therapies, must offer outstanding results<sup>11</sup>. Machine Learning (ML) artificial intelligence has performed well in this optic, and we predict its use to grow in the next years.

Study is crucial for identifying issues, developing therapeutic relevance from ideas, administering them, improving patient care, and recommending further research. Coronary illnesses require the most clinical studies. The most productive phase of coronary medicine and surgical specializations now provides the clearest evidence of clinical research<sup>12</sup>.

There was no official set-up in public service tertiary care centers to meet the demands of research-oriented clinical practice or start research on related topics until today. Liaquat University of Medical and Health Sciences Jamshoro, a national institute formalizing research as a Medical Research Center. Since its founding, LUMHS Jamshoro has led training and education in several fields.

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