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Innovations in interventional cardiology: Next-generation stents and valve technologies

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Rapid advances in interventional cardiology have revolutionized the management of coronary artery disease and structural heart disorders. This presentation explores cutting-edge developments in bioresorbable stents, drug-eluting technologies, and transcatheter valve therapies that continue to enhance procedural success and long-term patient outcomes. Next-generation stents with improved polymer coatings, optimized drug release profiles, and enhanced vascular compatibility are reducing restenosis rates and improving arterial healing.

In the realm of valvular interventions, transcatheter aortic valve replacement (TAVR) and transcatheter mitral valve repair have expanded treatment options for high-risk populations previously unsuitable for surgery. Newer valve designs featuring improved durability, anatomical adaptability, and reduced paravalvular leak have significantly improved safety and efficacy. The session will also highlight the role of advanced imaging modalities—such as 3D CT reconstruction and intravascular ultrasound—in procedural planning. Real-world clinical data and comparative studies between generations of stent and valve technologies will be discussed. In addition, emerging trends, including polymer-free stents, nanotechnology-enhanced coatings, and minimally invasive robotic catheter systems, will be examined. The presentation aims to provide clinicians with a comprehensive outlook on future innovations that will help optimize interventional outcomes and reduce procedural risks.

Biography

Sophia Muller is an Interventional Cardiologist at Heidelberg University Hospital and a leading researcher in stent engineering and transcatheter valve therapy. She has contributed to multiple clinical trials evaluating device safety and long-term performance. With extensive experience in catheter-based interventions, she collaborates with global research groups to advance minimally invasive cardiovascular therapies. Dr. Muller has authored several peer-reviewed studies and regularly speaks at international cardiology and device-innovation conferences.

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