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Enabling Advancements in

INTRAVASCULAR THERAPY

with High-Power, Advanced
Electronic Connector Products

According to the Centers for Disease Control and Prevention, up to 60% of Americans live with at least one chronic disease, including heart disease, cancer and diabetes. For patients living with these chronic conditions and the interventionalists who treat them, technology is improving the quality of life and outcomes from procedures. One trend helping to drive these positive outcomes is the use of intravascular techniques, which are processes

that work and are administered directly into a patient's vein. Intravascular systems enable minimally invasive surgeries and structural heart interventions, using advanced imaging, robotics and navigation systems to guide them. These practices are in turn fueled by technological advances in instruments and the machines that create images of veins. High-powered devices in miniature sizes and high-density cables and connectors are integral to the success of intravascular interventions.

Electronic
Design.

Intravascular therapies

Intravascular therapy procedures are used to treat a variety of conditions including heart and vascular disease. Interventionists use special catheters and devices to treat the problem by making small incisions through the skin, making these procedures less invasive. In addition, the growing use of techniques guided by intravascular imaging, such as intravascular ultrasound, plays a role in diagnoses and treatments because they allow for precise visualization of the area to be treated before, during, and after the procedure.

Trends in intravascular technology

Intravascular therapy is rapidly becoming the standard of care in hospitals and doctor's offices. It has several advantages over traditional surgery including less pain, less scarring, and faster recovery times. Here are some other trends around intravascular therapy and the technology involved:

Minimally invasive surgeries. There is a growing emphasis on minimally invasive procedures in interventional medicine. This approach aims to reduce patient trauma, promote quicker recovery times and minimize hospital stays. Techniques such as percutaneous interventions and endovascular procedures have gained popularity. The procedures may include percutaneous coronary intervention (PCI), which opens blocked coronary arteries or small incisions that deliver stents or grafts.

Advanced imaging techniques. Advances in imaging technology, such as intravascular ultrasound (IVUS), optical coherence tomography (OCT), and fractional flow reserve (FFR), have allowed for better visualization of blood vessels and improved decision-making during interventions.

Structural heart interventions. Interventional cardiology has witnessed significant advancements in treating structural heart diseases without open-heart surgery. Transcatheter aortic valve replacement (TAVR) and mitral valve repair/replacement are examples of minimally invasive procedures used to address valvular heart diseases.

Robotics and navigation systems. Robot-assisted interventions and advanced navigation systems improve the precision, control and outcomes of interventional procedures. These technologies are being developed and refined to enhance the capabilities of interventionalists.

Intravascular techniques are being driven by procedures that use new and advanced ways of ablating through tissue. Cryogenic techniques work by freezing the nerves. Pulse field ablation technology applies a high voltage (~3000 V) for a very small time (kiloseconds). This concentration of energy on one location limits the damage to surrounding tissue and decreases the chances of blood clots or stroke. Faster procedures mean patients are sedated for shorter times and potentially increase the number of procedures an interventionalist can administer in a day.

Electronic components facilitate better intravascular technology

A remarkable amount of connectivity products all work together in the room during an intravascular procedure.

Molex enables the growth and progress of this technology by providing a number of off-the-shelf products that work seamlessly in this space. This includes:

- Developing reliable, easy-to-use, high-density, medical-grade connectors with ever higher pin counts
- Real-time integration of multiple data and image signals with complex interconnects (copper and optical)
- Providing a core set of microminiature and RF off-the-shelf connectors that meet the robustness and life cycle needs of medical capital equipment
- Providing microelectronics, user interface, flexible substrates and internal cable assemblies for new surgeon consoles and signal generators needed to enable these new technologies

See the overview of standard Molex products available from Avnet used in intravascular therapies.



Molex Products used in Therapeutic Intervention — Robotic Surgery

Product Type	Backplane Connectors	Board to Board Connectors	FFC/FPC Connectors	Fiber Optics	I/O Connectors
Product Family	Impact	0.5 MM BTB	.5mm FFC/FPC	OptoE-Others	USB Type C
		0.635 MM BTB	1mm FFC/FPC	Multi Fiber Assembly	
		0.8 MM BTB			

Molex Products used in Therapeutic Intervention — Surgical Equipment/Electrosurgical

Product Type	Automotive	Wire to Board Connectors	FFC/FPC Connectors	I/O Connectors	Integrated Products
Product Family	DuraClik	0.4 MM BTB	.3mm FFC/FPC	Cat 3 Mod Jack/Plug	Flat Flex Jumpers
		0.635 MM BTB	.5mm FFC/FPC	Cat 5-7 Mod Jack/Plug	USB Based Assemblies
		0.8 MM BTB	1mm FFC/FPC	D-Sub	
		SEARAY	Over 1mm FFC/FPC	Universal Serial Bus	
				USB Type C	

The future is being created now

State-of-the-art intravascular techniques are bringing about better patient outcomes as they are minimally invasive, reduce time, are less risky and deliver more accurate treatments. These advances demand faster, better connectivity in the devices used. More signals are moving through the machine's footprint, which requires miniaturization, fiber optics for high definition and upgrading materials for high-voltage throughput. These technologies are available now as off-the-shelf products. To learn more about our solutions for intravascular technologies, please contact our experts at

www.avnet.com/molex-medical.