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Session Topic : The Future of Medical Devices for Hemodialysis
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원격 모니터링 이동형 혈액투석 의료기기 개발

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This lecture will present current development trends in hemodialysis medical devices, focusing on device characteristics and technical approaches. The session will begin with an overview of various types of artificial kidney systems, highlighting structural and functional differences. Following that, the lecture will introduce the design features and configuration of the hemodialysis machine currently under development by Synopex. The Synopex artificial kidney system is being developed with a strong emphasis on safety, operational efficiency, and maintenance convenience. Key features include modular design, stable circuit and control systems, and an intuitive user interface. A major component of the system is the remote monitoring module, which allows real-time tracking of device status and treatment data. While home hemodialysis is not currently implemented in Korea, this technology is being integrated as a preparatory step for future adoption when regulatory and clinical environments allow. Next, the lecture will introduce the structure and functionality of a mobile RO (Reverse Osmosis) water purification system, which is designed to connect externally to the artificial kidney unit. The system emphasizes portability, operational stability, and reliable water quality. It incorporates a comprehensive control system with sensor-based monitoring and alarm integration to ensure safe and continuous operation. Finally, the lecture will present Synopex’s commercialized dialyzer (blood filter), which has been fully developed and is currently on the market. The dialyzer is manufactured in a cleanroom environment under strict quality control. Each production step is carefully monitored, and a variety of tests are performed before shipment, including sealing integrity, flow path uniformity, and physical durability. These procedures ensure product reliability and compatibility with the artificial kidney system. This lecture will provide an integrated view of Synopex's hemodialysis system—comprising the artificial kidney, mobile RO system, and commercially available dialyzer—and will highlight the technical direction for future applications such as remote monitoring and home-based treatment support.

Keywords: Synopex, hemodialysis machine, mobile RO water purification system, dialyzer, Mobile Hemodialysis System