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BACKGROUND

The EkoSonic Endovascular System, EKOS, is a catheter-directed thrombolysis system which uses ultrasound to treat blood clots. The EKOS system was approved by the FDA in 2004 and is used to treat PE, DVT, and arterial occlusion.

METHODS

The EKOS Catheter has been evaluated for the treatment of severe PE (patients at imminent risk of death). EKOS is a minimally invasive system for dissolving thrombus. The ultrasonic core generates an acoustic field which greatly accelerates lytic dispersion by driving the drug deeper into the clot and unwinding the fibrin to expose plasminogen receptor sites. The EKOS system consists of an infusion catheter, an ultrasound core wire, and a control unit. This wire contains miniature ultrasound transducers that send pulsed-wave ultrasound energy along the catheter. This ultrasound accelerates the fibrinolytic process, allowing the drug to penetrate deeper into the clot and decreasing treatment time and the total dose of thrombolytic agent needed. The EKOS system is minimally invasive and can take as little as 15 minutes to perform. Catheters are usually inserted through the jugular vein in the neck or the femoral vein in the leg.

COMPOSITION

The EKOS catheter is comprised of 4-5 main parts (Figure 1):

CATHETER SHAFT: The main body of the catheter is a flexible tube made of medical-grade materials (polyurethane/silicone). This shaft is inserted into the body to reach the blood clot.

ULTRASOUND EMITTERS: Along the length of the catheter shaft, there are small ultrasound emitters which produce high-frequency sound waves that aid in breaking down the blood clot.

LUMEN: The catheter typically has one or more lumens (channels) running through its center. These lumens allow for the passage of other medical instruments or fluids. EX. Contrast dye, Medications, etc.

COMPOSITION CONT.

EXPANDABLE TIP: Some catheters have an expandable tip at the distal end. This helps stabilize the catheter within the blood vessel and ensures proper positioning for effective treatment.

CONNECTOR: At the proximal end of the catheter, there is a connector that allows for attachment to external equipment. This connector may be used to provide access during other medical procedures.

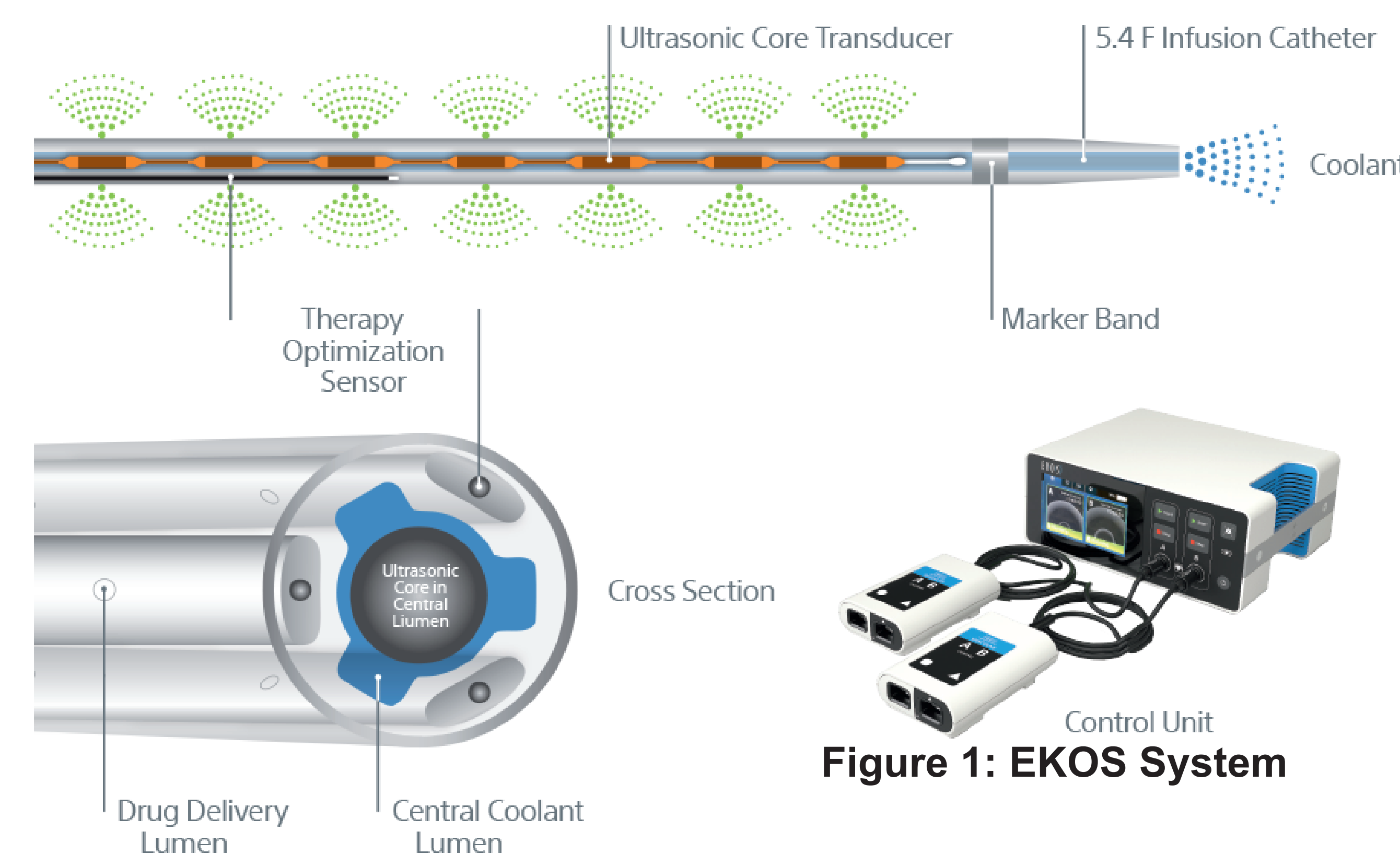


Figure 1: EKOS System

USES

The EKOS catheter is used to dissolve blood clots in patients with DVT and PE

The catheter is inserted into the affected blood vessel and uses ultrasound waves in order to dissolve the clot (Figure 2)

The EKOS catheter is a minimally invasive way of treating blood clots in patients suffering from DVT and PE.

While the EKOS catheter is revolutionary in treating blood clots, there may be side effects to its use, including bleeding, clot migration, vascular injury, etc. These side effects must be taken into consideration on a patient-to-patient basis. The catheter should be used on patients with acute DVT, pulmonary embolism (PE), or in cases where medicinal therapy with anticoagulants has failed.

The catheter should be avoided with patients with bleeding disorders or history of recent major bleeding, uncontrolled hypertension or active infections.

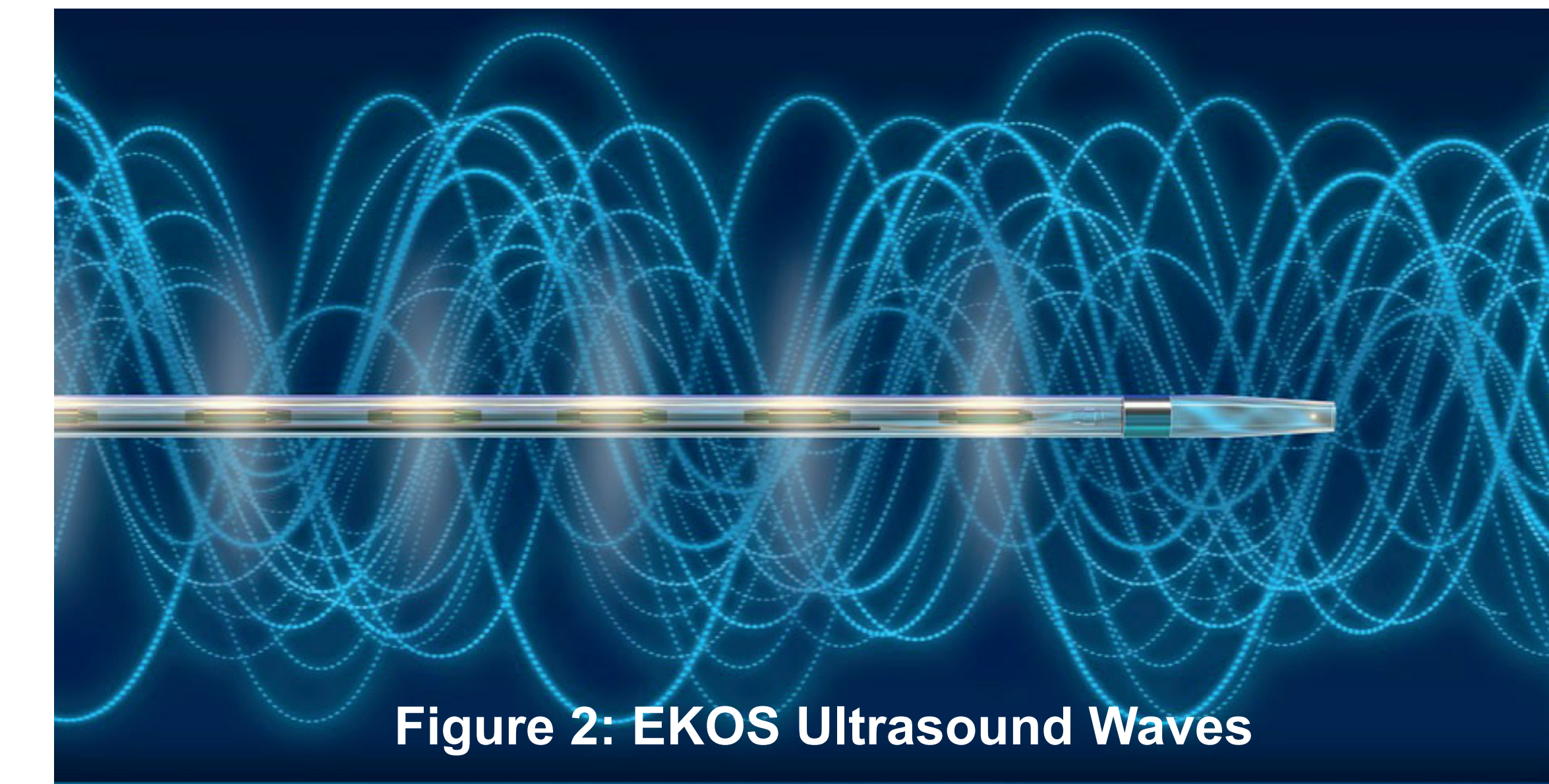


Figure 2: EKOS Ultrasound Waves

RESULTS

The EKOS catheter provides faster thrombolysis with fewer thrombolytic agents than standard C-D thrombolysis. EKOS catheter causes rapid improvement, restores RV function, and reduces clot size. The EKOS catheter can use up to 88-92% less thrombolytic dose than standard systemic treatment. Studies have shown that the EKOS catheter minimizes the risk of bleeding. One study found that none of the patients who underwent EKOS experienced intracranial bleeding. Another study found that about 10% of patients experienced bleeding with the clot-busting drugs. In one study, 73% of EKOS-treated patients experienced recanalization compared with 56% of patients who received a standard microcatheter without ultrasound.

CONCLUSION

An EKOS catheter is a medical device used in the treatment of blood clots. Specifically, these catheters are used to treat conditions such as deep vein thrombosis (DVT) and pulmonary embolism (PE). These devices employ a technology called ultrasound-accelerated thrombolysis, which involves the use of high-frequency sound waves to dissolve blood clots. This device is a revolution in medical care which can improve the health and wellbeing of many patients.

REFERENCES

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