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# alfapump® DSR – potential chronic therapy for heart failure patients that are not well controlled on diuretics

**Sequana Medical has leveraged its alfapump experience and is developing alfapump DSR (Direct Sodium Removal), a fully implanted system to manage volume overload in heart failure (HF) patients by removing excess sodium and fluid from the body.**

## Volume overload in heart failure is a major clinical problem and the leading cause of hospitalisations for patients with heart failure

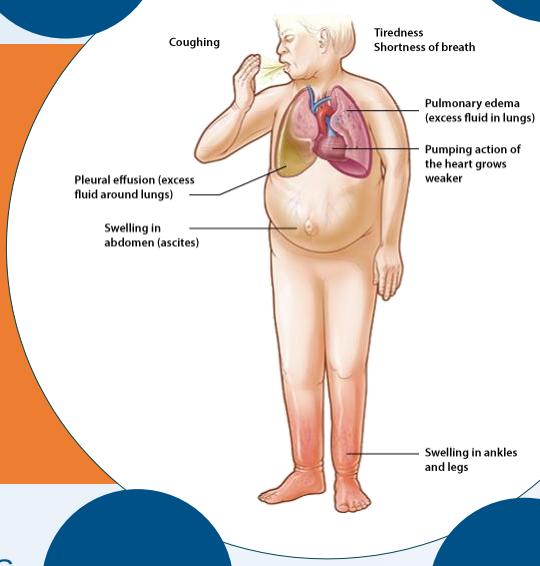
US hospitalisations annually due to HF[1]: **c.1m**

**90%** HF – hospitalisations due to volume overload[1]

Causes of heart failure include coronary artery disease, heart attacks, high blood pressure and faulty heart valves.

Heart failure can disturb the normal functioning of the kidney and diminish its ability to excrete sodium from the body. The resulting sodium retention leads to retention of fluid in the body (volume overload).

40% of heart failure patients on IV loop diuretics have a poor response[4].

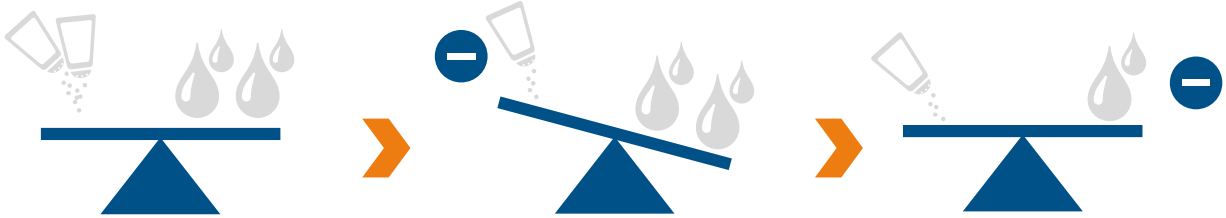



**c.5 days** Typical hospital stay[2]

**24%** Re-admission rate at 30 days[3]

**$13bn** Annual costs of US HF-related hospitalisations[2]

## DSR therapy is Sequana Medical's proprietary therapy to remove excess sodium and fluid from the body



**Volume overload in heart failure**

sodium concentration is in balance but there is too much sodium and too much fluid in the body

**Removal of excess sodium**

DSR approach is based on removing excess sodium from the body

**Elimination of excess fluid**

body acts to restore sodium concentration and eliminates excess fluid through ultrafiltration and urination

**DSR therapy involves the use of the peritoneal cavity for the removal of sodium via diffusion from the body into a sodium-free solution (DSR infusate)**

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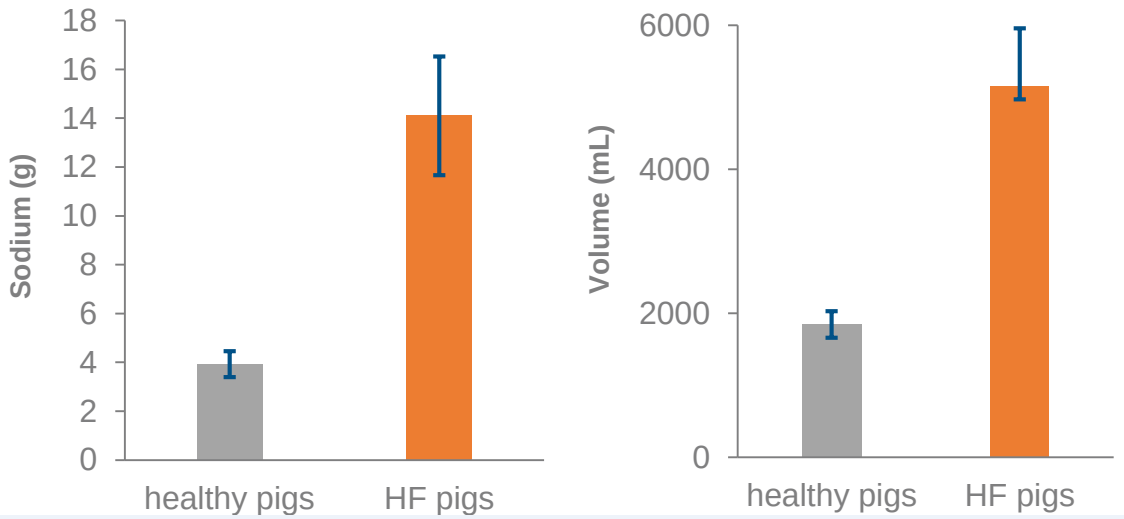
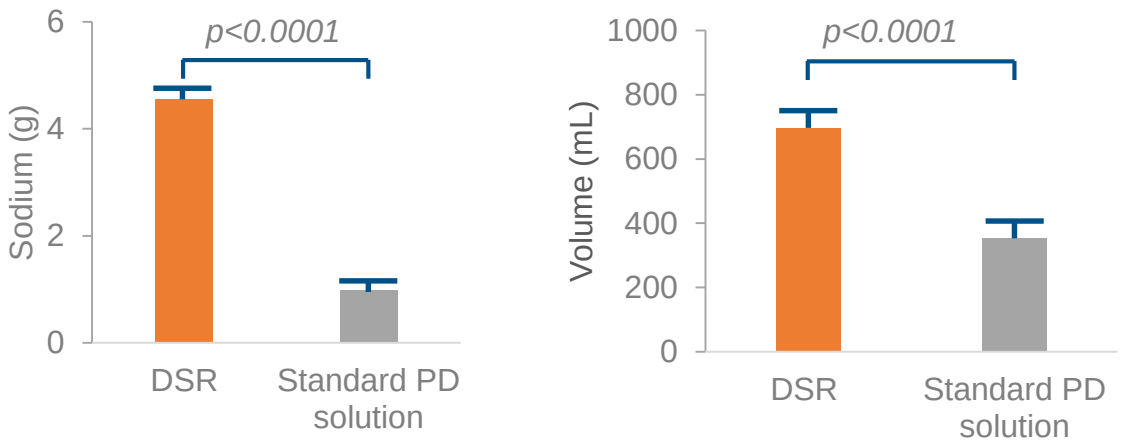
# Studies have demonstrated that DSR therapy is capable of removing large quantities of sodium and fluid in a safe, tolerable and consistent manner

## Pre-clinical study in 5 healthy pigs and 10 pigs with simulated heart failure (HF)

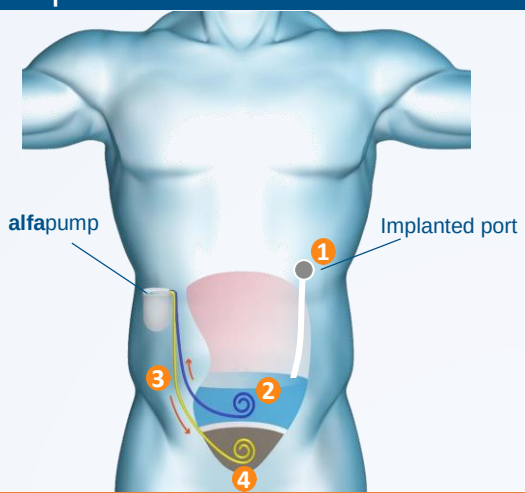



## First-in-human single dose DSR cross-over study in 10 patients with peritoneal dialysis (PD)




# **alfa**pump DSR leverages on proven elements: DSR, **alfa**pump and implanted port

1. Administration of DSR infusate to peritoneal cavity
2. Sodium from body diffuses into DSR infusate
3. **alfa**pump moves sodium-rich fluid into the bladder
4. Body eliminates excess fluid via urination




*Repeated dose **alfa**pump DSR proof-of-concept study (RED DESERT) ongoing*

*Sources: 1: Costanzo et al., J. Am. Coll., 2007; 2: Kilgore et al., 2017; 3: Ross et al., 2010; 4: Testani, Circ Heart Failure, 2014 & 2016*