

Today, there are two systems of Artificial Urinary Sphincters available in the market, one system that works with a Pressure Regulating Balloon and the other with a Spring System.

Both artificial sphincters are composed of a cuff squeezing the urethra, a pump and a pressure regulating system.

COMPARISON OF ISSUED PRESSURE

PRESSURE REGULATING BALLOON SYSTEM

The normal issued pressure of the pressure regulating balloon system is 60-70 cm H₂O, but this is the pressure of the cuff before it has been implanted. Two other factors must be considered that impact the pressure of the cuff around the urethra after implantation.

i) The muscular pressure of the pelvis

The muscular pressure of the pelvis increases the pressure of the Pressure-Regulating Balloon System of about 10 to 15cm H₂O, and at other times, even more. There have been some recorded cases where the registered pressure was as high as 180 cm H₂O

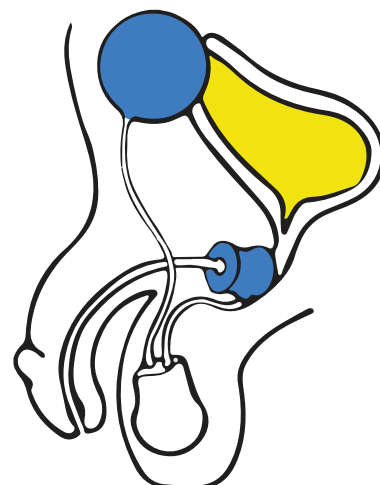
ii) The difference in height between the Pressure Regulating Balloon and Cuff

The difference in height between the Cuff and the Pressure-Regulating Balloon increases the pressure in the hydraulic circuit of about 10 to 15cm H₂O.

Conclusion

The normal pressure of 60-70 cm H₂O is valid before the device is implanted. Upon implantation, considering all given factors, the pressure of the cuff comes to:

$$\begin{aligned} &60-70 \text{ cm H}_2\text{O} \text{ (pressure of the balloon)} \\ &+ 10 \text{ to } 15 \text{ cm H}_2\text{O} \text{ (muscular pressure of the pelvis)} \\ &+ 10 \text{ to } 15 \text{ cm H}_2\text{O} \text{ (difference of height between balloon and cuff)} \\ &= 90 \text{ to } 100 \text{ cm H}_2\text{O} \text{ (final pressure of the cuff)} \end{aligned}$$



SPRING SYSTEM

The normal pressure of the Spring System is 90-100 cm H₂O, both before and after implantation. This is so because the calculation takes into consideration the only variable that impacts the pressure, namely, the difference of height between the spring and cuff.

The height difference of 5 cm decreases the pressure of the cuff between 0-5 cm H₂O

Conclusion

$$\begin{aligned} &90-100 \text{ cm H}_2\text{O} \text{ (pressure of the Spring-System)} \\ &- 0 \text{ to } 5 \text{ cm H}_2\text{O} \text{ (difference in height between the spring and the cuff.)} \\ &= 90 \text{ to } 100 \text{ cm H}_2\text{O} \end{aligned}$$

