INSTRUCTIONS FOR URETHRAL FUNCTION TESTING

Neomedix Catheter Version

Pressure Recording Technique:
This is prepared on the basis that the recording system utilises extra-corporeal pressure transducers and fluid filled, perfused lumen, catheters. A perfused lumen technology is required to record accurate pressure values over a physiological range of pressure rise-times (including those generated by a cough) in a sphincter. The technique comprises a pressurised fluid source, hydraulic resistance prior to the catheter connection and low compliance transducer and plumbing characteristics. Any single compromise of these items physical characteristics can considerably impair the systems performance. If recording cough pressure transmission ratios, the same pressure measuring characteristics should apply to both the channels being monitored to remove subtraction errors in the measuring system itself.

Frequently it is found that labs perfuse the urethral pressure lumen channel whilst the vesical pressure lumen channel is measured with a static fluid coupled (non perfused) technique. Assuming an identical pressure change is applied to each pressure sensing port it can be seen that the more sensitive, faster responding urethral channel will give a greater recorded amplitude response over the time from the resting baseline to the peak of the cough transient. A subtraction error will therefore occur and can reflect in a positive error in the measurement of a cough pressure transmission ratio. We therefore recommend that both channels are perfused.

Preparation:
Ensure Infupress Pump holding bracket is located on the roll pole about 40 cm above the pressure transducers which are also mounted on the roll pole below the pump/syringe. NOTE: There is an optional pressurised IV bag method also available for routine clinical testing from Neomedix. The pressure transient response is acceptable but not as high as that when using the InfuPress pump.

• Slide the sterile pressure transducers into their appropriate slots on the transducer mounting plate.

• Draw up 30ml (no greater) of sterile water or saline into the sterile 30ml Infupress syringe. (If using Infupress syringe pump).

• Connect the single input port of the Dynaset hydraulic resistor assembly to the luer fitting of the InfuPress syringe (or IV bag if not using the InfuPress pump).

• Connect the three Dynaset hydraulic resistor stopcocks to the lower luer ports of the three (Pura, Pves and Pabd) pressure transducers.

• Close all of the Dynaset hydraulic resistor stopcocks OFF to the hydraulic resistor lines.

• Load the syringe into the spring loaded Infupress Pump and turn the syringe barrel 90° to lock/secure it into the pump housing. Note the fluid in the syringe barrel is now under considerable pressure. (or pressurise the IV bag if not using the InfuPress pump).

• Hang the Infupress pump/syringe assembly on the Infupress holding bracket on the roll pole.

•• Remove the sterile dual or triple lumen catheter from the packaging and connect as follows.

•• Connect the (Pura) pressure line to the top luer fitting of the Pura transducer.

•• Connect the (Pves) pressure line to the top luer fitting of the Pves transducer.

•• Connect the I.V. filling bags giving set to the luer fitting of the white filling line.

•• Connect the Pabd perfused catheter to the top luer fitting of the Pabd transducer.

•• Ensure that the pressure transducer cable is firmly connected into the transducer extension cable for each channel and that all cables are connected to the appropriate AcquiAmplifer input connector. Note: not always, but usually, these are labelled with the letter as shown below. (There are configurations which allow CMG and Urethral testing with just two pressure transducers).

Pves = channel D
Pura = channel F
Pabd= channel E

Equipment Operating Instructions

1. With the multilumen catheter not yet introduced into the patient turn all Dynaset stopcocks OFF to the vent position. Allow flushing until all air is expelled from all lumen in the patient catheters.

2. Hold the multilumen and abdominal patient catheters horizontal at the pubis symphys level and whilst the pura lumen is being perfused have an assistant start the Acquidata scrolling button (or use F11) and zero balance all channels (using the zero all balance virtual button on the screen or F12 or the blue balance button under and to the left of the A input connector on the AcquiAmplifier).

3. Turn the Pabd stopcock OFF to the hydraulic resistor line.

Patient Procedural Instructions:

A. Introduce the multilumen catheter into the patient bladder via the urethra until both Pves and Pura sensing ports are both in the bladder. Monitor the Acquidata screen to evaluate pressures (similar resting values are between about 0 to 15cm H_2O depending upon patient size/obesity).

B. With the patient relaxed to establish a base-line ask for a good effort cough. Both channels should operate almost identically. Turn the Pura and Pves stopcocks OFF to the hydraulic resistor lines.

C. Introduce the Pabd catheter into the patient rectum or until the Pabd sensing port is in the rectum about 5cm past the proximal margin of the anal sphincter) . Monitor the Acquidata screen to evaluate pressure (resting value about 0 to 15cm H_2O depending upon patient size/obesity). Turn the Pabd stopcock OFF to the vent position.

D. With the patient relaxed to establish a base-line ask for a good effort cough. The Pabd channel should register a similar cough value as seen on the Pves channel.

E. Turn the Pves and Pura stopcocks OFF to vent. Ensure that all three pressure channels are now recording.

Patient Testing Instructions:

T1 Commence bladder filling. At approximately 200ml of introduced volume suspend filling.

T2 Record pressures whilst slowly withdrawing the multilumen catheter until the maximum Pura values increase, reach a maximum and then fall to about zero as the Pura sensing port exits the urethra. This data can be used to calculated functional urethral length.

T3 Record pressures whilst slowly reinserting the multilumen catheter until the maximum Pura point is again reached. Stop insertion. Recommence filling until approximately 50% of anticipated bladder volume is reached. Suspend filling.

T4 Carry out patient cough stimulation to allow measurement of both Pves and Pura values and the subtracted Puc value. This may be repeated in additional patient positions (supine, sitting, standing).

T5 Return patient to supine position and re-establish bladder filling until functional bladder capacity is reached.

T6 Repeat step T4 at maximum functional capacity.

T7 Assist the patient to the commode and, after allowing 5 –10 seconds to display new stable trace baselines, instruct the patient to void. Note there are often considerable (up to 40cm H_2O) baseline changes with changes to the patients positioning due to the force increases on the abdominal cavity from the upper body mass of the patient

T8 At the completion of voiding, turn all stopcocks OFF to the hydraulic resistor lines.

Note: Acquidata facilitates clinical variants of the above procedure if desired.