Biofeedback Anorectal Manometry System
Quick Reference Guide

Note: An mcompass® Petite 5-channel catheter may be used for pediatric patients if desired. Specific fill volumes for the Petite catheter are highlighted in yellow.

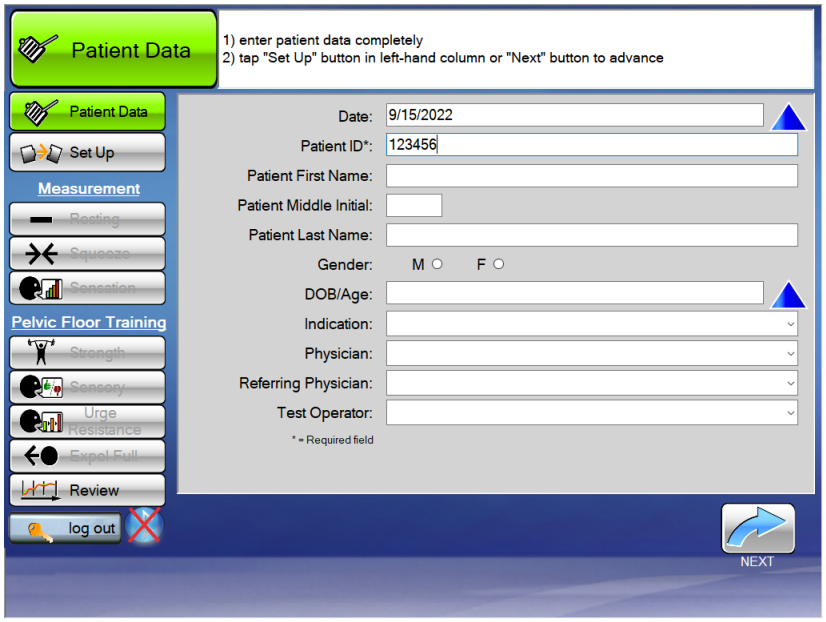
Login

Turn on Tablet
Double-click the *mcompass*® program icon
Tap "*mcompass* Biofeedback" button
Select "Pelvic Floor Retraining"
Select User. Initial user is "Admin" (Admin is selected when highlighted in **BLUE**.)
Open keyboard – tap keyboard icon on lower far right corner of screen
Enter case-sensitive password. Initial password is Medspira123

Enter Patient Data

Note: Steps 1 – 19 may be performed before the patient is brought into the room for the test.

1. Enter patient data completely
2. Tap "Set Up" button at top in left-hand column

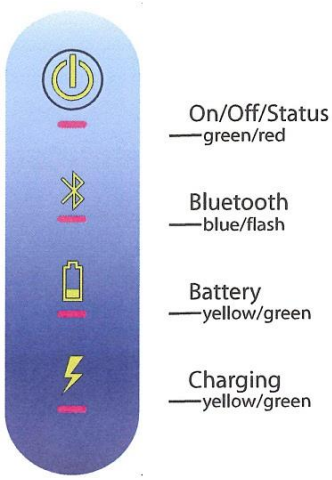


All that is required to move forward is a patient ID number, however, we recommend you complete everything first, as you cannot go back and change info once the test has been completed. Once you have written an indication, doctor's name, referring physician, it will populate a drop-down list making the process easier as you go.

Set Up – Bluetooth Connection

1. Make sure the Fob is charged and the charging plug is disconnected from the power source
2. Turn on the Fob by pressing "On/Off" button and wait until "On" light appears on Fob. All LEDs will be on for about 2 seconds.
3. You can proceed when you see steady green lights for On/Off and Battery, and one flashing blue light for Bluetooth.
4. Tap the "Connect Bluetooth" button on the screen 

5. Wait for the flashing blue LED on the Fob to turn steady blue. This means you are connected to the Tablet.



6. Make sure the lever is in Position 1 "OPEN" 

7. Tap Next on the screen 

Note: If the Fob fails to connect through Bluetooth to Tablet, follow Tablet instructions.

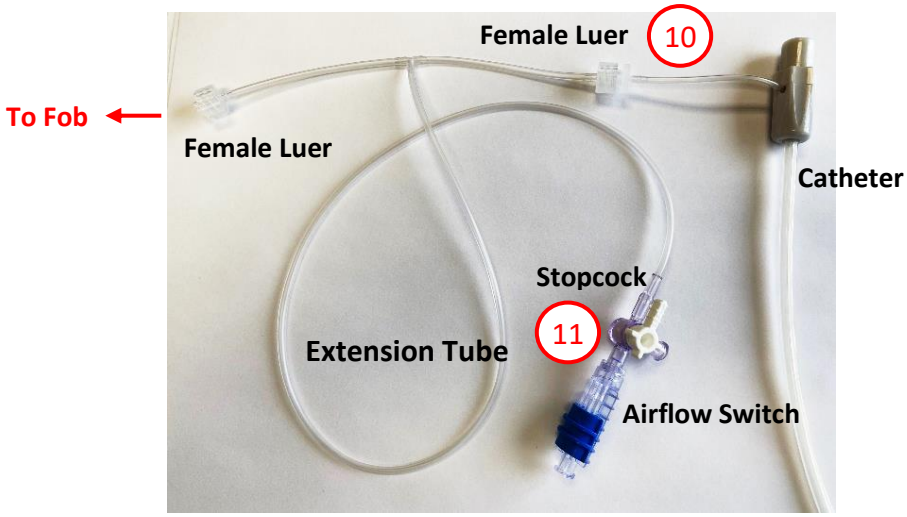
The FOB should have 2 green lights and a blinking blue light in the middle, once the blue light becomes steady the Fob is connected via Bluetooth properly. If the Fob fails to connect through Bluetooth to the Tablet, follow the instructions outlined in our document labeled: Troubleshooting Issues with the FOB: https://medspira.com/support/anorectal-manometry- support/

Set Up – Catheter Connection to Fob

NOTE: These must be performed in this order to obtain proper pressure readings.

8. Tap "FOB Connected" to confirm FOB connection 
9. Connect catheter to the FOB by plugging in with arrows aligned
   Line up the black triangle from the catheter to the blue triangle on the FOB and push it ALL the way in.

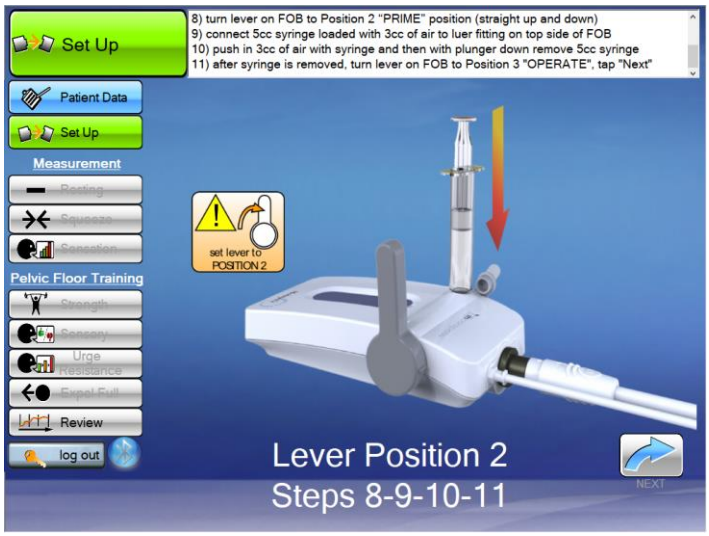
   NOTE: It does not snap or twist in place to connect or disconnect.
10. Connect the Extension Tube
    - One short end male luer connects to female luer on catheter
    - The other short end male luer connects to female luer on Fob



11. Connect Airflow Switch to 3-way Stopcock, and Connect large syringe to the Airflow Switch

Set Up – Priming the FOB

12. Move the lever on the FOB to Position 2 “PRIME” position (straight up and down)
13. Load the 5cc syringe with **2cc** of air
14. Connect the 5cc syringe loaded with **2cc** of air to luer fitting on top of the FOB
15. Push in **2cc** of air with syringe
16. While holding thumb on syringe plunger, remove the 5cc syringe from the FOB



After placing air into the sphincter balloon, remove the syringe and let air naturally bleed out of the balloon to normalize to the pressure in the room (count to seven before moving the lever to position 3).

17. After the syringe is removed, move lever on the FOB to position 3 “OPERATE” and click *NEXT*
    Moving the lever to position 3 closes the airlock to the sphincter balloons
18. Replace protective cap for 5cc syringe to prevent contamination
19. Tap “PRIMED” on screen

Everything up to this point (steps 1-19) may be done prior to seeing the patient so when they arrive, you are prepared to begin the procedure.

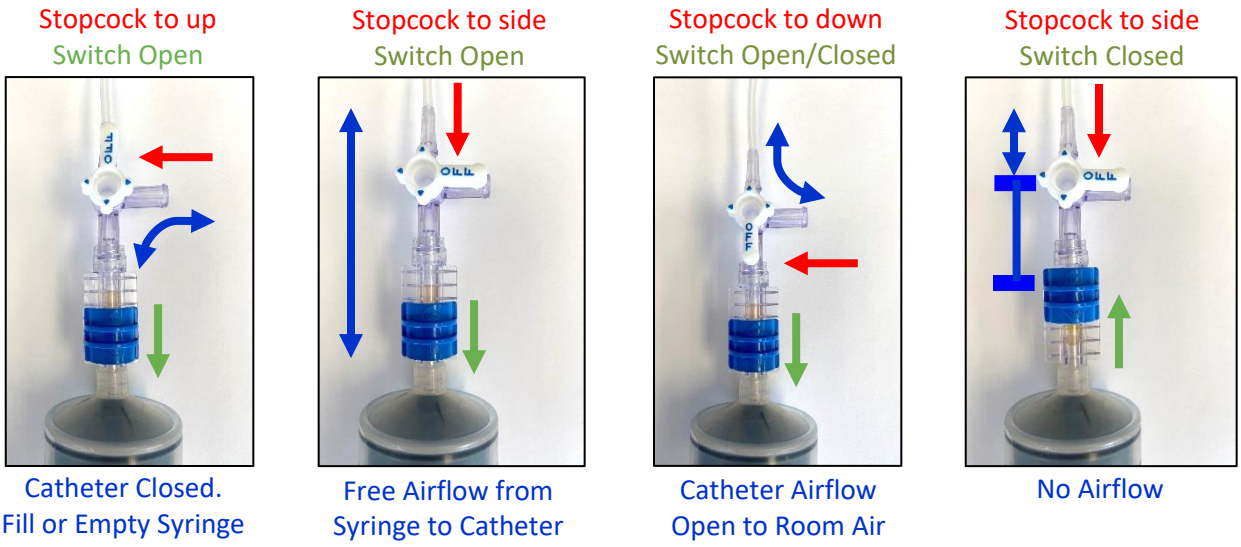
Prepare for Testing:

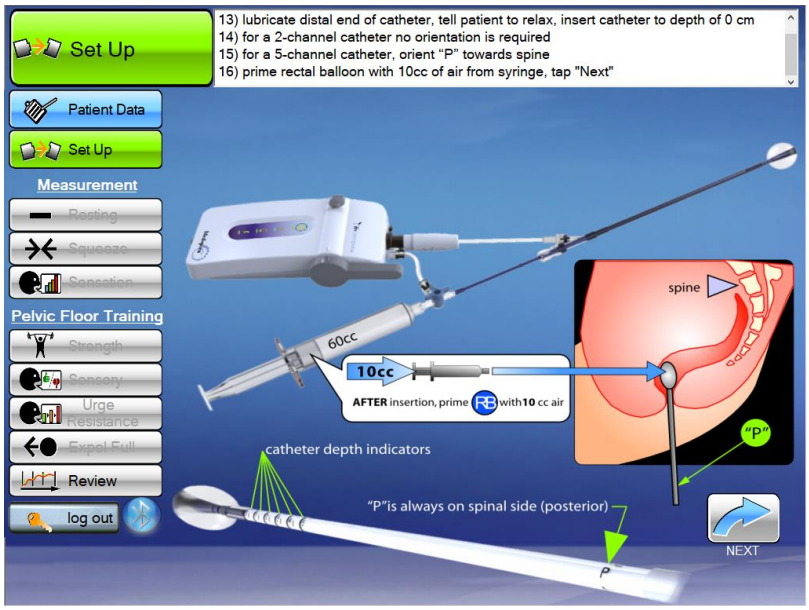
Have the patient lie on their left side, knees raised toward stomach.

With the patient in position for the procedure,

1) Lubricate distal end of catheter device; instruct the patient to relax
2) Insert the catheter into the patient to position "0" on catheter verifying the letter "P" is in the proper orientation (toward the patient's back)
3) Using a large syringe, prime rectal balloon with 10cc of air (3cc for Petite), press "Next"
4) Lock the stopcock UP to the "Catheter Closed" position

How to Use the Stopcock





At this point, the Set Up is complete.

MEASUREMENT

Resting Test – Measuring resting pressures and High Pressure Zone (HPZ)

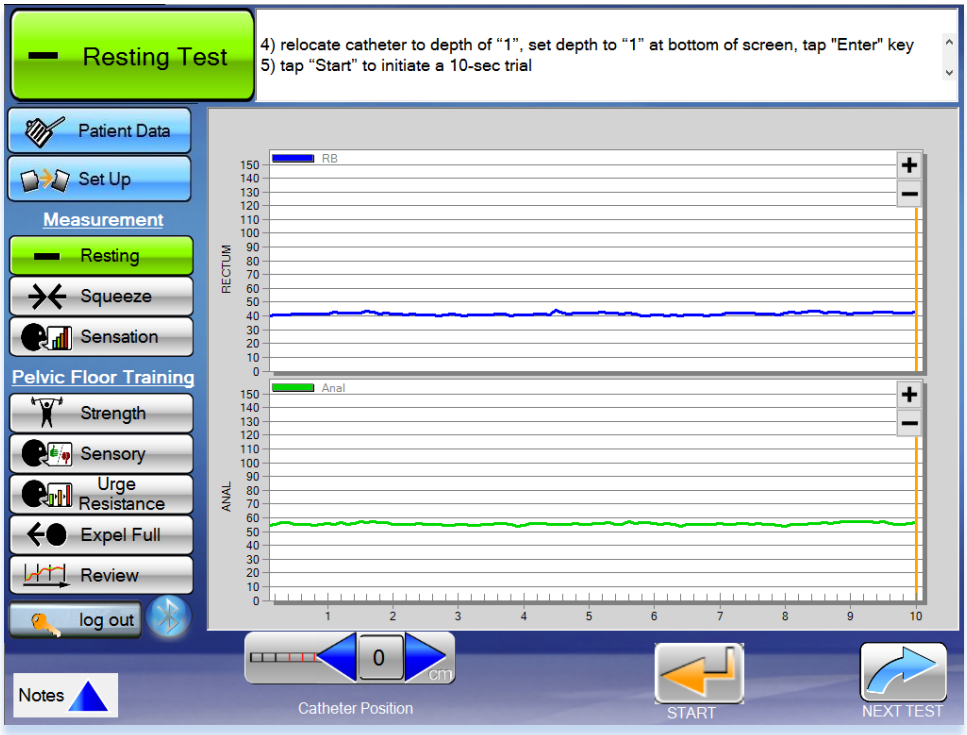
1) Hide patient screen from view, explain test is to measure anal canal resting pressure.
2) Tell patient to relax and lie still, verify rectal and anal pressures are appropriate.
3) Verify catheter depth is “0” at bottom of screen.
4) Tap “Start” to initiate a 10-sec trial.
5) Relocate catheter to depth of “1” set depth to “1” at bottom of screen. Tap “Enter” key.
6) Tap “Start” to initiate a 10-sec trial.
7) Relocate catheter to depth of “2” set depth to “2” at bottom of screen. Tap “Enter” key.
8) Tap “Start” to initiate a 10-sec trial.
9) Determine High Pressure Zone (HPZ) by tapping “Review”. Find HPZ and note catheter depth.
10) Tap “Back to Tests”, set catheter depth to match the HPZ depth, and tap “Enter” key.
11) To end Resting test, tap “Next Test” button, or tap any procedure on left-hand side of screen.

Determining the High Pressure Zone (HPZ) is required to properly perform the remaining tests.

With each Resting Test, at positions “0”, “1” and “2”, be aware of the MAX line which is near the bottom of the screen.

The highest MAX among positions “0”, “1” and “2” will determine the High Pressure Zone (HPZ).

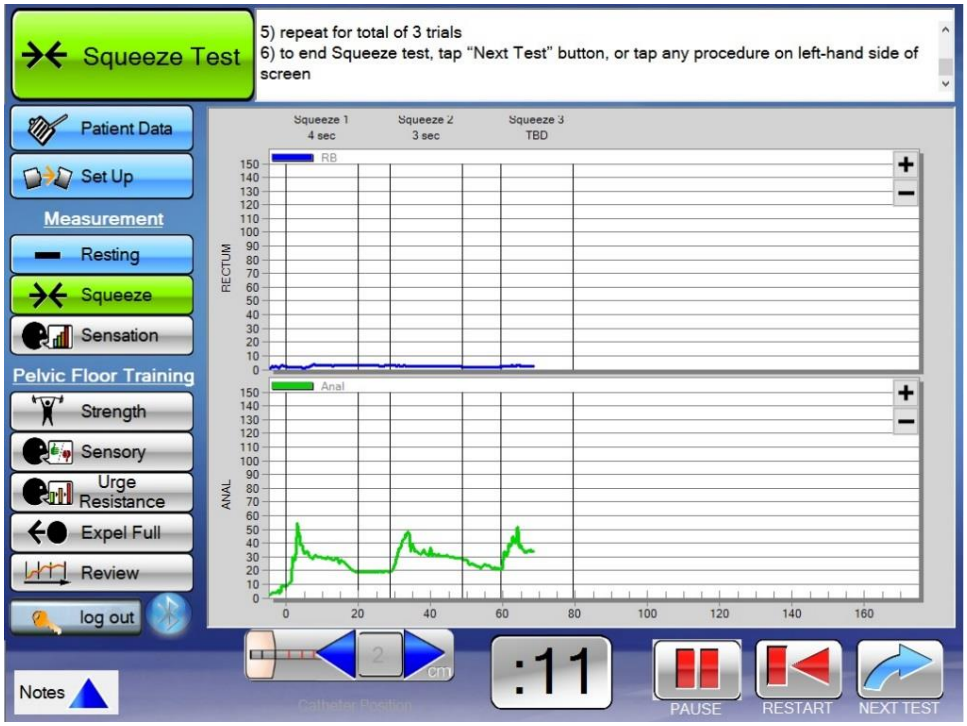
Continue the rest of the tests from that HPZ position.



Squeeze Test – Measuring anal/sphincter squeeze pressures

1) Hide the screen from patient view.
2) Explain this test is to measure anal canal squeeze pressure.
3) Instruct the patient to relax.
4) Verify catheter position is set to HPZ *(High Pressure Zone)* and tap "Run/Pause".
   - Note: You may choose to tape the catheter to the patient to maintain its HPZ position.
5) When "Start" appears, tap to begin first 20-sec measurement, and tell patient to squeeze.
6) When "Start" button reappears, tap it for new measurement and tell patient to squeeze.
7) Repeat for total of 3 trials.
8) To end Squeeze test, tap "Next Test" button or tap a procedure on left-hand side of screen.

You do not need to wait the full minute between the tests, if the patient is comfortable and ready to go you can enter the catheter position and run button will pop up and you can continue with the tests.



Perform 3 squeezes where the patient squeezes as hard as they can for 20 seconds. You will need to keep telling the patient to squeeze throughout the entire 20 seconds. We want them to not only squeeze hard but to hold it as long as possible. Tell the patient to squeeze like they're trying to prevent an accident as hard as they can.

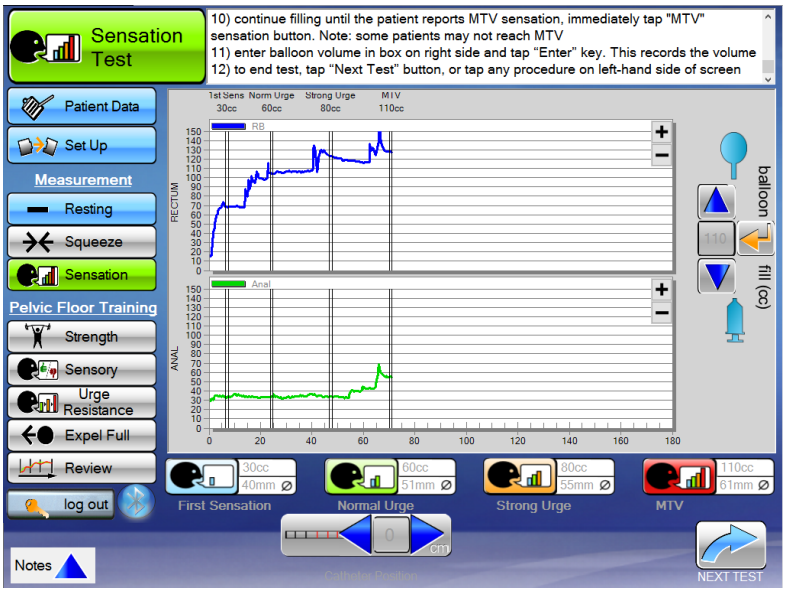
Sensation – Measuring Sensation Curve & Rectal Compliance

1) Hide the screen from patient view.
2) Explain this test is to measure rectal sensation levels. Instruct the patient to relax.
3) Verify catheter position is set at the HPZ *(High Pressure Zone)*.
4) When "Start" appears, tap to begin recording data.
5) Slowly inflate rectal balloon until patient reports first sensation.
    - **Immediately close the Airflow Switch.**
    - Tap the "First Sensation" button.
6) Enter balloon volume in box on right side and tap "Enter"  key. This records the volume.
7) Open the Airflow Switch and continue filling until the patient reports normal urgency sensation.
    - **Immediately close the Airflow Switch.**
    - Tap the "Normal Urge" sensation button.
8) Enter balloon volume in box on right side and tap "Enter"  key. This records the volume.
9) Open the Airflow Switch and continue filling until the patient reports strong urge sensation.
    - **Immediately close the Airflow Switch.**
    - Tap the "Strong Urge" sensation button.
10) Enter balloon volume in box on right side and tap "Enter"  key. This records the volume.
11) OPTIONAL: Open the Airflow Switch and continue filling until the patient reports Max Tolerable Volume / Pain (MTV).
    - **Immediately close the Airflow Switch.**
    - Tap the "MTV" sensation button.

    Note: Optional. Some patients may not reach MTV. Stop for any pain experienced during inflation.
12) Enter balloon volume in box on right side and tap "Enter"  key. This records the volume.
13) To end the test, tap "Next Test" button, or tap any procedure on left-hand side of screen.

It may be easier to just start the test and explain the steps as you go.

- *The patient may first alert you when they feel anything or a sense of fullness, such as when they feel like they need to go to the bathroom but know they can wait ("Normal urge").*
- *When they feel they absolutely have to go to the bathroom right away ("Strong urge").*
- *Last, when the patient reports that they cannot continue due to the very uncomfortable pressure from the inflated balloon ("MTV").*



PELVIC FLOOR RETRAINING

4 training exercises may be performed with the mcompass® Manometric Biofeedback System:

- **Strength**
- **Sensation**
- **Urge Resistance**
- **Expel Full**

After performing the Anorectal Manometry (ARM) tests, the referring physician should have provided the diagnosis and perhaps also the desired therapy path.

Clinical findings from ARM tests that may lead to each exercise being beneficial to a patient:

	Chronic Constipation / Dyssynergia	**Incontinence - Weak Sphincter**	**Incontinence - Hyposensitivity**	**Incontinence - Hypersensitivity**
IF INDICATION IS	• Weak rectal squeeze pressure during defecation. **or** • Insufficient anal relaxation – low or negative gradient. **or** • Expel full/empty tests show paradoxical muscle contraction during defecation.	• Pressure values from anal squeeze test and resting test are below normal values. **or** • Anal squeeze duration is shorter than acceptable.	• Rectal balloon volumes from sensation test are significantly above normal values.	• Rectal balloon volumes from sensation test are significantly below normal values.
EXERCISE TO PERFORM	**Expel Full Exercise** To help the patient visualize muscle contractions associated with defecation and improve muscle strength and coordination abnormalities.	**Strength Exercise** To help the patient increase pelvic floor strength and duration of squeeze in anal sphincter.	**Sensory Exercise** To help the patient lower the sensory threshold for stool in the rectum to a more normal level.	**Urge Resistance Exercise** To help the patient increase their tolerance of larger volumes of stool in the rectum, converting strong urges into normal urges.
GOALS	• Rectal pressure > anal pressure (positive gradient) • Rectal pressure increase from baseline • Anal pressure decrease from baseline (resting)	• > 100 mmHg max squeeze pressure • > 50 mmHg for 10 second duration of squeeze pressure • > 40 mmHg for resting pressure	< 40 cc volume sensory threshold	> 120 cc volume strong urge threshold

Please note that this is a general guidance based on typical factors. Medical practitioners are expected to use their own best judgment.

Strength Exercise

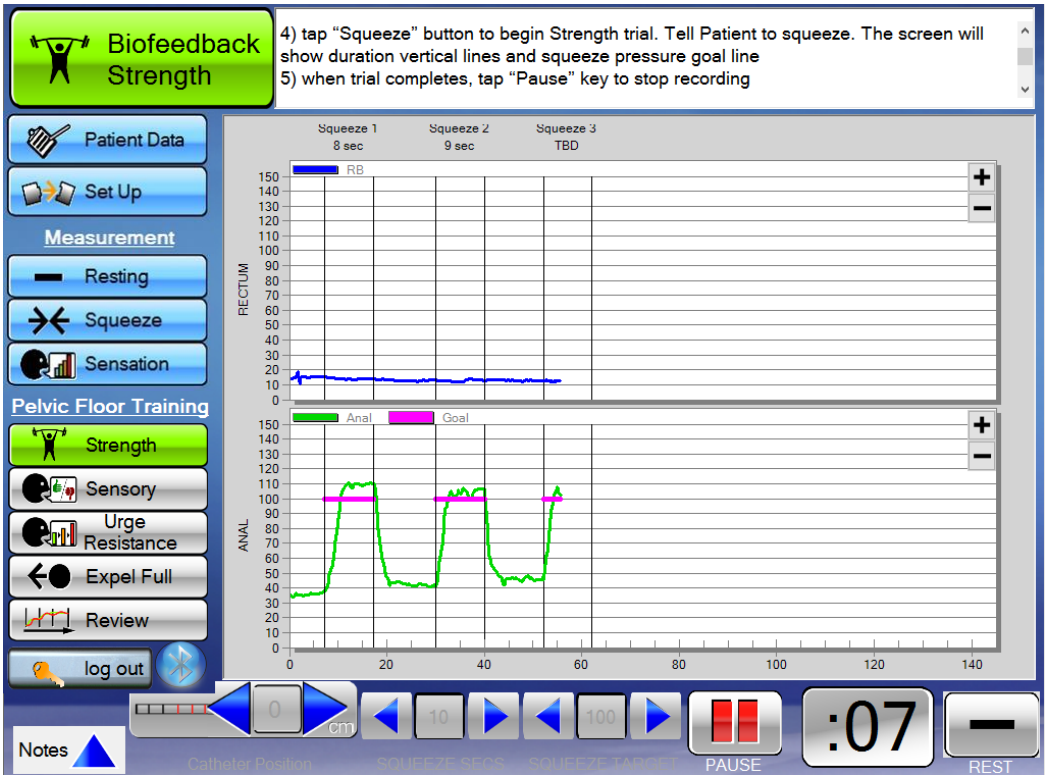
- **Biofeedback strength training highlights the importance of the clinician or therapist as a coach. Give the patient encouragement and praise.**
- **Many patients will not have good muscle isolation, strength, or the ability to squeeze for a 10 second duration at the first visit.**
- **Continue to work at each visit to achieve the strength training goals.**

Strength Training Goals:

Goal of Training	Biofeedback Goal
Increase squeeze strength	Squeeze strength of 100mmHg or higher
Increase squeeze duration	Maintain at least 50 mmHg squeeze for at least 10 seconds
Increase resting pressure	Resting pressure at least 40 mmHg
Maintain constant rectal balloon pressure	Rectal balloon pressure does NOT increase greater than 10mmHg with squeeze

Perform the Exercise:

1) Position screen so patient can view it. Explain the strength exercise purpose & expectations.
   - *The goal is to increase the patient's anal sphincter strength and hold duration.*
   - *Instruct the patient to focus on "squeezing" their sphincter muscles. The patient is not to be "bearing down" or using abdominal/gluteal muscles to increase rectum balloon pressure (blue line). It is important to teach the patient this difference.*
   - *Over time, their max strength and hold duration should increase.*
2) Verify catheter position is at HPZ. Also, verify rectal balloon has original "Prime" fill of 10cc (3cc for Petite).
3) Enter/verify the catheter position on the screen and tap "Enter"  key.
4) Enter a target duration ("Squeeze Secs") for the first squeeze trials – something achievable.
5) Set target squeeze pressure (pink line) based on the patient's earlier Squeeze Test. Patient should be able to reach. the target 50-75% of the time.
6) Tap "Run" to begin recording data. There will be a 5 second delay before the "Squeeze" button appears.
7) Tap "Squeeze" button to begin Strength trial. Tell patient to squeeze. The screen will show duration vertical lines and squeeze pressures for both Rectal and anal muscles.
8) When trial completes, tap "Pause" key to stop recording.
9) Provide feedback to patient on strength and duration of contraction and correct contraction of abdominal wall muscles.
10) Adjust strength trial duration (perhaps in 2 second increments), increase squeeze target (based on the patient's attainable pressure), and vertical scale if necessary.
11) Tap "Resume".
12) Tap "Squeeze" to initiate a new trial. Repeat squeeze trials until fatigued. (Average is ~ 5-10 times.)
13) To show patient previous Strength trials, tap "Review" button on the left side of the screen. After reviewing the history, return to strength exercise and continue training.


Biofeedback Strength
4) tap "Squeeze" button to begin Strength trial. Tell Patient to squeeze. The screen will show duration vertical lines and squeeze pressure goal line
5) when trial completes, tap "Pause" key to stop recording
Patient Data
Set Up
Measurement
Resting
Squeeze
Sensation
Pelvic Floor Training
Strength
Sensory
Urge Resistance
Expel Full
Review
log out
Notes
Squeeze 1
8 sec
Squeeze 2
9 sec
Squeeze 3
TBD
RB
RECTUM
Anal
Goal
ANAL
Catheter Position
SQUEEZE SECS
SQUEEZE TARGET
PAUSE
:07
REST

Sensory Exercise

Indications for Sensory Training:

- One or more bowel accidents that are larger than just staining that occurred with no warning
  or
- Abnormally high threshold for first sensation on ARM

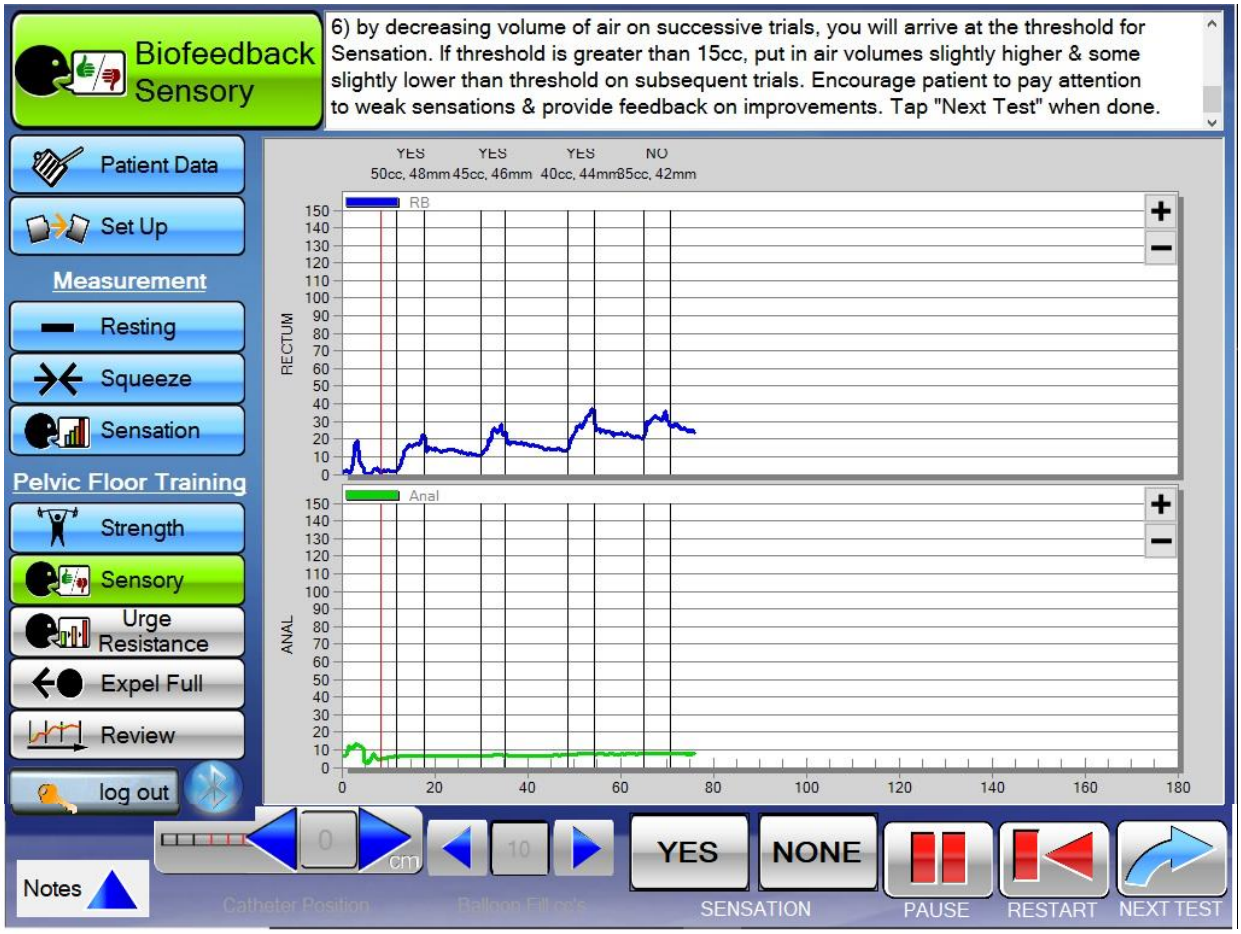
Sensory Training Goals:

To increase the patient's sensitivity to fecal matter in the rectum and sense/feel lower volumes, such as < 40cc.

Perform the Exercise:

1) Position screen so patient CANNOT view it. Explain the sensory exercise purpose & expectations.
   - *The goal is to simulate a stool in the rectum and gradually increase the patient's physical sensitivity to that.*
2) Verify catheter position is at the High Pressure Zone (HPZ).
3) Instruct patient to say so as soon as they feel anything. Enter a rectal balloon air volume such as 50cc or a volume you are confident they will feel. Tap the "Run" key.
4) Tap "Start"  button to begin first trial. Two response buttons appear: "YES" and "NONE".
5) Wait two seconds then inject the predetermined amount of air into the rectal balloon. **Close the stopcock.** Leave air in balloon for 3-5 seconds. If patient reports they felt it, tap "YES". If not, tap "NONE". **Open stopcock.**
6) Adjust volume of air for the next trial and tap "Start" to begin. Repeat until patient is fatigued.
7) By decreasing volume of air on successive trials, you will arrive at the threshold for sensation. If threshold is greater than 15cc, put in air volumes slightly higher & some slightly lower than threshold on subsequent trials. Encourage patient to pay attention to weak sensations & provide feedback on improvements. Tap "next test" when done.

It is important that the patient NOT have a view of the screen.
The goal is to increase the patient's physical sensitivity of fecal matter in the rectum.
Do not let the patient know you are gradually reducing the volume. You are trying to get the patient to sense/feel lower cc volumes.
Set a goal line (perhaps 50cc) and slowly lower it down with each subsequent trial. Once you have reached a threshold, try different varying degrees of air to train the sensitivity to occur at lower volumes and for the patient to feel sensation sooner.


Biofeedback
Sensory
6) by decreasing volume of air on successive trials, you will arrive at the threshold for Sensation. If threshold is greater than 15cc, put in air volumes slightly higher & some slightly lower than threshold on subsequent trials. Encourage patient to pay attention to weak sensations & provide feedback on improvements. Tap "Next Test" when done.
Patient Data
Set Up
Measurement
Resting
Squeeze
Sensation
Pelvic Floor Training
Strength
Sensory
Urge Resistance
Expel Full
Review
log out
YES YES YES NO
50cc, 48mm 45cc, 46mm 40cc, 44mm 85cc, 42mm
RB
RECTUM
Anal
ANAL
0 20 40 60 80 100 120 140 160 180
0
cm
10
YES
NONE
SENSATION
PAUSE
RESTART
NEXT TEST
Notes
Catheter Position
Balloon Fill cc's

Urge Resistance Exercise

Indications for Urge Resistance Training:

- One or more bowel accidents that are preceded by Strong Urge
  or
- Abnormally low maximum tolerable volume on ARM (less than 100ml),
  or
- Abnormally low urgency sensation (less than 80ml)

Urge Resistance Training Goals:

To improve control of strong urgency sensation and increase rectal capacity, such as > 120cc.

Perform the Exercise:

1) Position screen so patient CANNOT view it. Explain the exercise purpose & expectations.
   - *The goal is to teach them to use relaxation to counteract strong urge sensations and learn to tolerate larger volumes.*
2) All the air, except the 10cc priming volume, should be removed from the rectal balloon before starting.
3) Verify catheter position is at the High Pressure Zone (HPZ).
4) Tap "Run" to start recording data.
5) Tap "Start"  to begin biofeedback training. This activates response buttons for "Normal Urge", "Strong Urge", & "MTV" (Max Tolerable Volume).
6) Slowly inflate the rectal balloon until patient reports a sensation of Normal Urge. It may be necessary to reload the syringe with more air.
7) When patient reports an Urge sensation, immediately tap the appropriate button.
8) Adjust rectal balloon fill level on the screen to the inflated volume and tap "Record".
9) Tap "Start"  to reactivate response buttons.
10) Continue to inflate rectal balloon until patient reports a Strong Urge. Tap "Strong Urge" button, adjust balloon fill meter, tap "Record".
11) Remove 10cc and have the patient try to relax and breathe for 5-10 seconds.
12) Tap "Start"  to reactivate response buttons.
13) Remove 30cc from rectal balloon and check to see if the intensity of sensation has decreased from Strong Urge to Normal Urge.
    - If so, tap "Normal Urge" button, adjust balloon fill meter, tap "Record".
    - If not (Strong Urge is still reported), wait for 5 seconds and repeat question.
14) Tap "Pause" to stop recording. Have patient practice deep breathing or other relaxation technique. Tap "Resume" to resume recording.
15) Return to Step 4 and repeat the training for as many trials as appropriate.
    - Provide feedback to the patient on whether they are improving their tolerance for rectal filling.
16) Tap "review" button to show patient training session results.

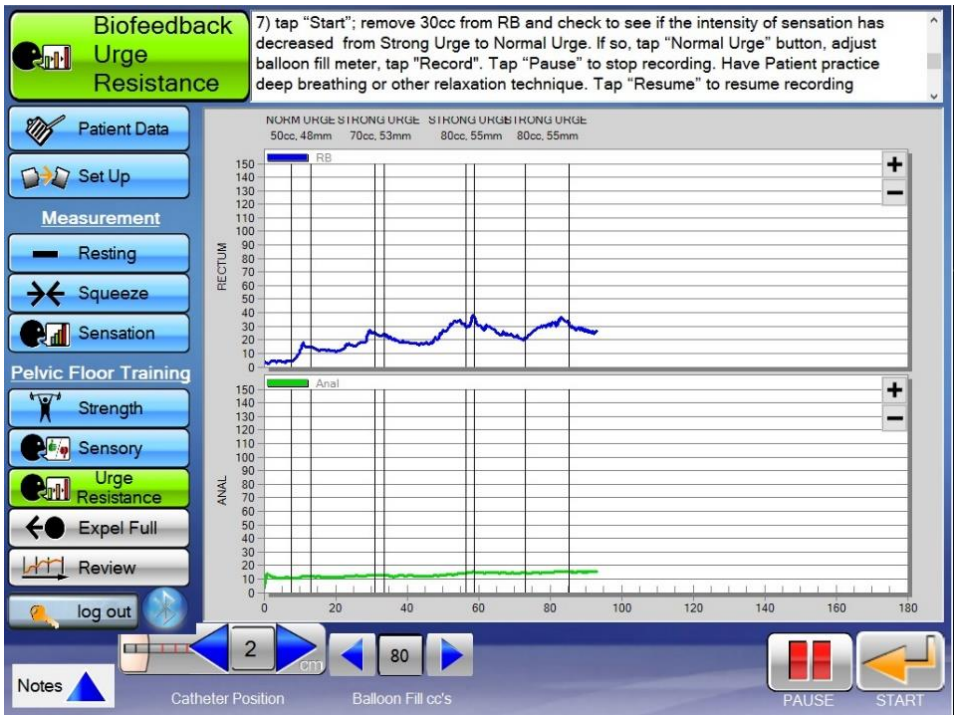
Urge Resistance Training Notes:

1. Pressing the Run button causes the balloon pressures to be displayed on the graph, but to initiate a trial you must press the Start button.
2. Pressing the Start button initiates a trial and puts a vertical line on the screen to show where you are starting. This causes the Sensory buttons ("Normal Urge", "Strong Urge", "MTV") to appear. An important note is that unless the Start button is pressed to initiate a trial, the software will not be

able to record the volume and pressure at the sensory threshold and will not be able to incorporate these into the reports.

3. As soon as the patient reports the sensation of urgency the clinician must immediately press the appropriate sensation button. This puts another vertical line on the graph and most importantly it holds the pressure at this point in a temporary file.
4. After pressing the sensation button, the clinician could actually reduce the volume of air in the rectal balloon without losing the ability to record the volume used at the point the sensation was reported. To record the volume at the point of sensation, the clinician has to change the rectal balloon fill ccs volume meter on the lower left and then press the Record button at the lower right-hand corner. This writes the volume and the pressure in the upper graph above the rectal balloon pressure. It writes the pressure from the temporary register and the volume you have just put in.
5. Although the software continues to record pressure in both balloons, the clinician will need to start a new trial to either find the next sensory threshold (strong urge after normal urge for example) or to have the patient try again after practicing relaxation. This would be done by tapping the Start icon again and repeating the process.
6. It is not necessary to provide biofeedback training on the threshold for Maximum Tolerable Volume (MTV). Instead, it is important to remind the clinician that after getting the patient to a threshold of Strong Urge, one should take some air out of the rectal balloon, have the patient relax for a minute or two, and then re-challenge them with another Strong Urge trial.

It is important that the patient NOT have a view of the screen. The goal is to help patients resist greater bowel pressures and suppress the immediacy of urges.
Teaching the patient to relax when they reach the Strong Urge (have to go right now) feeling and by removing the 30cc simulating the rectal wall relaxation, we are showing the patient how to convert the "go right now" situation into a Normal Urge (watching TV and going at the next commercial) feeling.
When the patient reaches the Normal Urge and Strong Urge levels, teach them to engage/contract their sphincter muscles. This is teaching the patient to hold the bowel movement back to avoid accidents.
The overall goal for this test is converting the Strong Urge to a Normal Urge. In a real life setting this will teach the patient skills so they are able to find a restroom and avoid an accident.
Increased anal sphincter muscle strength may also help with these urge suppression exercises.



Expel Full Exercise

1) Position screen so patient CAN easily view it. Explain the exercise purpose & expectations.
   - *The goal is to teach them to use the proper abdominal/rectal wall muscles while also relaxing the anal sphincter to ease defecation.*
2) Inflate balloon with the same volume where First Sensation was experienced during the Sensation Test, plus (+) 10cc, and confirm balloon volume.
3) Adjust the anal and rectal targets to the desired values.
4) Tap the "Run" button.
5) Instruct patient to "bear down" as if defecating for 20 seconds.
6) Tap "Bear Down" and wait until the 20-second test completes. (Encourage the patient to maintain this effort for as long as they can.)
7) Deflate balloon to original primed level of 10cc (3cc for Petite).
8) Return to Step 3 to repeat for new trial. Repeat trials until patient is fatigued.
9) Enter Notes and tap "Review".

It is important that the patient have a view of the screen. The goal is to help patients recruit the correct muscles during defecation.

There is a Rectum balloon pressure line (blue) and a goal line (pink) along with an Anal balloon pressure line (green) and a goal line (pink). The idea is to set the rectal balloon pressure goal line high and the anal balloon pressure goal line low.

Instruct the patient to bear down and tell the patient to relax their sphincter. This is teaching the patient not to "fight themselves" meaning bearing down with their abdomen/rectal wall while holding back with their sphincter muscles. Teaching the patient to only use their abdomen/rectal wall during defecation will allow for easier defecation.