

CLINICAL APPLICATIONS TRAINING SERIES

SIGNOS AS A BLADDER SCANNER

The Signos technique for the calculation of bladder volume is extremely simple. Novice users can adopt the technique in a less than half an hour and the volume calculation typically takes less than a minute to perform.

Procedure Outline

Bladder scanning hints

Quick estimation- one measurement

1. **Select B-Mode** - tap on the B or M mode symbol in the top right hand corner or hold down the snowflake scanning icon till it 'Honks' and changes mode – Figure A.

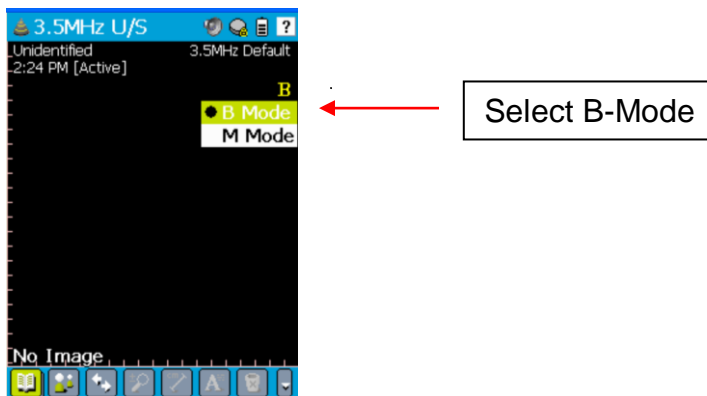


Figure A – Select B-Mode

2. **Select the Bladder Auto preset** - tap the stylus on the preset in the top right corner of the screen to obtain the drop down list or go to Main Menu (book icon) using the scroll wheel, select *scan presets* by clicking the scroll wheel in, scroll down to and click on *select preset* and choose *Bladder Auto* from the dropdown list – Figure B.

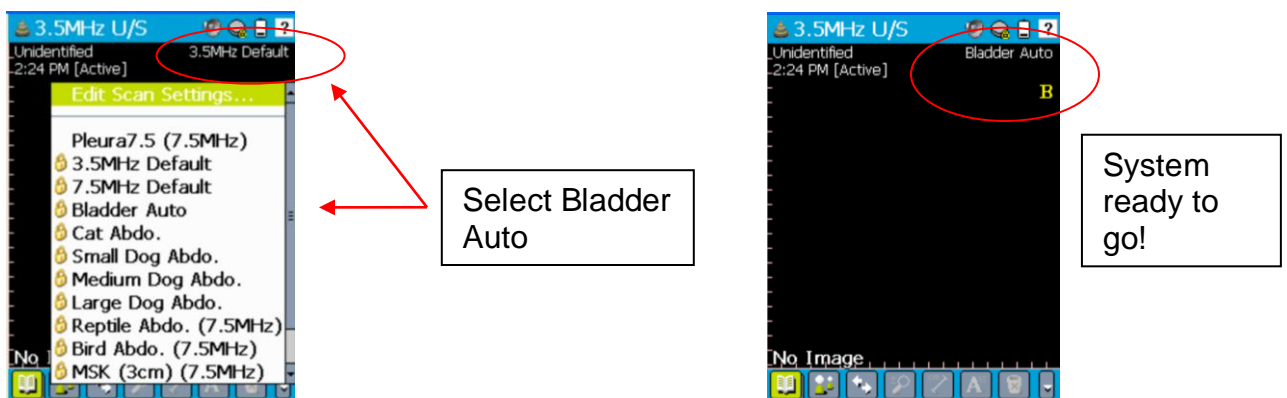


Figure B – Select Bladder Auto

3. **Perform a Sagittal scan (angle the probe from head to toe) to determine the longest and deepest section of the bladder – Figure C & D.** Survey the bladder at various points across the abdomen from right to left to determine the **deepest** section. You will be able to keep track of the deepest area by comparing the depth of the bladder to the centimeter markers on the side of the device. You need to get the superior and inferior ends of the bladder on the screen.

The transducer will be placed 2cm- 3cm above the pubic bone initially and perpendicular to the bed or just above or abutting the pubic bone if you are performing a post void residual volume. If there is retention and the bladder is huge both ends of the bladder will not fit on the screen.

Place the probe on the patient before pressing the snowflake icon to begin scanning.

N.B. - Always make sure in the sagittal scan that you have scanned under the pubic bone and aren't missing a small bladder. You should see the black shadow of the pubic bone on the right hand side of your image. Remember to use considerable downward pressure when scanning to make good contact, to compress the adipose tissue and assist in scanning under the pubic bone.

Once you have found the region of the deepest part of the bladder , perform a sagittal scan and sweep the line of ultrasound to the deepest part and pause scanning (don't freeze the image). Notice the *angle* of the transducer relative to the bed top – Figure C. It will probably be pointing downwards (towards the patient's feet). *Keep the probe at this angle and rotate the probe 90 degrees and then perform a transverse scan. – See Figure E.*

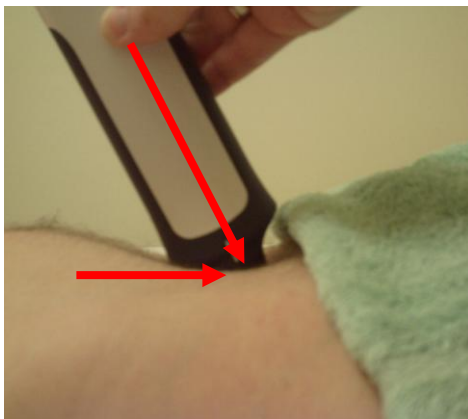


Figure C – Probe Position for Sagittal Scan of the Bladder

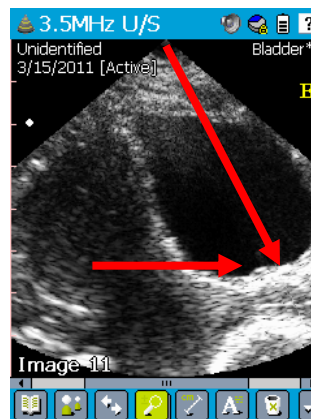


Figure D – Sagittal image of the bladder

4. **Transverse scan needs to include both sides of the bladder and be at the deepest part.** Remember how deep the bladder was in the **Sagittal scan**? It should be the same depth in the transverse scan if you have maintained the angle of the transducer. If it is not as deep change the angle of the transducer *a little* at a time as you scan to get the same depth. Usually you need more angle down towards the feet. Any adjustments you make when scanning are small and incremental.



Figure E – Probe Position for Transverse Scan of the Bladder

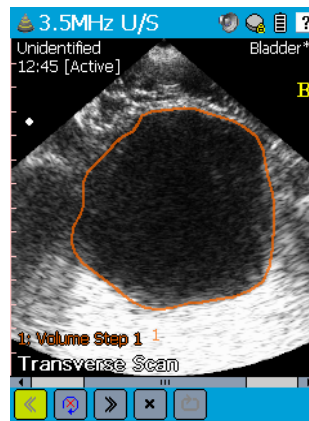


Figure F – Normal Transverse image of the Bladder with Volume outline.

- Freeze** the image when you are satisfied you have a transverse scan at the deepest part of the bladder. The device will ask you to tap on the bladder, with your fingernail or stylus. It will attempt to draw around the circumference of the bladder and estimate the volume. If the outline is not on the edges of the bladder touch the outline with the stylus and drag it to where it needs to be.

Remember to include the white reverberation artefact lines in the anterior part of the bladder or you will underestimate.

The measurement is displayed in the bottom left corner of the display – Figure H.

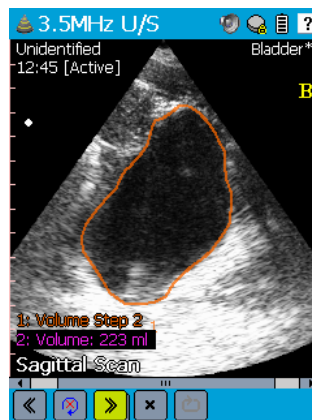


Figure G – Normal image of the Bladder with Volume outline and calculation in bottom left.

Two Measurement Sequence (Greater Accuracy)

1. **Select B-Mode** - as above (tap on the B or M mode symbol in the top right hand corner or hold down the snowflake scanning icon till it ‘Honks’ and changes mode)
2. **Select Scan Sequence** - Go to the Main Menu (book icon) using the scroll wheel or stylus. Select *Start Sequence*, then select *Bladder Auto*.
3. **Perform Sagittal scan** - The device will ask you to perform a transverse scan- *ignore it!* Survey the bladder. Perform your **Sagittal scan** (see above) at the deepest part.
4. **Freeze the image.**
5. **Tap the bladder** and move the outline to the edge of the bladder if necessary.
6. **Tap the >> icon** (at the bottom in the tool bar, green)
7. **Transverse scan** - The device will ask you to perform a sagittal scan. Perform another sagittal scan in the same place, at the deepest part, and then sweep the ultrasound line to point to the deepest part of the bladder. Notice the angle of the transducer, keep it the same and rotate it 90 degrees and **then do your transverse scan** making sure you get the complete bladder image.
8. **Freeze your Image.**
9. **Tap the bladder.** Move the outline if necessary. The volume is displayed in the bottom left of the display.

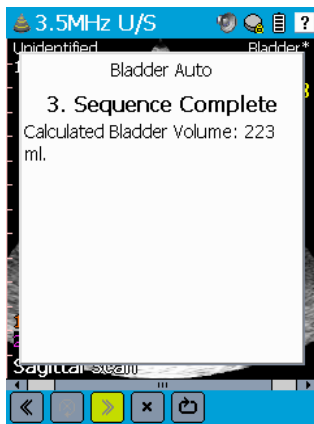


Figure H – Calculated Bladder Volume

Things to remember

- Place the probe on the patient before turning the snow flake on to scan.
- Use considerable downward force.
- Rock the transducer , don't slide it.
- Small bladders - place the probe just above the pubic bone in sagittal. Angle down a little to the feet if you can't see the bladder to angle under the pubic bone.
- Medium bladders place the probe 2-3cm above the pubic bone.
- Large bladders place the probe 4cm above the pubic bone.
- If you can't see the top of the bladder move the probe towards the head. If you can't see the bottom, move the probe closer to the pubic bone.
- You should always aim to see the black shadow of the pubic bone on the right of your image.
- Don't confuse the uterus for a bladder.
- A small bladder will always be near the pubic bone. If you see something black on the left hand side of the screen away from the pubic boneit's not the bladder
- Survey the bladder. Not all bladders lie in the midline of the patient or are the deepest at their middle.
- Keep your angle on the probe when changing from Sagittal to Transverse
- Your Transverse image should be as *deep* as your Sagittal image.
- Adjust your angle of scanning a *little* at a time.
- Include the *reverberation artifact* in your calculation.
- The calculated volume is a mathematical calculation not an absolute value.

View a video clip demonstrating this clinical application www.signosticsmedical.com

DISCLAIMER

This information is intended for educational purposes and to provide instruction in the operation of your Signostics ultrasound device. The techniques and procedures described should only be performed by a qualified clinician. The applicability of these techniques and procedures should be independently verified. Use of the information contained within this document is at your own risk.