bk medical

User Guide

Setting up and Using bkFusion on the bk3000 & 5000 Systems - Transperineal

This document forms part of the bk3000 & 5000 Short User Guide

bkFusion (16-01632-EN-05)
January 2020

CE 0543

For Professional Users Only

Table of Contents

English source version
16-01632-EN-05

General Information

- This user guide forms part of the bk3000 & bk5000 user guide. Please refer to the bk3000 & bk5000 user guide for safety information regarding bkFusion.
- Before using the equipment, please make yourself familiar with the information in the accompanying user information documents. Some documents are printed. Make sure that you also read the transducer user guide and specifications for each transducer that you use.
- See the CIVCO EX3 Tracked Stepper and Stand user guide for information on setting up and using the stepper.
- bkFusion is compatible with the USB foot switch, which can be set as 'mouse left-click'. See the bk3000 & bk5000 Advanced User Guide for foot switch configuration information.

MRI Data Transfer

- For information on importing MRI data from USB/CD, see below.
- For information on importing MRI data from the MIMcloud, see page 5.
- For information on importing MRI data from a Remote Patient List, see page 8.

To Import MRI Data From USB/CD in DICOM Format

1 Make sure that a Fusion-compatible transducer is connected to the ultrasound system and the **Prostate** exam type is selected.

2 Click the **Fusion** tab that appears at the bottom right-hand corner of the screen.

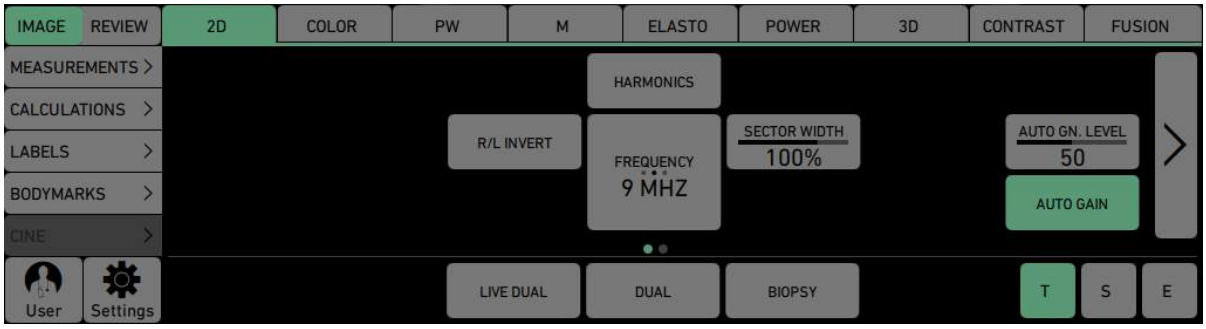


Figure 2-1. Fusion tab

3 Click the **Advanced View** tab.

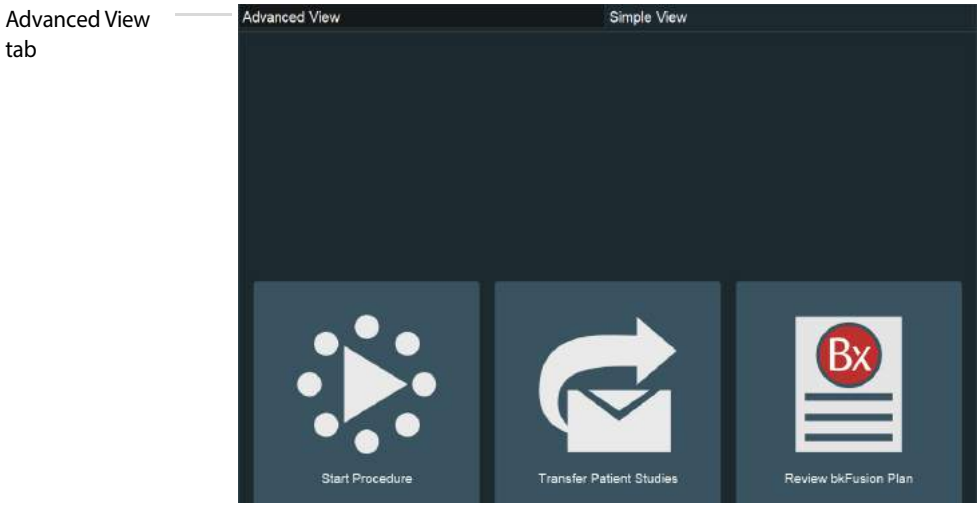


Figure 2-2. Advanced View tab

4 Click the **Import** button at the bottom of the screen.

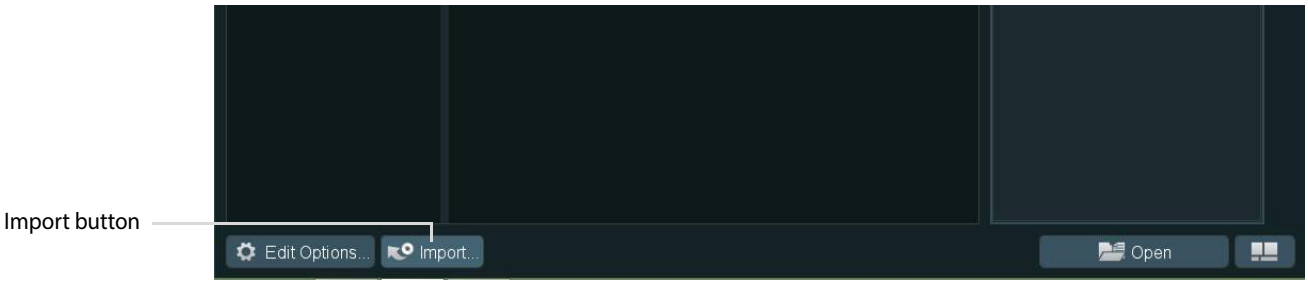


Figure 2-3. Import button

5 Click the **Browse** button in the pop-up window.

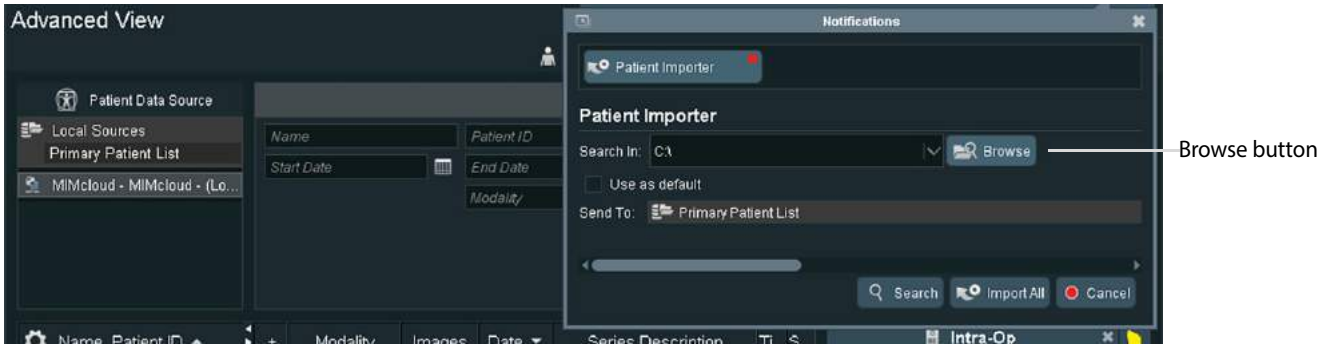


Figure 2-4. Browse button

6 Click on the appropriate location, then click **Select Folder**.

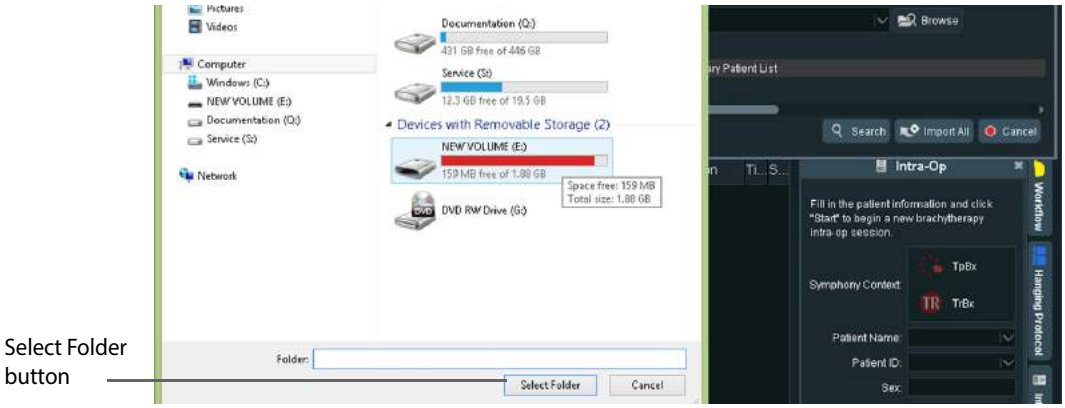


Figure 2-5. Browse screen

7 Check that the **Send To:** destination is the **Primary Patient List.** Click **Import All**. Data will take between two and five minutes to download, depending on the size of the data sets.

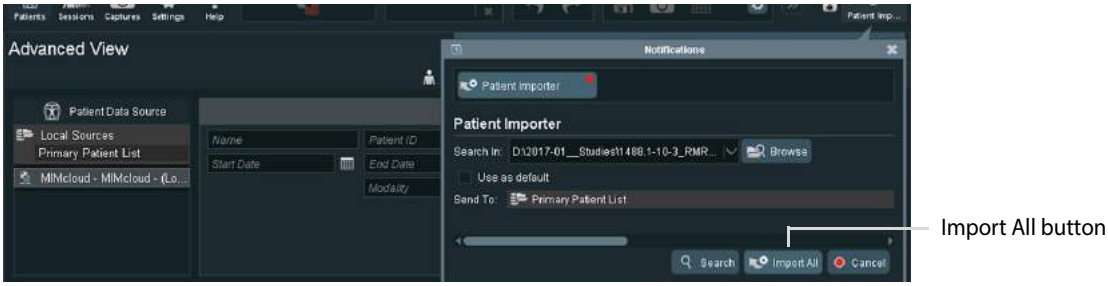


Figure 2-6. Import screen

8 To check transfer, double-click on **Primary Patient list**. Click **Newly Received**.

To import MRI data from MIMcloud (US only)

Requirements:

1 A MIMcloud group has been configured for your site by MIM Software.

2 Users have MIMcloud accounts.

3 The BK ultrasound system has Internet access.

To import:

1 Make sure that a Fusion-compatible transducer is connected to the ultrasound system and the **Prostate** exam type is selected.

2 Click the **Fusion** tab that appears at the bottom right-hand corner of the screen.

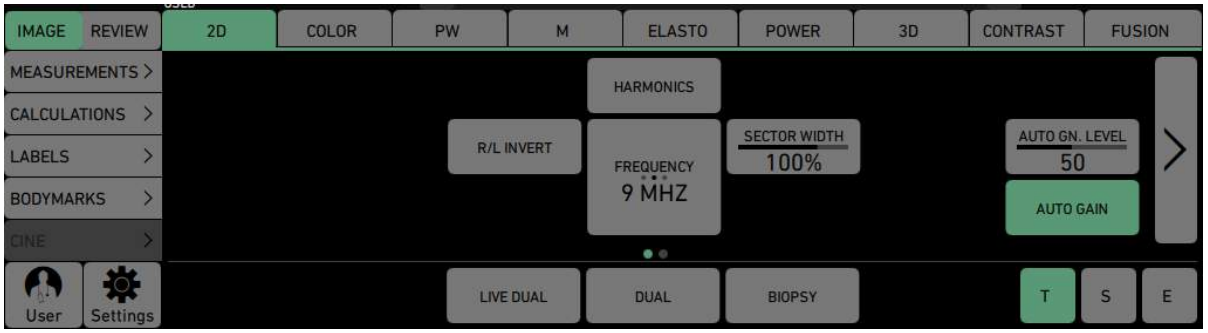


Figure 2-7. Fusion tab

3 Click the **Advanced View** tab.

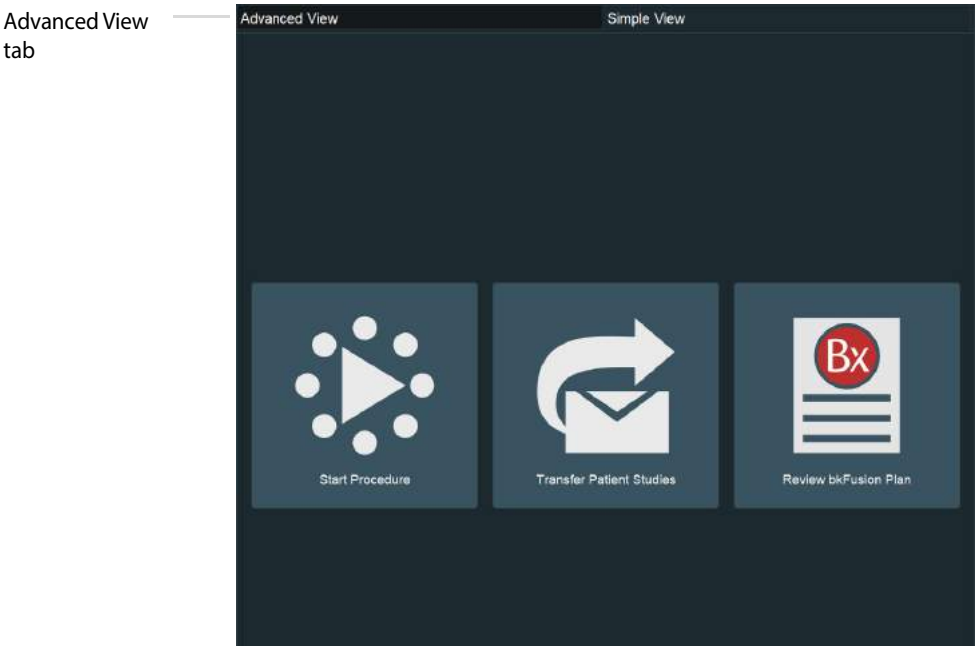


Figure 2-8. Advanced View tab

4 Double-click on the MIMcloud button, then enter your login details in the pop-up window.

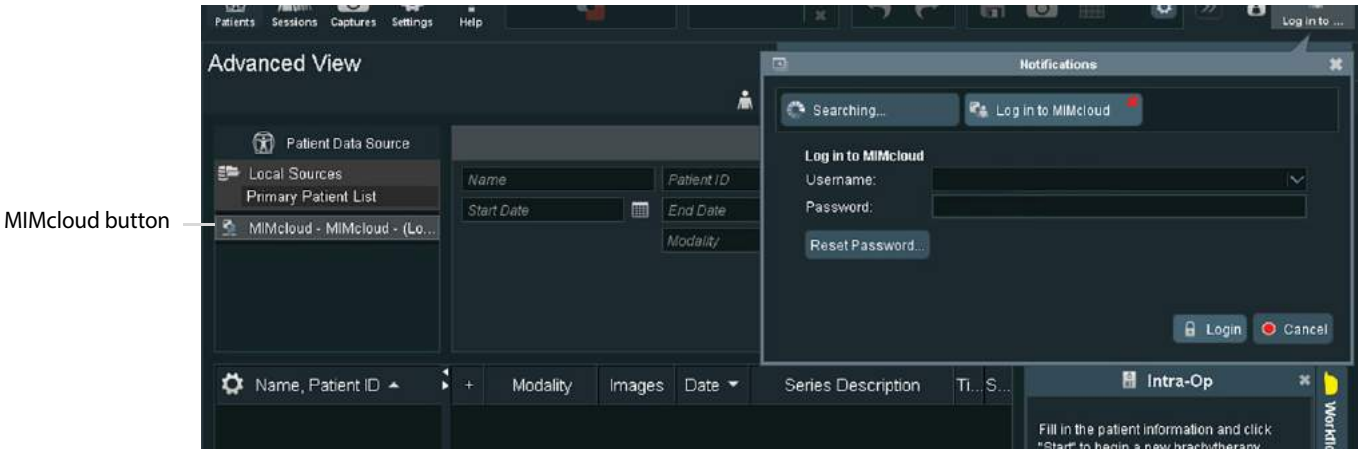


Figure 2-9. Enter login details screen

5 Your MIMcloud groups appear on the left-hand side of the screen. Double-click on the appropriate group to view associated patient studies.

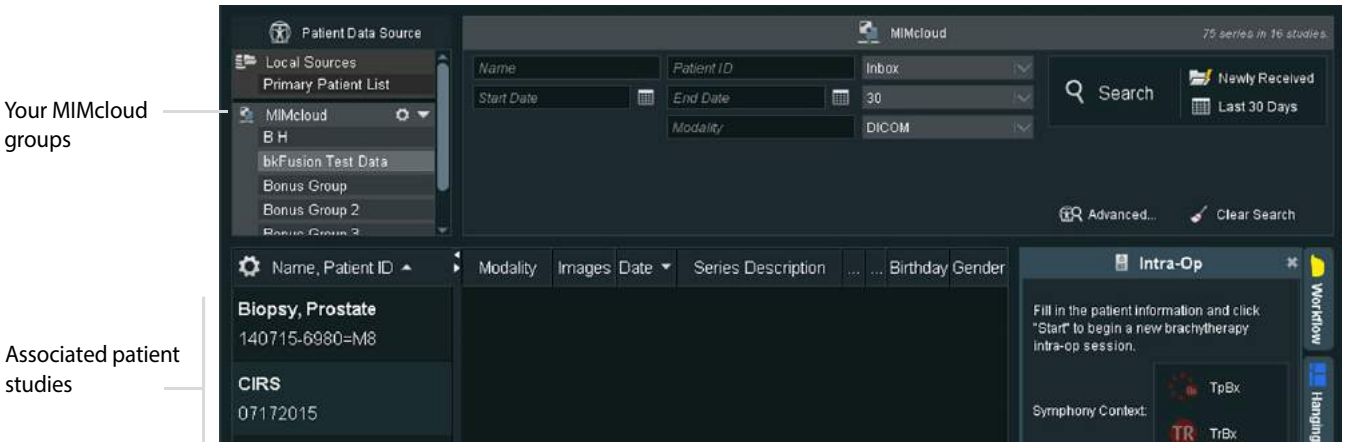


Figure 2-10. Study search screen

6 Click on the appropriate patient study to view associated patient results in the center of the screen. To import all results (recommended), click the **Transfer Patient Studies** tab, then double-click **Primary Patient List**. Click **Yes** when prompted by the pop-up window.

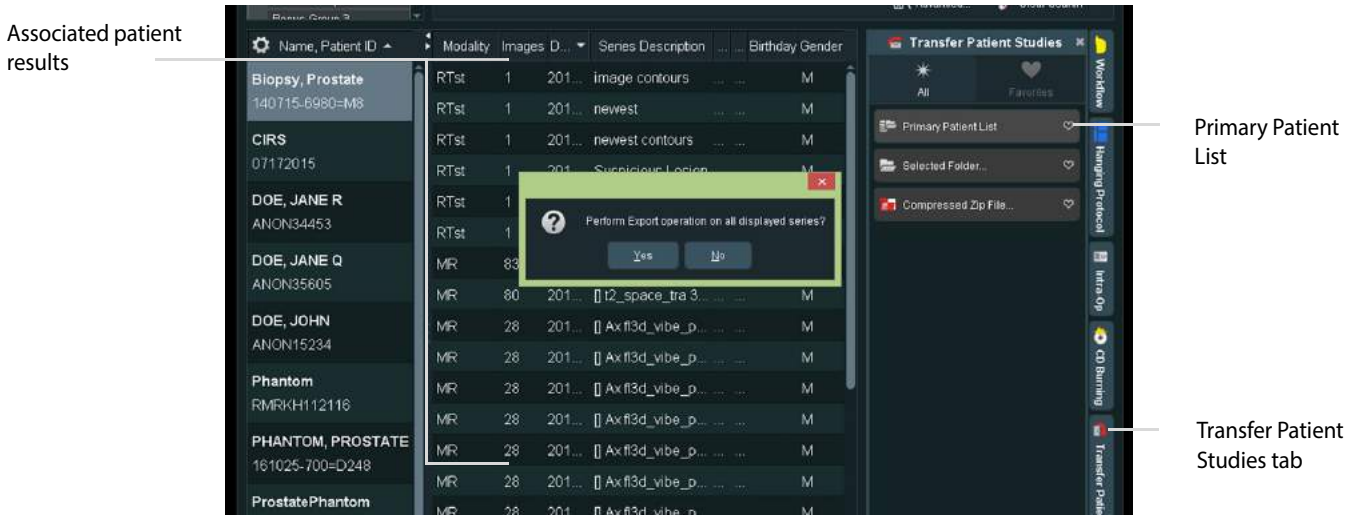


Figure 2-11. Export patient results

7 Data will take between two and five minutes to download, depending on the size of the data sets and your Internet connection.

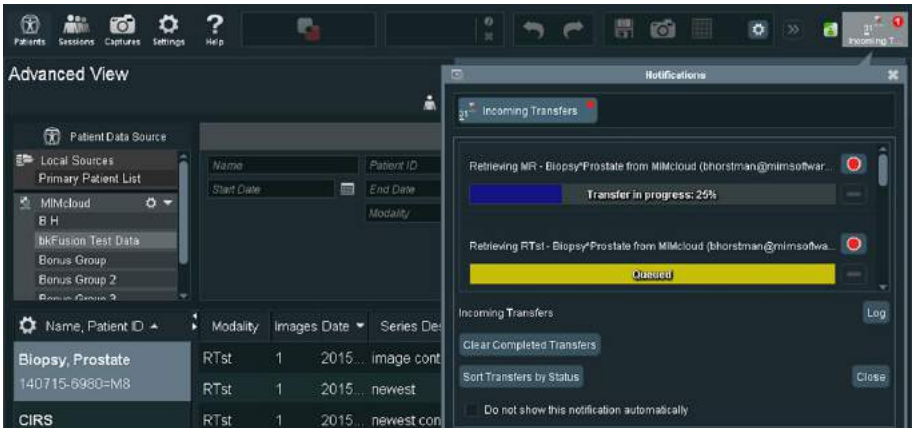


Figure 2-12. Data downloading from MIMcloud

8 To check transfer, double-click on **Primary Patient list**. Click **Newly Received**.

To import MRI data via Remote Patient List Transfer/PACS

Requirements:

- The BK ultrasound system has an IP address on the hospital network.

To set up Remote Patient List:

1 Make sure that a Fusion-compatible transducer is connected to the ultrasound system and the **Prostate** exam type is selected.

2 Click the **Fusion** tab that appears at the bottom right-hand corner of the screen.

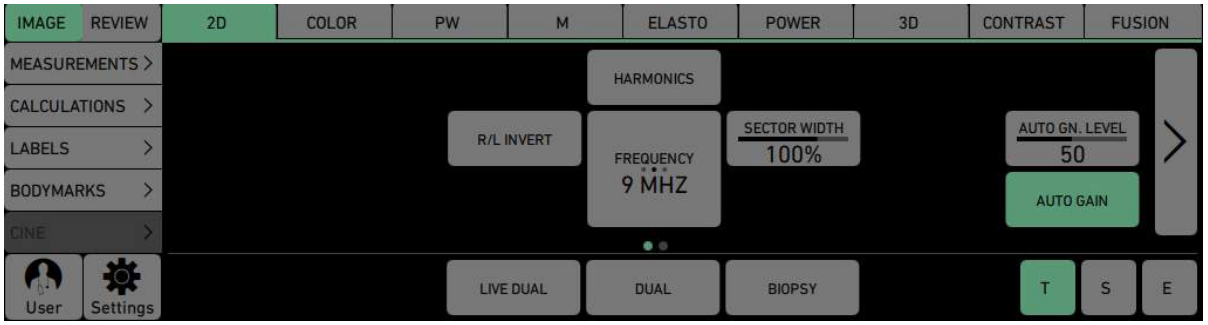


Figure 2-13. Fusion tab

3 Click the **Advanced View** tab.

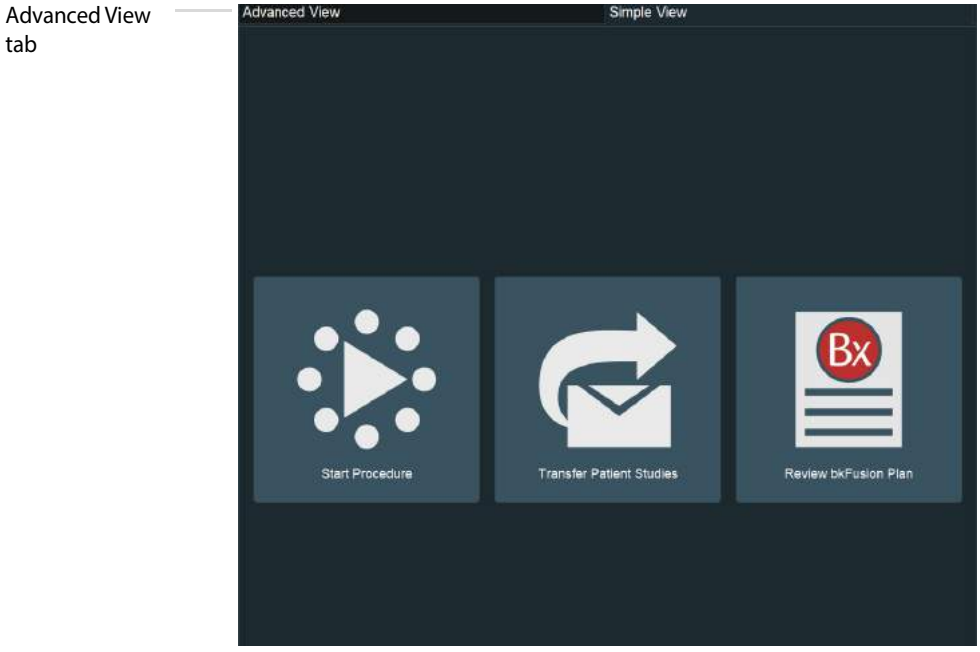


Figure 2-14. Advanced View tab

4 Click the **Settings** button.

5 Click **General Preferences**.

6 Double-click **Remote Patient List Locations**.

7 Click the **Add** button.

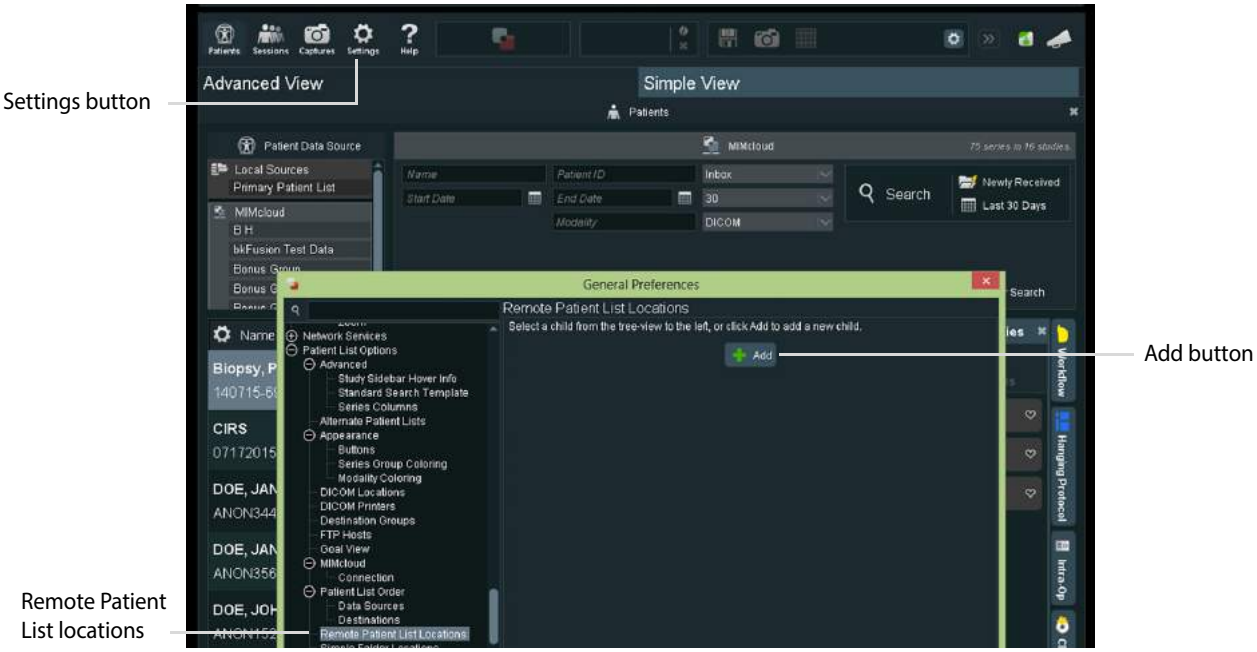


Figure 2-15. Adding a Remote Patient list

8 Enter **MIM Radiology** in the description box.

9 Enter the appropriate IP Address.

10 Click **Test Server Connection.**

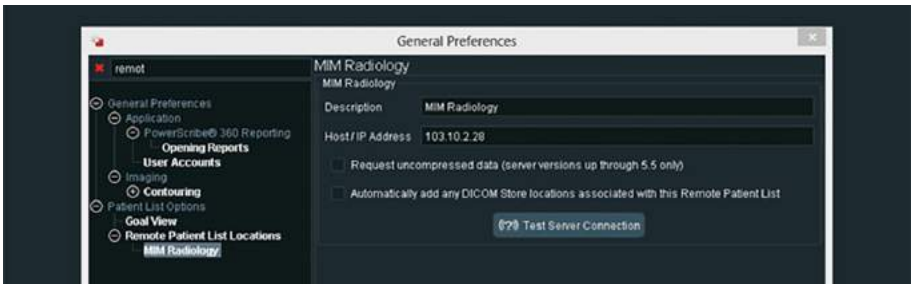


Figure 2-16. Testing server connection

11 The four test criteria should read *Successful,* and your MIM software version should appear. Please contact your BK representative if you experience any connectivity issues.

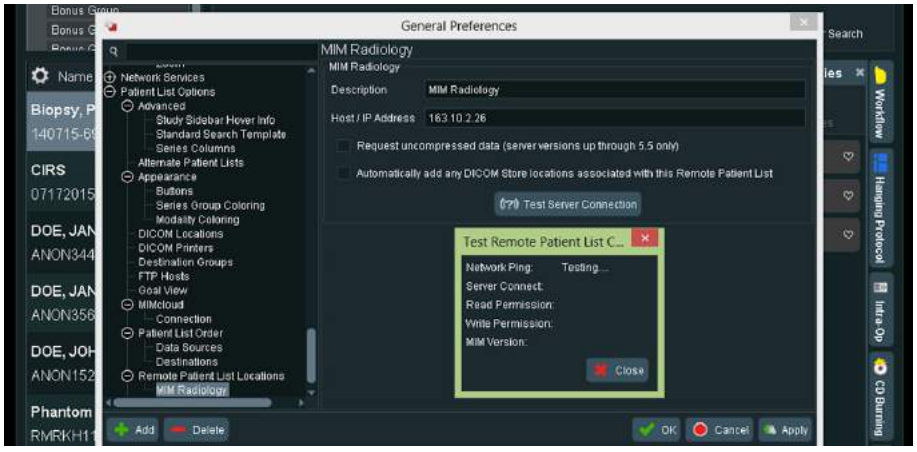


Figure 2-17. Connection test screen

12 Close General Preferences.

To Import:

1. Make sure that a Fusion-compatible transducer is connected to the ultrasound system and the **URO Prostate** exam type is selected.
2. Click the **Fusion** tab that appears at the bottom right-hand corner of the screen.
3. Click the **Advanced View** tab.
4. The Remote Patient List will appear in red on the left-hand side of the screen.

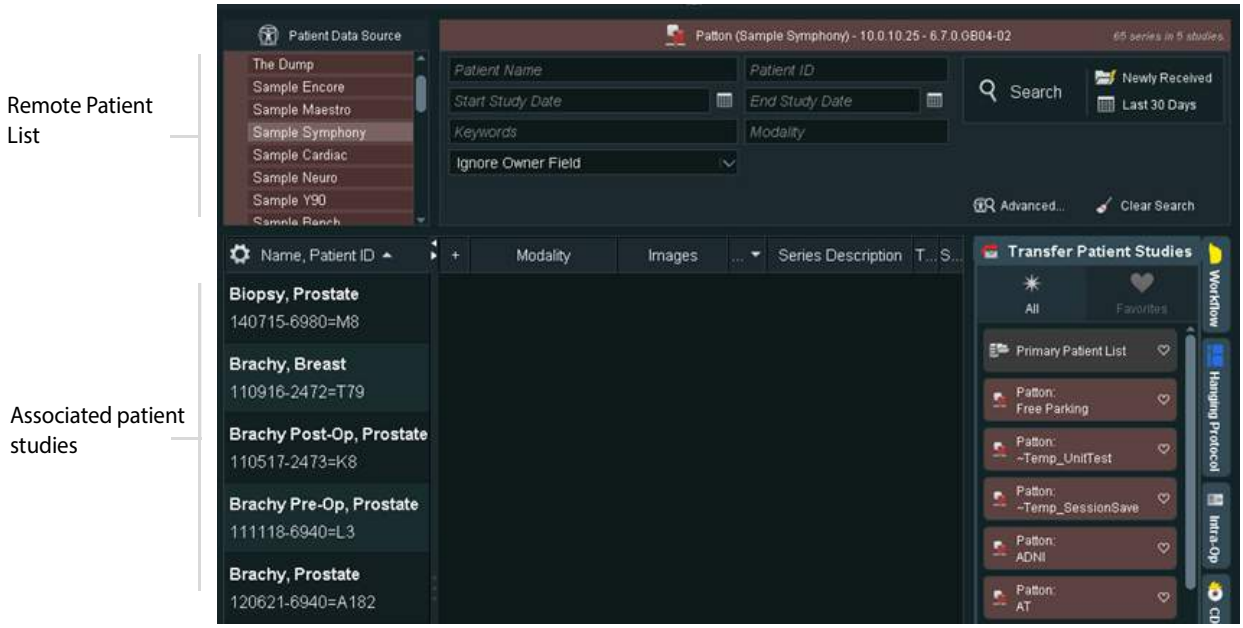


Figure 2-18. Patient Study Screen

5. Click on the appropriate patient study to view patient results in the center of the screen. To import all results (recommended), click on the **Transfer Patient Studies** tab, then double-click **Primary Patient List**. Click **Yes** when prompted by the pop-up window.

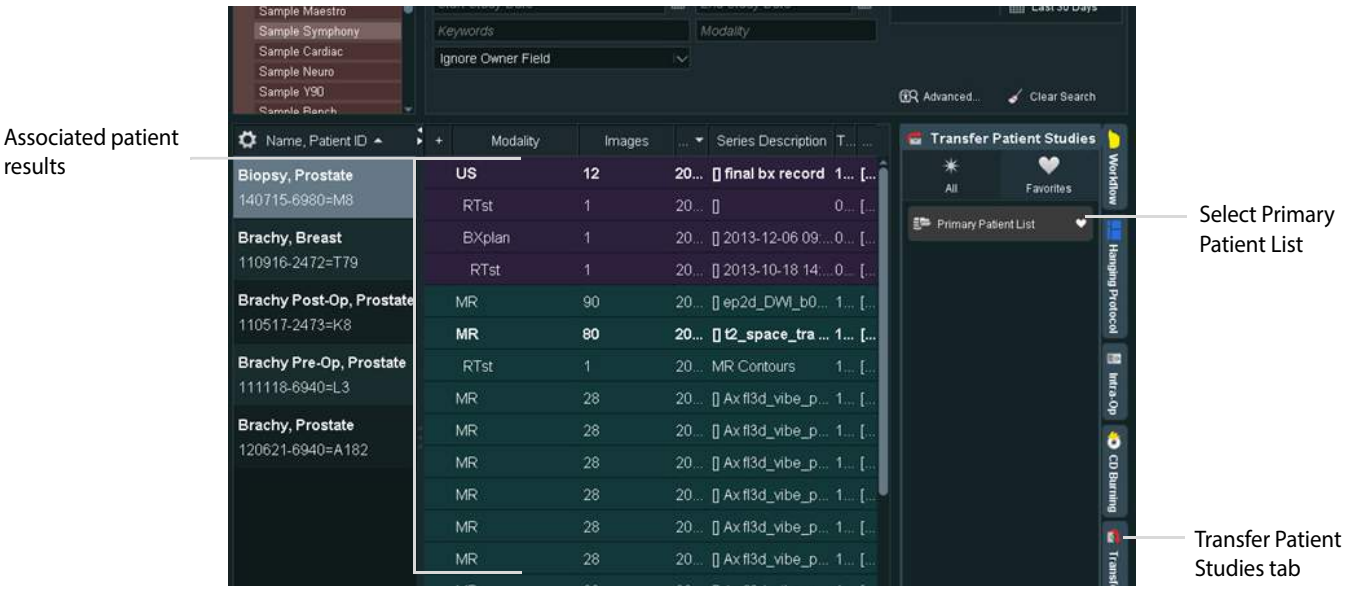


Figure 2-19. Import patient results

6. Data will take between one and five minutes to download, depending on the size of the data sets and your Internet connection.

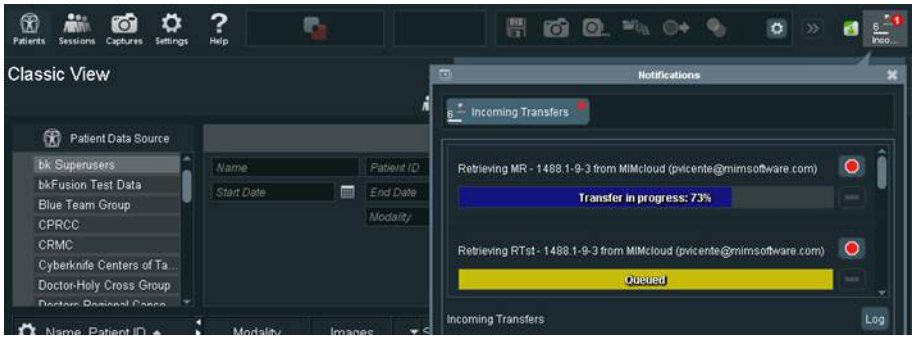


Figure 2-20. Data downloading

7 To check transfer, double-click on **Primary Patient list**. Click **Newly Received**.

To Review a BXplan

1 Click **Review bkFusion Plan**.

Figure 2-21. Review BXplan

2 Select the relevant source, then click **Next**.

Figure 2-22. Select relevant source

3 Click on **Newly Received** to view recent studies.

Figure 2-23. Locating a BXplan

4 Select the appropriate plan.

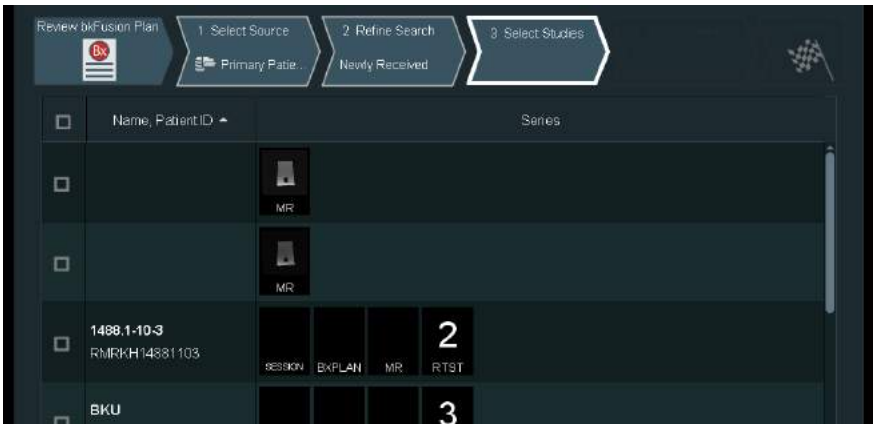


Figure 2-24. Select the appropriate plan

5 Double-click on the study to view the BXplan.

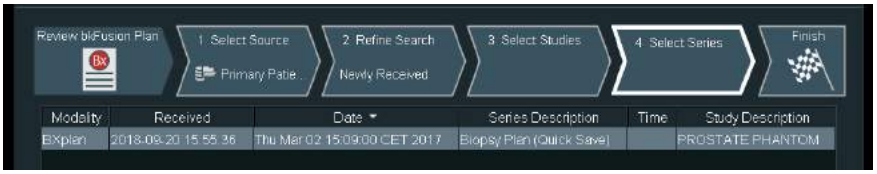


Figure 2-25. View BXplan details

To Contour/Re-contour MRI Slices

It may be necessary to contour or re-contour the MRI prostate/lesions before you continue. If you do not require this step, continue to “Predictive Fusion” on page 18.

1 Click the **Advanced View** tab at the top of the screen.

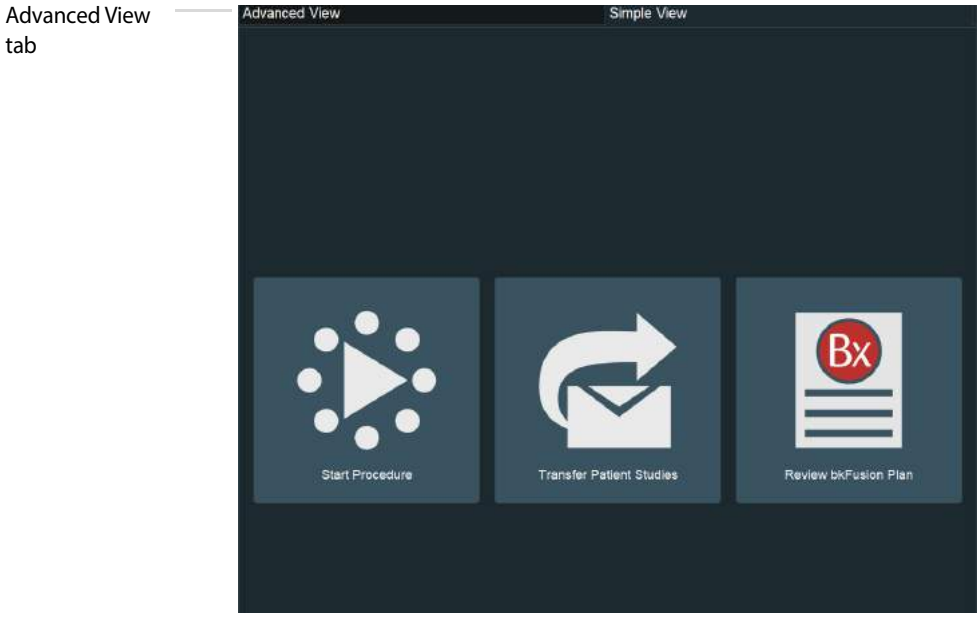


Figure 2-26. Select the Advanced View tab

2 Select Patient Data Source, then the appropriate patient. Double-click on the appropriate RTst study from the list.
An RTst study displays the MR image and the original contouring (if existing).

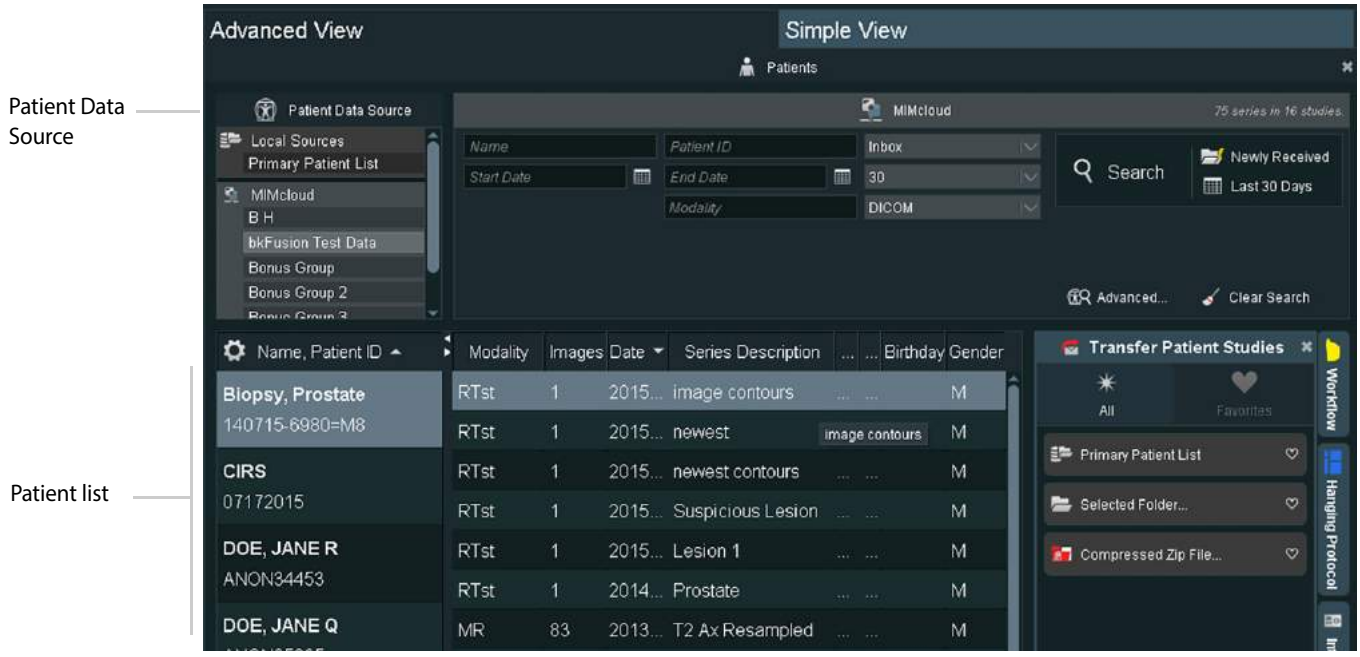


Figure 2-27. Select Patient Data Source tab

3 Double-click on the axial image to enlarge it. Press the **3** key to enlarge the image further, or the **2** key to reduce the image. Use the arrow keys ↓ ↑ to scroll through MR slices.

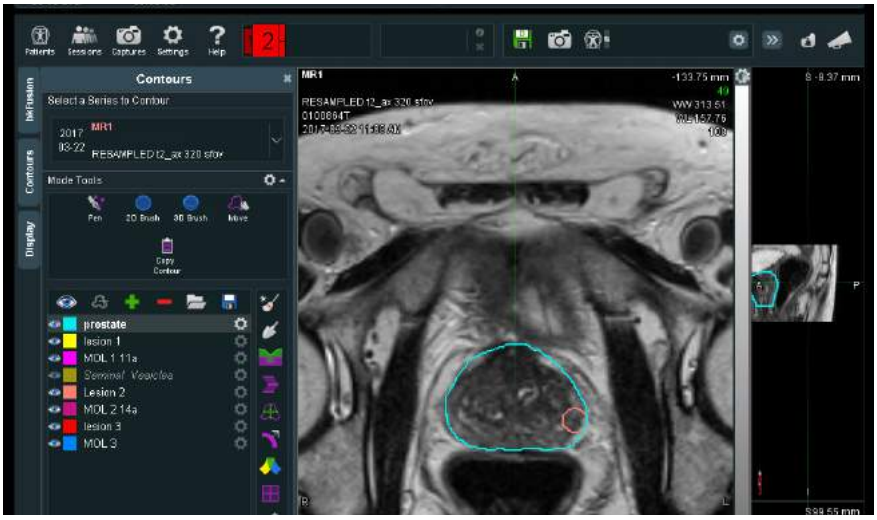


Figure 2-28. Enlarged axial image

To Contour the Prostate and Lesions:

4 To contour a prostate or lesion, click the **Contours** tab, select the **2D Brush** 

which allows for freehand drawing of contours on a plane-by-plane basis, then click the **New** icon. Your contour will appear in the list on the left-hand side of the screen. Rename and recolor the contour in the **Contour Settings** box at the bottom of the screen.

5 Use the − + keys in combination with the trackball to enlarge or reduce the size of the 2D Brush, then use the 2D Brush to 'paint' the contour.

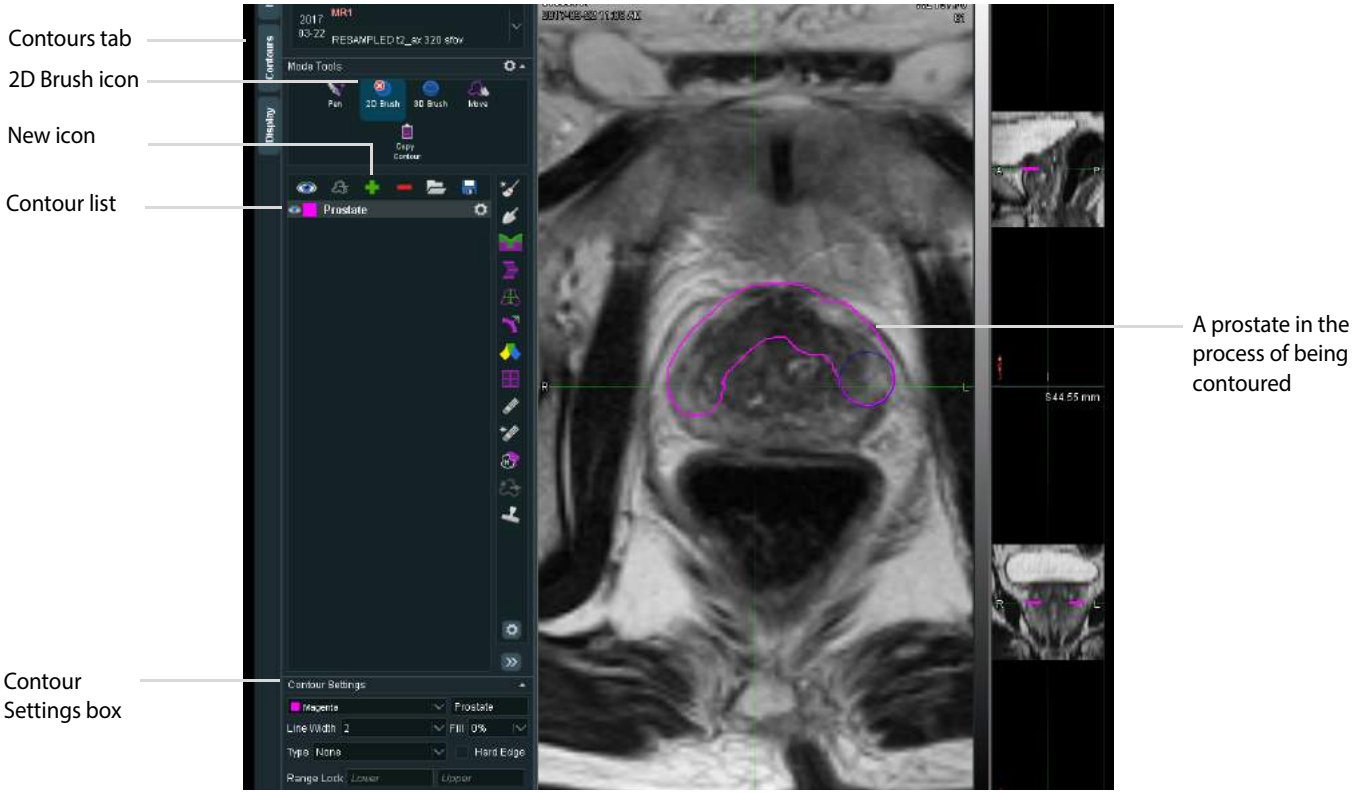


Figure 2-29. Contouring a prostate

6 Click on the **Settings** icon to erase or delete the contour.

Figure 2-30. Contour settings

7 Click the **Interpolate Contour** icon when you are finished contouring slices. The Interpolate Contour function contours across any empty slices.

To Re-contour the Prostate and Lesions:

8 To re-contour the prostate, click the **Contours** tab, select the **2D Brush** which allows for freehand editing of contours on a plane-by-plane basis, then select **prostate** from the Contour list.

9 Use the keys in combination with the trackball to enlarge or reduce the size of the 2D Brush, then use the 2D Brush to adjust or 'paint' the contour. The 2D Brush will appear red when outside the prostate, and blue when inside the prostate.

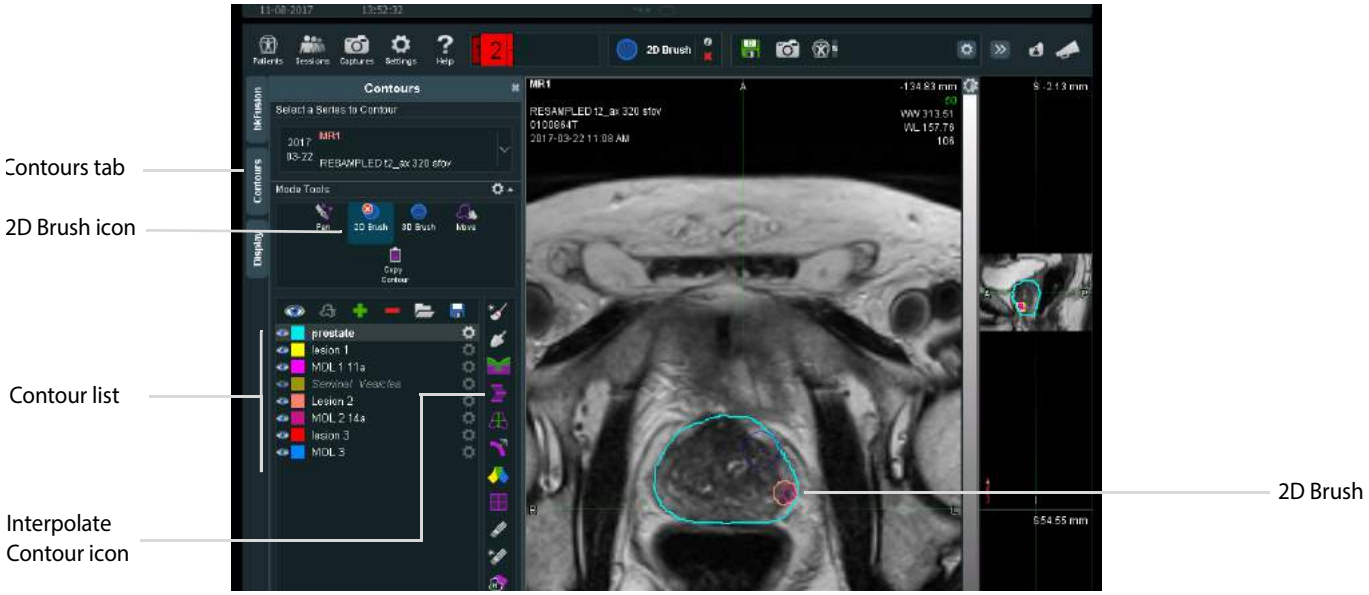


Figure 2-31. Re-contouring a prostate

10 To re-contour a lesion, select the **3D Brush** 

, which allows freehand creation and editing of 3D contours from any plane, then select the appropriate lesion from the Contour list.

11 Use the 

keys in combination with the trackball to enlarge or reduce the size of the 3D Brush, then use the 3D brush to adjust or 'paint' the lesion.

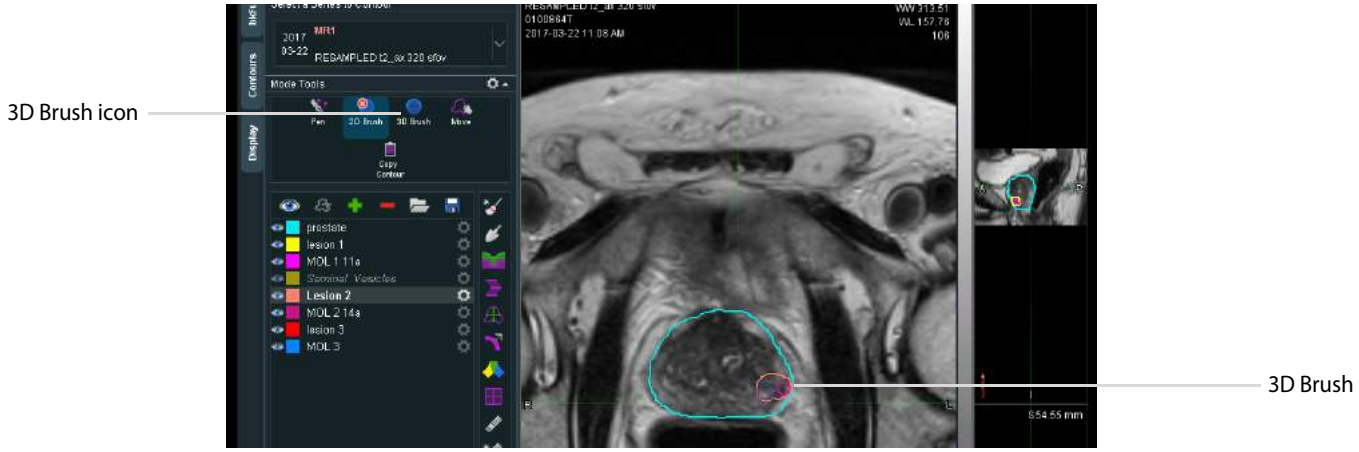


Figure 2-32. Re-contouring a lesion

12 Click the **Interpolate Contour** icon  when you are finished re-contouring slices. The Interpolate Contour function contours across any empty slices.

13 To save the contours, click the **Save** button under the contours tab and save the files as a DICOM RTstructure

.

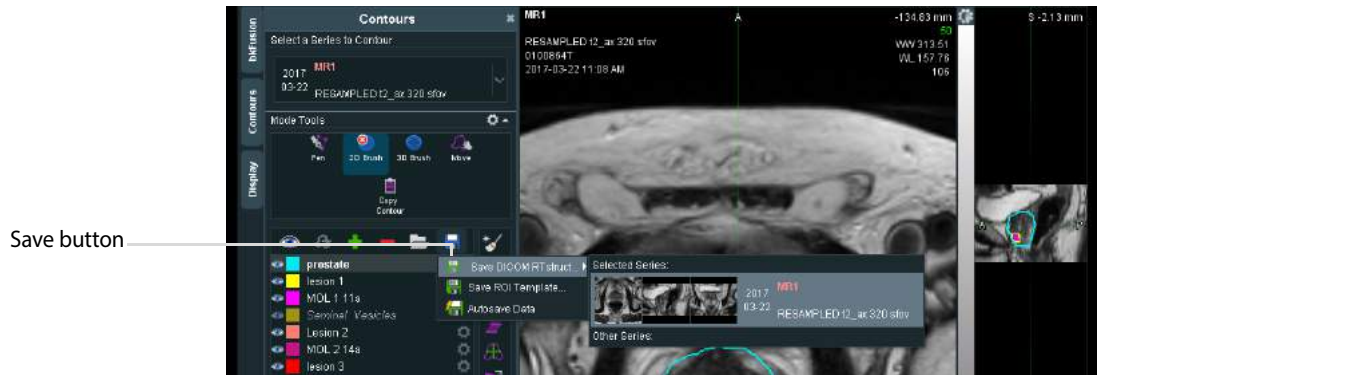


Figure 2-33. Save RTstructure

14 To return to Simple View, click **Sessions**, then **Close All Sessions**.

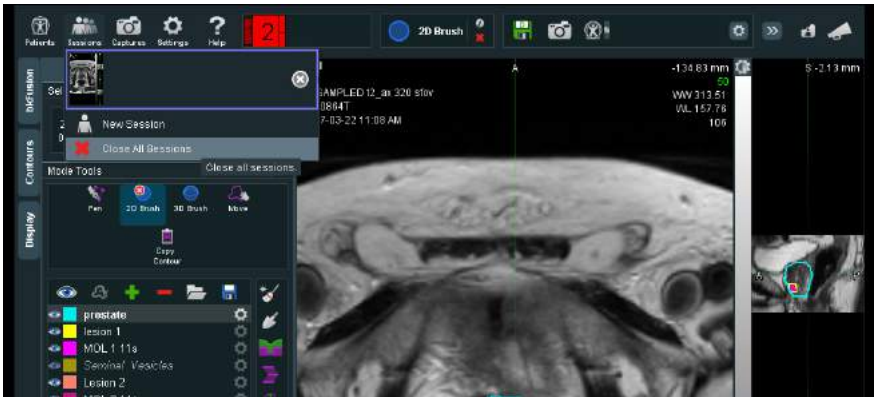


Figure 2-34. Close the session

Predictive Fusion

Predictive Fusion 'reslices' and pre-aligns MRI images to correspond to the prostate's orientation during biopsy. To improve precision and ease of registration, it is highly recommended to use Predictive Fusion.
To use Predictive Fusion:

1 From the Contour/Re-contour screen, click the **bkFusion** tab, then the **Begin Planning** button.

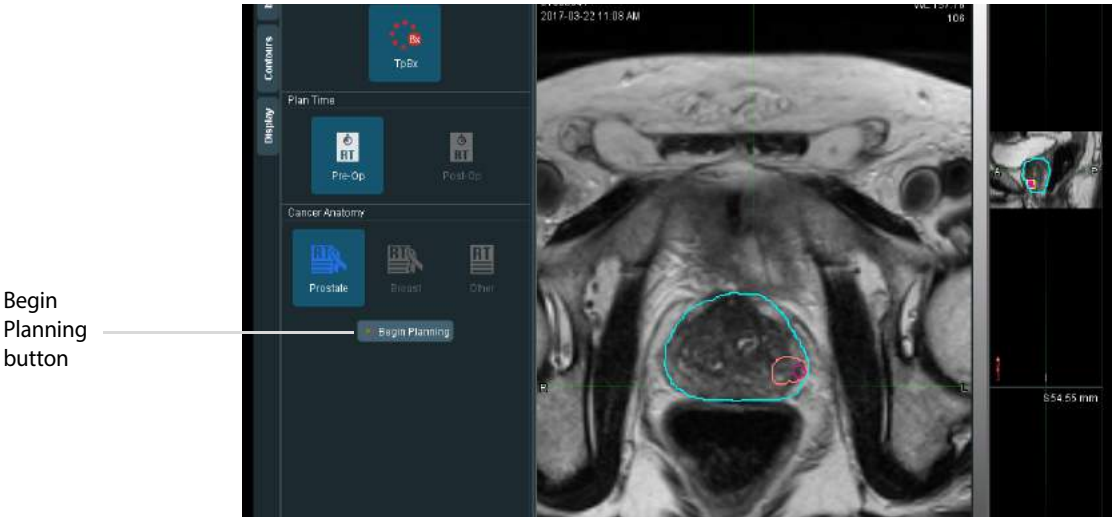


Figure 2-35. Select Patient Data Source tab

2 You will see the virtual transducer and grid superimposed on top of the MRI image (see Fig 2-36). Place the virtual transducer in the rectum (approx. 3mm from the posterior wall of the prostate), and adjust the angle accordingly with the trackball and the **Select** key. Move the virtual transducer until the blue base plane is aligned with the base slice of the prostate.

3 When the virtual transducer is in the correct location, click **Save As**, enter a description, then click **OK**.

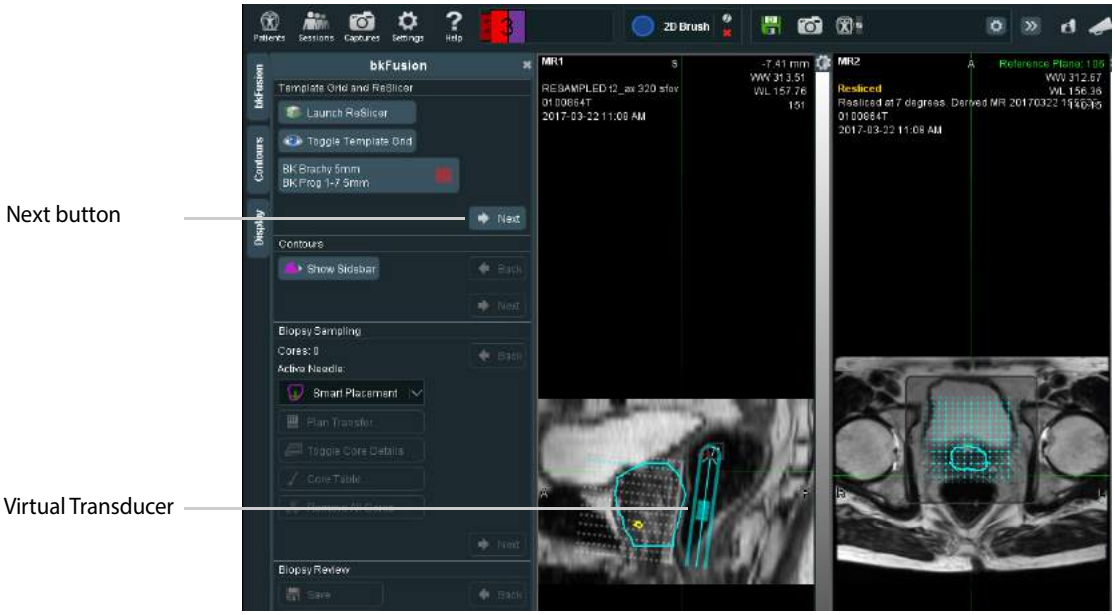


Figure 2-36. Virtual transducer screen

4 The prostate can be seen in the transverse plane. Use the arrow keys ↓ ↑ to scroll through MR slices and ensure that the Reference Plane is set at the base of the prostate.

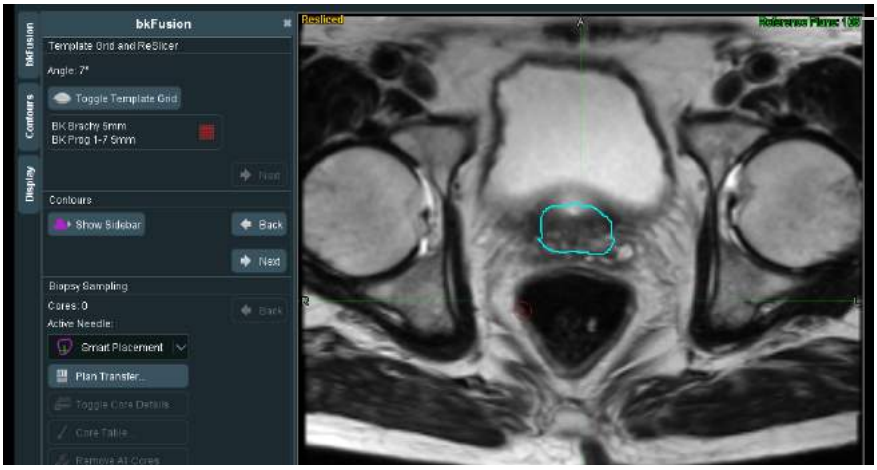


Figure 2-37. Reference Plane screen

5 Click the **Save** icon, enter a description, then click **OK**.

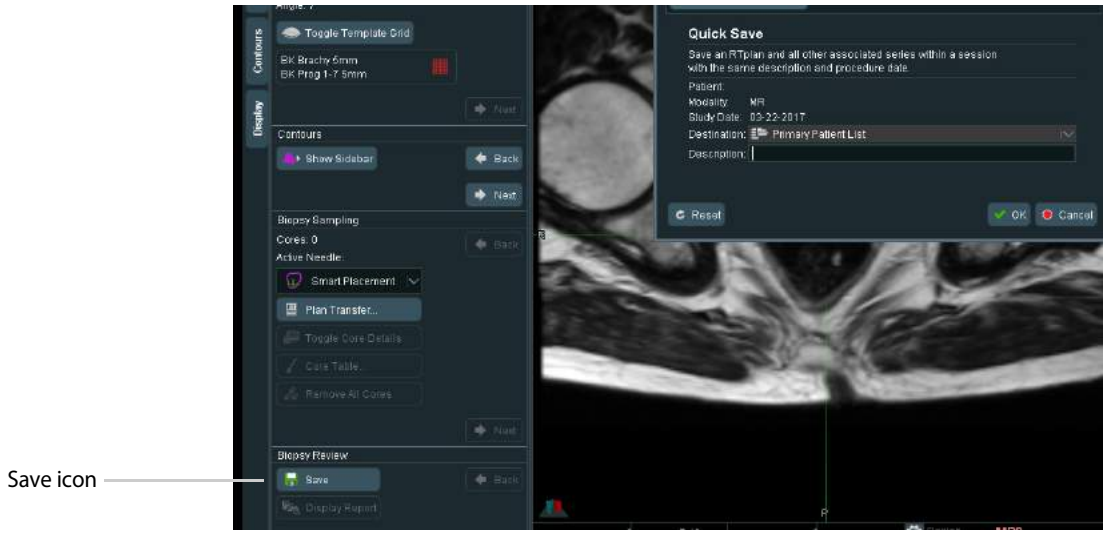


Figure 2-38. Save screen

6 Click **Sessions**, then **Close All Sessions.**

Figure 2-39. Close All Sessions

To Start the Procedure

1 Click **Start Procedure**.

Figure 2-40. Simple View tab

2 Click on the **TpBx** (transperineal biopsy) option. Enter the first two letters of the patient's name. A drop-down list under Patient Name will allow you to select the specific patient, and the remaining patient details will auto-populate.

You can also enter a new Patient Name and Patient ID. A dialog box will ask you whether you want to continue with an unrecognized patient name.

3 Click **Start Procedure** to begin the fusion exam.

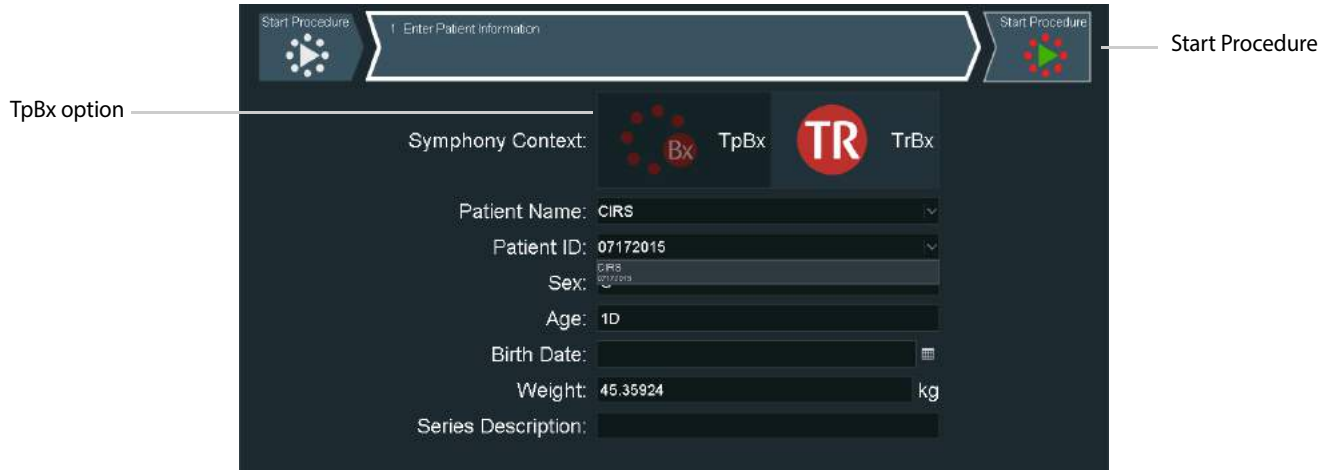


Figure 2-41. Enter Patient Information screen

To Fuse Ultrasound and Prostate Contours

1 Check that the correct biopsy grid is displayed on the monitor.

Figure 2-42. Biopsy grid screen

2 If the displayed biopsy grid is incorrect, click the **Needle Guide** button in the workspace, then select the correct biopsy grid from the drop-down list.

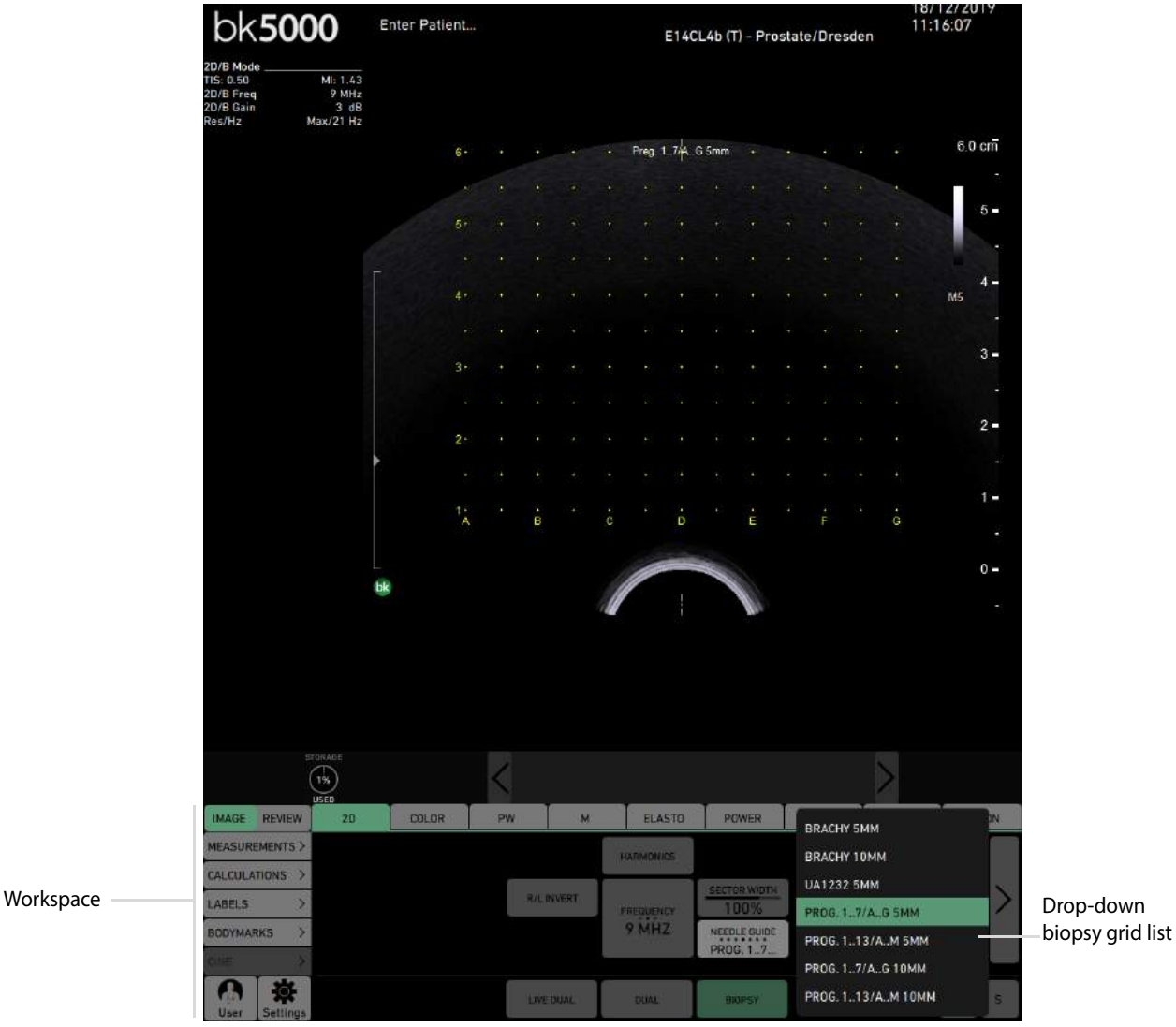


Figure 2-43. Brachytherapy grid list

3 Click **Next**. Ensure that there is a green tick ✔ next to the stepper connection, and wait for contours to superimpose on top of the ultrasound image.

4 In the Reference Plane, align the contour as closely as possible with the live ultrasound image.

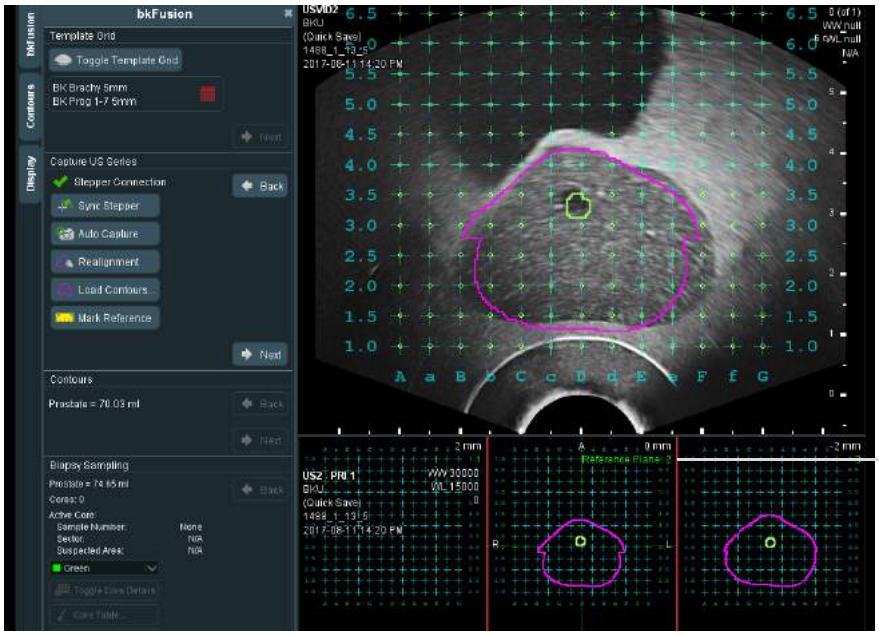


Figure 2-44. Align contour and prostate

5 Click **Sync Stepper**.

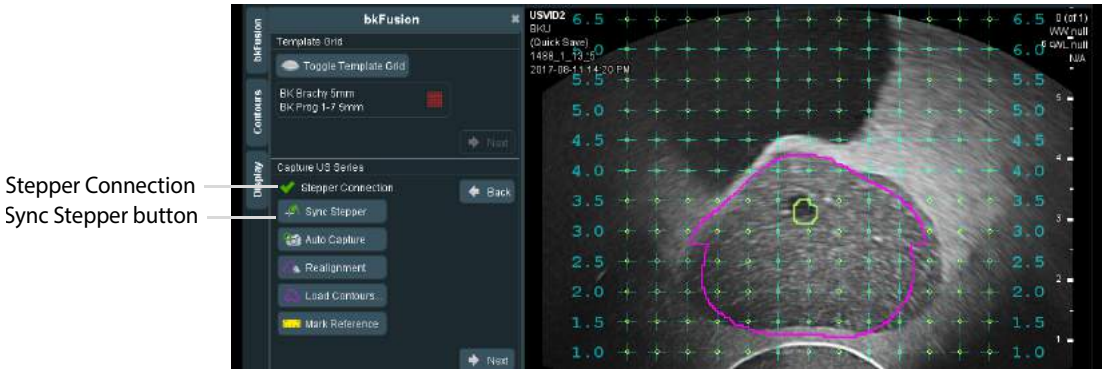


Figure 2-45. Synchronize the stepper

6 To capture a 3D volume of the prostate:
In the Reference Plane contour, by turning the wheel of the stepper, go all the way to the base of the prostate and click **Auto Capture.** Turn the wheel of the stepper to cover all slices of the prostate from base to apex. Click **Auto Capture** again to finish.

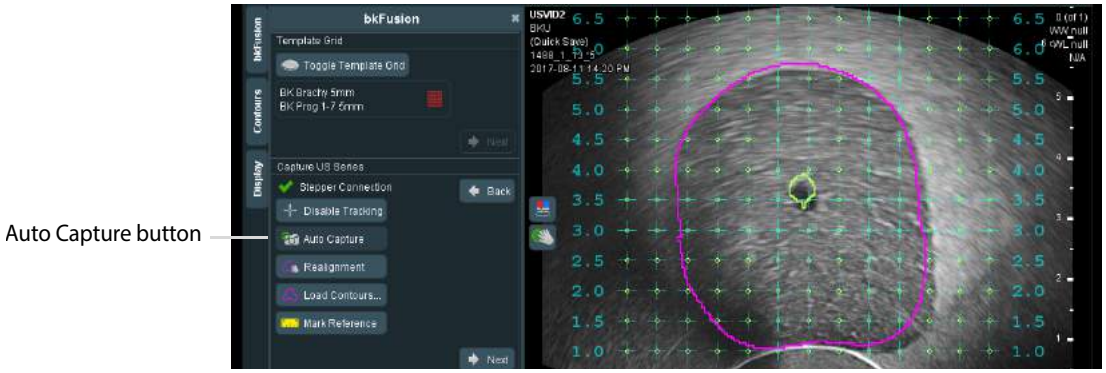


Figure 2-46. Auto Capture screen

7 Click the **Realignment** tab to view the realignment screen. The prostate contours and the ultrasound prostate can be realigned (if necessary) in all planes and slices. Click on the desired plane, then hold the **Select** button and use the  and  buttons to rotate and move the prostate contours until they match the ultrasound prostate. Use the arrow keys   to scroll through MR slices. Click the green flag icon  to finish.

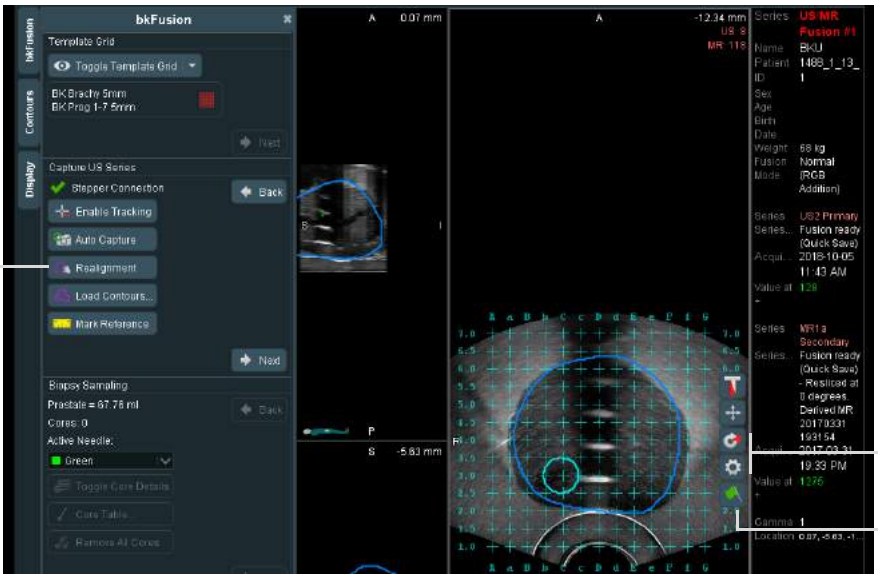
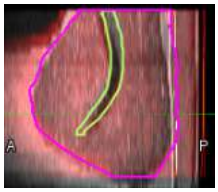


Figure 2-47. Realignment screen



(Optional): Click the Blend Button  to activate Blend Mode. Left-click and drag up or down over the image to adjust the percentage of primary (MRI) and secondary (ultrasound) volumes displayed.

8 Click the **Next** button to continue to the biopsy screen.

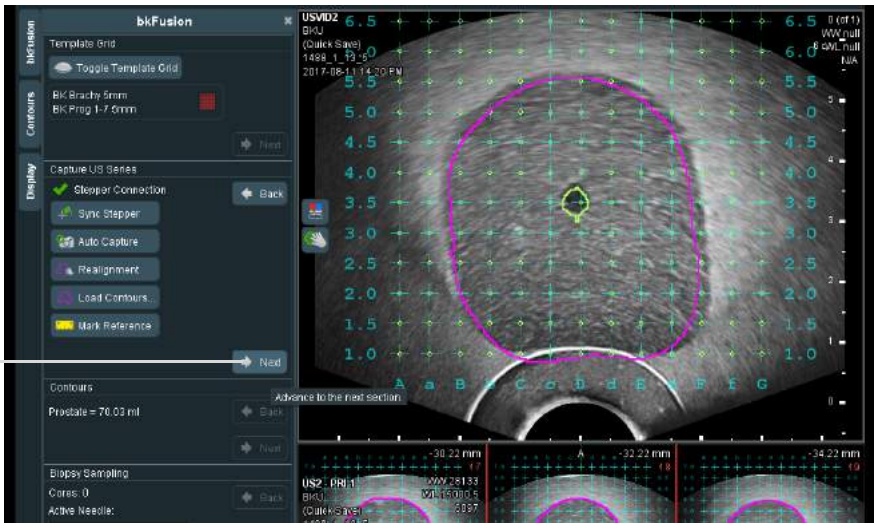


Figure 2-48. Realignment screen

To Biopsy with bkFusion

NOTES:
1. Always relax the prostate when making adjustments to bkFusion.
2. Always verify anterior prostate registration when targeting the anterior zone, due to inherent deformation.

1 You are now ready to biopsy with bkFusion. Press the top button on the transducer (or press the Change Plane key on the keyboard) to select the sagittal plane.

2 Turn the stepper wheel to bring the sagittal view of the prostate into full view.

3 (Optional) Click the Hand icon to manually realign the prostate contour with the ultrasound image.

4 Move the cursor to the bottom image of the screen (captured volume in transverse view). Use the arrow keys to scroll through slices.

5 When the lesion is visible in the captured volume, adjust the stepper cradle with the transducer until the red target line intersects the lesion (see Fig 2-49).

You can use one of two different methods to do biopsies:

To preplan the biopsy

a Use the trackball and the **Select** key to place the green target on the coordinates where you want to biopsy. The exact coordinates will be visible in the sample box.

b Take the biopsy.

c Adjust the biopsy core marker in the top window to display the red tip.

To get the coordinates after biopsy

a The biopsy grid tells you where to place the needle - in this instance *C, 3.0*.

b After each biopsy, use the trackball and the **Select** key to place biopsy markers on core locations.

For more information on taking a biopsy, please see the Advanced User Guide.

The Sample box in the bottom left-hand corner of the screen counts sample numbers and their placement in the prostate.

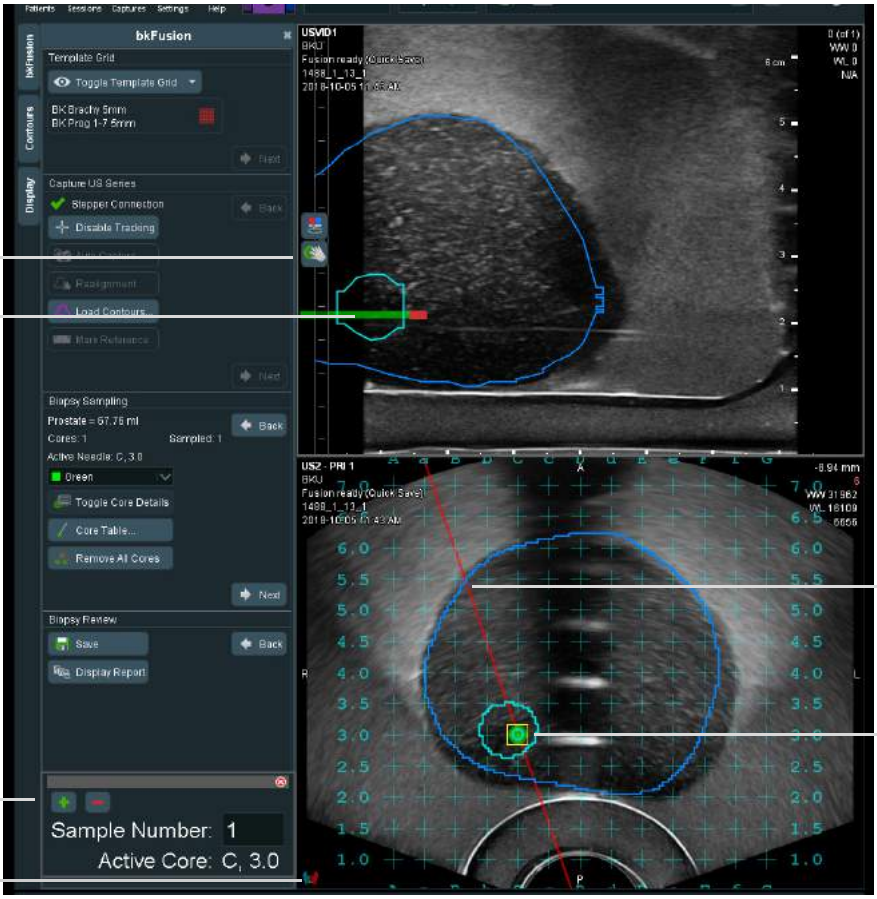


Figure 2-49. Biopsy placement screen

NOTE:

To remove a core, either:

1. *Move the trackball cursor precisely on top of the core, press the* + *button, and click* **Remove Core** (see Fig 2-50).
2. *Open the Core Table, press the* + *button on the appropriate core, and click* **Remove Core.**
3. *Click the* **Remove Last Core** *button.*

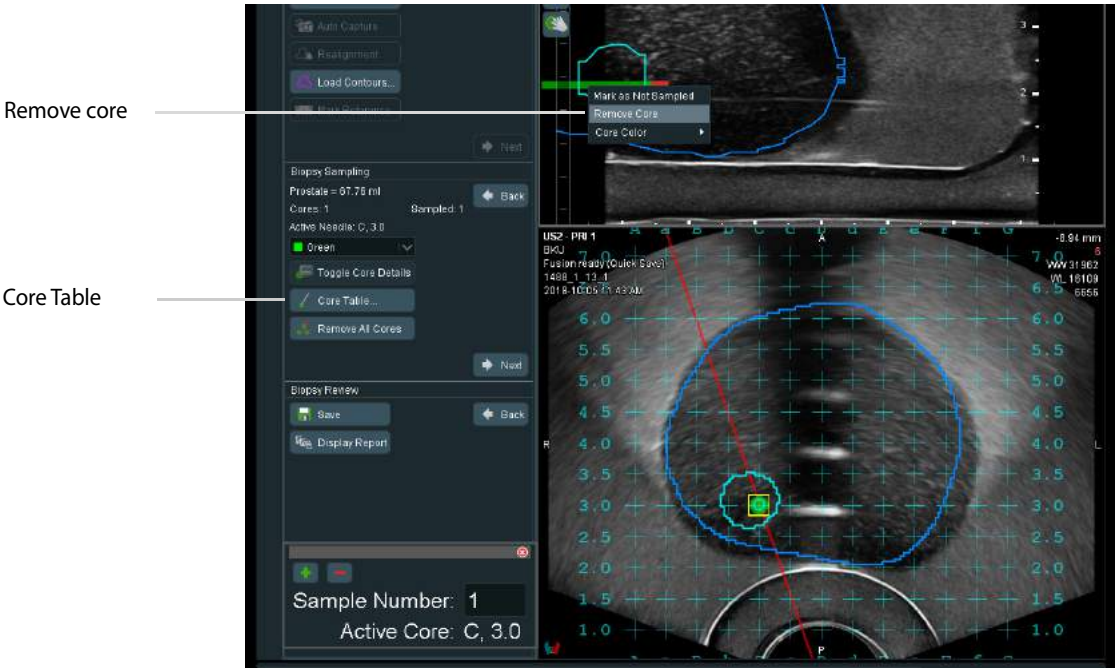


Figure 2-50. Biopsy marker screen

To Make Measurements

To make measurements, click the **Measure** button and follow the on-screen instructions.

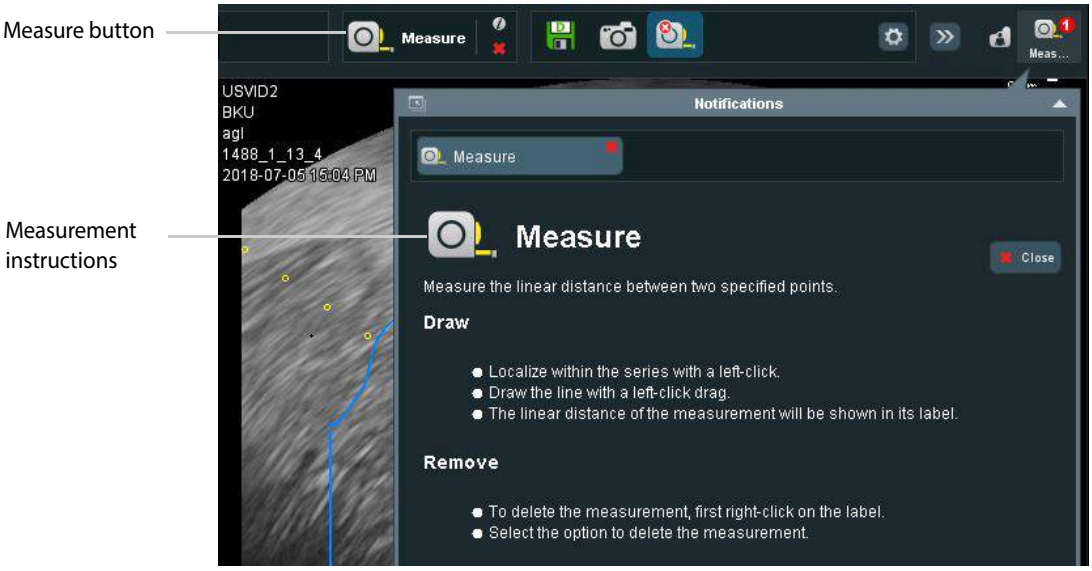
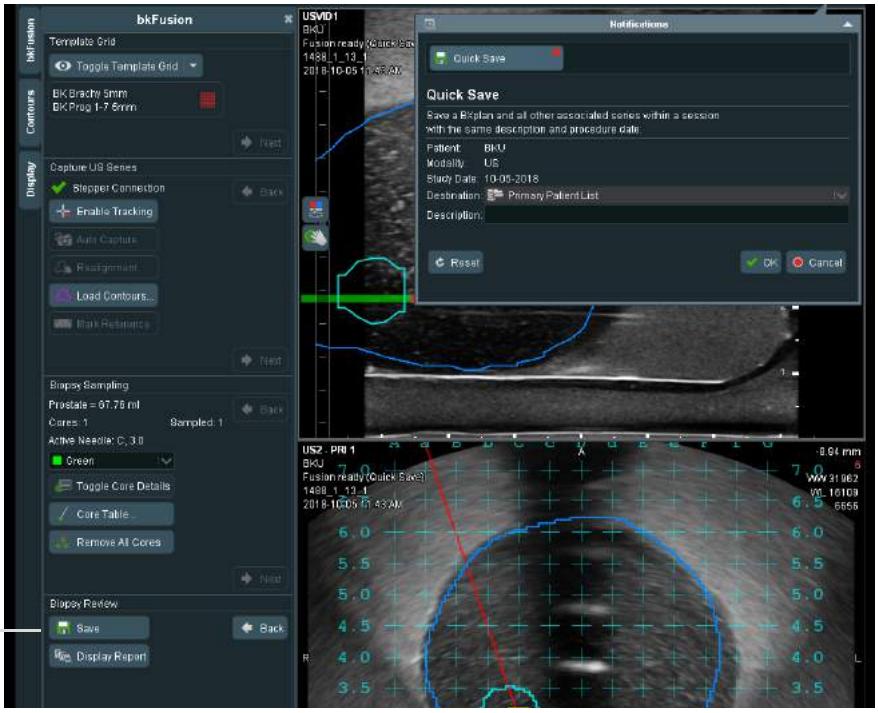


Figure 2-51. Measurement instructions

To Save Biopsy Results and Create a Report

1. When biopsy specimens have been acquired, click the **Save** icon in the Biopsy Review tab to save all data. Select your chosen destination and enter a description for the plan.
2. Click **Display Report** in the Biopsy Review box on the left-hand side of the screen.
3. Select your Structured Reporting Template from the Notifications popup window.



Save icon

Figure 2-52. Structured Reporting templates

4 Click **OK** to view a report similar to that shown below. Reports can be saved in PDF format.

NOTE: *To locate a report from a closed session, double-click* ***Primary Patient List****, double-click the appropriate BXplan, then click* ***Display Report****.*

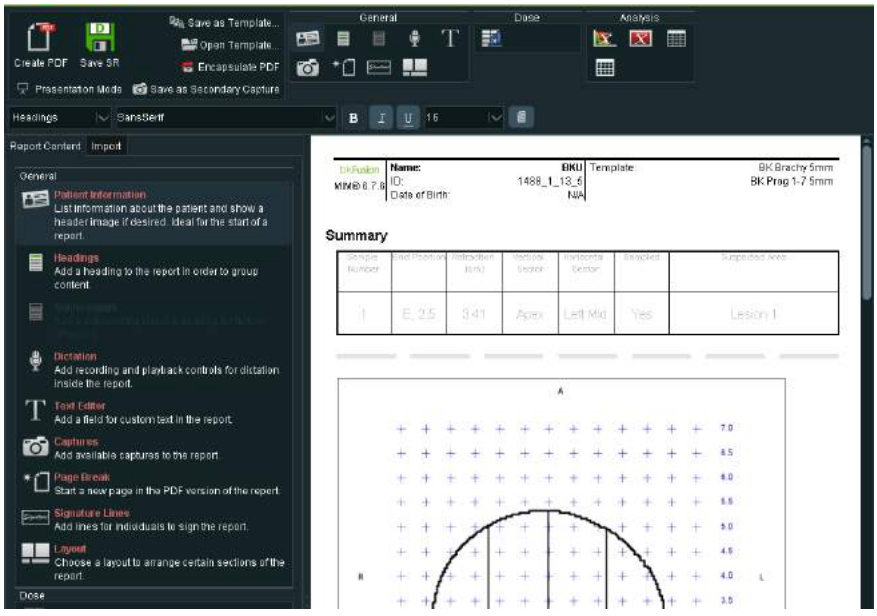


Figure 2-53. Display Report screen

To Save a Report to a USB device

In an open report:

1 Click the **Save PDF** icon.

2 Select the appropriate USB device from the network list.

3 Type the report name, then click **Save.**

To Save Structured Reports

In an open report:

1 Click the **Save SR** icon.

2 Select Primary Patient List from the Destination menu.

3 Enter Series Description, Operator Name, then click **OK.** Your structured report will appear in the Sessions window.

To Save DICOM Images

After you have finished the procedure:

1 Click on the **Captures** icon (top left of the screen).

2 Select the appropriate images you want save, then select **Primary Patient List** from the **Send To:** drop-down menu.

3 Click the **Save DICOM** button.

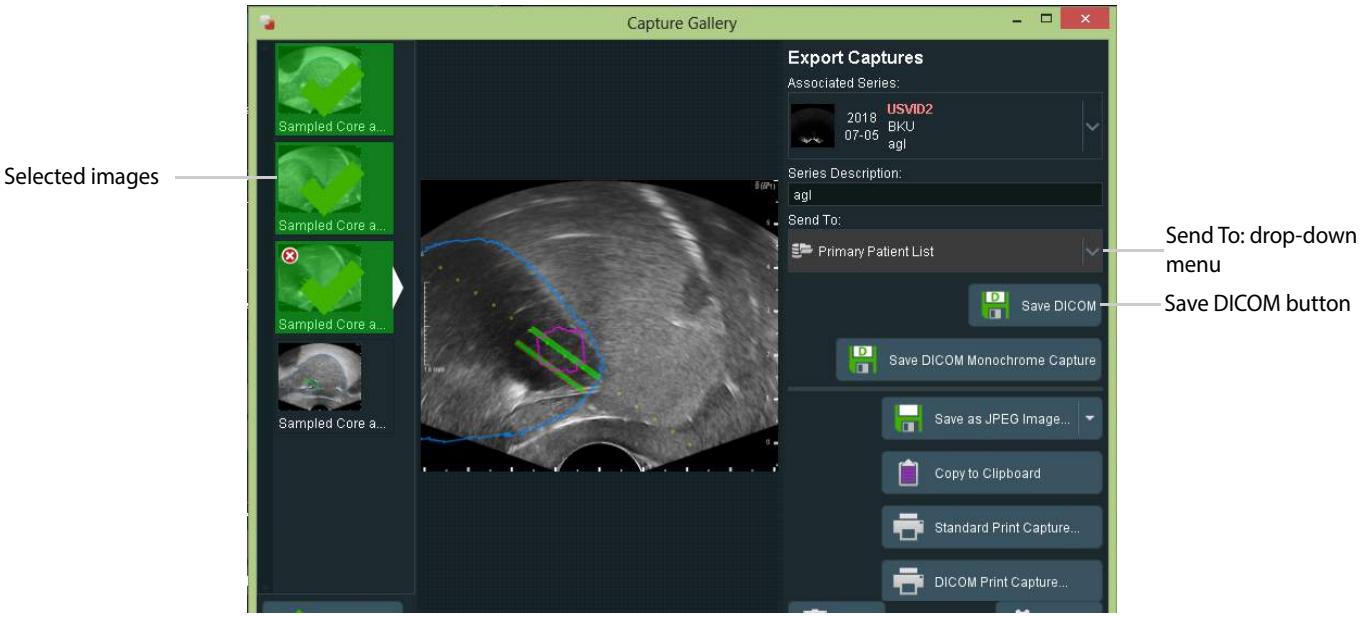


Figure 2-54. DICOM save screen

BK Medical ApS, Mileparken 34, 2730 Herlev, Denmark.T +45 4452 8100 F +45 4452 8199

BK Medical
8 Centennial Drive
Peabody
MA01960
USA
T + 1 978-326-1300
bkmedical.com

USA
Sales & Service
BK Medical
8 Centennial Drive
Peabody
MA01960
USA
T + 1 978-326-1300
F + 1 978-326-1399
bkmedical.com

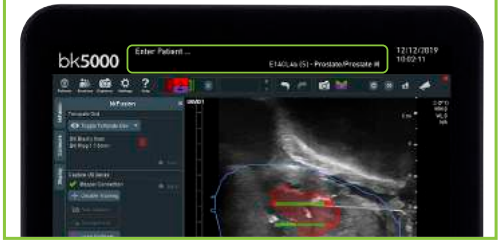
Europe and Rest of World
Sales, Service & Design Center
BK Medical
Mileparken 34
2730 Herlev
Denmark
T +45 4452 8100
F +45 4452 8199
bkmedical.com

bkFusion TP Steps Quick Guide

Patient, Transducer, Preset Modifications

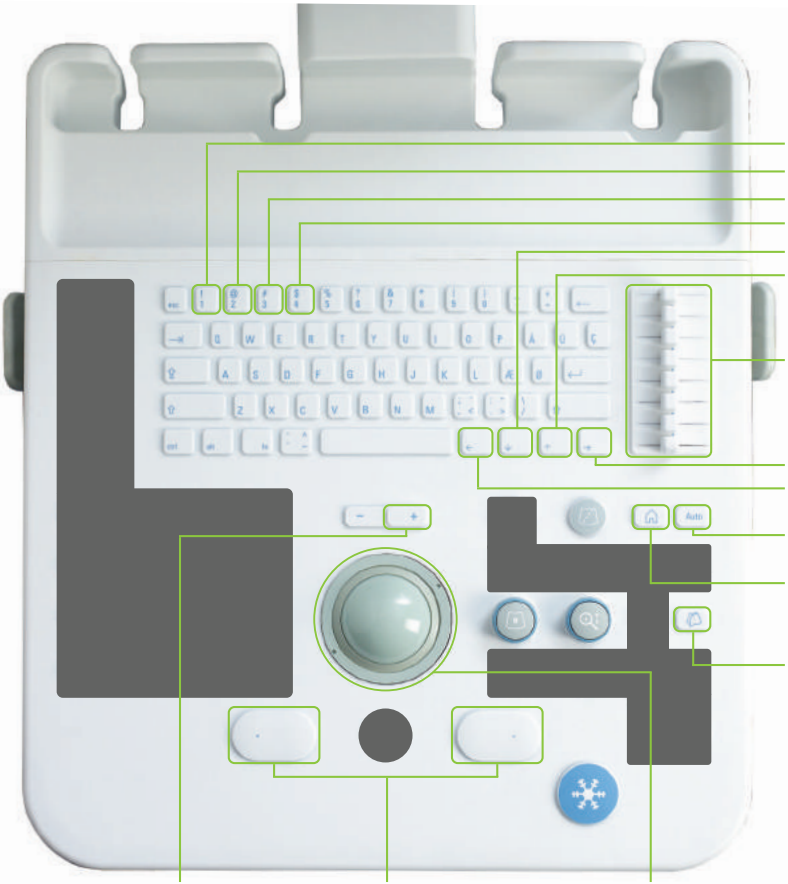
The top controls for altering exam information is inactive when using bkFusion. You will not be able to modify the following:

- Enter Patient ID
- Change Transducer
- Change Preset



If you have any issues or problems using bkFusion, please contact your BK Medical representative.

Keyboard functions with bkFusion for bk3000/bk5000



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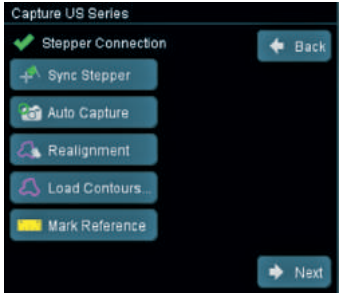
CE 0543

Biopsy Steps for TP bkFusion on bk3000/bk5000

1. Calibrate the grid (use Prog. 1...7/A...G 5mm). Save programmable grid as the default.

2. **Scan the prostate in B-mode**
   - Select the Prostate preset (S, M, or L) and appropriate grid (fusion tab will not appear if brachy pro package is used).
   - Adjust the stepper so that the entire prostate can be scanned in transverse (base to apex).

3. Click the **Fusion** tab, click **TpBx**, **enter ID**, and click **Start Procedure**



4. Confirm the grid size. Click **Next**

5. **To Capture an Ultrasound Series**
   - Check the stepper connection (green checkmark).
   - Wait for contours to load.
   - Use to align contours with the prostate.
   - In the reference window (the bottom image on the screen), align the contour as closely as possible with the live ultrasound image (to scroll through the contours in the reference window, move the cursor to the bottom image on the screen and use on the keyboard).
   - Click **Sync Stepper**.
   - Go all the way to the base of the prostate and click **Auto Capture**. Turn the wheel of the stepper to cover all slices of the prostate from base to apex. Click **Auto Capture** again to finish.
   - Click **Realignment** to fine tune position of contours. Contours can be adjusted left/right, up/down, and rotated.
   - Use on the right side of the image to confirm alignment.
   - Click Next.

6. **Biopsy Sampling**
   - Use the top button on the transducer or the on the keyboard to switch to sagittal view.
   - Turn the stepper wheel to bring the sagittal view of the prostate in full view.
   - Click if you need to adjust the contours.
   - Move the cursor to the bottom image on the screen (captured volume in transverse view) and use on the keyboard to scroll through all slices.
   - When the lesion is visible in captured volume, move the cradle so that the red line goes through the desired grid-coordinates. Insert the needle in the coordinates on the grid, and take the biopsy.
   - Move the cursor to the top of the image (sagittal view) and mark the core by clicking the Set/Select button.
   - Repeat last three steps until all the desired biopsies are taken.

7. **Biopsy Results and Report**
   - Click the **Save** button in the Biopsy Review box to save all data. Select your chosen destination and enter a description for the series.
   - Click **Display Report** in the Biopsy Review.

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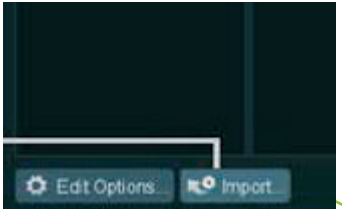
MRI data import from USB/CD Quick Guide

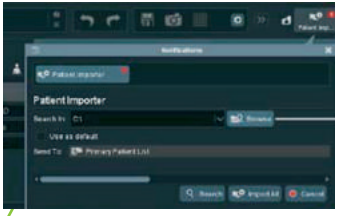
Connect transducer.
Select **Prostate** Exam Type

Click the **Fusion** tab

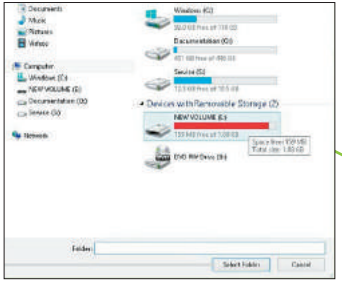
Click the **Advanced View** tab



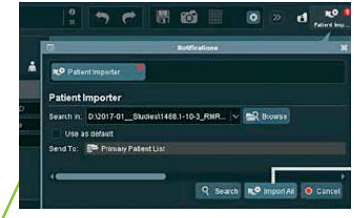
Click **Import** button at the bottom left of the screen



Click **Browse** button in the pop-up window



Choose the appropriate location, then click **Select Folder**



Check the **Send To** destination is set to **Primary Patient List**. Click I**mport All**

bk medical

MRI data import Quick Guide

Connect transducer. Select **Prostate** Exam Type

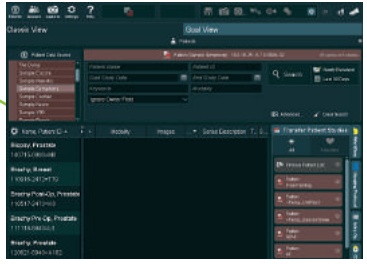
Click the **Fusion** tab

Click the **Advanced View** tab

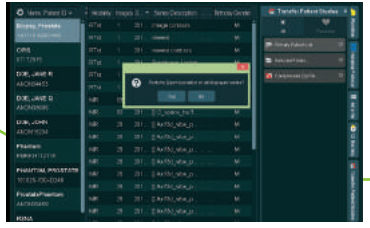
Requirements for MIMcloud
- A MIMcloud group has been configured for your site by MIM Software
- Users have MIMcloud accounts
- The BK Ultrasound system has Internet access

...from Remote Patient List

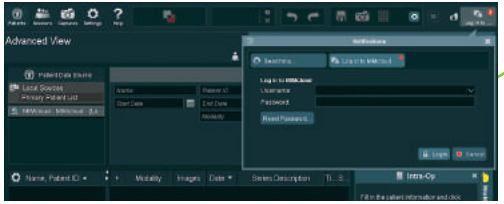
Click on the appropriate patient from the Remote Patient List.



Click the **Transfer Patient Studies** tab, then double-click **Primary Patient List**. Click Yes when prompted by the pop-up window



...from MIM-Cloud (US Only)



Double-click the **MIM Cloud** on the left-hand side of the screen

Enter your login details in the pop-up window

Click on the appropriate patient in the MIM-cloud database

Click the **Transfer Patient Studies** tab, then double-click **Primary Patient List**. Click Yes when prompted by the pop-up window

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