NKB Delineation editor

The application opens with on the left side a test image and on the right side a password dialog.

Test image

Check the monitor settings for brightness and contrast, using the test screen.

Password

Enter your password and push the OK button. The patient selection dialog appears.

Patient selection dialog

Select a patient that has not yet been submitted and push the OK button.
The scan of the selected patient will be shown.

Structure selection

Select the structure you want to delineate by clicking on the name.
The name of the structure will appear blue when selected.

Contrast (Level & Window)

If desired adjust the window / level by clicking ‘contrast | medium, low, high…….’ on the menu bar or clicking the contrast icon  and adjust the contrast with the left mouse button.

Delineating

After selection of the structure, drawing can start by clicking on the sketch button  .
The contour is drawn by moving the mouse with the left mouse button down.
To close the contour, let the mouse button up close to the starting point.
For some structures multiple contours per slice are allowed.
The drawing section on the menu bar has several options for editing the contour.
See function overview and draw Functions.

Save and close a patient

Select the menu ‘File | Save and close Patient’. The data is saved and can later be accessed.

Submit a patient

When all structures of a patient are delineated the data **must** be submitted.
To submit push the submit button .

After submission, the data for this patient can no longer be accessed.

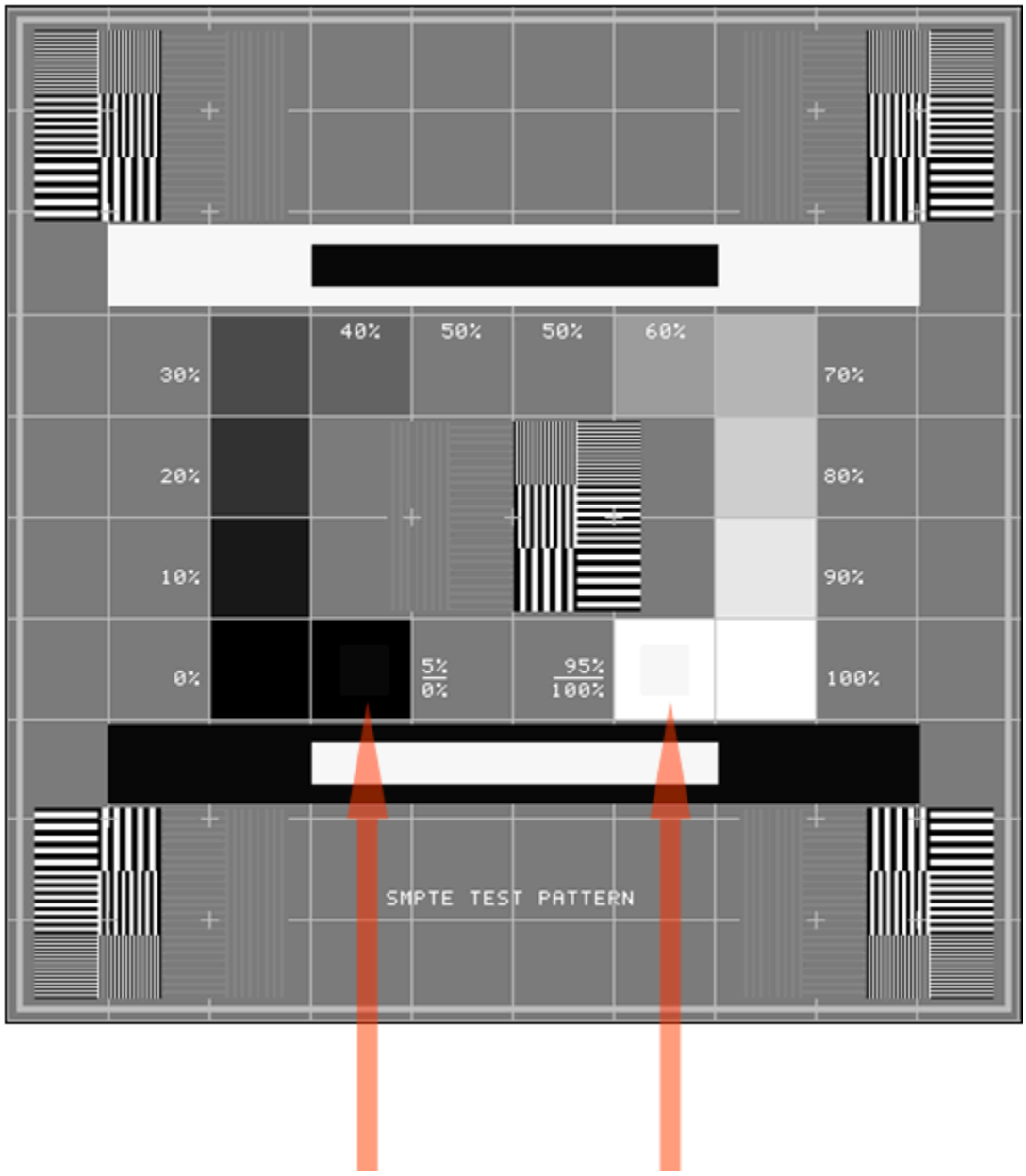
Select a new patient

Select the menu ‘File | Select patient’.

Close the application

Select the menu ‘File | Exit’.

Test screen



This test image is displayed on startup of the delineation editor.

Check the 2 squares indicated by the red arrows.

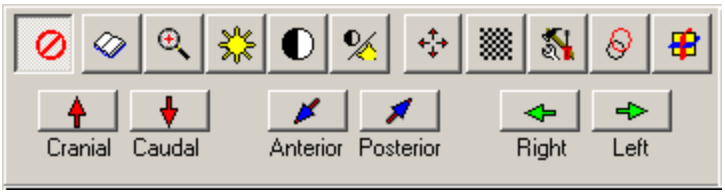
The left square should be black with a smaller square inside that is slightly lighter.

The right square should be white with a smaller square inside that is slightly darker.

Use the contrast and brightness buttons on the monitor to correct the contrast and brightness settings if n

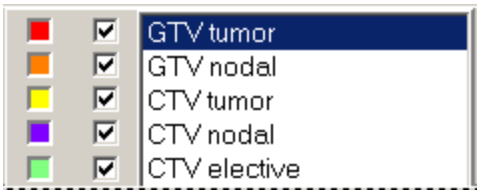
Function overview

The toolbar is divided in 3 parts:



Buttons for changing the appearance (scroll, zoom, contrast etc).

Buttons for scrolling through the scan.



Buttons used for selection of the structure to be delineated.

Buttons for selection of the drawing mode.

Appearance buttons

Deselect the left mouse button. All drawing functions and appearance functions are switched off.

Change the slice in the active viewer using the left mouse button.

Change zoom factor in the active viewer using the left mouse button.

Change brightness (level) in the active viewer using the left mouse button.
Moving from left to right the brightness decreases (level increases).

Change contrast (window) in the active viewer using the left mouse button.
Moving from left to right the contrast increases (the window goes down).

Change brightness and contrast (level and window) in the active viewer using the left mouse button.
Moving from left to right the contrast increases (the window goes down).
Moving from top to bottom the brightness decreases (the level goes up).

Fit image in the active window.

Display slice overview in the active window. An array of all slices is shown.
Select a slice with the right mouse button.

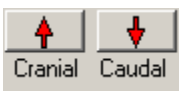
Display controls. Shows a window with scrollbars for adjusting slice, zoom, brightness or contrast in the active window.

Show surrounding contours. While this button is kept down contours in the previous and next slice are shown - in dashed lines – in the edit window. Only the active structure is shown. (F4)

Link the viewers in 3D. When this button is down a left mouse down / move causes the other viewers to jump to the corresponding slice. A yellow cross is shown in the corresponding position.
(Does not work with diagnostic viewers)

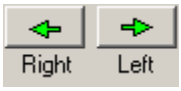
Slice buttons

When these buttons are pushed once, the next or previous slice is shown.
When the buttons are kept down, the action is repeated automatically.



Change axial slice.

Change slice in coronal reconstruction.



Change slice in sagittal reconstruction.

In addition the mousewheel can be used to change slices in the active window.

Structure selector

Each structure in the structure selection list has a name, a color button and a show / hide checkbox.
Use the mouse to select a structure from the structure selection list.
The name of the structure will appear blue when selected.

The color button shows the drawing color for the corresponding structure.
Push the color button to change the drawing color for this structure.

Push the show / hide checkbox to switch between show structure (checked) and
hide structure (unchecked).

Draw functions

Sketch contour. This function will start a new contour or extend an existing contour. An existing contour is extended when the active contour is **not closed** and the extending point is **on** or **close to** one of the contour ends.
A new contour is started when the contour is **closed** or the new point is **far from** one of the contour ends (if **multiple** contours are allowed at all).
Drawing is done with the left mouse button down.

Replace polyline. This function replaces a part of the contour by a new polyline. Click with the left mouse button on a point or line and draw a new polyline with the mouse button down. Release the mouse button to connect the new polyline with the nearest point on the contour.
The new polyline divides the contour in 2 parts. The longer part is kept.

Push the spacebar or 'j' key to switch to the part with the smallest area.
The original contour does not have to be closed. The resulting contour is always closed.

Edit detail. With this function an existing point can be moved, or a new point can be inserted on an existing line. When a new point is inserted on an existing line it may also be moved.

Delete detail (keep connect). With this function points and lines are deleted, but the remaining line segments are reconnected. It is, therefore, not possible to divide the contour in multiple parts.

Erase. With this function points and lines are erased. Only one opening is allowed. After the contour is opened only the end lines can be erased.

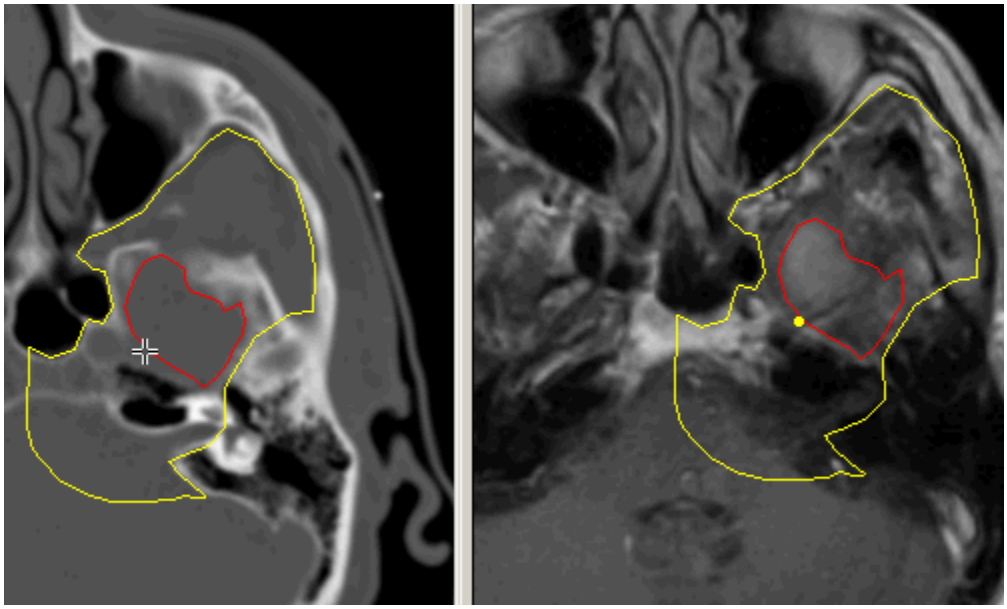
Delete in slice. The following dialog will be shown: ‘Do you want to delete contour(s) of …..?’ with 3 choices: ‘delete in this slice’, ‘delete in all slices’, or ‘cancel’.

Diagnostic window

When a diagnostic scan is available, the 

button is enabled.

The diagnostic window has a tab with 1 or more scans.



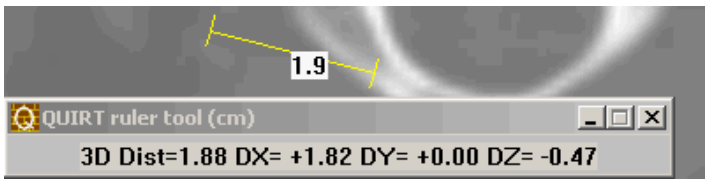
Main viewer with CT Diagnostic viewer with MRI

When the scans are matched, the location of the cursor on the CT is indicated with a yellow dot on the diagnostic scan.

Ruler

Type 'r' or select menu item 'Ruler' from the context menu.

In one of the corners of the viewer the ruler window will be displayed



The ruler tool.

Click on the desired starting point and drag to another point. The distances along the orthogonal axis ***DX***, ***DY*** and ***DZ***

are displayed as well as the 3D distance. ***3D Dist*** is the vector length derived from ***DX***, ***DY*** and ***DZ***.

The ruler tool can be closed using the **X button** and minimized using the **_** button.

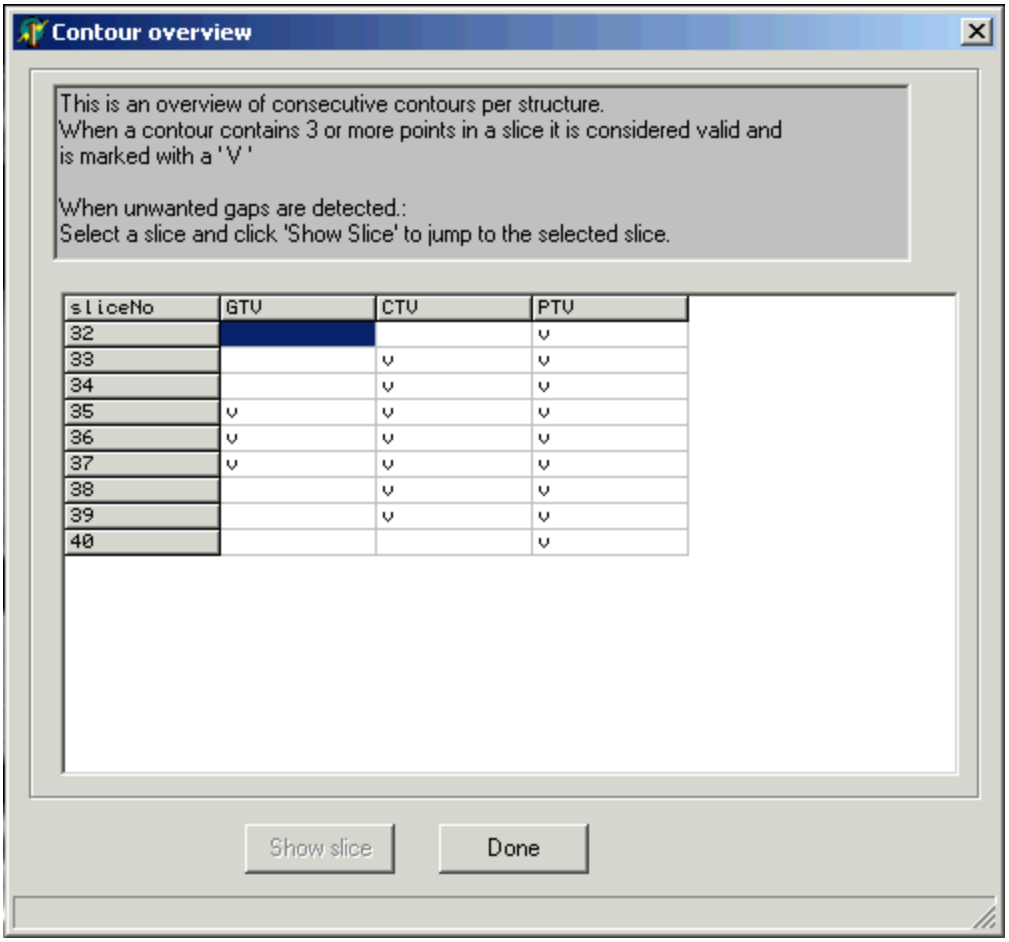
A minimized ruler window is still usable. Closing the ruler window removes all drawn rulers.

Scale

In addition, at the bottom of the main viewer, a permanent ruler shows the current scale of the scan in the main viewer .

0cm 5cm 10cm

Contour overview



Push the ‘Contour overview’ button to display a list of delineations per slice for each of the structures.

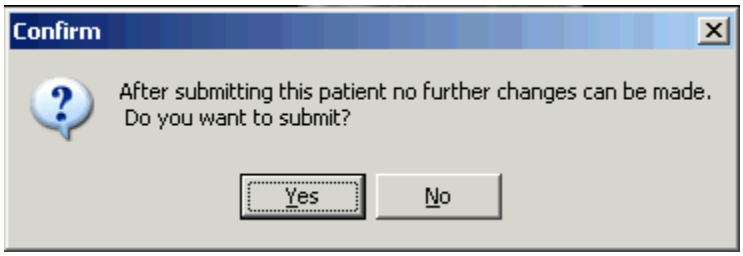
When a contour contains 3 or more points in a slice it is considered valid and is marked with a “V” .

When unwanted gaps are detected, select a slice and click 'Show slice' to jump to the selected slice.

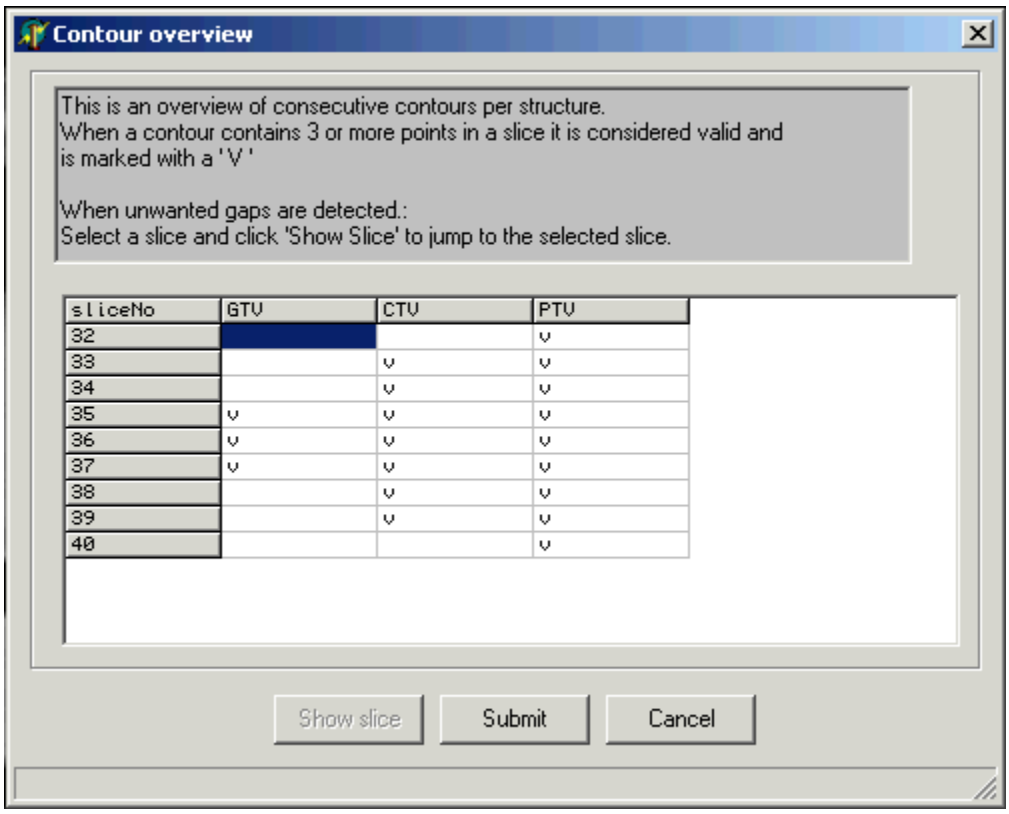
Submit Patient

Push the ‘Submit’ button to submit all data.

A confirmation dialog appears.
Push the ‘Yes’ button to continue or push the ‘No’ button to cancel.



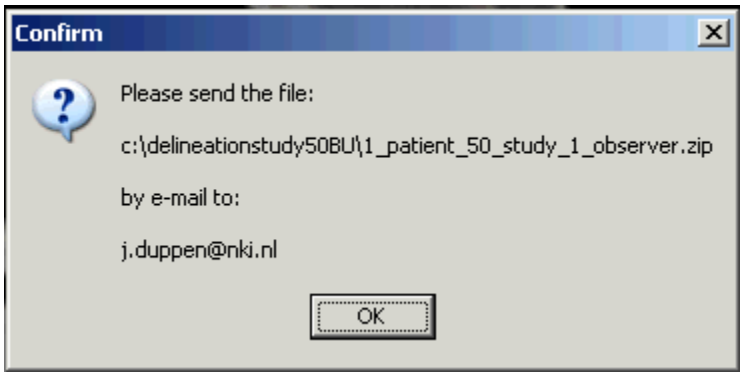
Next a contour overview is shown. See below.



If the delineation is not complete, select a slice and push the ‘Show slice’ button to jump to the selected slice.

If the delineation is complete, push the ‘Submit’ button to continue.

A message is displayed with a request to send the result by E-mail.



Push the OK button.

The explorer pops up, showing the files to be sent.

The data for this patient can now **no longer** be accessed.