# Four useful tools that will improve the results when 3D printing with Sectra

Sectra's pre-operative planning system makes it possible to send orthopaedic cases for 3D printing with just a few clicks. Thanks to easy-to-use features and a network of 3D printing services integrated with the system, you no longer need to spend time creating specific file formats or searching for suppliers. Furthermore, Sectra's system includes pre-operative planning tools that are also useful in a 3D print context.
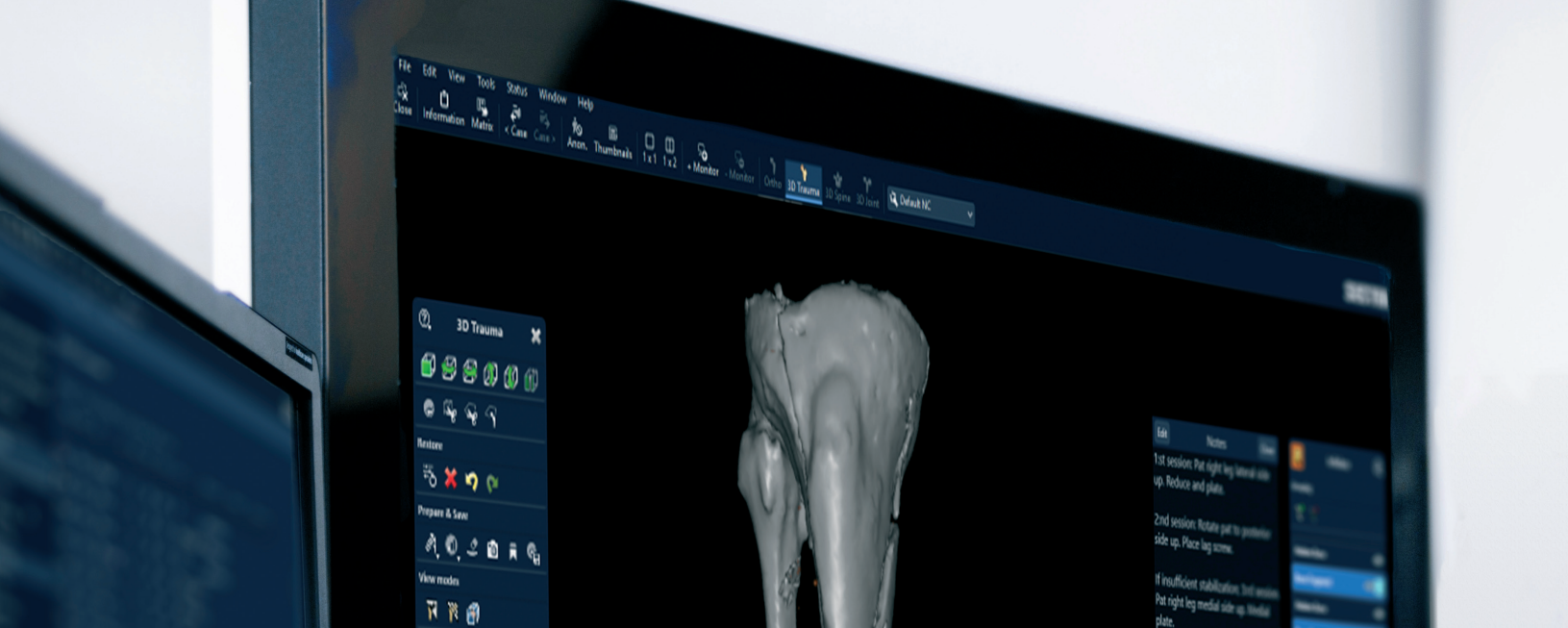
We have compiled some tips on how these tools can be used to maximize the quality of your 3D printing.
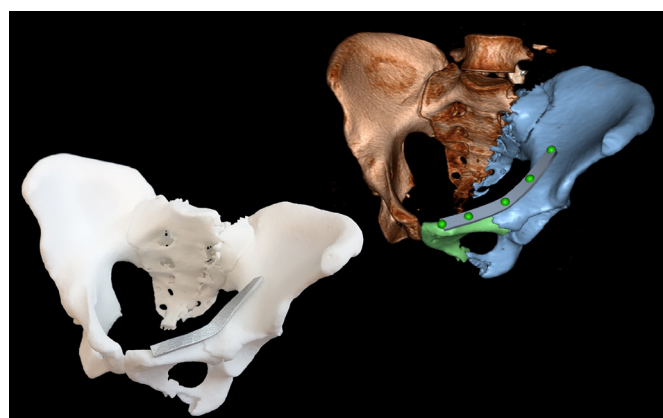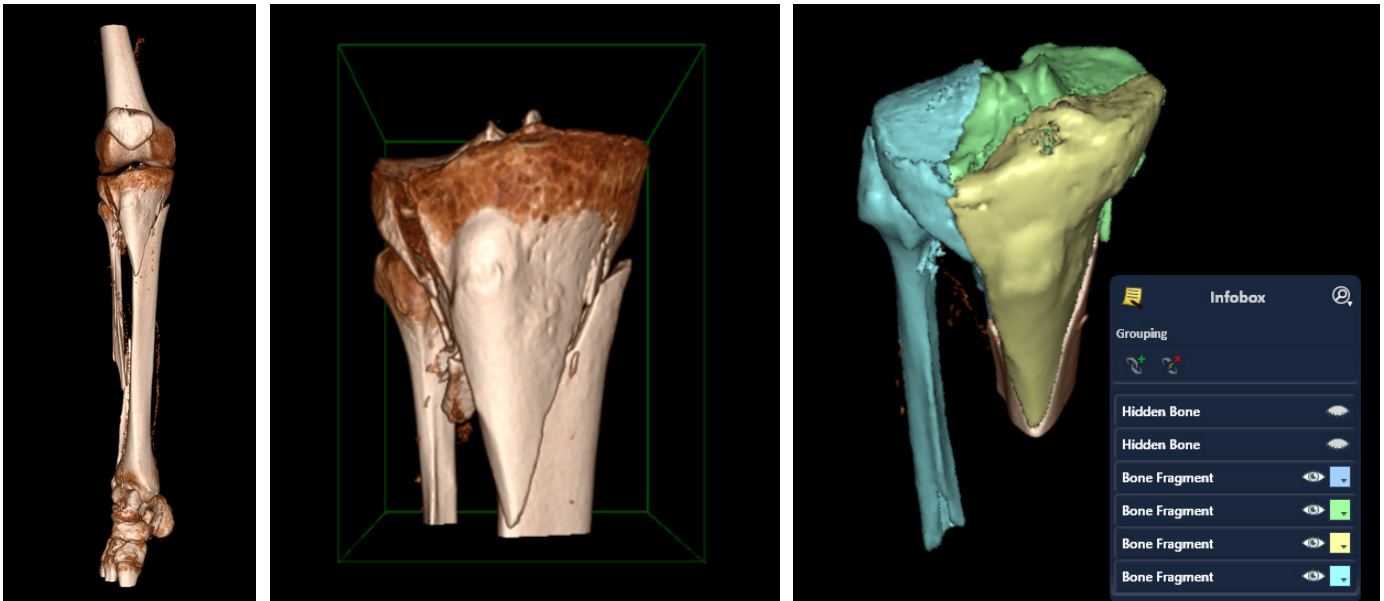


**Optimal conditions for 3D printing**
» Slice thickness between 0.6 and 1 mm
» Soft kernel



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## Clip Box

The clip box lets you crop an image in 3D and thereby focus on what is most important. It is then easy to start marking the fragments that you are interested in printing.



**Create a clip box**

1. Select the Clip Box tool. A clip box will be activated.
Initially the clip box surrounds the whole volume.

2. Scroll the mouse wheel to adjust the size of the clip box.

3. Drag the clip box to adjust its position.

4. Drag a single side of the clip box to adjust that side's position.

5. Select the Rotate tool when satisfied.

**Remove a clip box**

1. Select the Clip Box tool.

2. Click the Remove Clip Box button in the clip box tab.

## Window Level

To ensure the best possible results when 3D printing, make sure that you have the correct window level when starting to mark your fragments. You do not want to have any artifacts from soft tissue remaining on your printed bone fragments.

In Sectra's system, this can be done easily. Simply press down your mouse wheel and drag from left to right in order to adjust for as little tissue as possible without losing bone.



Visible noise from soft tissue due to low window level.

Perfect balance between soft tissue and bone for 3D printing.

Cavities created from missing bone due to high window level.

## Any Visible Tissue

By default, the system is set to create fragments from bone tissue, which means that only tissue with a certain density is used to create fragments, regardless of whether the tissue is visible in the 3D view or not. By changing the tool to create fragments from any visible tissue, fragments will be created depending on what tissue is currently visible in the 3D view.

For 3D printing, the Any Visible Tissue setting is recommended since it will fix cavities created by tissue or soft bone and thereby smooth the surface.
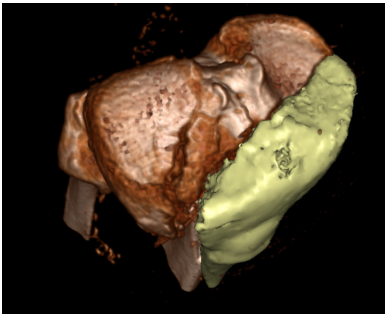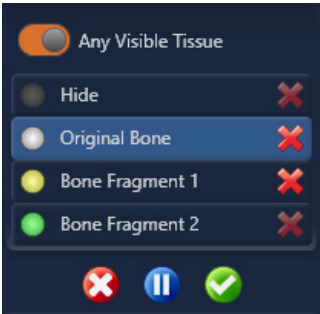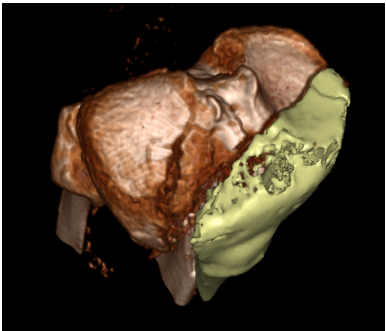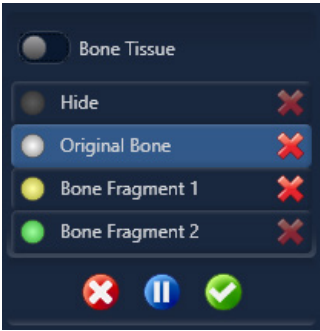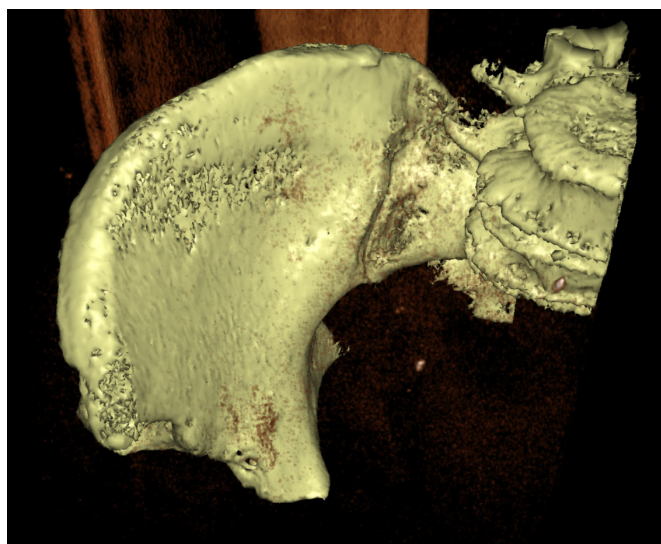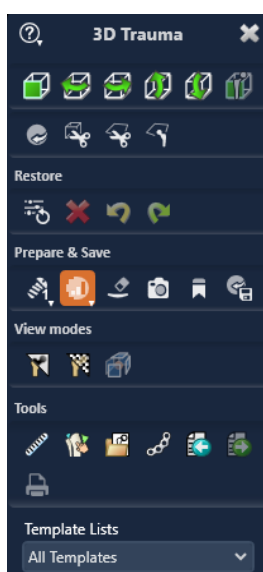
## Smoothing

When 3D printing, it is beneficial to avoid artifacts or other irregularities that create a rough surface on the models. Sectra's system contains a tool that can smooth the volume to varying degrees before extracting bone fragments for printing. This gives you the best-looking end result in the printing process.

The Smoothing tool can also improve the results when generating 3D prints from lower-quality images, or images that have a larger slice thickness than recommended (optimal slice thickness is between 0.6 and 1 mm).
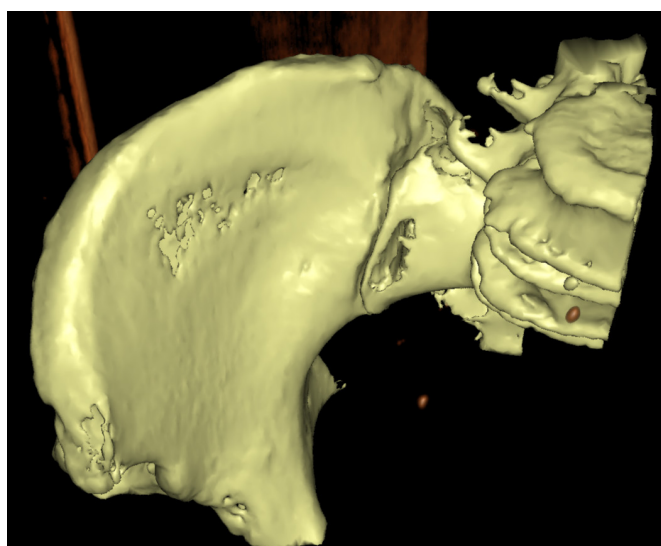
*The best overall 3D printing results are typically achieved when Window Level, Any Visible Tissue and Smoothing are used in a balanced combination.*



Before using the Smoothing tool.



Choose between minimum, medium and maximum noise reduction in the drop-down menu. Image smoothing is temporary for the current session and does not affect the stored image data.



After using the Smoothing tool.

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