

# Ortho Simulation 📱



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# 1 Introduction and Overview

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## 1.1 Medit Ortho Simulation Overview

Simulate the trajectory of teeth movement using Medit Ortho Simulation. With Ortho Simulation, create numerous outcome scenarios by adjusting each tooth position. The easy-to-follow guide messages accompany each stage to help you create sophisticated simulations in minutes.

Run Medit Ortho Simulation from both clinic and lab accounts in Medit Link.

## 1.2 Intended Use and Disclaimer

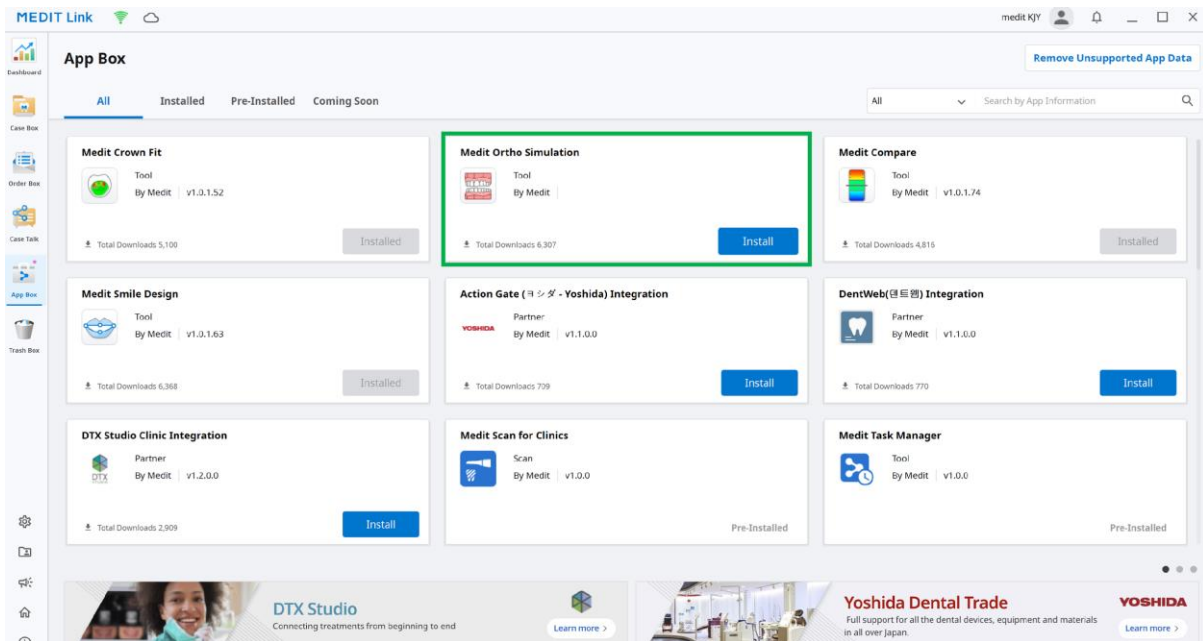
- ① The user is entirely responsible for the process and informing the patients that the simulation results generated by the application may not be precise or reliable; it should only be used for consultation or communication purposes. Medit does not take any responsibility or liability for any misunderstandings or miscommunications that might happen. The application is to be used solely for communication purposes.
- ② Medit Ortho Simulation is not developed for using in medical or clinical purposes.
- ③ The software may not be used for the following purposes:
  - For the purposes of diagnosing, treating, mitigating, or preventing diseases.
  - For the purposes of diagnosing, treating, mitigating, or preventing injuries or disorders.
  - For the purposes of inspecting, replacing, or transforming a structure or function.

## 1.3 System Requirements

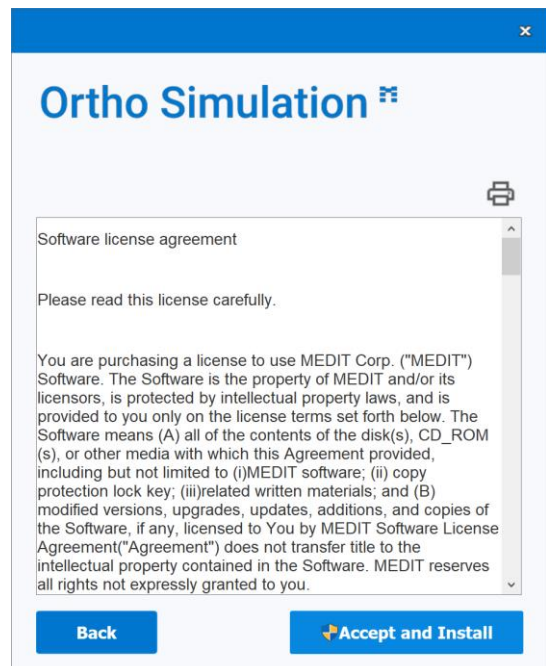
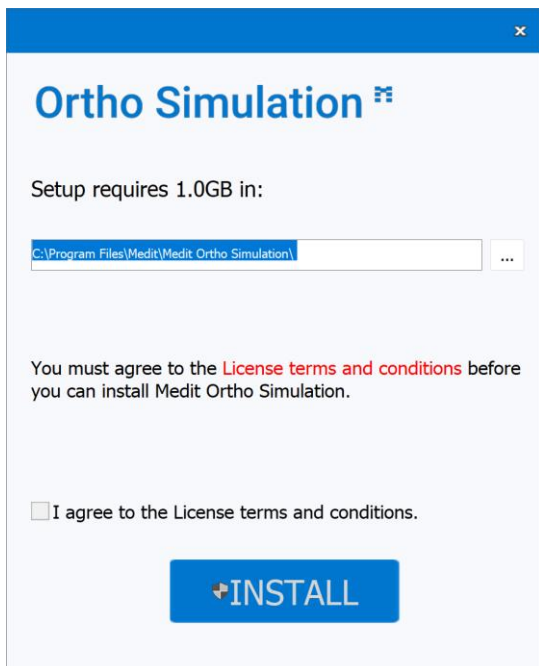
	Laptop	Desktop
<b>CPU</b>	Intel Core i5 2.6 GHz or higher	
<b>RAM</b>	16 GB or higher	
<b>Graphics</b>	NVIDIA GeForce GTX 1060 (2 GB) or higher	
<b>OS</b>	Windows 10 64-bit, Window 11 64-bit	

## 1.4 Installation Guide

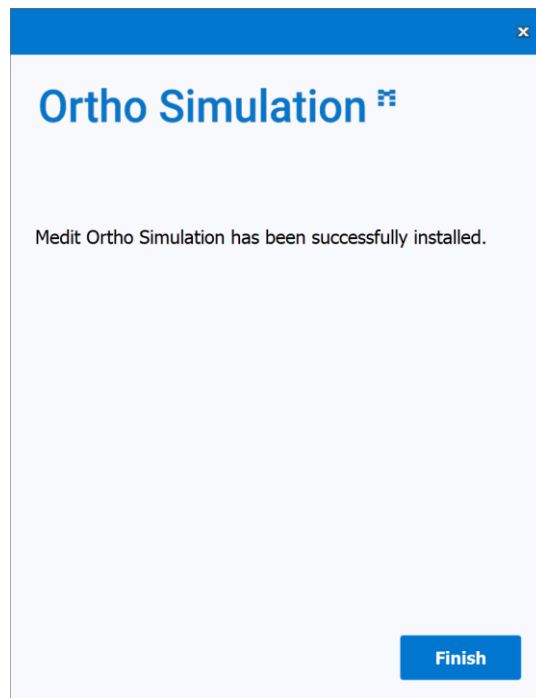
- ① Log in into your Medit Link Account and go to the **App Box**.



- ② Find **“Medit Ortho Simulation”** App and click on the **“Install”** button.
- ③ Once the download is complete, Medit Ortho Simulation installer will be run automatically.
- ④ Read and agree to the License Terms and Conditions.



- ⑤ It may take up to several minutes to finish the installation process. Please do not turn off the PC until the installation is complete.
- ⑥ Click **“Finish”** to complete the installation.



- ⑦ Restart Medit Link.

## 2 Data Management

### 2.1 Acquiring 3D Data

For clinic users, scan data acquired through Medit Scan for Clinics will be automatically saved in Medit Link.

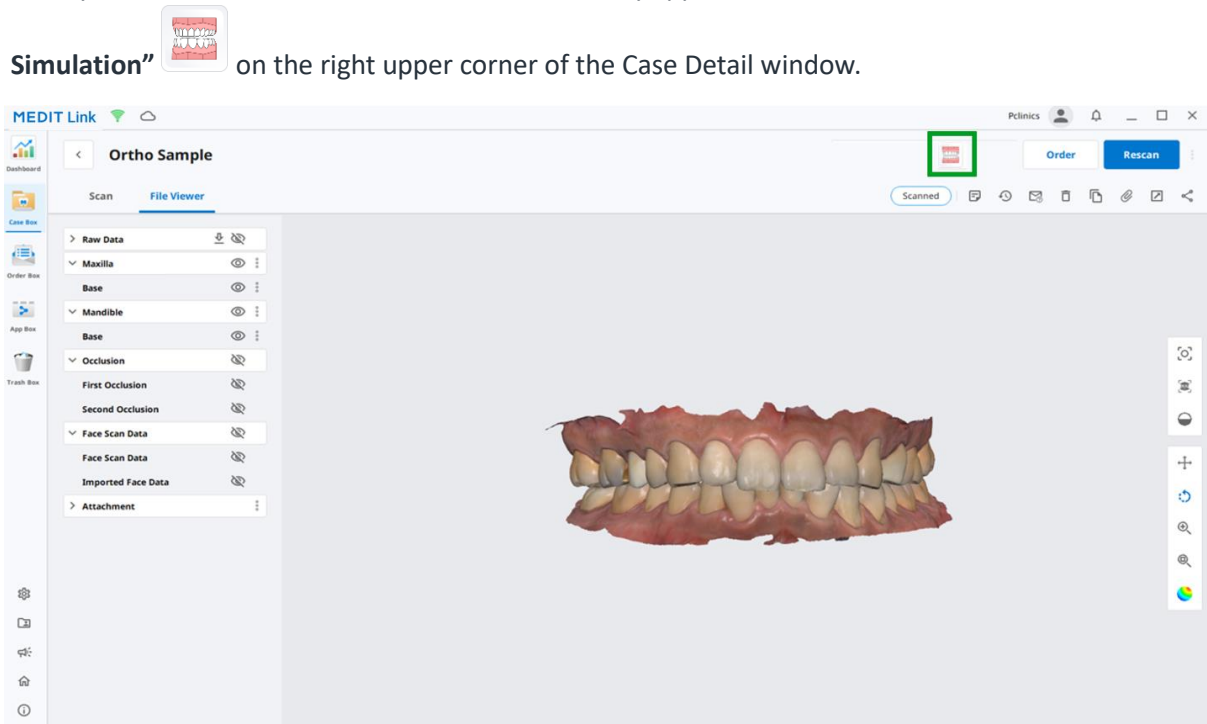
For labs users, running Medit Ortho Simulation is possible from the cases received from Clinics.



Both maxilla and mandible scans and their respective occlusions are necessary to run Medit Ortho Simulation.

### 2.2 Running Medit Ortho Simulation from Medit Link




- ① Go to the **Case Box** (for Clinic account) or **Work Box** (for Lab account) and choose the case you would like to use in Ortho Simulation.
- ② Once you install Ortho Simulation, it will automatically appear when Medit Link is relaunched. Click “**Ortho Simulation**” on the right upper corner of the Case Detail window.



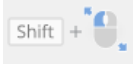
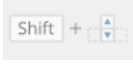



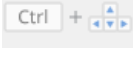
Medit Ortho Simulation project file will be saved to the Medit Link Case when completed along with the captured images.

## 2.3 3D Data Control

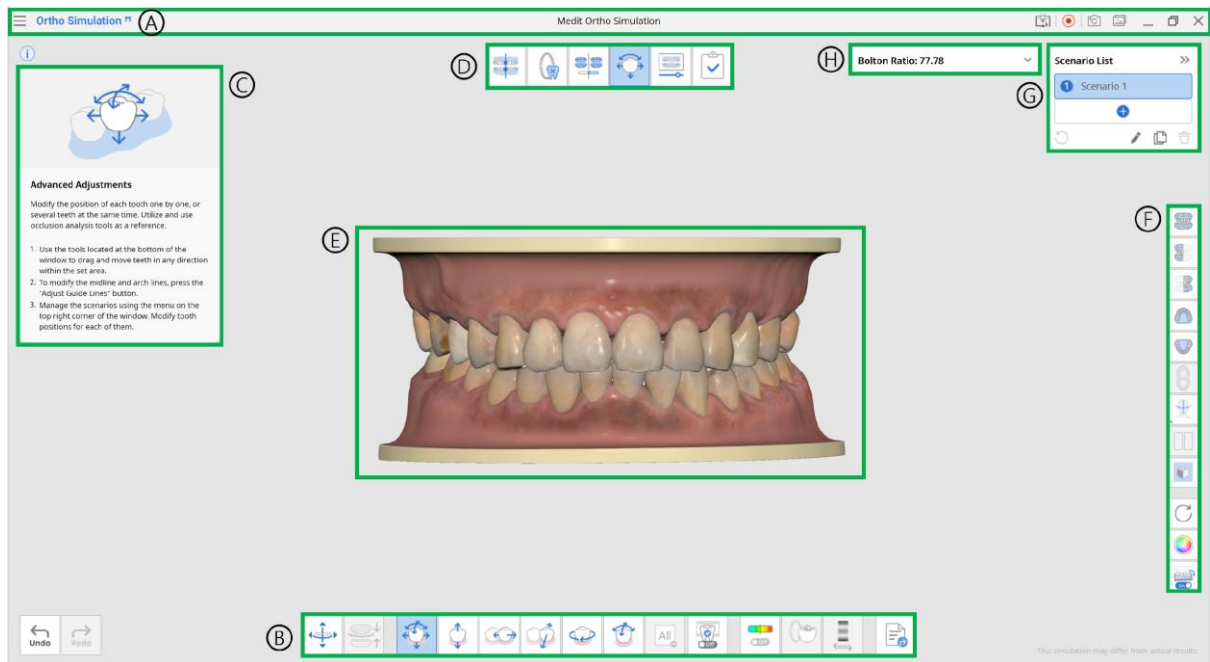
### 3D data control using mouse:

Button	Action	Use	Image
Wheel	Drag	Move the data in view screen.	
	Scroll	Zoom in/out the data in view screen.	
Right	Drag	Rotate data in view screen.	

### 3D data control using mouse and keyboard buttons:

Button	Action	Use	Image
Shift	Left Click and Drag	Zoom in/out	
	Up and Down Keys		
Alt	Left Click and Drag	Rotate	
	Up, Down, Left and Right Keys	Rotate	
Ctrl	Left Click and Drag	Move	
	Up, Down, Left and Right Keys	Move	

## 3 User Interface



- |                  |                 |                  |
|------------------|-----------------|------------------|
| A. Title Bar     | B. Toolbox      | C. Guide Message |
| D. Stage         | E. Model View   | F. Side Toolbar  |
| G. Scenario List | H. Bolton Ratio |                  |

### 3.1 Title Bar

The Title Bar consists of the following options:

Menu	The Menu includes tools to manage data display options and shows the details of application.
Start Video Recording	Start video capture.
Screenshot	Capture the screen.
Screen Capture Image Manager	Manage the captured screen images.
Minimize	Minimize the application.
Maximize or Restore	Maximize or restore the application.
Exit	Terminate the application.

## 3.2 Side Toolbar

The Side Toolbar provides the tools to change data display and view options.

	Frontal View	Show frontal view.
	Right Lateral View	Show right lateral view.
	Left Lateral View	Show left lateral view.
	Maxilla View	Show maxilla occlusal surface.
	Mandible View	Show mandible occlusal surface.
	Occlusal Surface View	Show the occlusal surfaces of maxilla and mandible.
	Show/Hide Reference Data	Show/hide such reference data as midline, arch line, face data.
	Show/Hide Face	Show or hide the face data.
	Show/Hide Midline	Show or hide the midline on the data.
	Show/Hide Arch Line	Show or hide the arch line on the data.
	Scenario Comparison Mode	Show the selected scenario or all scenarios in comparison to the original model.
	Grid Settings	Set grid display options. It shows or hides the grid and control its position in relation to the model (overlay on/off).
	Rotate	Rotate the model in any direction with left mouse button.  Useful when you use touch screen.
	Model Display Modes	Change the model display mode between <b>“Original Color Display Mode”</b> and <b>“Study Model Display Mode.”</b>



Lower Jaw  
Movement  
On/Off

When on, shows lower jaw movement together with teeth.

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### 3.3 Undo/Redo

The undo/redo buttons are located at the bottom left corner of the window.



Undo Undo previous action.



Redo Redo previous action.










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## 4 Stages

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Stages indicate the current step of the simulation you are working on. Stages are subjected to the specific sequence; however, after completing work at the **Advanced Adjustments stage** you can move back to the **Simulation Preview stage** to compare the scenarios you have created with the original model.

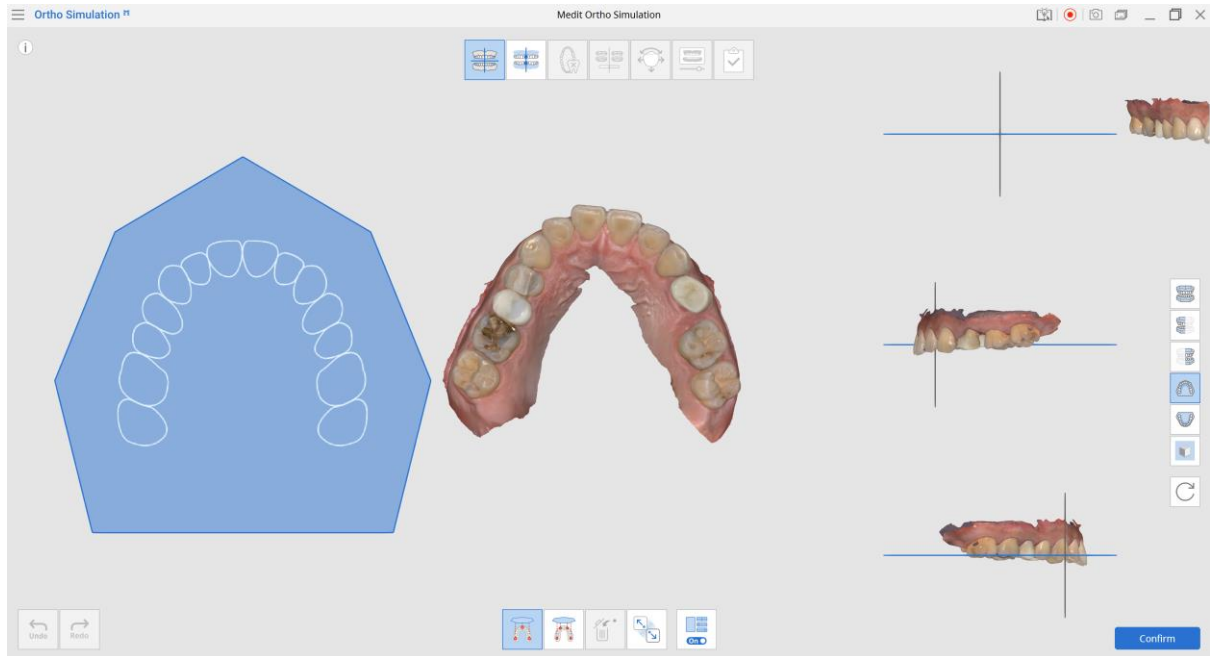
---

	Alignment Mode	Align the data to the occlusal plane.
	Model Settings	Set the model midline and clean the data.  If you change the midline settings while working on the project, you will lose all current progress.
	Simulation Settings	Adjust settings for the simulation by defining missing teeth, planned extractions, and prostheses.
	Simulation Preview	Display the simulation preview in comparison with the original model.
	Advanced Adjustments	Make advanced adjustments for the position of each tooth.
	Animation View	View simulation in animation. Choose a scenario in the top right corner to see its teeth movement animation.
	Complete	Save all information and creates capture images.  The captured images will be saved to the case in Medit Link under Attachments.






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## 4.1 Alignment Mode

In Alignment Mode, align the maxilla and mandible data to the occlusal plane. Alignment to the occlusal plane is essential when starting the simulation with an attachment. Skip this step and start from “Model Settings” if you are using data scanned by Medit Scan for Clinics or Medit Scan for Labs rather than data from an attached file.



### The toolbox includes:

	<b>Align with Occlusal Plane by Three Points</b>	Draw three points to align the maxilla or mandible data with the occlusal plane.
	<b>Align with Occlusal Plane by Four Points</b>	Draw four points to align the maxilla or mandible data with the occlusal plane.
	<b>Delete Marker Point</b>	Delete marker points.
	<b>Detach Data</b>	Reset alignment and move data to the initial position. Select points on the data to align it manually.
	<b>Multi-View</b>	Turn on to show data from four different angles.

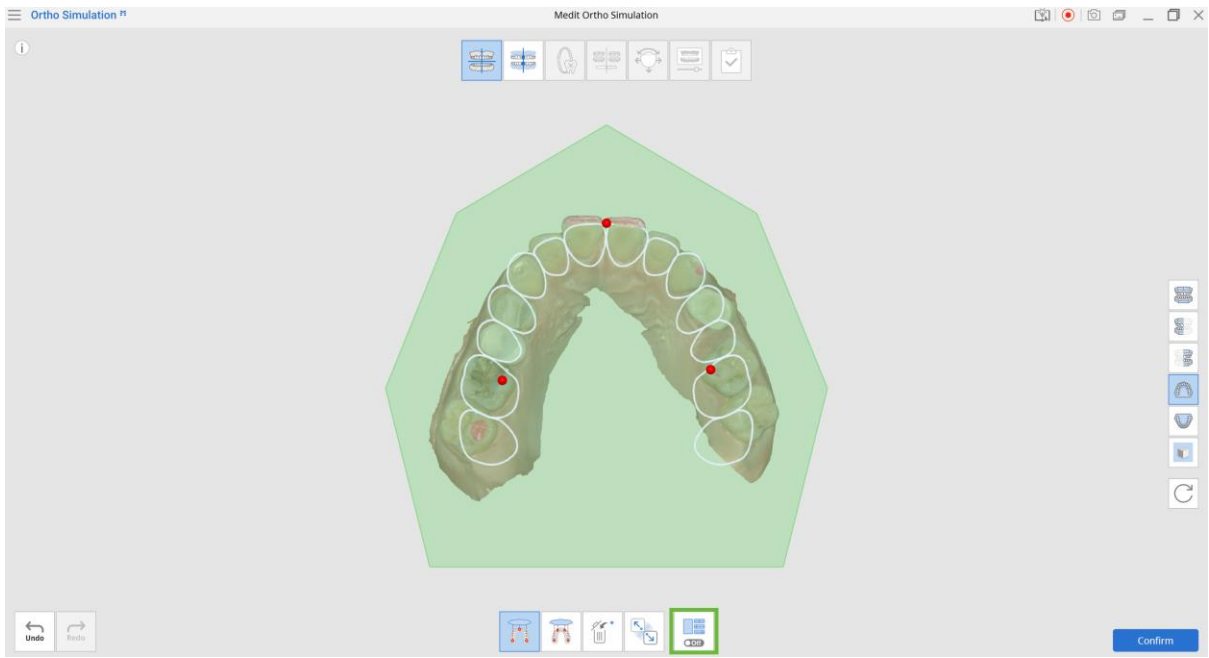
① Place three or four points on the data to automatically align it to the occlusal plane.



② Use the Multi-View on the right to move the data around and control the location of the occlusal plane.



③ If you turn Multi-View off, only the occlusal plane will be displayed.



## 4.2 Model Settings

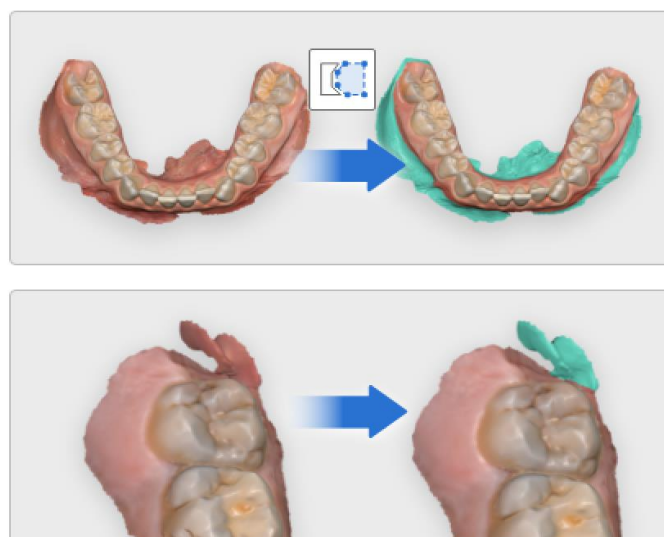
This stage helps adjust the orientation of the arches by defining midline points on each of them. This step is necessary for simulation.

- ① Adjust the midline points on each arch as shown below.



- ② Use the trimming tool located on the right to edit the data. Trimming the gingiva area can help the model look cleaner for consultation. Left-click and drag to select the area, then right-click to delete.

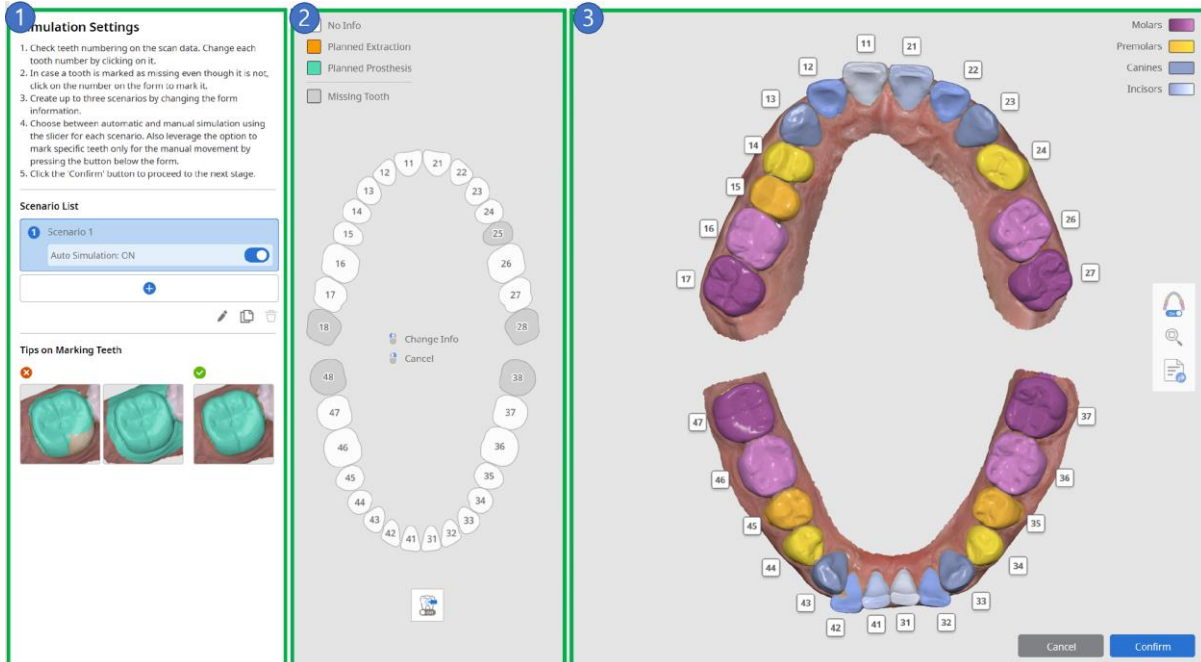
### Tips on Data Cleaning



- ③ Click **“Confirm”** to move to the next stage.

## 4.3 Simulation Settings

This stage contains the settings for the simulation that include defining form information, creating scenarios, and segmenting the teeth.



### 1 Overview

Overview section provides the space to create several scenarios of teeth movement. Adjust the form information for each of them to compare them at next stages.

You can turn Auto Simulation on and off in each scenario.



Additional tools for moving position of each tooth are provided at **Advanced Adjustments** stage.

### 2 Form Information

Use the form information section to mark teeth as missing, planned for prosthesis, or extraction for the selected scenario.

The teeth selected as “Manual Movement Only” are excluded from Auto Simulation.

### 3 Scan Data

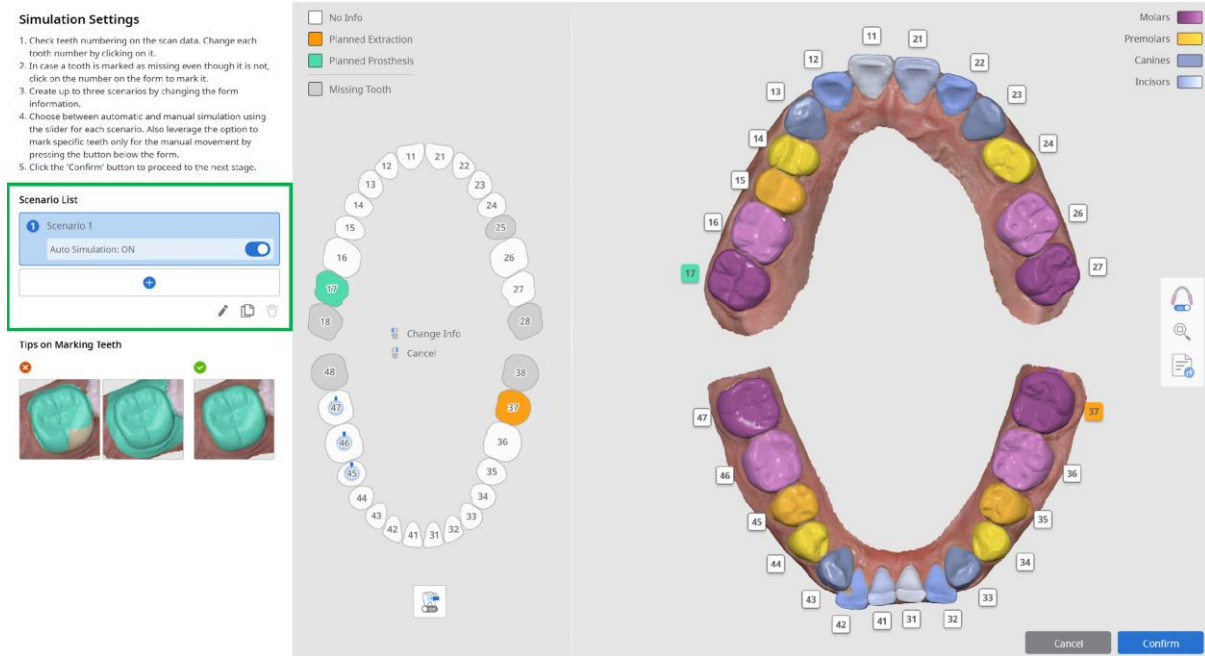
Scan data section provides options to change tooth numbering in case the automatic segmentation is not made correctly by the program.



You can export each of the segmented teeth as separate files to the Medit Link case.

### 4.3.1 Overview & Creating Scenarios

Create up to three scenarios of teeth movement based on the form information to visualize possible simulation outcomes. You can create several variations of the form information by changing the planned teeth for extraction or prosthesis along with the option to turn **“Auto Simulation”** on and off in each scenario.



① Click **+** to add a scenario.

	Auto Simulation	Turn Auto Simulation on and off. When off, the original and simulation results are the same.
	Add	Add a new scenario for each teeth movement scenario.
	Rename	Rename the selected scenario.
	Clone	Clone the selected scenario. You cannot clone a scenario if there are more than three of them already in existence.
	Delete	Delete the selected scenario.

② Edit the form for each of the planned scenarios.

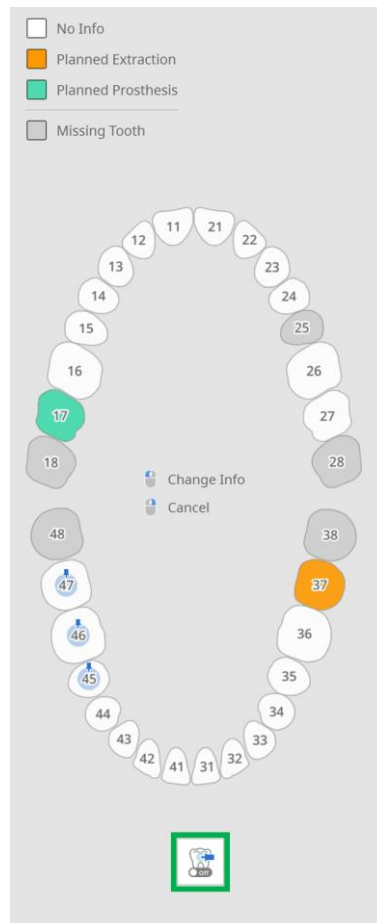
③ Once the simulation scenario is complete, click **“Confirm”** to proceed to the next stage.

### 4.3.2 Form Information

The form on the left shows the scan data's results in an easy-to-understand format.

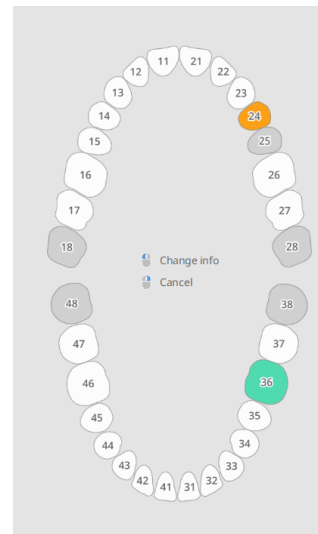
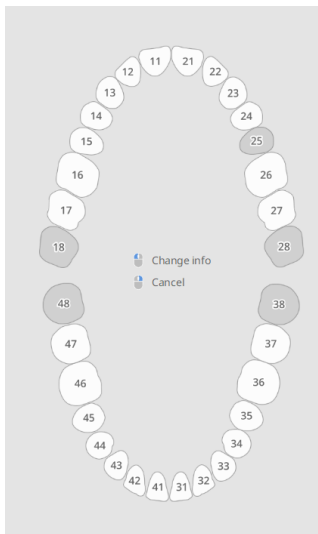
- ① Click a tooth once to mark as "Planned Extraction" or double-click to mark as "Planned Prosthesis."
- ② Teeth marked as "Manual Movement Only" do not move in "Auto Simulation;" you can only move them manually in "Advanced Adjustments."

"Manual Movement Only" is helpful for when you want to check the simulation of only certain teeth while the rest remain static. You can move the static teeth manually in "Advanced Adjustments."




- ③ Click a tooth in the form if an extraction or prosthesis is planned.
- ④ Click once to mark a tooth as "Planned Extraction."

⑤ Click again to mark it as “Planned Prosthesis.”



Simulation result cannot be created if there are less than 10 teeth.

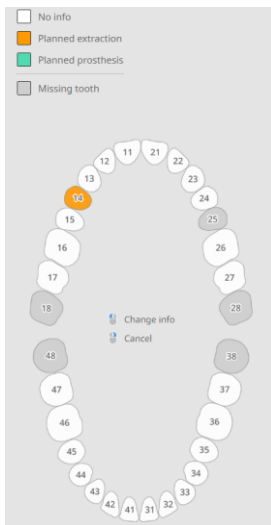
⑥ Click “Add Tooth Area”  button to add a tooth if the tooth is still present but marked as a missing tooth.

⑦ Click “Add Prosthesis Tooth”  button to add a “Planned Prosthesis.”

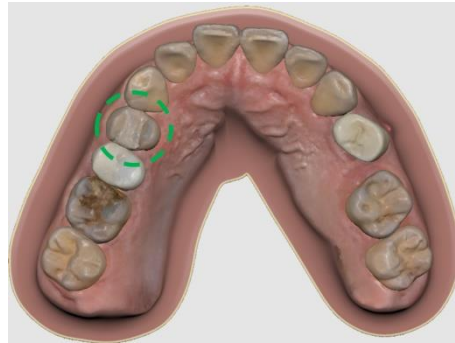


## Differences between “Planned Extraction” and “Planned Prosthesis:”

### Planned Extraction



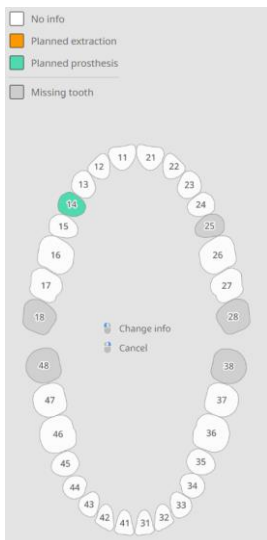
Original



After Simulation



### Planned Prosthesis



Original



After Simulation

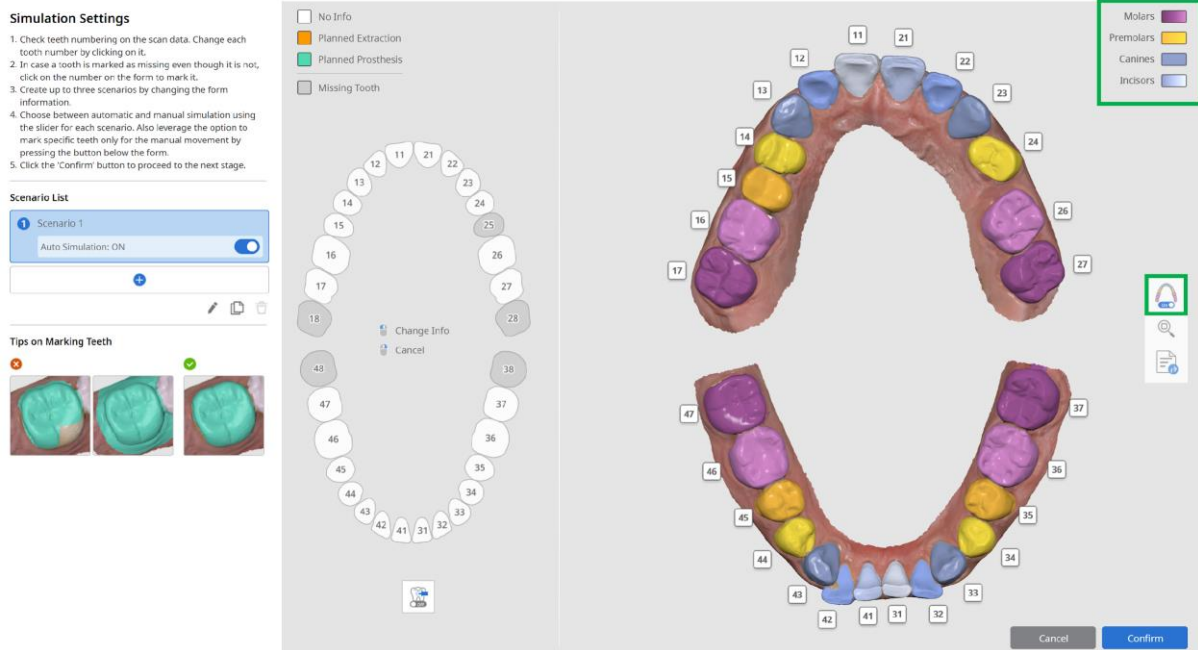


Check the teeth numbering on the scan data. You can change the teeth number by clicking on the tooth on the scan data.

If a tooth is misnumbered, click it on the scan data. The program will suggest one or two options to change the numbering.

### 4.3.3 Teeth Marking

The program will automatically segment and mark teeth based on their type. You can always edit the number if it is inaccurate. You also have the option to export segmented teeth as a separate file.



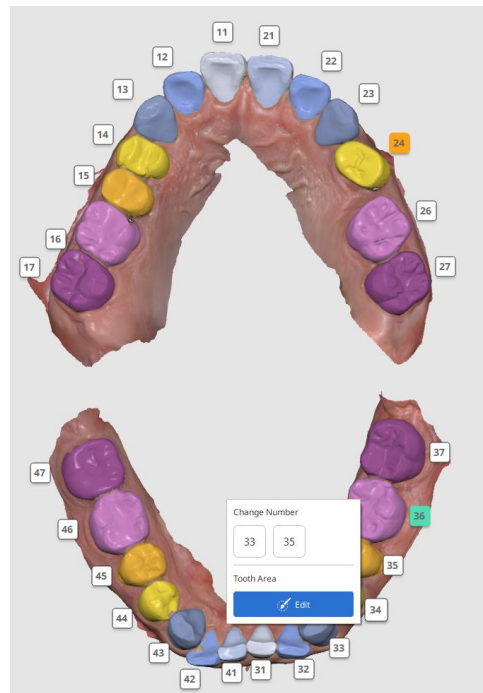
Use the marked teeth as a reference for when you have to manually mark a tooth. Ensure that only the tooth (and no soft tissues) is selected as shown on the image below.

#### Tips on Tooth Area Selection

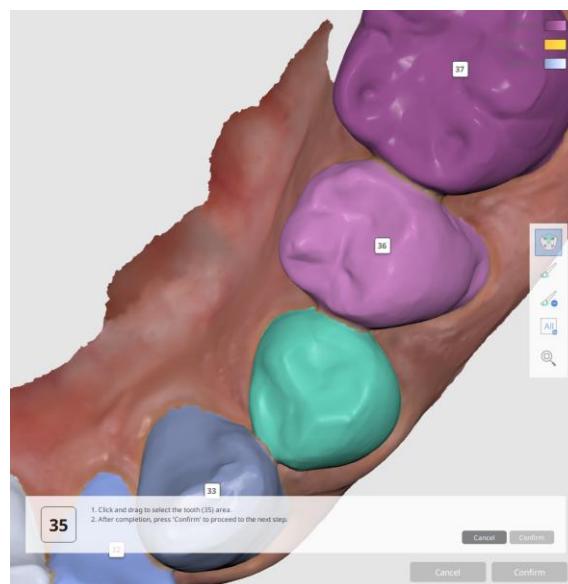


- 1 Check the tooth number in the scan data. Click on the number to change the number.

- ② Click the tooth number to see the possible options if the wrong number is assigned.



- ③ Use the tools located on the right to select the correct area for the tooth.
- ④ Use **“Smart Tooth Selection”** function to mark the area in one click or by click and drag the mouse to automatically expand the selected area. You can also use the brush tool to mark the tooth.



## Toolbox



Smart Tooth Selection

Automatically select the area of the tooth. Click and drag the mouse on the tooth.



Brush Selection

Select the area using the brush.



Brush Deselection

Deselect the area using the brush.



Clear All Selection

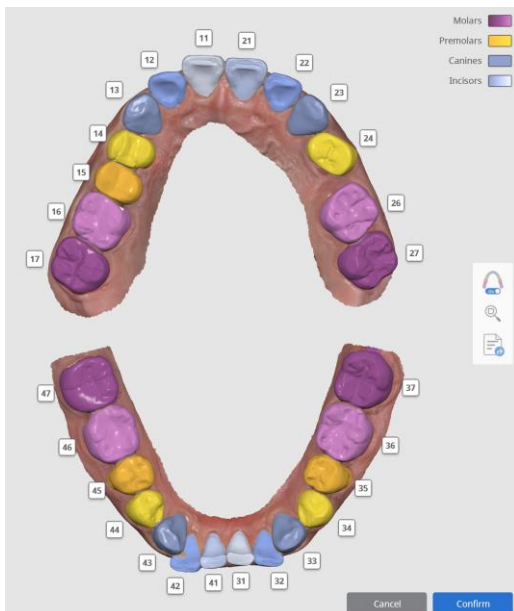
Clear all selection.




Zoom Fit to Selection

Zoom to the selected area.

⑤ Click “Show/Hide Teeth Marking” to see the data in its original color.



⑥ Click “Segmented Export”  to export each of the segmented teeth as separate files to Medit Link.

#### Simulation Settings

1. Check teeth numbering on the scan data. Change each tooth number by clicking on it.
2. In case a tooth is marked as missing even though it is not, click on the number on the form to mark it.
3. Create up to three scenarios by changing the form information.
4. Choose between automatic and manual simulation using the slider for each scenario. Also leverage the option to mark specific teeth only for the manual movement by pressing the button below the form.
5. Click the “Confirm” button to proceed to the next stage.

#### Scenario List

Scenario 1  
Auto Simulation: ON

#### Tips on Marking Teeth



Legend for Marking:

- No Info
- Planned Extraction
- Planned Prosthesis
- Missing Tooth

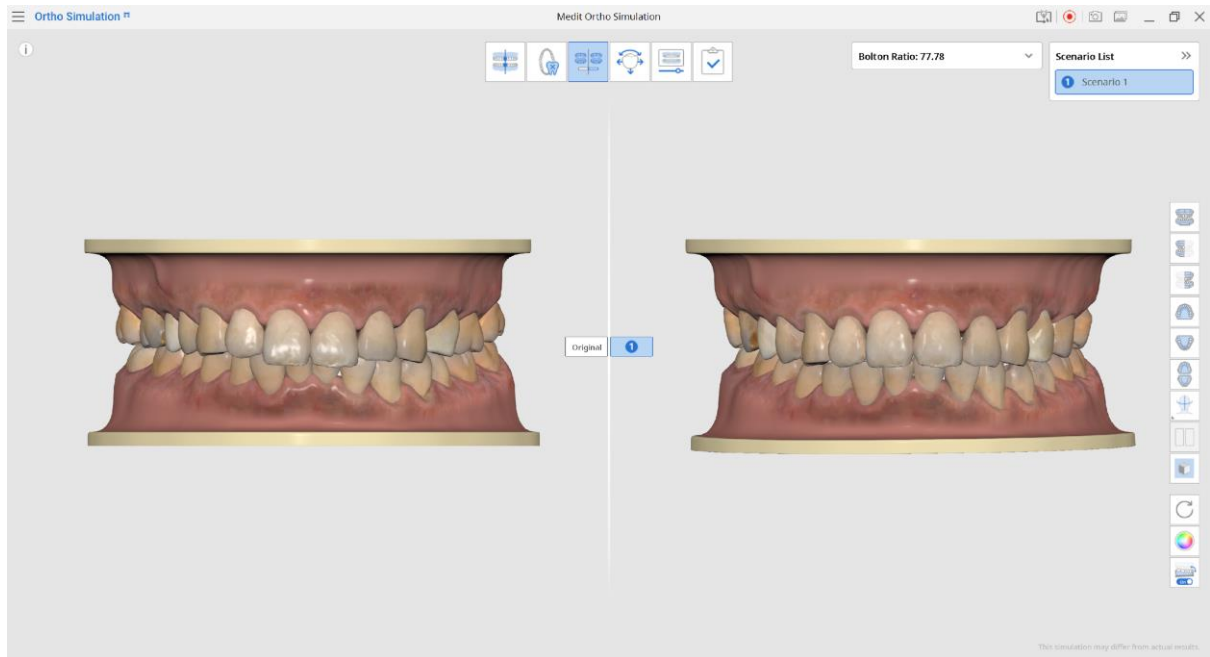
Legend for Tooth Types:

- Molars
- Premolars
- Canines
- Incisors

Buttons: Change Info, Cancel, Cancel, Confirm

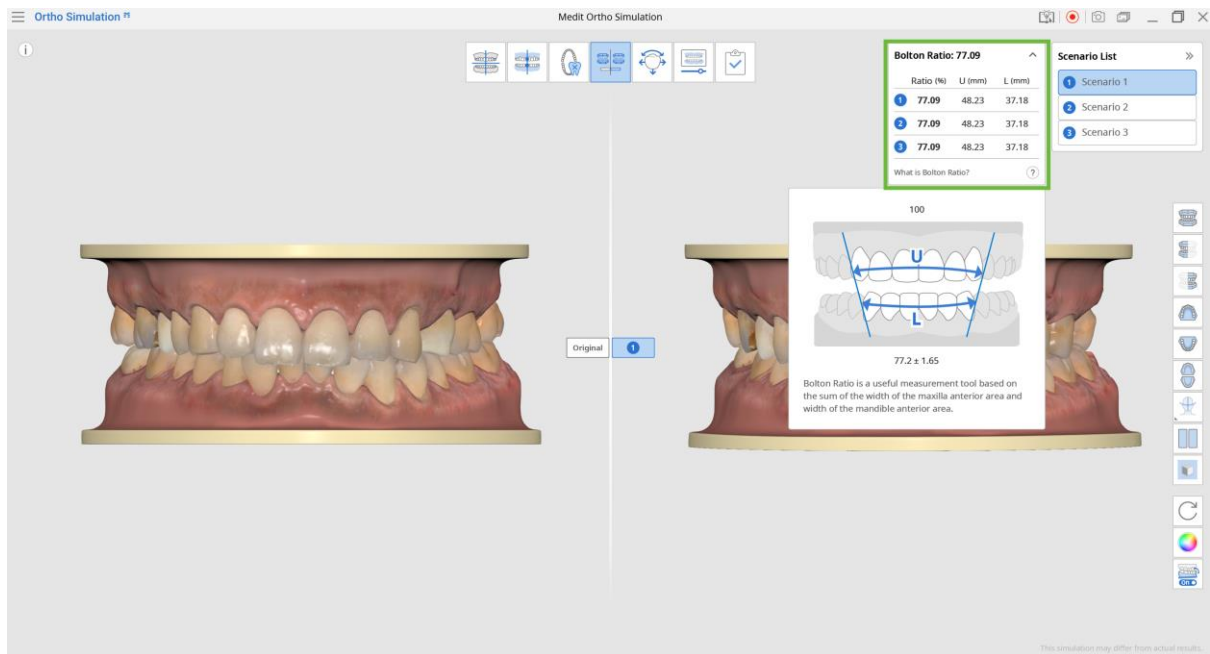
## 4.4 Simulation Preview

This stage generates and shows the expected simulation result compared to the original model.

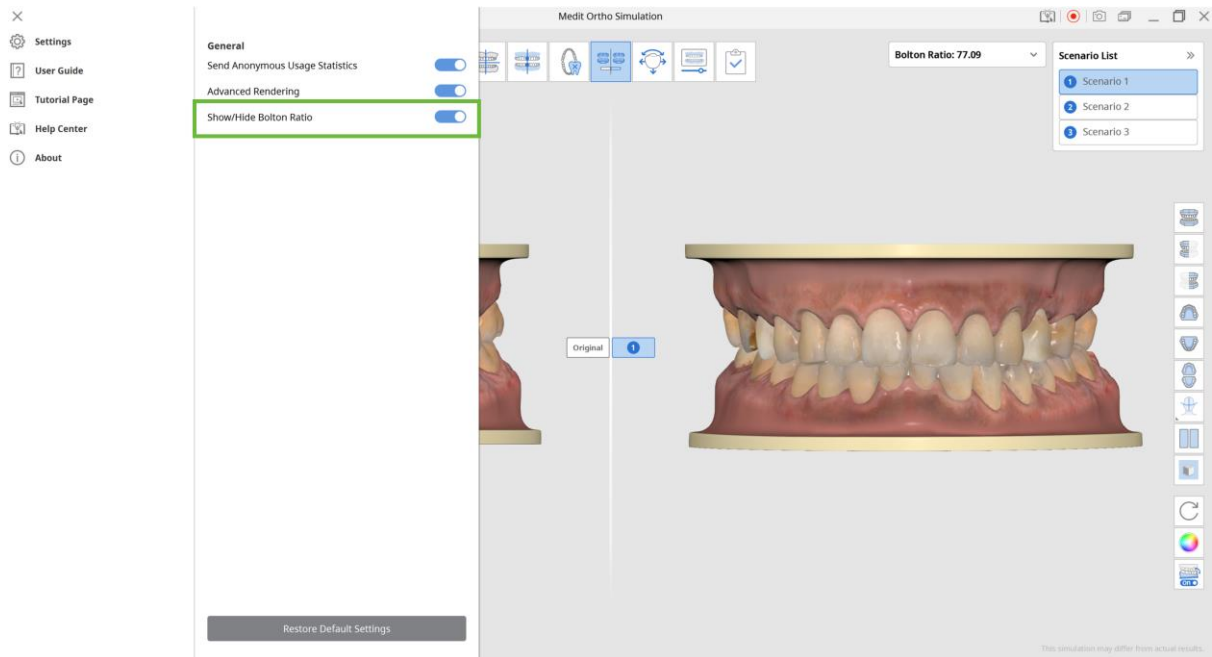


You can check the Bolton Ratio.

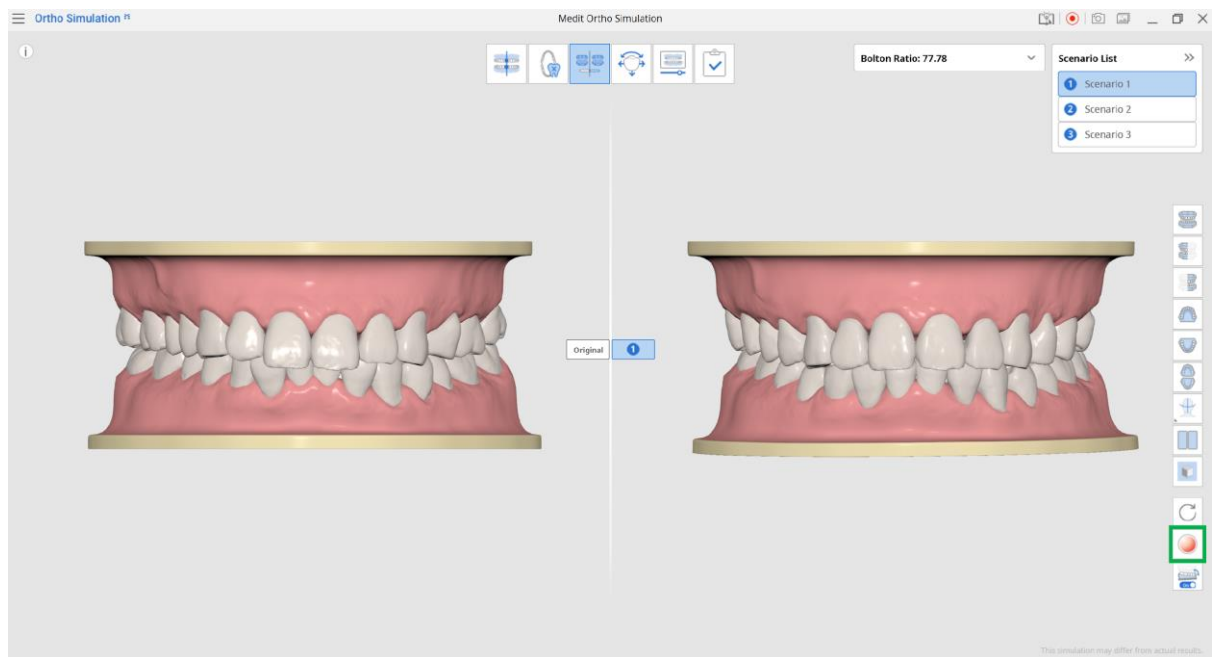
The ratio for each scenario will be displayed when there are more than two scenarios.



Turn “Show/Hide Bolton Ratio” off in Settings to hide it.

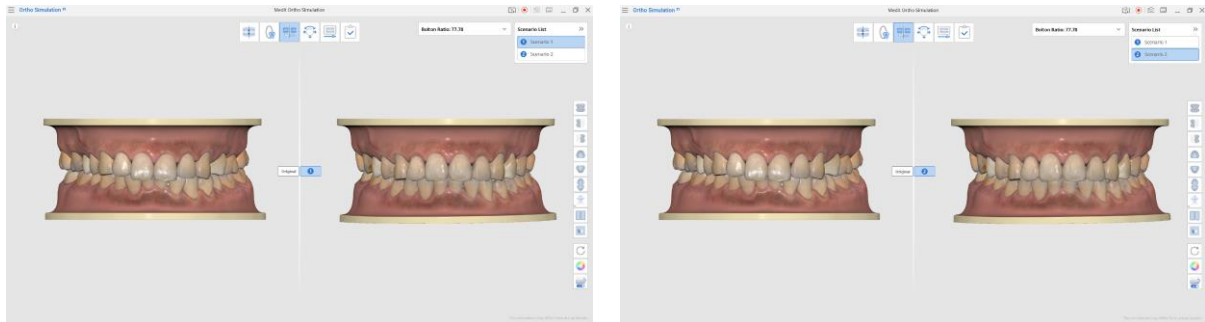


Try changing the model display style by clicking  to view in Study Model Mode.

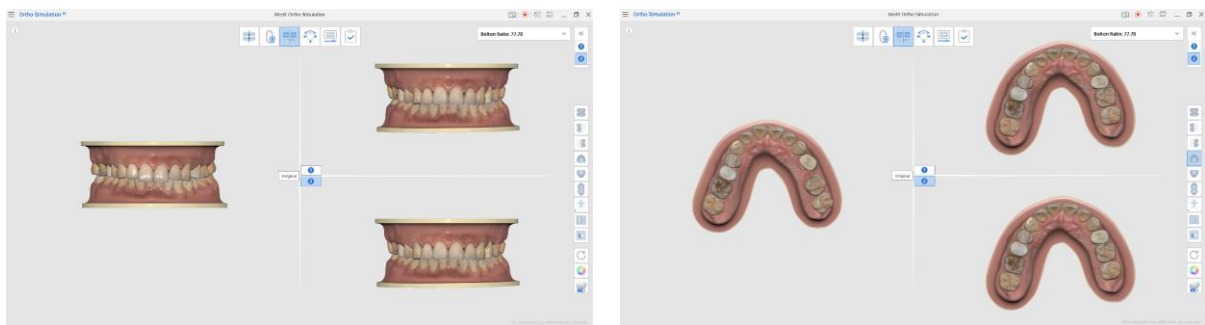




In **Advanced Adjustments** stage, use advanced tools to modify the position of each tooth in various directions.

- ① When there is more than one scenario, compare them to the original model one by one by choosing the scenario at the top right corner.



- ② Compare all of them by clicking “Scenario Comparison Mode”  on the Side Toolbar on the right.



- ③ Preexisting face scan data from Medit Link can be displayed at this stage. Click “Show/Hide Reference Data”  → “Show/Hide Face”  ” on the Side Toolbar.

- ④ Use “Show/Hide Midline” and “Show/Hide Arch Line” options to check their location.

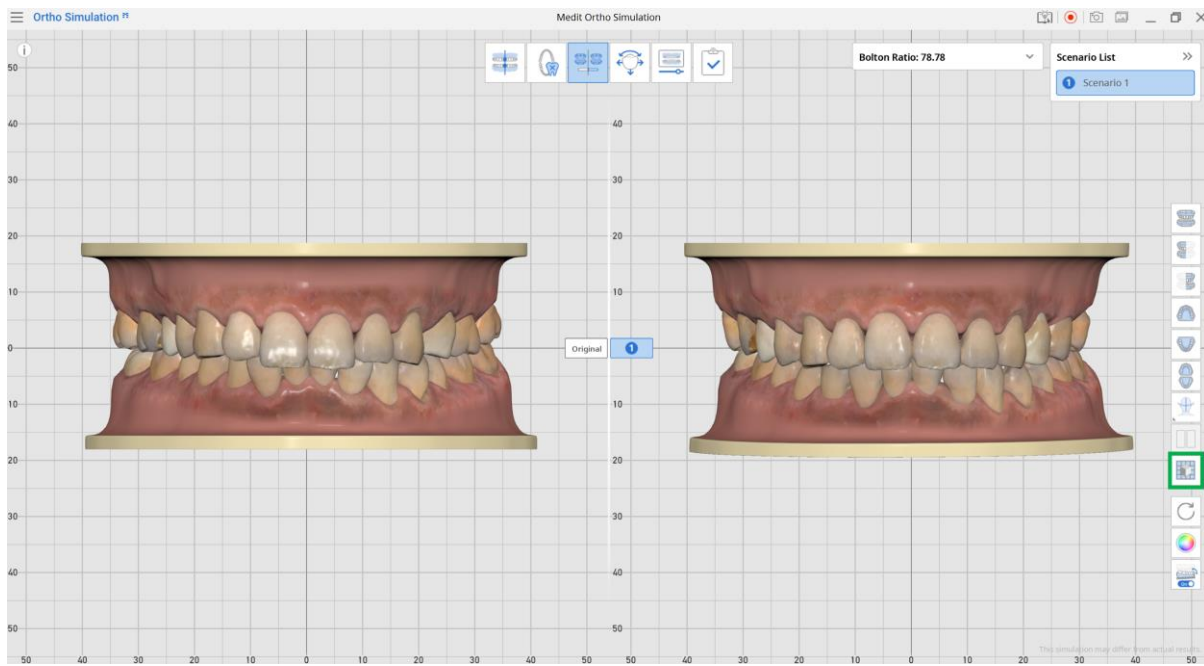


You can adjust the guidelines such as midline and arch line at the next stage (**Advanced Adjustments**).



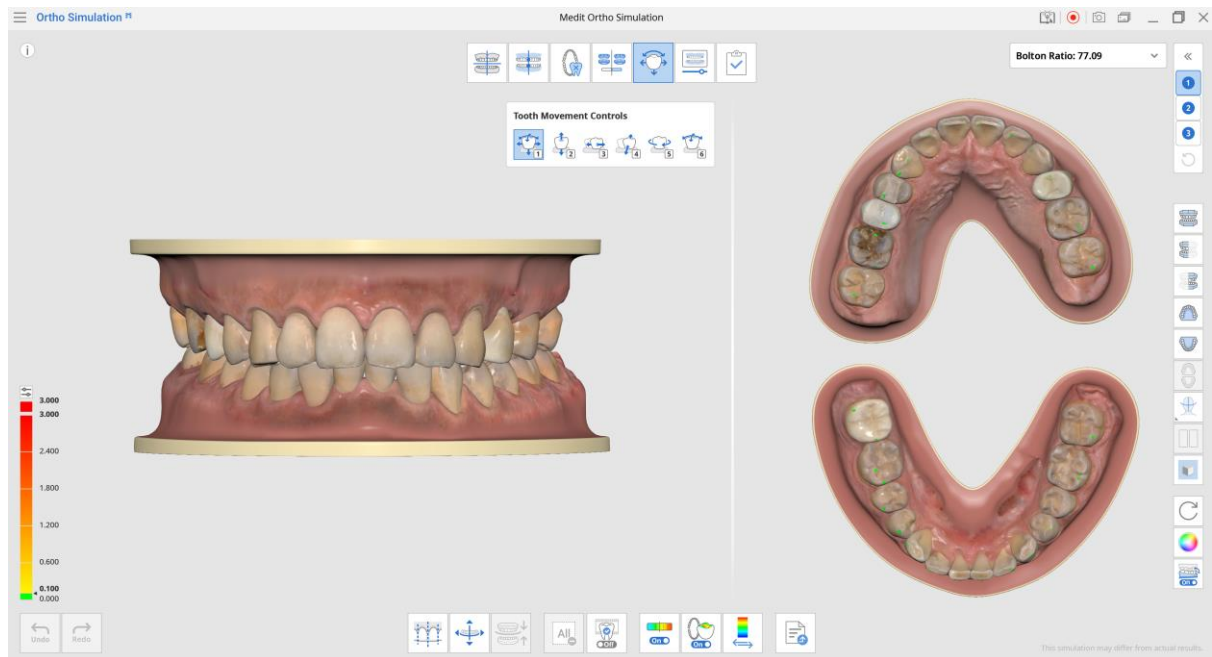
Simulation results for each scenario will be saved in the Medit Link Case when completed as captured images.

- ⑤ Select “Grid Settings” to show or hide the grid and control its position in relation to the model (Overlay On/Off).



## 4.5 Advanced Adjustments

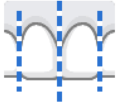
Modify the position of each tooth and edit (add or delete) teeth movement scenarios in this stage.



### 4.5.1 Preview IPR

Select the tooth, set the amount of tooth (mm) to remove, and preview the results.

#### Details



**Preview IPR** Set the tooth removal amount (mm) and preview the results.

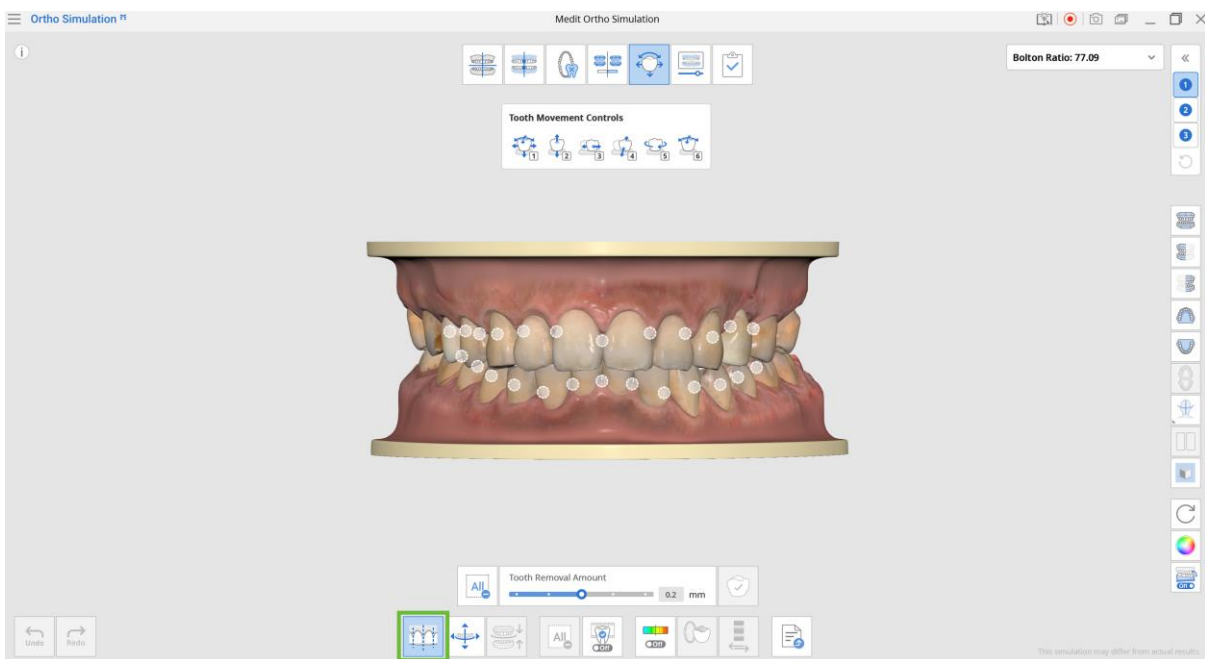


**Deselect All** Remove all selections.

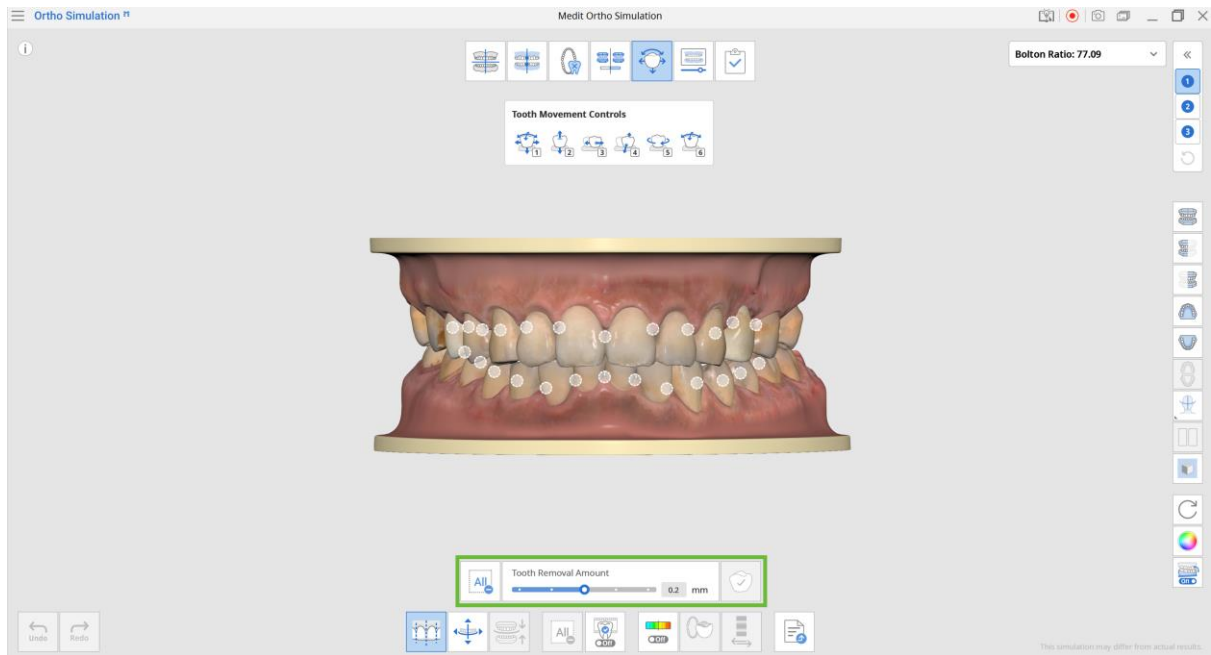


**Apply** Apply and save the changes.

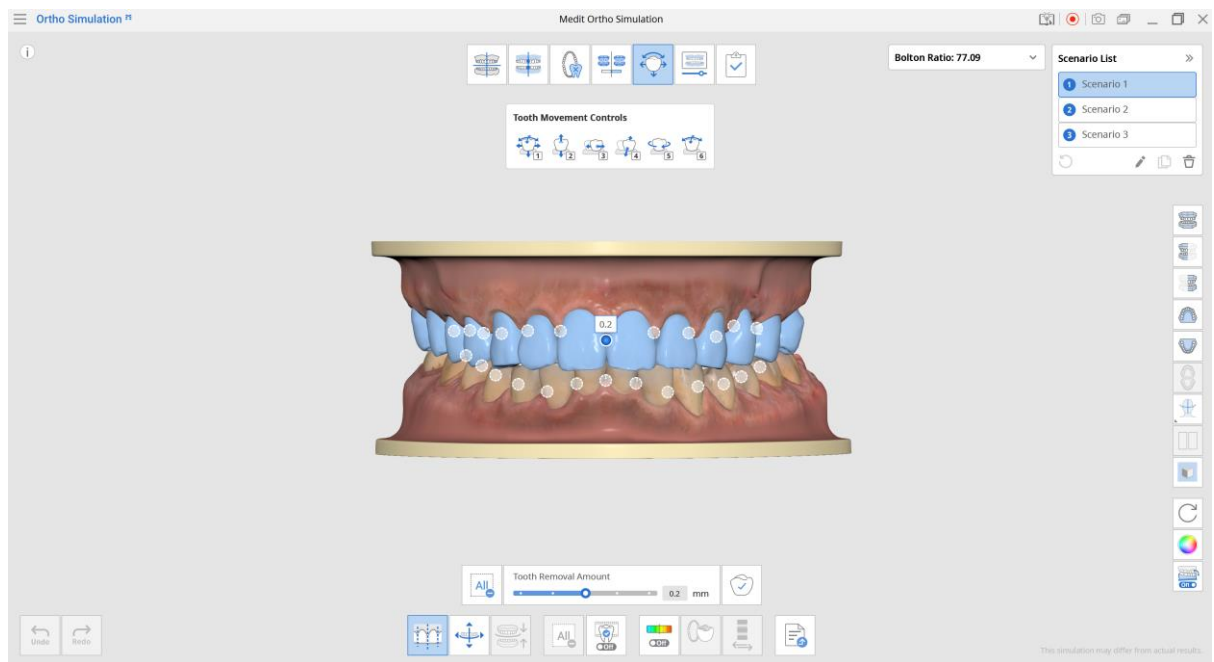
① Use the “Preview IPR” function to preview how the teeth would look after interproximal reduction.



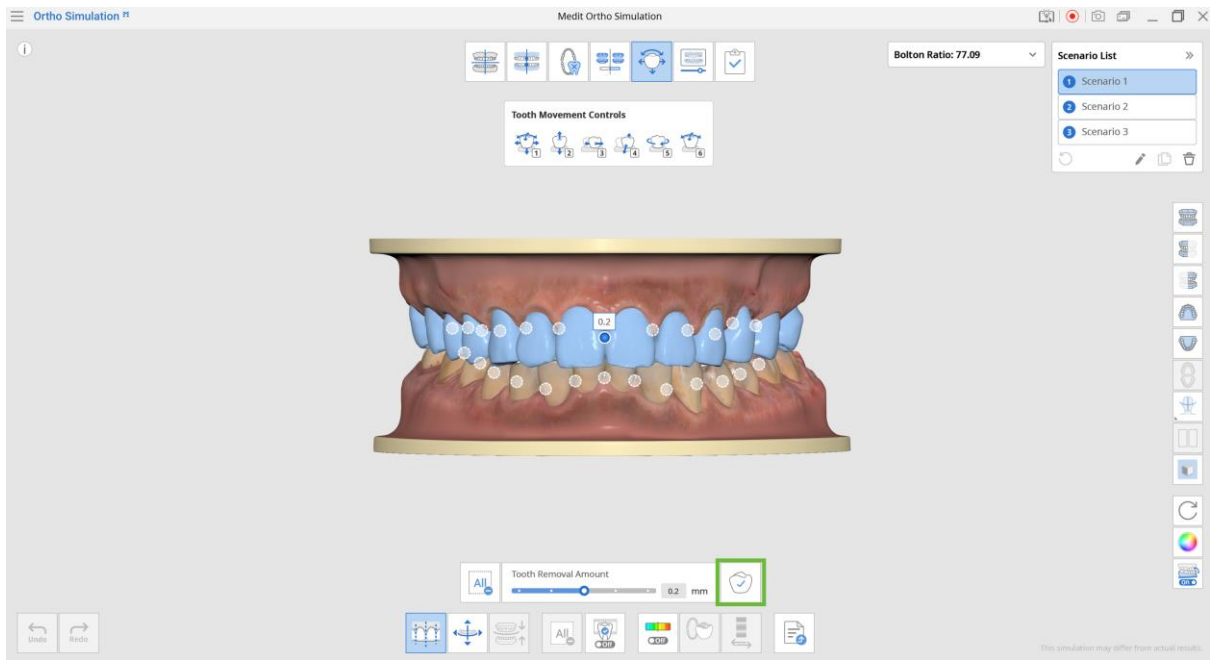
② Set the tooth removal amount (mm) using the slider.



③ Select which interproximal area you would like to remove by clicking the dot between the teeth. Click the area again to deselect.



④ When finished, click “Apply”  to apply and save the changes.



## 4.5.2 Working with Guidelines

You can work with guidelines by adjusting them and aligning the model to match them.

### Toolbox



Adjust  
Guidelines

Adjust the guidelines.

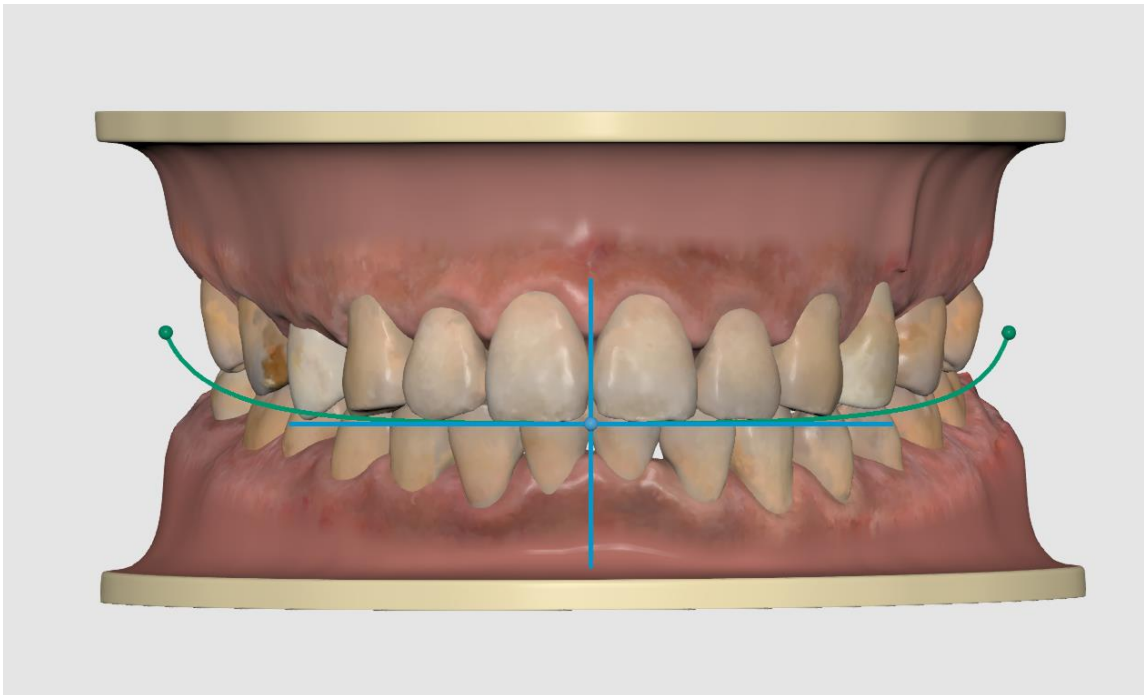


Align to  
Guidelines

Automatically adjust the model so that it fits to the guidelines.

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- ① Use the **“Adjust Guidelines”** function to move the position of the guidelines.



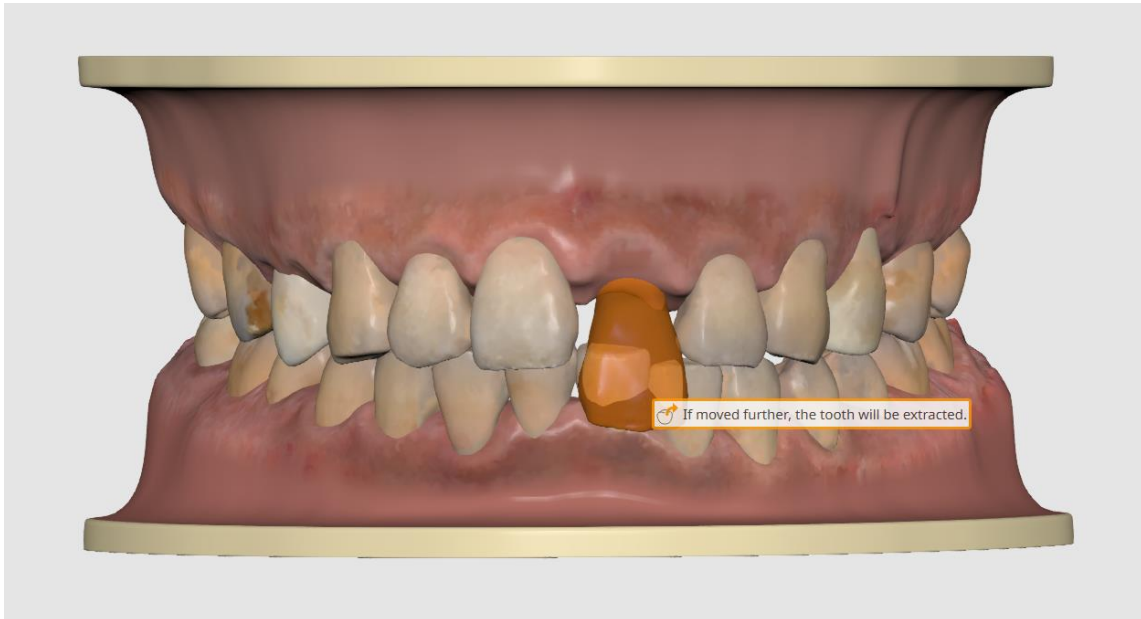
- ② If needed, use the **“Align to Guidelines”** tool that will automatically make the model fit the new guidelines.

### 4.5.3 Adjusting Teeth Position

- ① Select the scenarios you would like to work on additionally and adjust position of each tooth if necessary.
- ② Use the tools located at the bottom of the window to drag and move the teeth in various directions within a set range.




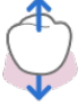







If you move a tooth out of the set area, it will be extracted.





- ③ Click multiple teeth to select and move them as a group.

When multiple teeth are selected, they will not be extracted even if you move them out of the set area.


## Toolbox

	Move Freely	Moves the tooth freely without any constraints. Press and hold Ctrl to rotate the tooth around lingual/buccal and mesial/distal directions.
	Move along Occlusal Direction	Moves the tooth along occlusal direction.
	Move along Mesial/Distal Direction	Moves the tooth along mesial/distal direction.
	Move along Lingual/Buccal Direction	Moves the tooth along lingual/buccal direction.
	Rotate around Occlusal Direction	Rotates the tooth around occlusal direction.
	Rotate around Lingual/Buccal or Mesial/Distal Direction	Rotates the tooth around lingual/buccal or mesial/distal direction.
	Deselect All	Cancels the selection of all teeth.
	Selected Simulation	Shows the simulation of selected teeth and allows you to move them.
	Export to Medit Link	Exports the current scenario at this stage of progress.

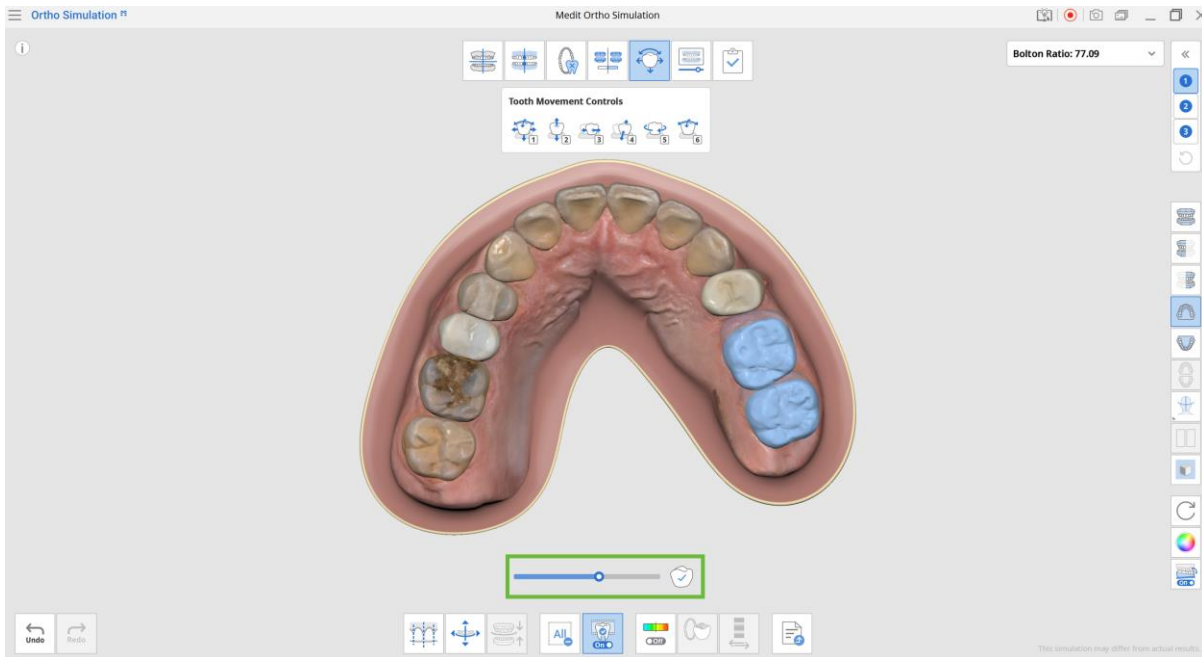
④ Click “Selected Simulation”  to see the selected teeth’s simulation and move them.


⑤ Select one or more teeth and click “Selected Simulation.” 

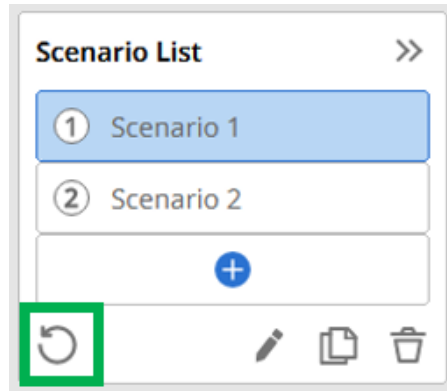
⑥ Check how the position changes from the original to the current position by moving the slider.


⑦ Click “Apply”  to apply the teeth’s current position to the simulation.

This function is useful when you want to track the changes of each tooth or move the tooth/teeth during the middle of the scenario.



⑧ You can reset the selected scenario by clicking “Reset”  on the Scenario List.




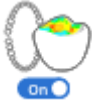

 You can move back and forth among the scenarios and adjust the position of the teeth.

 Go back to the previous stage to see the comparison among all scenarios and the original model.

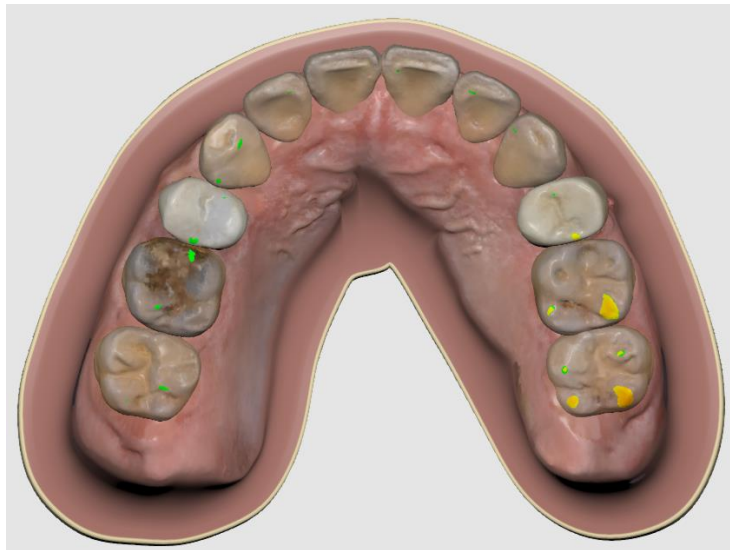
## 4.5.4 Adjusting Teeth Position While Referencing the Occlusion

You can adjust the position of each tooth while referencing the occlusion deviation scale.

### Toolbox

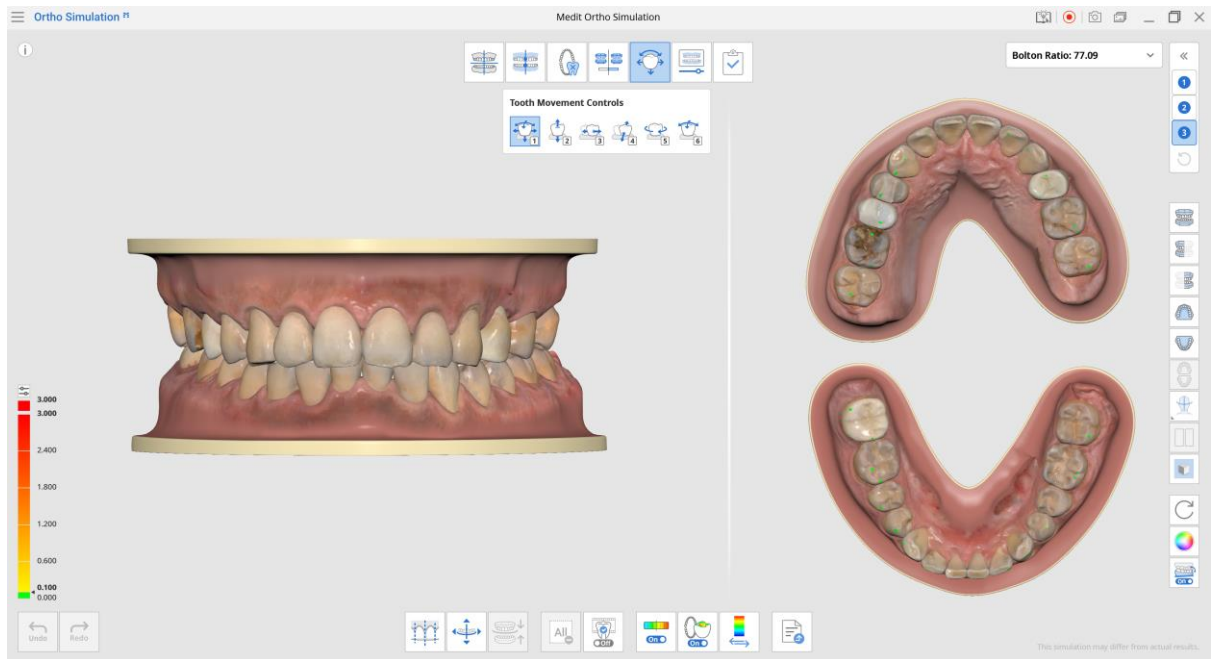
	Show/Hide Occlusal Intersection	When turned on, shows the occlusion intersection.
	Occlusion Multi-view	Adjust the position of each tooth while observing the changes in occlusion deviation on the right.
	Switch Deviation Display Area	Switch the deviation display scale between all data and contact area only.

- ① Click **“Show/Hide Occlusal Intersection”** to reference the occlusion intersection.
- ② Choose **“Maxilla View”** or **“Mandible View”** on the Side Bar on the right to view the deviation results.
- ③ The deviation occlusion data will be updated in real-time as you move the position of the teeth.

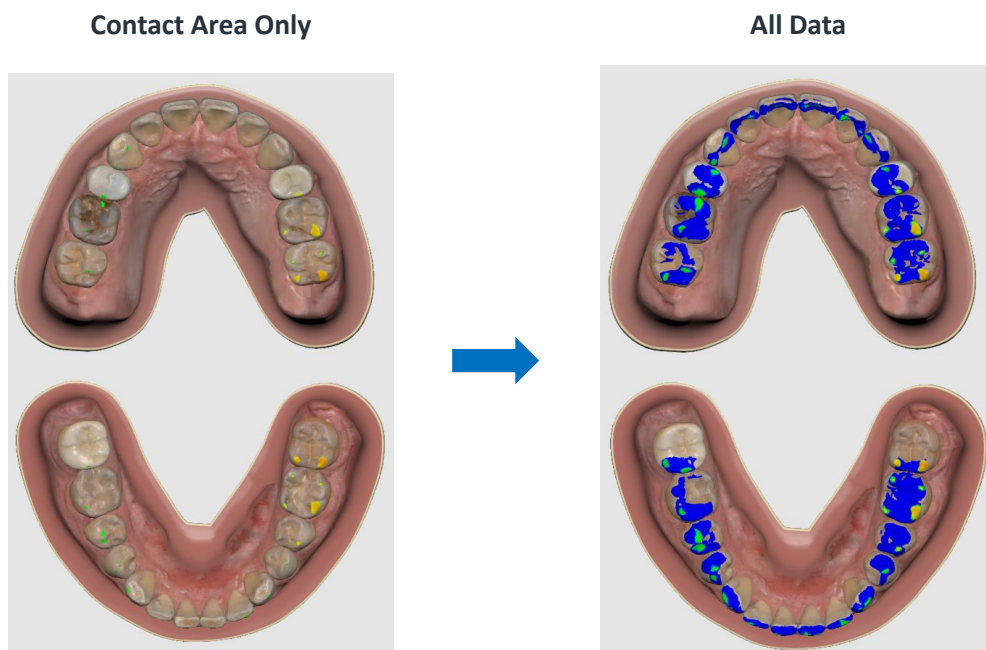


- ④ Click **“Occlusion Multi-View”** to see the model in frontal view and reference the occlusion deviation simultaneously.

- ⑤ You will see deviation changed on the right side as you change the position of the teeth on the left.



- ⑥ Click “Switch Deviation Display Area” change the deviation display scale from contact area only to all data.

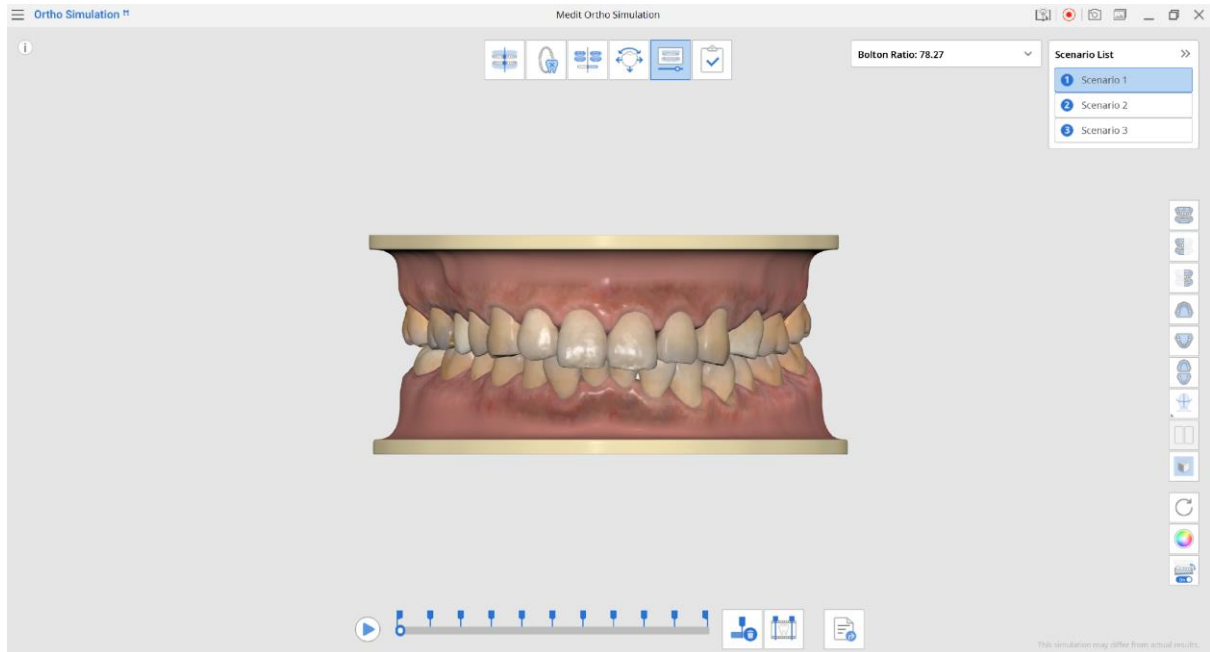




## 4.6 Animation View

View the transformation of the model's before and after in animation.

You can export the simulation data in various formats to Medit Link.



### Toolbox



Delete All Pins Delete all pins.



Split Animation into Steps Divide the animation into several steps.



Export to Medit Link Export maxilla, mandible, or each of the segmented tooth as separate files to the Medit Link.

① Choose a scenario in the top right corner to see the animated teeth movement.



Click on the scan data with the left button on the mouse to see the original model during the animation.



Use the data display options on the Side Toolbar to watch the animation from different angles.

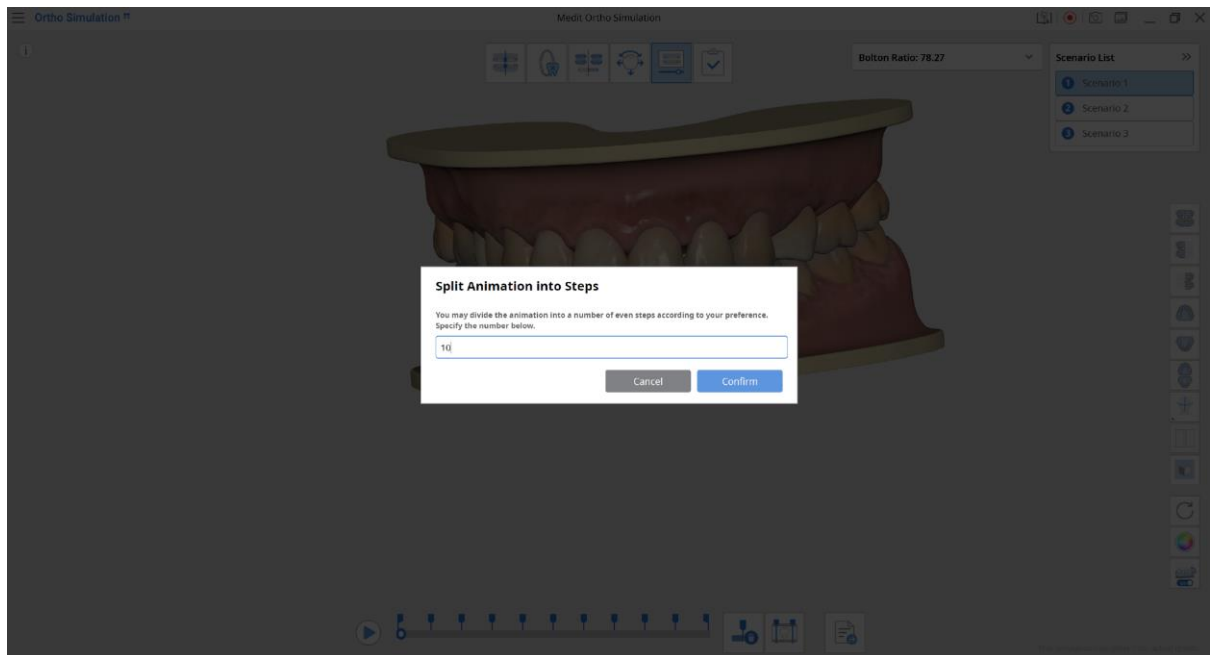


Make face data visible to see the changes with intraoral data.

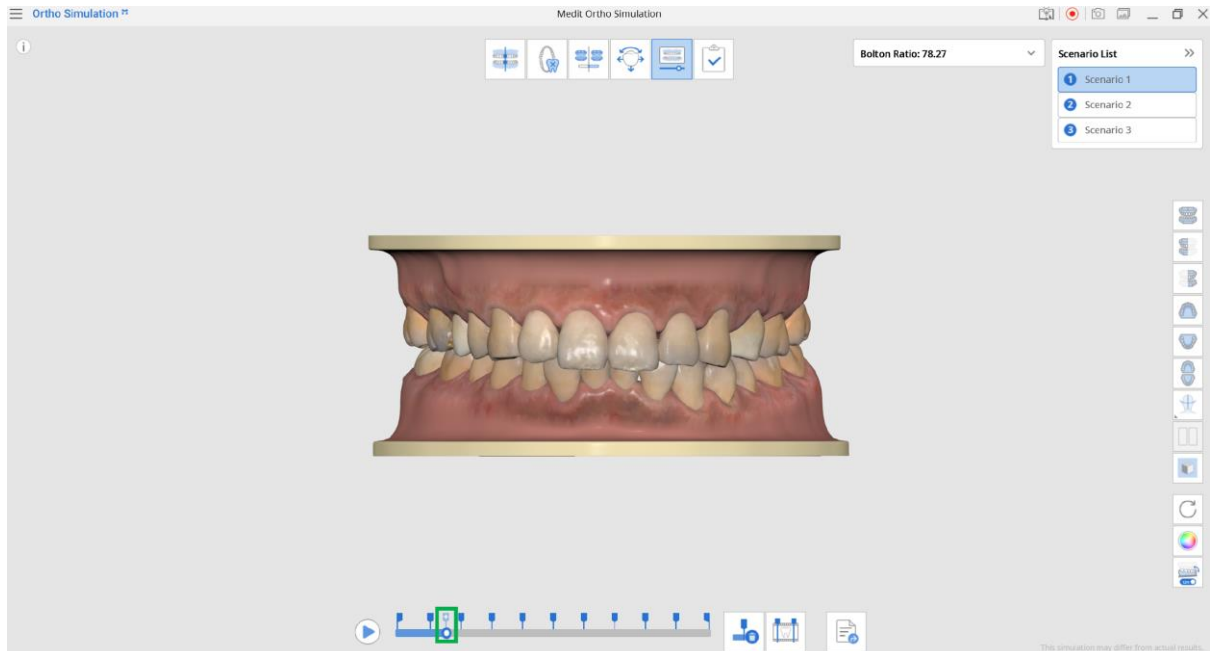
② Click “Split Animation into Steps” button to divide the animation into several steps to suit your preference.



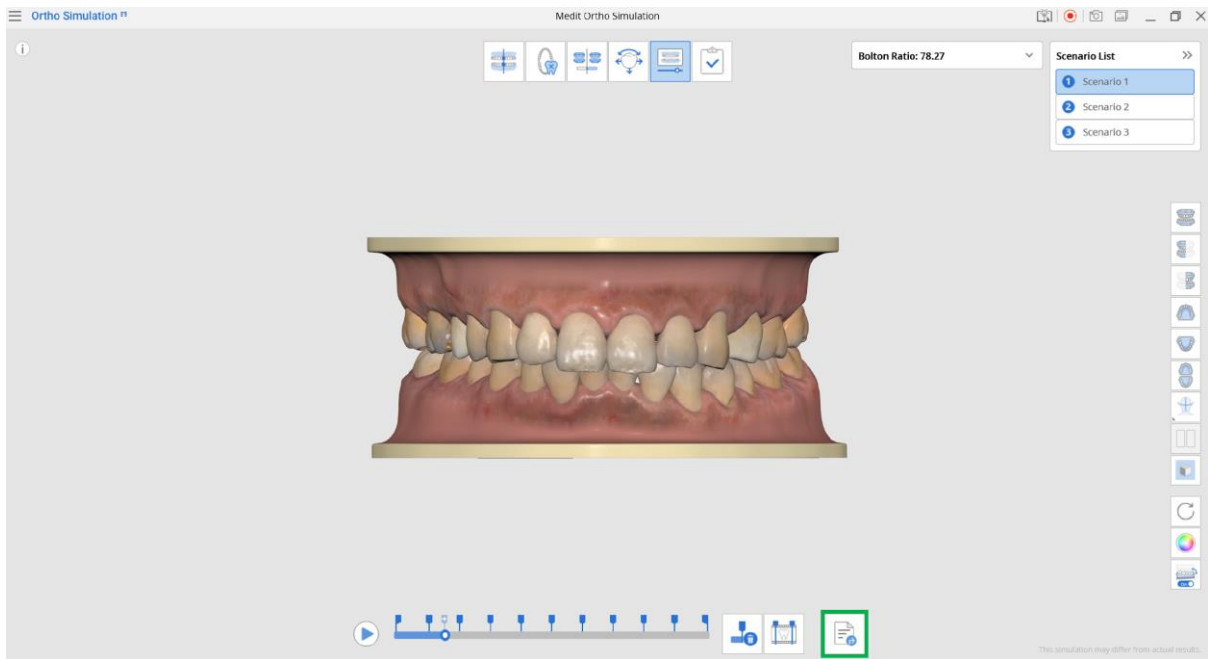
The animation can be divided up to 20 steps.



③ You can check each step. Click  and add pins that will add more steps.

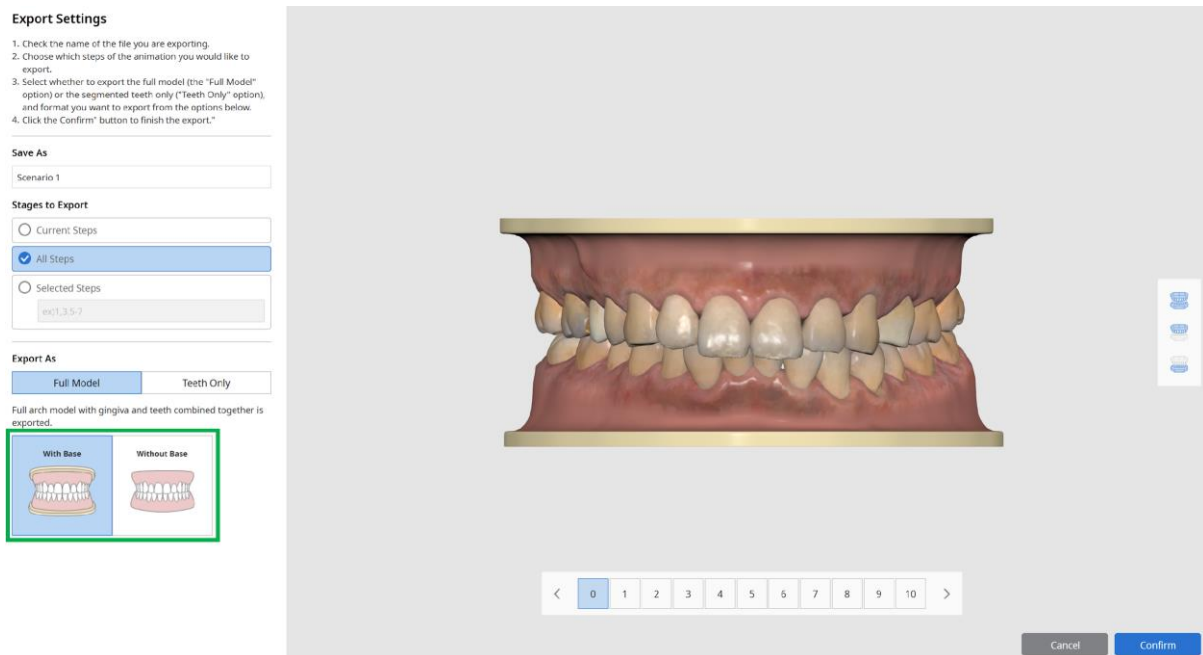


- ④ Click “Export to Medit Link”  to export the model to Medit Link.



You can export the current 3D data in animation by clicking “Export to Medit Link.”

- ⑤ Go to Export Settings and choose stages and model (base model and teeth) to export.  
For the model, you can choose between “With Base” and “Without Base.”



Only segmented teeth are exported. You can choose between an “Open” and “Closed” teeth options.

## 4.7 Complete

Save the project and make capture images for the simulation.

- ① When complete, you will be asked to choose which scenario you want to generate capture images.

### Save to Medit Link

Select one or more simulation scenario results to create capture images. They will be saved in the Medit Link case together with animation.



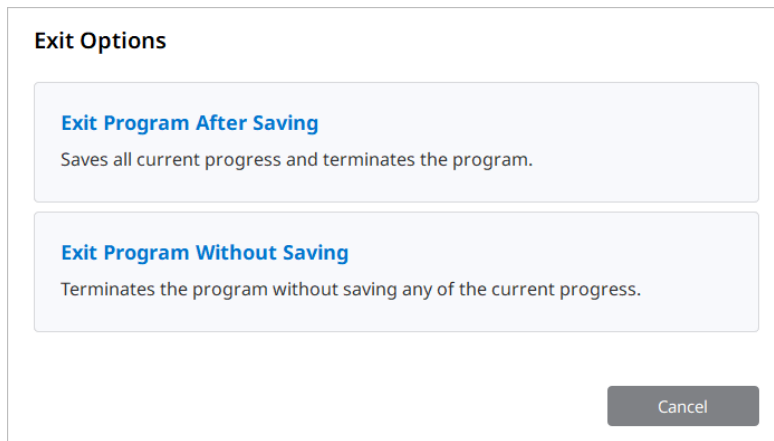
### Patient Information

Select the information you want to include in the Ortho Simulation Report.

Patient	Case
<input type="checkbox"/> ID	<input checked="" type="checkbox"/> Name
<input checked="" type="checkbox"/> Name	<input checked="" type="checkbox"/> Scanned Date
<input type="checkbox"/> Birth Date	<input checked="" type="checkbox"/> Report Created On
<input type="checkbox"/> Include Facial Data	

Select All

- ② Select one or more scenarios to create capture images. Click **“Confirm”** when the selection is done. This will close the application.
- ③ The capture images for the selected scenarios will be saved in your Medit Link case.
- ④ If you exit the program while the project is incomplete, you will have two options to select from: 1) Exit the program after saving or 2) Exit the program without saving.



- ⑤ If you choose the first option, continue later by reopening the same Medit Link case and running the application.