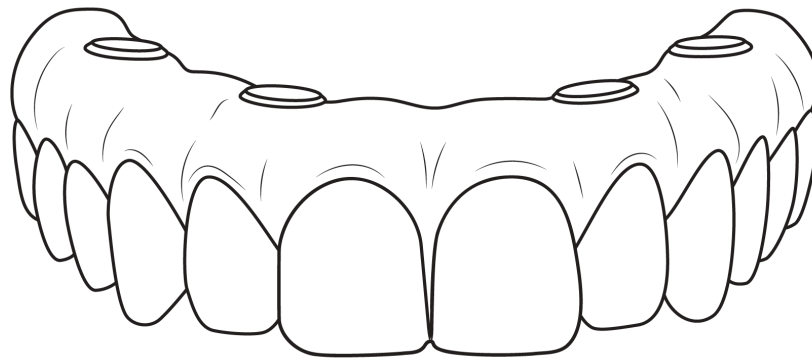


## Workflow Guide:

# 3D Printing for Same-appointment Fixed Hybrid Dentures



With 3D printing, you can provide fixed hybrid dentures in a single appointment to more patients for a fraction of the cost of other methods. This guide will walk you through data gathering, design, fabrication, preparation, and placement.

### Resins compatible with this workflow:

- SprintRay OnX Tough 2 - any shade



*This guide covers the post-surgical placement of fixed hybrid dentures. For information on 3D printing for surgical guide workflows, consult the relevant IFU/workflow guide.*



Scan to Learn

### Partner Resources

Scan the QR code to access partner resources, including photogrammetry, grammetry, and more.

# Workflow at a Glance

## 1. Pre-surgical Data Capture



Time:

15 mins



Tools:

- Intraoral scanner
- Camera

## 2. Schedule Design Appt



Time:

5 mins

Tools:

- Computer with internet
- Patient data
- Pre-surgical data

## 3. Post-surgical Data Capture



Time:

15 mins



Tools:

- Intraoral scanner
- Camera (optional)
- Photogrammetry scanner

## 4. Get Design



Time:

45 mins

Tools:

- Computer with internet
- Patient data
- Post-surgical data

## 5. Create a Print Job



Time:

5 mins

Tools:



- Computer with internet
- SprintRay account

## 6. 3D Print



Time:

30 mins

Tools:



- SprintRay 3D Printer
- OnX Tough 2 resin

## 7. Wash and Clean



Time:

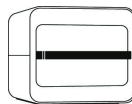
10 mins

Tools:



- SprintRay ProWash S (Optional)
- Micro applicator
- Compressed air

## 8. Post Cure



Time:

5+ mins

Tools:

- SprintRay Cure Device

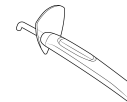
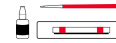
## 9. Prepare for Placement



Time:

20 mins

Tools:



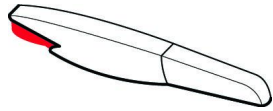
- Vita Akzent LC kit
- Lab handpiece
- Handheld curing light
- Abrasive fiber wheel
- Other optional tools

# 1. Capture Pre-surgical Data

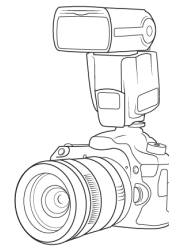
Time

15 minutes

Tools



Intraoral scanner



Camera

## 1.1 Intraoral Scans

Take upper and lower scans of the patient's current dentition before surgery. This will allow our designers to create the template for the post-surgical hybrid denture.



Upper scan



Lower scan



Bite scan



*If the patient is already edentulous and has a denture, perform pre-op upper, lower, and bite scans of the denture; you'll submit these during the planning phase*

## 1.2 Patient Photos

Photos of the patient allow your designer to create a fixed hybrid denture with the perfect aesthetics. Capture the following intraoral photos:



Rest position



High line smile



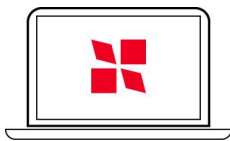
Retracted

## 2. Submit Data & Schedule Appointment

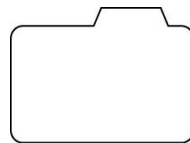
Time

5 minutes

Tools



Computer with internet  
access



Pre-surgical patient data



SprintRay account

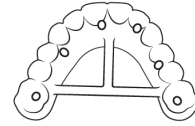
### 2.1 Submit Request on Cloud Design

Visit [dashboard.sprinray.com](https://dashboard.sprinray.com) and sign in or sign up for a SprintRay account.

Select or add your patient, then choose the 'Hybrid Denture' treatment type. Follow the prompts on the screen to upload all the data you gathered during step 1.



*Hybrid implant dentures designed by SprintRay will feature a T-bar to improve accuracy. If you design the prosthetic yourself or use another lab, we recommend this feature.*



## 2.2 Schedule Appointment for Date of Surgery

During the treatment request form, you'll be given a link to schedule the date & time of your hybrid placement appointment. When choosing your appointment, **select when you will be ready to send us the post-surgical files.**

Our designer will be on standby during the appointment window you select. You'll upload post-surgical data and receive the 3D printable design within 30-45 minutes.

## 2.3 Review Provisional Hybrid Design

3 days after submission, we'll send you the provisional hybrid denture. Work with the designer to create the exact hybrid denture you want, which will be used on the surgery date. We'll use this exact design, just with screw channels added with post-surgical data.

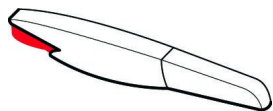
---

# 3. Capture Post-surgical Data

Time

15 minutes

Tools



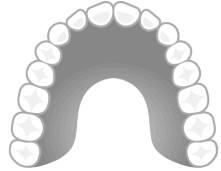
Intraoral scanner



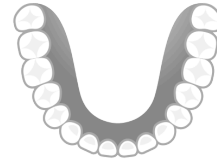
Photogrammetry scanner

### 3.1 Intraoral Scans

Once the surgery is complete, take an intraoral scan of the patient's tissue with the healing caps positioned over the implants. This will give your designer an understanding of the implants' position.



Upper tissue scan



Lower tissue scan

### 3.2 Photogrammetry Scans

Attach the scan bodies to the implants, then perform photogrammetry to the manufacturer's specifications. This will record the exact final positioning of the implants so that your lab partner can adjust their design accordingly for a good passive fit.

Keep the entire information folder intact - you'll upload it all at once during the treatment planning phase. If you have any questions about this process, please contact the manufacturer of your photogrammetry scanner.

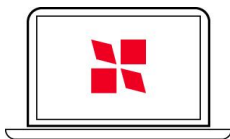
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## 4. Get Final Design

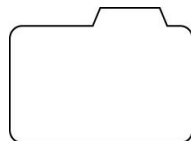
#### Time

45 minutes

#### Tools



Computer with internet



Post-surgical patient data



SprintRay account

## 4.1 Open Case in Cloud Design

Sign in to Cloud Design and open the patient's case during the allotted appointment slot. During this appointment, you'll use the chat function to send the post-surgical patient data to your designer.

Once the files have been transferred, your designer will prepare the hybrid denture design. This will take a maximum of 45 minutes.

## 4.2 Review and Approve Design

Once the printable hybrid denture is ready, your designer will send the printable file for you to review. If you'd like changes, you can communicate with your designer live via the chat function.

Once you approve the design, you'll be able to download the design and close out the appointment.

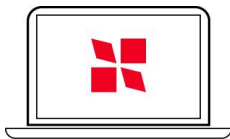
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# 5. Create a Print Job

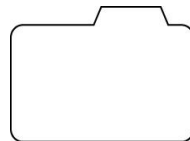
### Time

5 minutes

### Tools



Computer with internet  
access



Hybrid denture design file(s)



SprintRay account

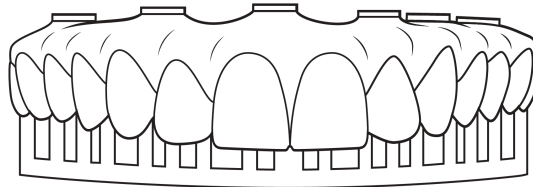
## 5.1 Build Job in RayWare

Visit [rayware.sprintray.com](http://rayware.sprintray.com) and sign in with your SprintRay account. Then, go to Cloud Design, select the hybrid denture case, and open the job in RayWare.

## RayWare Setup Details

RayWare should automatically set up your print job, but for verification purposes, ensure you use the following settings:

<b>Job Type</b>	Hybrid Denture
<b>Material</b>	SprintRay OnX Tough 2 - any shade
<b>Thickness</b>	100 microns
<b>Orientation</b>	Occlusion facing the build platform, occlusion parallel to build platform
<b>Supports</b>	Default settings, at least 3 supports on the incisal edge, no supports around screw channels



## 5.2 Send to Printer

Once you've set up the print job, use the 'Send to Print' button, then select your printer. Click the 'Send to Queue' button to send to the printer.

---



## 6. 3D Print

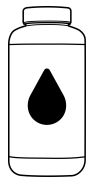
### Time

30 minutes

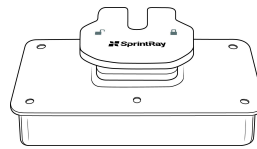
### Tools



SprintRay 3D Printer



OnX Tough 2

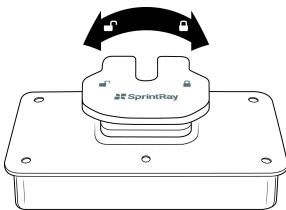


Build Platform



Resin Tank

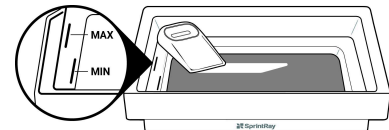
### 6.1 Prepare the Printer



Check that the platform is locked



Check that the tank is seated in its cradle



Fill the tank to the max line and stir the resin

### 6.2 Start the Print Job

On the printer touchscreen, go to the 'Queue' tab and locate your crown print job. Select 'Start Print'. It may take a few minutes before the printer arm starts to lower, depending on whether or not the resin tank and/or build platform need to be heated up.

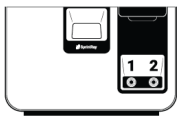
You can view the progress of your print on the printer's touchscreen, including how much time is left before your job is complete. This information can also be viewed via RayWare Cloud.

## 7. Wash and Clean

Time

10 minutes

Tools



SprintRay ProWash S  
(Optional)



Micro applicator



Compressed air

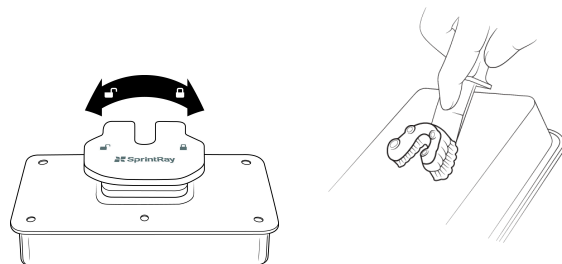


Spray bottle with IPA  
91%

### 7.1 Remove Supports Structures

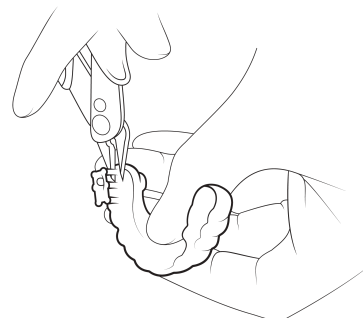
Unlock the build platform and gently pull it toward you to remove it from the printer.

Remove the hybrid denture from the build platform.



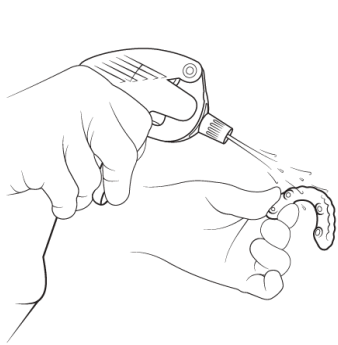
Use flush cutters to clip supports off. If you printed with a T-bar, remove it using cutters or a lab handpiece with a cutting disc.

Don't worry if there are still small stubs left on the model, you'll remove those later.



### 7.2.1 Hand Wipe with IPA - **Preferred Workflow**

This method produces parts with the strongest possible **mechanical properties**. It only takes a few minutes, and you only need a spray bottle, IPA 91%, and compressed air.



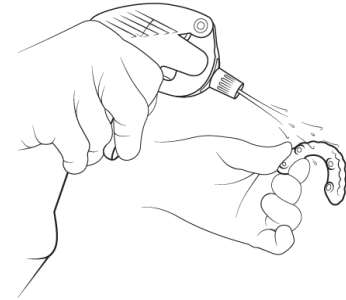
A) Spray with IPA 91% and wipe with a dry towel

**15 seconds**



B) Blow Dry using compressed air until fully dry

**30 seconds**



C) Spray with IPA 91% and wipe with a dry towel

**15 seconds**

### 7.2.2 Wash in SprintRay Wash - **Optional**

To use SprintRay ProWash S, run a custom OnX Tough 2 wash cycle by tapping Custom Cycle on the home screen. If you are using Pro Wash/Dry, run a Single-Cycle Wash by tapping the wrench icon on the home screen. Run the following wash procedure:



Wash 1

**3 minutes**



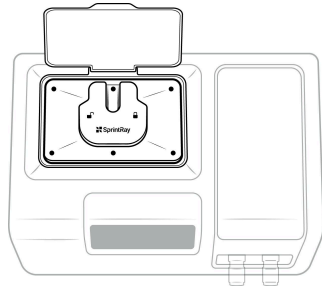
Wash 2

**0 minutes**

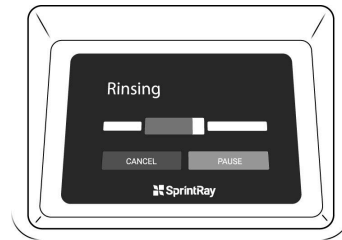


Dry

**3 minutes**



Transfer the build platform to ProWash S

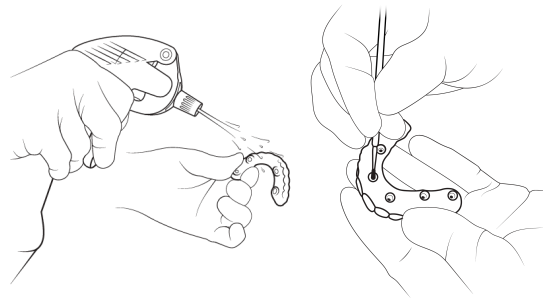


Run the custom cleaning cycle described above

### 7.3 Clean Screw Channels

Because of the extremely high dimensional accuracy requirements for hybrid dentures, the screw channels demand extra attention.

Spray each screw channel with IPA. Dip the micro applicator in IPA and use it to clean the screw channels to remove resin thoroughly.



Use compressed air to remove final debris and evaporate any IPA that is trapped in the screw channels.

Repeat as needed until the channels are clean. Make sure the hybrid denture is dry and free from IPA.



*Do not let IPA stand on the surface of the prosthetic for more than 30 seconds, otherwise, it may develop a chalky surface finish that will require sandblasting*

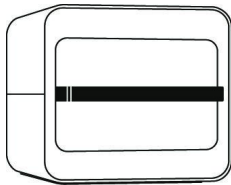
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## 8. Post Cure Prosthetic

### Time

12 minutes

### Tools



SprintRay Curing Device

### 6.1 Place in Cure

Place the prosthetic in your SprintRay curing device. On the touchscreen, select the OnX Tough 2 profile. If you are signed in on all your devices, simply check the queue for this production job. If using ProCure 1, run a custom profile of 60 minutes at 60°C.

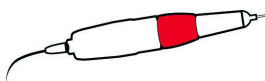
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## 9. Prepare for Placement

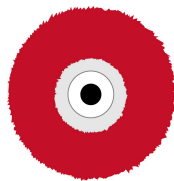
### Time

20-30 minutes

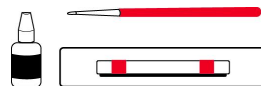
### Tools



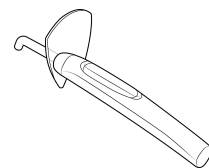
Lab handpiece



Abrasive fiber wheel



Vita Akzent LC kit  
(Optional)

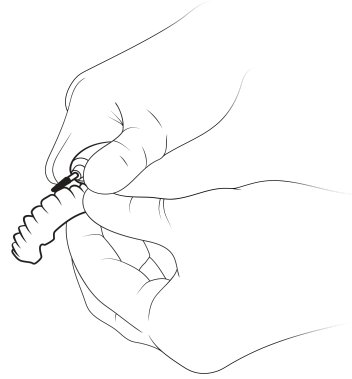


Handheld curing light  
(Optional)

## 9.1 Smoothen the Prosthetic

Use a fine lab carbide bur or an abrasive fiber wheel attachment to remove remaining stubs leftover by the support structures until the surface is smooth and uniform.

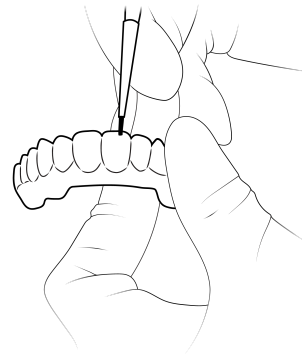
Use a lab handpiece and cutting disc to remove the T-bar.



## 9.2 Characterize (Optional)

This step is optional, but we recommend it for the best patient experience and aesthetics. We recommend Vita Akzent LC™ for the best cosmetic effect, which you can layer and light cure to your desired aesthetics.

There are many great techniques to characterize a hybrid denture. For a natural-looking 3D printed restoration, we recommend the following:



1. Use pink composite or create pink Vita Akzent LC with 1 drop of red and 1 drop of pink - you can experiment using your own mix to get the desired shade of pink
2. Use a fine brush to stain the gingiva with pink stain to add more depth and character
3. Use a blue stain at the incisal edges to create a translucent effect
4. Use other stains (like cream, brown, and orange) to create a more natural look
5. Paint the entire surface (except the intaglio) with a thin layer of clear glaze

Tack cure in between steps using a handheld curing light. Final cure the hybrid denture in the ProCure 2 for 5 minutes.



*Always check the manufacturer's IFU and recommendations before using a handheld curing light to cure glaze*

### 9.3 Disinfect

Disinfect the denture using a steamer if available, then brush lightly with dish soap before placement. Make sure that the hybrid is completely dry before placing it.

### 9.4 Cement TiBase to Hybrid (If using)

If you're using the direct screw delivery method, skip to step 9.5 - Sequence Torque Bolts.

#### **Apply Primer to the Screw Channels**

Apply Clearfil Ceramic Primer Plus to the inner surface of the screw channels. Dry the adherent surface with compressed air.

#### **Clean and Prepare Tooth or TiBase**

Follow the manufacturer's instructions for Clearfil Ceramic Primer Plus for priming the TiBase.

#### **Apply Cement**

Apply the cement to the intaglio surface of the inner surface of the screw channels, distributing evenly. Press the TiBase into the screw channels and hold firmly. Apply gentle pressure until it is fully seated.

#### **Initial Polymerization**

Remove excess cement from the margins of the TiBase and light cure for 5 seconds. Remove the remaining excess cement with a dental hand instrument.

#### **Final Check**

Perform a final check to ensure that the TiBase is fully seated and there is no excess cement.

### 9.5 Sequence Torque Bolts

Turn each screw gently until you feel contact with the screw channel collar, then stop. Do not tighten until you've seated all the screws. Once seated, begin tightening each screw in an alternating pattern.



*Failure to follow proper torque bolt sequencing may result in a poor fitting appliance; always follow the sequencing method provided for passive fit*