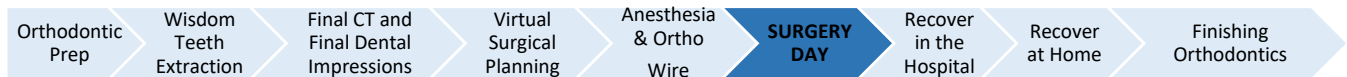


Patient and Caregiver Handbook: Jaw Surgery

Jaw surgery, also called orthognathic (or-thog-NATH-ik) surgery can correct problems with your jaws that cannot be fixed by orthodontics alone. Having jaw and teeth alignment is important for biting, chewing and speech. It can also help protect your teeth and the joint of your jaws from injury caused by misalignment. This surgery will also change the appearance of the face. It is important that you understand exactly why we are recommending this surgery for you and what will be done. It is also important to consider how a change in appearance might change how you see yourself as well as how friends or strangers may see you.

A typical timeline for Jaw Surgery



<input type="checkbox"/>	Orthodontic Preparation	12-18 months before surgery	Work with one of our CHOP orthodontists or a local orthodontist to prepare your teeth. It is important that your orthodontist know that you are planning to have jaw surgery in the future. Your CHOP surgeon and your orthodontist should discuss your plan of care to make sure everyone understands the timeline.
<input type="checkbox"/>	Wisdom Tooth Extraction	At least 6 months before surgery	This can be done by an Oral Surgeon at CHOP or a local oral surgeon. We often recommend that all 4 wisdom teeth be removed as the surgery could damage these teeth if left in place. The areas of the gum where the teeth were removed need time to heal before jaw surgery.
<input type="checkbox"/>	CT Scan	4 -6 weeks before surgery	Complete the CT ordered by your surgeon. This will provide images of your jaws and face that will be used for Virtual Surgical Planning.
<input type="checkbox"/>	Dental Impressions	4- 6 weeks before surgery	IF you are being treated by a local Orthodontist, please send any imaging (Lateral Cephalogram, Panorama X-Rays, CT/CBCT, intraoral and extraoral photos, clinical photography), digital study models, and dental records to your CHOP Orthognathic Surgery Team. This will allow us to complete your Pre-Surgical Orthodontic Preparation, with pre-surgical splints made with your teeth in the planned FINAL position.
<input type="checkbox"/>		CHECKPOINT	CHOP Orthognathic Surgery Team should have all your imaging, models and records to complete the Pre-Surgical Orthodontic Preparation and Virtual Surgical Planning.
<input type="checkbox"/>	Virtual Surgical Planning	4 weeks before surgery	Your surgeon and orthodontist will use the models and CT scan to virtually plan your surgery. This allows us to make accurate surgical plates and screws fully customized for you. Virtual Surgical Planning gives you the best possible outcome while streamlining your surgery.

<input type="checkbox"/>		CHECKPOINT	<p>This is a good time to check back in with your surgeon and the whole Orthognathic Surgery Team to make sure we have answered all your questions. We also recommend meeting with our psychologist to help prepare for surgery and all the changes that will come with it. Psychology visits can be coordinated on the same day as orthodontics, surgery, or anesthesia visits.</p> <p>Link below for more information to help you prepare Preparing Your Child for Surgery Children's Hospital of Philadelphia (chop.edu)</p>
<input type="checkbox"/>	Pre-Surgical Orthodontic Wire	1-2 weeks BEFORE surgery	Your Orthodontist will insert surgical wires to secure your teeth ahead of surgery. This can happen on the same visit day as the Anesthetic review.
<input type="checkbox"/>	Anesthesia Review	1-2 weeks BEFORE surgery	You will talk with our Anesthesia team and complete necessary pre-op testing; this includes blood work ahead of the surgery. Sometimes the Anesthesia team will need to meet you in person, sometimes they can review your history over the phone and then order the bloodwork to be done at a lab near you. They will review your regular medications and advise you which to stop taking and when you need to stop eating and drinking before surgery.
<input type="checkbox"/>		Day Before Surgery	<p>If your child is having surgery at the University City Hospital in Philadelphia, call 267-425-4699 between 3:30 p.m. and 6:00 p.m. the day before surgery to get your child's arrival time. If your child is having surgery on a Monday, please call on Friday.</p> <p>Now is a good time to pack anything you might want to bring with you for your hospital stay – comfortable clothing, devices and chargers, books or games. Try your best to relax – You are in great hands and we have been preparing for this day for a long time!</p> <p>Link below for more info on the day before surgery The Day before Your Child's Surgery Children's Hospital of Philadelphia (chop.edu)</p>
<input type="checkbox"/>	Surgery Day	The Big Day!	<p>You will arrive to the hospital with your caregivers, get checked in, and go to your preoperative room.</p> <p>Link below for more on what to expect on the day of surgery The Day of Your Child's Surgery Children's Hospital of Philadelphia (chop.edu)</p>
<input type="checkbox"/>	Recovery in the Hospital	1-2 days after surgery	We will keep you in the hospital 1-2 nights so we can monitor your recovery. You will be very sore and very swollen, this is normal! You will have rubber bands (sometimes wires or other mouth guards) in place to keep your jaws in the correct position as you heal. You will work with your surgeon and nursing team to manage your pain and make sure you are able to eat and drink
<input type="checkbox"/>	Recover at Home	2+ weeks after surgery	You will go home 1-2 days after your surgery and rest at home. You should plan to be at home for about 2 weeks after your surgery. This will mean 2 weeks off of school and most activities. This can be the hardest part for many of our patients. You will be sore, swollen, and bruised. You will be taking some pain medication to help you feel more comfortable. You will be on a soft diet.
<input type="checkbox"/>	Postoperative Orthodontics	Starting 7-10 days after surgery	You will see your CHOP Orthodontist to manage your elastic bands. Depending on your surgical plan, the Orthodontist will need to see you every 1-2 weeks as we gradually change the tension on your rubber bands.
<input type="checkbox"/>	Postoperative Surgery Visit	2-4 weeks after surgery	You will see your surgeon or a Plastic Surgery Nurse Practitioner to check your bite and examine the incisions inside your mouth to make sure you are healing correctly. If you have questions or concerns you do not need to wait until this visit! Please call us or send us a message though My CHOP.
<input type="checkbox"/>	Longer term recovery	4-6 weeks after surgery	You will continue to heal in the months after your surgery. You cannot engage in any contact sports or activities that present a risk for injury for 6 weeks after your

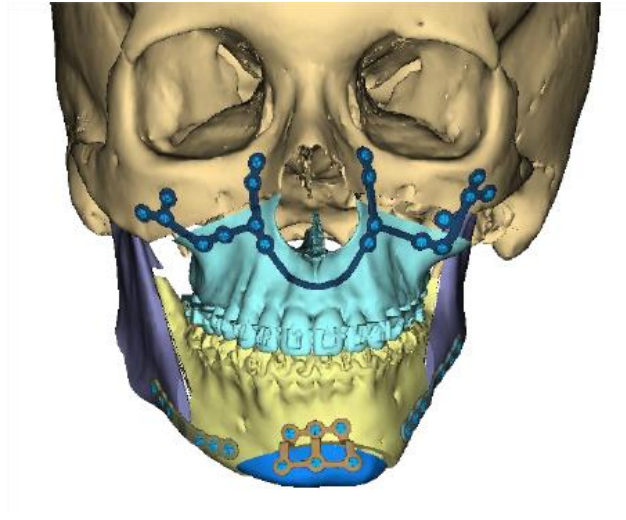
			surgery. Most students return to school about 2 weeks after surgery but cannot participate in gym class for 6 weeks after surgery. You will continue to eat soft foods for about 4-6 weeks after your surgery. You will need to see your surgeon and your orthodontist for scheduled follow-up visits.
<input type="checkbox"/>	Finishing Orthodontics	6-18 months after surgery	Your Orthodontists will need time to complete final adjustments to the positioning of your teeth before you can get your braces off for good. We want to make sure you look your best when we finish our work!

Virtual Surgical Planning

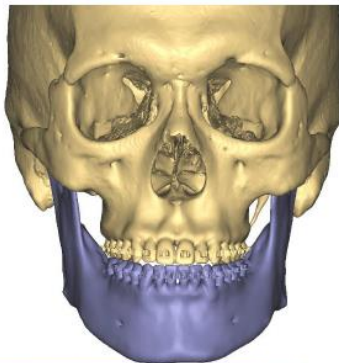
Your surgeon and orthodontist will use the models of your teeth and your CT scan to plan your surgery and develop the custom plates and screws that will be used. Because the planning calculates the movements of your bones to a fraction of a millimeter it is important that the models and the CT scan be done within a week or two of each other.

This is an example of the virtual surgical planning for a patient with facial asymmetry.

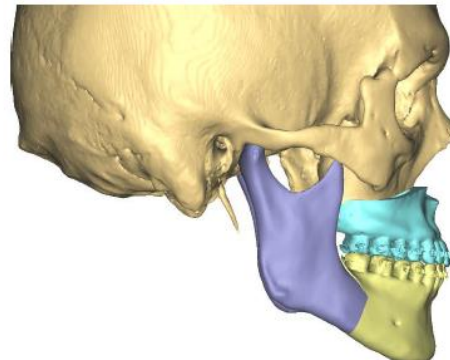
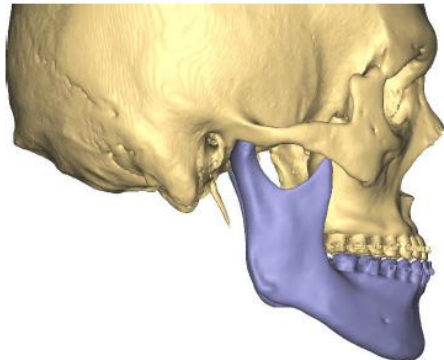
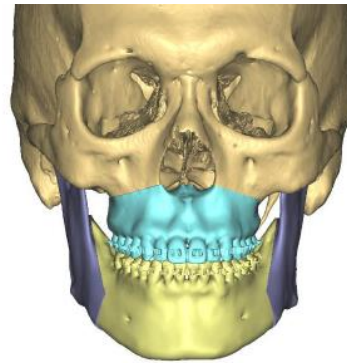
Custom Plates and Screws



Pre-Op Jaw Position



Post-Op Jaw Position



Pre-Op Photos



Post-Op Photos



What to Expect from Surgery and Hospitalization

During Surgery

You will be under the care of the Anesthesia Team. You will have General Anesthesia for your jaw surgery. The purpose of operative general anesthetics is to keep you free of any pain, awareness, and memory during the surgery. Although it may be something you have seen in the movies, waking up or having memories from the surgery is extremely rare.

After Surgery

After your surgery you will be transferred to a recovery room. You will get to see your family. The nursing staff will work with you to keep you comfortable while you wait to be transferred to the hospital room where you will stay for 1-2 nights. When you wake up you will likely have an IV in place in your arm or hand; this will be used to provide medication and fluids if you are not able to take it by mouth.

Nausea

Many people will feel sick to their stomach when they wake up, and sometimes people will vomit. Let your doctors and nurses know right away if you feel sick – they can give you medication that can help reduce nausea and will get you a basin and help clean up if you do get sick. Your jaws will have thick rubber bands, or wires, on them to limit how far you can open your mouth after surgery. Vomiting with your jaws shut can seem scary but don't worry - our CHOP staff are experienced and well trained to help you manage this! If you are vomiting a lot, we may need to cut the wires or the rubber bands. Although this is very rare, we are always prepared for any emergency and will keep special scissors near your bed while you are in the hospital. Nausea usually settles down within the first few days after surgery.

Pain or Soreness

There are multiple ways our team will work to help you manage your pain from surgery. While you are asleep during your surgery your surgeon will inject local anesthetic to numb the surgical sites. This will make you feel more comfortable when you wake up, but it will wear off several hours after surgery. After you are awake, we will treat your pain with medication through your IV or mouth. Having an increase in soreness as the numbing medication wears off is normal and is not a sign that there is something wrong. Unfortunately, there is no way to take away all of your pain, but we will help you to be as comfortable as possible. Most patients need some strong prescription medication for 4-5 days after surgery. Some patients only need to take prescription pain medicine for a few days after surgery and then can take Tylenol and Ibuprofen. Our team will work with you to stop taking narcotic pain medication as soon as you can to help reduce the risk of overuse, abuse or addiction. There are also non-medication pain management strategies that can help you feel more comfortable, including using rest, distraction, and other sensory activities.

Saliva

Most of your surgical incisions will be inside your mouth, while helps us avoid putting scars on your face. Because of this, when you wake up your saliva might taste a little funny from small amounts of residual blood. Sometimes patients prefer not to swallow, so they end up drooling or spitting this out. If this happens to you, don't be alarmed if your saliva is a little blood tinged. Your treating team is well-

experienced to monitor for unusual quantities of blood loss. Once you are comfortable to start swallowing your saliva, the drooling will also improve.

Temporary numbness

Many patients experience temporary numbness or tingling in the face and chin after jaw surgery. The movement of your jaws may be close to some major nerves that supply the sensation to your face. We always take extra care to protect these nerves, but any movement can temporarily bruise or stretch the nerves. The time it takes for these nerves to recover can vary widely but should continually improve over time. Permanent numbness is rare.

Swelling

You will have swelling after your surgery, with the most swelling between 2 to 5 days after surgery and improving over weeks to months after. How long the swelling lasts varies widely between patients. If your skin still feels firm to the touch, then your swelling is still resolving. Ice packs can help reduce the swelling in the first few days after surgery but be careful not to apply this directly to your skin as it can cause burns, especially since you might have some facial numbness. Place a washcloth or towel in between the ice pack and your skin.

Bruising

Bruising after jaw surgery is normal. It might affect you anywhere on your face - over your cheeks, jaws and down to your neck. We expect the bruising to resolve in the first few weeks.

Smoking or Vaping

Both traditional cigarettes and vaping are known to slow healing, primarily through its constriction of small blood vessels. While marijuana is less tested, it is thought to cause similar reactions in these blood vessels. We recommend avoiding smoking and reducing your exposure to secondhand smoke as much as possible while you are healing to get the best result.

Antibiotic Duration

Not everyone will need post-operative antibiotics. Based on the risks of your surgery, your surgeon will let you know if and how long you will have to take antibiotics for. If you are prescribed antibiotics, please make sure you take the full course.

Discharge Criteria

Our goal is to get you recovering at home as soon as it is safe to do so. Some milestones need to be met before our team will know you are ready to go home after surgery. Some examples include:

- Not needing additional oxygen
- No longer needing IV medication for pain or nausea
- Able to use the bathroom without difficulty
- Able to eat and drink

There are a few things that vary depending on the surgeon taking care of you. Here are some general guidelines, and space for you to take notes when you are discussing your specific plan of care with your surgeon.

Diet

Your post-operative diet recommendations will progress from clear fluids (any liquid you can see through) up to liquid or soft diet. For a liquid diet, anything you can blend is a good option. As much as possible, try to include different food groups since nutrition is crucial as you heal from surgery. Avoid anything hard, chewy, or crunchy, such as chips, nuts, apples, popcorn, or candy.

Some Examples of Soft Foods to Enjoy

Soup, Mac and Cheese, Pasta, Eggs, Oatmeal, Pancakes, Finely Ground Beef, Pudding, Pancakes, Yogurt, Soft Bread, Blenderized Foods, Milkshakes, Smoothies, Popsicles

Oral Hygiene

Keeping your mouth clean is important. Not only does it help you heal and avoid wound infections, it also keeps your teeth healthy! You'll be given a mouth wash to use after you eat and before bedtime. When you run out of the prescription mouth wash, you can also rinse with salt water. We ask you to do this regularly while you are awake for the first two weeks before graduating to gentle brushing.

Activity Restrictions

We will ask you to take things easy for 4-6 weeks after surgery. This includes avoiding strenuous activities, contact sports, heavy lifting, or anything that can raise your blood pressure or heart. Ask your surgical team about any specific activities you participate in so we can give you an exact timeline.

Long Term Post-Operative Course: What to expect after it's all over

Functional

Teeth: Orthognathic surgery realigns your jaws and teeth so that your occlusion, or the resting position of your teeth, is in the correct position. This can improve your bite or the way you chew and realign and change your smile. Most patients will require post-op orthodontic care. The final touches to refine the alignment and appearance of your teeth is important to give you the best result after all your hard work.

Breathing: Because orthognathic surgery repositions your jaws, it can also improve your breathing. Some patients report improvements in the quality of their sleep, improved energy, and an easier time breathing. Patients with sleep apnea before surgery may even experience a resolution of their symptoms afterward.

Speech: There is a chance that your speech could change after surgery, sometimes for the better and sometimes for the worse. Speech sounds and articulation can be dependent on the position and length of your palate relative to the rest of your larynx and may be changed with your new jaw position. Often, patients will heal for a few months to see how things adapt. If you have continued concerns for your speech after surgery, you can follow up with your surgeon and speech language pathologist.

Aesthetics

Orthognathic surgery can result in a big change in your appearance. Even though the surgery focuses on shifting the position of the bones in your face, any overlying soft tissue or skin will also shift. After the surgery, you may look different to yourself in the mirror, and friends and family might also perceive a change in the way you look. It might take some time for you to adjust to the new way you look. If you were considering a final rhinoplasty, the best time is to plan this after your orthognathic surgery since this give you the best and most reliable results.

Psychosocial Support

We have a team of psychosocial providers, including specialists in psychology, child life services, and social work, who can support you and your family through all stages of your orthognathic surgery experience. Most people cope better with surgery and recovery when they know what to expect before, during and after the day of surgery. Meeting with your team and reviewing this handbook should teach you most of what you need to know. Our psychosocial team is available to talk with you and your family about any additional concerns you have related to coping with surgery or recovery.

Decision Making: Making the decision about whether or when to proceed with orthognathic surgery is a big one. We recommend that you write down any questions or concerns that you have and bring this to your appointments so you can be sure to get the information you need to understand your treatment plan. It can be helpful to talk through the short and long term pros and cons of treatment options and your feelings about it with someone. Our team has a clinical psychologist who can support you as you make this important decision.

Timing: Most of our patients undergoing jaw surgery are busy teens with lots of interests and activities. We recommend that when possible, you and your team plan for surgery at a time when you are most able to take a step back from major activities for 4-6 weeks to focus on your recovery. You can still go to school and hang out with friends, but more active pursuits like sports will be on hold while you heal. Considering the best timing can help you maintain a good quality of life during your extended recovery period.

Anxiety and Mood: It is completely normal to experience some anxiety and mood challenges related to your surgery and recovery. Almost everyone is nervous as they prepare for surgery and will experience irritability and some sadness throughout their recovery. If you find that your anxiety or mood symptoms are so strong that it's hard for you to sleep, eat or do your regular daily activities, we recommend that you speak with your team and consider setting up a meeting with our psychologist.

Coping with Recovery: Recovering from surgery is a process that takes weeks and months, with lots of ups and downs along the way. Postoperative progress can feel uneven but it's important to remember that you are getting better every day. In the early postoperative period, having a plan for the day can help you take things one moment or day at a time as you take care of yourself. It can be helpful to break your daily routine into morning, afternoon, and evening periods during which you aim for one work, one rest, and one play activity. Work activities can include self-care and hygiene, taking care of home responsibilities, or doing schoolwork. Rest activities should be quiet, low movement and provide ample opportunity for you to take a break. Play activities should be fun, engaging and as active as possible given your postoperative activity restrictions. Balancing work, rest and play each morning, afternoon and evening can help give a structure to your day and help ease your return to regular schedule and activities as you heal.

Appearance and Body Image Concerns: Having surgery can mean an increased focus on your facial appearance. It can be challenging to cope with the ways in which your appearance will change throughout your recovery. Physical healing and emotional adjustment to changes in appearance can follow different timelines. Most of our patients can take a few weeks to months to adapt to their changed appearance. They may receive a lot of comments or feedback from others about their new look, which can make some people feel good and other people feel self-conscious. If you find that your concerns about your appearance are affecting your self-esteem, your confidence, or your engagement in school, recreational or social activities, we encourage you to speak with our psychologist.

A Patient Experience

Pictures and story shared by M, a 17 year old patient with a cleft who had upper and lower jaw surgery.



Pre-Op
Right before heading into surgery!



Post-Op
Waking up very swollen with oxygen and ice packs



Day 1
Even more swollen, lots of nausea. Drinking apple juice and ice pops



Using syringes to take my medicines, the big blue ones are Gatorade!



Day 5
Still swollen. Small incisions on cheek are from surgery, all others are in the mouth.
Taking short walks, but still very tired. Using ice, tylenol and motrin for pain. All foods are soft.



DAY 9
Feeling much better but still need a nap in the middle of the day. Going to movies with friends, lots of walks, going to friends houses.

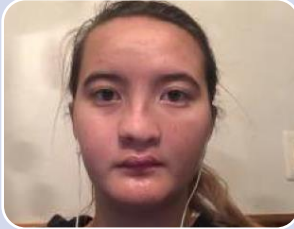
DAY 11

First time I really felt happy about how I looked after surgery. Swelling finally starting to go down. Still eating lots of milkshakes and blended food. Cant feel my chin still!



Day 14

Starting to get more feeling back in my face swelling still going down.



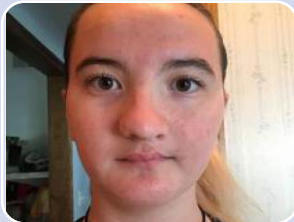
Week 6a

Increased swelling after long day at school then long sports practice. Pictures are taken a day apart.



Week 6b

It is normal to have periods of increased swelling!



Month 4



Month 5



Month 6

