Oral Hygiene

- **Reasons for Wearing Retainers After Treatment**
  Reasons for Wearing Retainers After Treatment Differences Between Removable and Fixed Retention Establishing a Routine to Prevent Tooth Shifting Oral Hygiene Tips for Retainer Care Monitoring Changes After Active Orthodontic Phase Factors That Influence Retention Duration Communicating the Value of Long Term Follow Ups How Retainers Support Jaw Positioning Over Time Signs That Signal the Need for Retainer Adjustments Materials Used in Crafting Effective Retainers Incorporating Retainer Wear Into Daily Habits Assessing Compliance and Its Impact on Stability
- **Basics of Brushing With Braces or Aligners**
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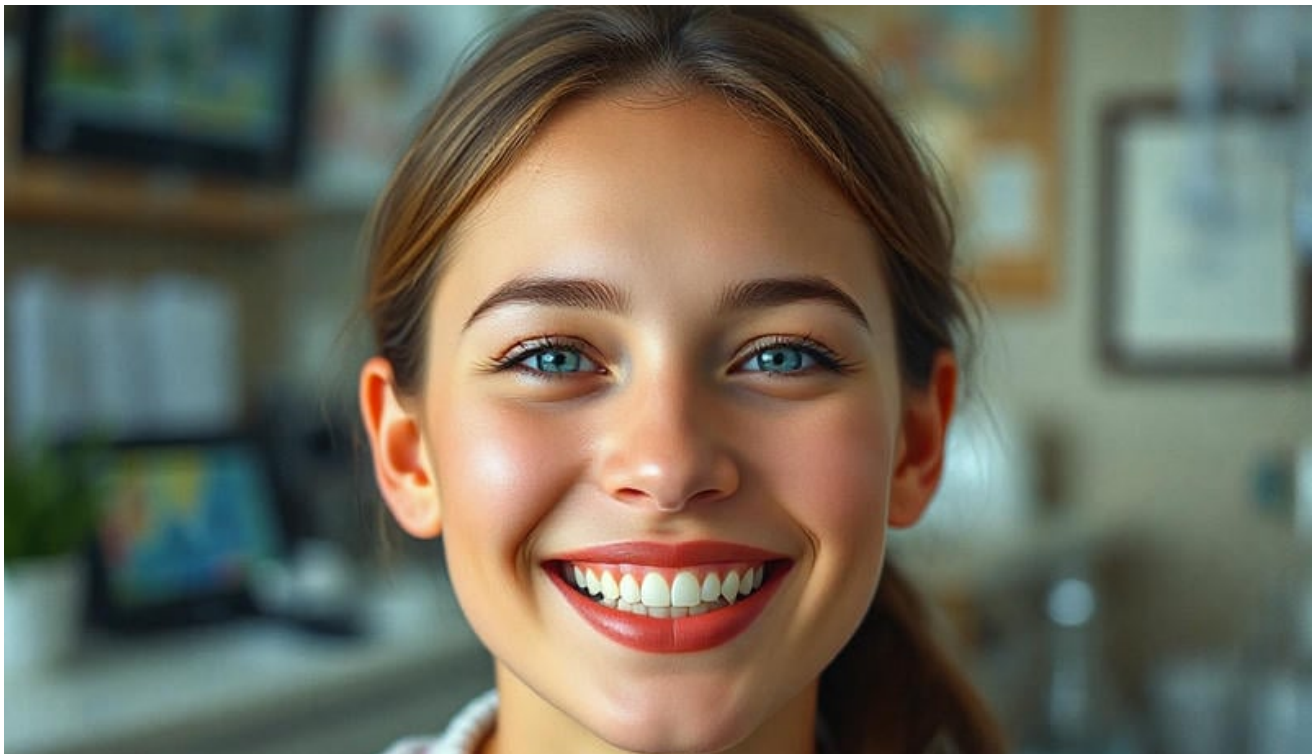

Okay, so you've got braces. Welcome to the club! It's a journey to a straighter smile, but let's be real, it comes with some lifestyle adjustments. And one of the biggest ones involves food. Specifically, certain snacks that can wreak havoc on your brackets and wires. Let's talk about hard candies and chewy sweets – those seemingly innocent treats that can quickly turn into orthodontic nightmares.

Think about it. Orthodontic expanders can create more space in the mouth for teeth **Children's braces treatment** jaw. Hard candies, like lollipops or jawbreakers, require sustained pressure and constant sucking and grinding. That pressure, particularly when you're trying to crack them (we all do it!), can loosen a bracket or even bend a wire. And once a bracket is loose, it's not doing its job, extending your treatment time. Plus, that loose bracket can irritate your gums and cheek – not fun.

Then there are the chewy culprits: things like caramels, gummy bears, or even super-sticky toffee. These are like little glue bombs for your braces. They get stuck in every nook and cranny, pulling on wires and brackets with every chew. The stickiness also makes them incredibly difficult to clean, increasing the risk of plaque buildup and, ultimately, cavities. Trust me, no one wants to add a dentist visit on top of their orthodontist appointments.

So, what's a sweet tooth to do? Don't despair! You don't have to live a life devoid of all sweetness. The key is to choose smarter alternatives. Soft chocolates that melt easily are generally a good option. Think about yogurt-covered pretzels (just be gentle!), soft-baked cookies, or even ice cream (though be mindful of sugar content!). Fruit is another great choice, but maybe cut up apples or pears into bite-sized pieces to avoid putting too much pressure on your brackets.

The goal is to enjoy treats that are gentle on your braces. When you're mindful of what you're eating, you're protecting your investment in a straighter smile. So, skip the hard and chewy stuff, and opt for something softer and easier to manage. Your braces (and your teeth!) will thank you for it.

* Preventing teeth from shifting back to their original positions as the jawbone settles. —

- *** Maintaining the corrected tooth alignment achieved during braces.**
- *** Preventing teeth from shifting back to their original positions as the jawbone settles.**
- *** Protecting the investment made in orthodontic treatment.**
- *** Ensuring the long-term stability of the bite and smile.**
- *** Supporting proper jaw growth and development in younger children.**
- *** Avoiding the need for future, potentially more extensive, orthodontic intervention.**
- *** Contributing to overall oral health by preventing crowding and misalignment.**

Okay, so you've got braces. Welcome to the club! Straightening your teeth is a fantastic investment in your smile and your overall health. But let's be real, it also comes with some lifestyle adjustments, especially when it comes to food. You've probably already heard about avoiding certain things, and one category that deserves its own spotlight is sticky foods.

Think about it: what happens when you chew on a caramel? It clings to your teeth, right? Now imagine that caramel getting stuck *around* your brackets and wires. That's a recipe for disaster, not just because it's hard to clean, but because it can actually damage your orthodontic appliances. Sticky foods like taffy, gummy candies, even some chewy granola bars, can pull brackets loose, bend wires, or even break them. And that means extra trips to the orthodontist, longer treatment times, and potentially more discomfort. Nobody wants that!

So, what can you do? The easiest solution is often just avoidance. That means saying a temporary goodbye to those tempting treats. But let's be honest, cravings happen! If you absolutely *must* have something sticky, consider these modifications. Cut it into very small

pieces instead of biting off a large chunk. This minimizes the pulling force on your braces. Also, chew with your back teeth as much as possible, as this area is generally less vulnerable to damage. And most importantly, brush and floss thoroughly immediately after indulging. Don't let that sticky residue linger!

Beyond outright avoidance, look for alternatives. Instead of a chewy caramel, maybe opt for a smooth chocolate. Instead of a gummy bear, try a piece of fruit cut into bite-sized pieces. There are often softer or less sticky versions of your favorite treats out there if you look carefully.

Ultimately, being mindful of what you eat is key to protecting your braces and ensuring a smooth, successful orthodontic journey. A little bit of planning and some smart substitutions can save you a lot of hassle (and potential dental bills) down the road. So, choose wisely, chew carefully, and keep that smile sparkling!

* Protecting the investment made in orthodontic treatment.

Okay, so your kiddo just got braces. Congratulations! Straight teeth are awesome, but navigating the food world suddenly gets a little trickier. One of the biggest challenges? Hard fruits and veggies. We all want our kids eating healthy, but biting into a whole apple or gnawing on a raw carrot can spell disaster for those brackets and wires.

Basically, you need to think about minimizing the force and pressure on the braces. The good news is, you don't have to banish apples and carrots altogether! It's all about the prep work.

Think small and soft. Instead of handing your child a whole apple, peel it and cut it into bite-sized pieces. Even better, cook it! Applesauce is a fantastic option, and baked apples become wonderfully tender. Carrots can be grated and added to salads or cooked until soft in soups and stews. Steamed broccoli and cauliflower are much gentler on braces than raw florets.

Essentially, you want to avoid anything that requires a lot of front-teeth biting. Other hard fruits like pears can be treated similarly – peeled, chopped, or cooked. Even something like corn on the cob becomes braces-friendly if you cut the kernels off before serving.

The key is to be proactive and a little creative. A little extra time spent prepping fruits and veggies will not only keep your child's braces intact but will also ensure they're still getting the nutrients they need. It's a win-win! So, embrace the chopping board and the steamer, and keep those smiles sparkling!

* Ensuring the long-term stability of the bite and smile.

Okay, so you've got braces. You're on the road to a straighter, healthier smile, which is awesome! But that road has a few potholes, and some of those potholes are paved with sugary drinks and snacks. I know, I know, it's a bummer. But honestly, these seemingly innocent treats can be a real double whammy when it comes to your orthodontic appliances and your teeth.

Think about it. Sugary drinks, like sodas and juices, are basically liquid candy. They coat your teeth and, more alarmingly when you have braces, they sneak into all those tiny crevices around your brackets and wires. It's like a sugar party happening right there in your mouth! This fuels bacteria that produce acid, which attacks your tooth enamel, leading to cavities. And with braces making it harder to brush effectively, that acid has a field day. Hello, tooth decay!

But the sugary snacks are just as sneaky. Sticky candies, chewy caramels, even seemingly harmless cookies – they can all latch onto your braces like glue. Trying to dislodge them can put undue pressure on your brackets and wires, potentially bending them, loosening them, or even pulling them off completely. Suddenly, you're looking at an emergency trip to the orthodontist, extra appointments, and potentially a longer treatment time. Nobody wants that!

So, what's the bottom line? Limiting sugary drinks and snacks isn't just about avoiding cavities. It's about protecting your investment in your smile. It's about keeping your braces intact and working properly. It's about making the whole orthodontic process smoother and faster. Think of it as a way to save yourself time, money, and a whole lot of dental drama. Choose water, healthier snacks like fruits and vegetables, and brush diligently. Your braces (and your teeth!) will thank you.

* Supporting proper jaw growth and development in younger children.

Alright, let's talk about popcorn and nuts when you're rocking braces or aligners. I know, I know, they're practically essential snacks for movies and ballgames, but they can be sneaky little appliance wreckers. The thing is, those hard kernels and stubborn nut fragments can wedge themselves into all sorts of nooks and crannies around your brackets and wires.

Imagine chomping down on a handful of popcorn. Everything feels fine at first, until *bam*, a rogue kernel gets stuck between your molar band and your cheek. You try to dislodge it with your tongue, but it's in there good. Now you're poking at it with a toothpick (not recommended, by the way!), potentially bending a wire or loosening a bracket in the process. Nuts are similar offenders. Their smaller, harder pieces can exert a ton of pressure on your appliances, leading to breakage or even dislodgement.

So, what's a brace-faced snack lover to do? Complete avoidance is the safest bet, honestly. But if you absolutely *must* have your popcorn fix, be extra cautious. Opt for hull-less popcorn if possible, as the hulls are notorious for getting wedged. Eat it slowly, one piece at a time, being mindful of any resistance or unusual sensations. And for nuts? Consider nut butters instead of whole nuts. You still get the nutty flavor, but without the hard pieces.

After indulging in either, make sure you thoroughly brush and floss, paying extra attention to the areas around your brackets and wires. A water flosser can also be a lifesaver for dislodging stubborn particles. Keep an eye out for any loose brackets, bent wires, or discomfort. If you notice anything amiss, call your orthodontist right away. A little precaution can save you a lot of time, money, and discomfort in the long run. Your smile will thank you!

* Avoiding the need for future, potentially more extensive, orthodontic intervention.

Okay, so you've got braces! That's awesome, you're on your way to a killer smile. But let's talk about protecting that investment, specifically when it comes to food. We all know some snacks are just trouble waiting to happen. But even with seemingly harmless foods, a little extra care goes a long way.

Think of it this way: your braces are like tiny, delicate works of art glued to your teeth. You wouldn't just whack a sculpture with a hammer, right? Same principle applies here. The absolute biggest favor you can do for your braces (and yourself!) is to get really good at cutting your food into small, manageable pieces.

Seriously, this makes a world of difference. Instead of trying to bite into a whole apple, which puts a ton of pressure on your front brackets, slice it up into thin wedges. A sandwich? Cut it into quarters. Even something relatively soft like a cookie benefits from being broken into smaller bits.

And then, the chewing. Slow down! Chew carefully and deliberately. Don't rush. Think about where the food is in your mouth and avoid putting unnecessary stress on your brackets. Imagine you're navigating a minefield with your teeth, and the mines are your braces.

This isn't about depriving yourself. It's about being smart and adjusting your eating habits a bit. Small pieces and careful chewing are your best friends when you're rocking braces. Trust me, a little extra effort now will save you a lot of potential headaches (and emergency trips to the orthodontist!) later.

* Contributing to overall oral health by preventing crowding and misalignment.

Okay, so we're talking about braces, right? And avoiding those food disasters that send you straight to the orthodontist for emergency repairs. But even with the best intentions and a super-strict diet, accidents happen. Wires bend, brackets loosen – it's just part of the journey. That's where open communication comes in, and it's HUGE.

Think about it from a kid's perspective: maybe they feel embarrassed that they broke a bracket tackling a particularly chewy caramel. Or they're worried they'll get in trouble for sneaking that forbidden gummy bear. Whatever the reason, if they're afraid to tell you or the orthodontist, a small problem can quickly become a big one. A loose wire can irritate their cheek, a detached bracket can slow down treatment progress, and neglecting these issues can even lead to longer treatment times overall.

That's why creating a safe space for them to talk about any damage is so important. As parents, we need to emphasize that we're not going to be angry or judgmental. Instead, we're there to help them fix the problem and get back on track. And kids need to understand that their orthodontist is a partner in this process, too. The orthodontist isn't there to scold them, but to provide solutions and make sure their treatment stays on course.

Encouraging them to be honest about any damage, no matter how small, allows for quick intervention. A simple adjustment can prevent more serious complications down the line. Plus, it empowers them to take responsibility for their orthodontic care and learn the importance of

proactive communication. Ultimately, a little honesty goes a long way in ensuring a smoother, faster, and more comfortable braces experience for everyone involved.

About dental braces

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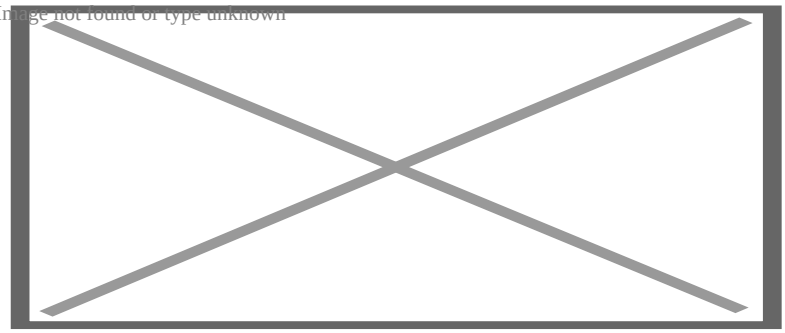

Dental braces

Dental braces (also known as **orthodontic braces**, or simply **braces**) are devices used in orthodontics that align and straighten teeth and help position them with regard to a person's bite, while also aiming to improve dental health. They are often used to correct underbites, as well as malocclusions, overbites, open bites, gaps, deep bites, cross bites, crooked teeth, and various other flaws of the teeth and jaw. Braces can be either cosmetic or structural. Dental braces are often used in conjunction with other orthodontic appliances to help widen the palate or jaws and to otherwise assist in shaping the teeth and jaws.

Process

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The application of braces moves the teeth as a result of force and pressure on the teeth. Traditionally, four basic elements are used: brackets, bonding material, arch wire, and ligature elastic (also called an "O-ring"). The teeth move when the arch wire puts pressure on the brackets and teeth. Sometimes springs or rubber bands are used to put more force in a specific direction.[1]

Braces apply constant pressure which, over time, moves teeth into the desired positions. The process loosens the tooth after which new bone grows to support the tooth in its new position. This is called bone remodelling. Bone remodelling is a biomechanical process responsible for making bones stronger in response to sustained load-bearing activity and weaker in the absence of carrying a load. Bones are made of cells called osteoclasts and osteoblasts. Two different kinds of bone resorption are possible: direct resorption, which starts from the lining cells of the alveolar bone, and indirect or retrograde resorption, which occurs when the periodontal ligament has been subjected to an excessive amount and duration of compressive stress.[2] Another important factor associated with tooth movement is bone deposition. Bone deposition occurs in the distracted periodontal ligament. Without bone deposition, the tooth will loosen, and voids will occur distal to the direction of tooth movement.[3]

Types

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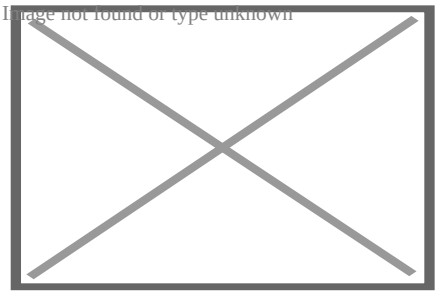
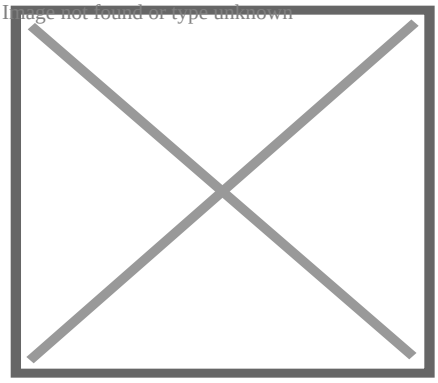


"Clear" braces



Upper and Lower Jaw Functional Expanders

- ***Traditional metal wired*** *braces* (also known as "train track braces") are stainless-steel and are sometimes used in combination with titanium. Traditional metal braces are the most common type of braces.[4] These braces have a metal bracket with elastic ties (also known as rubber bands) holding the wire onto the metal brackets. The second-most common type of braces is self-ligating braces, which have a built-in system to secure the archwire to the brackets and do not require elastic ties. Instead, the wire goes through the bracket. Often with this type of braces, treatment time is reduced, there is less pain on the teeth, and fewer adjustments are required than with traditional braces.
- ***Gold-plated stainless steel*** braces are often employed for patients allergic to nickel (a basic and important component of stainless steel), but may also be chosen for aesthetic reasons.
- ***Lingual*** *braces* are a cosmetic alternative in which custom-made braces are bonded to the back of the teeth making them externally invisible.
- ***Titanium*** *braces* resemble stainless-steel braces but are lighter and just as strong. People with allergies to nickel in steel often choose titanium braces, but they are more expensive than stainless steel braces.
- ***Customized orthodontic treatment systems*** combine high technology including 3-D imaging, treatment planning software and a robot to custom bend the wire. Customized systems such as this offer faster treatment times and more efficient

results.[5]
- ***Progressive, clear removable aligners*** may be used to gradually move teeth into their final positions. Aligners are generally not used for complex orthodontic cases, such as when extractions, jaw surgery, or palate expansion are necessary.[*medical citation*][6]

Fitting procedure

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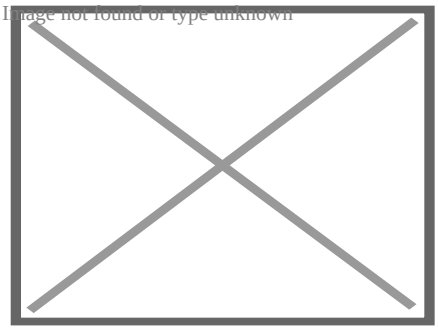


A patient's teeth are prepared for the application of braces.

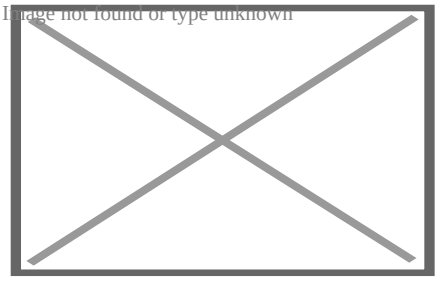
Orthodontic services may be provided by any licensed dentist trained in orthodontics. In North America, most orthodontic treatment is done by orthodontists, who are dentists in the diagnosis and treatment of *malocclusions*—malalignments of the teeth, jaws, or both. A dentist must complete 2–3 years of additional post-doctoral training to earn a specialty certificate in orthodontics. There are many general practitioners who also provide orthodontic services.

The first step is to determine whether braces are suitable for the patient. The doctor consults with the patient and inspects the teeth visually. If braces are appropriate, a records appointment is set up where X-rays, moulds, and impressions are made. These records are analyzed to determine the problems and the proper course of action. The use of digital models is rapidly increasing in the orthodontic industry. Digital treatment starts with the creation of a three-dimensional digital model of the patient's arches. This model is produced by laser-scanning plaster models created using dental impressions. Computer-automated treatment simulation has the ability to automatically separate the gums and teeth from one another and can handle malocclusions well; this software enables clinicians to ensure, in a virtual setting, that the selected treatment will produce the optimal outcome, with minimal user input.[*medical citation needed*]

Typical treatment times vary from six months to two and a half years depending on the complexity and types of problems. Orthognathic surgery may be required in extreme cases. About 2 weeks before the braces are applied, orthodontic spacers may be required to spread apart back teeth in order to create enough space for the bands.

Teeth to be braced will have an adhesive applied to help the cement bond to the surface of the tooth. In most cases, the teeth will be banded and then brackets will be added. A bracket will be applied with dental cement, and then cured with light until hardened. This process usually takes a few seconds per tooth. If required, orthodontic spacers may be inserted between the molars to make room for molar bands to be placed at a later date. Molar bands are required to ensure brackets will stick. Bands are also utilized when dental fillings or other dental works make securing a bracket to a tooth infeasible. Orthodontic tubes (stainless steel tubes that allow wires to pass through them), also known as molar tubes, are directly bonded to molar teeth either by a chemical curing or a light curing adhesive. Usually, molar tubes are directly welded to bands, which is a metal ring that fits onto the molar tooth. Directly bonded molar tubes are associated with a higher failure rate when compared to molar bands cemented with glass ionomer cement. Failure of orthodontic brackets, bonded tubes or bands will increase the overall treatment time for the patient. There is evidence suggesting that there is less enamel decalcification associated with molar bands cemented with glass ionomer cement compared with orthodontic tubes directly cemented to molars using a light cured adhesive. Further evidence is needed to withdraw a more robust conclusion due to limited data.[7]

An archwire will be threaded between the brackets and affixed with elastic or metal ligatures. Ligatures are available in a wide variety of colours, and the patient can choose which colour they like. Arch wires are bent, shaped, and tightened frequently to achieve the desired results.



Dental braces, with a transparent power chain, removed after completion of treatment.

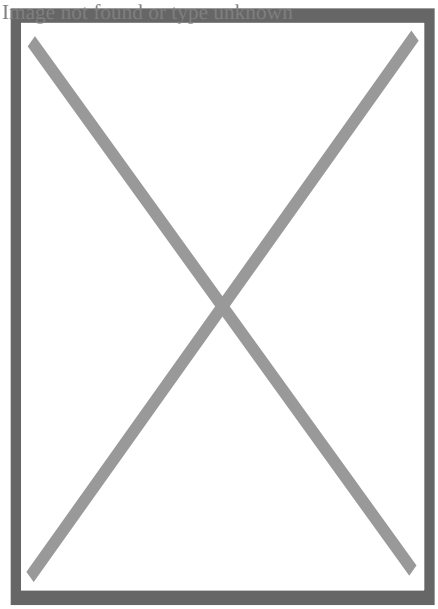
Modern orthodontics makes frequent use of nickel-titanium archwires and temperature-sensitive materials. When cold, the archwire is limp and flexible, easily threaded between brackets of any configuration. Once heated to body temperature, the arch wire will stiffen and seek to retain its shape, creating constant light force on the teeth.

Brackets with hooks can be placed, or hooks can be created and affixed to the arch wire to affix rubber bands. The placement and configuration of the rubber bands will depend on the course of treatment and the individual patient. Rubber bands are made in different diameters, colours, sizes, and strengths. They are also typically available in two versions: Coloured or clear/opaque.

The fitting process can vary between different types of braces, though there are similarities such as the initial steps of moulding the teeth before application. For example, with clear braces, impressions of a patient's teeth are evaluated to create a series of trays, which fit to the patient's mouth almost like a protective mouthpiece. With some forms of braces, the brackets are placed in a special form that is customized to the patient's mouth, drastically reducing the application time.

In many cases, there is insufficient space in the mouth for all the teeth to fit properly. There are two main procedures to make room in these cases. One is extraction: teeth are removed to create more space. The second is expansion, in which the palate or arch is made larger by using a palatal expander. Expanders can be used with both children and adults. Since the bones of adults are already fused, expanding the palate is not possible without surgery to separate them. An expander can be used on an adult without surgery but would be used to expand the dental arch, and not the palate.

Sometimes children and teenage patients, and occasionally adults, are required to wear a headgear appliance as part of the primary treatment phase to keep certain teeth from moving (for more detail on headgear and facemask appliances see Orthodontic headgear). When braces put pressure on one's teeth, the periodontal membrane stretches on one side and is compressed on the other. This movement needs to be done slowly or otherwise, the patient risks losing their teeth. This is why braces are worn as long as they are and adjustments are only made every so often.



Young Colombian man during an adjustment visit for his orthodontics

Braces are typically adjusted every three to six weeks. This helps shift the teeth into the correct position. When they get adjusted, the orthodontist removes the coloured or metal ligatures keeping the arch wire in place. The arch wire is then removed and may be replaced or modified. When the archwire has been placed back into the mouth, the

patient may choose a colour for the new elastic ligatures, which are then affixed to the metal brackets. The adjusting process may cause some discomfort to the patient, which is normal.

Post-treatment

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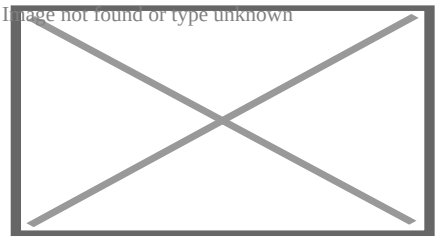
Patients may need post-orthodontic surgery, such as a fiberotomy or alternatively a gum lift, to prepare their teeth for retainer use and improve the gumline contours after the braces come off. After braces treatment, patients can use a transparent plate to keep the teeth in alignment for a certain period of time. After treatment, patients usually use transparent plates for 6 months. In patients with long and difficult treatment, a fixative wire is attached to the back of the teeth to prevent the teeth from returning to their original state.[8]

Retainers

[edit]
Main article: Retainer (orthodontic device)



Hawley retainers are the most common type of retainers. This picture shows retainers for the top (right) and bottom (left) of the mouth.

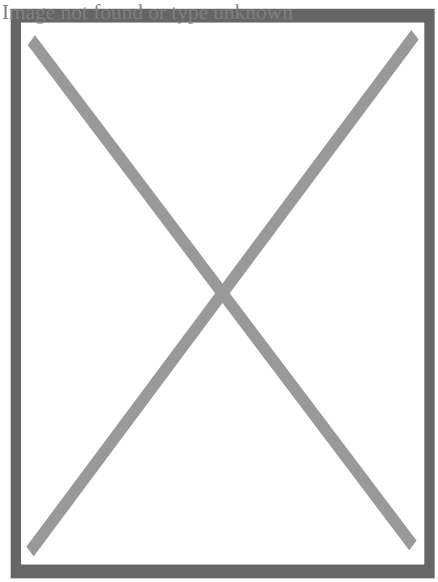
In order to prevent the teeth from moving back to their original position, retainers are worn once the treatment is complete. Retainers help in maintaining and stabilizing the position of teeth long enough to permit the reorganization of the supporting structures after the active phase of orthodontic therapy. If the patient does not wear the retainer appropriately and/or for the right amount of time, the teeth may move towards their previous position. For regular braces, Hawley retainers are used. They are made of metal hooks that surround the teeth and are enclosed by an acrylic plate shaped to fit the patient's palate. For Clear Removable braces, an Essix retainer is used. This is similar to the original aligner; it is a clear plastic tray that is firmly fitted to the teeth and stays in place without a plate fitted to the palate. There is also a bonded retainer where a wire is permanently bonded to the lingual side of the teeth, usually the lower teeth only.

Headgear

[edit]
Main article: Orthodontic headgear

Headgear needs to be worn between 12 and 22 hours each day to be effective in correcting the overbite, typically for 12 to 18 months depending on the severity of the overbite, how much it is worn and what growth stage the patient is in. Typically the prescribed daily wear time will be between 14 and 16 hours a day and is frequently used as a post-primary treatment phase to maintain the position of the jaw and arch. Headgear can be used during the night while the patient sleeps.[9][*better source needed*]

Orthodontic headgear usually consists of three major components:



Full orthodontic headgear with head cap, fitting straps, facebow and elastics

1. Facebow: the facebow (or J-Hooks) is fitted with a metal arch onto headgear tubes attached to the rear upper and lower molars. This facebow then extends out of the mouth and around the patient's face. J-Hooks are different in that they hook into the patient's mouth and attach directly to the brace (see photo for an example of J-Hooks).
2. Head cap: the head cap typically consists of one or a number of straps fitting around the patient's head. This is attached with elastic bands or springs to the facebow. Additional straps and attachments are used to ensure comfort and safety (see photo).
3. Attachment: typically consisting of rubber bands, elastics, or springs—joins the facebow or J-Hooks and the head cap together, providing the force to move the upper teeth, jaw backwards.

The headgear application is one of the most useful appliances available to the orthodontist when looking to correct a Class II malocclusion. See more details in the section Orthodontic headgear.

Pre-finisher

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The pre-finisher is moulded to the patient's teeth by use of extreme pressure on the appliance by the person's jaw. The product is then worn a certain amount of time with the user applying force to the appliance in their mouth for 10 to 15 seconds at a time. The goal of the process is to increase the exercise time in applying the force to the appliance. If a person's teeth are not ready for a proper retainer the orthodontist may prescribe the use of a preformed finishing appliance such as the pre-finisher. This appliance fixes gaps between the teeth, small spaces between the upper and lower jaw, and other minor problems.

Complications and risks

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A group of dental researchers, Fatma Boke, Cagri Gazioglu, Selvi Akkaya, and Murat Akkaya, conducted a study titled "Relationship between orthodontic treatment and gingival health." The results indicated that some orthodontist treatments result in gingivitis, also known as gum disease. The researchers concluded that functional appliances used to harness natural forces (such as improving the alignment of bites) do not usually have major effects on the gum after treatment.[10] However, fixed appliances such as braces, which most people get, can result in visible plaque, visible inflammation, and gum recession in a majority of the patients. The formation of plaques around the teeth of patients with braces is almost inevitable regardless of plaque control and can result in mild gingivitis. But if someone with braces does not clean their teeth carefully, plaques will form, leading to more severe gingivitis and gum recession.

Experiencing some pain following fitting and activation of fixed orthodontic braces is very common and several methods have been suggested to tackle this.[11][12] Pain associated with orthodontic treatment increases in proportion to the amount of force that is applied to the teeth. When a force is applied to a tooth via a brace, there is a reduction in the blood supply to the fibres that attach the tooth to the surrounding bone. This reduction in blood supply results in inflammation and the release of several chemical factors, which stimulate the pain response. Orthodontic pain can be managed using pharmacological interventions, which involve the use of analgesics applied locally or systemically. These analgesics are divided into four main categories, including opioids, non-steroidal anti-inflammatory drugs (NSAIDs), paracetamol and local

anesthesia. The first three of these analgesics are commonly taken systemically to reduce orthodontic pain.[13]

A Cochrane Review in 2017 evaluated the pharmacological interventions for pain relief during orthodontic treatment. The study concluded that there was moderate-quality evidence that analgesics reduce the pain associated with orthodontic treatment. However, due to a lack of evidence, it was unclear whether systemic NSAIDs were more effective than paracetamol, and whether topical NSAIDs were more effective than local anaesthesia in the reduction of pain associated with orthodontic treatment. More high-quality research is required to investigate these particular comparisons.[13]

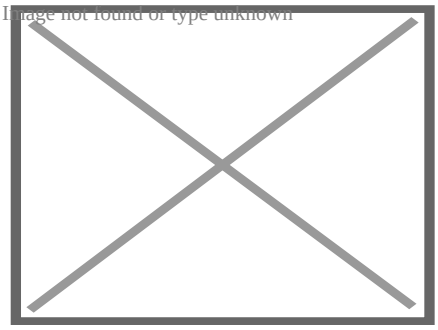
The dental displacement obtained with the orthodontic appliance determines in most cases some degree of root resorption. Only in a few cases is this side effect large enough to be considered real clinical damage to the tooth. In rare cases, the teeth may fall out or have to be extracted due to root resorption.[14][15]

History

[edit]

Ancient

[edit]



Old Braces at a museum in Jbeil, Lebanon

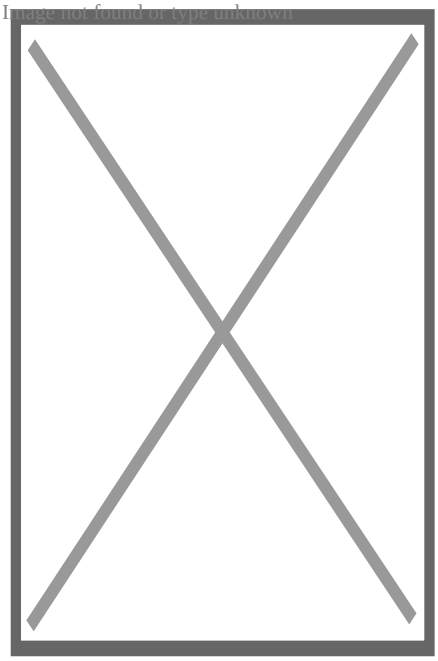
According to scholars and historians, braces date back to ancient times. Around 400–300 BC, Hippocrates and Aristotle contemplated ways to straighten teeth and fix various dental conditions. Archaeologists have discovered numerous mummified ancient individuals with what appear to be metal bands wrapped around their teeth. Catgut, a type of cord made from the natural fibres of an animal's intestines, performed a similar role to today's orthodontic wire in closing gaps in the teeth and mouth.[16]

The Etruscans buried their dead with dental appliances in place to maintain space and prevent the collapse of the teeth during the afterlife. A Roman tomb was found with a number of teeth bound with gold wire documented as a ligature wire, a small elastic wire

that is used to affix the arch wire to the bracket. Even Cleopatra wore a pair. Roman philosopher and physician Aulus Cornelius Celsus first recorded the treatment of teeth by finger pressure. Unfortunately, due to a lack of evidence, poor preservation of bodies, and primitive technology, little research was carried out on dental braces until around the 17th century, although dentistry was making great advancements as a profession by then.[*citation needed*]

18th century

[edit]



Portrait of Fauchard from his 1728 edition of *"The Surgical Dentist"*.

Orthodontics truly began developing in the 18th and 19th centuries. In 1669, French dentist Pierre Fauchard, who is often credited with inventing modern orthodontics, published a book entitled *"The Surgeon Dentist"* on methods of straightening teeth. Fauchard, in his practice, used a device called a "Bandeau", a horseshoe-shaped piece of iron that helped expand the palate. In 1754, another French dentist, Louis Bourdet, dentist to the King of France, followed Fauchard's book with *The Dentist's Art*, which also dedicated a chapter to tooth alignment and application. He perfected the "Bandeau" and was the first dentist on record to recommend extraction of the premolar teeth to alleviate crowding and improve jaw growth.

19th century

[edit]

Although teeth and palate straightening and/or pulling were used to improve the alignment of remaining teeth and had been practised since early times, orthodontics, as a science of its own, did not really exist until the mid-19th century. Several important dentists helped to advance dental braces with specific instruments and tools that allowed braces to be improved.

In 1819, Christophe François Delabarre introduced the wire crib, which marked the birth of contemporary orthodontics, and gum elastics were first employed by Maynard in 1843. Tucker was the first to cut rubber bands from rubber tubing in 1850. Dentist, writer, artist, and sculptor Norman William Kingsley in 1858 wrote the first article on orthodontics and in 1880, his book, *Treatise on Oral Deformities*, was published. A dentist named John Nutting Farrar is credited for writing two volumes entitled, *A Treatise on the Irregularities of the Teeth and Their Corrections* and was the first to suggest the use of mild force at timed intervals to move teeth.

20th century

[edit]

In the early 20th century, Edward Angle devised the first simple classification system for malocclusions, such as Class I, Class II, and so on. His classification system is still used today as a way for dentists to describe how crooked teeth are, what way teeth are pointing, and how teeth fit together. Angle contributed greatly to the design of orthodontic and dental appliances, making many simplifications. He founded the first school and college of orthodontics, organized the American Society of Orthodontia in 1901 which became the American Association of Orthodontists (AAO) in the 1930s, and founded the first orthodontic journal in 1907. Other innovations in orthodontics in the late 19th and early 20th centuries included the first textbook on orthodontics for children, published by J.J. Guilford in 1889, and the use of rubber elastics, pioneered by Calvin S. Case, along with Henry Albert Baker.

Today, space age wires (also known as dental arch wires) are used to tighten braces. In 1959, the Naval Ordnance Laboratory created an alloy of nickel and titanium called Nitinol. NASA further studied the material's physical properties.[17] In 1979, Dr. George Andreasen developed a new method of fixing braces with the use of the Nitinol wires based on their superelasticity. Andreasen used the wire on some patients and later found out that he could use it for the entire treatment. Andreasen then began using the nitinol wires for all his treatments and as a result, dental doctor visits were reduced, the cost of dental treatment was reduced, and patients reported less discomfort.

See also

[edit]

icon
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Medicine portal

- Mandibular advancement splint
- Oral and maxillofacial surgery
- Orthognathic surgery
- Prosthodontics
- Trismus
- Dental implant

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Orthodontics

Diagnosis	○ Bolton analysis ○ Cephalometric analysis ○ Cephalometry ○ Dentition analysis ○ Failure of eruption of teeth ○ Little's Irregularity Index ○ Malocclusion ○ Scissor bite ○ Standard anatomical position ○ Tooth ankylosis ○ Tongue thrust
Conditions	○ Overbite ○ Overjet ○ Open bite ○ Crossbite ○ Dental crowding ○ Dental spacing ○ Bimaxillary Protrusion ○ Prognathism ○ Retrognathism ○ Maxillary hypoplasia ○ Condylar hyperplasia ○ Overeruption ○ Mouth breathing ○ Temperomandibular dysfunction

Appliances	○ ACCO appliance ○ Archwire ○ Activator appliance ○ Braces ○ Damon system ○ Elastics ○ Frankel appliance ○ Invisalign ○ Lingual arch ○ Lip bumper ○ Herbst Appliance ○ List of orthodontic functional appliances ○ List of palatal expanders ○ Lingual braces ○ Headgear ○ Orthodontic technology ○ Orthodontic spacer ○ Palatal lift prosthesis ○ Palatal expander ○ Quad helix ○ Retainer ○ SureSmile ○ Self-ligating braces ○ Splint activator ○ Twin Block Appliance
Procedures	○ Anchorage (orthodontics) ○ Cantilever mechanics ○ Fiberotomy ○ Interproximal reduction ○ Intrusion (orthodontics) ○ Molar distalization ○ SARPE ○ Serial extraction
Materials	○ Beta-titanium ○ Nickel titanium ○ Stainless steel ○ TiMolium ○ Elgiloy ○ Ceramic ○ Composite ○ Dental elastics

Notable contributors	○ Edward Angle ○ Spencer Atkinson ○ Clifford Ballard ○ Raymond Begg ○ Hans Peter Bimler ○ Samir Bishara ○ Arne Björk ○ Charles B. Bolton ○ Holly Broadbent Sr. ○ Allan G. Brodie ○ Charles J. Burstone ○ Peter Buschang ○ Calvin Case ○ Harold Chapman (Orthodontist) ○ David Di Biase ○ Jean Delaire ○ Terry Dischinger ○ William B. Downs ○ John Nutting Farrar ○ Rolf Frankel ○ Sheldon Friel ○ Thomas M. Graber ○ Charles A. Hawley ○ Reed Holdaway ○ John Hooper (Orthodontist) ○ Joseph Jarabak ○ Harold Kesling ○ Albert Ketcham ○ Juri Kurol ○ Craven Kurz ○ Benno Lischer ○ James A. McNamara ○ Birte Melsen ○ Robert Moyers ○ Hayes Nance ○ Ravindra Nanda ○ George Northcroft ○ Dean Harold Noyes ○ Frederick Bogue Noyes ○ Albin Oppenheim ○ Herbert A. Pullen ○ Earl W. Renfroe ○ Robert M. Ricketts ○ Alfred Paul Rogers ○ Ronald Roth ○ Everett Shapiro ○ L. F. Andrews ○ Frederick Lester Stanton ○ Earl Emanuel Shepard

Organizations	○ American Association of Orthodontists ○ American Board of Orthodontics ○ British Orthodontic Society ○ Canadian Association of Orthodontists ○ Indian Orthodontic Society ○ Italian Academy of Orthodontic Technology ○ Society for Orthodontic Dental Technology (Germany)
Journals	○ American Journal of Orthodontics and Dentofacial Orthopedics ○ The Angle Orthodontist ○ Journal of Orthodontics
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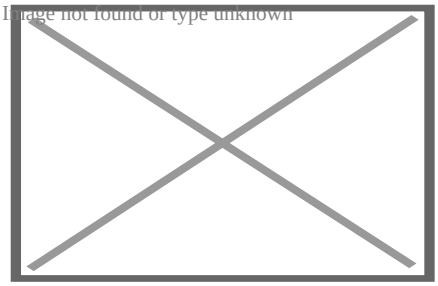
About jaw

This article is about the anatomical part. For the mountain, see The Jaw. For other uses, see Jaws (disambiguation) and Jawbone (disambiguation).



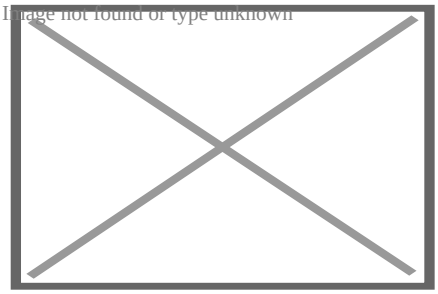
Human lower jaw viewed from the left

The **jaws** are a pair of opposable articulated structures at the entrance of the mouth, typically used for grasping and manipulating food. The term *jaws* is also broadly applied to the whole of the structures constituting the vault of the mouth and serving to open and close it and is part of the body plan of humans and most animals.

Arthropods

[edit]

Further information: Mandible (arthropod mouthpart) and Mandible (insect mouthpart)



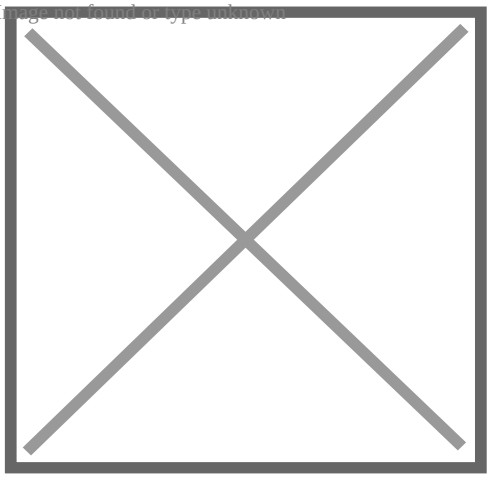
The mandibles of a bull ant

In arthropods, the jaws are chitinous and oppose laterally, and may consist of *mandibles* or *chelicerae*. These jaws are often composed of numerous mouthparts. Their function is fundamentally for food acquisition, conveyance to the mouth, and/or initial processing (*mastication* or *chewing*). Many mouthparts and associate structures (such as pedipalps) are modified legs.

Vertebrates

[edit]

In most vertebrates, the jaws are bony or cartilaginous and oppose vertically, comprising an *upper jaw* and a *lower jaw*. The vertebrate jaw is derived from the most anterior two pharyngeal arches supporting the gills, and usually bears numerous teeth.



Jaws of a great white shark

Fish

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Moray eels have two sets of jaws: the oral jaws that capture prey and the pharyngeal jaws that advance into the mouth and move prey from the oral jaws to the esophagus for swallowing.

Main article: Fish jaw

The vertebrate jaw probably originally evolved in the Silurian period and appeared in the Placoderm fish which further diversified in the Devonian. The two most anterior pharyngeal arches are thought to have become the jaw itself and the hyoid arch, respectively. The hyoid system suspends the jaw from the braincase of the skull, permitting great mobility of the jaws. While there is no fossil evidence directly to support this theory, it makes sense in light of the numbers of pharyngeal arches that are visible in extant jawed vertebrates (the Gnathostomes), which have seven arches, and primitive jawless vertebrates (the Agnatha), which have nine.

The original selective advantage offered by the jaw may not be related to feeding, but rather to increased respiration efficiency.[1] The jaws were used in the buccal pump (observable in modern fish and amphibians) that pumps water across the gills of fish or air into the lungs in the case of amphibians. Over evolutionary time the more familiar use of jaws (to humans), in feeding, was selected for and became a very important function in vertebrates. Many teleost fish have substantially modified jaws for suction feeding and jaw protrusion, resulting in highly complex jaws with dozens of bones involved.[2]

Amphibians, reptiles, and birds

[edit]

The jaw in tetrapods is substantially simplified compared to fish. Most of the upper jaw bones (premaxilla, maxilla, jugal, quadratojugal, and quadrate) have been fused to the braincase, while the lower jaw bones (dentary, splenial, angular, surangular, and articular) have been fused together into a unit called the mandible. The jaw articulates via a hinge joint between the quadrate and articular. The jaws of tetrapods exhibit varying degrees of mobility between jaw bones. Some species have jaw bones completely fused, while others may have joints allowing for mobility of the dentary,

quadrate, or maxilla. The snake skull shows the greatest degree of cranial kinesis, which allows the snake to swallow large prey items.

Mammals

[edit]

In mammals, the jaws are made up of the mandible (lower jaw) and the maxilla (upper jaw). In the ape, there is a reinforcement to the lower jaw bone called the simian shelf. In the evolution of the mammalian jaw, two of the bones of the jaw structure (the articular bone of the lower jaw, and quadrate) were reduced in size and incorporated into the ear, while many others have been fused together.[3] As a result, mammals show little or no cranial kinesis, and the mandible is attached to the temporal bone by the temporomandibular joints. Temporomandibular joint dysfunction is a common disorder of these joints, characterized by pain, clicking and limitation of mandibular movement.[4] Especially in the therian mammal, the premaxilla that constituted the anterior tip of the upper jaw in reptiles has reduced in size; and most of the mesenchyme at the ancestral upper jaw tip has become a protruded mammalian nose.[5]

Sea urchins

[edit]

Sea urchins possess unique jaws which display five-part symmetry, termed the *Aristotle's lantern*. Each unit of the jaw holds a single, perpetually growing tooth composed of crystalline calcium carbonate.

See also

[edit]

- Muscles of mastication
- Otofacial syndrome
- Predentary
- Prognathism
- Rostral bone

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[edit]

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Human regional anatomy

Body Skin

Head

- Hair
- Face
  - Forehead
  - Cheek
  - Chin
  - Eyebrow
  - Eye
  - Eyelid
  - Nose
  - Mouth
  - Lip
  - Tongue
  - Tooth
- Ear
- Jaw
- Mandible
- Occiput
- Scalp
- Temple

Neck

- Adam's apple
- Throat
- Nape

Torso (Trunk)

- Abdomen
  - Waist
  - Midriff
  - Navel
- Vertebral column
- Back
- Thorax
  - Breast
  - Nipple
- Pelvis
- Genitalia
  - Penis
  - Scrotum
  - Vulva
- Anus

- **Limbs**
  - **Arm**
    - Shoulder
    - Axilla
    - Elbow
    - Forearm
    - Wrist
    - Hand
      - Finger
      - Fingernail
      - Thumb
      - Index
      - Middle
      - Ring
      - Little
  - **Leg**
    - Buttocks
    - Hip
    - Thigh
    - Knee
    - Calf
    - Foot
      - Ankle
      - Heel
      - Toe
      - Toenail
      - Sole

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The facial skeleton of the skull

Maxilla	**Surfaces**	○ Anterior: *fossae* (Incisive fossa, Canine fossa) ○ Infraorbital foramen ○ Orbital bones ○ Anterior nasal spine ○ Infratemporal: Alveolar canals ○ Maxillary tuberosity ○ Orbital: Infraorbital groove ○ Infraorbital canal ○ Nasal: Greater palatine canal ○ Zygomatic process
	Processes	○ Frontal process (Agger nasi, Anterior lacrimal crest) ○ Alveolar process ○ Palatine process (Incisive foramen, Incisive canals, Foramina of Scarpa, Incisive bone, Anterior nasal spine)
	Other	○ Body of maxilla ○ Maxillary sinus
Zygomatic		○ Orbital process (Zygomatico-orbital) ○ Temporal process (Zygomaticotemporal) ○ Lateral process (Zygomaticofacial)
Palatine	**Fossae**	○ Pterygopalatine fossa ○ Pterygoid fossa
	Plates	○ Horizontal plate (Posterior nasal spine) ○ Perpendicular plate (Greater palatine canal, Sphenopalatine foramen) ○ Hard palate
	Processes	○ Pyramidal ○ Orbital ○ Sphenoidal

Mandible

Body
- *external surface* (Chin, Jaw, Mandibular prominence, Mandibular symphysis, Lingual foramen, Mental protuberance, Mental foramen, Mandibular incisive canal)
- *internal surface* (Mental spine, Mylohyoid line, Sublingual fovea, Submandibular fovea)
- Alveolar part
- Mylohyoid groove
  - Mandibular canal
  - Lingula

Ramus
- Mandibular foramen
- Angle
- Coronoid process
- Mandibular notch
- Condyloid process
- Pterygoid fovea

Nose
- Nasal bone
  - Internasal suture
  - Nasal foramina
- Inferior nasal concha
  - Ethmoidal process
  - Maxillary process
- Vomer
  - Wing
- Lacrimal
  - Posterior lacrimal crest
  - Lacrimal groove
  - Lacrimal hamulus

Other
- Prognathism
- Retromolar space

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- icon Anatomy

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