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Es importante alargar todo lo que puedas la vida de tus dientes. Para ello, ya lo sabes, es fundamental que tengas unos hábitos de limpieza y unas pautas de nutrición saludables.Estos autocuidados y una visita semestral o anual al dentista te permitirán prevenir o adelantarte a los problemas. En la infografía que acompaña a este post queremos mostrarte cómo es la evolución de la caries una vez que hace su aparición.Como verás, una caries sin tratar puede acabar completamente con un diente, así que vamos a detallarte qué es lo que ocurre fase por fase y qué tratamientos ponemos a tu disposición.Una caries es una infección que se produce por la acumulación de bacterias en la boca. Comienza atacando al esmalte del diente y, poco a poco, va destruyendo las siguientes capas.Quizás hayas oído que una caries no duele hasta que no está avanzada, pero no entiendas muy bien por qué. Esto es debido a que el esmalte, la primera capa de los dientes, no es una materia viva. Va a ser difícil que tú mismo te veas una caries porque en esta fase incipiente son blancas y suelen pasar desapercibidas.Ahí es donde juegan un papel primordial las revisiones dentales. Una caries leve o incipiente puede resolverse fácilmente mediante la eliminación de la zona de esmalte afectada y su relleno con un empaste.Si no eres consciente de tener una caries, y tampoco acudes al dentista una vez al año, seguramente ésta siga avanzado afectando ahora a la dentina.Es la segunda capa del diente y contiene túbulos dentarios conectados directamente con la pulpa. Por eso, en esta fase, comenzarás a notar dolor o la conocida sensibilidad dental, es decir, molestias con bebidas frías y/o calientes o con ciertos sabores como el dulce o el ácido. Otro síntoma que puedes tener es mal sabor de boca.Por último, también es posible que si te haces una exploración empieces a ver en el diente ese horrible color marrón o negro asociado a la caries.Todavía en este punto podemos solucionarlo con un empaste y posterior reconstrucción. Eso sí, la infección irremediablemente va a seguir su curso, así que no lo dejes.Cuando la infección llega a la tercera capa del diente o pulpa dentaria estamos ante una pulpitis. La pulpa es la parte viva del diente y tiene multitud de terminaciones nerviosas, así que, en ese punto, sentirás bastante dolor incluso al masticar.Seguramente antes de comenzar cualquier tratamiento, te recetemos algún antibiótico para que remita la infección. En esta fase, generalmente tenemos que pensar en una endodoncia, el único tratamiento dental que nos permitirá salvar el diente.Accederemos a la cámara pulpar practicando un agujero en la corona del diente, extraeremos la pulpa y limpiaremos bien toda la zona que quedará insensibilizada. Posteriormente, procedemos a sellar nuevamente el diente con un empaste.Si a pesar de sentir dolor, no acudes al dentista, la caries, y por tanto la infección, seguirá avanzando. Ya se ha ‘cargado’ el esmalte, la dentina y la pulpa dentaria, pero no parará ahí. Le toca el turno a los ligamentos periodentales, el hueso y la encía.Estos tres elementos son los pilares del diente. No te vamos a engañar. Una periodontitis compromete tu diente en mayor o menor medida.Hay casos en los que, además de una limpieza profunddad, tenemos que hacer diversas cirugías para recuperar la encía y el hueso dañado. En otras ocasiones, desgraciadamente, la única solución es extraer el diente y colocar un implante dental. Usted esta aquí: Otros nombres: Caries dentales La caries es el daño en la superficie o esmalte de un diente. Ocurre cuando bacterias en la boca fabrican ácido que ataca el esmalte. Las caries son huecos en el diente. Si no son tratadas, pueden causar dolor, infección e incluso pérdida de dientes. ¿Cuál es la causa de las caries? Nuestras bocas están llenas de bacteria. Algunas bacterias son beneficiosas, pero otras dañinas, incluyendo las que causan las caries. Estas bacterias se mezclan con la comida para formar una capa pegajosa llamada placa bacteriana. Las bacterias usan el azúcar y el almidón que usted come y toma para fabricar ácidos. Estos ácidos corroen los minerales del esmalte. Con el tiempo, la placa se endurece y forma el sarro. Además de dañar sus dientes, la placa y el sarro puede irritar sus encías y causar enfermedades de las encías. Usted obtiene el flúor de la pasta dental, agua y otras fuentes. Este flúor, junto a la saliva, ayuda al esmalte a repararse a sí mismo al reemplazar los minerales perdidos. Sus dientes pasan por este proceso de perder y recuperar minerales durante el día. Pero si no cuida sus dientes y/o come muchos alimentos azucarados, su esmalte seguirá perdiendo minerales. Esto conduce a la aparición de caries. Puede aparecer una mancha blanca donde se han perdido minerales. Este es un signo temprano de caries. Es posible que pueda detenerla o revertirla. Su esmalte aún puede repararse a sí mismo si cuida mejor sus dientes y limita los alimentos y bebidas azucarados o almidonados. Pero si el proceso de caries dental continúa, se pierden más minerales. Con el tiempo, el esmalte se debilita y se destruye, formando una caries, o un agujero en su diente. Este es un daño permanente que un dentista tiene que reparar con un relleno. ¿Quién está en riesgo de caries? Los principales factores de riesgo de caries dental son descuidar sus dientes y consumir demasiadas comidas y bebidas azucaradas o con almidón. Algunas personas tienen un mayor riesgo de caries dentales, incluyendo quieres: No tienen suficiente saliva debido a medicamentos, ciertas enfermedades o algunos tratamientos para el cáncer No obtener suficiente flúor Son muy jóvenes. Los bebés y niños pequeños que toman biberón están en riesgo, especialmente si se les da jugo o se los toman a la hora de acostarse. Esto expone sus dientes a los azúcares durante largos períodos de tiempo Son mayores. Muchos adultos mayores tienen encías en retroceso y más desgaste en sus dientes. Estos aumentan el riesgo de caries en las superficies expuestas de las raíces de sus dientes ¿Cuáles son los síntomas de las caries? La caries dental temprana por lo general no tiene síntomas. A medida que la caries empeora, puede causar: Dolor de dientes Sensibilidad a los dulces, calientes o fríos Manchas blancas o marrones en la superficie de un diente Un hueco Una infección que puede provocar la formación de un absceso (bolsa de pus). El absceso puede causar dolor, hinchazón facial y fiebre ¿Cómo se diagnostican las caries? En general, los dentistas encuentran caries al observar sus dientes y examinarlos con instrumentos dentales. Su dentista también le preguntará si tiene algún síntoma. A veces es posible que necesite una radiografía dental. ¿Cuáles son los tratamientos para las caries? Existen varios tratamientos para la caries dental. El tratamiento que reciba depende de qué tan serio sea el problema: Tratamientos con flúor: Si tiene caries dental temprana, un tratamiento con flúor puede ayudar al esmalte a repararse por sí mismo Rellenos: Si tiene una caries típica, su dentista removerá el tejido dental cariado y luego lo restaurará llenándolo con un material de relleno Tratamiento de conducto: Si el daño al diente y/o una infección se extienden a la pulpa (interior del diente), es posible que necesite una endodoncia. Su dentista extirpará la pulpa cariada y limpiará el interior del diente y la raíz. El siguiente paso es tapar el diente con un relleno temporal. Luego tendrá que regresar para obtener un relleno permanente o una corona (una cubierta en el diente) Extracción: En los casos más severos, cuando el daño a la pulpa no puede ser reparado, su dentista puede sacar el diente. Su dentista le sugerirá que obtenga un puente o implante para reemplazar la pieza faltante. De lo contrario, los dientes junto a la pieza extraída pueden moverse y cambiar su mordida ¿Se puede prevenir la caries dental? Hay pasos que puede tomar para prevenir la caries dental: Obtenga suficiente flúor Cepíllese con una pasta dental con flúor Beba agua del grifo con flúor. La mayoría del agua embotellada no contiene flúor Use un enjuague bucal con flúor Practique una buena salud bucal al cepillarse los dientes dos veces al día con una pasta dental con fluoruro y usar hilo dental regularmente Opte por alimentos y bebidas que no tengan un alto contenido de azúcares y almidones. Consuma comidas nutritivas, balanceadas y limite las meriendas No use productos de tabaco, incluido el tabaco sin humo. Si actualmente consume tabaco, considere dejar de fumar Visite a un dentista para chequeos regulares y limpiezas profesionales Asegúrese de que a sus hijos le sellen los dientes. Los selladores dentales son recubrimientos plásticos delgados que protegen las superficies de los dientes posteriores. Los niños deben ponerse selladores en sus dientes traseros tan pronto salgan, antes de que las caries puedan atacar los dientes NIH: Instituto Nacional de Investigación Dental y Craneofacial Dolores de muelas (Enciclopedia Médica) También en inglés Examen dental (Biblioteca Nacional de Medicina) También en inglés La información disponible en este sitio no debe utilizarse como sustituto de atención médica o de la asesoría de un profesional médico. Hable con un profesional de la salud si tiene preguntas sobre su salud. Conozca cómo citar esta página Official websites use .gov A .gov website belongs to an official government organization in the United States. Secure .gov websites use HTTPS A lock (A locked padlock) or https:// means you’ve safely connected to the .gov website. Share sensitive information only on official, secure websites. Cord of thin filaments used in interdental cleaning "Flossing" redirects here. For the dance, see Floss (dance). For the song by YoungBoy Never Broke Again, see Flossin'. A picture demonstrating the use of floss to remove dental plaque between the teeth Dental floss is a cord of thin filaments, typically made of nylon or silk, used in interdental cleaning to remove food and dental plaque from between teeth or places a toothbrush has difficulty reaching or is unable to reach.[1] Its regular use as part of oral cleaning is intended to maintain oral health. Use of floss is recommended to prevent gingivitis and the build-up of plaque.[2] The American Dental Association claims that up to 80% of plaque can be removed by flossing, and it may confer a particular benefit in individuals with orthodontic devices.[3] However, empirical scientific evidence demonstrating the clinical benefit of flossing as an adjunct to routine tooth brushing alone remains limited.[3] Dental floss (waxed) Levi Spear Parmly (1790-1859), a dentist from New Orleans, is credited with inventing the first form of dental floss.[4] In 1819, he recommended running a waxen silk thread "through the interstices of the teeth, between their necks and the arches of the gum, to dislodge that irritating matter which no brush can remove and which is the real source of disease."[5][6] He considered this the most important part of oral care.[4] Floss was not commercially available until 1882, when the Codman and Shurtleft company started producing unwaxed silk floss.[7] In 1898, the Johnson & Johnson Corporation received the first patent for dental floss that was made from the same silk material used by doctors for silk stitches.[7] One of the earliest depictions of the use of dental floss in literary fiction is found in James Joyce's famous novel Ulysses (serialized 1918–1920), but the adoption of floss was low before World War II. During the war, nylon floss was developed by physician Charles C. Bass.[7] Nylon floss was found to be better than silk because of its greater abrasion resistance and ability to be produced in great lengths and at various sizes.[7] Floss became part of American and Canadian daily personal dental care routines in the 1970s.[8] Dental professionals recommend that a person floss once per day before or after brushing to reach the areas that the brush will not and allow the fluoride from the toothpaste to reach between the teeth.[9][10] Floss is commonly supplied in plastic dispensers that contain 10 to 100 meters of floss. After pulling out approximately 40 cm of floss, the user pulls it against a blade in the dispenser to cut it off. The user then strings the piece of floss on a fork-like instrument, or holds it between their fingers using both hands with about 1–2 cm of floss exposed. The user guides the floss between each pair of teeth and gently curves it against the side of the tooth in a 'C' shape and guides it under the gumline. This removes particles of food stuck between teeth and dental plaque that adhere to dental surfaces below the gumline.[3] Various dental flosses are commonly used in many forms, including waxed, unwaxed monofilaments and multifilaments. Dental floss that is made of monofilaments coated in wax slides easily between teeth, does not fray and is generally higher in cost than its uncoated counterparts. The most important difference between available dental flosses is thickness. Waxed and unwaxed floss are available in varying widths. Studies have shown that there is no difference in the effectiveness of waxed and unwaxed dental floss,[11] but some waxed types of dental floss are said to contain antibacterial agents and/or sodium fluoride. Factors to consider in choosing a floss include the amount of space between teeth and user preference. Dental tape is a type of floss that is wider and flatter than conventional floss. Dental tape is recommended for people with larger tooth surface area.[11] The ability of different types of dental floss to remove dental plaque does not vary significantly;[12] the least expensive floss has essentially the same impact on oral hygiene as the most expensive. Factors to be considered when choosing the right floss or whether the use of floss as an interdental cleaning device is appropriate may be based on:[11] The tightness of the contact area: determines the width of floss The contour of the gingival tissue The roughness of the interproximal surface The user's manual dexterity and preference: to determine if a supplemental device is required left: floss molded in disposable prongs, top: 135° handle, bottom: 90° handle Specialized plastic wands, or floss picks, have been produced to hold the floss. These may be attached to or separate from a floss dispenser. While wands do not pinch fingers like regular floss can, using a wand may be awkward and can also make it difficult to floss at all the angles possible with regular floss. These types of flossers also run the risk of missing the area under the gum line that needs to be flossed. On the other hand, the enhanced reach of a wand can make flossing the back teeth easier. Dental floss is the most frequently recommended cleaning aid for teeth sides with a normal gingiva contour in which the spaces between teeth are tight and small.[11] The dental term 'embrasure space' describes the size of the triangular-shaped space immediately under the contact point of two teeth.[11] The size of the embrasure space is useful in selecting the most appropriate interdental cleaning aid. There are three interproximal embrasure types or classes as described below:[11] The classification of the amount of gum that fills the spaces between the teeth Type I – the gums fills embrasure space completely Type II – the gums partially fills embrasure space Type III – the gums do not fill embrasure space The table below describes the types of interdental non-powered self-care products available.[11] Interdental nonpowered self-care products Description Indications Contraindications and limitations Common problems experienced during misuse of product Number of times it can be used/duration of use Waxed floss Traditional string floss, Nylon waxed Monofilament floss also available coated in polytetrafluoroethylene (PTFE), Does not fray Type I embrasures, Floss cleans between the gum and tooth Type II and III embrasures Floss cuts, Floss clefts, Circulation to fingers may cut off from wrapping floss too tight, Inability to reach back teeth due to spacing and dexterity difficulties One time use. Dispose after use Unwaxed floss Traditional string floss, Unwaxed, multifilaments Type I embrasures, Floss cleans between the gum and tooth Type II and III embrasures See waxed floss One time use. Dispose after use Dental tape Waxed floss that has a wider and flatter design to conventional floss Type I embrasures, Floss cleans between the gum and tooth that may have large tooth surface area Type II and III embrasures See waxed floss One time use. Dispose after use Tufted/braided dental floss/ Superfloss Regular diameter floss, wider tufted portion looks like yarn. Tip of product also resembles a threader Type II and III embrasures. Under pontics of fixed partial dentures Type I embrasures Trauma from forcing threader into tissues. Yarnlike portion/fibers may catch on appliances or dental work (which may cause gum irritation/problem) One time use. Dispose after use Continuous floss holder Handle with two prongs in Y or F shape Type I embrasures. Recommended where spacing or gag reflexes make finger-held flossing difficult. Floss holders may assist caregivers Type II and III embrasures Unable to maintain tension of floss against tooth and fully wrap around tooth side. Need to set a fulcrum/finger rest (e.g. cheek, chin) to avoid trauma to gums and floss cuts. Varied designs offer varied ease in repositioning floss. Can be used a number of times; long continuous floss is repositioned after each use. Molded floss holder - two-piece Handle with separable prongs in Y shape Type I embrasures. Recommended where spacing or gag reflexes make finger-held flossing difficult. Floss holders may assist caregivers Type II and III embrasures Eases positioning and moving floss with tension, in tight spaces, and improves visibility. Handle is reused indefinitely. Prongs and molded-in floss are changed after each use, or when frayed. Molded floss holder - one-piece Small handle with prongs in Y or F shape Type I embrasures. Recommended where spacing or gag reflexes make finger-held flossing difficult. Floss holders may assist caregivers Type II and III embrasures Eases positioning and moving floss with tension, in tight spaces, and improves visibility. Pronged handle and molded-in floss are changed after each use, or when frayed. Floss threader A nylon loop designed to resemble a needle with large opening to thread floss. Tip of floss threader inserted and pulled through the space between two teeth to allow cleaning of the teeth sides Type I embrasures: tight contacts between teeth, floss between and under abutment teeth and pontics of fixed prosthesis (e.g. fixed bridges and dental implants), under orthodontic appliances such as wires and lingual bar, under bars for implants Type II and III embrasures Trauma to gums from flossing threader into tissues Can be used a number of times, however floss is to be changed after each use Threader-tip floss A length of floss with an attached threader tip Type I embrasures, Floss cleans between the gum and tooth Type II and III embrasures See waxed floss One time use. Dispose after use The table below describes the different types of Interdental powered self-care products available.[11] Powered flosser Interdental powered self-care products Description Indications Contraindications and limitations Common problems experienced during misuse of product Power flossers Bow type tip and single filament nylon tip Type I embrasures: Individuals with physical challenges. Individuals who cannot master traditional string floss. Individual preference. Type II and III embrasures. Tight contacts between teeth or crowded teeth Floss cuts or clefts with floss holder designs. Unable to maintain tension or wrap floss completely around tooth side. The American Dental Association has stated that flossing in combination with brushing of teeth can help prevent gum disease[13] and halitosis.[14] However, evidence favoring commonplace use of floss remains limited. A 2008 systematic review concluded that adjunct flossing was no more effective than tooth brushing alone in reducing plaque or gingivitis.[3] The authors concluded that routine instruction of flossing in gingivitis patients as helpful adjunct therapy is not supported by scientific evidence, and that flossing recommendations should be made by dental professionals on an individual basis. A 2011 Cochrane Database systematic review identified "some evidence from 12 studies that flossing in addition to tooth brushing reduces gingivitis compared to tooth brushing alone", and "weak, very unreliable evidence from 10 studies that flossing plus tooth brushing may be associated with a small reduction in plaque at 1 and 3 months."[15] Studies of flossing behavior are based on self-report and many people do not floss properly. A 2006 review of 6 studies in which professionals flossed the teeth of school children over a period of 1.7 years showed a 40% reduction in the risk of tooth decay.[16] More recently, a 2019 Cochrane Database systematic review compared toothbrushing alone to interdental cleaning devices, and also compared flossing to other interdental cleaning methods.[17] In all, 35 randomized control trials met the criteria for inclusion, with all but 2 studies at high risk for performance bias. The authors concluded that "overall, the evidence was low to very low certainty, and the effect sizes observed may not be clinically important." As many authors note, the efficacy of flossing may be highly variable based on individual preference, technique, and motivation.[18] Moreover, flossing may be a relatively more difficult and tedious method of interdental cleaning compared to an interdental brush.[18] There was a controversy when the 2015 United States Dietary Guidelines for Americans[19] did not include a recommendation about flossing. The U.S. Department of Health and Human Services and the U.S. Department of Agriculture publish Dietary Guidelines for Americans every five years.[20] Guidelines published in 2000, 2005 and 2010[21] recommended flossing as part of a combined approach to preventing dental diseases. The 2010 Guidelines[22] mention flossing once in 95 pages, in 2005[23] the word also appears once in 71 pages and it appears twice in the 38-page 2000 document.[24] In August 2016, an Associated Press (AP) article titled "Medical benefits of dental floss unproven"[25] reported on the omission of flossing from the 2015 document. The article tied the omission to the AP's Freedom of Information Request to the departments of Health and Human Services and Agriculture where it asked for the scientific evidence behind the Guidelines' flossing recommendation noting that "The guidelines must be based on scientific evidence, under the law." The story was picked up by other news organizations including The New York Times in an article entitled "Feeling Guilty About Not Flossing? Maybe There's No Need".[26] The American Dental Association contacted the U.S. Department of Health and Human Services[27][28] about the omission and reported that the omission of the flossing recommendation was due to the fact that the Dietary Guidelines chose to focus on diet and that the omission was not because the Department questions the efficacy of flossing. As reported by Medscape An HHS spokesperson explained in an e-mailed statement that "since neither the 2010 nor 2015 Advisory Committees reviewed evidence on brushing and flossing teeth, the authors of the current edition decided not to carry forward the information on brushing and flossing included in past editions of the guidelines. By doing so, they were not implying that this is not an important oral hygiene practice. It is also important to note that, although dental floss was mentioned in past editions of the Guidelines, it was most likely identified as a supporting recommendation along with brushing teeth, with the primary emphasis being on the nutrition-based recommendation to reduce added sugars." The 2010 guidelines mention flossing only once, as one of the components of an oral health regimen.[29] A website managed by a maker of dental floss referred to the entire episode as "Flossgate".[30] Orthodontic appliances, such as brackets, wires, and bands, can harbor plaque with more virulent changes in bacterial composition, which can ultimately cause a reduction in periodontal health as indicated by increased gingival recession, bleeding on probing, and plaque retention measurements.[31] Furthermore, fixed appliances makes plaque control more challenging and restricts the natural cleaning action of the tongue, lips, and cheek to remove food and bacterial debris from tooth surfaces, and also creates new plaque stagnation areas that stimulate the colonisation of pathogenic bacteria.[32] Floss threader Patients undergoing orthodontic treatment may be recommended to maintain a high level of plaque control through not only conscientious toothbrushing, but also proximal surface cleaning via interdental aids, with dental floss being the most recommended by dental professionals.[31] Notably, small-scale clinical studies have demonstrated that dental floss, when used correctly, may lead to clinically significant improvements in proximal gingival health.[31] A floss threader is loop of fiber that is shaped in order to produce better handling characteristics. It is (similar to fishing line) used to thread floss into small, hard to reach sites around teeth.[33] Threaders are sometimes required to floss with dental braces, fix retainers, and bridge. Floss pick shapesF-shaped A floss pick is a disposable oral hygiene device generally made of plastic and dental floss. The instrument is composed of two prongs extending from a thin plastic body of high-impact polystyrene material. A single piece of floss runs between the two prongs. The body of the floss pick generally tapers at its end in the shape of a toothpick. There are two types of angled floss picks in the oral care industry, the Y-shaped angle and the F-shaped angle floss pick. At the base of the arch where the "Y" begins to branch there is a handle for gripping and maneuvering before it tapers off into a pick. Floss picks are manufactured in a variety of shapes, colors and sizes for adults and children. The floss can be coated in fluoride, flavor or wax.[34] In 1888, B.T. Mason wrapped a fibrous material around a toothpick and dubbed it the "combination tooth pick."[35] In 1916, J.P. De L'eau invented a dental floss holder between two vertical poles.[36] In 1935, F.H. Doner invented what today's consumer knows as the Y-shaped angled dental appliance.[37] In 1963, James B. Kirby invented a tooth-cleaning device that resembles an archaic version of today's F-shaped floss pick.[38] In 1972, an inventor named Richard L. Wells found a way to attach floss to a single pick end.[39] In the same year, another inventor named Harry Selig Katz came up with a method of making a disposable dental floss tooth pick.[40] A Japanese macaque and long-tailed macaques have been observed in the wild and in captivity flossing with human hair and feathers.[41][42][43] Medicine portal Oral irrigator Tongue cleaner Chlorhexidine Mouthwash Xylitol Sugar-free gum Electric toothbrush ^ "How to Floss". Flossing Techniques-Flossing Teeth Effectively. Colgate. 2015. 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"Serum concentrations of PFASs and exposure-related behaviors in African American and non-Hispanic white women". Journal of Exposure Science & Environmental Epidemiology. 29 (2): 206–217. Bibcode:2019JESEE..29..206B. doi:10.1038/s41370-018-0109-y. PMC 6380931. PMID 30622332. Retrieved from " España es uno de los países con mayor número de casos de caries dental de Europa. Esto es un problema fácil de tratar si el dentista lo detecta a tiempo. Si se deja pasar puede generar grandes daños y puede hacer que incluso pierdas la pieza dental. De hecho, según la odontología neurofocal, las caries pueden afectar de manera negativa otras partes del cuerpo humano, no solo la boca y los dientes. La caries no tratada en dientes permanentes tiene una prevalencia global del 40%, según datos del Atlas de Salud Bucodental en España, elaborado por el Consejo General de Dentistas. En Dentaly sabemos la preocupación que genera la aparición de una nueva caries. Por eso, te vamos a dar todo tipo de información sobre las caries dentales en esta guía completa en la que te explicamos en detalle qué es, tipos que existen, causas de la caries y cómo prevenirla. Definición: Una caries es una enfermedad que ataca y destruye el tejido dentario, comenzando por el esmalte dental. Descubre más. Causas: Factores como la predisposición del diente, acumulación de placa bacteriana y dieta rica en azúcares contribuyen al desarrollo de caries. Ver las causas. Síntomas: Dolor al masticar, sensibilidad a temperaturas, agujeros visibles en los dientes y mal aliento son síntomas comunes de la caries. Ver los síntomas. Prevención y tratamiento: Consejos como evitar bebidas azucaradas, cepillarse los dientes regularmente y tratamientos como empastes o endodoncias ayudan a prevenir y tratar la caries. Aprende a prevenirlas. Caries infantil: La caries afecta a un gran porcentaje de niños, siendo importante la prevención con pastas dentales con flúor y cuidados adecuados. Más sobre caries infantil. ¿Qué son las caries? Una caries es una enfermedad que ataca y destruye el tejido dentario. Comienza por la capa más externa del diente, llamada esmalte dental. La placa dental está formada por bacterias que metabolizan los azúcares de los alimentos que comemos. Como resultado de dicho metabolismo bacteriano, se libera ácido que, al entrar en contacto con el diente, comienza a descomponer el esmalte de forma progresiva provocando caries. Se trata de una afección asociada con el estilo de vida de cada uno: la dieta, la higiene bucal… En este vídeo podrás ver en profundidad en qué consiste una caries dental: Tipos de caries dental Existen las caries simples (cuando abarcan una única cara del diente), compuestas (abarcan dos caras) o complejas (abarcan más de dos caras). También: Las caries aguda y crónica se diferencian por su nivel de avance (drástico o lento y progresivo) aunque actualmente esta clasificación ha quedado en desuso. Caries atípica. Actualmente la clasificación se realiza según su ubicación en la pieza y la parte del diente afectada: Dependiendo de la parte de tejido del diente afectado pueden ser: Es uno de los tipos de caries más frecuentes y la que habitualmente el paciente no da importancia, ya que no genera dolor. Tiene la particularidad de ser un tipo de caries que avanza lentamente. En este tipo de afección se puede notar un daño que comienza en el esmalte con la presencia de una mancha de color blanquecino en la superficie dental, y luego avanza hasta formar una cavidad con fondo oscuro. Comienza por el esmalte o el cemento y avanza hasta llegar a la dentina. Se diagnostica a simple vista, sin necesidad de una radiografía. Se trata de una caries muy profunda que afecta al esmalte, la dentina y la pulpa. Dependiendo de la zona del diente en la que se encuentra, pueden ser: Este tipo de caries se presenta en la parte coronal del diente, particularmente la cara de los premolares y molares con la que el paciente mastica, y que tiene surcos y fisuras donde se acumulan bacterias y restos de alimentos, por lo que se tienden a acumular. Es un tipo de caries muy común que puede ser identificada por el cambio de color en la superficie del diente. Es una caries que se forma en la raíz del diente y por lo general se forma en el cuello del mismo. Son caries coronales que se forman en las caras interproximales de los dientes, por lo que son muy difíciles de diagnosticar a simple vista. Se forman, como todas las caries, debido a la liberación de ácidos tras el metabolismo bacteriano. Las radiografías Bite wing son de gran ayuda en el diagnóstico de una caries interproximal. Existen también las caries de tipo recurrente, que se producen en los contornos de las restauraciones, generalmente por una filtracion bacteriana. Son caries recurrentes o secundarias que se producen en el mismo lugar de una caries ya tratada. ¿Qué son las cavidades dentales? Una cavitación o cavidad dental surge cuando lo que comenzó como una mancha de desmineralizacion termina convirtiéndose en un agujero. Muchas veces cavitación y caries son usadas como sinónimos, pero la cavitación es la lesión elemental de la caries. ¿Cuáles son las causas de la caries dental? Todas las personas son propensas a padecer este tipo de afección. Existen 3 factores etiológicos de la caries dental: Predisposición del diente: hay dientes susceptibles a las caries cuya anatomía presenta muchos surcos, fisuras y zonas de difícil limpieza. Acumulación de placa bacteriana en los dientes. Tiempo: la coexistencia de estos factores de manera prolongada. Dieta rica en azúcares. Como el factor principal para desarrollar caries es la acumulación de placa en la superficie de la pieza dental, también hay que tener en cuenta los siguientes aspectos que podemos controlar: Un ph bucal muy bajo. Consumo de gaseosas y bebidas energéticas. Beber alcohol en las comidas. Una inadecuada higiene bucal. Fumar. No hacerse revisiones dentales con regularidad. Características de las caries ¿Cómo saber si tienes caries? Para poder detectarlas con seguridad es necesario acudir a un odontólogo. De esta manera la afección será tratada a tiempo, evitando así que pueda avanzar y causar un daño mayor. No obstante, hay algunos síntomas que te pueden poner en alerta y hacer que acudas al dentista de urgencias. Las cavidades dentales pueden distinguirse por la presencia de una mancha oscura en la pieza dental o dependiendo del tamaño, se puede incluso sentir el agujero al pasar la lengua por el diente. El signo más evidente de una caries es una mancha negra, gris, blanca o parda en el diente, pero hay otro síntomas: Entre los síntomas de la caries más frecuentes se encuentran: Ante cualquiera de estos síntomas te recomendamos asistir al odontólogo lo antes posible. Caries: medidas preventivas Posiblemente habrás escuchado varias veces la frase de que «es mejor prevenir que curar». Por eso, te damos algunos consejos para de cuidar de una forma adecuada las piezas dentales y prevenir, en la medida de lo posible, la aparición de esta enfermedad: No consumas bebidas gaseosas o azucaradas. Cepíllate los dientes después de cada comida: si no puedes, es recomendable masticar chicles sin azúcar y elaborados con xilitol. Realiza un cambio del cepillo de dientes de forma regular, preferiblemente después de 3 meses de uso. Te recomendamos usar una pasta de dientes con flúor. Usa un colutorio: utiliza un enjuague bucal antibacteriano y niveles adecuados de flúor. Tratamientos para la caries El tratamiento va a depender del avance de la lesión dentro de la pieza dental, por lo que el dentista puede requerir la realización de una placa radiográfica para poder evaluar la dimensión de la cavidad, en especial si se encuentra entre las piezas dentales, siendo más difícil de diagnosticar.Si la afección es detectada en una etapa temprana, puede que el esmalte no haya sido dañado por completo. Si no existe cavitacion, simplemente se puede remineralizar la mancha blanca. Cuando la hay, se realiza un empaste. El uso de la anestesia o no va a depender de la profundidad de la caries. Si la caries llega hasta la pulpa dental, ésta se infectará y será necesario la realización de un tratamiento de conducto para poder retirar todo el tejido descompuesto y acumulado dentro de la cavidad. Después, dependiendo de cuanto diente sano quede, se podra reconstruir el diente mediante un empaste, una incrustación, o en el peor de los casos una corona. Si hay que extraer la pieza, el dentista puede ofrecerte varias opciones para reemplazarlo de forma artificial, como por ejemplo los puentes o los implantes dentales. La caries infantil La caries es un problema que afecta a un gran porcentaje de niños a nivel mundial, siendo más frecuente en países con mayor nivel de pobreza, en gran parte por la deficiencia en cuanto a la atención médica. En España afecta al 33% de los niños menores de 5 años. A pesar de ser un problema muy frecuente, existen diversas maneras en las que los padres pueden intervenir para evitar el daño en las piezas dentales de sus hijos, como utilizar pastas dentales con flúor. Una caries común en niños es la caries rampante o caries del biberón. Esta caries es de tipo agudo y se produce en los dientes de leche. Suele ocurrir generalmente al quedarse dormidos toda la noche con el biberón (que contiene azúcares) en la boca. Son de un color amarillento o pardo con una textura blanca, y puede diagnosticarse con la vista o palpando la lesión. Si te interesa leer este tema más en profundidad recomendamos echarle un ojo a nuestro artículo de caries infantil. Preguntas frecuentes ¿Cómo curar las caries? Las caries son un proceso irreversible. Si se presentan, hay que tratarlas lo antes posible. Dependiendo de cuánto haya avanzado, un dentista realizará una remineralización del esmalte, un empaste, una endodoncia o incluso una extracción. ¿Cómo eliminar las caries naturalmente? No existe ningún método para curar una caries de manera natural. Si presentas dolor y no puedes acudir al dentista de inmediato, nuestro artículo sobre remedios caseros para el dolor de muela puede ayudarte a aliviar las molestias. ¿Qué tipo de microorganismos producen las caries? La principal responsable de provocar las caries es la bacteria Streptococcus mutans. Otro microorganismo importante en el desarrollo de esta infección es el Lactobacillus acidophilus. ¿Cómo sé si la caries me ha llegado al nervio? En algunos casos, el daño del nervio dental no produce síntomas. No obstante, lo más común es que se sienta algo de dolor o incomodidad en el diente afectado, sensibilidad, fiebre o que surja un flemón o absceso dental. Deformation of teeth due to acids produced by bacteria For caries of bone, see Osteolysis. Medical conditionTooth decayOther namesDental cavities, dental caries, cavities, cariesDestruction of a tooth by dental caries and diseasePronunciationCaries /ˈkɛəriːz/ SpecialtyDentistrySymptomsPain, tooth loss, difficulty eating[1][2]ComplicationsInflammation around the tooth, tooth loss, infection or abscess formation[1][3]DurationLong termCausesBacteria producing acid from food debris[4]Risk factorsDiet high in simple sugar, diabetes mellitus, Sjögren syndrome, medications that decrease saliva[4]PreventionLow-sugar diet, tooth brushing, fluoride, flossing[2][5]MedicationParacetamol (acetaminophen), ibuprofen[6]Frequency3.6 billion (2016)[7] Tooth decay, also known as caries,[a] is the breakdown of teeth due to acids produced by bacteria.[6] The resulting cavities may be a number of different colors, from yellow to black.[1] Symptoms may include pain and difficulty eating.[1][2] Complications may include inflammation of the tissue around the tooth, tooth loss and infection or abscess formation.[1][3] Tooth regeneration is an ongoing stem cell–based field of study that aims to find methods to reverse the effects of decay; current methods are based on easing symptoms. The cause of cavities is acid from bacteria dissolving the hard tissues of the teeth (enamel, dentin and cementum).[4] The acid is produced by the bacteria when they break down food debris or sugar on the tooth surface.[4] Simple sugars in food are these bacteria's primary energy source and thus a diet high in simple sugar is a risk factor.[4] If mineral breakdown is greater than buildup from sources such as saliva, caries results.[4] Risk factors include conditions that result in less saliva, such as diabetes mellitus, Sjögren syndrome and some medications.[4] Medications that decrease saliva production include antihistamines and antidepressants.[4] Dental caries are also associated with poverty, poor cleaning of the mouth, and receding gums resulting in exposure of the roots of the teeth.[6][8] Prevention of dental caries includes regular cleaning of the teeth, a diet low in sugar, and small amounts of fluoride.[2][4] Brushing one's teeth twice per day, and flossing between the teeth once a day is recommended.[4][6] Fluoride may be acquired from water, salt or toothpaste among other sources.[2] Treating a mother's dental caries may decrease the risk in her children by decreasing the number of certain bacteria she may spread to them.[4] Screening can result in earlier detection.[6] Depending on the extent of destruction, various treatments can be used to restore the tooth to proper function, or the tooth may be removed.[6] There is no known method to grow back large amounts of tooth.[9] The availability of treatment is often poor in the developing world.[2] Paracetamol (acetaminophen) or ibuprofen may be taken for pain.[6] Worldwide, approximately 3.6 billion people (48% of the population) have dental caries in their permanent teeth as of 2016.[7] The World Health Organization estimates that nearly all adults have dental caries at some point in time.[2] In baby teeth it affects about 620 million people or 9% of the population.[10] They have become more common in both children and adults in recent years.[11] The disease is most common in the developed world due to greater simple sugar consumption, but less common in the developing world.[6] Caries is Latin for "rottenness".[3] (A) A small spot of decay visible on the surface of a tooth. (B) The radiograph reveals an extensive region of demineralization within the dentin (arrows). (C) A hole is discovered on the side of the tooth at the beginning of decay removal. (D) All decay removed; ready for a filling. A person experiencing caries may not be aware of the disease.[12] The earliest sign of a new carious lesion is the appearance of a chalky white spot on the surface of the tooth, indicating an area of demineralization of enamel. This is referred to as a white spot lesion, an incipient carious lesion, or a "micro-cavity".[13] As the lesion continues to demineralize, it can turn brown but will eventually turn into a cavitation ("cavity"). Before the cavity forms, the process is reversible, but once a cavity forms, the lost tooth structure cannot be regenerated. A lesion that appears dark brown and shiny suggests dental caries were once present, but the demineralization process has stopped, leaving a stain. Active decay is lighter in color and dull in appearance.[14] As the enamel and dentin are destroyed, the cavity becomes more noticeable. The affected areas of the tooth change color and become soft to the touch. Once the decay passes through the enamel, the dentinal tubules, which have passages to the nerve of the tooth, become exposed, resulting in pain that can be transient, temporarily worsening with exposure to heat, cold, or sweet foods and drinks.[15] A tooth weakened by extensive internal decay can sometimes suddenly fracture under normal chewing forces. When the decay has progressed enough to allow the bacteria to overwhelm the pulp tissue in the center of the tooth, a toothache can result, and the pain will become more constant. Death of the pulp tissue and infection are common consequences. The tooth will no longer be sensitive to hot or cold but can be very tender to pressure. Dental caries can also cause bad breath and foul tastes.[16] In highly progressed cases, an infection can spread from the tooth to the surrounding soft tissues. Complications such as cavernous sinus thrombosis and Ludwig angina can be life-threatening.[17][18][19] Diagrammatic representation of acidogenic theory of causation of dental caries. Four factors, namely, a suitable carbohydrate substrate (1), micro-organisms in dental plaque (2), a susceptible tooth surface (3) and time (4); must be present together for dental caries to occur (5). Saliva (6) and fluoride (7) are modifying factors. Four things are required for caries to form: a tooth surface (enamel or dentin), caries-causing bacteria, fermentable carbohydrates (such as sucrose), and time.[20] This involves adherence of food to the teeth and acid creation by the bacteria that makes up the dental plaque.[21] However, these four criteria are not always enough to cause the disease and a sheltered environment promoting development of a cariogenic biofilm is required. The caries disease process does not have an inevitable outcome, and different individuals will be susceptible to different degrees depending on the shape of their teeth, oral hygiene habits, and the buffering capacity of their saliva. Dental caries can occur on any surface of a tooth that is exposed to the oral cavity, but not the structures that are retained within the bone.[22] Tooth decay is caused by biofilm (dental plaque) lying on the teeth and maturing to become cariogenic (causing decay). Certain bacteria in the biofilm produce acids, primarily lactic acid, in the presence of fermentable carbohydrates such as sucrose, fructose, and glucose.[23][24][25] Caries occur more often in people from the lower end of the socio-economic scale than people from the upper end of the socio-economic scale, due to lack of education about dental care, and lack of access to professional dental care which may be expensive.[26] A Gram stain image of Streptococcus mutansSee also: Oral ecology The most common bacteria associated with dental cavities are the mutans streptococci, most prominently Streptococcus mutans and Streptococcus sobrinus, and lactobacilli. However, cariogenic bacteria (the ones that can cause the disease) are present in dental plaque, but they are usually in too low concentrations to cause problems unless there is a shift in the balance.[27] This is driven by local environmental change, such as frequent sugar intake or inadequate biofilm removal (toothbrushing).[28] If left untreated, the disease can lead to pain, tooth loss and infection.[29] The mouth contains a wide variety of oral bacteria, but only a few specific species of bacteria are believed to cause dental caries: Streptococcus mutans and Lactobacillus species among them. Streptococcus mutans are gram-positive bacteria which constitute biofilms on the surface of teeth. These organisms can produce high levels of lactic acid following fermentation of dietary sugars and are resistant to the adverse effects of low pH, properties essential for cariogenic bacteria.[24] As the cementum of root surfaces is more easily demineralized than enamel surfaces, a wider variety of bacteria can cause root caries, including Lactobacillus acidophilus, Actinomyces spp., Nocardia spp., and Streptococcus mutans. Bacteria collect around the teeth and gums in a sticky, creamy-coloured mass called plaque, which serves as a biofilm. Some sites collect plaque more commonly than others, for example, sites with a low rate of salivary flow (molar fissures). Grooves on the occlusal surfaces of molar and premolar teeth provide microscopic retention sites for plaque bacteria, as do the interproximal sites. Plaque may also collect above or below the gingiva, where it is referred to as supra- or sub-gingival plaque, respectively. These bacterial strains, most notably S. mutans, can be inherited by a child from a caretaker's kiss or through feeding pre-masticated food.[30] Bacteria in a person's mouth convert glucose, fructose, and most commonly sucrose (table sugar) into acids, mainly lactic acid, through a glycolytic process called fermentation.[23][25] If left in contact with the tooth, these acids may cause demineralization, which is the dissolution of its mineral content. The process is dynamic, however, as remineralization can also occur if the acid is neutralized by saliva or mouthwash. Fluoride toothpaste or dental varnish may aid remineralization.[31] If demineralization continues over time, enough mineral content may be lost so that the soft organic material left behind disintegrates, forming a cavity or hole. The impact such sugars have on the progress of dental caries is called cariogenicity. Sucrose, although a bound glucose and fructose unit, is in fact more cariogenic than a mixture of equal parts of glucose and fructose. This is due to the bacteria using the energy in the saccharide bond between the glucose and fructose subunits. S.mutans adheres to the biofilm on the tooth by converting sucrose into an extremely adhesive substance called dextran polysaccharide by the enzyme dextran sucranase.[32] "Stephan curve", showing sudden decrease in plaque pH following glucose rinse, which returns to normal after 30–60 min. Net demineralization of dental hard tissues occurs below the critical pH (5.5), shown in yellow. The frequency with which teeth are exposed to cariogenic (acidic) environments affects the likelihood of caries development.[citation needed] After meals or snacks, the bacteria in the mouth metabolize sugar, resulting in an acidic by-product that decreases pH. As time progresses, the pH returns to normal due to the buffering capacity of saliva and the dissolved mineral content of tooth surfaces. During every exposure to the acidic environment, portions of the inorganic mineral content at the surface of teeth dissolve and can remain dissolved for two hours.[33] Since teeth are vulnerable during these acidic periods, the development of dental caries relies heavily on the frequency of acid exposure. The carious process can begin within days of a tooth's erupting into the mouth if the diet is sufficiently rich in suitable carbohydrates. Evidence suggests that the introduction of fluoride treatments has slowed the process.[34] Proximal caries take an average of four years to pass through enamel in permanent teeth. Because the cementum enveloping the root surface is not nearly as durable as the enamel encasing the crown, root caries tend to progress much more rapidly than decay on other surfaces. The progression and loss of mineralization on the root surface is 2.5 times faster than caries in enamel. In very severe cases where oral hygiene is very poor and where the diet is very rich in fermentable carbohydrates, caries may cause cavities within months of tooth eruption. This can occur, for example, when children continuously drink sugary drinks from baby bottles (see later discussion). Tooth decay There are certain diseases and disorders affecting teeth that may leave an individual at a greater risk for cavities. Molar incisor hypo-mineralization seems to be increasingly common.[35] While the cause is unknown it is thought to be a combination of genetic and environmental factors.[36] Possible contributing factors that have been investigated include systemic factors such as high levels of dioxins or polychlorinated biphenyl (PCB) in the mother's milk, premature birth and oxygen deprivation at birth, and certain disorders during the child's first 3 years such as mumps, diphtheria, scarlet fever, measles, hypoparathyroidism, malnutrition, malabsorption, hypo-vitaminosis D, chronic respiratory diseases, or undiagnosed and untreated coeliac disease, which usually presents with mild or absent gastrointestinal symptoms.[35][37][38][39][40][41] Amelogenesis imperfecta, which occurs in between 1 in 718 and 1 in 14,000 individuals, is a disease in which the enamel does not fully form or forms in insufficient amounts and can fall off a tooth.[42] In both cases, teeth may be left more vulnerable to decay because the enamel is not able to protect the tooth.[43] In most people, disorders or diseases affecting teeth are not the primary cause of dental caries. Approximately 96% of tooth enamel is composed of minerals.[44] These minerals, especially hydroxyapatite, will become soluble when exposed to acidic environments. Enamel begins to demineralize at a pH of 5.5.[45] Dentin and cementum are more susceptible to caries than enamel because they have lower mineral content.[46] Thus, when root surfaces of teeth are exposed from gingival recession or periodontal disease, caries can develop more readily. Even in a healthy oral environment, however, the tooth is susceptible to dental caries. The evidence for linking malocclusion and/or crowding to dental caries is weak;[47][48] however, the anatomy of teeth may affect the likelihood of caries formation. Where the deep developmental grooves of teeth are more numerous and exaggerated, pit and fissure caries is more likely to develop (see next section). Also, caries is more likely to develop when food is trapped between teeth. Reduced salivary flow rate is associated with increased caries since the buffering capability of saliva is not present to counterbalance the acidic environment created by certain foods. As a result, medical conditions that reduce the amount of saliva produced by salivary glands, in particular the submandibular gland and parotid gland, are likely to lead to dry mouth and thus to widespread tooth decay. Examples include Sjögren syndrome, diabetes mellitus, diabetes insipidus, and sarcoidosis.[49] Medications, such as antihistamines and antidepressants, can also impair salivary flow. Stimulants, most notoriously methylamphetamine, also occlude the flow of saliva to an extreme degree. This is known as meth mouth. Tetrahydrocannabinol (THC), the active chemical substance in cannabis, also causes a nearly complete occlusion of salivation, known in colloquial terms as "cotton mouth". Moreover, 63% of the most commonly prescribed medications in the United States list dry mouth as a known side-effect.[49] Radiation therapy of the head and neck may also damage the cells in salivary glands, somewhat increasing the likelihood of caries formation.[50][51] Susceptibility to caries can be related to altered metabolism in the tooth, in particular to fluid flow in the dentin. Experiments on rats have shown that a high-sucrose, cariogenic diet "significantly suppresses the rate of fluid motion" in dentin.[52] The use of tobacco may also increase the risk for caries formation. Some brands of smokeless tobacco contain high sugar content, increasing susceptibility to caries.[53] Tobacco use is a significant risk factor for periodontal disease, which can cause the gingiva to recede.[54] As the gingiva loses attachment to the teeth due to gingival recession, the root surface becomes more visible in the mouth. If this occurs, root caries is a concern since the cementum covering the roots of teeth is more easily demineralized by acids than enamel.[55] Currently, there is not enough evidence to support a causal relationship between smoking and coronal caries, but evidence does suggest a relationship between smoking and root-surface caries.[56] Exposure of children to secondhand tobacco smoke is associated with tooth decay.[57] Intrauterine and neonatal lead exposure promote tooth decay.[58][59][60][61][62][63][64] Besides lead, all atoms with electrical charge and ionic radius similar to bivalent calcium,[65] such as cadmium, mimic the calcium ion and therefore exposure to them may promote tooth decay.[66] Poverty is also a significant social determinant for oral health.[67] Dental caries have been linked with lower socio-economic status and can be considered a disease of poverty.[68] Forms are available for risk assessment for caries when treating dental cases; this system using the evidence-based Caries Management by Risk Assessment (CAMBRA).[69] It is still unknown if the identification of high-risk individuals can lead to more effective long-term patient management that prevents caries initiation and arrests or reverses the progression of lesions.[70] Saliva also contains iodine and EGF. EGF results effective in cellular proliferation, differentiation and survival.[71] Salivary EGF, which seems also regulated by dietary inorganic iodine, plays an important physiological role in the maintenance of oral (and gastro-oesophageal) tissue integrity, and, on the other hand, iodine is effective in prevention of dental caries and oral health.[72] Microbe communities attach to tooth surface and create a biofilm. As the biofilm grows an anaerobic environment forms from the oxygen being used. Microbes use sucrose and other dietary sugars as a food source. The dietary sugars go through anaerobic fermentation pathways producing lactate. The lactate is excreted from the cell onto the tooth enamel

then ionizes. The lactate ions demineralize the hydroxyapatite crystals causing the tooth to degrade. The progression of pit and fissure caries resembles two triangles with their bases meeting along the junction of enamel and dentin. Teeth are bathed in saliva and have a coating of bacteria on them (biofilm) that continually forms. The development of biofilm begins with pellicle formation. Pellicle is an acellular proteinaceous film which covers the teeth. Bacteria colonize on the teeth by adhering to the pellicle-coated surface. Over time, a mature biofilm is formed, creating a cariogenic environment on the tooth surface.[73][74] The minerals in the hard tissues of the teeth – enamel, dentin and cementum – are constantly undergoing demineralization and remineralization. Dental caries result when the demineralization rate is faster than the remineralization, producing net mineral loss, which occurs when there is an ecologic shift within the dental biofilm from a balanced population of microorganisms to a population that produces acids and can survive in an acid environment.[75] Tooth enamel is a highly mineralized acellular tissue, and caries act upon it through a chemical process brought on by the acidic environment produced by bacteria. As the bacteria consume the sugar and use it for their own energy, they produce lactic acid. The effects of this process include the demineralization of crystals in the enamel, caused by acids, over time until the bacteria physically penetrate the dentin. Enamel rods, which are the basic unit of the enamel structure, run perpendicularly from the surface of the tooth to the dentin. Since demineralization of enamel by caries follows the direction of the enamel rods, the different triangular patterns between pit and fissure and smooth-surface caries develop in the enamel because the orientation of enamel rods are different in the two areas of the tooth.[76] As the enamel loses minerals, and dental caries progresses, the enamel develops several distinct zones, visible under a light microscope. From the deepest layer of the enamel to the enamel surface, the identified areas are the: translucent zone, dark zones, body of the lesion, and surface zone.[77] The translucent zone is the first visible sign of caries and coincides with a one to two percent loss of minerals.[78] A slight remineralization of enamel occurs in the dark zone, which serves as an example of how the development of dental caries is an active process with alternating changes.[79] The area of greatest demineralization and destruction is in the body of the lesion itself. The surface zone remains relatively mineralized and is present until the loss of tooth structure results in a cavitation. Unlike enamel, the dentin reacts to the progression of dental caries. After tooth formation, the ameloblasts, which produce enamel, are destroyed once enamel formation is complete and thus cannot later regenerate enamel after its destruction. On the other hand, dentin is produced continuously throughout life by odontoblasts, which reside at the border between the pulp and dentin. Since odontoblasts are present, a stimulus, such as caries, can trigger a biologic response. These defense mechanisms include the formation of sclerotic and tertiary dentin.[80] In dentin from the deepest layer to the enamel, the distinct areas affected by caries are the advancing front, the zone of bacterial penetration, and the zone of destruction.[76] The advancing front represents a zone of demineralized dentin due to acid and has no bacteria present. The zones of bacterial penetration and destruction are the locations of invading bacteria and ultimately the decomposition of dentin. The zone of destruction has a more mixed bacterial population where proteolytic enzymes have destroyed the organic matrix. The innermost dentin caries has been reversibly attacked because the collagen matrix is not severely damaged, giving it potential for repair. The faster spread of caries through dentin creates this triangular appearance in smooth surface caries. The structure of dentin is an arrangement of microscopic channels, called dentinal tubules, which radiate outward from the pulp chamber to the exterior cementum or enamel border.[81] The diameter of the dentinal tubules is largest near the pulp (about 2.5 μm) and smallest (about 900 nm) at the junction of dentin and enamel.[82] The carious process continues through the dentinal tubules, which are responsible for the triangular patterns resulting from the progression of caries deep into the tooth. The tubules also allow caries to progress faster. In response, the fluid inside the tubules brings immunoglobulins from the immune system to fight the bacterial infection. At the same time, there is an increase of mineralization of the surrounding tubules.[83] This results in a constriction of the tubules, which is an attempt to slow the bacterial progression. In addition, as the acid from the bacteria demineralizes the hydroxyapatite crystals, calcium and phosphorus are released, allowing for the precipitation of more crystals which fall deeper into the dentinal tubule. These crystals form a barrier and slow the advancement of caries. After these protective responses, the dentin is considered sclerotic. According to hydrodynamic theory, fluids within dentinal tubules are believed to be the mechanism by which pain receptors are triggered within the pulp of the tooth.[84] Since sclerotic dentin prevents the passage of such fluids, pain that would otherwise serve as a warning of the invading bacteria may not develop at first. See also: Tertiary dentin In response to dental caries, there may be production of more dentin toward the direction of the pulp. This new dentin is referred to as tertiary dentin.[82] Tertiary dentin is produced to protect the pulp for as long as possible from the advancing bacteria. As more tertiary dentin is produced, the size of the pulp decreases. This type of dentin has been subdivided according to the presence or absence of the original odontoblasts.[85] If the odontoblasts survive long enough to react to the dental caries, then the dentin produced is called "reactionary" dentin. If the odontoblasts are killed, the dentin produced is called "reparative" dentin. In the case of reparative dentin, other cells are needed to assume the role of the destroyed odontoblasts. Growth factors, especially TGF-β,[85] are thought to initiate the production of reparative dentin by fibroblasts and mesenchymal cells of the pulp.[86] Reparative dentin is produced at an average of 1.5 μm/day, but can be increased to 3.5 μm/day. The resulting dentin contains irregularly shaped dentinal tubules that may not line up with existing dentinal tubules. This diminishes the ability for dental caries to progress within the dentinal tubules. The incidence of cemental caries increases in older adults as gingival recession occurs from either trauma or periodontal disease. It is a chronic condition that forms a large, shallow lesion and slowly invades first the root's cementum and then dentin to cause a chronic infection of the pulp (see further discussion under classification by affected hard tissue). Because dental pain is a late finding, many lesions are not detected early, resulting in restorative challenges and increased tooth loss.[87] The tip of a dental explorer, which is used for caries diagnosis A dental infection resulting in an abscess and inflammation of the maxillary sinus Tooth samples imaged with a non-coherent continuous light source (row 1), LSI (row 2) and pseudo-color visualization of LSI (row 3)[88] The presentation of caries is highly variable. However, the risk factors and stages of development are similar. Initially, it may appear as a small chalky area (smooth surface caries), which may eventually develop into a large cavitation. Sometimes caries may be directly visible. However other methods of detection such as X-rays are used for less visible areas of teeth and to judge the extent of destruction. Lasers for detecting caries allow detection without ionizing radiation and are now used for detection of interproximal decay (between the teeth). Primary diagnosis involves inspection of all visible tooth surfaces using a good light source, dental mirror and explorer. Dental radiographs (X-rays) may show dental caries before it is otherwise visible, in particular caries between the teeth. Large areas of dental caries are often apparent to the naked eye, but smaller lesions can be difficult to identify. Visual and tactile inspection along with radiographs are employed frequently among dentists, in particular to diagnose pit and fissure caries.[89] Early, uncavitated caries is often diagnosed by blowing air across the suspect surface, which removes moisture and changes the optical properties of the unmineralized enamel. Some dental researchers have cautioned against the use of dental explorers to find caries,[90] in particular sharp ended explorers. In cases where a small area of tooth has begun demineralizing but has not yet cavitated, the pressure from the dental explorer could cause a cavity. Since the carious process is reversible before a cavity is present, it may be possible to arrest caries with fluoride and remineralize the tooth surface. When a cavity is present, a restoration will be needed to replace the lost tooth structure. At times, pit and fissure caries may be difficult to detect. Bacteria can penetrate the enamel to reach dentin, but then the outer surface may remineralize, especially if fluoride is present.[91] These caries, sometimes referred to as "hidden caries", will still be visible on X-ray radiographs, but visual examination of the tooth would show the enamel intact or minimally perforated. The differential diagnosis for dental caries includes dental fluorosis and developmental defects of the tooth including hypomineralization of the tooth and hypoplasia of the tooth.[92] The early carious lesion is characterized by demineralization of the tooth surface, altering the tooth's optical properties. Technology using laser speckle image (LSI) techniques may provide a diagnostic aid to detect early carious lesions.[88] G. V. Black Classification of Restorations Caries can be classified by location, etiology, rate of progression, and affected hard tissues.[93] These forms of classification can be used to characterize a particular case of tooth decay to more accurately represent the condition to others and also indicate the severity of tooth destruction. In some instances, caries is described in other ways that might indicate the cause. The G. V. Black classification is as follows: Class I: occlusal surfaces of posterior teeth, buccal or lingual pits on molars, lingual pit near cingulum of maxillary incisors Class II: proximal surfaces of posterior teeth Class III: interproximal surfaces of anterior teeth without incisal edge involvement Class IV: interproximal surfaces of anterior teeth with incisal edge involvement Class V: cervical third of facial or lingual surface of tooth Class VI: incisal or occlusal edge is worn away due to attrition Rampant caries caused by methamphetamine abuse Early childhood caries (ECC), also known as "baby bottle caries," "baby bottle tooth decay" or "bottle rot," is a pattern of decay found in young children with their deciduous (baby) teeth. This must include the presence of at least one carious lesion on a primary tooth in a child under the age of 6 years.[94] The teeth most likely affected are the maxillary anterior teeth, but all teeth can be affected.[95] The name for this type of caries comes from the fact that the decay usually is a result of allowing children to fall asleep with sweetened liquids in their bottles or feeding children sweetened liquids multiple times during the day.[96] Another pattern of decay is "rampant caries", which signifies advanced or severe decay on multiple surfaces of many teeth.[97] Rampant caries may be seen in individuals with xerostomia, poor oral hygiene, stimulant use (due to drug-induced dry mouth[98]), and/or large sugar intake. If rampant caries is a result of previous radiation to the head and neck, it may be described as radiation-induced caries. Problems can also be caused by the self-destruction of roots and whole tooth resorption when new teeth erupt or later from unknown causes. Children at 6–12 months are at increased risk of developing dental caries.[99] A range of studies have reported that there is a correlation between caries in primary teeth and caries in permanent teeth.[100][101] This section needs additional citations for verification. Please help improve this article by adding citations to reliable sources in this section. Unsourced material may be challenged and removed. (November 2016) (Learn how and when to remove this message) Temporal descriptions can be applied to caries to indicate the progression rate and previous history. "Acute" signifies a quickly developing condition, whereas "chronic" describes a condition that has taken an extended time to develop, in which thousands of meals and snacks, many causing some acid demineralization that is not remineralized, eventually result in cavities. Recurrent caries, also described as secondary, are caries that appear at a location with a previous history of caries. This is frequently found on the margins of fillings and other dental restorations. On the other hand, incipient caries describes decay at a location that has not experienced previous decay. Arrested caries describes a lesion on a tooth that was previously demineralized but was remineralized before causing a cavitation. Fluoride treatment can help recalcification of tooth enamel as well as the use of amorphous calcium phosphate. Micro-invasive interventions (such as dental sealant or resin infiltration) have been shown to slow down the progression of proximal decay.[102] Depending on which hard tissues are affected, it is possible to describe caries as involving enamel, dentin, or cementum. Early in its development, caries may affect only enamel. Once the extent of decay reaches the deeper layer of dentin, the term "dentinal caries" is used. Since cementum is the hard tissue that covers the roots of teeth, it is not often affected by decay unless the roots of teeth are exposed to the mouth. Although the term "cementum caries" may be used to describe the decay on roots of teeth, very rarely does caries affect the cementum alone. Toothbrushes are commonly used to clean teeth. The primary approach to dental hygiene care consists of tooth-brushing and flossing. The purpose of oral hygiene is to remove and prevent the formation of plaque or dental biofilm,[103] although studies have shown this effect on caries is limited.[104] While there is no evidence that flossing prevents tooth decay,[105] the practice is still generally recommended.[5] A toothbrush can be used to remove plaque on accessible surfaces, but not between teeth or inside pits and fissures on chewing surfaces. When used correctly, dental floss removes plaque from areas that could otherwise develop proximal caries but only if the depth of sulcus has not been compromised. Additional aids include interdental brushes, water picks, and mouthwashes. The use of rotational electric toothbrushes might reduce the risk of plaque and gingivitis, though it is unclear whether they are of clinical importance.[106] However, oral hygiene is effective at preventing gum disease (gingivitis / periodontal disease). Food is forced inside pits and fissures under chewing pressure, leading to carbohydrate-fuelled acid demineralisation where the brush, fluoride toothpaste, and saliva have no access to remove trapped food, neutralise acid, or remineralise tooth enamel. (Occlusal caries accounts for between 80 and 90% of caries in children (Weintraub, 2001).) Unlike brushing, fluoride leads to proven reduction in caries incidence by approximately 25%; higher concentrations of fluoride (>1,000 ppm) in toothpaste also helps prevents tooth decay, with the effect increasing with concentration up to a plateau.[107] A randomized clinical trial demonstrated that toothpastes that contain arginine have greater protection against tooth cavitation than the regular fluoride toothpastes containing 1450 ppm alone.[108] A Cochrane review has confirmed that the use of fluoride gels, normally applied by a dental professional from once to several times a year, assists in the prevention of tooth decay in children and adolescents, reiterating the importance of fluoride as the principal means of caries prevention.[109] Another review concluded that the supervised regular use of a fluoride mouthwash greatly reduced the onset of decay in the permanent teeth of children.[110] Professional hygiene care consists of regular dental examinations and professional prophylaxis (cleaning). Sometimes, complete plaque removal is difficult, and a dentist or dental hygienist may be needed. Along with oral hygiene, radiographs may be taken at dental visits to detect possible dental caries development in high-risk areas of the mouth (e.g. "bitewing" X-rays which visualize the crowns of the back teeth). Alternative methods of oral hygiene also exist around the world, such as the use of teeth cleaning twigs such as miswaks in some Middle Eastern and African cultures. There is some limited evidence demonstrating the efficacy of these alternative methods of oral hygiene.[111] Annual caries incidence increases exponentially with annual per capita sugar consumption. Data based on 10,553 Japanese children whose individual lower first molar teeth were monitored yearly from the age of 6 to 11 years of age. Caries plotted on a logarithmic scale, so line is straight. People who eat more free sugars get more cavities, with cavities increasing exponentially with increasing sugar intake. Populations with less sugar intake have fewer cavities. In one population, in Nigeria, where sugar consumption was about 2g/day, only two percent of the population, of any age, had had a cavity.[112] Chewy and sticky foods (such as candy, cookies, potato chips, and crackers) tend to adhere to teeth longer. However, dried fruits such as raisins and fresh fruit such as apples and bananas disappear from the mouth quickly, and do not appear to be a risk factor. Consumers are not good at guessing which foods stick around in the mouth.[113] For children, the American Dental Association and the European Academy of Paediatric Dentistry recommend limiting the frequency of consumption of drinks with sugar, and not giving baby bottles to infants during sleep (see earlier discussion).[114][115] Parents are also recommended to avoid sharing utensils and cups with their infants to prevent transferring bacteria from the parent's mouth.[116] Xylitol is a naturally occurring sugar alcohol that is used in different products as an alternative to sucrose (table sugar). As of 2015 the evidence concerning the use of xylitol in chewing gum was insufficient to determine if it is effective at preventing caries.[117][118][119] Common dentistry trays used to deliver fluoride Fluoride is sold in tablets for cavity prevention. The use of dental sealants is a means of prevention.[120] A sealant is a thin plastic-like coating applied to the chewing surfaces of the molars to prevent food from being trapped inside pits and fissures. This deprives resident plaque bacteria of carbohydrate, preventing the formation of pit and fissure caries. Sealants are usually applied on the teeth of children, as soon as the teeth erupt but adults are receiving them if not previously performed. Sealants can wear out and fail to prevent access of food and plaque bacteria inside pits and fissures and need to be replaced so they must be checked regularly by dental professionals. Dental sealants have been shown to be more effective at preventing occlusal decay when compared to fluoride varnish applications.[121][needs update] Calcium, as found in food such as milk and green vegetables, is often recommended to protect against dental caries. Fluoride helps prevent decay of a tooth by binding to the hydroxyapatite crystals in enamel.[122] Streptococcus mutans is the leading cause of tooth decay. Low concentration fluoride ions act as bacteriostatic therapeutic agent and high concentration fluoride ions are bactericidal.[123] The incorporated fluorine makes enamel more resistant to demineralization and, thus, resistant to decay.[124] Fluoride can be found in either topical or systemic form.[125] Topical fluoride is more highly recommended than systemic intake to protect the surface of the teeth.[126] Topical fluoride is used in toothpaste, mouthwash and fluoride varnish.[125] Standard fluoride toothpaste (1,000–1,500 ppm) is more effective than low fluoride toothpaste (< 600ppm) to prevent dental caries.[127] It is recommended that all adult patients to use fluoridated toothpaste with at least 1350ppm fluoride content, brushing at least 2 times per day and brush right before bed. For children and young adults, use fluoridated toothpaste with 1350ppm to 1500ppm fluoride content, brushing 2 times per day and also brush right before bed. American Dental Association Council suggest that for children