

Tooth Discolouration — Types, Causes & Treatment Options

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Description:

Why are your teeth discoloured? Learn about intrinsic and extrinsic staining, common causes, and the treatment options available at CSSC Melbourne.

Details:

Collins Street Specialist Centre — Tooth discolouration: types, causes and treatment options

Tooth discolouration is one of the most common concerns we see in specialist dental practice, and also one of the most misunderstood. A brighter smile is a reasonable goal, but how you get there depends entirely on correctly identifying what type of discolouration is present and what caused it. A treatment that works well for one patient may be completely ineffective — or even counterproductive — for another.

The good news is that most forms of tooth discolouration are treatable. What varies is the complexity of treatment required and the degree of improvement that can realistically be achieved. That's why a thorough clinical assessment by a qualified dental professional is always the starting point, not a whitening kit from a pharmacy shelf.

At Collins Street Specialist Centre, our specialists assess and treat patients across every presentation of tooth discolouration. With the full range of specialist disciplines under one roof, we're well placed to recommend and deliver the treatment that fits your specific situation.

Understanding the two types of tooth discolouration

Tooth discolouration falls into two broad categories. The distinction matters clinically, because it determines which treatments will work and which won't.

Extrinsic staining

Extrinsic stains are deposits on or within the outer surface of the tooth — the enamel. They result from external substances that come into contact with the teeth over time. As a general rule, extrinsic staining is more amenable to treatment than intrinsic staining, and often responds well to professional cleaning and whitening.

Common causes include:

- **Coffee and tea.** Both contain tannins — colour-producing compounds with a strong affinity for tooth enamel. Black tea, in particular, can produce staining that rivals coffee.
- **Red wine.** The combination of chromogens, tannins, and acidity makes red wine an especially effective staining agent.
- **Tobacco.** Both smoked and chewed tobacco produce stubborn brown and yellow deposits. Tar is inherently dark, while nicotine — colourless in its natural state — oxidises to a yellow-brown compound on contact with air.
- **Pigmented foods.** Berries, beetroot, tomato-based sauces, soy sauce, and

curries all contribute to cumulative surface staining with regular consumption. - **Inadequate oral hygiene.** Insufficient brushing and flossing allows plaque and extrinsic stain to build up at the gum line and across tooth surfaces. - **Chlorhexidine mouthwash.** This antibacterial rinse, commonly prescribed for periodontal disease management, is associated with brown extrinsic staining with prolonged use — a well-documented and somewhat ironic side effect. - **Iron supplements.** Liquid iron preparations in particular can cause dark staining on tooth surfaces, especially in children.

Intrinsic staining

Intrinsic stains are incorporated within the tooth structure itself — within the dentine (the mineralised layer beneath the enamel) or, in some cases, within the enamel matrix. These stains can't be polished or scaled away. They require treatments that either modify the colour of the tooth from within, or mask the affected surfaces with restorative materials.

Common causes include:

- **Tetracycline antibiotics.** Tetracycline and related compounds (including doxycycline and minocycline) can cause deep, permanent intrinsic staining when administered during tooth development — generally before the age of eight. The resulting discolouration typically presents as grey, brown, or blue-grey horizontal banding across the teeth, and can be highly resistant to conventional whitening. - **Dental fluorosis.** Excessive systemic fluoride intake during childhood — whether from swallowing fluoridated toothpaste, drinking water with elevated natural fluoride levels, or inappropriate fluoride supplementation — can disrupt enamel formation. Mild cases present as faint white striations; more severe presentations involve brown pitting and surface irregularity. - **Dental trauma.** A traumatic injury can damage the neurovascular supply within the pulp chamber. As the pulp tissue breaks down, haemorrhagic by-products and degradation compounds permeate the surrounding dentine, causing the tooth to darken progressively — sometimes turning grey, brown, or in rare cases, pink. This discolouration may not become apparent until months or years after the original injury. - **Root canal treatment.** Teeth that have undergone endodontic treatment may darken over time. Residual blood products, pulp tissue remnants, and certain endodontic materials can leach into the dentinal tubules, producing discolouration from within. - **Ageing.** With age, the enamel layer gradually thins through attrition and erosion, allowing the naturally more yellow dentine to show through. Secondary dentine deposition causes the dentine itself to darken, and the pulp chamber reduces in volume — all contributing to a progressively yellower appearance over time. - **Genetic conditions.** Rare hereditary conditions including amelogenesis imperfecta (affecting enamel formation) and dentinogenesis imperfecta (affecting dentine formation) can result in significant structural and aesthetic compromise from the time teeth erupt. - **Developmental disturbances.** Systemic illness, prolonged high fever, or nutritional deficiency during tooth formation can disrupt normal enamel mineralisation, resulting in permanent localised discolouration or structural defects.

Age-related discolouration

Age-related tooth discolouration is a combination of both extrinsic and intrinsic processes. Over decades, enamel wears progressively thinner, dentine naturally deepens in colour, and cumulative exposure to dietary staining agents and tobacco compounds the overall effect. This is why teeth that appeared bright in a patient's twenties may look markedly more yellow or grey by their fifties, even without any specific pathology or unusual staining history.

When discolouration warrants clinical attention

Most tooth discolouration is a cosmetic concern rather than a sign of active pathology. There are specific presentations, however, where discolouration may point to an underlying condition requiring prompt assessment:

- **A single tooth that has darkened.** Unilateral darkening of an isolated tooth may indicate pulp necrosis, internal resorption, or a developing periapical pathology. Timely assessment is warranted. - **Brown or black spot lesions.** These may represent extrinsic stain, but they can equally indicate active carious decay, particularly at fissures and contact points. - **White spot lesions appearing on adult teeth.** These may represent early-stage demineralisation, enamel hypoplasia, or post-orthodontic decalcification — all of which benefit from early intervention. - **Discolouration accompanied by pain, thermal sensitivity, or swelling.** These symptoms suggest an active pathological process — decay, pulpitis, or periapical infection — and require prompt clinical evaluation.

If there's any uncertainty about whether discolouration is purely cosmetic or a sign of underlying disease, a dental assessment should always come before any aesthetic treatment is considered.

Treatment options for tooth discolouration

Selecting the right treatment requires careful consideration of the type, cause, and severity of discolouration, alongside the patient's clinical presentation, aesthetic goals, and dental history. The following outlines the range of evidence-based options available.

Professional dental cleaning

A thorough professional scale and clean performed by a dentist or oral health therapist removes supragingival calculus, plaque biofilm, and superficial extrinsic staining. For patients with mild extrinsic discolouration, a professional clean may be sufficient to produce a meaningfully brighter result. Maintaining a regular recall schedule — typically every six months for most patients — helps prevent progressive stain accumulation between visits.

Professional teeth whitening

Professional tooth whitening — more precisely termed dental bleaching — remains the most widely used intervention for extrinsic staining and mild-to-moderate intrinsic discolouration. The active agents, hydrogen peroxide or carbamide peroxide, penetrate the enamel and dentine to oxidise chromogenic compounds within the tooth structure.

Two principal delivery options are available:

- **In-chair whitening.** Performed within the dental practice under clinical supervision, in-chair whitening involves applying a high-concentration bleaching gel to the tooth surfaces, sometimes with light or heat activation. Clinically meaningful results are typically achieved within a single appointment of 60 to 90 minutes. - **Take-home whitening.** Custom-fabricated bleaching trays, constructed from impressions of the patient's dentition, are provided for use at home with a lower-concentration whitening gel over one to two weeks. This approach allows for more gradual, controlled whitening and is often better tolerated by patients with dentinal sensitivity.

A combined protocol — in-chair whitening followed by take-home maintenance — is frequently recommended to optimise and sustain results.

A note on Australian regulations: Tooth whitening products containing more than 6% hydrogen peroxide (or the carbamide peroxide equivalent) are classified as Schedule 4 substances and must be supplied and applied by or under the direct supervision of a registered dental practitioner. Patients considering whitening should verify that their treating clinician holds current registration with the Australian Health Practitioner Regulation Agency (AHPRA). Over-the-counter whitening products available in pharmacies and through online retailers are restricted to significantly lower peroxide concentrations and are correspondingly less effective.

Internal bleaching

Where a single tooth has darkened following trauma or endodontic treatment, internal bleaching — sometimes called the walking bleach technique — can produce excellent aesthetic outcomes. The procedure involves placing a concentrated bleaching agent within the pulp chamber, accessed via the existing root canal access cavity, and sealing it in position for several days. The process is repeated as necessary until the desired shade is achieved, at which point the access cavity is permanently restored.

Internal bleaching is a specialised technique most appropriately performed by an endodontist or a clinician with specific training in the procedure. The endodontists at Collins Street Specialist Centre perform internal bleaching routinely and achieve consistently reliable results.

Dental bonding (direct composite resin)

For localised discolouration, isolated white spot lesions, or minor surface irregularities, direct application of tooth-coloured composite resin offers a conservative and cost-effective solution. The resin is incrementally applied, shaped, and polished to blend with the surrounding dentition, effectively masking the underlying discolouration.

Direct bonding is typically completed in a single visit, requires minimal or no removal of tooth structure, and is generally more affordable than indirect porcelain restorations. Composite resin is less resistant to staining and wear than porcelain, however, and may require periodic maintenance, repair, or replacement over time.

Porcelain veneers

For more extensive or severe discolouration — significant tetracycline staining, advanced fluorosis, or cases where whitening hasn't produced sufficient improvement — porcelain veneers are the most predictable and durable aesthetic solution. Veneers are thin, custom-fabricated shells of dental porcelain adhesively bonded to the prepared labial surface of the teeth, completely concealing any underlying discolouration.

Porcelain provides a natural translucency that closely approximates tooth enamel, and is highly resistant to future staining. Veneer placement does require the removal of a thin layer of enamel from the tooth surface — typically 0.3 to 0.7 mm — making it a less reversible intervention than direct bonding.

The prosthodontists at Collins Street Specialist Centre are specialist-trained in the design, fabrication, and placement of porcelain veneers, with particular expertise in achieving natural-looking, proportionate results across a range of clinical presentations.

Porcelain crowns

Where severe discolouration is accompanied by significant structural compromise — extensive previous restorations, fracture, or substantial tooth tissue loss — a full-coverage porcelain crown may be the most appropriate restorative solution. A crown encases the entire visible coronal portion of the tooth, restoring both aesthetics and structural integrity at once.

Microabrasion

For superficial enamel discolouration confined to the outermost enamel layer — particularly the white or brown spot lesions associated with mild-to-moderate fluorosis — enamel microabrasion offers a conservative option. The technique involves controlled removal of a very thin layer of surface enamel using a slurry of hydrochloric acid and fine pumice, eliminating staining restricted to this superficial zone. Microabrasion is often combined with subsequent whitening to optimise the overall result.

A note on whitening toothpastes

Whitening toothpastes reduce extrinsic surface staining through mild abrasive agents and, in some products, low concentrations of peroxide. They don't alter the intrinsic colour of the tooth structure and shouldn't be considered a substitute for professional whitening. Their most appropriate role is as a maintenance adjunct following professional bleaching, to help slow the re-accumulation of extrinsic stain.

Patients should be cautious with highly abrasive whitening toothpastes used over extended periods. Excessive abrasion can accelerate enamel wear, paradoxically making teeth appear more yellow over time as the thinning enamel reveals more of the underlying dentine.

Which specialist is best placed to help?

The appropriate specialist depends on the underlying cause and the treatment indicated:

- **General dentist or cosmetic dentist** — Professional cleaning, standard whitening, direct bonding, and straightforward veneer cases. - **Prosthodontist** — Complex veneer cases, full-coverage crowns, and cases involving multiple teeth or comprehensive smile rehabilitation. Prosthodontists hold specialist registration with AHPRA following an additional three years of postgraduate clinical training in the restoration and replacement of teeth. - **Endodontist** — Internal bleaching for teeth that have darkened following root canal treatment or pulp necrosis, and assessment of discolouration associated with suspected pulpal pathology. - **Periodontist** — Where gum disease, gingival recession, or altered gingival architecture is contributing to the overall aesthetic presentation of the dentition.

At Collins Street Specialist Centre, all of these specialist disciplines are represented within the one practice. Patients can receive the appropriate specialist opinion — and, where necessary, coordinated multidisciplinary care — without the inconvenience of referral to multiple separate locations.

Prevention: maintaining the colour of your teeth

Some causes of tooth discolouration aren't preventable — genetic conditions, medication-related effects during childhood development, and the physiological changes of ageing among them. There's still a meaningful amount patients can do to minimise extrinsic staining and preserve the results of any whitening treatment:

- **Maintain consistent oral hygiene.** Twice-daily brushing and daily interdental cleaning remain the foundation of stain prevention. - **Rinse with water promptly** after consuming staining foods or beverages, to dilute chromogenic compounds before they bind to the enamel surface. - **Use a straw** when drinking iced coffee, tea, cold brew, or other staining beverages, to reduce direct contact with the front tooth surfaces. - **Avoid tobacco in all forms.** Cessation of smoking is one of the most impactful steps a patient can take for both the appearance and long-term health of their teeth. - **Attend regular professional cleans.** A six-monthly recall interval suits most patients; some may benefit from more frequent visits depending on their staining susceptibility and periodontal status. - **Use a whitening toothpaste judiciously** for maintenance following professional whitening, rather than as a primary treatment. - **Wear a custom-fitted mouthguard** during contact sports and high-risk recreational activities to protect against dental trauma — a preventable cause of intrinsic discolouration.

Taking the next step

Tooth discolouration is a common clinical presentation, but it's rarely straightforward. The range of underlying causes, the variation in severity, and the significant differences in how different types of staining respond to different treatments all make a proper clinical assessment essential before any treatment decision is made.

At Collins Street Specialist Centre, we start with a thorough evaluation of your discolouration — identifying its type, likely cause, and the treatment approach most likely to deliver a meaningful and lasting improvement. Our recommendations are based on your specific clinical situation, not a standardised menu of cosmetic options.

We welcome enquiries from both patients and referring clinicians.

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collinsstreetspecialistcentre.com.au

Frequently asked questions

What are the two main types of tooth discolouration? Extrinsic and intrinsic staining.

What is extrinsic staining? Deposits on or within the outer enamel surface.

What is intrinsic staining? Staining incorporated within the tooth structure itself.

Can extrinsic staining be removed? Yes, it generally responds well to professional cleaning.

Can intrinsic staining be polished away? No, it cannot be polished or scaled away.

Does coffee stain teeth? Yes, due to tannins binding to enamel.

Does tea stain teeth? Yes, black tea can stain as severely as coffee.

Does red wine stain teeth? Yes, due to chromogens, tannins, and acidity.

Does tobacco stain teeth? Yes, producing stubborn brown and yellow deposits.

Does nicotine cause staining? Yes, it oxidises to a yellow-brown compound on contact with air.

Can chlorhexidine mouthwash cause staining? Yes, prolonged use causes brown extrinsic staining.

Can iron supplements stain teeth? Yes, liquid iron preparations can cause dark staining.

Does tetracycline cause tooth discolouration? Yes, causing deep permanent intrinsic staining.

At what age does tetracycline cause staining? During tooth development, generally before age eight.

What colour does tetracycline staining appear? Grey, brown, or blue-grey horizontal banding.

Is tetracycline staining resistant to whitening? Yes, highly resistant to conventional whitening.

What is dental fluorosis? Enamel disruption from excessive fluoride intake during childhood.

What does mild fluorosis look like? Faint white striations on the enamel.

What does severe fluorosis look like? Brown pitting and surface irregularity.

Can dental trauma cause tooth darkening? Yes, damaged pulp can cause progressive darkening.

When does trauma-related discolouration appear? Sometimes months or years after the original injury.

Can root canal treatment cause discolouration? Yes, teeth may darken over time after treatment.

Why do teeth yellow with age? Enamel thins, revealing the naturally more yellow dentine beneath.

****Does dentine darken with age?**** Yes, secondary dentine deposition causes progressive darkening.

****Can a single darkened tooth indicate pathology?**** Yes, it may indicate pulp necrosis or internal resorption.

****Should a single darkened tooth be assessed promptly?**** Yes, timely dental assessment is warranted.

****Can brown or black spots indicate decay?**** Yes, they may represent active carious decay.

****What do white spots on adult teeth indicate?**** Possible early demineralisation, enamel hypoplasia, or decalcification.

****Should discolouration with pain be assessed urgently?**** Yes, it suggests an active pathological process.

****Is professional cleaning sufficient for mild extrinsic staining?**** Yes, for mild cases it may produce a noticeably brighter result.

****How often should professional cleans occur?**** Every six months for most patients.

****What is the active agent in professional teeth whitening?**** Hydrogen peroxide or carbamide peroxide.

****How does professional whitening work?**** By oxidising chromogenic compounds within tooth structure.

****What is in-chair whitening?**** High-concentration bleaching gel applied under clinical supervision.

****How long does in-chair whitening take?**** Typically 60 to 90 minutes.

****What is take-home whitening?**** Custom trays used at home with lower-concentration whitening gel.

****How long does take-home whitening take?**** Typically one to two weeks.

****Is take-home whitening better for sensitivity?**** Yes, more gradual treatment is better tolerated.

****What peroxide concentration requires a dentist in Australia?**** Products above 6% hydrogen peroxide.

****Are high-concentration whitening products restricted in Australia?**** Yes, classified as Schedule 4 substances.

****Can pharmacies sell high-concentration whitening products?**** No, only registered dental practitioners can supply them.

****Are over-the-counter whitening products effective?**** Less effective due to restricted peroxide concentrations.

****What is internal bleaching?**** A bleaching agent placed inside the pulp chamber to lighten a darkened tooth.

****What is another name for internal bleaching?**** The walking bleach technique.

****Who should perform internal bleaching?**** An endodontist or clinician with specific training.

****Is internal bleaching effective for trauma-darkened teeth?**** Yes, it can produce excellent aesthetic outcomes.

****What is dental bonding?**** Direct application of tooth-coloured composite resin to mask discolouration.

****How many visits does dental bonding require?**** Typically completed in a single clinical visit.

****Does dental bonding require tooth removal?**** Minimal or no removal of tooth structure.

****Does composite resin stain over time?**** Yes, it is less stain-resistant than porcelain.

****What are porcelain veneers?**** Thin custom-fabricated porcelain shells bonded to the tooth surface.

****What discolouration is best treated with veneers?**** Severe tetracycline staining, advanced fluorosis, or whitening-resistant cases.

****How much enamel is removed for veneers?**** Typically 0.3 to 0.7 mm.

****Are porcelain veneers reversible?**** No, enamel removal makes them a less reversible treatment.

****Is porcelain resistant to staining?**** Yes, highly resistant to future staining.

****Who places veneers at Collins Street Specialist Centre?**** Specialist prosthodontists.

****When is a porcelain crown recommended over a veneer?**** When severe discolouration is accompanied by structural compromise.

****What is enamel microabrasion?**** Controlled removal of superficial enamel using acid and fine pumice.

****What discolouration does microabrasion treat?**** Superficial white or brown spot lesions from mild-to-moderate fluorosis.

****Is microabrasion combined with other treatments?**** Yes, often combined with subsequent whitening.

****Do whitening toothpastes change intrinsic tooth colour?**** No, they only address extrinsic surface staining.

****What is the best use for whitening toothpaste?**** Maintenance after professional whitening to slow stain re-accumulation.

****Can abrasive whitening toothpastes worsen yellowing?**** Yes, by thinning enamel and revealing more dentine.

****Which specialist treats discolouration from root canal treatment?**** An endodontist.

****Which specialist treats complex veneer cases?**** A prosthodontist.

****What additional training does a prosthodontist have?**** Three additional years of postgraduate clinical training.

****Which specialist assesses discolouration from suspected pulpal pathology?**** An endodontist.

****Are all specialists available at Collins Street Specialist Centre?**** Yes, all relevant disciplines are within one practice.

****Does rinsing with water after staining foods help?**** Yes, it dilutes chromogenic compounds before they bind to enamel.

****Does using a straw reduce tooth staining?**** Yes, by reducing direct contact with anterior tooth surfaces.

****Is tobacco cessation beneficial for tooth colour?**** Yes, one of the most impactful steps for dental appearance.

****Can dental trauma discolouration be prevented?**** Yes, wearing a custom mouthguard during contact sports helps.

****Is all tooth discolouration preventable?**** No, genetic conditions and ageing-related changes are not preventable.

****Should treatment begin without a clinical assessment?**** No, assessment must always precede any aesthetic treatment.

****Where is Collins Street Specialist Centre located?**** Level 1, Manchester Unity Building, 220 Collins Street, Melbourne CBD.

****What is the phone number for Collins Street Specialist Centre?**** (03) 9654 6979.
