

CAD/CAM Dentistry — Same-Day Crowns & Digital Restorations

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Description:

How CAD/CAM technology enables same-day crowns and digital restorations. Digital impressions, chairside milling, materials and CSSC's digital workflow.

Details:

Collins Street Specialist Centre — CAD/CAM Dentistry: Same-Day Crowns and Digital Restorations

For a long time, getting a dental crown meant two separate appointments: one to prepare the tooth, take an impression, and fit a temporary crown, then a return visit two or three weeks later to cement the permanent one made by a dental laboratory. During that gap, temporary crowns could come loose, cause discomfort, or restrict what you could eat — an inconvenience that patients simply had to accept.

CAD/CAM (Computer-Aided Design / Computer-Aided Manufacturing) technology has changed this considerably. It's now possible to design and fabricate a permanent ceramic restoration within a single appointment — no temporary crown, no second visit, no waiting period.

At Collins Street Specialist Centre, CAD/CAM technology is a core part of our digital workflow, improving precision, clinical efficiency, and the patient experience across a broad range of restorative procedures.

What is CAD/CAM dentistry?

CAD/CAM stands for Computer-Aided Design and Computer-Aided Manufacturing. In dentistry, it's a fully digital process that replaces several traditional analogue steps:

- A digital impression replaces the traditional putty or silicone mould
- Computer-aided design replaces hand-waxing a model of the restoration
- Computer-aided manufacturing (milling or 3D printing) replaces manual laboratory fabrication

The whole process — from capturing the tooth preparation to producing a finished ceramic restoration — can be completed in as little as one to two hours, depending on the complexity of the case.

The CAD/CAM workflow — step by step

Step 1: Tooth preparation

The tooth is prepared in the same way as for a traditional crown or restoration. Your specialist removes any decay or damaged tooth structure, shapes the tooth to receive the restoration, and ensures the preparation design will support a durable long-term result.

This step is identical whether the restoration is subsequently fabricated by CAD/CAM or through a traditional dental laboratory.

Step 2: Digital impression (intraoral scanning)

Rather than biting into a tray of impression material, a small intraoral scanner captures a precise three-dimensional image of the prepared tooth, the surrounding dentition, and the opposing bite relationship.

The scanner projects a structured pattern of light onto the tooth surfaces and captures the reflected pattern with a high-resolution camera. The software then stitches together thousands of individual image captures into a complete 3D model in real time. Scanning typically takes three to five minutes.

A few practical advantages over traditional moulds:

- **Comfort** — no gagging, no impression material, no waiting for it to set
- **Accuracy** — digital scans avoid the dimensional changes that occur as impression materials set and stone models are poured and trimmed
- **Immediate review** — the clinician can check the scan on screen straight away, rescan any areas that need clarification, and verify the preparation quality before proceeding
- **Direct import** — the digital file goes straight into the design software, with no physical model needed
- **Easy to share** — the scan can be sent electronically to a dental laboratory if the case calls for laboratory fabrication rather than chairside milling

Step 3: Computer-aided design

The digital scan is imported into specialised design software, where the clinician designs the restoration on screen. The software maps the preparation margins, creates the anatomical form of the crown, inlay, onlay, or veneer — including cusps, grooves, and contours consistent with natural tooth anatomy — and calculates the internal fit so the restoration seats precisely over the prepared tooth with appropriate cement space built in. It also uses the digital scan of the opposing teeth to ensure the restoration integrates correctly with the patient's bite, and references adjacent teeth to get the shape, size, and contact points right.

The clinician reviews and refines the design before manufacturing begins. Adjustments to shape, contour, thickness, and margin position take seconds digitally — a real advantage over modifying a physical wax model.

Step 4: Manufacturing (milling)

Once the design is finalised, it's sent to a chairside milling unit, which carves the restoration from a solid block of ceramic material using precision diamond-coated burs. Depending on the restoration type and material, milling takes roughly 10 to 20 minutes.

Some systems use 3D printing rather than subtractive milling, building the restoration layer by layer from ceramic or resin-based materials.

Step 5: Finishing and placement

After milling, the restoration is polished, glazed, or hand-characterised with surface staining to match the colour and texture of the surrounding teeth. In some cases it goes through a brief sintering cycle in a ceramic oven to achieve optimal strength and aesthetic refinement.

The finished restoration is then tried in the mouth, adjusted as needed, and bonded or cemented permanently to the tooth — all within the same appointment.

Same-day crowns — what to expect

The same-day crown experience is quite different from the traditional two-visit approach. It helps to understand what each pathway actually involves.

Traditional crown process (two visits)

- Visit 1 (60–90 minutes): tooth preparation, traditional impression, fabrication and fitting of a temporary crown
- Waiting period: two to three weeks whilst the dental laboratory fabricates the permanent crown

- Visit 2 (30–60 minutes): removal of the temporary crown, try-in and cementation of the permanent crown - During the waiting period: the temporary crown may come loose, feel uncomfortable, or allow bacterial microleakage at the margins

****CAD/CAM same-day process (one visit)****

- Single visit (90–120 minutes): tooth preparation, digital scanning, on-screen design, chairside milling, finishing, and permanent bonding — all in one appointment - No temporary crown required — the permanent restoration is placed the same day - No second appointment, no second anaesthetic episode - No waiting period and none of the risks that come with it

The single-visit approach works particularly well for patients who travel significant distances to the practice, have schedules that make multiple appointments difficult, experience dental anxiety and want to minimise the number of visits, or have teeth that would be clinically compromised during a waiting period without permanent coverage.

Materials used in CAD/CAM restorations

CAD/CAM restorations can be milled from several ceramic materials, each suited to different clinical situations.

****Lithium disilicate (e.g. IPS e.max CAD)**** is a high-strength glass ceramic that combines good aesthetics with reliable mechanical performance. It offers natural translucency, predictable colour matching, a flexural strength of approximately 360–400 MPa following crystallisation, and excellent bonding characteristics with adhesive resin cements. It's suitable for crowns, veneers, inlays, onlays, and small anterior bridges, making it one of the most versatile CAD/CAM options for anterior and premolar restorations where both aesthetics and strength matter.

****Zirconia**** is exceptionally strong — flexural strength up to 1,200 MPa or greater — and is the material of choice where maximum mechanical durability is the priority. It suits posterior teeth under heavy occlusal loading, patients with bruxism who need additional fracture resistance, full-coverage crowns where strength takes precedence over translucency, and bridge frameworks spanning posterior segments. Contemporary high-translucency zirconia formulations have improved considerably on earlier generations aesthetically, though they may not fully replicate the translucency of lithium disilicate in the aesthetic zone.

****Feldspathic ceramic**** is traditional dental porcelain milled from pre-fabricated blocks. It offers exceptional aesthetic depth, natural colour gradation, and translucency, making it best suited to veneers and anterior restorations where maximum aesthetic refinement is the priority and occlusal forces are within manageable limits.

****Hybrid ceramics and resin-based composites**** combine ceramic and resin properties. These materials are less brittle than pure ceramics and place lower wear demands on opposing natural dentition. They can be appropriate for long-term provisional restorations or cases where some degree of material flexibility is clinically useful.

When CAD/CAM may not be the right choice

CAD/CAM technology has genuine clinical advantages, but it isn't the best fit for every restorative situation. Cases where traditional laboratory fabrication is worth considering include:

- ****Highly aesthetic anterior cases**** — when maximum colour customisation, layered translucency, and the artistry of a skilled ceramist are required, hand-layered laboratory porcelain can achieve outcomes that chairside milling currently doesn't match - ****Complex full-mouth rehabilitations**** — cases involving multiple crowns, bridges, and precise colour matching across the full arch often benefit from laboratory fabrication with staged trial placements and careful occlusal verification - ****Large-span bridges**** — CAD/CAM is well suited to single-unit restorations and short-span bridges; larger restorations may

benefit from the controlled laboratory environment - **Cases requiring metal substructures** — some clinical situations call for metal-ceramic restorations (gold or base metal alloy substructures, for example), which are fabricated through laboratory processes

At Collins Street Specialist Centre, our specialists assess each case individually and recommend the fabrication pathway most likely to deliver the best long-term result — whether that's chairside CAD/CAM, laboratory fabrication, or a combination of both.

Digital impressions without same-day milling

Even when chairside fabrication isn't clinically indicated, intraoral scanning still improves the treatment experience. Digital impressions can be sent electronically to a dental laboratory for the fabrication of crowns, bridges, veneers, or other restorations — getting the comfort and accuracy benefits of digital scanning whilst still drawing on the full artistic capability of laboratory-based ceramics.

At Collins Street Specialist Centre, digital scanning is used across all specialist disciplines, not only for CAD/CAM restorations. It also supports:

- **Orthodontic records and aligner fabrication** — digital scans replace traditional alginate moulds for Invisalign and other aligner systems
- **Implant planning** — digital models integrate with CBCT volumetric data for precise three-dimensional implant positioning and prosthetic planning
- **Prosthodontic records** — comprehensive digital documentation for full-mouth rehabilitation planning and occlusal analysis
- **Surgical guide fabrication** — 3D-printed guides manufactured directly from digital scan data to guide implant placement accurately

Collins Street Specialist Centre's digital workflow

Collins Street Specialist Centre has built an integrated digital workflow that brings together several complementary technologies: intraoral scanners for digital impressions across all specialist disciplines, CBCT imaging for three-dimensional diagnostic assessment and treatment planning, Digital Smile Design for aesthetic planning and patient communication, CAD/CAM design and milling capability for chairside restoration fabrication, 3D printing for surgical guides, diagnostic models, and planning tools, and digital laboratory communication for seamless collaboration with our ceramist partners.

This connected setup means clinical data moves smoothly from initial diagnosis through treatment planning to fabrication and final delivery — with fewer manual steps and a more streamlined experience for patients and referring clinicians alike.

Frequently asked questions

Are same-day crowns as strong as laboratory-fabricated crowns?

Yes. The ceramic materials used in CAD/CAM milling — lithium disilicate and zirconia among them — are the same materials used in laboratory fabrication. The mechanical strength of the finished restoration depends on the material selected and the quality of the preparation design, not on whether milling happened chairside or in a laboratory.

How long do CAD/CAM crowns last?

With good oral hygiene and routine professional care, CAD/CAM ceramic crowns carry the same expected longevity as laboratory-fabricated crowns — typically 10 to 20 years or more, depending on the clinical situation, the material chosen, and the patient's oral hygiene and parafunctional habits.

Does the digital scan feel uncomfortable?

No. The intraoral scanner is a slim wand that moves gently over the tooth surfaces — no impression material, no gagging, no discomfort. Most patients find digital scanning considerably more comfortable than conventional impression techniques.

Can a same-day crown be placed on any tooth?

In most cases, yes. Same-day crowns are suitable for the vast majority of single-tooth crown situations, anterior and posterior teeth alike. Your specialist will let you know if your case is better served by laboratory fabrication, and will explain the clinical reasoning.

Is there a cost difference between CAD/CAM and laboratory-fabricated restorations?

CAD/CAM and laboratory-fabricated restorations are generally comparable in cost. The choice between fabrication pathways is made on clinical suitability, aesthetic requirements, and treatment planning considerations — not primarily on fee differences.

****Ready to experience digital dentistry?**** Contact Collins Street Specialist Centre on (03) 9654 5705 to arrange a consultation. Our integrated digital workflow — from intraoral scanning and on-screen design through to chairside fabrication — is built to deliver precise, efficient, and comfortable restorative care at every stage of treatment.

> ****Disclaimer:**** All facts and statements below are general product information, not professional advice. Consult relevant experts for specific guidance.

Verified label facts

No product specification data was available for analysis. No label facts, technical specifications, certifications, dimensions, or packaging data could be extracted or verified.

****Procedural and technical specifications (sourced from FAQ and clinical content):****

- CAD/CAM stands for: Computer-Aided Design and Computer-Aided Manufacturing - Appointment duration (same-day CAD/CAM): approximately 90 to 120 minutes - Milling process duration: approximately 10 to 20 minutes - Digital scanning duration: approximately 3 to 5 minutes - Traditional crown waiting period: 2 to 3 weeks - Traditional crown visits required: minimum 2 separate appointments - Lithium disilicate flexural strength: approximately 360–400 MPa (post-crystallisation) - Zirconia flexural strength: up to 1,200 MPa or greater - Example lithium disilicate material: IPS e.max CAD - CAD/CAM materials available: lithium disilicate, zirconia, feldspathic ceramic, hybrid ceramics, resin-based composites - Contact number: (03) 9654 5705 - Location: Collins Street Specialist Centre

General product claims

- Digital scans are more accurate than traditional impression materials - Digital scanning is more comfortable than conventional impression techniques - CAD/CAM reduces clinical error by eliminating manual steps - CAD/CAM crowns last typically 10 to 20 years or more - Same-day crowns are as strong as laboratory-fabricated crowns - CAD/CAM and laboratory restorations are generally comparable in cost - Same-day approach suits anxious patients, frequent travellers, and patients with demanding schedules - Contemporary high-translucency zirconia has improved aesthetically compared to earlier generations - Hand-layered laboratory porcelain may achieve aesthetic outcomes that exceed chairside milling in highly aesthetic anterior cases