In-Office Digital Dentistry: The Real Cost

A practical financial guide to resin printers and chairside CAD/CAM systems

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Why this conversation matters

Digital fabrication has moved from the lab into the operatory. A general practice can now mill a lithium disilicate crown in under 10 minutes or print a surgical guide overnight on equipment that fits on a countertop. The clinical case is increasingly settled. The financial case is not.

Most ROI pitches you will hear come from manufacturers and resellers whose math conveniently rounds in their favor. They tend to compare a sticker price against your lab bill, then declare the equipment "pays for itself" in 12 to 18 months. That math leaves out staff time, consumables, software subscriptions, service contracts, redo rates, and the very real cost of cases you couldn't have produced in-house anyway. This document walks through the full picture, with current 2025–2026 pricing, so you can decide whether the equipment fits your practice rather than the reverse.

1. Capital cost: the equipment itself

Chairside CAD/CAM (mill-based) systems

A complete chairside ceramic workflow has four pieces: an intraoral scanner, a design workstation/software, a milling unit, and a sintering/glazing oven. Bought new from Dentsply Sirona (CEREC) or Planmeca, the full stack typically lands between $130,000 and $180,000 turnkey. Industry sources commonly cite roughly $150,000 for a full new CEREC build (Primescan + Primemill + SpeedFire + software).

The refurbished market changes the math substantially. Independent resellers list refurbished CEREC Primescan + MCXL mill + SpeedFire bundles in the $55,000 to $80,000 range, and older Omnicam/MC X bundles below $30,000. These figures generally include a one-year warranty but exclude the manufacturer's annual software subscription ("CEREC Club") which is essentially required to keep current.

Item	Typical price (new, USD)	Refurbished range (USD)
Intraoral scanner only (Primescan, iTero, Trios, Medit)	$25,000 – $45,000	$10,000 – $20,000
Mill (Primemill, MCXL, PlanMill)	$60,000 – $90,000	$9,000 – $35,000
Sintering/glazing oven (SpeedFire, Programat)	$15,000 – $25,000	$6,000 – $12,000
Complete turnkey system	$130,000 – $180,000	$55,000 – $80,000
Annual software subscription (CEREC Club or equivalent)	$2,500 – $4,500	Same

Resin 3D printers

Resin printing is an order of magnitude cheaper than milling and serves a different purpose: models, surgical guides, occlusal splints/night guards, denture bases and try-ins, temporary crowns and bridges (validated up to ~12 months), and orthodontic models. Permanent ceramic restorations are still a milling job.

The two main clinical desktop platforms in 2026 are Formlabs (Form 4B) and SprintRay (Pro 2, Pro 95S, and the Midas chairside system). Per Formlabs published comparisons, the Form 4B starts at $7,699 (printer + essentials) and around $12,006 for the complete package with post-processing and a three-year service plan. SprintRay Pro 2 starts at $10,995 and approaches $20,000 fully loaded; the Midas chairside printer starts at $10,995 and runs about $16,576 with cure unit and one-year service.

Component	Typical price (USD)
Clinical desktop printer (Form 4B, SprintRay Pro 2/95S)	$7,000 – $11,000
Wash station	$700 – $1,500
UV cure unit	$1,200 – $3,500
Annual service/warranty plan	$1,200 – $3,500
Print-prep software (RayWare, PreForm)	Included with printer
Case planning / CAD subscription (optional)	$1,500 – $6,000/yr
Total realistic startup (printer + post-processing)	$10,000 – $16,000

A note on software costs: SprintRay's RayWare and Formlabs' PreForm — the print-prep software that takes a digital file and orients/supports/slices it for the printer — are included with the printer at no additional cost. The optional software subscriptions in the table above cover three categories that genuinely add up: implant case planning software for surgical guides (coDiagnostiX ~$1,500–$3,000/yr, Blue Sky Plan free as an alternative), in-house CAD design platforms if you don't outsource design (Exocad Dental CAD ~$5,000–$8,000 one-time + ~$1,500/yr maintenance, 3Shape Dental System $15,000+ initial), and SprintRay Cloud Design credits (pay-as-you-go rather than a subscription). Most general practices spend $0–$2,000/yr; practices doing implants and in-house CAD design land at the high end of this range.

2. Ongoing costs: the part nobody mentions in the brochure

Service and maintenance contracts

Manufacturer service plans for chairside CAD/CAM run roughly $4,000 to $7,000 per year after the included first-year warranty expires. These typically cover phone/remote support, software updates, and parts/labor for in-warranty failures. Out of warranty, a single major repair (mill spindle, scanner head) can cost $5,000 to $15,000. Most experienced users consider the contract non-optional past year one.

Printer service plans are cheaper, often $1,000 to $2,500 per year. Common wear items: light engine/LPU replacement, resin tank replacement, build platform resurfacing.

Consumables: the recurring drip

CAD/CAM blocks (per restoration)

Indicative chairside block pricing from major US distributors (TDSC, Patterson, Henry Schein):

Block type	Per-block cost	Best for
Pre-dyed monolithic zirconia (e.g., CEREC MTL, KATANA ONE)	$22 – $30	Posterior crowns, bridges

Block type	Per-block cost	Best for
Multi-layer zirconia (Cercon 4D, Zirconia+)	$25 – $40	Anterior crowns, esthetic posteriors
Lithium disilicate (e.max CAD)	$28 – $40	Anterior crowns, veneers, inlays/onlays
Hybrid ceramic / advanced lithium silicate (Tessera, Celtra Duo, LiSi)	$25 – $40	Posterior crowns, partial coverage
Feldspathic / leucite (Empress CAD)	$28 – $35	Veneers, anterior esthetics

In addition to the block, chairside crown production consumes mill burs ($30–$60 per set, lasting 20–60 units depending on material), oven firing trays/pins, glaze and stain kits ($150–$400 per kit, lasting hundreds of units), and try-in/cement materials. A reasonable all-in chairside material cost is $35–$55 per zirconia crown and $45–$70 per e.max crown.

3D printing resin and supplies

Resin pricing varies dramatically by application and brand. SprintRay's published pricing ranges from $149/kg for model resin to over $500/kg for ceramic crown and permanent restoration resins. Formlabs runs comparable per-application resins, often slightly less per kg with no auto-mixing tax.

Resin type	Typical price	Material per appliance
Model resin (orthodontic, study models)	$120 – $180/kg	$1 – $3 / model
Surgical guide resin	$300 – $450/kg	$5 – $10 / guide
Splint / night guard resin	$300 – $450/kg	$8 – $15 / appliance
Denture base resin	$300 – $450/kg	$8 – $14 / arch
Denture teeth resin	$400 – $600/kg	$6 – $12 / arch
Temporary crown & bridge resin	$300 – $500/kg	$2 – $5 / unit
Ceramic-filled permanent crown resin	$450 – $550/kg	$4 – $7 / crown

Other recurring printer costs include resin tanks ($60–$200, based on usage), build platform films, isopropyl alcohol or proprietary wash solvent, gloves, filters, and post-processing supports/handles.

Stain, glaze, and finishing kits

A stain and glaze kit (e.g., IPS e.max Ceram, Ivoclar Universal Stain) runs $150 to $400 and produces hundreds of restorations. Brushes, mixing palettes, and characterization stains add modest recurring cost. The bigger hidden cost is staff time spent finishing: a chairside e.max crown that the software designed in eight minutes can still take 25 to 40 minutes of total staff handling between try-in, staining, glazing, firing, and seating.

3. Staff time: the cost everyone underestimates

Lab fees are visible. Staff hours absorbed into payroll are not. When a clinical assistant runs a milled crown through design, milling, sintering, staining, glazing, and polishing, the practice is paying a fully-loaded labor cost

(wages + benefits + payroll tax) that typically runs $35–$55/hour for a chairside assistant and $55–$85/hour for a trained CAD/CAM technician.

Realistic per-restoration handling time:

Appliance / restoration	Active staff time (digital design + production + finishing)
Single zirconia crown (chairside mill)	30 – 50 minutes
Single e.max crown (chairside mill, stained & glazed)	35 – 55 minutes
3-unit zirconia bridge (chairside)	60 – 90 minutes
Surgical guide (printed)	20 – 35 minutes (mostly post-processing)
Night guard / occlusal splint (printed)	25 – 40 minutes
Diagnostic/orthodontic model (printed)	10 – 15 minutes
Temporary crown (printed)	15 – 25 minutes
Try-in denture (printed)	30 – 45 minutes

Multiply that handling time by your fully-loaded staff rate, and a chairside crown often carries $25 to $50 of internal labor on top of the $35 to $70 in materials. That's before you account for the doctor's chair time, which is the same in either workflow.

4. Outsourced design: a middle path

One of the most overlooked cost levers in digital dentistry is not whether to fabricate in-house, but who designs the file. Designing a crown in CEREC software or a night guard in other software takes 8–20 minutes of trained staff time. Done well, it's a skill that takes months to develop. Done poorly, it leads to remakes. A growing number of practices keep the milling or printing in-house but outsource the design step, paying a remote CAD studio a flat per-unit fee in exchange for a finished, mill-ready or print-ready STL file.

This decouples two economic decisions. You still capture the lab-fee savings on materials and the patient-experience win of same-visit delivery, but you avoid hiring or training an in-house CAD technician and you stop paying assistant-level labor for design work that a specialist can do faster and more reliably.

Independent CAD design services for milling

Remote dental CAD studios accept STL/PLY scans (or DICOM/CBCT for guided surgery), design the case in 3Shape, Exocad, or Dental Wings, and return a validated STL within 8–24 hours. Pricing is per-unit and generally similar across providers.

Service / item	Typical fee per unit	Turnaround
Full-contour crown design (zirconia, e.max)	$5 – $18	8–24 hours
Veneer or virtual prep design	$15 – $25	12–24 hours

Service / item	Typical fee per unit	Turnaround
Coping / cutback design	$10 – $20	12–24 hours
Bridge pontic / connector	$10 – $20 per pontic	12–24 hours
Custom implant abutment design	$25 – $60	24–48 hours
Surgical guide design	$80 – $150	24–48 hours
Full-arch hybrid / All-on-X design	$300 – $500	2–4 days
Complete denture CAD design	$75 – $120 per arch	2–3 days
Bar / thimble bar design	$90 – $300	2–4 days
Diagnostic wax-up / smile design	$20 – $40 per tooth	1–3 days

Representative providers: iDentCAD ($5/unit starting), FullContour, Digital Dental Designers, Alien Milling Technologies, VCAD, KNK Dental Solutions. Quality varies; most practices test 2–3 providers with 5–10 cases each before committing to one. Some offer free or discounted test cases for new clients.

Manufacturer cloud-design services for 3D printing

SprintRay Cloud Design is the most prominent example, integrated directly into the SprintRay printer ecosystem. The dentist uploads scans through the dashboard, an expert designer (or AI for posterior crowns and night guards) returns a print-ready file, often within hours, and the case is automatically queued to the practice's printer. The convenience comes at a higher per-unit price than independent CAD studios because the workflow is fully integrated.

SprintRay Cloud Design service	Fee	Notes
AI Crown (posterior, single tooth)	$15 per crown	~5 minute turnaround, AI-designed
AI Night Guard (upper)	$30 per appliance	Minutes, AI-designed
Occlusal Guard (manual design)	$30+ per guard	+$5 for advanced (Michigan, KOI)
Crown & Bridge (signature design)	$8 per tooth	Manual designer
Bracket Removal (post-ortho)	$20 per case	
Implant Surgical Guide	$110 per guide	Includes treatment walkthrough video
Surgical Guide + Temporary Restoration	$120+ per case	
Smile Design	$25 per tooth	
Models for Clear Aligners	$200 per case	Full series of models
Removable Denture (Basic / Standard / Pro)	$75 / $85 / $95 per arch	

SprintRay Cloud Design service	Fee	Notes
Hybrid Denture	$300 per arch	
Custom Bleaching Trays	$40 per arch	

Pricing accurate as of late 2025. Cloud Design credits can be pre-purchased at modest discounts (e.g., Voxel Dental sells $600 of credit for $500, $1,500 for $1,200) which lowers effective per-case cost by roughly 17–20% for high-volume users.

When outsourcing design makes sense

Outsourcing design becomes a strong financial decision when (a) the practice doesn't have a designated CAD technician and the assistant doing design work has a fully-loaded cost above ~$45/hour, (b) design volume is below ~50 cases/month — too low to justify a dedicated employee, (c) the design types vary (single crowns one day, surgical guides another, dentures the next), making depth of expertise hard to develop in-house, or (d) the practice wants to start fabricating in-house but doesn't want to slow down clinical care during the 6-12 month CAD learning curve.

The math is straightforward: if a remote service charges $10 per crown design and your in-house design takes 15 minutes of assistant time at $45/hour, you're paying $11.25 in-house versus $10 outsourced — about the same. The break-even shifts in favor of outsourcing when the in-house designer takes longer than 12-15 minutes, when remakes are frequent due to design errors, or when the assistant's time is more profitably spent elsewhere.

5. The impression and pour-up cost most people forget

Comparing a printed digital model against an outsourced lab model is the easy half of the math. The harder, more honest comparison is against pouring up a stone model in your own office from a conventional impression — because that's actually what many practices were doing before digital. If you're evaluating whether to keep using alginates or polyvinylsiloxanes (PVS) and pour your own diagnostic models versus scanning and printing, the in-office stone workflow has costs of its own that frequently get rounded down to zero.

Impression material per single arch

Material	Cost per single-arch impression	Use
Alginate (Identic, Cavex, House Brand, Zhermack)	≈ $0.80 – $1.20	Study/diagnostic models, ortho, opposing arch, simple appliances
Alginate alternative (Algin-X, irreversible hydrocolloid premium)	$2 – $4	Same as alginate, better dimensional stability
PVS light body (Aquasil, Imprint 4, Examix)	≈ $4 – $6 wash	Crown/bridge impressions, fine detail
PVS medium / heavy body cartridge (50ml)	≈ $4 – $6	Tray material, bulk fill
PVS combined wash + tray, single arch	≈ $8 – $12	Single crown impression

Material	Cost per single-arch impression	Use
PVS full quad/full arch combination	$15 – $25	Complex restorative cases
Polyether (Impregum)	$12 – $18	Implant cases, high precision

Material cost alone undercounts the real expense. Add the impression tray (disposable $0.50–$1, custom $4–$8), bite registration material ($2–$4 per case), tray adhesive, and disinfection solution, and the all-in consumables per single-arch PVS impression are closer to $12–$16.

Stone pour-up: the cost no one writes down

A poured stone model is so quick and routine that most practices never put a dollar figure on it. But it has both material and labor components.

Component	Cost per model
Type III dental stone (Yellow Buff, Labstone) — ~150–200g per arch	$0.50 – $1.00
Type IV die stone (Silky-Rock, Snap-Stone, Jade Stone) — if needed	$1.50 – $2.50
Base former or boxing wax	$0.30 – $0.50
Mixing supplies (water, bowl wash, paper towels)	≈ $0.20
Staff time: 5–8 minutes (pour, vibrate, trim, base) at $40–$50/hr loaded	$3.30 – $6.70
Total per single-arch Type III model	≈ $4 – $8

That total assumes a smooth workflow with no recasts. Air bubbles, voids, or fractures on demolding force a re-pour from a fresh impression, adding 50–100% to the cost on those cases.

Comparing the workflows honestly

Whether you take an alginate impression, a PVS impression, or a digital scan, the in-office model creation step has a real per-arch cost. The honest comparison isn't "does digital save money?" — it's "how does each workflow stack up when you cost everything to the same line item?" Below is the all-in cost per single-arch model across the four workflows most practices realistically choose between. The first three keep the model production in your office; the fourth outsources the print to a lab.

Workflow	Materials	Staff time	Outsourced fee	Total per arch
Alginate impression + in-office stone pour	$1 alginate + $1 stone = $2	$3 – $5 (pour, trim, ~5 min)	—	≈ $5 – $7
PVS impression + in-office stone pour	$9 PVS + $1 stone = $10	$3 – $5 (pour, trim, ~5 min)	—	≈ $13 – $15

Workflow	Materials	Staff time	Outsourced fee	Total per arch
Digital scan + in-office printed model	≈ $2 resin + $1 build supplies	$3 – $5 (design, print queue, post-process)	—	≈ $6 – $8
Digital scan + lab-printed model (STL sent out)	—	$1 – $2 (file prep, upload)	$15 – $40 lab fee per arch	≈ $16 – $42

A few things stand out from this comparison. First, the in-office printed model is roughly cost-equivalent to an alginate-poured model — the savings on going digital are not in raw materials. Second, PVS pour-ups are about twice as expensive per arch as alginate-poured or printed models, almost entirely because of the impression material itself. Third, outsourcing STL files to a lab for printing is by far the most expensive workflow per arch — the lab's fee ($15–$40) typically dwarfs every other line.

The financial argument for an in-office printer therefore depends heavily on which workflow it's replacing. If you currently use alginates for diagnostic and ortho models, the printer offers very little raw-cost savings — the case is about turnaround time, scan storage, and patient experience. If you take a lot of PVS impressions for crown-and-bridge cases and have your scans printed at a lab, the savings are substantial and compound quickly. And if you don't take impressions at all but currently outsource every printed model to a lab, the printer typically pays for itself in well under a year on model volume alone.

The companion calculator's printer tab uses the lab-fee column to capture this — enter your lab's actual per-arch printing fee in the Models row, and the math reflects what you'd actually save by bringing it in-house. If you're considering shifting from alginate or PVS workflows to digital, the real cost lever is staff time and patient experience, not materials.

6. What labs charge in 2025–2026

Lab pricing varies enormously by region, lab tier (economy/offshore vs. premium domestic), and case complexity. The figures below reflect current published price lists from a representative range of US labs (R-Dent, Next Dental Lab, Burbank Dental, Cera-Tech, Puche, S.A.N. Creations, and others).

Appliance / restoration	Economy lab fee	Mid-tier lab fee	Premium lab fee
Full-contour zirconia crown	$39 – $59	$75 – $110	$130 – $180
Layered zirconia crown	$75 – $110	$130 – $170	$185 – $250
e.max / lithium disilicate crown	$69 – $99	$130 – $180	$200 – $335
PFM crown (base alloy)	$45 – $79	$95 – $135	$160 – $200
3-unit zirconia bridge (per unit avg)	$45 – $75	$95 – $130	$150 – $200
Custom titanium implant abutment	$105 – $160	$160 – $220	$250 – $300
Zirconia screw-retained implant crown	$99 – $150	$155 – $220	$220 – $300
Surgical guide (single)	$150 – $250	$250 – $400	$400 – $600

Appliance / restoration	Economy lab fee	Mid-tier lab fee	Premium lab fee
3D-printed clear night guard	$66 – $110	$110 – $160	$160 – $220
Hard acrylic occlusal splint	$90 – $140	$140 – $200	$200 – $300
3D-printed digital denture (per arch)	$215 – $299	$300 – $400	$400 – $550
Premium conventional denture (per arch)	$250 – $345	$345 – $500	$500 – $750
Diagnostic wax-up (per tooth)	$40 – $60	$50 – $75	$75 – $100
Printed orthodontic model	$10 – $20	$15 – $25	$25 – $40

Add shipping, rush fees, and remake/redo rates (roughly 3–8% of cases industry-wide). For an honest comparison, use your own actual lab spend over the last 12 months rather than the price list — most practices are surprised how much the rush and redo lines add.

7. Putting it together: where the math actually works

In-office milling tends to be financially defensible when the practice produces 20+ single crowns per month and the doctor genuinely values single-visit dentistry as a clinical and patient-experience differentiator. Below 12–15 crowns per month, the per-unit overhead (depreciation + service contract + software subscription, spread over too few units) often makes outsourcing cheaper, even before counting staff time.

In-office printing tends to be financially defensible at much lower volumes, because the capital outlay is small and the lab fees being displaced (especially night guards, surgical guides, and models) are high-margin lab products. A practice making 4–6 night guards or 3–5 surgical guides per month often pays the printer off in 12 months.

There are also legitimate non-financial reasons to bring fabrication in-house: same-visit treatment for traveling or anxious patients, marketing as a digital-forward practice, faster turnaround on remakes, and the doctor's own job satisfaction from controlling the entire workflow. None of these belong on the spreadsheet, but they are real and matter. The elephant in the room is office quality vs lab quality. Will you be satisfied with the quality you create in your office compared to laboratory manufactured? Only you can answer that question.

Hidden costs to keep on your spreadsheet

- First-year ramp: expect 20–40% slower production and a higher remake rate while the team learns the workflow.
- Training and CE: $2,000–$8,000 in courses for the doctor and lead assistant, plus 2–4 weeks of reduced production during onboarding.
- Office IT: dedicated workstation, network upgrades, backup, often $3,000–$6,000.
- Physical footprint: milling units need a vibration-damped surface, ventilation, and water/air; printers need a dedicated, ventilated space (very important) and post-processing area.
- Insurance and disposal: photopolymer resin, ceramic dust, and milling slurry are regulated waste streams in many jurisdictions.
- Obsolescence: scanners and printers see meaningful generational improvements every 3–4 years; mills hold value longer.

How to use the companion calculator

The interactive calculator that accompanies this document asks you to enter the numbers from your own practice rather than arbitrary ones I used to test the feasibility of the worksheet. It compares (a) your projected in-house production cost — capital amortization + service + consumables + staff time — against (b) what you currently pay your lab for the same case mix. It then estimates a payback period and a five-year net position. The output is only as good as the inputs, so spend a few minutes pulling your actual lab spend from the last 12 months and your real per-restoration counts before filling it in.

Use the calculator as a sanity check, not as a purchase decision. If two reasonable scenarios produce wildly different answers, the technology is probably on the edge of viability for your practice and the non-financial factors should drive the decision.

Pricing in this document reflects publicly available manufacturer, distributor, and laboratory information from 2025–2026 and is intended for educational purposes. Confirm current pricing with your suppliers and tax/financial advisor before making a purchase decision.