Assessing Dynamic Occlusion

Inside-out and outside-in — two ways to read the same excursion.

Static occlusion tells you **where** the teeth meet. Dynamic occlusion tells you what happens on the way out and on the way back in — and that is where ceramics chip, composites fracture, bonds fail and teeth wear. Most occlusal surprises after a restoration are not ICP problems; they are excursive ones.

BEFORE YOU MARK ANYTHING

- **Dry the field properly.** Air, then gauze/tissue. Saliva is the commonest cause of smudged marks — and of adjusting a tooth that was never high.
- **Go thin.** 40 µm paper or thinner for excursions; 8–12 µm shimstock to confirm a true holding contact rather than proximity.
- **Miller's forceps, not fingers** — control the plane of the paper, or you mark its movement rather than the mandible's.
- **Two colours, used with discipline.** ICP first in one colour, excursions in the second, so holding and guiding contacts stay distinguishable.
- **Confirm ICP is reproducible** and the patient unguarded — otherwise nothing marked afterwards is reliable.

THE TWO DIRECTIONS OF TRAVEL

DIRECTION 1

Inside-out

Starts in ICP and slides *outwards* — into lateral excursion and protrusion, to and beyond edge-to-edge.

WHAT IT SHOWS

- The pathway the teeth travel leaving ICP
- Which teeth take the load, and in what sequence
- Whether disclusion happens — and how quickly

WHERE IT FALLS SHORT

- Less reproducible — needs coaching and rehearsal
- Muscles unloaded, so the path flattens and patients struggle
- A deflective contact can be slid past unregistered

DIRECTION 2

Outside-in

Starts at the eccentric border position and comes back *into* ICP — closing and sliding home rather than away.

WHAT IT SHOWS

- Interferences on the return path, where load is applied
- Non-working side contacts the outward stroke skips
- Distal inclines that inside-out rarely picks up

WHERE IT FALLS SHORT

- Easy to over-mark if the paper stays in too long
- Harder in a guarded or symptomatic patient

Chewing and parafunction are **outside-in** events. If you only ever assess inside-out, you are examining the one direction your patient spends the least time loading.

READING THE MARKS

- **Discrete dots (colour one, ICP).** Holding contacts — on cusp tips and fossae, even and simultaneous, confirmed with shimstock held bilaterally.
- **Streaks (colour two, excursion).** Guiding pathways. Read the *direction* — it tells you the vector of load on that tooth or restoration.
- **Bull's-eye — a streak through a dot.** That surface is both holding and guiding. Sometimes intended; often the first thing to adjust.
- **Wide, pale, smeared marks.** Usually a wet field or paper that is too thick — not a heavy contact. Re-dry and re-verify before you reach for a bur.

CHAIRSIDE SEQUENCE

- Dry. Mark ICP in colour one; verify with shimstock
- Dry. Mark excursions **inside-out** in colour two — right, left, protrusive, one at a time
- Dry. Repeat all three **outside-in**, coaching the patient to slide home with support
- Compare. Anything appearing only outside-in would otherwise have walked out of the surgery
- Adjust conservatively, re-mark from scratch, re-check sitting upright

PITFALLS & WHY IT MATTERS

- Marking on a wet field, or one colour doing two jobs
- Learning to interpret the mark
- Adjusting the mark rather than the interference
- Missed excursive load shows up as chipping, repeat debonds, wear facets and sensitivity — and later as mobility, muscle tenderness and joint symptoms