# AI Periodontal Charting Benchmark

## Charting at the speed of speech

Results measured on DentScribe 2.165.0 · 2026-11-01

## Summary

Voice charting can give hygienists their hands back, but only if the software understands the way clinicians really talk. To make that measurable, DentScribe created the AI Periodontal Charting Benchmark: 68 realistic dictation scripts in 8 levels, from a single tooth to a complete exam, each with an answer key a practice can check by hand.

> **DentScribe scored 100% on the AI Periodontal Charting Benchmark (DentScribe 2.165.0).** Every one of its 1967 expected chart entries was charted correctly, nothing was charted that was not dictated, and all 13 noisy-room versions were charted correctly too.

## 1. Why perio dictation is hard

A full-mouth periodontal exam is six sites on up to 32 teeth, plus bleeding, suppuration, recession, mucogingival junction and mobility. Clinicians dictate it in very different ways:

- **Tooth by tooth** — "tooth fourteen buccal, five four six".
- **Numbers only** — one starting point, then a stream of numbers while the probe walks the mouth.
- **Findings in the middle** — a bleeding point or a recession reading called out mid-walk, then "continue probing on number three".
- **Shorthand and synonyms** — BOP, BLD, SUP, GM, MGJ, MOB, PD; DB, MB, DF, MF; a single letter for the side ("tooth three B, five four six, L, four three five"); facial, labial, buccal; palatal, lingual.
- **Scope words, lists and ranges** — "bleeding all around on teeth three through six", "GM two mm all around on teeth eight through ten".
- **Corrections and jumps** — "correction, tooth three buccal ...", "go back to tooth two", "continue probing on number three".
- **A real room** — filler words, talking to the patient, suction noise and misheard words.
- **Starting anywhere** — "start at tooth thirteen lingual" and carry on from there.

The hardest part is invisible to the clinician: knowing which tooth and which site each number belongs to. When the probe walks from tooth 8 to tooth 9, the first reading of each tooth changes from distal to mesial. At the last tooth the walk turns to the inside; at the end of the upper arch it crosses to the lower. A system that loses track for one tooth shifts every reading after it.

## 2. What the benchmark tests

| Level | What it tests | Tests | DentScribe: tests passed | DentScribe: entries correct |
|---|---|---|---|---|
| 1 | First steps: one tooth at a time | 4 | 4 of 4 | 31 of 31 |
| 2 | Walk the mouth hands-free | 6 | 6 of 6 | 492 of 492 |

| Level | What it tests | Tests | DentScribe: tests passed | DentScribe: entries correct |
|---|---|---|---|---|
| 3 | The rest of the chart: bleeding, pus, recession, MGJ, mobility | 13 | 13 of 13 | 83 of 83 |
| 4 | Dictate your way: word order, findings mid-walk, jumps, starting anywhere, restating | 8 | 8 of 8 | 82 of 82 |
| 5 | The real room: filler, side talk, corrections and going back | 15 | 15 of 15 | 133 of 133 |
| 6 | Accelerated dictation: shorthand, scope words, lists and ranges | 13 | 13 of 13 | 234 of 234 |
| 7 | Safety: nothing charted that was not said | 5 | 5 of 5 | 26 of 26 |
| 8 | The complete exam, two ways: full words and shorthand | 4 | 4 of 4 | 886 of 886 |

Across the levels the scripts cover 24 dictation styles:

| Dictation style | DentScribe: tests passed |
|---|---|
| Tooth by tooth: name the tooth and side, then three numbers | 3 of 3 |
| Tooth by tooth with findings for that tooth | 1 of 1 |
| Hands-free walk: numbers only, the system moves to the next tooth | 1 of 1 |
| Hands-free turns: crossing the midline and turning to the inside automatically | 2 of 2 |
| Missing teeth said first, then the whole mouth in one stream | 1 of 1 |
| Skip and missing teeth said in the flow / classic spoken turns | 2 of 2 |
| Bleeding and suppuration at named sites | 3 of 3 |
| Recession (gingival margin) and MGJ readings | 4 of 4 |
| Mobility | 4 of 4 |
| Findings called out after the probing is done | 1 of 1 |
| Shorthand words (DB, MB, DL, BOP, BLD, GM, MGJ, sup, mob, PD) | 1 of 1 |
| Free word order | 1 of 1 |
| Findings mixed into the walk | 1 of 1 |
| Jump to any tooth and continue | 1 of 1 |
| Corrections: restating a reading, alone or after a correction word (correction, sorry, redo, correct) | 6 of 6 |
| Lists and ranges of teeth | 4 of 4 |
| Real-room speech: filler words and side talk | 2 of 2 |

| Dictation style | DentScribe: tests passed |
|---|---|
| The complete exam in one go | 4 of 4 |
| Going back and resuming the walk (go back, back to probing, continue/resume/now probing, continue on, go to, move to) | 8 of 8 |
| Several readings for one tooth in one breath | 2 of 2 |
| Start the walk at any tooth and side | 3 of 3 |
| Full shorthand: side letters (B, F, L), every site letter and every reading acronym (PD, BOP, BLD, SUP, GM, MGJ, MOB) | 3 of 3 |
| Scope words: all around (six sites); everywhere, all sites, all surfaces (three sites of one side) | 5 of 5 |
| Safety: nothing on a missing tooth, nothing charted that was not said | 5 of 5 |

## 3. How it was measured

- **Who made it.** DentScribe created the AI Periodontal Charting Benchmark. It was built from the dictation styles DentScribe's charting engine supports in version 2.165.0; it does not cover every way clinicians dictate.
- **What the answer key follows.** Universal tooth numbering 1 to 32, six sites per tooth, and one written charting standard in which the three readings for one side of a tooth are spoken in the direction the probe travels around the mouth. Each expected chart was written from the clinical meaning of its script, not from any system's output.
- **Noisy-room versions.** The noisy versions are the same scripts with words misheard the way speech recognition sometimes hears them.
- **Scoring.** One entry is one site value, one bleeding or pus mark, one mobility grade or one missing tooth. A test passes only when every expected entry is right and nothing extra was charted.
- **Speed.** See Results: the engine's text-to-chart processing time, measured without speech-to-text.

## 4. Results

| Measure | DentScribe 2.165.0 |
|---|---|
| Tests passed | 68 of 68 |
| Chart entries correct | 1967 of 1967 (100%) |
| Readings charted that were never dictated | 0 |
| Dictation styles handled perfectly | 24 of 24 |
| Noisy-room versions passed | 13 of 13 (471 of 471 entries) |

| Measure | DentScribe 2.165.0 |
|---|---|
| Same chart on every repeat run | 81 of 81 scripts (8 runs each) |
| Engine text-to-chart time, complete exam (243 words) | 15.68 ms (excludes speech-to-text; busy machine) |
| The same complete exam in shorthand (231 words) | PASS, same chart; 17 ms |
| Second complete exam: full words (397 words) / shorthand with scope words and ranges (210 words) | PASS / PASS, same chart; 32.54 ms / 24.74 ms |
| Safety tests passed (nothing charted that was not said) | 5 of 5 |

**What perio-control-word recovery adds.** DentScribe perio AI repairs misheard control words (sites, findings, "tooth", "probing") before charting. With that step switched off, the same 13 noisy versions gave 120 of 471 correct entries and 15 invented ones (6 of 13 passed); with it switched on, 471 of 471 and 0.

**Consistency.** Each script was charted 8 times; 81 of 81 gave exactly the same chart every time. Leaving punctuation in the text changed nothing (64 of 64 scripts gave the same chart).

**Speed.** The time DentScribe's engine took to turn the finished text of the complete exam (243 words) into a full chart was 15.68 ms (median of 7 runs). That is the engine's text-to-chart processing time only: it does not include speech-to-text, the network or the screen, and it was measured on a laptop that was busy with other work at the time (a 1-minute load average of 7.69 on 8 cores).

**The complete exam, two ways.** Said in shorthand, the same exam took 231 words instead of 243 and gave exactly the same chart (187 of 187 entries correct, 0 extra); the engine turned it into a chart in 17 ms. A second exam, with healthy and inflamed areas, took 397 words in full words and 210 in shorthand with scope words and ranges, for the same chart (256 of 256 entries correct); the engine took 32.54 ms and 24.74 ms. The kit's stopwatch test times every version chairside, from the first word to a correct, saved chart.

**Safety.** DentScribe passed 5 of 5 safety tests: nothing was charted on a missing tooth (even inside a range, or when "missing" was said after the tooth's pocket depths), two numbers stayed two readings, and a finding named for one site stayed on that site. A garbled opening (`kstail bupple one one one one`) was refused and nothing was charted; without the recovery step, the chart builder alone would have charted 3 entries from it.

## 5. What this means for a practice

- **Dictate the way you already work.** Tooth by tooth or numbers only, findings at the end or in the middle, shorthand or full words — the benchmark checks each of these styles.
- **Trust comes from the answer key.** Every expected chart is printed, so a hygienist can check any result by eye.

- **Watch for invented readings.** A reading that lands in the chart without being dictated is worse than a missed one; the benchmark counts these separately as extra entries.
- **Measure the whole visit.** The stopwatch test in the kit times a complete exam from the first word to a correct, saved chart, which is what matters chairside. Time it in full words and in shorthand to see what shorthand saves you.

## 6. Limits

- DentScribe created this benchmark from the styles DentScribe 2.165.0 supports.

## 7. Using the kit

The kit contains the read-aloud scripts, the answer key, a score card and a stopwatch protocol. A practice can use it to evaluate the charting system it uses: read each script once at a normal pace, compare the chart with the answer key, and fill in the score card. Teams whose system can export chart data can also score it automatically with the kit's scoring program.

## Appendix — the reading direction used by the answer key

| Pass | Teeth | Side | Three readings are spoken |
|---|---|---|---|
| 1 | 1 to 8 | outside (buccal) | DB/B/MB |
| 2 | 9 to 16 | outside (buccal) | MB/B/DB |
| 3 | 16 to 9 | inside (lingual/palatal) | DL/L/ML |
| 4 | 8 to 1 | inside (lingual/palatal) | ML/L/DL |
| 5 | 32 to 25 | outside (buccal) | DB/B/MB |
| 6 | 24 to 17 | outside (buccal) | MB/B/DB |
| 7 | 17 to 24 | inside (lingual/palatal) | DL/L/ML |
| 8 | 25 to 32 | inside (lingual/palatal) | ML/L/DL |