

# Description of the swimlane diagram

## Overview

This model maps the end-to-end appointment-booking workflow for a dental clinic, covering General Checkup, Cleaning, Consultation, Orthodontics, and Cosmetic Dentistry services. It enforces business rules—no same-day bookings, up to 14 days in advance, and operating hours (Mon–Fri 08:00–20:00; Sat–Sun 09:00–17:00). Notifications are sent via email 24 hours before the appointment.

## Swimlane Roles

- **Patient:** Initiates booking or reschedule/cancellation requests through the online interface.
- **System:** Validates requested date/time against clinic rules, checks slot availability, persists the appointment, and enqueues the reminder.
- **EmailService (External):** Sends reminder emails exactly 24 hours before the appointment.
- **Provider:** Receives real-time updates on new bookings and reminders.
- **Admin:** Handles any bookings or changes within 24 hours of the appointment and assists clients who book via telephone or in-office.

## Process Flow

1. **Start & Request:** The Patient opens the booking interface, selects service, desired date, and time.
2. **Validation:** The System checks if the slot lies within the next 14 days and inside operating hours. Invalid requests loop back to the Patient with an error.
3. **Availability Check:** If available, the System saves the appointment and schedules a reminder job; if not, the Patient is prompted to choose another slot.
4. **Notification:** 24 hours before, the EmailService sends a reminder email to the Patient (and copies the Provider).
5. **Day-Of Changes:** If a Patient attempts to reschedule/cancel less than 24 hours before, control passes to the Admin swimlane, who processes the request manually.
6. **Office-Assisted Booking:** The Admin can also create or modify bookings on behalf of clients who call or visit the clinic.

## MIS Benefits

- **Bottleneck Identification:** Visualizing each step highlights where delays (e.g., validation failures) occur.
- **Improved Decision-Making:** Admins see clear handoffs between automated and manual tasks, enabling better staffing during peak flows.

- **Enhanced Accountability:** Each transaction (booking, reminder, change) maps to database triggers and audit tables in Phase VII, ensuring traceability.
- **Optimized Patient Experience:** Automating reminders and validations reduces no-shows and double-bookings, boosting clinic utilization and patient satisfaction.