



# Patient Collection Form

Low Back Pain System - Data Structure Documentation

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## Overview

The patient collection form collects comprehensive clinical data across 7 major sections, supporting both manual entry and AI-assisted OCR extraction.

70+

Total Data Fields

7

Main Sections

4

Required Fields

8

Nested Objects

## Key Features

**OCR Integration:** Automated text extraction from medical record images

**AI Posture Analysis:** Real-time ROM measurement using MediaPipe pose detection

**Interactive Body Map:** SVG-based pain area selection with 20 anatomical regions

**Conditional Logic:** Dynamic field display based on user selections

**Multi-platform Support:** Optimized for mobile and desktop data collection

**Auto-save:** Real-time data synchronization with backend database

## 1 Basic Information (基本信息)

Essential patient demographics and contact information

| Field Name | Field Key | Type   | Label (中文) | Status   |
|------------|-----------|--------|------------|----------|
| Name       | name      | Text   | 患者姓名       | Optional |
| Study ID   | study_id  | Text   | Study ID   | Required |
| Phone      | phone     | Text   | 联系电话       | Optional |
| Age        | age       | Number | 年龄         | Required |
| Gender     | gender    | Select | 性别 (男/女)   | Required |

## 2 Medical History (病史资料)

Clinical history, symptom characteristics, and previous treatments

| Field Name          | Field Key           | Type     | Label (中文)         | Status      |
|---------------------|---------------------|----------|--------------------|-------------|
| Chief Complaint     | chief_complaint     | Textarea | 主诉 (supports OCR)  | Optional    |
| History Type        | history_type        | Select   | 现病史类型 (首次发作/复发)    | Optional    |
| First Onset Date    | first_onset_date    | Date     | 初次发作日期             | Optional    |
| Pain Type           | pain_type           | Select   | 疼痛类型 (局部/放射/牵涉)    | Optional    |
| Aggravating Factors | aggravating_factors | Textarea | 加重因素               | Optional    |
| Relieving Factors   | relieving_factors   | Textarea | 缓解因素               | Optional    |
| Has Radiation       | has_radiation       | Boolean  | 是否有放射痛             | Optional    |
| Radiation Location  | radiation_location  | Text     | 放射至何处              | Conditional |
| Previous Treatment  | previous_treatment  | Textarea | 其他已接受治疗            | Optional    |
| Condition Progress  | condition_progress  | Select   | 病情进展 (改善/恶化/稳定/波动) | Optional    |

## 3 Pain Area Selection (疼痛区域选择)

Interactive body diagram for anatomical pain location mapping

**Data Structure:** pain\_areas - Object with boolean values for each anatomical region

|                             |                              |
|-----------------------------|------------------------------|
| ✓ upper_cervical - 上颈椎      | ✓ lower_cervical - 下颈椎       |
| ✓ left_upper_trap - 左上斜方肌   | ✓ right_upper_trap - 右上斜方肌   |
| ✓ left_mid_trap - 左中斜方肌     | ✓ right_mid_trap - 右中斜方肌     |
| ✓ left_lower_trap - 左下斜方肌   | ✓ right_lower_trap - 右下斜方肌   |
| ✓ left_latissimus - 左背阔肌    | ✓ right_latissimus - 右背阔肌    |
| ✓ thoracic_erector - 胸椎竖脊肌  | ✓ lumbar_erector - 腰椎竖脊肌     |
| ✓ left_glute_max - 左臀大肌     | ✓ right_glute_max - 右臀大肌     |
| ✓ left_glute_med - 左臀中肌     | ✓ right_glute_med - 右臀中肌     |
| ✓ left hamstring - 左腘绳肌     | ✓ right hamstring - 右腘绳肌     |
| ✓ left_gastrocnemius - 左腓肠肌 | ✓ right_gastrocnemius - 右腓肠肌 |

## 4 Subjective Examination (主观检查)

Patient-reported pain, function, and red flag screening

### Pain & Function Assessment

| Field Name            | Field Key             | Type    | Label (中文)       | Status      |
|-----------------------|-----------------------|---------|------------------|-------------|
| Pain Score            | pain_score            | Select  | NPRS 疼痛评分 (0-10) | Optional    |
| Sitting Tolerance     | sitting_tolerance     | Number  | 坐姿耐受时间 (分钟)      | Optional    |
| Standing Tolerance    | standing_tolerance    | Number  | 站立耐受时间 (分钟)      | Optional    |
| Walking Tolerance     | walking_tolerance     | Number  | 行走耐受时间 (分钟)      | Optional    |
| Has Assistive Tools   | has_assistive_tools   | Boolean | 是否使用辅助工具         | Optional    |
| Assistive Tools       | assistive_tools       | Text    | 辅助工具描述           | Conditional |
| Has Claudication      | has_claudication      | Boolean | 是否有间歇性跛行         | Optional    |
| Claudication Distance | claudication_distance | Text    | 间歇性跛行距离          | Conditional |

### Red Flags Screening

**Data Structure:** red\_flags - Object with boolean values

|                                       |                                     |
|---------------------------------------|-------------------------------------|
| weight_loss - 显著体重减轻                  | appetite_loss - 食欲不振                |
| fever - 发热                            | night_pain - 夜间疼痛                   |
| bladder_bowel_dysfunction - 膀胱/肠道功能障碍 | saddle_numbness - 鞍区麻木              |
| bilateral_limb_weakness - 双侧肢体无力      | bilateral_sensory_abnormal - 双侧感觉异常 |
| hand_clumsiness - 手部不灵活               | gait_abnormal - 步态异常                |

## Cervical Function Problems

**Data Structure:** cervical\_function\_problems - Object with boolean values

|                                |  |
|--------------------------------|--|
| ✓ dropping_objects - 物品掉落      | ✓ difficulty_picking_small_items - 难以拾取小物件 |
| ✓ writing_difficulty - 书写困难    | ✓ phone_usage_difficulty - 使用手机困难          |
| ✓ buttoning_difficulty - 扣纽扣困难 | ✓ chopstick_usage_difficulty - 使用筷子困难      |

## 5 Objective Examination (客观检查)

Physical examination findings including posture, ROM, special tests, and reflexes

### AI Posture Analysis (MediaPipe)

**Data Structure:** ai\_posture\_analysis - Complex object with ROM measurements and clinical recommendations

|   |
|---|
| rom_degrees - Measured ROM angles             |
| rom_assessment - Functional assessment        |
| compensations - Compensation patterns         |
| recommendations - Clinical recommendations    |
| annotatedStandingUrl - Standing posture image |
| annotatedFlexionUrl - Flexion posture image   |

### Posture Assessment

| Field Name       | Field Key        | Type   | Options               |
|------------------|------------------|--------|-----------------------|
| Cervical Posture | cervical_posture | Select | 前凸过度 / 正常 / 前凸消失 / 后凸 |
| Lumbar Posture   | lumbar_posture   | Select | 前凸过度 / 正常 / 曲度变平 / 后凸 |

### Range of Motion (ROM)

**Cervical ROM:** cervical\_rom - Object with 6 directional measurements

|                     |                     |                      |
|---------------------|---------------------|----------------------|
| flexion - 屈曲        | extension - 伸展      | left_lateral - 左侧屈   |
| right_lateral - 右侧屈 | left_rotation - 左旋转 | right_rotation - 右旋转 |

**Lumbar ROM:** lumbar\_rom - Object with 6 directional measurements

|                     |                     |                      |
|---------------------|---------------------|----------------------|
| flexion - 屈曲        | extension - 伸展      | left_lateral - 左侧屈   |
| right_lateral - 右侧屈 | left_rotation - 左旋转 | right_rotation - 右旋转 |

**Special Tests****SLR Test:** slr\_test - Object with bilateral angles

|                    |
|--------------------|
| left_angle - 左侧角度  |
| right_angle - 右侧角度 |

**Femoral Nerve Test:** femoral\_nerve\_test - Object with bilateral results

|              |
|--------------|
| left - 左侧结果  |
| right - 右侧结果 |

**Reflex Examination****Data Structure:** reflexes - Object with 5-grade scale (-, +, ++, +++, +++)

|                      |                     |                     |
|----------------------|---------------------|---------------------|
| biceps_left - 二头肌左   | biceps_right - 二头肌右 | triceps_left - 三头肌左 |
| triceps_right - 三头肌右 | knee_left - 膝反射左    | knee_right - 膝反射右   |
| ankle_left - 踝反射左    | ankle_right - 踝反射右  |                     |

**Vascular Assessment**

| Field Name   | Field Key    | Type   | Options  |
|--------------|--------------|--------|----------|
| Distal Pulse | distal_pulse | Select | 存在 / 不存在 |

## 6 Functional Score (功能评分)

Standardized disability and function assessment tools

| Scale | Field Key  | Type   | Range  | Interpretation                                      |
|-------|------------|--------|--------|---|
| RMDQ  | rmdq_score | Number | 0-24   | 0-4: 轻微<br>5-14: 中等<br>15-24: 重度                    |
| NDI   | ndi_score  | Number | 0-100% | 0-20%: 轻微<br>21-40%: 中等<br>41-60%: 重度<br>>60%: 完全残疾 |

# 7 Intervention & Recommendations (干预建议)

Treatment interventions and clinical recommendations

## Interventions Provided

**Data Structure:** interventions - Object with boolean values

posture\_correction - 姿势矫正

pain\_management - 疼痛调节 (热敷)

therapeutic\_exercise - 治疗性运动

gait\_reeducation - 步态再教育

## Clinical Recommendations

**Data Structure:** recommendations - Object with boolean values

discharge\_with\_advice - 出院并提供建议及家庭锻炼计划

specialist\_followup - 进一步专科门诊(SOPD)随访

outpatient\_pt - 门诊物理治疗

day\_rehabilitation - 日间康复

medication\_intervention - 药物干预

## Additional Documentation

| Field Name         | Field Key          | Type     | Description                                    |
|--------------------|--------------------|----------|--|
| Medication Details | medication_details | Textarea | Drug name, dosage, frequency, timing, duration |
| Remarks            | remarks            | Textarea | General clinical notes and observations        |

# Technical Implementation

## Data Validation & Sanitization

**Numeric Fields:** age, pain\_score, sitting\_tolerance, standing\_tolerance, walking\_tolerance, rmdq\_score, ndi\_score - Validated as integers with range checking

**Boolean Fields:** has\_radiation, has\_assistive\_tools, has\_claudication - Converted to strict boolean values

**Nested Boolean Objects:** red\_flags, cervical\_function\_problems, interventions, recommendations - Each key converted to boolean

**Required Field Validation:** study\_id, age, gender must be present for form submission

## Auto-Save & Synchronization

**Real-time Auto-save:** Form data automatically saved to backend after each section completion

**Sync Interval:** 3-second polling for remote updates via `last_sync_timestamp`

**Conflict Resolution:** Remote changes override local data when timestamps indicate newer version

**Workspace Association:** All patient data linked to `workspace_id` for multi-tenant support

## AI Features

**OCR Extraction:** Upload medical record images → AI extracts structured data → Auto-populate form fields

**MediaPipe Pose Analysis:** Real-time body posture detection → Automatic ROM calculation → Generate clinical recommendations

**Data Sanitization:** AI-extracted data validated and sanitized before form population

**Section Completion Tracking:** Smart detection of completed sections based on non-empty validated fields