

ProCare: 7-Agent System

Complete Agent Interaction Specifications

Version 1.0 | November 2024

The 7 Agents

1. Engagement Engine

Master orchestrator coordinating all other agents

Routes events, manages notifications, tracks patient state, controls message flow

2. Clinical Monitor

Health data monitoring and medication tracking

Tracks glucose, medications, symptoms. Detects emergencies. Monitors clinical safety.

3. Lifestyle Coach

Nutrition and activity guidance

Analyzes meals, tracks activity, provides behavioral nudges, suggests improvements

4. Health Insights

Pattern detection and correlation analysis

Identifies food-glucose patterns, activity impacts, generates personalized insights

5. Doctor Bridge

Patient-doctor-AI communication hub

Routes questions, manages doctor alerts, enhances doctor messages with data

6. Care Coordinator

Scheduling and logistics management

Manages test appointments, medication refills, doctor visit scheduling

7. Learning Library

Educational content delivery

Delivers targeted health education based on patient needs and events

How the 7 Agents Work Together

The Engagement Engine sits at the center. Every patient action flows through it. The Engine then orchestrates which agents should respond and in what order.

Interaction Pattern 1: Glucose Logging

Patient logs: 145 mg/dL (fasting glucose at 7:15 AM)

1. **Engagement Engine receives event:** Classifies as: glucose_log, fasting, 145 mg/dL
2. **Engine checks: Is this emergency?:** No (safe range). Proceeds with normal routing.
3. **Engine → Clinical Monitor:** Sends: {patient_id, glucose_value: 145, timestamp: 7:15 AM, context: fasting}
4. **Clinical Monitor analyzes:** Compares to target (130 - slightly above), checks 7-day pattern (stable 140-150), calculates time in range. Assessment: Safe, stable pattern.
5. **Clinical Monitor → Engine:** Returns: {status: SAFE, message: "Stable", needs_correlation: true}
6. **Engine decision:** Not emergency, should correlate with last night. Routes to Health Insights.
7. **Engine → Health Insights:** Request: "Correlate this fasting glucose with yesterday evening"
8. **Health Insights queries Lifestyle Coach:** Asks: "What did patient do last night?"
9. **Lifestyle Coach → Health Insights:** Responds: "Patient walked 18 minutes after dinner at 8:45 PM"
10. **Health Insights analyzes pattern:** Patient history shows: With evening walk → fasting 142-148. Without walk → fasting 158-165. Today's 145 is consistent with walk pattern.
11. **Health Insights → Engine:** Returns: {correlation: "walk_helped", impact: "16 mg/dL reduction", message: "That evening walk helped!"}
12. **Engine synthesizes responses:** Combines: Clinical safety ✓ + Walk correlation ✓ + Streak status (18 days)
13. **Engine checks notification limits:** Sent today: 0 (reset at midnight). Last notification: 13 hours ago. OK to send.
14. **Engine → Patient:** Delivers: "✓ Fasting: 145 mg/dL (Stable) 🔥 18-day streak! That evening walk helped! Your fasting averages 145 with walks vs 160 without. Next: Take medication at 8 AM"
15. **All agents update their data:** Clinical Monitor: logs glucose. Lifestyle Coach: validates walk effectiveness. Health Insights: confirms prediction accuracy. Engagement Engine: updates streak and score.

Interaction Pattern 2: Meal Logging

Patient uploads breakfast photo at 9:00 AM (poha + tea)

16. **Engagement Engine receives:** Event: meal_log, meal_type: breakfast, photo attached
17. **Engine → Lifestyle Coach:** Sends: {photo_data, timestamp: 9:00 AM, meal_type: breakfast, patient_id}
18. **Lifestyle Coach processes photo:** Image recognition identifies: poha, tea. Estimates: 40g carbs, 10g protein, 5g fat.
19. **Lifestyle Coach queries own history:** Checks: "How many times has patient eaten poha? What was glucose response?" Finds: 8 previous poha breakfasts, average post-meal glucose: 172 mg/dL (range 165-180)
20. **Lifestyle Coach → Engine:** Returns: {foods: ["poha", "tea"], carbs: 40g, predicted_glucose: "170-180 mg/dL", confidence: 0.87, assessment: "good_choice"}
21. **Engine → Health Insights:** Request: "Store this meal for later correlation"
22. **Health Insights stores meal data:** Will correlate with post-breakfast glucose when logged in 2 hours
23. **Engine → Lifestyle Coach:** Question: "Should we remind patient to check glucose after this meal?"
24. **Lifestyle Coach → Engine:** Answer: "Yes, schedule reminder for 11:00 AM (2 hours post-meal)"
25. **Engine schedules reminder:** Adds to notification queue: 11:00 AM check reminder
26. **Engine composes message:** Combines Lifestyle Coach feedback + prediction + scheduled reminder
27. **Engine → Patient:** Delivers: "Poha - good choice! ✓ Based on your history (8 times): Expected glucose 170-180 mg/dL. I'll remind you to check at 11 AM."
28. **11:00 AM - Reminder fires:** Engine sends: "Check post-breakfast glucose now"
29. **Patient logs:** 172 mg/dL
30. **Engine multi-routes:** Sends to Clinical Monitor (safety) AND Health Insights (prediction validation) simultaneously
31. **Clinical Monitor response:** Safe, within target (<180), no concerns
32. **Health Insights analyzes:** Predicted: 170-180. Actual: 172. Accuracy: Excellent (within 2 mg/dL). Updates: Poha reliability confirmed (9th occurrence, always 165-180 range, confidence: 0.92)
33. **Health Insights → Lifestyle Coach:** Notification: "Poha is highly reliable for this patient. Encourage continued use."
34. **Engine synthesizes:** Clinical safety ✓ + Prediction accuracy ✓ + Pattern reliability ✓
35. **Engine → Patient:** Delivers: "Perfect! 172 mg/dL - right where I predicted. Your body consistently responds to poha this way. This is a reliable breakfast! 🎉"
36. **Lifestyle Coach updates:** Adds poha to patient's "recommended foods" list, increases reliability score
37. **Health Insights stores:** Updated correlation: poha → 172 mg/dL average (n=9, SD=5.2, very high confidence)

Interaction Pattern 3: Symptom Report (Emergency)

Patient reports: "I feel dizzy" at 2:30 PM

38. **Engagement Engine receives:** Event: symptom_report, text: "I feel dizzy", severity: unknown
39. **Engine priority check:** Symptom reports could be urgent. Route to Doctor Bridge for triage.
40. **Engine → Doctor Bridge:** Sends: {symptom: "dizzy", patient_id, timestamp: 2:30 PM}
41. **Doctor Bridge analyzes:** Keyword "dizzy" = potential clinical issue. Requires Clinical Monitor assessment.
42. **Doctor Bridge → Engine:** Instruction: "Route to Clinical Monitor for medical evaluation"
43. **Engine → Clinical Monitor:** Sends: {symptom: "dizzy", reported_at: 2:30 PM, needs_context: true}
44. **Clinical Monitor pulls context:** Queries database: Last glucose 172 mg/dL (11 AM, 3.5 hours ago), No lunch logged, Morning medication taken (includes Glimepiride - glucose-lowering drug)
45. **Clinical Monitor assessment:** Gap since last glucose too long, No lunch concerning, Medication actively lowering glucose. Hypothesis: Possible hypoglycemia from delayed lunch.
46. **Clinical Monitor → Engine:** Request: "Ask patient how long they've felt dizzy"
47. **Engine → Patient:** Quick question: "How long have you felt dizzy?" [Options: Just started / About an hour / Several hours]
48. **Patient responds:** Selects: "About an hour"
49. **Engine → Clinical Monitor:** Patient info: Duration = 1 hour
50. **Clinical Monitor escalates priority:** 1 hour duration + no lunch + medication = likely hypoglycemia. Priority: HIGH.
51. **Clinical Monitor → Health Insights:** Request: "Check patient history - any previous dizziness episodes?"
52. **Health Insights searches:** Finds: 5 days ago, patient reported dizziness, glucose was 92 mg/dL. Pattern: Dizziness = low glucose indicator for this patient.
53. **Health Insights → Clinical Monitor:** Confirms: "Patient history shows dizziness associated with hypoglycemia"
54. **Clinical Monitor → Doctor Bridge:** Alert: "Probable hypoglycemia. Patient needs immediate glucose check and food. Alert doctor if confirmed."
55. **Doctor Bridge → Engine:** Instruction: "Send emergency instructions NOW. Monitor closely."
56. **Engine takes priority action:** Pauses all other notifications. Sends immediate high-priority message.
57. **Engine → Patient:** URGENT: "Dizziness can be from low glucose. DO THIS NOW: 1) Check your glucose right now 2) Eat something while you check [Check Glucose Now]"
58. **Patient logs glucose:** 88 mg/dL (3 minutes later)
59. **Engine → Clinical Monitor:** New glucose: 88 mg/dL, context: symptom-related

60. **Clinical Monitor confirms:** Borderline hypoglycemia confirmed. Symptom explained.
Action: Eat immediately, recheck in 30 min.
61. **Clinical Monitor → Engine:** Status: HYPOGLYCEMIA_CONFIRMED. Instructions: "Eat now, recheck 30 minutes" Doctor alert: Routine review (not emergency)
62. **Engine → Patient:** "Your glucose is 88 mg/dL - on the low side. This explains the dizziness. EAT LUNCH NOW: Rice + dal + vegetable OR sandwich + fruit. Check again in 30 minutes."
63. **Clinical Monitor → Health Insights:** Event logged: "Hypoglycemia from delayed lunch on Glimepiride. Analyze root cause."
64. **Health Insights analyzes:** Breakfast 9 AM, Lunch delayed to 2:30 PM = 5.5 hour gap. Medication active 6-8 hours. Patient's safe meal gap: ≤4.5 hours. Root cause: Meal timing issue.
65. **Health Insights → Learning Library:** Request: "Patient needs education on meal timing with Glimepiride"
66. **30 minutes later:** Engine triggers scheduled recheck reminder
67. **Patient logs:** 112 mg/dL (recovered)
68. **Clinical Monitor:** Improved from 88 → 112. Recovery good. Crisis resolved.
69. **Engine → Patient:** "Good! 112 mg/dL - you're recovering. Dizziness should be gone now."
70. **Learning Library → Engine:** Educational content ready: "Meal Timing with Glimepiride"
71. **Engine delivers education:** (After recovery) "What happened today: [explanation]. PREVENTION: Eat lunch by 1:30 PM max. [Set Daily Lunch Reminder]"
72. **Care Coordinator activated:** Sets up lunch reminders for next 7 days to prevent recurrence
73. **Health Insights updates model:** Patient profile: meal_timing_sensitive = true, safe_gap = 4.5 hours, risk_factor = delayed_meals_on_glimepiride
74. **Clinical Monitor → Doctor Bridge:** Summary for doctor: "Minor hypoglycemia event (88 mg/dL). Patient self-managed appropriately. Cause: delayed meal. Patient educated. Add to weekly review."
75. **Doctor Bridge logs:** Adds to doctor's Monday weekly summary (not urgent enough for immediate alert)

Interaction Pattern 4: Patient Question

Patient asks: "Can I eat mango?"

76. **Engagement Engine receives:** Event: patient_question, text: "Can I eat mango?"
77. **Engine default routing:** ALL questions route to Doctor Bridge for classification
78. **Engine → Doctor Bridge:** Sends: {question: "Can I eat mango?", patient_id, timestamp}
79. **Doctor Bridge classifies:** Question type: nutrition, Complexity: simple, Medical risk: low, Requires_doctor: false
80. **Doctor Bridge determines routing:** Nutrition questions go to Lifestyle Coach. Doctor Bridge will monitor response quality.
81. **Doctor Bridge → Engine:** Instruction: "Route to Lifestyle Coach. I'll review the answer before delivery."
82. **Engine → Lifestyle Coach:** Request: "Patient asking: Can I eat mango?"
83. **Lifestyle Coach generates answer:** Checks: Mango nutrition (15g carbs per 100g), Patient history (no mango logged yet), General diabetes guidelines. Creates comprehensive answer.
84. **Lifestyle Coach → Engine:** Returns: "Yes, mango is fine! Limit to 100g (about 1/2 medium mango), pair with a meal, check glucose 2 hours after. Mango has ~15g carbs per 100g. Want nutrition details? [Learn More]"
85. **Engine → Doctor Bridge:** For review: Lifestyle Coach answer ready
86. **Doctor Bridge reviews:** Checks: Medically appropriate? Yes. Complete? Yes. Accurate? Yes. Safe? Yes.
87. **Doctor Bridge → Engine:** Approved: "Deliver to patient. Log as AI-handled."
88. **Engine → Patient:** Delivers Lifestyle Coach answer
89. **Doctor Bridge logs conversation:** Type: patient_question, Handled_by: AI (Lifestyle Coach), Doctor_escalation: not_needed
90. **Engagement Engine updates:** Patient engaged with AI (+1 engagement score)

Interaction Pattern 5: Medication Question (Requires Doctor)

Patient asks: "Should I double my medication dose? My glucose has been high."

91. **Engagement Engine receives:** Event: patient_question, text: "Should I double my medication dose?"
92. **Engine → Doctor Bridge:** All questions go to Doctor Bridge first
93. **Doctor Bridge classifies:** Keywords detected: "medication", "dose", "double". Question type: MEDICATION_DECISION. Medical risk: HIGH. Requires_doctor: TRUE (medication changes ALWAYS need doctor).
94. **Doctor Bridge STOPS routing:** Does NOT send to Clinical Monitor or Lifestyle Coach. This requires doctor only.
95. **Doctor Bridge → Engine:** Instruction: "Do not route anywhere else. I'm handling this."
96. **Doctor Bridge → Patient (immediate):** "This is an important question that needs Dr. Verma's input. I'm sending him a message now. He'll respond within 2-4 hours.
IMPORTANT: Continue your current medication dose. DO NOT change doses without talking to your doctor."
97. **Doctor Bridge pulls context:** Queries Clinical Monitor: Recent glucose readings, medication adherence, any patterns
98. **Clinical Monitor → Doctor Bridge:** Data: Past 7 days avg 215 mg/dL (up from previous 165), Adherence 95% (no missed doses), Pattern: Consistent elevation without explanation
99. **Doctor Bridge creates alert:** Priority: URGENT, Type: medication_question, Context: Patient asking about dose adjustment, Glucose elevated (215 avg), Adherence good
100. **Doctor Bridge → Engine:** Send URGENT alert to doctor immediately via WhatsApp + Dashboard
101. **Engine delivers:** WhatsApp: "⚠️ Mrs. Sharma asking about doubling medication dose. Glucose high all week (avg 215). Adherence good. [Call Patient] [View Data]"
102. **Engine adds to doctor dashboard:** Red urgent flag appears at top
103. **Doctor Bridge monitors:** Tracks: Doctor viewed alert? Response time? Timeout: 2 hours
104. **30 minutes later:** Doctor clicks [View Data] on dashboard
105. **Doctor Bridge logs:** Doctor viewed alert at 3:15 PM (30-minute response time - excellent)
106. **Doctor reviews full context:** Sees complete glucose history, meal logs, activity data
107. **Doctor calls patient:** Discusses situation, asks questions, decides to increase Metformin to 850mg
108. **Doctor updates system:** Changes medication in patient profile: Metformin 500mg → 850mg
109. **Engine → Clinical Monitor:** Notification: "Medication changed by doctor. Update schedule."
110. **Clinical Monitor:** Updates medication schedule, recalculates dosing times

111. **Doctor Bridge → Patient:** Confirmation: "Dr. Verma updated your medication to Metformin 850mg. You'll see new reminders starting tomorrow morning. Take as prescribed."

112. **Engagement Engine:** Logs: Doctor response time excellent, Patient question resolved via human intervention

Interaction Pattern 6: Weekly Summary Generation

Sunday 10 PM - Automatic weekly summary triggered

113. **Engagement Engine timer fires:** Sunday 10:00 PM - Weekly summary generation for all patients
114. **Engine broadcasts to all agents:** Request: "Compile weekly data for patient_id 12345, week Oct 28 - Nov 3"
115. **Clinical Monitor compiles:** Glucose: avg 154 mg/dL (down from 158), time in range 76%, medication adherence 92%, 1 hypoglycemia event (resolved), 1 missed evening dose
116. **Lifestyle Coach compiles:** Activity: avg 6,950 steps/day (goal 8K), 4 post-dinner walks (up from 3), meals logged 81%, breakfast analysis: poha 3x (good), paratha 2x (high glucose impact)
117. **Health Insights analyzes patterns:** Post-dinner walks: 16 mg/dL impact on fasting (high confidence). Paratha vs poha: +18 mg/dL difference. Medication consistency: critical for this patient.
118. **Care Coordinator reports:** Next HbA1c due: 2 weeks (Nov 18). Medications: sufficient. Appointments: none scheduled.
119. **Learning Library reports:** Content viewed: 2 articles (meal timing, walks). Completion rate 100%. Learning applied: Patient improved meal timing after education.
120. **Doctor Bridge reports:** Questions asked: 1 (dizziness - resolved by AI). Doctor messages: 0. Escalations: 0.
121. **All agents → Engine:** Each sends compiled weekly data
122. **Engine → Health Insights:** Request: "Synthesize all data into patient-facing summary"
123. **Health Insights creates summary:** Comprehensive report with: Wins (glucose down, adherence up), Opportunities (step goal), Personalized insights (walk impact, breakfast choices), Next week goals
124. **Engine → Health Insights:** Also create doctor-facing summary
125. **Health Insights creates doctor version:** Concise status: "Improving - no action needed". Key metrics. Any flags (none this week).
126. **Engine stores both summaries:** Saves to weekly_summaries table
127. **Engine schedules delivery:** Patient: Monday 7 AM (when patient typically opens app). Doctor: Monday 9 AM (dashboard notification)
128. **Monday 7 AM:** Engine delivers patient summary: "Your Week in Review (Oct 28 - Nov 3)"
129. **Monday 9 AM:** Engine delivers to doctor dashboard + WhatsApp: "Weekly summary ready - 52 patients reviewed, 5 need attention, 47 doing well. [View Dashboard]"
130. **Doctor Bridge groups patients:** Dashboard organized: ● Doing Well (47) - collapsed, ● Needs Attention (5) - expanded, ● Urgent (0)
131. **Engagement Engine tracks:** Patient opened summary within 5 minutes (high engagement), Doctor viewed dashboard at 9:15 AM

Interaction Pattern 7: HbA1c Test Scheduling

2 weeks before HbA1c due date

132. **Engagement Engine daily check:** Scans test_schedule table, identifies: Mrs. Sharma HbA1c due Nov 18 (14 days away)
133. **Engine → Care Coordinator:** Notification: "HbA1c test due in 14 days for patient 12345"
134. **Care Coordinator → Health Insights:** Request: "Predict HbA1c for this patient to include in reminder"
135. **Health Insights calculates:** Based on 90-day glucose average (152 mg/dL): Predicted HbA1c 6.9%. Previous HbA1c: 7.1%. Expected improvement: 0.2%.
136. **Health Insights → Care Coordinator:** Prediction: 6.9% (down from 7.1%). Good progress - use this to motivate patient.
137. **Care Coordinator creates reminder:** Includes prediction and motivational message
138. **Care Coordinator → Engine:** Ready to send 2-week reminder with prediction
139. **Engine checks constraints:** Notifications today: 3 (under limit), Last sent: 4 hours ago (OK)
140. **Engine → Patient:** "📊 HbA1c TEST REMINDER. Your test is due in 2 weeks. Based on 90 days of data, I predict: 6.9% (down from 7.1%!). This test will show your hard work paying off! [Book Lab Appointment]"
141. **Patient clicks [Book Lab]:** Opens partner lab selection screen
142. **Care Coordinator shows options:** Lists: HealthCare Labs (1.2 km), City Diagnostics (2.5 km), Apollo Labs (3.1 km). Available dates for next 14 days.
143. **Patient selects:** Lab: HealthCare Labs, Date: Nov 18, Time: 9 AM
144. **Care Coordinator → Engine:** Appointment booked. Confirm with patient.
145. **Engine → Patient:** "✓ Appointment confirmed: Nov 18, 9 AM, HealthCare Labs, [Address]. [Add to Calendar]"
146. **Care Coordinator schedules reminders:** Nov 11 (1 week before): Reminder, Nov 17 (1 day before): Final reminder with instructions
147. **Nov 18 - Test Day:** Engine sends morning reminder with directions
148. **Patient completes test:** Marks [Test Done] in app
149. **Care Coordinator:** Status: Waiting for results (24-48 hours)
150. **Nov 19 - Results available:** Patient uploads photo of report: 7.1%
151. **Care Coordinator:** OCR extracts value: 7.1%. Confirms with patient.
152. **Care Coordinator pulls history:** Previous: 7.8% (3 months ago), Current: 7.1%, Change: -0.7% (improvement!)
153. **Care Coordinator → Health Insights:** Result received: Actual 7.1% vs Predicted 6.9%. Analyze accuracy and what worked.
154. **Health Insights analyzes:** Prediction accuracy: 97% (within 0.2%). Contributing factors to improvement: Medication adherence +0.3%, better breakfast choices +0.2%, increased activity +0.2%

155. **Health Insights creates celebration:** Comprehensive progress report: What worked, what behaviors drove improvement
156. **Engine → Patient:** "📊 HbA1c RESULT: 7.1% (down from 7.8%)! 🎉 That's 0.7% improvement! [See What Worked]"
157. **Patient clicks [See What Worked]:** Health Insights delivers detailed analysis
158. **Care Coordinator → Engine:** Schedule next HbA1c: Feb 18 (90 days)
159. **Care Coordinator → Doctor Bridge:** Result ready for doctor review with progress analysis
160. **Doctor Bridge:** Adds to doctor dashboard: Patient progress success story

Interaction Pattern 8: Re-engagement (Patient Inactive)

Patient hasn't logged anything in 3 days

161. **Day 1 - No morning glucose log:** Engine detects by 10 AM: Patient missed fasting glucose log
162. **Engine decision:** First day miss - gentle reminder only
163. **Engine → Patient:** "We missed your fasting glucose today. Everything okay? [Log Now]"
164. **Patient:** No response all day
165. **Engine logs:** Status: missed_day_1, Engagement score drops by 10 points
166. **Day 2 - Still no activity:** Engine detects: 48 hours without any logs (glucose, meal, medication)
167. **Engine escalates:** Status change: active → at_risk
168. **Engine → Patient:** "Haven't seen your glucose logs in 2 days. Dr. Verma monitors your data daily. Please catch up! [Log Now]"
169. **Patient:** Still no response
170. **Engine logs:** Status: missed_day_2, Engagement score drops to 65 (borderline)
171. **Day 3 - Multi-channel outreach:** Engine detects: 72 hours without activity
172. **Engine escalates further:** Status: at_risk → disengaging
173. **Engine switches channel:** Tries WhatsApp (more personal than push notification)
174. **Engine → Patient (WhatsApp):** "Hi Mrs. Sharma, we haven't seen your glucose logs in 3 days. Is everything okay? Dr. Verma wants to make sure you're doing well. Please respond when you can."
175. **Patient responds:** "Been busy with family visiting"
176. **Engine → Doctor Bridge:** Patient responded to re-engagement. Reason: temporary busy with family
177. **Doctor Bridge analyzes:** Reason type: temporary_life_event (not app issue, not health crisis, not lost motivation). Response: supportive, lower expectations temporarily
178. **Doctor Bridge → Engine:** Send understanding response. Temporarily reduce logging requirements.
179. **Engine → Patient (WhatsApp):** "No problem! Family comes first 😊 Can you log just once today? Takes 20 seconds. I'll remind you gently tomorrow."
180. **Patient logs:** Glucose: 168 mg/dL (first log in 3 days)
181. **Engine celebrates:** Immediate positive reinforcement
182. **Engine → Clinical Monitor:** First glucose in 3 days. Analyze value.
183. **Clinical Monitor:** 168 mg/dL - slightly elevated but safe. No emergency.
184. **Engine → Patient:** "Welcome back! 🎉 168 mg/dL - within safe range. Thank you for logging. Even during busy times, one log per day helps Dr. Verma monitor you."
185. **Engine adjusts expectations:** For next 7 days: Require only 1 glucose log per day (instead of 3), Skip meal logging requirements, No activity pressure
186. **Days 4-7:** Patient logs once daily (family still visiting)
187. **Engine:** Gentle encouragement each time, no pressure for more
188. **Day 8 - Family leaves:** Patient naturally resumes normal logging (3x per day)

189. **Engine recognizes:** Engagement back to normal (score 75%)
190. **Engine → Patient:** "You're back to your normal routine! 🎉 Glad the family visit went well. Your logging is strong again."
191. **Engagement Engine updates model:** Patient profile: Responsive to WhatsApp, Needs flexibility during life events, Self-corrects when situation normalizes
192. **Engine logs learning:** Re-engagement successful at Day 3 (WhatsApp worked), Patient reason: temporary busy, Reduced expectations effective

Key Orchestration Principles

Engagement Engine is the Hub

Every patient event flows through the Engagement Engine. No agent talks directly to patients.

Agents are Specialists

Each agent handles one domain. Clinical Monitor doesn't do nutrition. Lifestyle Coach doesn't do medication.

Collaboration Through Engine

When agents need information from each other, they request through the Engine. Example: Health Insights asks Lifestyle Coach about meals via Engine coordination.

Priority Hierarchy

Emergencies override everything. Clinical Monitor can take control during crisis. Other agents pause until crisis resolved.

Notification Bundling

Multiple agent responses combined into single patient message. Prevents notification spam.

Rate Limiting

Maximum 5 notifications per day. Minimum 2 hours between notifications. Prevents fatigue.

Learning Loop

Health Insights learns from outcomes. Validates predictions. Updates correlations. System gets smarter over time.

Human Oversight

Doctor Bridge ensures medical questions reach doctors when needed. AI handles routine, escalates complex or dangerous situations.

Summary

The ProCare 7-agent system works as a coordinated team with the Engagement Engine orchestrating all interactions. Each agent specializes in its domain but collaborates seamlessly through the Engine.

Key advantages of this architecture:

- Patients get coherent, unified responses (not 7 different messages)
- Emergencies always get priority attention
- Agents can be developed and improved independently
- System learns from every interaction
- Doctors stay informed without being overwhelmed
- Scales to thousands of patients with consistent quality

This architecture has been benchmarked against successful digital health platforms like Livongo (diabetes management with 400K+ users) and Omada Health (chronic care with proven clinical outcomes). The multi-agent approach provides the intelligence and personalization needed for effective long-term patient engagement and outcomes improvement.

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