



Portfolio Case Study

Clinic Operations Efficiency Analysis
& Patient Education Program Design

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PROJECT AT A GLANCE

Client	DRNC Partners, LLP - Private multi-specialty medical practice
Location	Metro Atlanta, Georgia
Specialties	Dermatology, Rheumatology, Neurology, Cardiology
Staff Size	23 employees (4 physicians, 6 Advanced Practice Providers, 7 RNs, 6 administrative staff)
Engagement Type	Operations efficiency analysis and instructional design consulting
My Role	Consulting Designer and Strategic Partner for needs analysis, job task analysis, data modeling, instructional design, course development, and evaluation planning
Recommendation	Complementary two-component intervention: Patient Education Series (demand reduction) + Staff Efficiency Training (supply optimization)
Pilot Focus	Epilepsy patient education : GETCS and focal seizures (Neurology practice, championed by Dr. Horton)
3-Year Cost Comparison	Complementary approach: ~\$465,000 vs. Staffing alternative: \$780,000
Deliverables	15 project artifacts spanning analysis, design, evaluation, and project management
Revision Cycles	3 peer review cycles; 15 arguments analyzed; mean strength rating: 1.60
Interactive Prototype	Live course prototype (React/Tailwind) deployed to web

THE CHALLENGE

DRNC Partners initially requested a training intervention to help their nursing staff respond more efficiently to patient messages through the Electronic Medical Record (EMR) system. The volume of incoming patient communications: phone calls, voicemails, and EMR messages, was consuming a disproportionate share of clinic resources, and the partners believed staff efficiency training would alleviate the pressure.

Rather than accepting the stated request at face value, I recommended a comprehensive needs analysis to determine whether a training intervention was the most impactful investment available. Industry research suggests that communication breakdowns account for 60–70% of operational overhead in medical practices, yet only 16% of medical groups conduct formal skills gap analyses to identify the true source of inefficiency (MGMA, 2024).

This decision proved critical. The analysis revealed that the root cause of the operational strain was not staff inefficiency alone, but unsustainable demand for patient communication driven primarily by gaps in patient education at the point of diagnosis. However, the analysis also confirmed that the client's original concern, staff efficiency in handling remaining communications, was a legitimate need that warranted its own intervention component.

Key Finding

More than 65% of incoming patient contacts were traceable to two causes: follow-up questions from patients who could not retain information delivered during emotionally overwhelming appointments (30%+), and anxiety-driven inquiries from patients or family members who had sought information from unreliable online sources (35%). The problem was primarily demand-driven, but required a complementary solution that also addressed staff efficiency.

THE APPROACH

The analysis was structured in three phases, each building on the findings of the previous to ensure the final recommendation was grounded in evidence rather than assumptions. The research foundation included a 28-source literature review spanning Medical Group Management Association (MGMA) industry reports, academic journals (PubMed Central), professional association publications (American Academy of Family Physicians), and healthcare management publications.

Phase 1: Organizational Analysis

Using a structured interview protocol organized around seven organizational dimensions (strategy, structure, systems, shared values, skills, staff, style), I conducted anonymous interviews with all 23 employees. The interview data was analyzed using a SWOT (Strengths, Weaknesses, Opportunities, Threats) framework to produce actionable strategic insights. I supplemented this with an external evaluation using redacted patient feedback data, voicemail transcripts, EMR messages,

and website comments, from the preceding two months. The consistent finding across both internal and external data was that patient communication volume was the dominant operational concern.

Phase 2: Job Task Analysis

I facilitated a two-part cognitive task analysis with the four physician partners, integrated with 12+ months of Relative Value Unit (RVU) reports. RVUs are the standard Medicare metric for quantifying the relative effort and resource cost of physician services (they translate clinical work into a standardized productivity measure). I developed a custom efficiency metric for each task activity by integrating RVU generation with self-reported time allocation, revealing which responsibilities generated the highest and lowest return on physician time. The analysis showed that Patient Education was the least efficient activity in terms of RVU generation, half as efficient as most other clinical tasks. This quantified the opportunity cost: every hour physicians spent on uncompensated patient education communications was an hour unavailable for reimbursable clinical services.

Phase 3: Root-Cause Analysis

The root-cause analysis applied the Staffing to Demand (S2D) framework, a data-driven approach widely used in healthcare operations and documented by the MGMA, which aligns workforce levels with actual and forecasted demand. S2D models compare current staffing to required levels based on workload data, using benchmark ratios to identify variances between current and optimal staffing levels. The analysis framed the communication challenge as a structural supply-demand imbalance: the patient population (demand) was consuming all available communication capacity (supply). Increasing supply alone would not sustainably resolve the issue, because latent demand would absorb any new capacity: a pattern consistent with S2D findings that adding staff without addressing demand drivers leads to chronic overextension (MGMA, 2023). Reducing demand alone would not address the legitimate efficiency gaps the client identified. A complementary approach, reducing demand through patient education while simultaneously improving staff efficiency through targeted training, would address both the root cause and the presenting symptom.

What “Complementary Intervention” Means

A complementary intervention addresses the root cause (demand reduction) and the presenting symptom (supply optimization) by deploying two coordinated components. Unlike either component alone, the complementary approach both reduces unnecessary demand (through patient education that provides reliable information before patients turn to unvetted sources) and ensures the remaining communications are handled efficiently through targeted staff training. The two components work together because each addresses half of the problem the analysis identified.

THE SOLUTION: A COMPLEMENTARY INTERVENTION

Component 1: Patient Education Series (Demand Reduction)

A self-paced, asynchronous patient education program that physicians can assign to patients following an initial diagnosis. Designed to provide reliable, physician-vetted information available when the patient is emotionally ready to process it; serve as a credible alternative to unvetted online sources; accommodate the cognitive and emotional barriers patients face when processing a new diagnosis; and be available 24/7 on demand.

Component 2: Staff Efficiency Training (Supply Optimization)

Targeted training for clinic staff to improve efficiency in handling the communications that remain after demand reduction. This includes EMR workflow optimization, communication skills development using evidence-based frameworks (e.g., the R.E.D.E. model for relationship-centered care), technology proficiency training to address documented EHR adoption barriers (43% of clinical staff rate initial EHR training as insufficient), and structured competency assessments at 30, 90, and 180-day intervals.

Pilot Selection: Why Neurology

The pilot focuses on seizure patients in the Neurology practice. Dr. Horton, the neurologist partner, initiated the request for proposal and championed the project to the partnership. His practice area serves as the proof of concept: if the complementary intervention demonstrates measurable outcomes with epilepsy patients (a population that generates high communication volume due to the anxiety and uncertainty surrounding a new seizure diagnosis) the model can then be expanded across the remaining specialties (Dermatology, Rheumatology, Cardiology).

Cost-Benefit Comparison

Metric	Patient Education Only	Increased Staffing Only	Complementary Approach
Year 1 Investment	\$436,189	\$260,000	~\$450,000
3-Year Cumulative	~\$437,447	\$780,000	~\$465,000
Ongoing Annual Cost	~\$629 (hosting)	\$260,000+ (salaries & benefits)	~\$15,000 (hosting + training refresh)
Addresses Demand (Root Cause)	Yes	No	Yes
Addresses Supply (Client Request)	No	Partially	Yes

The complementary approach costs marginally more than patient education alone in Year 1 (~\$450,000 in development costs, derived from the documented education development formula, plus ~\$14,000 for training based on comparable competency-based programs). The 3-year cumulative of ~\$465,000 adds hosting (\$629/year) plus annual training refresh (~\$14,000/year). A key feature of the recommended design is its low ongoing maintenance cost: after the initial

development investment, the self-paced digital course requires only server hosting and periodic content updates, compared to the permanent annual salary obligation of the staffing alternative. This makes the complementary approach both more comprehensive in scope and more sustainable over time.

Note: The cost-benefit analysis documents its assumptions and exclusions transparently. Revenue recovery projections and refined lifecycle costs are structured as a client data framework, ready to populate if the clinic elects to supply operational data, but not presented as estimates in the interim.

FROM ANALYSIS TO DESIGN

The needs analysis revealed an operational problem through an efficiency lens; the course design addresses it through a patient-centered lens. These are not competing framings, they are complementary perspectives appropriate to their respective audiences. The operational analysis speaks to physician-owners making investment decisions; the course design speaks to patients navigating a life-changing diagnosis.

The 65% finding from Phase 3 directly shaped the course architecture. The two root causes, retention failure during emotionally overwhelming appointments (30%+) and anxiety-driven reliance on unreliable sources (35%) each demanded a specific instructional response:

Root Cause	Instructional Response	Where It Appears
Patients cannot retain information delivered during diagnosis (30%+)	Asynchronous, self-paced modules that revisit the same topics covered during the diagnostic appointment, available when the patient is emotionally ready to process them. Spaced retrieval practice reinforces retention across modules.	All modules; specifically D-Triage (spaced retrieval), D-Diary, D-QList (template completion for follow-up visits)
Patients seek information from unreliable online sources (35%)	A credible, physician-vetted alternative available 24/7. Source evaluation training teaches patients to distinguish trustworthy from misleading health information. Verified community resources provide ongoing human support.	A-Source (source evaluation), D-Resources (verified community organizations), persistent Epilepsy Foundation helpline footer on every module
Emotional distress at diagnosis creates cognitive barriers	Psychosocial support segment normalizing emotional reactions; warm, non-clinical tone throughout; emphasis on patient agency; no time pressure to complete.	A-Psych (psychosocial support), course-wide design philosophy (low-stakes assessment, no grades, warm tone)

Learning Science Foundations

The course design is grounded in cognitive load theory (Sweller, 1988), which holds that instructional materials should manage intrinsic, extraneous, and germane cognitive load to optimize learning, particularly critical for patients processing medical information during an emotionally taxing period. Three evidence-based learning strategies operationalize this principle throughout the course:

Retrieval practice: Knowledge checks at the end of each module and the spaced triage refresher in Module D require patients to actively recall information rather than passively review it. Research consistently shows that retrieval practice produces stronger long-term retention than re-reading (Roediger & Butler, 2011).

Interleaving: Triage decision exercises mix medication, safety, and emergency scenarios rather than grouping them by topic. Interleaving forces learners to discriminate between categories: a skill directly relevant to the triage decisions patients must make in daily life (Kornell & Bjork, 2008).

Spaced repetition: Critical safety content (triage decisions, medication adherence) appears in initial instruction, module-level knowledge checks, co-summative scenario exercises, and a final triage refresher in Module D. Distributing practice across time and contexts supports transfer to long-term memory (Cepeda et al., 2006).

The S2D framework that informed the needs analysis also shapes the intervention's operational design. By reducing the volume of preventable communications (demand) while improving staff capability to handle the remainder (supply), the complementary approach aligns workforce capacity with actual service needs - the core principle of staffing to demand. The self-paced, asynchronous delivery model further supports this alignment: patients access education on their own time, placing zero additional demand on staff during the learning process.

COURSE DESIGN: UNDERSTANDING YOUR EPILEPSY

The pilot course covers two major seizure categories: Generalized Epilepsy Tonic-Clonic Seizures (GETCS) and focal seizures (focal onset aware and focal onset impaired awareness) to serve the majority of the neurology practice's epilepsy patient population. Focal epilepsy accounts for approximately 60% of all epilepsy diagnoses (Fisher et al., 2017). Content that applies to both seizure types is presented once; content that differs is presented in parallel with clear labeling.

Field	Details
Format	Self-paced, asynchronous, online. Available on demand 24/7.
Audience	Newly diagnosed epilepsy patients (GETCS and focal) and family members/caregivers
Reading Level	8th grade or below (per health literacy best practices for patient education)
Estimated Time	95–135 minutes across six modules plus digital literacy orientation
Platform	Articulate Rise with Storyline-embedded interactive components (HIPAA compliance pathway documented)
Assessment Model	Dual-track: Course Completion Check (8–10 selected-response items) + five required co-summative performance assessments

Module Structure

Module	Title	Est. Time	Key CLOs
Pre-Module	Digital Literacy Orientation	3–5 min	
A	Understanding Your Diagnosis	25–30 min	CLO 1, CLO 7
B	Your Seizure Medications	20–25 min	CLO 2, CLO 3
C1	Staying Safe: Awareness & First Aid	15–20 min	CLO 3, CLO 4
C2	Staying Safe: Decisions & Rules	15–20 min	CLO 4, CLO 5
D	Managing Your Health Between Visits	20–25 min	CLO 4, CLO 6, CLO 7

The course addresses seven Course-Level Learning Objectives (CLOs) spanning identification of seizure types (CLO 1), medication purpose and side effects (CLO 2), medication adherence strategies (CLO 3), triage decision-making (CLO 4), Georgia driving regulations (CLO 5), visit preparation and seizure documentation (CLO 6), and psychosocial support (CLO 7). Each CLO is written using Bloom's Taxonomy verbs in ABCD structure (Audience, Behavior, Condition, Degree) and mapped to one or more of three Program-Level Outcomes focused on reducing ER visits, communication volume, and hospitalizations.

Assessment Architecture

The assessment design uses a dual-track completion model. Track one is the Course Completion Check (CC): a set of 8–10 selected-response items sampling recognition-level knowledge across all modules. Track two comprises five required co-summative performance assessments that evaluate behavioral competencies: medication adherence scenarios (B-SC), a five-scenario triage decision exercise (C-Triage), visit question list and seizure diary template completion (D-QList, D-Diary), and a triage refresher requiring a perfect score (D-Triage). Individual assessment responses are never shared with healthcare providers, only completion status (patient name, date, modules completed) is reported to the assigning neurologist. This preserves the low-stakes philosophy while giving providers actionable follow-up information.

Patient Characters

Branching scenarios and case-based exercises feature three patient characters spanning age, gender, race/ethnicity, seizure type, and life context: Maria (35, Hispanic, GETCS, teacher concerned about seizures at school), James (62, African American, focal seizures, retired military managing multiple medications), and Priya (19, South Asian, GETCS, college student worried about social stigma and driving). These characters appear across Modules B, C1, C2, and D, providing demographically representative contexts for clinical decision-making practice.

Evaluation Framework

The evaluation plan uses Kirkpatrick's four-level model, a widely adopted framework that assesses training outcomes at progressively deeper levels:

Reaction (did learners value the experience?),

Learning (did they acquire knowledge and skills?),

Behavior (did they change what they do?), and

Results (did organizational outcomes improve?)

Two supplementary dimensions drawn from the RE-AIM framework (Glasgow et al., 1999), a model for assessing real-world program impact across Reach, Effectiveness, Adoption, Implementation, and Maintenance, address gaps that Kirkpatrick does not inherently cover:

Reach (whether the course is accessed equitably across the patient population, using a clinic-side demographic comparison workflow) and

Maintenance (whether effects persist over time, with measurement windows at 90-day, 6-month, and 12-month post-completion intervals)

The SMILE UK trial (Ridsdale et al., 2018; n=404) found that epilepsy self-management education increased initial confidence but showed no significant differences at 12-month follow-up, a finding that directly motivated the Maintenance dimension.

Recalibrated Success Targets

All evaluation targets have been recalibrated against published meta-analytic benchmarks from epilepsy self-management education research. For example, the patient confidence target was revised from an aspirational 65% improvement (which lacked a baseline) to a standardized mean difference (SMD) of ≥ 0.30 for self-efficacy, a statistical measure of effect size used in meta-analyses, benchmarked against Huang et al. (2025): SMD = 0.32 (95% CI: 0.12–0.52). The research literature suggests the course's strongest expected outcomes are in quality of life and psychological wellbeing, with more modest effects likely for medication compliance (Goh et al., 2023). The evaluation plan is designed to capture and report outcomes across this full spectrum.

INTERACTIVE PROTOTYPE

A fully functional interactive prototype of the course has been built and deployed to demonstrate the design in action. The prototype implements the complete module structure, all activity types (knowledge checks with scoring and retry, branching scenarios with the three patient characters, flip cards, self-check prompts with model answer comparison), the DRNC brand system, and design note annotations that highlight instructional decisions for portfolio reviewers.

The prototype is built as a self-contained, single-page React application using Tailwind CSS and the shadcn/ui component library, delivered as a single HTML file that requires no server infrastructure, further illustrating the low-maintenance, sustainable nature of the digital delivery model.

View the Live Prototype

<https://c3cognitive.github.io/drnc-course-prototype/>

DEVELOPMENT PROCESS: ITERATIVE PEER REVIEW

The project underwent three structured revision cycles using a formal argument analysis methodology. Each cycle identified weaknesses in the design and produced targeted revisions.

Key Revisions by Cycle

Cycle	Key Revisions
Cycle 1	Reframed central thesis from demand-only to complementary two-component intervention; connected supply-demand economic framing to patient-centered design values
Cycle 2	Added digital literacy orientation, support group resources, psychosocial support segment (CLO 7), multiple scenario characters, focal seizure content, HIPAA compliance pathway, provider completion reporting; recalibrated all evaluation targets against meta-analytic benchmarks
Cycle 3	Disclosed cost-benefit assumptions and exclusions; created client data framework for expanded analysis; added RE-AIM Reach and Maintenance supplementary evaluation dimensions with clinic-side workflows

PORTFOLIO DELIVERABLES

This case study is supported by the following project artifacts, each demonstrating distinct competencies within the instructional design and performance consulting process:

#	Deliverable	Type
1	Clinic Operations Efficiency Analysis Report	Client Report
2	Job Task Analysis : Physician	Analytical Report
3	Curriculum Design Document (Epilepsy Course)	Design Specification
4	Patient Education Series Storyboard	Storyboard
5	Syllabus	Course Syllabus
6	Course Map & Assessment Plan	Design Deliverable
7	Learning Activities Inventory	Activity Specifications
8	Alignment Review & Remediation Report	Quality Assurance
9	UX Design Document	Visual/Interaction Design
10	Evaluation Plan	Program Evaluation
11	Project Charter	Project Management
12	ID Profile and Style Guide	Design Standards
13	DRNC Partners Presentation	Client Communication
14	7S Model Infographic	Organizational Analysis
15	Clinic Practice Metrics (Research Bibliography)	Literature Review

COMPETENCIES DEMONSTRATED

This engagement required operating across the full spectrum of instructional design and performance consulting, from initial stakeholder discovery through solution design, iterative revision, and evaluation planning:

Performance Consulting: Reframing a client's stated training request into a broader performance analysis, identifying that the root cause required a complementary intervention addressing both demand reduction and supply optimization.

Needs Analysis: Conducting organizational (7S-structured interviews with SWOT analysis), job task (cognitive task analysis with RVU integration), and root-cause analyses (S2D-informed supply-demand economic framing) using multiple data sources.

Data-Driven Decision Making: Integrating RVU reimbursement data with self-reported time allocation to create a custom efficiency metric that quantified the business impact of each physician task activity.

Economic Analysis: Applying S2D and supply-demand economic framing to a healthcare operations challenge, building a 3-year cost-benefit model with transparent assumptions disclosure and a structured client data framework.

Research Synthesis: Building a 28-source evidence base and calibrating evaluation targets against published meta-analytic benchmarks from epilepsy self-management education research (Goh et al., 2023; Huang et al., 2025; Correia et al., 2023).

Instructional Design: Developing measurable learning objectives grounded in Bloom's Taxonomy, sequencing content across six modules plus orientation using cognitive load theory principles, and designing a dual-track assessment architecture employing retrieval practice, interleaving, and spaced repetition.

Evaluation Design: Layering RE-AIM supplementary dimensions (Reach and Maintenance) onto a Kirkpatrick framework to address equity and sustainability questions the primary framework does not cover.

Iterative Revision Methodology: Managing three structured peer review cycles using formal argument analysis, addressing 15 identified weaknesses and achieving a mean strength rating of 1.60.

HIPAA Compliance Analysis: Documenting a two-option platform compliance pathway and designing all self-check assessments for local processing with no data storage or transmission.

Stakeholder Management: Working directly with physician-owners as both subject matter experts and decision-makers, including navigating the pivot from their original request to a data-supported alternative.

REFLECTIONS

[Placeholder: This section is reserved for the author's personal reflection on the project. Content will be composed separately and integrated into the final version.]