the ANESTHESIOLOGY annual meeting
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AI-Assisted "Vibe Coding" for Clinical Workflow Optimization

An Anesthesiology Use Case

Andrew Peace, BS, FP-C[1] · Alexander Morris, MS[2]

[12] Burrell College School of Osteopathic Medicine, Class of 2027 — [1]Las Cruces, NM [2]Albuquerque, NM

BACKGROUND

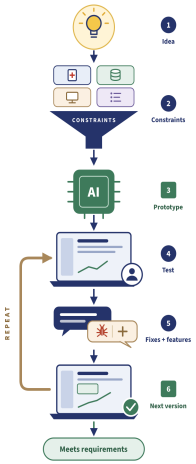
Traditional software development requires programming expertise, creating a barrier between clinical ideas and working prototypes. Large language models (LLMs) lower this barrier by allowing clinicians to translate natural-language requirements into functional applications. We demonstrate this workflow through development of a native iOS application providing point-of-care anesthetic reference values.

DEVELOPMENT WORKFLOW

An iterative build loop with the AI assistant

1. **Think of an application** — User forms the idea
2. **Define constraints** — User gives the AI requirements
3. **Create a prototype** — AI builds a first version
4. **Test the prototype** — Try it, gather feedback
5. **Define new features** — Identify what to add
6. **Build the next version** — AI updates the prototype

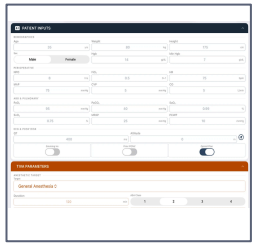
repeat



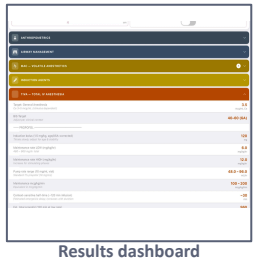
Steps 4–6 repeat until the prototype meets requirements. No programming training needed — **zero lines of code authored by hand.**

■ User ■ AI

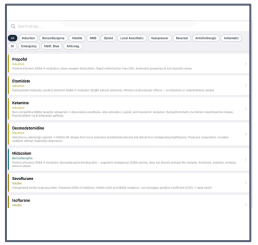
WORKED EXAMPLE — ANESCALC *A NATIVE iOS ANESTHESIA CALCULATOR*



Patient inputs



Results dashboard



Drug reference cards

SCOPE — v1.0 SESSION → v2.0 TODAY

116 → 231	10 → 55	0 → 10	0 → 0
Live calculations	Drug reference cards	Clinical tools	Lines of code authored

FEATURES

Application features

- **16** — **Clinical domains:** MAC, NMB, TIVA, vasopressors, LAST, OB, peds
- **55** — **Drug reference cards:** 14 classes, searchable
- **10** — **Bedside clinical tools:** RSBI, RASS, Fick, driving pressure

100% OFFLINE — no data transmitted

Also: OB/regional protocols · unit conversions · PDF export

Dosing verification audit

191	24	3
rows audited	sections	independent passes

All values externally reviewed and cross-referenced against UpToDate, Miller's 9e, and Barash 8e.

BEYOND THIS APPLICATION

The workflow, not the app, is the transferable product.

SAME **6 STEPS** any clinical need

- **EMR tools** — calculators & order-set helpers
- **Desktop widgets** — quick reference at the workstation
- **Plan generators** — anesthetic plans from case data
- **Case simulators** — resident training scenarios
- **QI dashboards** — protocols, checklists & metrics

LIMITATIONS & FUTURE WORK

LIMITATIONS

- AI-generated content and calculations **require independent verification.**
- Visual and UI design **require iterative human refinement.**
- Hardware and OS compatibility require testing on physical devices.
- Institutional IT, security, and protected health information policies may limit deployment.
- Current implementation is iOS-only and has not undergone prospective clinical validation.

FUTURE WORK

- Prospective outcomes validation
- FDA SaMD regulatory classification
- Clinician evaluation • formal usability review in training contexts
- App Store sponsorship for publication
- Android functionality

AI DISCLOSURE

A conversational LLM, Claude Sonnet 4.6 (Anthropic, PBC), was utilized for native code generation ("vibe coding"). The first author (AP) directed all prompt engineering, designed the system architecture, and verified compilation outputs. **The AI assistant does not hold authorship status.**

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Contact: Andrew Peace, andrew.peace@burrell.edu