



Carerresponse: A Collaborative Digital Ecosystem For Nonpharmacologic Support And Behavioral Analysis In Memory Care Centers

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KEY TAKEAWAYS

Safe by Design

Nonpharmacologic BPSD support achievable with constrained AI — no PHI, no clinical directives, no installation required

Clinically Grounded Outputs

Prioritizes reassurance, environmental de-escalation, and communication — consistent with PALTC and CMS Emergency Preparedness principles

Replicable Architecture

Hybrid rules-based + constrained LLM design trades generative flexibility for structured safety — a model for AI in regulated care settings

BACKGROUND

Behavioral and psychological symptoms of dementia (BPSD) are prevalent in long-term and post-acute care (PALTC) settings and may intensify during environmental disruptions or emergencies.

The CMS Emergency Preparedness Rule emphasizes staff training, communication strategies, and resident-centered responses — yet frontline caregivers often lack rapid-access tools that translate these principles into actionable, nonpharmacologic guidance.

CLINICAL PROBLEM

Staff lack real-time de-escalation tools during emergencies

BPSD triggers amplify during environmental disruptions

METHODS

We developed **Crisis Card AI**, a web-based prototype providing person-centered, nonpharmacologic responses to BPSD — aligned with CMS Emergency Preparedness and PALTC care principles.

60+ Scenarios:
Curated rules-based BPSD scenarios

Constrained LLM:
Fixed schema · Grade 4 reading level

FIGURE 1 · SYSTEM ARCHITECTURE

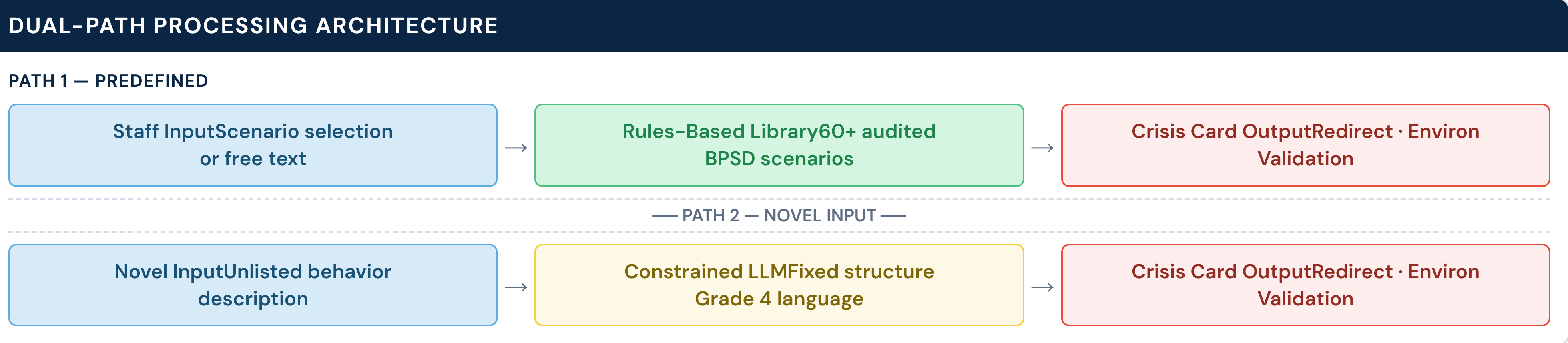


FIGURE 2 · CRISIS CARD OUTPUT EXAMPLE

EXAMPLE CRISIS CARD — Sundowning Behavior

1

REDIRECT
Give a simple, familiar task such as folding towels or sorting items.

2

ENVIRONMENT
Close curtains, turn on warm lighting, reduce ambient noise.

3

VALIDATION
"It's getting late, but you're safe here. I'm right here with you."

<3 seconds for output

CMS-aligned

No Private Health Info collected

FIGURE 3 · CMS EMERGENCY PREPAREDNESS ALIGNMENT

Staff Training
On-demand de-escalation protocols for frontline staff

Communication
Standardized validation language for person-centered care

Environment Controls
Sensory & spatial modification guidance

Resident-Centered
Person-first reassurance strategies

The prototype consistently generated structured crisis cards using the predefined three-domain framework (Redirect, Environment, Validation). Response generation remained rapid across predefined and constrained-LLM pathways while maintaining a fixed output schema without collecting protected health information. No installation needed.

TABLE 1 · PREDEFINED BEHAVIORAL SCENARIOS

Scenario	BPSD Description
Sundowning	Evening agitation, confusion
Wandering	Elopement, exit-seeking
Paranoia	Accusatory delusions
Repetition	Repetitive questions/acts
Hygiene Refusal	Bathing/grooming resistance
Dressing	Clothing-related distress
Sleep Disturbance	Nighttime wakefulness
Mealtime Refusal	Eating reluctance
Verbal Outbursts	Agitation, yelling
Social Withdrawal	Disengagement, isolation

Partial list; full library: 60+ scenarios

CONCLUSIONS

- This prototype demonstrates that CMS nonpharmacologic dementia care guidance can be delivered in real time at the point of care.
- A constrained prompt produces consistent, simplified crisis response outputs suitable for emergency disruption scenarios.
- The prototyp have safety constraints and aligned with PALTC nonpharmacologic care principles.

Contact Information



TGRF Info



FUTURE DIRECTIONS

- Usability testing in PALTC setting to evaluate real-world acceptability and workflow integration
- Longitudinal evaluation of Crisis Card AI adoption
- Integration into PALTC Emergency Preparedness programs

APP DESIGN PRINCIPLES

- Device-agnostic · No installation required
- Grade 4 reading level target
- Fixed output structure for consistency
- Photo policy: Green — sharing permitted
- Educational tool · Not diagnostic

INFORMATION

- CareResponse / Crisis Card AI
- The Tele-Geriatric Research Fellowship
- <https://aicrisiscards.com/>
- The authors declare no competing financial interests related to this work.

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