KARINA

KTPH AUTOROUTE INTELLIGENCE & NURSE ASSIGNMENT

Transforming Manual Scheduling in Home Healthcare Through AI Assistance

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NHG Health

1 BACKGROUND



KTPH@Home delivers acute care in patients' homes. Each day, charge nurses manually coordinate visits — balancing nursing manpower, patient locations, procedure types, timing windows and continuity-of-care preferences. The process is cognitively demanding, slow, and scales poorly as visit volumes grow.

2 AIM

To reduce daily scheduling time for charge nurses — while maintaining:

- Appropriate visit spacing
- Efficient route planning
- Shift coordination across the team
- Continuity of care for each patient
- Minimal scheduling errors

3 THE CHALLENGE

3 h spent on manual scheduling each day

5+ competing factors per assignment

- Daily rework from last-minute changes
- Capped headroom for service growth
- Cognitive load carried by one person

4 METHOD

KARINA was developed on **PAIR**, the Singapore Government's secure large-language-model platform. It encodes KTPH@Home's operational protocols, geographical routing intelligence and nurse-assignment decision matrices, turning manual scheduling into an automated proposal that stays flexible to real-world constraints.

Custom scheduling protocols
Encoded from KTPH@Home operational guidelines

Geographical routing intelligence
Optimal route and travel-time planning

Assignment decision matrices
Continuity of care and language capability

Validation frameworks
Healthcare policy compliance checks

SCHEDULING WORKFLOW

1. **Patient & visit information** — Visit details, location, type, timing, language
2. **Operational rules & data** — Protocols, nurse skills, shifts, availability
3. **KARINA scheduling engine** — Route optimisation, assignment, constraint checks
4. **Charge nurse review** — Validate and adjust for real-world changes
5. **Final schedule** — Approved plan released for the day's home visits

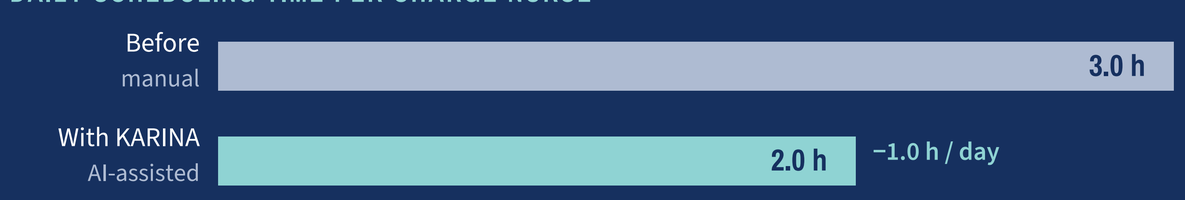
5 RESULTS

33%
reduction in daily scheduling time

7 h saved weekly

30 h saved monthly

DAILY SCHEDULING TIME PER CHARGE NURSE



IMPROVED OUTCOMES

- More time for direct patient care
- Better continuity and patient experience
- Reduced cognitive workload for charge nurses
- Fewer scheduling errors
- Headroom to absorb rising patient volumes

LIMITATIONS

Output still requires manual validation, with occasional re-processing due to platform limits. Savings are operational estimates from routine practice, not a controlled trial.

6 CONCLUSION

KARINA streamlined KTPH@Home's scheduling operations, showing how AI assistance can improve healthcare operational efficiency while preserving care quality and staff well-being.

Better Efficiency. Better Care. Better Together.

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Innovation sub-topic: Pioneer digital health solutions