

"I saw my mother not getting prompt responses from caregivers when they obviously needed to be toileted. I began looking for a solution in mid-2021, and what was out there was ineffective, or required too much involvement from the caregiver for them to adopt the solution. Dr. Aberle was the one who suggested we make this a capstone project, beginning in the fall of 2022"

- Andy Morrison, correspondence

Diaper dermatitis, often associated with infants, significantly impacts adults in memory care due to communication barriers. Team PQue has developed a cost-effective urine detection system for adult diapers, alerting caregivers to prevent this condition.

Diaper **Dermatitis**

2022-2023:RFID tag used as a wireless sensor that could be extracted to a remote notification system. Honors Thesis suggested using LoRa to greatly expand the range.

2023-2024: Urine powered battery concept proven with Cu-Zn cells. Urine-battery wired to the transmitter. Wireless transmission to receiver then propagated to Discord notifications.





Results:

- **Customer and family satisfaction** Patient comfort
- **Quality of life**

- Patient response time
- **Overall care costs**
- **Superfluous patient-caregiver interactions**

PQue Project Elements

Goal: Utilize lessons from previous Novel Urine Sensor systems to bring concept closer to trials and marketing

- Diaper with embedded voltaic cells (urine sensor) 1)
- IR coupling between sensor and communicator 2)
- LoRaWAN transmitter, packaged in a 3D-printed case, used to take 3) signals from the sensor to the gateway
- A LoRaWAN gateway able to query communicators, receive information, and send SMS to specific devices 📀
- **Stretch Goal:** Audible sound from communicator via wireless request 5)
- **Stretch Goal:** Integrated GPS module sends location data via LoRaWAN 6)



Dementia-related wandering claims four lives around metro Atlanta | How to combat it

By Kim Leoffler

Published December 28, 2024 9:47pm EST

FOX 5 Atlanta

Six in 10 people living with dementia will wander at least once; many do so repeatedly. -Alzheimer's Association

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Arizona State University

Pque, families be comforted With can knowing their loved ones can be found



A Geo-fence can be established to alert staff to a wandering patient.

residents These 2 went play an to intense round of pickleball.

Team PQue agreed to continue to develop the product with Mr. Andy Morrison or consult for future capstone projects. We believe this team has the skills and motivation necessary to push into production soon.