



Maternal Mortality in Black Mothers Caused by Excessive Bleeding

Group 3 Section A04

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Problem Statement

Our goal is to design a way to monitor **blood loss** for postpartum women that is **affordable**, **comfortable**, and **accurate** in its measurement in order to curb maternal mortality due to Postpartum Hemorrhaging.

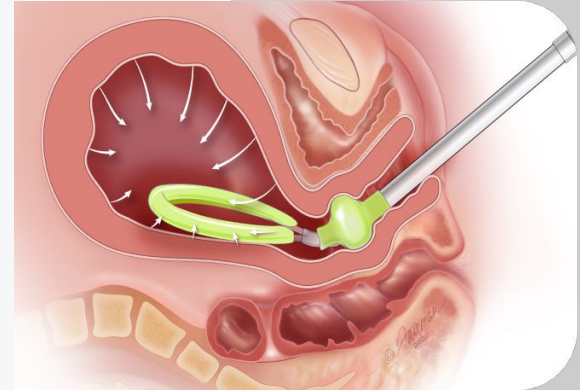
Established/Related Solutions



Oxytocin

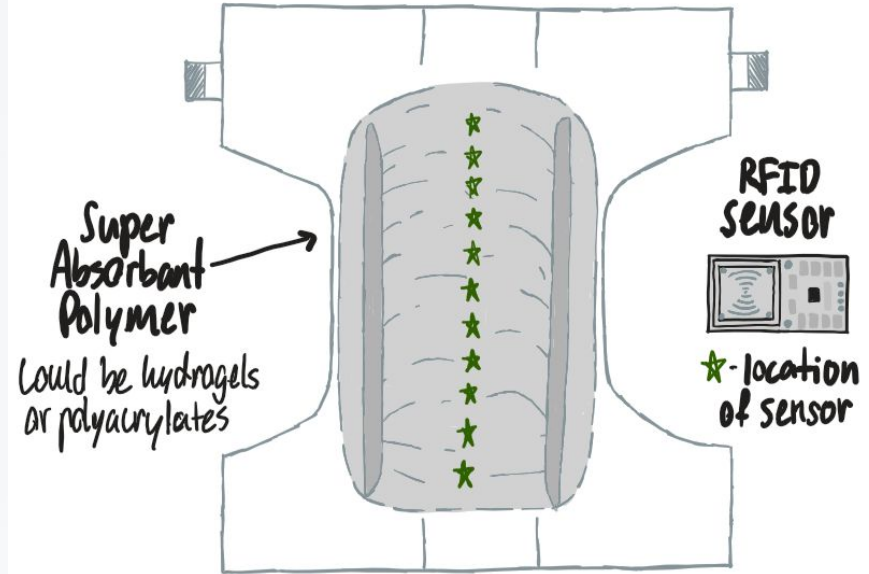
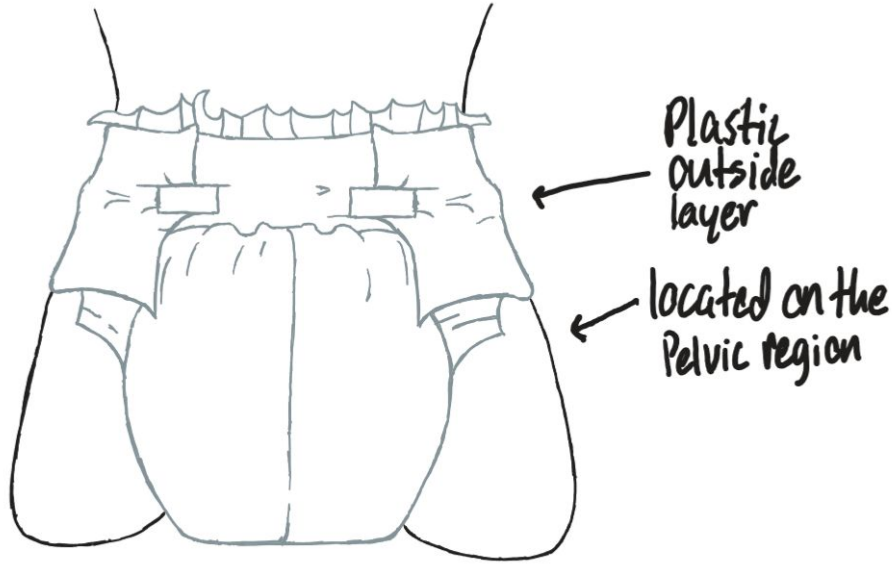


Liquid-detecting
diapers for babies

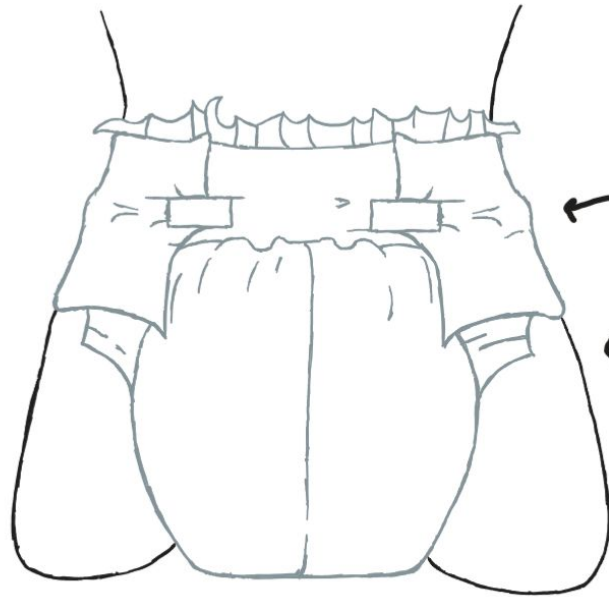


JADA System

Concept 1 - RFID Sensor

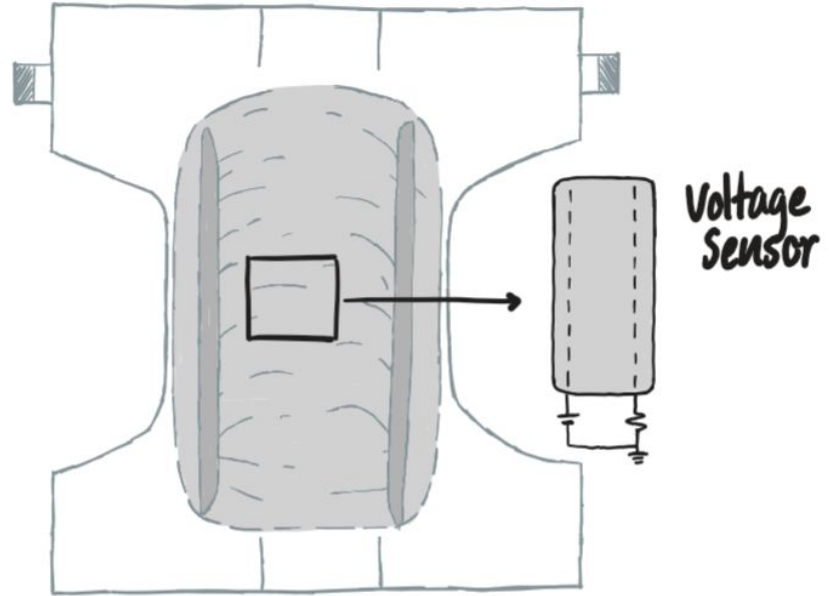


Concept 2 - Voltage Sensor



Plastic
outside
layer

located on the
Pelvic region



Key Questions

- How much blood is being lost over time (days/weeks)?
- How will the signal be received?
- When does blood loss reach critical levels?
- How does the mother get alerted?
- How will the data show increasing/decreasing blood levels?

Evaluation Criteria

Critical

Essential

Want

Reusable	Reliable	Uncomplicated Maintenance
Inexpensive	Durable	User Friendly
Hygienic	Accurate	
	Computational	

Evaluation Criteria (cont.)

- Affordable
 - <\$0.50 each
 - Just as expensive as normal PP diaper
- Reusable
 - Removable sensor
 - Able to be reused >100 times
- Accurate
 - >95% accuracy in diagnosis
 - Testing

Future Steps

- Knowledge gaps:
 - Data storage
 - How to integrate w/Arduino
 - Fluid/sweat vs. blood
- Funding:
 - Pre-seed: Parents
 - Seed: Angel Investors

References

- Armstrong-Mensah, E., Dada, D., Bowers, A., Muhammad, A., & Nnoli, C. (2021). Geographic, Health Care Access, Racial Discrimination, and Socioeconomic Determinants of Maternal Mortality in Georgia, United States. *International journal of MCH and AIDS*, 10(2), 278–286. <https://doi.org/10.21106/ijma.524>
- Clark, Michelle, and Danielle MacDougall. "Vacuum-Induced Uterine Tamponade for Postpartum Hemorrhage." *Canadian Journal of Health Technologies*, vol. 2, no. 3, 8 Mar. 2022, <https://doi.org/10.51731/cjht.2022.282>.
- Gyamfi-Bannerman, C., Srinivas, S. K., Wright, J. D., Goffman, D., Siddiq, Z., D'Alton, M. E., & Friedman, A. M. (2018). Postpartum hemorrhage outcomes and race. *American Journal of Obstetrics and Gynecology*, 219(2), 185.e1–185.e10. <https://doi.org/10.1016/j.ajog.2018.04.052>
- McGowan, B. K. (2018, March 19). New report explores why preventable maternal deaths continue to occur in the United States. Maternal Health Task Force. <https://www.mhtf.org/2018/03/16/new-data-explore-why-preventable-maternal-deaths-continue-to-occur-in-the-united-states/#:~:text=Over%2060%25%20of%20pregnancy%2Drelated.of%20hemorrhage%20deaths%20were%20preventable>
- Reader, T. W., & Gillespie, A. (2013). Patient neglect in healthcare institutions: a systematic review and conceptual model. *BMC health services research*, 13, 156. <https://doi.org/10.1186/1472-6963-13-156>
- Mukherjee, M., Naqvi, S. A., Verma, A., Sengupta, D., & Parnami, A. (2019). Menstru loss. *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies*, 3(2), 1–21. <https://doi.org/10.1145/3328929>

Thanks!
Any Questions?

