

INNOVATIVE NEONATAL TECHNOLOGIES





Intensive vs Developmental Care

400,000 babies are cared in NICU per year in Europe = 1/10 babies

Premature babies can be cared for up to 4 months

Wires tether the baby to the incubator create a barrier to care



'There were more wires than him': the potential for wireless patient monitoring in neonatal intensive care



The Challenge – The Collaboration



Clinical stability



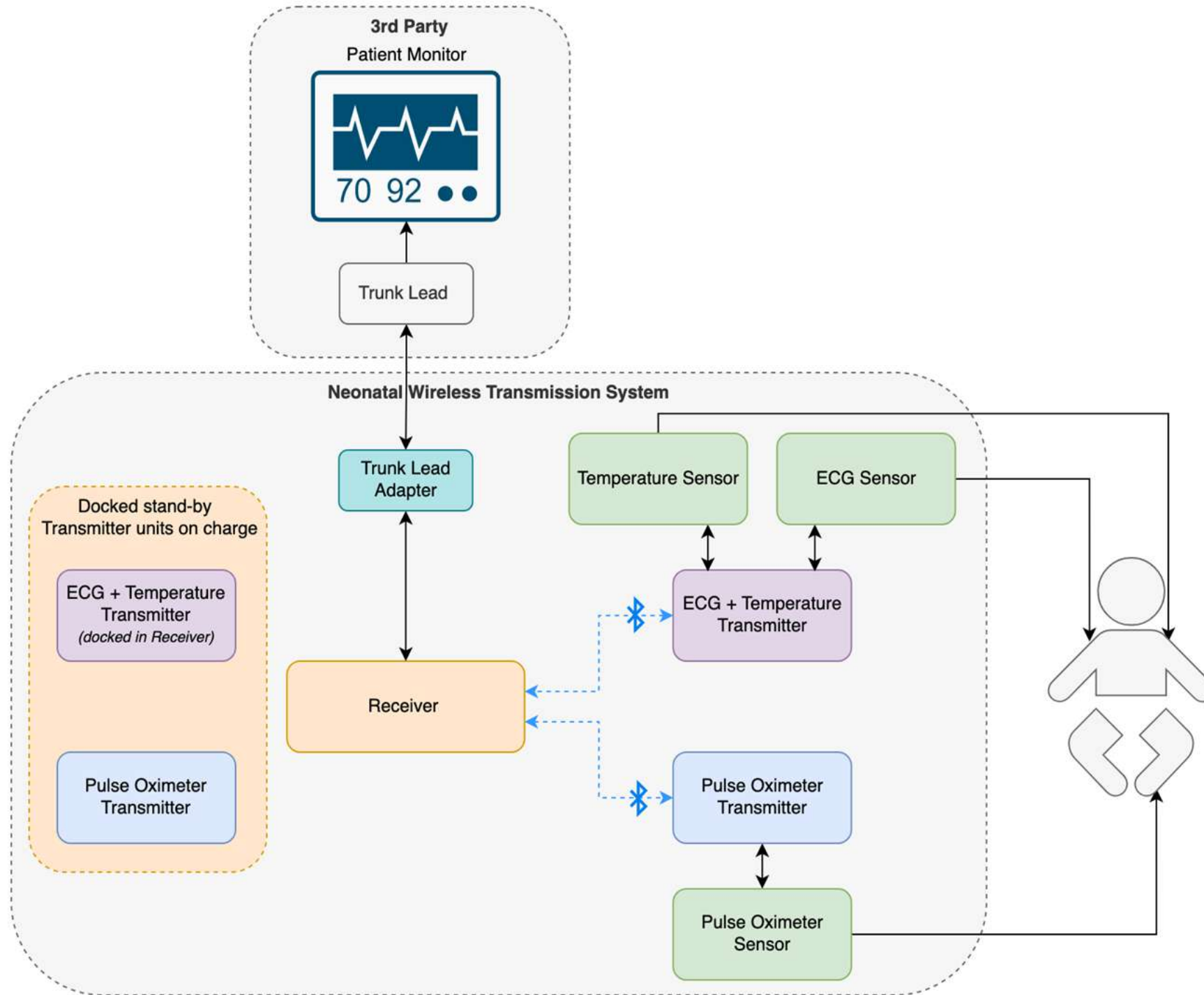
Maternal stress



Breastfeeding

**Importance of Positive
Physical touch**

**Health outcomes
Quality of care
Maternal mental health**



Design

Critical changes
Minimally disruptive
Parents central





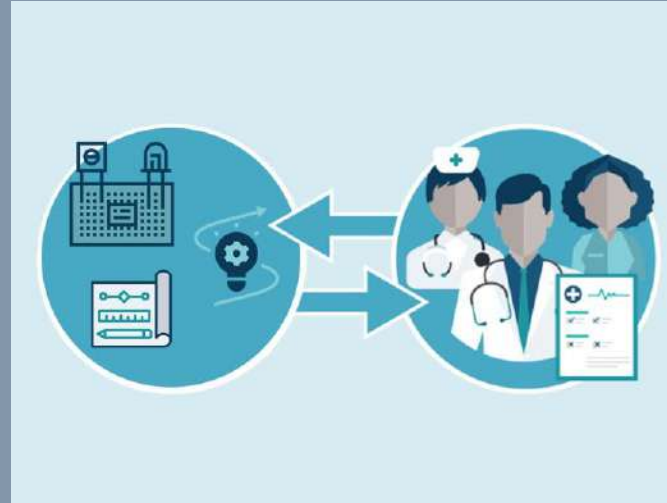
- All standard vital signs
- 12 hour battery life
- Integrates with monitors
- Connects to EMR

Human Factors Design

Product Development



Clinical Studies



Business Case



More than a product

***The simple act of picking up your
baby is so hard ..***

***...would greatly decrease
maternal anxiety***

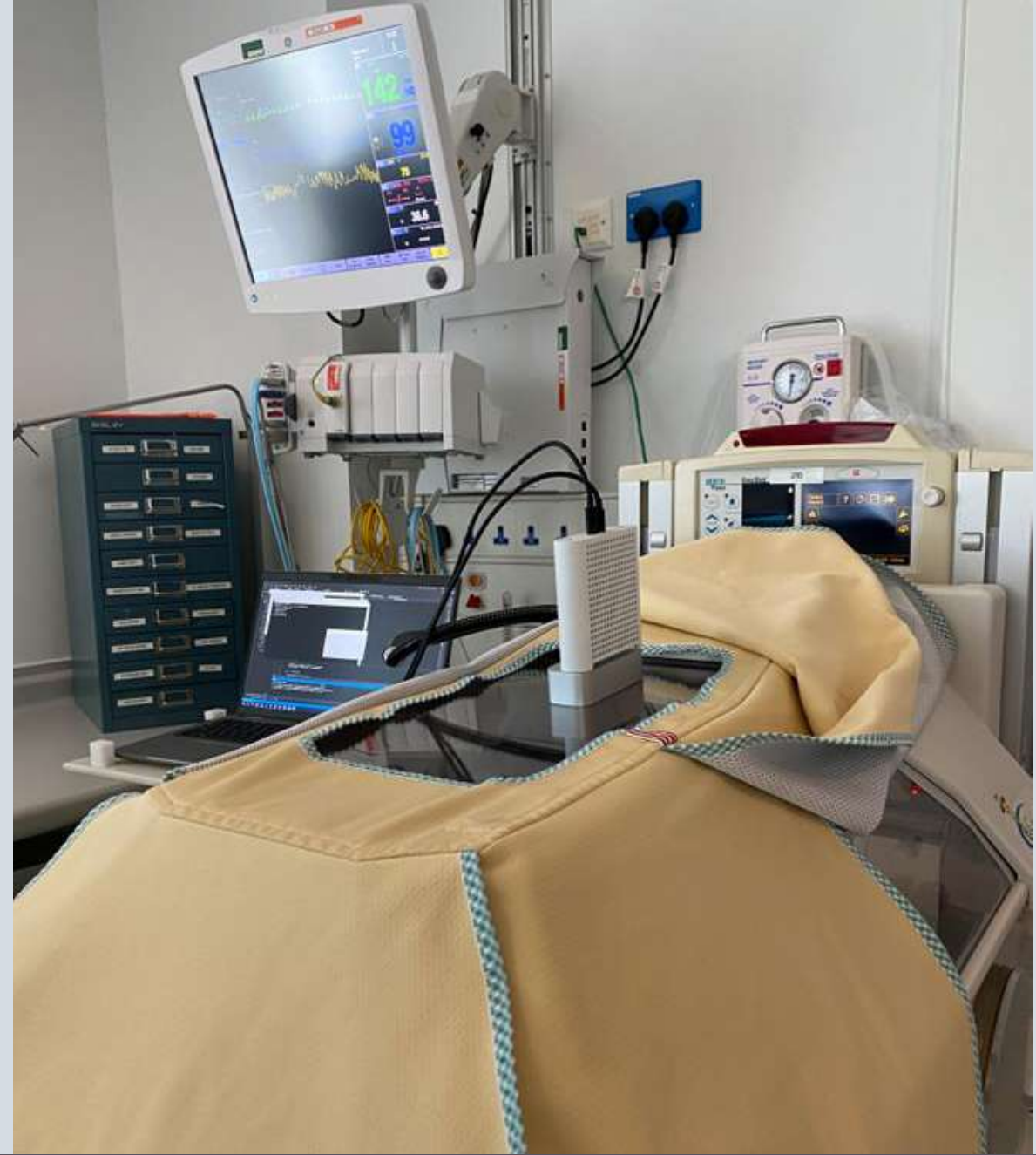
This is a crucial advance...

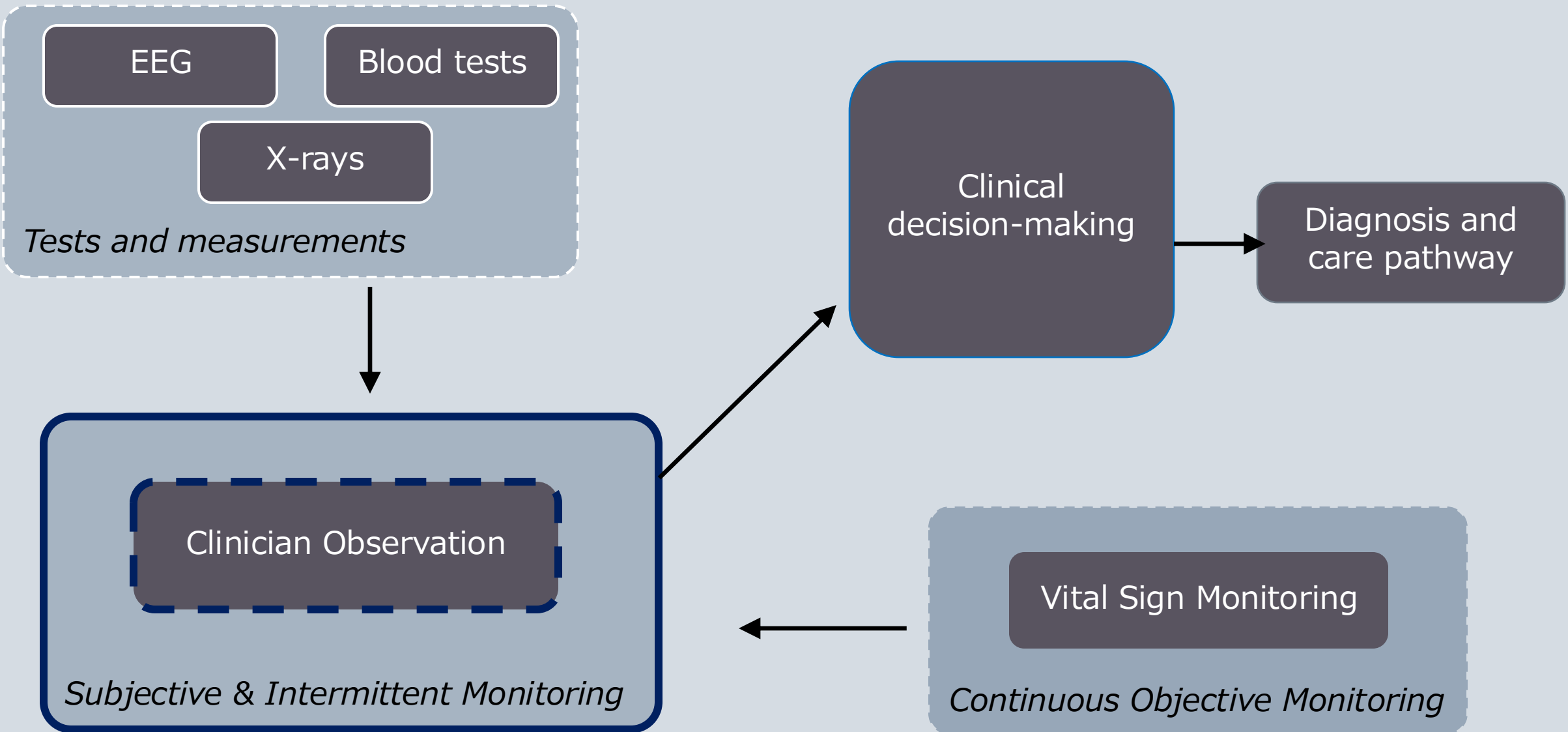


Parent and Staff Feedback

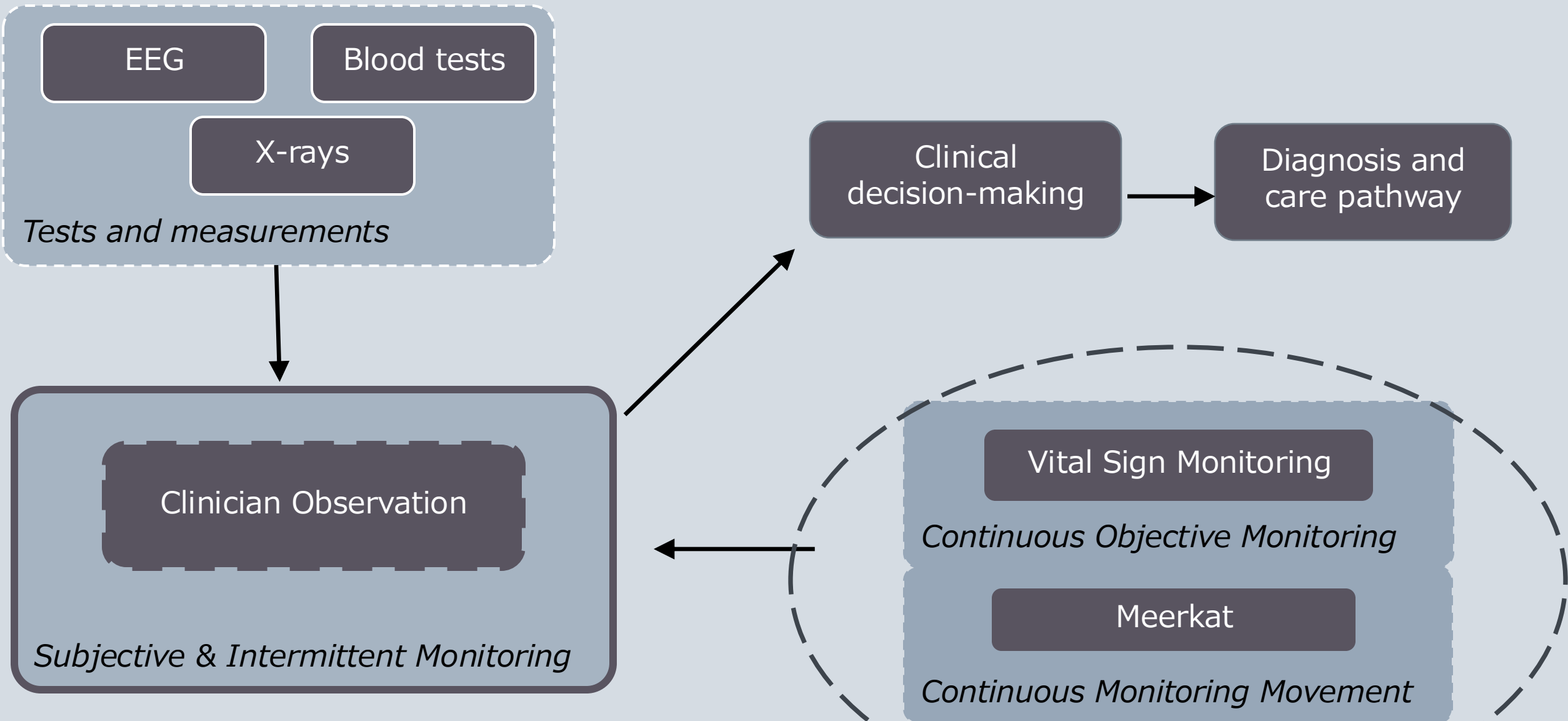
Meerkat

Neonatal monitoring





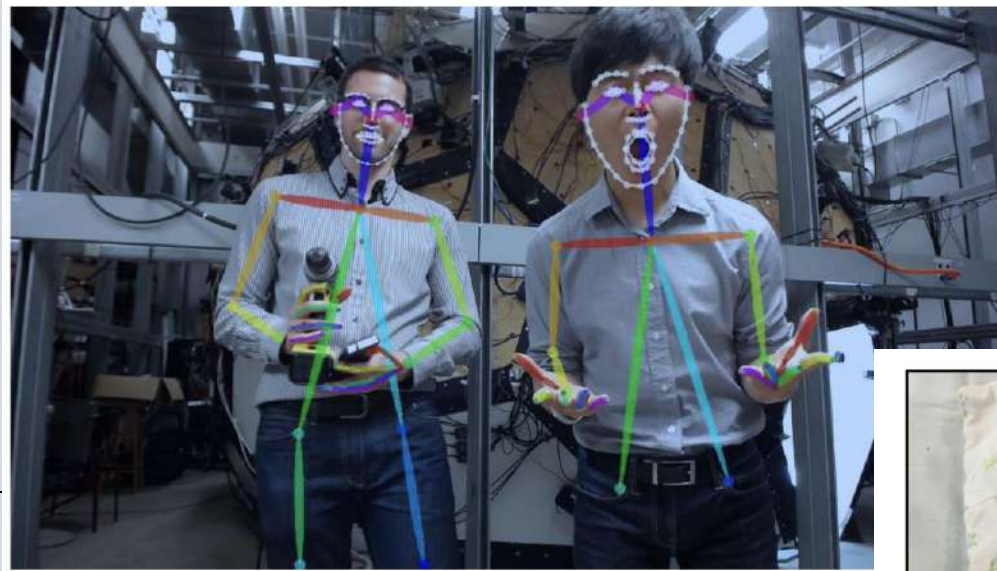
Current Practice – Intermittent clinical observation



Intelligent Integrated Monitoring



Pose Estimation



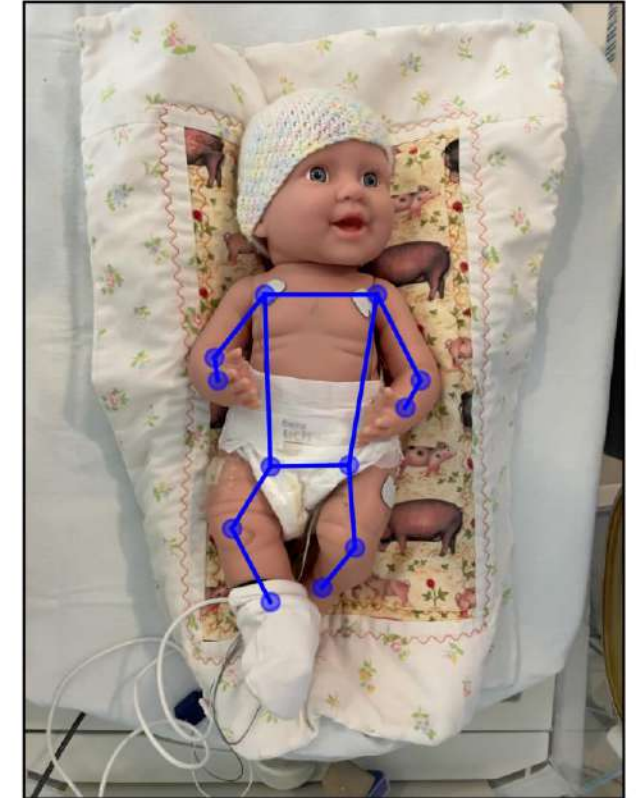
Locating the joint positions ('poses')

Image



Skeleton Joint
Positions

Joint positions
indicate activity
identify regions for vital sign monitoring



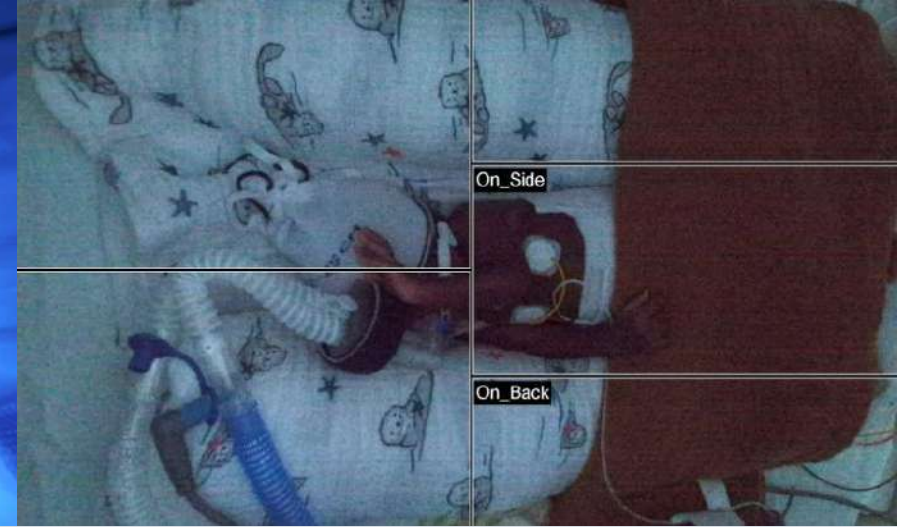
Monitoring Key Activity and Physiology



Coverage



Light
condition



Position

Video Data (30 frames per second)

- *RGB Video*
- *Depth Video (3D data)*
- *Infra-Red Video*

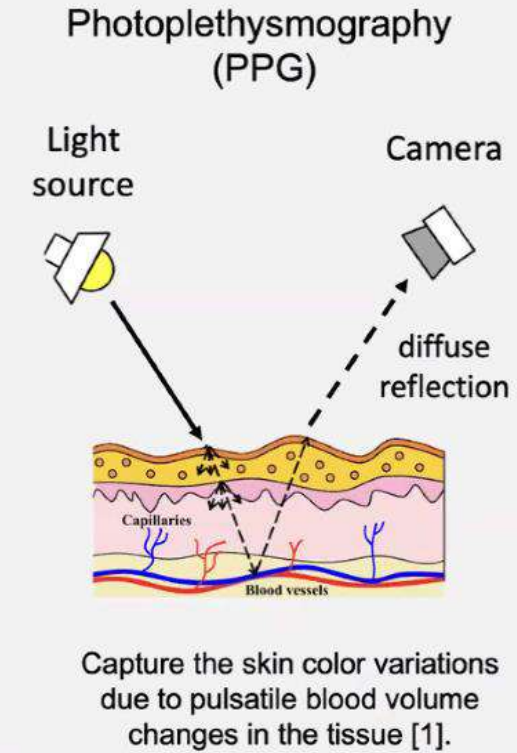
Patient Monitor Data

- *Vital Signs (HR, RR, SpO2, etc)*
- *Waveforms (ECG, Respiratory, etc)*

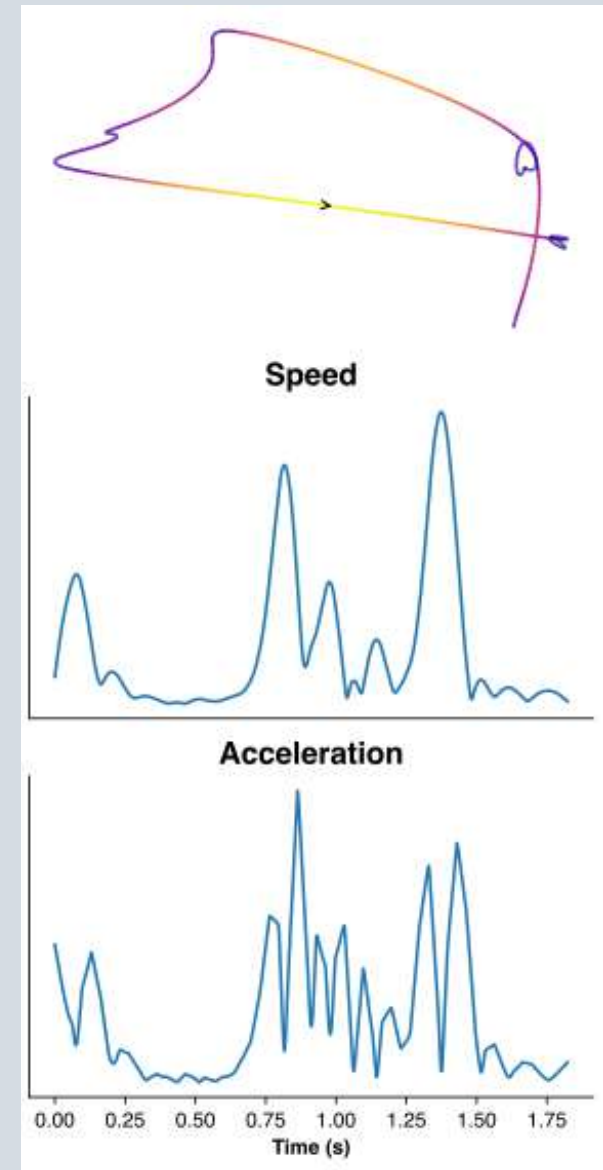
Additional Data

- *Cot Noise Levels (divided by frequency)*
- *Environment Noise Levels*
- *CFM Data (future seizure data)*

Data Collection Challenges



Combining Key Activity and Physiology



Combining Key Activity and Physiology



Collaboration Accelerates translation



Design for needs



Faster Translation



Equitable Access

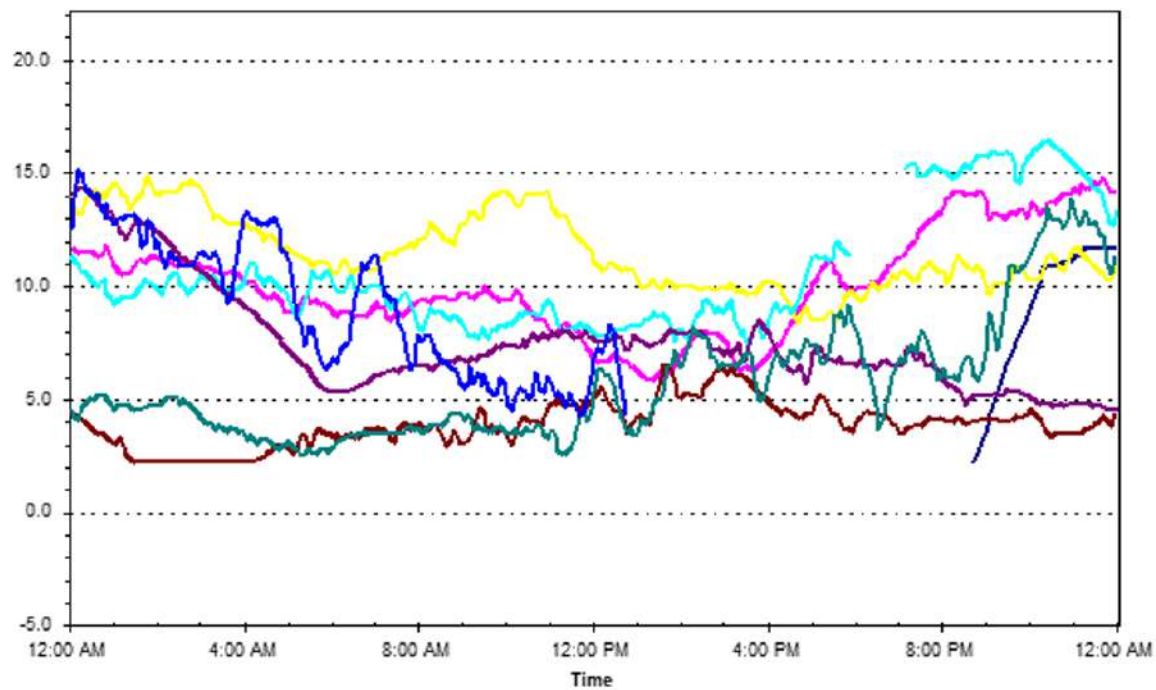
Babies are Not Small Adults

THANK YOU

INNOVATIVE NEONATAL TECHNOLOGIES

DESIGNING TECHNOLOGY AROUND BABIES AND
FAMILIES





Off License use of CGM