Staying Dry: Notification System for Incontinence Underwear

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The 2015 Global IAD Expert Panel recommends caregivers use specific cleaning regimes for incontinent patients to prevent incontinence-associated dermatitis/IAD. However, non-communicative patients are unable to notify caregivers who increasingly rely on predetermined schedules, prolonging moisture contact time and accelerating skin breakdown. Alerts of moisture in incontinence underwear could help caregivers to prevent IAD and pressure ulcers. The researcher created a notification system with a sensor designed for manufacture within disposable incontinence underwear and a separate, reusable notifying device. The researcher created this flexible sensor to detect excess moisture using concepts of capacitive and resistive sensing. The notification device uses a microcontroller programmed for accuracy, has built-in time allowances for changing, and prevents false-positive notifications. For optimal performance, the sensor was placed within the absorbent layer of 1.5x1.5cm samples of target area incontinence underwear fabric. Proportional typical load amounts of liquid for incontinence underwear of 2.2ml and light load amounts of 1ml distilled water were introduced on testing samples to mimic incontinent episodes. The device was tested 30 times for each volume. Stage II tests show 100% notification activation with both 2.2 and 1ml testing showing caregivers will be notified of moist incontinence underwear. This research successfully created a notification system to help caregivers prevent incontinence associated dermatitis, pressure ulcers, and unnecessary pain in immobile and non-communicative patients. As caregivers attempt to isolate patients from Covid-19 and other potentially deadly viruses in the future, the need for this notification system likely will increase.

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