More than counting steps: Common wearable fitness tracker helps clinicians assess at-home recovery after kids' surgery

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A recent study from Ann & Robert H. Lurie Children's Hospital of Chicago found that using a consumer-grade wearable device to track a

child's heart rate and physical activity after surgery could help clinicians decide if at-home recovery is going as expected or if an emergency department (ED) visit is needed to address possible complications. Their findings, published in the *Journal of Pediatric Surgery*, show that this more affordable and widely accessible monitoring method has the potential to drive earlier intervention or potentially prevent an unnecessary ED visit if clinicians judge the physiologic data to be reassuring.

"Our study demonstrates strong preliminary evidence that objective data from the wearables, coupled with a parent's report on the child's recovery, might improve triage and guide unplanned follow-up care after surgery," said senior author Fizan Abdullah, MD, Ph.D., Division Head of Pediatric Surgery at Lurie Children's and Professor of Surgery at Northwestern University Feinberg School of Medicine. "A heart rate above expected levels that is sent to us from the device tells clinicians that the child may be in pain or bleeding, while a step count that is lower than normal suggests that the child may be bedridden and having a complication at home. In our focus group study, we found that this data aids clinicians' decision-making when a parent calls with concerns."

Previous research by Dr. Abdullah and colleagues used the consumer-grade wearable data to quantify expected recovery trajectory by specific operations. They followed 200 patients after surgery and found consistent patterns across different procedures. This information was used in the current study as baseline against which they judged whether the situation is concerning or reassuring.

In the current study, clinicians were asked to evaluate three real-life scenarios that included a parent call summary, with or without the wearable data. When presented with reassuring wearable data, their likelihood of recommending an ED visit decreased significantly. Likewise, their likelihood of recommending an immediate ED visit

increased significantly based on concerning wearable data. Even when the patient's wearable data did not change their decision, clinicians reported that it increased their confidence in decision-making when responding to parent telephone calls.

"In an ongoing study, we are developing machine learning algorithms that will alert clinicians to concerning wearable data," said Dr. Abdullah, who is the Orvar Swenson Founders' Board Chair in Pediatric Surgery. "This would allow us to intervene even earlier and potentially improve the child's outcome."

More information: Samuel C Linton et al, Effect of consumer-grade wearable device data on clinician decision making during post-discharge telephone calls after pediatric surgery, *Journal of Pediatric Surgery* (2021). DOI: 10.1016/j.jpedsurg.2021.09.040

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