Next-Generation Pulse Oximetry.
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Pulse oximetry is a noninvasive monitoring technique used to assess a patient's arterial blood oxygen saturation and pulse rate. This technology has been shown to be effective at helping clinicians detect hypoxemia. However, conventional pulse oximeters are known to have difficulty obtaining accurate readings during periods of motion and low perfusion, resulting in frequent nuisance alarms. To address the limitations of conventional pulse oximeters, several suppliers have developed what we term next-generation technologies. These technologies are marketed as being able to obtain accurate values when conventional technologies cannot. But do these technologies live up to their suppliers' claims? In this Evaluation, we test the technologies from five suppliers--Masimo, Nellcor, Philips, Respironics Novametrix, and Siemens--to answer that question.

Our laboratory testing focused on the technologies' ability to monitor saturation and pulse rate during periods of motion and low perfusion--and thus their ability to reduce nuisance alarms compared with conventional technology. We also looked for evidence of missed alarm events, we examined susceptibility to light interference, we analyzed the literature, and we spoke with current users. In addition to Product Profiles for each evaluated technology and a Conclusions section that describes our comparative ratings, we present a detailed discussion of our test results, a selection guide to help healthcare facilities make implementation decisions, and a comprehensive review of the literature on next-generation pulse oximetry.