Novel Use of Google Glass for Vital Sign Monitoring During Simulated Bedside Procedures

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Introduction: Real-time monitoring of patient vital signs is essential during surgical procedures requiring conscious sedation. Google Glass, with its head-mounted display, provides a novel hands-free platform for enhanced situational awareness of vital-sign parameters, especially during procedures where anesthesiologists are not present and safe multi-tasking is required.

Methods: In this randomized-controlled pilot, surgery residents (n=14) participated in standardized thoracostomy tube placement (SimMan) and bronchoscopy (EndoscopyVR) simulation scenarios. Traditional vital-sign monitors were available 90 degrees from the operative field during all procedures, and residents were additionally randomized with or without continuous wireless vital-sign streaming to Google Glass. User feedback was collected by survey.

Results: Live streaming of vital signs to Google Glass resulted in a trend towards earlier recognition of critical vital sign changes. During bronchoscopy, the experimental group used traditional monitors 88.2% less (p=0.001), yet recognized critical desaturation 8.8 seconds earlier than the control group (64.6s vs. 73.4s, p=ns). Similarly, time to recognition of hypotension during thoracostomy tube placement occurred 10.5 seconds earlier in the experimental versus control group (31.3s vs. 42.8s, p=ns). The majority of participants 'agreed' or 'strongly agreed' that Google Glass increased their situational awareness (64%), was helpful in monitoring vital signs (86%), was easy to use (93%), and has potential to improve patient safety (85%).

Conclusion: This randomized pilot study demonstrates the utility and feasibility of vital-sign streaming on Google Glass. Moreover, it provides preliminary evidence that this novel head-mounted display platform can be used in the clinical setting to enhance procedural situational awareness and patient safety.