Implementing an electronic hand hygiene system improved compliance in the intensive care unit

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Hand hygiene (HH) compliance is low and difficult to improve among healthcare workers. We aim to validate a new electronic HH system (Sanibit system) and assess the impact of this system on HH compliance and quality changes over time at both group and individual levels. The Sanibit system is a sensor-based platform with automated HH compliance and quality monitoring, real-time feedback, and comprehensive HH compliance analysis. The Sanibit system was installed in a 10-bed surgical intensive care unit. The full HH compliance rate increased significantly from 8.4% in week 01 to 20.5% in week 16 with week 10 being the highest (27.4%). The partial compliance rate maintained relative consistency between 13.2 % to 20.0 %. The combined compliance rate (full compliance rate + partial compliance rate) increased from 23.5% in week 01 to 34.6% in week 16 with week 10 being the highest (41.4%). We found significant variations among providers in terms of HH opportunities per shift, full compliance, partial compliance and combined compliance rates. The average duration of hand rubbing over time in partial compliance occurrences did not change significantly over time. In conclusion, a sensor-based platform with automated HH compliance and quality monitoring, real time feedback and comprehensive individual level analysis, improved providers' HH compliance in an ICU. There were significant variations among individual providers.

Comparison of droplet spread in standard and laminar flow operating theatres: SPRAY study group

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Reducing of COVID-19 transmission relies on controlling droplet and aerosol spread. Fluorescein staining reveals microscopic droplets. We used this technique to compare the droplet spread in a standard theatre (ST) and a laminar air flow theatre (LAF). We used a 'cough-generator' fixed to a theatre trolley at 45-degrees. Fluorescein stained 'secretions' were projected onto a series of calibrated targets. These were photographed under UV light and a 'source detection' software measured droplet splatter size and distance. The smallest droplet detected was 120 µm and the largest 24,000 µm. We detected an average of 25,862 spots in the ST, compared with 11,430 in the LAF (54% reduction). The LAF mainly affected the smaller droplets (<1000 microns). The surface area covered with droplets was: 6% at 50 cm, 1% at 2 m and 0.5% at 3 m in the ST; and 3%, 0.5% and 0.2% in the LAF respectively. Accurate mapping droplet spread in clinical environments is possible using fluorescein staining and image analysis. The laminar flow affected the smaller droplets but had limited effect on larger droplets in our AGP cough model.

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