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Automated Assessment of Drug Administration in the Operating Room with Smart Eyewear Technology

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Mentored Research Training Grant

This project aims to transform anesthesiology electronic medical records (EMRs) by documenting actions in real time in the operating room (OR) to improve patient care and safety. Using cutting-edge smart eyewear technology, we plan to automate a common manual data entry task: documentation of drug delivery. When drugs are given to a patient in the operating room, the anesthesiologist completes several steps. First, the drug is drawn up from a vial into a syringe and labeled with the drug name and dose. Later, the syringe is selected by the provider, the label is read, and the drug is injected into the patient. The anesthesiologist manually records the time and dosage on the computer. This project will train smart eyewear to recognize drugs' names on the vial and syringe labels and to calculate the delivered dose as a step towards automation of drug delivery documentation in the EMR. Additionally, the eyewear can notify the anesthesia provider of the syringe's contents prior to drug delivery. Smart eyewear thus can serve as a second set of eyes in the OR, checking medications at the time an anesthesia provider picks up a syringe and alerting the provider to the correct medication prior to administration. This would eliminate complete reliance on the providers themselves for preventing errors and would be the first clinical warning system based on computer vision. Direct recording of drug delivery based on event detection by the smart eyewear would free physicians from the distraction of having to manually record medication administration.