Video games designed to improve results of doctors making triage decisions

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A team of researchers with widely diverse backgrounds from several institutions in the U.S. has developed two video games designed to help improve results by doctors making triage decisions. In their paper

published in *Proceedings of the National Academy of Sciences*, the group describes how the games were developed and how well they worked when tested by doctors.

As the researchers note, nearly half of all patients in the U.S. transported to a hospital for emergency medical treatment arrive at a facility that is not equipped to handle severe trauma. When that happens, doctors there must decide right away if a patient needs to be transported to a different facility or if they can be treated onsite. They note also that most people living in the U.S. will experience a diagnostic error at least once in their lifetime—one that might occur when they meet with doctors who must decide if an injury requires advanced trauma support. In this new effort, the researchers sought to improve the rate at which doctors make the right call under such conditions.

The researchers note that doctors who make triage decisions know what they are supposed to do, but sometimes fail to do it because of other pressing issues—in such instances, they need a reminder. Such a reminder could be in the form of a video game in which doctors make triage decisions for virtual patients and are also asked to spell out the protocols involved with each decision afterward. They also developed a story-driven game meant to help doctors make the right decisions.

After creating the video games, the researchers tested them by enlisting the assistance of 320 physicians attending a medical seminar. After playing one of the video games, each volunteer was asked to take part in a virtual triage simulation that is used to test the judgment of doctors carrying out triage decisions. Control groups reviewed a triage manual or did nothing at all before engaging with the triage simulation.

The researchers found that those volunteers who played either video game under-triaged less often than did those in the control groups. They suggest this indicates that playing such games can improve triage rates,

though they acknowledge more research needs to be done before it can be implemented as a tool in medical facilities.

Abstract

Trauma triage depends on fallible human judgment. We created two "serious" video game training interventions to improve that judgment. The interventions' central theoretical construct was the representativeness heuristic, which, in trauma triage, would mean judging the severity of an injury by how well it captures (or "represents") the key features of archetypes of cases requiring transfer to a trauma center. Drawing on clinical experience, medical records, and an expert panel, we identified features characteristic of representative and nonrepresentative cases. The two interventions instantiated both kinds of cases. One was an adventure game, seeking narrative engagement; the second was a puzzle-based game, emphasizing analogical reasoning. Both incorporated feedback on diagnostic errors, explaining their sources and consequences. In a four-arm study, they were compared with an intervention using traditional text-based continuing medical education materials (active control) and a no-intervention (passive control) condition. A sample of 320 physicians working at nontrauma centers in the United States was recruited and randomized to a study arm. The primary outcome was performance on a validated virtual simulation, measured as the proportion of undertriaged patients, defined as ones who had severe injuries (according to American College of Surgeons guidelines) but were not transferred. Compared with the control group, physicians exposed to either game undertriaged fewer such patients [difference = −18%, 95% CI: −30 to −6%, P = 0.002 (adventure game); −17%, 95% CI: −28 to −6%, P = 0.003 (puzzle game)]; those exposed to the text-based education undertriaged similar proportions (difference =

+8%, 95% CI: −3 to +19%, P = 0.15).

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