## Media Relations

# Pioneering Device By UNH Faculty Could Give Student Nurses A Shot In The Arm

October 26, 2011



A "smart" training syringe developed by University of New Hampshire nursing and engineering faculty members will help nurses and other health care professionals learn how to give the most effective intramuscular injections by providing real-time feedback. Credit: Paula McWilliam

DURHAM, N.H. – Getting a yearly flu shot or other vaccination, while generally considered a wise health move, is hardly anyone's idea of fun. Now, a breakthrough device from University of New Hampshire researchers aims to ensure that such shots are as effective – and painless -- as possible.

UNH nursing and electrical engineering faculty have crossed departmental lines to create a "smart" training syringe that will help nurses and other health care professionals learn how to give the most effective intramuscular injections by providing real-time feedback. It's the first device of its type ever created.

"We want to be sure people are getting the medicine in the muscle where it's going to work. This would be a way to ensure that people are getting immunized," says Paula McWilliam, assistant professor of nursing, who is collaborating with professor John LaCourse, chair of the department of electrical and computer engineering. Tyler Rideout, a graduate student in electrical and computer engineering, and undergraduates Amanda Makowiecki '14 (electrical engineering) and Holly Parker '13 (nursing) are assisting, as did Dana Daukssa '11 (biochemistry).

The project, which has produced a prototype training syringe, has its origins when McWilliam realized the dearth of both standardized procedures for giving intramuscular (IM) injections and of teaching tools for helping new nurses learn to give injections. Although injections are common – 16 billion are given per year – and considered a basic skill, if they're not given properly, McWilliam says, their effectiveness at delivering medicine could be compromised.

"I can watch a student nurse practice an injection and say 'that looks right,' but I have no way to tell for certain," she says. "This will measure the outcome more accurately."

"If nurses could practice with this training tool, they can learn to give a better shot," LaCourse adds. "I would imagine it's nerve-wracking to stick a needle in somebody for the first time."

The prototype "smart" syringe is a simple plastic syringe equipped with force and acceleration sensors. "How you grab it, how you move it through space, how deeply you push it in all gets measured," says LaCourse, and is then transmitted to a computer. "For example, the syringe's readout could advise a student to modify technique by adjusting their injection angle."

Rideout developed a graphical user interface (GUI) that plots users' force, trajectory, angle and pressure data on a computer screen within a range of best-practice data. He recently published his work in the publication of the 2011 Northeast Bioengineering Conference, at which he also presented the project.

Surprisingly, best-practice data for giving injections does not exist; now that the device has been built, the researchers are pursuing agreed-upon standards for delivering IM injections.
LaCourse and McWilliam are working with UNH's office for research partnerships and commercialization, which has filed a patent application for their prototype. They're also looking for a commercial partner who could take their prototype to market. "This is a great example of the exceptional research coming out of UNH, and we're excited about the commercial potential for the technology," says Maria Emanuel, senior

licensing manager.

For McWilliam, who is in UNH's College of Health and Human Services, and LaCourse, who works in the College of Engineering and Physical Sciences, the cross-disciplinary aspect of this project is especially rewarding. "As a junior faculty, to have the opportunity to work with John has really helped me grow," McWilliam says.

LaCourse, who has worked on medical products previously, adds that McWilliam provides much-needed expertise in her domain. "It's just bloody exciting to work with other faculty," he says.

The University of New Hampshire, founded in 1866, is a world-class public research university with the feel of a New England liberal arts college. A land, sea, and space-grant university, UNH is the state's flagship public institution, enrolling 12,200 undergraduate and 2,300 graduate students.

-30-

**Photographs available to download:**
http://www.unh.edu/news/cj_nr/2011/oct/bp21ceps.jpg
Caption: A "smart" training syringe developed by University of New Hampshire nursing and engineering faculty members will help nurses and other health care professionals learn how to give the most effective intramuscular injections by providing real-time feedback.
Credit: Paula McWilliam

http://www.ceps.unh.edu/images/syringe_needle.jpg
Caption: UNH graduate student Tyler Rideout, who helped develop the "smart" syringe, demonstrates it on a fellow "student."
Credit: Paula McWilliam

---

*Reporters and editors: John LaCourse (603-862-1324, john.lacourse@unh.edu) and Paula McWilliam (603-862-1213, paula.mcwilliam@unh.edu) are available for interviews.*

---

Media Contact: Beth Potier | 603-862-1566 | UNH Media Relations

---