Title: Opportunities and challenges in delivering influenza vaccine by microneedle patch

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Abstract
Simple and efficacious delivery methods for influenza vaccines are needed to improve health outcomes and to manage possible pandemics in the United States and globally. One approach to meeting these needs is the microneedle patch (MNP), a small array of micron-scale needles that is applied to the skin like a bandage. Because MNPs do not require a conventional needle and syringe, training requirements for providers can be reduced, making it an attractive option for use in both low-and high-income countries. To inform additional technical developments and the eventual introduction of MNPs for influenza vaccination, we interviewed 24 key opinion leaders in the United States for insights into the opportunities and challenges associated with this technology, particularly its potential for self-administration. All interviewees expressed high support for administration of MNPs by health care providers and for supervised self-administration. Self-administration via prescription or over-the-counter purchase received lower levels of support, although even the latter received approval or a neutral score from a majority of interviewees. Interviewees also listed issues that should be considered in the ongoing development of the MNP, such as confirming it as efficacious as existing influenza vaccines and ensuring safety for self-administration. For patient and health care provider acceptability, important attributes are ease of use, short wear times, and an easily accessible application site. All agreed that MNPs could help to increase coverage, facilitate easy and safe delivery scenarios, reduce the cost of vaccination, and decrease the global morbidity and mortality associated with influenza.

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