Measles and rubella vaccination using a microneedle patch

Mark R. Prausnitz
Georgia Institute of Technology
Disclosure:

Mark Prausnitz is a founder, officer and shareholder in Micron Biomedical, Inc., which is developing microneedle patch technology.
subcutaneous injection  transdermal patch  microneedle patch

stratum corneum
viable epidermis
dermis
fat
Patient administration
Transportation and storage
Waste disposal
Manufacturing
Patient administration

- Minimally trained personnel
- No applicator, no reconstitution
- Painless delivery, no fear of needles

1) Apply patch
2) Press to skin
3) Remove from skin
4) Vaccine is delivered
Transportation and storage

- Small package size
- Improved thermostability
Waste disposal

• Impossible to reuse
• Reduced disposal volume
Prepare microneedle mold
Cast antigen formulation onto mold
Cast matrix formulation onto mold
Dry and remove microneedle patch
Low-cost, scalable manufacturing
Mock vaccination demonstration

1. Stand on the right side of your table
2. Put out your wrist for “vaccination”
3. Sit down once “vaccinated”
4. Return the patch at the end

*The patches contain no microneedles and no vaccine!*
"This first-in-man study shows that the use of a single dissolvable microneedle patch for influenza vaccination was well tolerated, resulted in robust antibody responses, and was preferred over conventional influenza vaccination with needles and syringes."

See Articles (page 449)
“This first-in-man study shows that the use of a single dissolvable microneedle patch for influenza vaccination was well tolerated, resulted in robust antibody responses, and was preferred over conventional influenza vaccination with needles and syringes.”
Field evaluation of vaccination in Ghana
Sarah McGray, PATH