TRANSDERMAL DRUG DELIVERY:
via MICRONEEDLES

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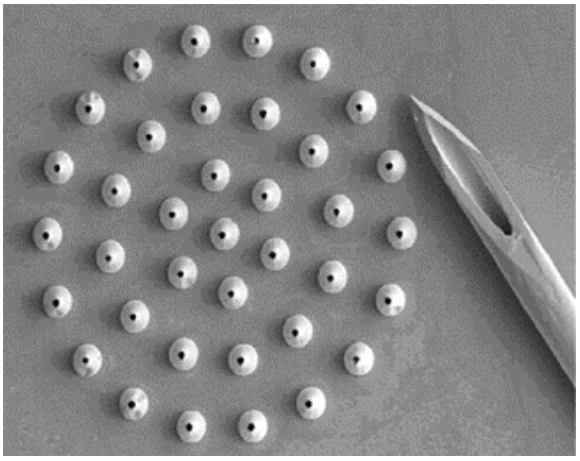
A revolution in medicine occurred in the 1850's with the introduction of the syringe and hypodermic needle. It was the first device able to penetrate the skin and administer drugs subcutaneously in an effective manner. However, this innovation had its drawbacks including risk of infection and a large factor of pain. Since it's introduction the main advances in the hypodermic needle have consisted of producing one-time use needles to reduce infection, and to make increasingly finer points to minimize the pain from the penetration of the skin. A beveled tip was also introduced to provide a better angle of drug administration.

A new revolution has now occurred in the field, 150 years in the making.

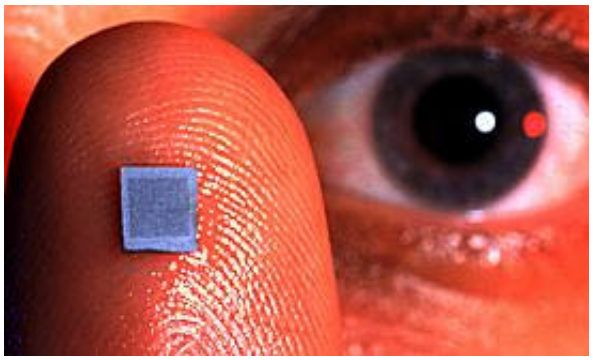


An array of hollow microneedles compared to a traditional hypodermic needle.

Georgia Institute of technology has been borrowing methods developed in the microelectronics industry to fabricate needles that are up to one third the diameter of a human hair, many times smaller than traditional needles.
These microneedles are composed of metals, Si, and biodegradable polymers. They are laid out in arrays of hundreds on sticker like wafers which house the medications they will be used to administer.

The advantages of microneedle drug administration as opposed to traditional is an extensive list, but the main reasons include:

-virtually painless delivery
-substantially lower infection risk than already low hypodermic injection.



-no need for special training for patient to administer.

Along with one-time use wafers, development of microchip integrated time released wafers are also in development.

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