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1. Liedberg H, Lundeberg T, Silver alloy coated catheters reduce catheter-associated bacteriuria. *British Journal of Urology*. 1990;65:379-381.
2. American Journal of Infection Control, April 1998, Vol. 26 No.2.
3. American Journal of Infection Control, April 1997, Vol. 25 No.2.
4. Abstracts of 38th ICAAC, September 1998.
5. Infection Control and Hospital Epidemiology, April 1998.
6. Journal of Urology, May 1998.
7. American Journal of Infection Control, April 1996, Vol. 24 No.2.

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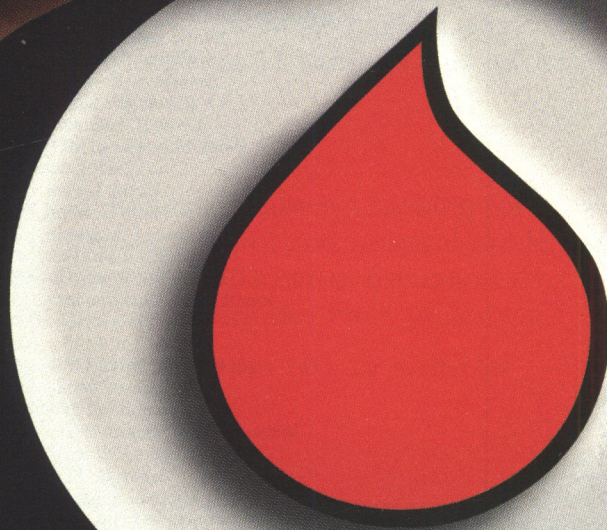
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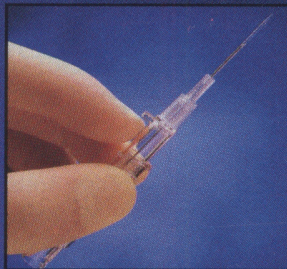
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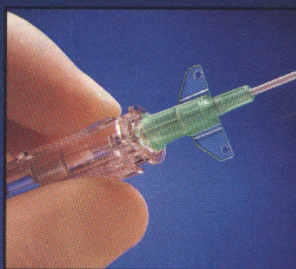
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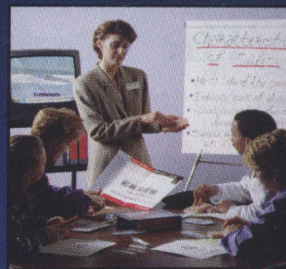
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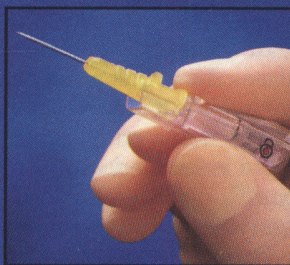
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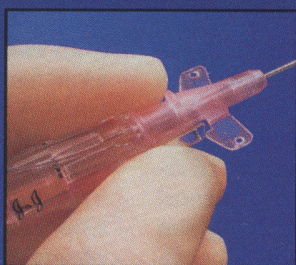
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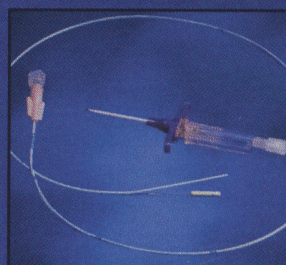
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