Chlorhexidine 2% as skin antisepsis

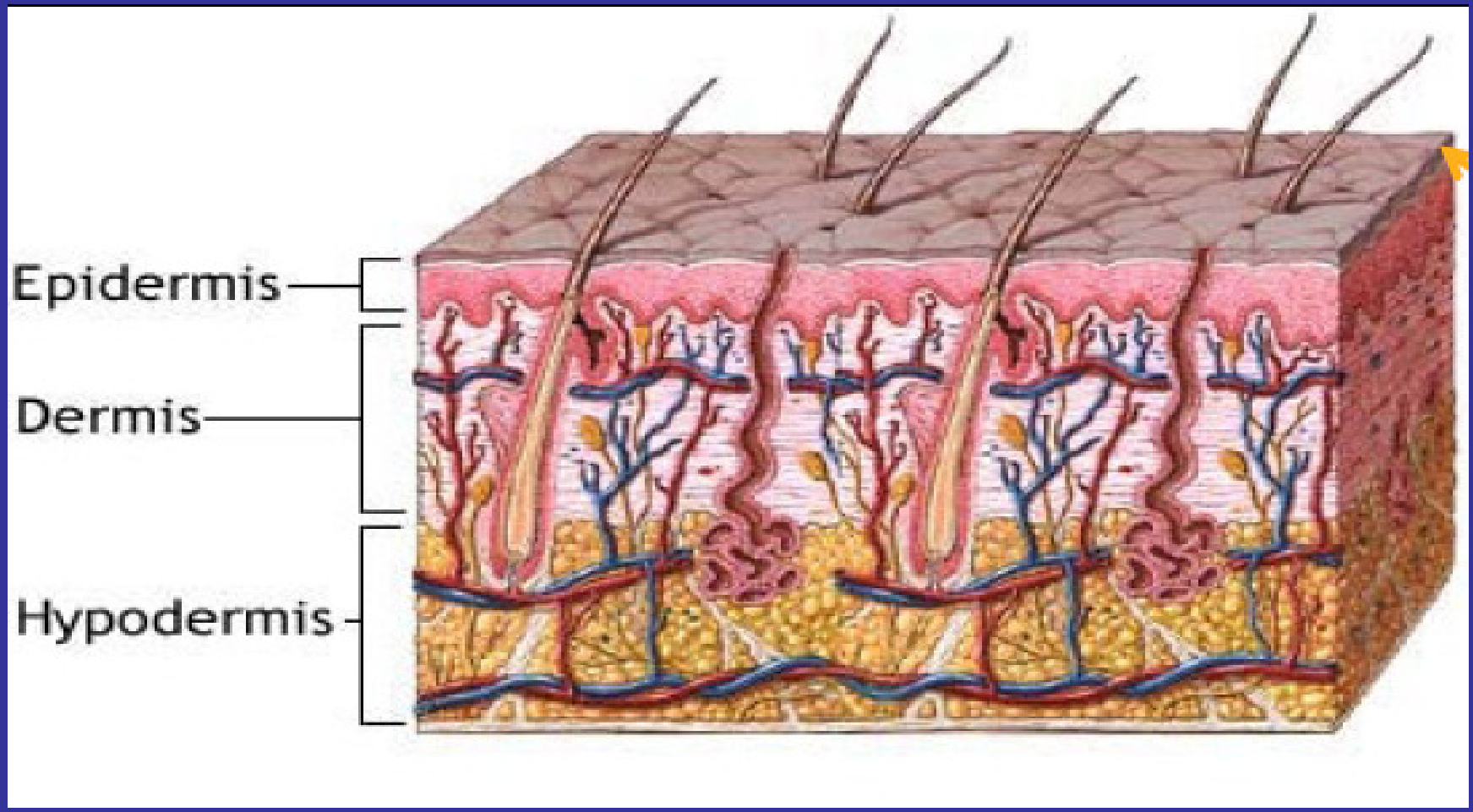
Central Venous Catheter Care Bundle Workshop

Langkawi

14 – 16th April 2008

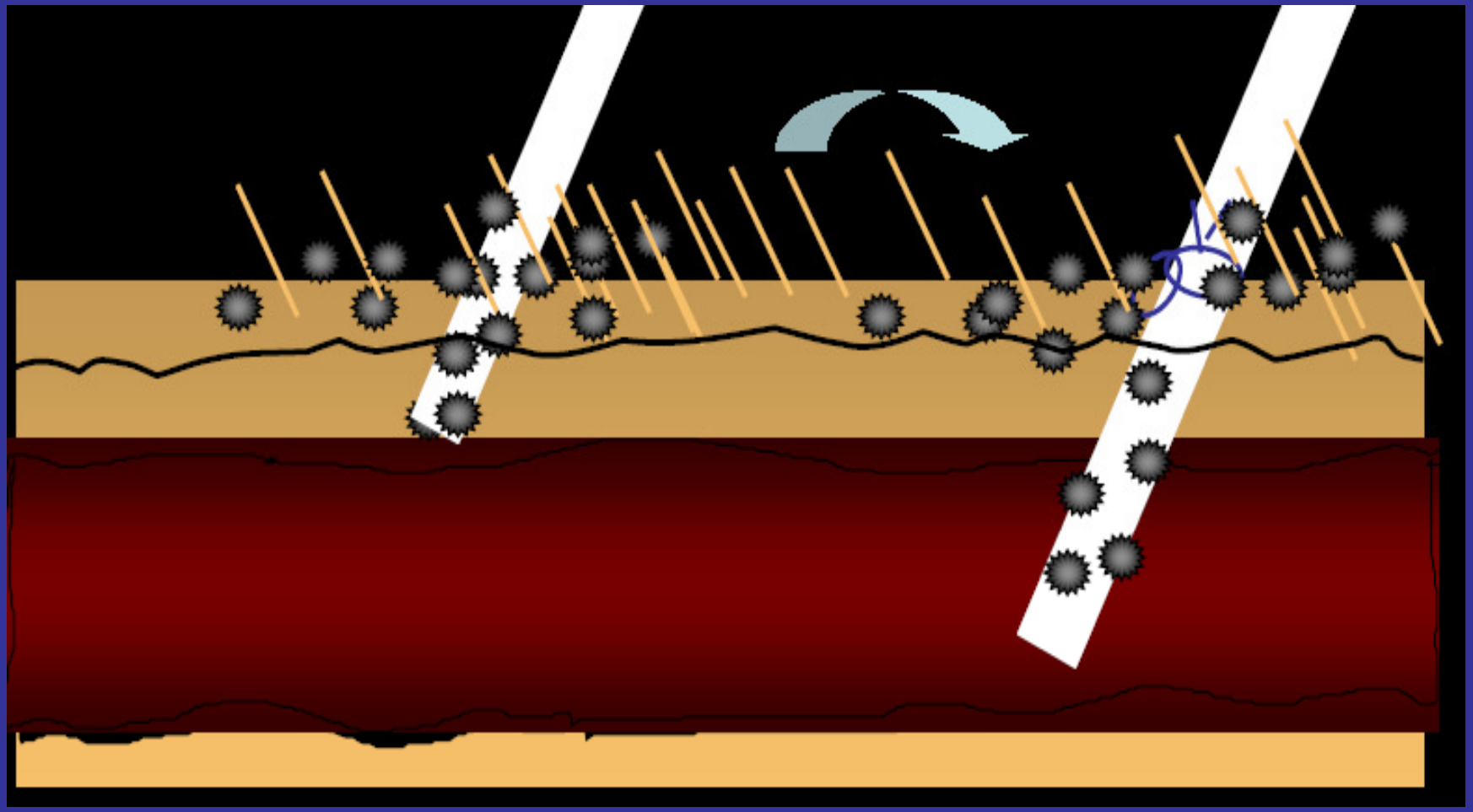
Pathogenesis of CRBSI

- Migration of skin organisms
- Contamination of the catheter hub
- Infusate contamination
- Hematogenously seeded

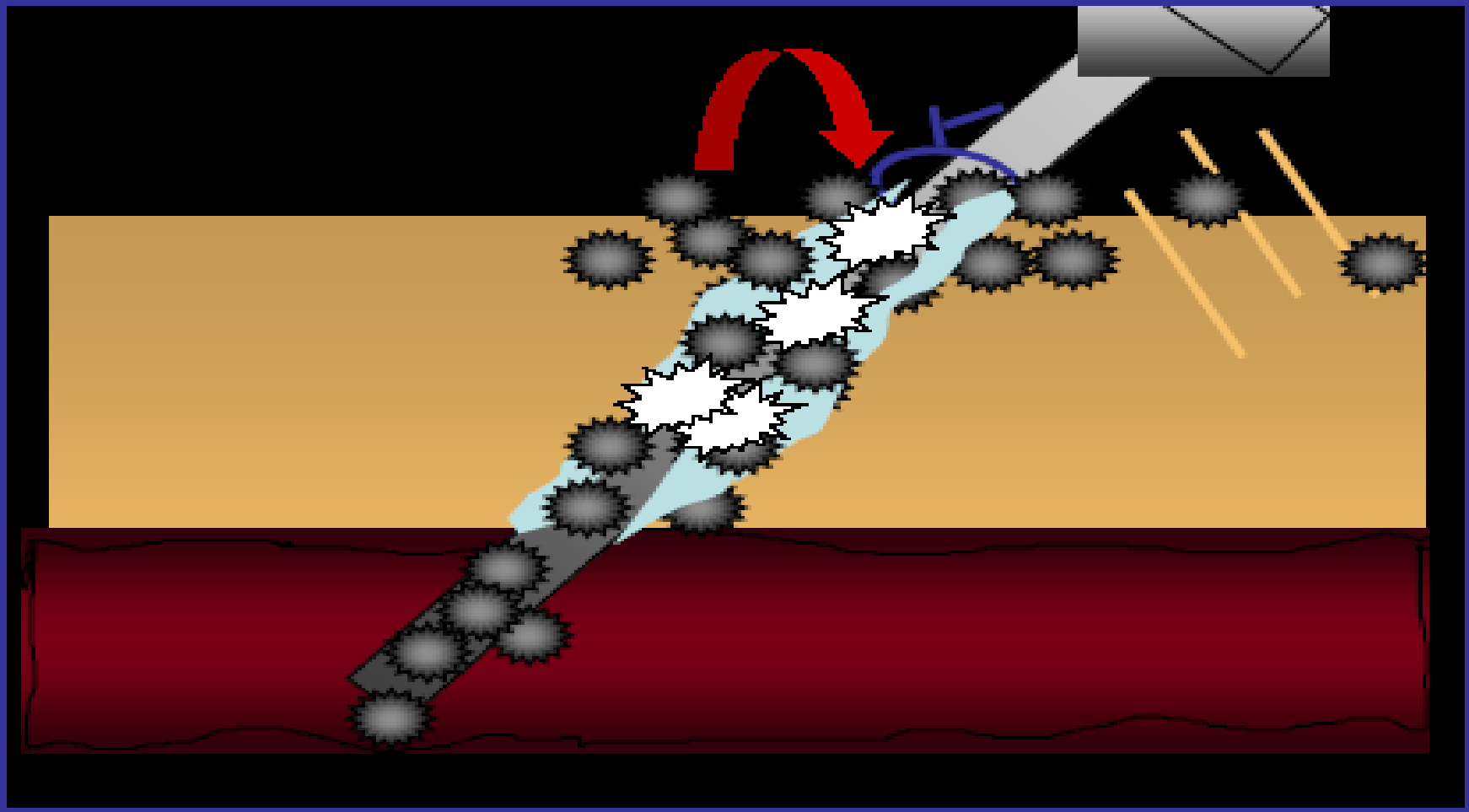


80% resident bacteria in the first 5 layers of stratum corneum

20% resident bacteria in hair follicles and sebaceous glands

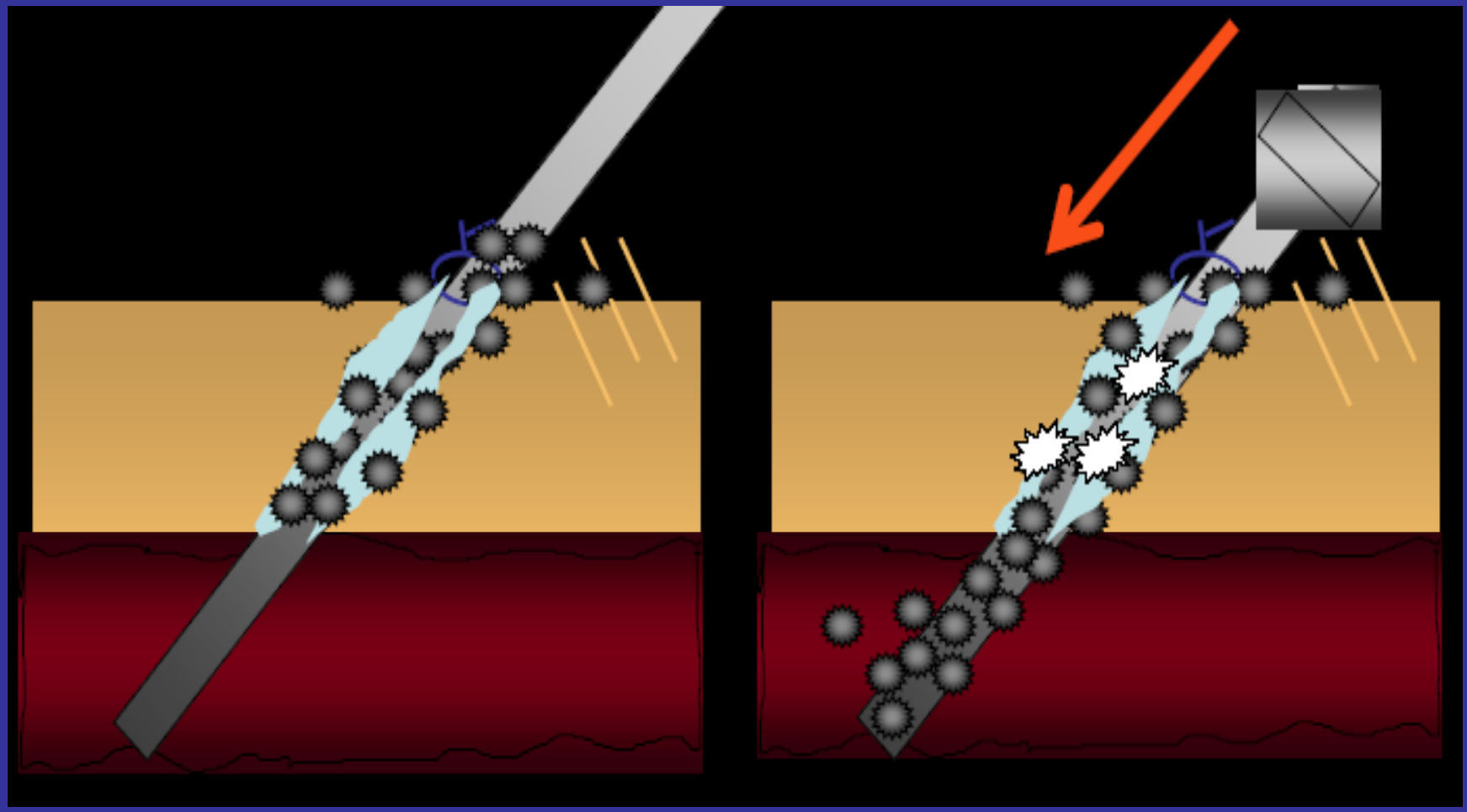


Microorganisms attach to the catheter on passage through the skin



Within hours oedema occupy the skin tract

Migration of regrowing surface bacteria by diffusion into the edematous skin tract



Catheter migration transports bacteria into the skin tract and bloodstream

- Microbial populations on the skin are suppressed with antiseptic solutions
- Using an antiseptic solution for skin disinfection at the catheter insertion site helps to prevent catheter-related infections

Properties of antiseptic

	Mechanism of action	Rapidity of action	Residual effect	Affect by organic matter
2%CHG/ 70% IPA	Denatures protein Disruption cell membrame	Rapid	Excellent	Remains active
Povidone-iodine	Substitution by free ions	Rapid	Minimal	Diminished
Alcohol	Denatures protein	Intermediate	None	No data

Chlorhexidine vs. povidone-iodine vs. alcohol

Maki et al

- 668 central venous and arterial catheters
- 2% chlorhexidine vs. 10% povidone-iodine vs. 70% alcohol
- Rate of CRBSI (per 100 catheters)

  CHG (2.3) vs. PI (7.3) vs. alcohol (9.1)

Maki DG, Ringer M, Alvarado CJ. Prospective randomised trial of povidone-iodine, alcohol, and chlorhexidine for prevention of infection associated with central venous and arterial catheters. *Lancet.* 1991 Aug 10;338(8763):339-43

Chlorhexidine vs. povidone-iodine

Chaiyakunapruk

- Meta-analysis involving 8 RCTs
- 4143 catheters
- CVCs
  - chlorhexidine gluconate 2% reduced the risk for CRBSI by 49%

    Risk ratio, 0.51 , 95% CI (0.27 to 0.97)
- Using a decision model to calculate the probability of CRBSI and related costs
  - savings of $113 per catheter used

Chaiyakunaprak N et al. Chlorhexidine compared with povidone-iodine solution for vascular catheter care: A meta-analysis. *Ann Intern Med 2002: 136: 792-801*.

Other concentrations of chlorhexidine gluconate

- Chlorhexidine gluconate 0.5% is no more effective in preventing CRBSI or CVC colonization than 10% povidone iodine in adults

  Humar A et al.l. Prospective randomized trial of 10% povidone-iodine versus 0.5% tincture of chlorhexidine as cutaneous antisepsis for prevention of central venous catheter infection.CID 2000;31:1001–7

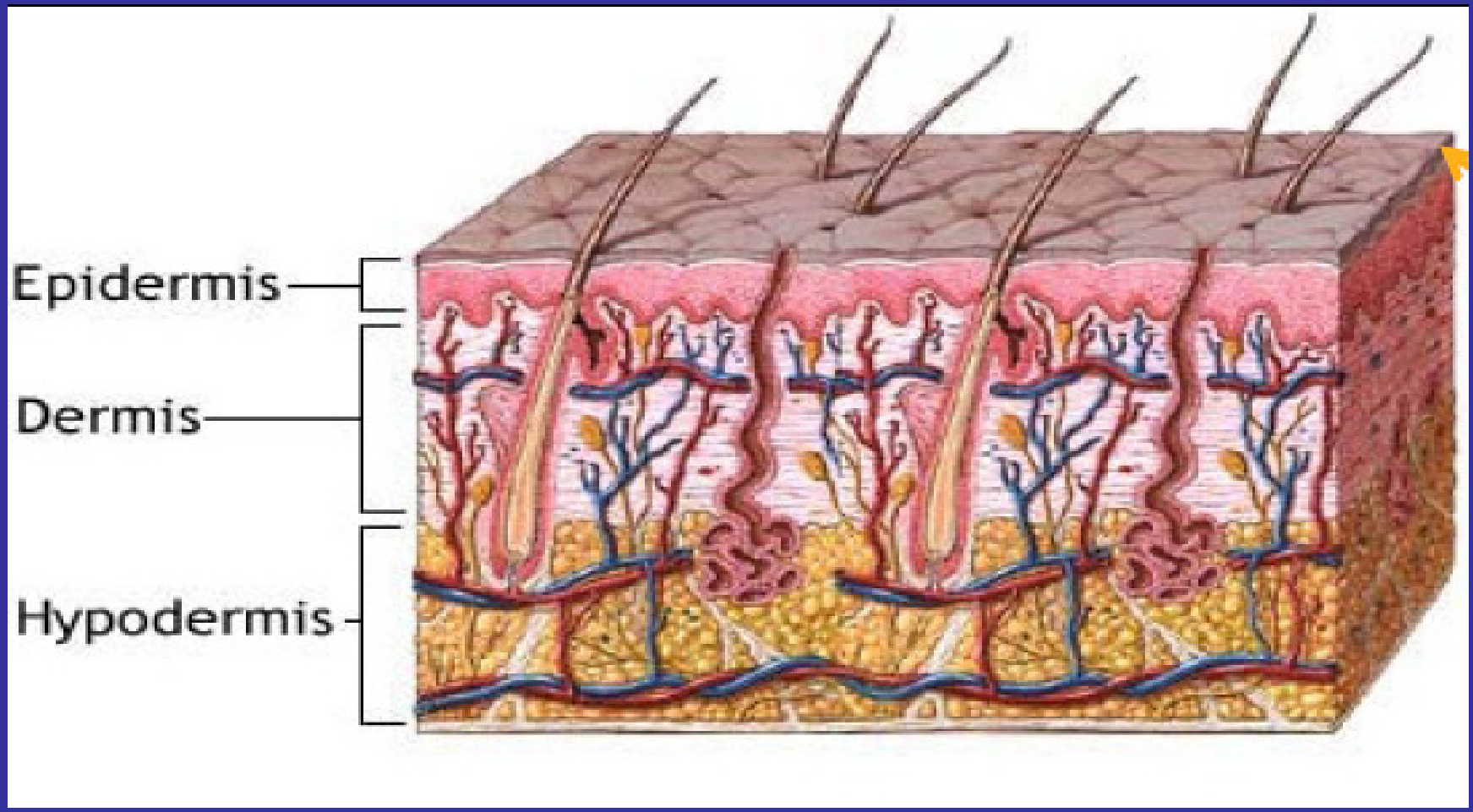
- Chlorhexidine 0.5% reduced peripheral IV colonisation compared with povidone iodine in neonates.

  No CVCs included and insufficient cases to assess differences in BSI rates

- Garland JS et al. Comparison of 10% povidone-iodine and 0.5% chlorhexidine gluconate for the prevention of peripheral intravenous catheter colonization in neonates: a prospective trial. Pediatr Infect Dis J 1995;14:510–6.

Proper method of using chlorhexidine 2% as skin antisepsis

Scrubbing in a back and forth motion for 30 seconds



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Contraindications for chlorhexidine 2%

- Meninges
- Genital area
- Eyes
- Middle ear
- Age less than 2 months

Side-effects

- Irritation
- Erythema
- Generalised allergic reactions
- Skin burns in neonates

Knowing is not enough;

we must apply

Willing is not enough;

we must do

Goethe