TABLE 13.7
Percutaneous Absorption of Nitroglycerin: Topical Concentration versus Absorption for Neat Liquid Application

	Absorption	
Topical Nitroglycerin concentration (mg/cm²)	**%**	**Total (µg)**
0.01	41.8	0.004
0.1	43.5	0.04
1.0	36.6	0.4
7.0	26.6	1.9
10.0	7.8	0.8

Source: From Reference 27 (unpublished observations).

Howes and Black (12) determined the comparative percutaneous absorption of sodium and zinc pyrithione in shampoo through rat skin. As the concentrations of material in shampoo increased from 0.1% to 2%, the penetration also increased from 0.7 to 1 µg/cm² (Table 13.8).

13.6 CONCENTRATION AND NEWBORNS

Wester et al. (13) compared the percutaneous absorption in newborn versus adult rhesus monkeys. The total amount absorbed per square centimeter of skin again increased with increased applied dose and was further increased when the site of application was occluded. In the newborn the question of concentration may have special significance because surface area/body mass ratio is greater than in the adult. Therefore, the systemic availability per kilogram of body weight can be increased by as much as threefold.

13.7 CONCENTRATION AND WATER TEMPERATURE

Cummings (14) determined the effect of temperature on rate of penetration on *n*-octylamine through human skin. Increasing the temperature increased the rate of penetration, as evidenced by octylamine-induced wheal formation and erythema. The increase in cutaneous blood flow mainly involved areas of the wheal. The increase in cutaneous blood flow mainly involved areas of the epidermal factors. Therefore, increased temperature along with increased concentration will increase the percutaneous absorption.

TABLE 13.8
The Effect of Concentration of Sodium Pyrithione in Shampoo on Absorption through Rat Skin

Concentration in Shampoo (% w/v)	**Total Absorption (%)**
0.1	0.07
0.5	0.27
1.0	0.62
2.0	1.02

Source: From Reference 12.