

TABLE 61.2
Nail Core Sampled from the Ventral (Inner) Surface Center of The Human Nail Platt

Test chemicals	Whole Nail Thickness (mm)	Nail Core Sampled from the Ventral (Inner) Surface Center of the Nail Platea		
		Depth of Core (mm)	% Whole Nail Thickness	Powder Sample Collected (mg)
Ciclopirox (8%) ¹⁸	0.65 ± 0.17	0.29 ± 0.10	44.9 ± 11.7	5.3 ± 3.8
Econazole (5%) ¹⁹	0.76 ± 0.17	0.42 ± 0.16	53.8 ± 10.4	9.8 ± 3.9
Efinaconazole (10%)*	0.82 ± 0.19	0.42 ± 0.04	52.8 ± 11.0	5.7 ± 1.3
Ketoconazole (2%) ¹⁵	0.68 ± 0.05	0.28 ± 0.03	41.9 ± 1.2	6.7 ± 2.6
Luliconazole (1%)*	0.85 ± 0.14	0.38 ± 0.11	44.4 ± 11.5	11.2 ± 3.9
Salicylic acid (2%) ¹⁹	0.77 ± 0.07	0.25 ± 0.08	32.6 ± 9.4	6.0 ± 0.5
Tavaborole (10%) ¹⁶	0.68 ± 0.17	0.32 ± 0.11	47.3 ± 10.5	6.9 ± 2.7
Terbinafine (1%) ²²	0.76 ± 0.25	0.31 ± 0.11	42.2 ± 9.1	6.6 ± 3.3

Note: Each number represents mean ± S.D. of five to six samples.

*Unpublished data.

Nail sample area, approximately 0.24 mm in depth and 7.9 mm in diameter, was drilled from the center of the ventral surface of the nail. The amount of nail sample removed was measured by difference in weight and depth of the drilled area before and after sampling.

The mass balance as total applied radioactive recovery of eight [¹⁴C]-antifungal agents: ciclopirox (18), econazole (19), efinaconazole, ketoconazole (15), luliconazole, salicylic acid (19), tavaborole (16), and terbinafine (22) following a 14-day nail treatment was summarized in Table 61.3. The overall recovery range of these agents was from 88% to 102%, indicating that essentially the entire doses were accounted for, in which approximately 64% to 98% was removed with the wash method from the dosed surface. The ventral/intermediate nail center (deep nail plate) sample collected beneath the dose area proves the test chemical permeated vertically from the surface. After the deep

TABLE 61.3
Mass Balance of Eight Antifungal Chemicals Following 14-Day Human Nail Incubation
In vitro

Test Chemicals	Radioactive Recovery as Percentage of Applied Dose (% D)				
	Surface Residue	Nail Plate	Deep Nail Layer	Cotton Pad	Mass Balance
Ciclopirox (8%) ¹⁸	85.2 ± 21.0	3.9 ± 1.6	0.1 ± 0.1	0.05 ± 0.08	89.3 ± 1.6
Econazole (5%) ¹⁹	72.4 ± 4.8	15.5 ± 5.0	1.1 ± 0.8	1.0 ± 0.1	89.0 ± 3.4
Efinaconazole (10%)*	91.5 ± 4.6	1.3 ± 0.5	0.1 ± 0.0	1.3 ± 0.7	94.0 ± 3.2
Ketoconazole (2%) ¹⁵	97.9 ± 27.2	2.6 ± 1.7	0.8 ± 0.3	3.1 ± 2.0	102.8 ± 3.6
Luliconazole (1%)*	65.0 ± 25.4	19.7 ± 7.2	2.2 ± 1.1	16.3 ± 2.6	102.3 ± 10.8
Salicylic acid (2%) ¹⁹	91.2 ± 4.5	8.1 ± 4.7	0.6 ± 0.3	10.7 ± 2.0	86.8 ± 9.6
Tavaborole (10%) ¹⁶	68.4 ± 10.7	26.0 ± 8.2	0.7 ± 0.3	1.4 ± 0.1	95.8 ± 5.9
Terbinafine (1%) ²²	87.4 ± 34.9	7.9 ± 3.1	0.5 ± 0.2	0.3 ± 0.1	95.8 ± 3.3

Note: Each number represents mean ± S.D. of five to six samples.

*Unpublished data.