ORAL AND TRANSDERMAL ESTROGEN DOSE EQUIVALENTS

Prescribing estrogen replacement therapy (ERT) can be confusing. When ERT first came to market in 1942 it was a simple choice, as there was only one FDA-approved medication, Premarin. As the name indicates, it is derived from *Pre*gnant *Mar*es *U*r*ine*, a mixture of conjugated horse estrogens. Today, plant-based and "bioidentical estrogens," which have the same chemical and molecular structure as human estrogen, are also available.

Even with the availability of newer forms of ERT, Premarin remains the most prescribed form of ERT worldwide. Practitioners are most comfortable writing for Premarin, a drug they are very familiar with, as it has been available for more than 70 years Additionally, information on how to convert oral Premarin into other oral or transdermal therapies has not been readily available.

The following chart compares oral and transdermal estrogens and summarizes the names, formulations, dosages, and routes of administration and most importantly, dose equivalents, for available oral and transdermal ERT options.

ORAL ESTROGENS	TRANSDERMAL ESTROGENS
• Plasma estrogen peaks & troughs • First pass through GI tract & liver (requires higher dose) • Increased hepatic enzymes, inflammatory markers • Increased triglycerides • Increased blood pressure • Reduced IGF-1 • Decreased LDL cholesterol and increased HDL	• Serum E2 levels relatively constant • Does not pass through liver – lower doses required • No change in inflammatory markers • No change or decrease in triglycerides • Decrease in blood pressure • No effect on GH/IGF-1 • Decreases LDL but no change in HDL

Active Ingredient	Brand	Source of Estrogen	Dose Equivalents
ORAL			
Equine conjugated estrogen	**PREMARIN**	Pregnant mares urine	0.625mg
Synthetic conjugated estrogen	**CENESTIN**	Plant derived: Soy/Yams	0.625mg
	ENJUVIA		
Esterified estrogens	**MENEST**	Plant derived: Soy/Yams	0.625mg
17-β-estradiol* (micronized)	**ESTRACE**	Plant derived: Soy/Yams	1mg
17-β-estradiol*	**FEMTRACE**	Plant derived: Soy/Yams	No equivalence data, only studied with placebo
Estropipate	**OGEN**	Plant derived: Yams	0.625mg
	ORTHO-EST		
TRANSDERMAL			
17-β-estradiol* patch (reservoir)	**ESTRADERM**	Plant derived: Soy/Yams	0.05mg
17-β-estradiol* patch (matrix)	**ALORA**	Plant derived: Soy/Yams	0.05mg
	CLIMARA		
	VIVELLE		
	VIVELLE-DOT		
	MENOSTAR		
17-β-estradiol* gel	**DIVIGEL**	Plant derived: Soy/Yams, Sunflower seeds, Rapeseed, Poppy seeds, Pine trees	1g Divigel = 34pg/mL estradiol
	ELESTRIN	Plant derived: Soy, Rapeseed, Pine tree wood	1 pump (0.87g/d) = 0.0125mg estradiol 2 pumps (1.7g/d) = 0.0375mg estradiol
	ESTROGEL	Plant derived: Oil seed, Soy, Pine tree wood	No comparison studies done in U.S. Rate of delivery is 35µg/day which is therapeutically equivalent to Climara 50µg/day
17-β-estradiol* emulsion	**ESTRASORB**	Plant derived: Soy	2 packets (3.48g) = 0.05mg systemic estrogen
17-β-estradiol* spray	**EVAMIST**	Plant derived: Soy/Yams	No direct comparison trials. 1.53mg/spray. For 1 spray, 21µg gets to blood stream (29µg for 2 sprays, 40µg for 3 sprays). Premarin 0.625mg = just over 3 sprays of Evamist.

NOTES

*The only formulation considered bioidentical, as defined by the 2007 Position Statement of the Endocrine Society.

Matrix patch: Estradiol is embedded in the adhesive layer that is applied directly to the skin.

Reservoir patch: Estradiol is contained in a drug reservoir and its release is controlled by a copolymer membrane; contains more layers than matrix patch.

Adapted from: Dong BJ. Hormonal Drugs: Female Sex Hormones in: Anderson PO, Knoben JE, Troutman WG, eds. Handbook of Clinical Drug Data. 10th ed. New York, N.Y. McGraw Hill; 2002:679–697.

Kenigsberg L, Balachandar S, Prasad K, et al. Exogenous Pubertal Induction by Oral versus Transdermal Estrogen Therapy. *J Pediatr Adolesc Gynecol*. 2011 Nov 22. [Epub ahead of print].

(Created 10/2012)