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# Transdermal Psychotropic Agents: “Aye” or “Nay”?

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One way to turn a drug into a slow-release preparation is through transdermal delivery systems (TDS) or patches. Essentially, the active drug is placed into a gel-like substance that is adhered to an impermeable backing. Next, adhesive glue is placed along the perimeter of the patch to adhere it to the patient’s skin. Pressure and constant drug-to-skin contact are ensured, and the active drug is gradually absorbed through skin capillaries, allowing for slow constant absorption.<sup>1</sup>

TDS for psychotropic medications sounds attractive. It is a user-friendly approach with less-frequent dosing. It is especially convenient for patients with dysphagia commonly seen in neurologic wards, the pediatric population with difficulty swallowing oral formulations, or those with gastrointestinal ailments. Moreover, TDS provides a visual proof of treatment adherence—a top priority in psychiatric patients. Given the reduced hepatic first-pass metabolism, this would translate into less drug-drug interactions for patients on polypharmacy. It allows for constant serum levels (zero-order kinetics) that stop upon removal of the patch. Last but not least, TDS is obviously hassle free with minimal risk of overdosing—again, an important consideration in suicidal patients.<sup>2</sup>

On the other hand, TDS has some potential downsides. A major hurdle is the limited availability of therapeutic options—only a handful of psychotropic agents come in TDS formulations (Table 1). Local skin reactions at application sites are quite ubiquitous. Erratic absorption (as hair or sweating may interfere) and, hence, unpredictable bioavailability can be problematic. Slower actions and steady state are only maintained as long as the patch is applied, and this renders TDS impractical for emergencies. Furthermore, TDS is expensive.<sup>3</sup>

Despite these uncertainties, TDS might open new customized treatment venues, expanding our pharmacopeia, and represents a welcomed addition to the psychopharmacologic armamentarium that begins to gather a momentum on clinical grounds. However, time will tell with regard to its real position in clinical practice.

Psychotropics in patch form currently on the market include the following:

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Prim Care Companion CNS Disord 2021;23(2):20br02673

**To cite:** Naguy A. Transdermal psychotropic agents: “aye” or “nay”? *Prim Care Companion CNS Disord.* 2021;23(2):20br02673.

**To share:** <https://doi.org/10.4088/PCC.20br02673>

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**Table 1. Psychotropic Agents in Patch Form**

Antipsychotics	Asenapine (Secuado), blonanserin
Antidepressants	Selegiline (Emsam), doxepin cream
ADHD medications	Methylphenidate (Daytrana), clonidine (Catapres-TTS)
Alzheimer’s disease	Rivastigmine (Exelon)
Addiction	Nicotine (NicoDerm CQ), buprenorphine (Butrans)
Restless leg syndrome	Rotigotine (Neupro)
Sialorrhea	Scopolamine (Scopoderm)

Abbreviation: ADHD = attention-deficit/hyperactivity disorder.

**Antipsychotics:** Two atypical antipsychotics are currently available in patch form. One is asenapine (Secuado) that recently has been granted US Food and Drug Administration (FDA) approval for adult schizophrenia (and bipolar mood disorder) to be applied at 3.8 mg every 24 hours to the hip, abdomen, upper arm, or upper back.<sup>4</sup> The other is blonanserin, which is available exclusively in Japan.

**Antidepressants:** The monoamine oxidase-B inhibitor selegiline (Emsam) comes in 3 sizes—one of which is 20 mg/20 cm<sup>2</sup> that delivers almost 6 mg over 24 hours and, hence, abrogates the need for a tyramine-restricted diet. It is also indicated in Parkinson disease.<sup>5</sup> The tricyclic antidepressant doxepin, due to its strong antihistaminic H<sub>1</sub> actions, comes in a 5% cream (Zonalon) for short-term use (8 days) for moderate pruritus in adults with atopic dermatitis or lichen simplex chronicus.

For attention-deficit/hyperactivity disorder (ADHD), methylphenidate patches (Daytrana) should be applied to the hip area (using alternating sites) 2 hours before an effect is needed and should be removed 9 hours after application. This stimulant is FDA approved for children with ADHD aged ≥ 6 years.<sup>6</sup> Similarly, clonidine, the α<sub>2</sub> agonist, is available as Catapres-TTS.<sup>7</sup>

For Alzheimer’s disease, the acetylcholine esterase (and also butyrylcholinesterase) inhibitor rivastigmine comes in patch form (Exelon patch) to start at 4.6 mg/24 hours. It is also indicated for Parkinson disease dementia.<sup>8</sup>

For smoking cessation, nicotine patches (NicoDerm CQ) are available. Those who smoke more than 10 cigarettes a day should start at 21 mg for 6 weeks, then 14 mg for 2 weeks, and, finally, 7 mg for 2 weeks.<sup>9</sup>

Buprenorphine, the μ opiate partial agonist and κ opiate antagonist, is available as Butrans 5 μ/hour for analgesia and can be used for opiate use disorder.<sup>10</sup>

Rotigotine, the non-ergot more selective dopamine D<sub>3</sub> agonist, comes in Neupro 2-mg/24-hour patches for Parkinson disease and restless leg syndrome.<sup>11</sup>

The anticholinergic hyoscyne is available as Scopoderm 1.5-mg patches covering up to 72 hours that can be used in children aged ≥ 10 years and adults for motion sickness. It is sometimes used in psychiatry for psychotropic-induced sialorrhea (eg, clozapine).<sup>12</sup>

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**Published online:** April 1, 2021.

**Potential conflicts of interest:** None.

**Funding/support:** None.

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