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Specified Adverse effects Among *Echinacea* and St. John's wort Exposures, by Age Group

Herbal Dietary Supplement Age group	Organ System	Symptom [Adverse effects due to suspected suicide]
<i>Echinacea</i>		
< 20 years	Cardiac -1	Tachycardia -1
	Dermal - 1	Hives/welts - 1
	Gastrointestinal - 12	Abdominal pain - 2, diarrhea - 1, nausea - 1, vomiting - 8
	Respiratory - 1	Cough/choke - 1
	Misc. - 1	Other - 1
≥ 20 years	Cardiac - 3	Hypertension - 1, tachycardia - [2]
	Dermal - 8	Erythema/flushed - 1, hives/welts - 3, pruritus - 2, rash - 2
	Gastrointestinal - 16	Abdominal pain - 2, [1], nausea - 4, [1], oral irritation - 3, throat irritation - 1, vomiting - 4
	Neurological - 6	Agitated/irritable [1], dizziness/vertigo - 2, headache - 1, seizure-single [1], syncope - 1
	Ocular - 1	Irritation/pain - 1
	Respiratory - 2	Cough/choke - 1, dyspnea - 1
	Misc. - 8	Acidosis [1], anion gap increase [1], electrolyte abnormality - 1, other - 4, pain-other - 1

Herbal Dietary Supplement	Organ System	Symptom [Adverse effects due to suspected suicide]
St. John's wort < 20 years	Cardiac - 2 Dermal - 8 Gastrointestinal - 16 Neurological - 16 Ocular - 1 Misc. - 3	Hypertension – [1], tachycardia [1] Edema - 1, erythema/flushed - 3, hives/welts - 1, irritation/pain - 1, pallor - 1, puncture wound/sting - 1 Abdominal pain - 1, [1], diarrhea - 1, nausea 5, [1], vomiting - 7 Agitation/irritability 2, [1], confusion [1], dizziness/vertigo - 2, drowsiness/lethargy - 5, [1], headache – 1, [2], slurred speech – [1] Blurred vision - 1 Other – 2, [1]
≥ 20 years	Cardiac - 5 Dermal - 10 Gastrointestinal - 10 Neurological - 24 Ocular - 1 Misc. - 6	Hypertension – 1, [1], tachycardia – 2, [1] Edema - 1, erythema/flushed – 2, [1], irritation/pain – 1, [1], rash – 3, [1] Abdominal pain – [1], diarrhea - 1, nausea - 2, oral irritation - 1, vomiting – 1, [4] Agitation/irritability - 4, ataxia - 1, confusion – 1, [2], dizziness/vertigo - 4, drowsiness/lethargy – 4, [3], peripheral neuropathy - 1, slurred speech - 1, tremor – 2, [1] Mydriasis - 1 Electrolyte abnormality [1], other - 5

In the table above, adverse effects associated with *Echinacea* and SJW exposures – and a subset of suspected suicidal exposures - are categorized by affected system. Neurological and gastrointestinal problems were the most frequent clinical manifestations associated with *Echinacea* and SJW exposures, although specific symptoms varied by age group. Overall, a more limited adverse effects profile was reported for *Echinacea*, while greater variation was observed for SJW exposures.

Comparing the adverse effects listed in the table above to adverse effects described in herbal reference texts,¹⁻³ an industry monograph,⁴ and recent systematic reviews of *Echinacea*⁵ and SJW,^{6,7} most of the adverse effects listed have been previously reported. For *Echinacea*, specific adverse effects not reported in the above sources include tachycardia, seizure (single episode), acidosis, increase in anions, and electrolyte abnormality. Likewise, edema, ataxia, mydriasis, pallor, oral irritation, and electrolyte abnormality were not specifically mentioned in these sources as reported adverse effects of SJW.

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1. *Pharmacist's letter/Prescriber's letter natural medicines comprehensive database*. 4th ed. Stockton, CA: Therapeutic Research Faculty; 2002.
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 3. Duke JA, ed. *Handbook of Medicinal Herbs, 2nd ed*. Boca Raton, FL: CRC Press; 2002.
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 5. Huntley AL, Thompson Coon J, Ernst E. The safety of herbal medicinal products derived from echinacea species : a systematic review. *Drug Saf* 2005; **28**: 387-400.
 6. Hammerness P, Basch E, Ulbricht C, *et al*. St. John's wort: A systematic review of adverse effects and drug interactions for the consultation psychiatrist. *Psychosomatics* 2003; **44**: 271-282.
 7. Knuppel L, Linde K. Adverse Effects of St. John's Wort: A Systematic Review. *J Clin Psychiatry* 2004; **65**: 1470-1479.