



### K9 Sertraline in Postmortem Blood and Liver: Deaths in North Carolina (2002 – 2011)

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After attending this presentation, attendees will have greater insight into the different types of postmortem casework associated with sertraline and norsesertraline at therapeutic and toxic concentrations.

This presentation will impact the forensic science community by providing information regarding sertraline and norsesertraline concentrations as it relates to cause and manner of death determinations.

Sertraline (Zoloft®) is a Selective Serotonin Reuptake Inhibitor (SSRI) used in the treatment for depression in typical, daily adult doses ranging from 50 – 200mg. Patients on chronic oral daily doses of as much as 300mg reached a steady-state plasma level averaging 0.206mg/L (0.099-0.309mg/L). Sertraline undergoes N-demethylation to norsesertraline which has about 10% – 20% the pharmacologic activity of its parent.

At the North Carolina Office of the Chief Medical Examiner, cases suspicious for toxicological cause or with essentially negative autopsy findings are routinely screened for common over-the-counter, prescription, and illegal drugs via various laboratory techniques. A search of the database for sertraline/norsesertraline liver data with or without corresponding blood data revealed upwards of 200 cases over a 10-year period. Decedents were divided into three groups according to the classification of the effect of sertraline as it impacts the cause of death. The pathologist considered sertraline to be either the primary cause of death (below), additive to the cause of death, or not implicated in death. The foci of the study are the overdose cases where sertraline was determined to be the primary cause of death regardless of other drugs and their concentrations (N=30) and non-overdose cases where sertraline received no classification (N=140). The latter focus may be considered postmortem normal concentrations.

Sertraline metabolism and elimination could be altered by the health of the patient, drug-drug interactions, and genetic deficiencies. The concentrations of sertraline and norsesertraline, as well as the parent/metabolite ratio, were reviewed in light of pathological findings and co-intoxicants. Case studies involving significant postmortem redistribution and potential drug interactions will be highlighted.

Sertraline Overdose Cases (Suicide)

Specimen Location	N	Range		Average		Median	
		Sertraline	Norsesertraline	Sertraline	Norsesertraline	Sertraline	Norsesertraline
Central (mg/L)		0.49-25	0.32-8.2	4.19	2.28	1.85	1.5
Peripheral (mg/L)		0.74-9.2	0.27-4.6	2.86	1.79	1.75	1.55
Liver (mg/kg)	20	27-490	5.4-940	137	127	94	72.5

Sertraline Overdose Cases (Accident)

Specimen Location	N	Range		Average		Median	
		Sertraline	Norsesertraline	Sertraline	Norsesertraline	Sertraline	Norsesertraline
Central (mg/L)		0.61-3.1	0.93-4	1.16	1.92	0.82	1.6
Peripheral (mg/L)		0.74-1.8	0.36-3.7	1.21	1.71	1	1.3
Liver (mg/kg)	10	20-279	15-518	90.2	166.8	63.5	155

#### Sertraline, Death Investigation, Toxicology