



DMPS : Urinary Metals/Metalloids

- ◆ Hg
- ◆ Bi
- ◆ As
- ◆ Pt
- ◆ Ni
- ◆ Ag
- ◆ Sb
- ◆ Cu
- ◆ W
- ◆ Sn
- ◆ Cr
- ◆ Co
- ◆ Mo
- ◆ Zn
- ◆ Au
- ◆ Cd*

Quig, Unpublished observations, DDI, Inc.



Equilibrium Constants for DMPS-Metal Complexes

	<u>logK₁</u>	<u>logK₂</u>
Hg ²⁺	27	36
Ag ²⁺	25	35
CH ₃ -Hg ¹⁺	21	31
Cu ²⁺	18	29
Cd ²⁺	18	26
Pb ²⁺	17	25
Zn ²⁺	15	25

Heyltex Corp

EDTA Stability Constants

	<u>Log K</u>
Pb^{2+}	18.4
$\text{Cu}^{2+}, \text{Ni}^{2+}$	18.3
$\text{Cd}^{2+}, \text{Zn}^{2+}, \text{Co}^{2+}$	~16.1
Fe^{2+}	14.4
Mn^{2+}	13.4
Ca^{2+}	10.6
Mg^{2+}	8.7
Sr^{2+}	8.6

Chemistry of Metal Chelate Compounds (1978)



Metal

1st Choice

2nd Choice

Inorg. Hg

DMPS

DMSA

Org. Hg

DMSA/ DMPS

Pb

DMSA/EDTA

DMPS

As

DMPS

DMSA

Cd

EDTA

DMPS*

Sb

DMPS/DMSA

EDTA

Sn

DMPS,DMSA

EDTA

Tl

Prussian Blue

DMSA

(K ferric cyanoferrate II)

Kemper(1990) Aposhian Toxicol (1995)97:23-38



Urinary Metals After Slow Push Ca-Na₂-EDTA Challenge

	<u>Increase</u> *
Lead	147-X
Zn	32-X
Manganese	15-X
Iron	7.4-X
Cadmium	7-X
Antimony	4.4-X

*p<0.05, n=14

Quig, Filidei, Whitaker (2002)

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Efficacy of Agents to Remove Hg

- ◆ Kidneys slices incubated with “chelators” at equivalent concentrations

Reduction in tissue Hg/ μ g DNA

DMPS	86% *	DTT	55%
DMSA	65% *	Lipoic acid	35%
D-Pen	60%	EDTA	20%

*($p < 0.05$)

Toxicol. (1997) 116: 67-75