

Cobalt		
nmol/l	g/mol	ug/L
10	58.93	0.59
20	58.93	1.18
30	58.93	1.77
40	58.93	2.36
50	58.93	2.95
60	58.93	3.54
70	58.93	4.13
80	58.93	4.71
90	58.93	5.30
100	58.93	5.89
120	58.93	7.07
140	58.93	8.25
160	58.93	9.43
180	58.93	10.61
200	58.93	11.79

Chromium		
nmol/l	g/mol	ug/L
10	52.00	0.52
20	52.00	1.04
30	52.00	1.56
40	52.00	2.08
50	52.00	2.60
60	52.00	3.12
70	52.00	3.64
80	52.00	4.16
90	52.00	4.68
100	52.00	5.20
120	52.00	6.24
140	52.00	7.28
160	52.00	8.32
180	52.00	9.36
200	52.00	10.40

Haddad et al JBJS 93-B May 2011

There is no accepted cut-off level at which high serum ion levels indicate a poorly functioning device.

An overall consensus is that well functioning MoM hip will have a cobalt or chromium serum level of **2 ppb**

$$= 2 \text{ ug/L} = \text{approx. } 35 \text{ nmol/L}$$

For bilateral MoM devices, this rises to 3 ppb

$$= 3 \text{ ug/L} = \text{approx... } 55 \text{ nmol/L}$$

The AOA Metal on Metal Expert Group have defined the upper limit of acceptability as **7 ppb**.

$$= 7 \text{ ug/L}$$

$$\text{Co } 120 \text{ nmol/L} \quad \text{Cr } 135 \text{ nmol/L}$$

Nargol et al: 4 ppb / 4 ug/L

$$\text{Co } 70 \text{ nmol/L} \quad \text{Cr } 77 \text{ nmol/L}$$