



## Micro Trace Minerals Laboratory

40+ years of clinical & environmental  
laboratory diagnostics

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### MTM Newsletter

N° 21 - March 2017

- **Laboratory News**
  - **Report Graphics**
  - **Indium (In)**
  - **Thallium (Tl)**
- **Medical Workshops and Conferences**
  - **Conferences and Workshops 2017**
  - **Webinars**

### Laboratory News

#### ■ **Report Graphics**

Explanations are found in our reports with additional details listed in our laboratory brochure; please see the extract listed below:

[https://microtraceminerals.com/fileadmin/uploads/pdf/en/newsletter/report\\_explanation\\_extended.pdf](https://microtraceminerals.com/fileadmin/uploads/pdf/en/newsletter/report_explanation_extended.pdf)

For our full catalogue, please visit the link listed below:

<https://microtraceminerals.com/en/laboratory-catalog>

#### ■ **Indium (In)**

Indium is used as an alloy to improve the properties of metals used in industry and dentistry. It is also used in scintigraphy. For example, 111-indium-DTPA-octreotide scintigraphy is a sensitive method for the detection of primary tumors and metastases in neuroendocrinology.

We test indium on request.

#### ■ **Thallium (Tl)**

The economic importance of thallium is relatively insignificant. Thallium is used in the metal processing industry, in the production of special glass and in measuring technology. While the highly toxic thallium sulfate has been used as a rodenticide and insecticide, its use is no longer permitted in Germany, Switzerland and the USA.

Thallium enters the environment through natural weathering processes and through anthropogenic activities. Through industrial wastewater and the atmosphere, it reaches waters and becomes available for organisms as it rapidly accumulates in plants and animals, becoming part of the food chain.

**Acute thallium poisoning is rare. However, depending on the type of exposure, the following symptoms may occur:**

- Irritation of respiratory tract
- Irritation of the gastrointestinal tract
- Nausea (nausea) / vomiting



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### Symptoms that may occur after a few symptomless days:

- Constipation (constipation)
- Gastroenteritis (gastrointestinal inflammation)
- Polyneuropathy
- Alopecia (hair loss) - severe hair loss approximately after the 13th day of exposure
- Paresis (paralysis) - after 3-4 weeks

### Late symptoms:

- Micturition disorders
- Bowel movement disorders such as a weakness of the sphincter
- Leukonychia striata - white stripes on nails

### A chronic thallium exposure may be associated with the following symptoms:

- Anorexia nervosa
- Weight loss
- Alopecia
- Neuralgia
- Visual disturbances

**Diagnostic:** Serum, Urine, Hair.

## Pharmacological Properties

Thallium enters the intestine via liver and bile and is subjected to enterohepatic circulation. There is partial reabsorption through the intestinal mucosa and thus renewed poisoning may occur.



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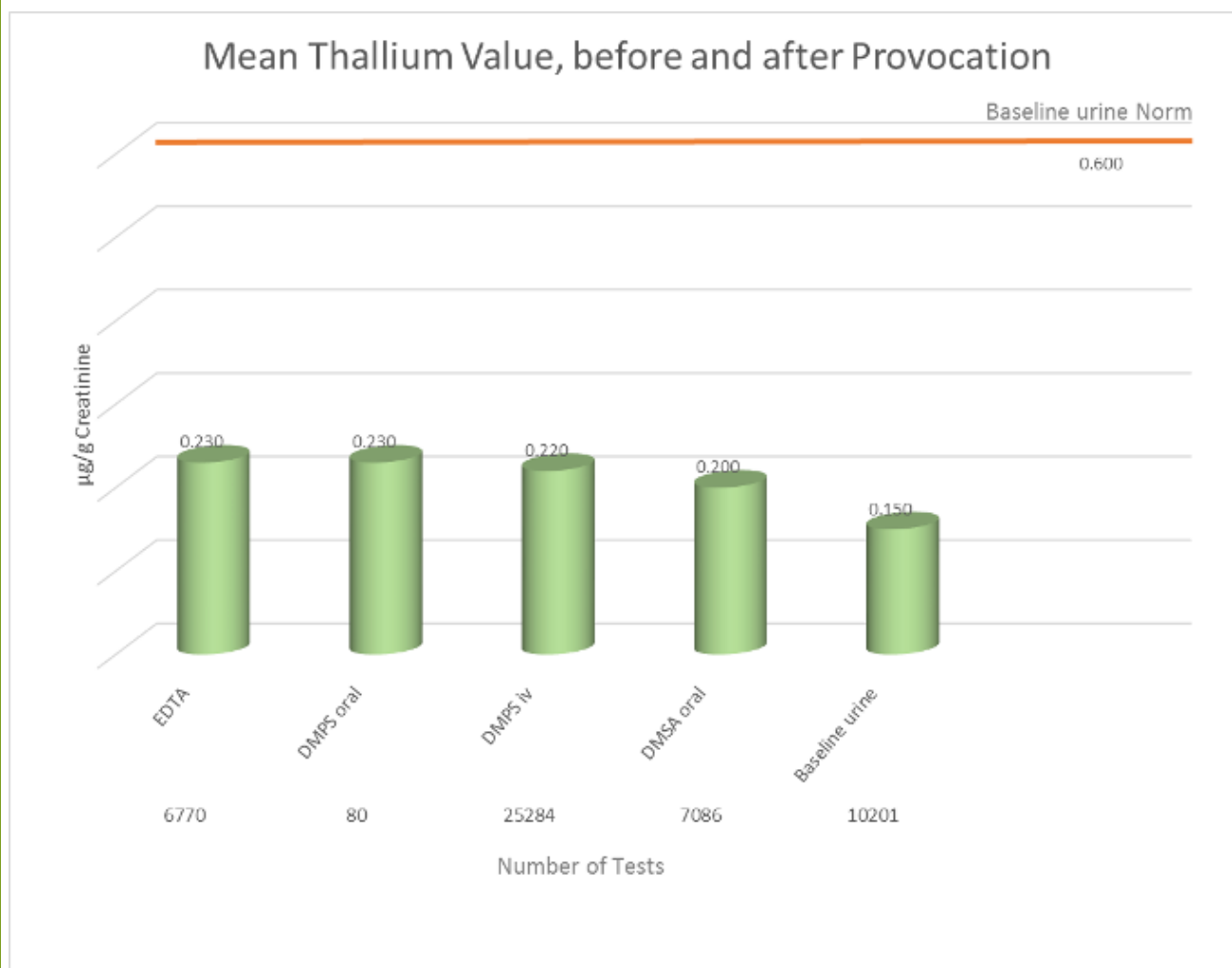
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### Antidote Treatment in Acute Intoxication

Iron (III) -hexacyanoferrate (II) (insoluble Berlin blue, commercially available as Thallii Heyl) is orally administered and practically not absorbed. However, it binds thallium in the intestine and prevents its absorption or reabsorption, thus interrupting the enterohepatic circulation. Together with the antidote, thallium is excreted via fecal matter. By increasing fecal excretion, the length of time thallium resides within in the organism is reduced, which also reduces toxic effects.

The oral administration of Berlin blue is only effective as long as thallium is circulating within the enterohepatic system. The following graph shows that the chelating substances DMPS, EDTA, and DMSA show no appreciable binding with thallium. Since thallium poisoning is extremely rare, no data of patients with acute thallium poisoning is included here.



Source: Micro Trace Minerals Database 2017



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### Assessing Metals in Fecal Matter

The following table shows that.

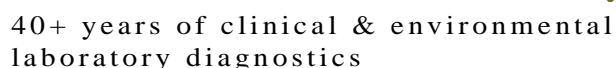
We evaluated our database. Of 417 tests, for thallium only 0.5% showed values above the reference range. However, an exceptional maximum value of 61 mcg/kg of thallium was noted. The source or cause is unknown to us.

For zirconium, only 0.2% of the measured values were above the reference value, but an extreme maximum value was measured: 1563 mcg/kg zirconium.

Only 3% of the mercury values were above the reference range, however three of the extreme test values exceeded the reference range by about one thousand times. One possible cause would be the consumption of mercury-laden fish. The German Federal Office for Consumer Protection and Food Safety warned in 2007 of an excessive consumption of shark and swordfish. These "big old predators, which are at the end of the food chain" are burdened with heavy metals. The maximum permitted mercury level of 1 mg/kg (= 1000 mcg/kg) was found in every fourth swordfish (27%).

For lead, cadmium and tin, the percentage of test values above the reference range is higher than expected. We also noted extreme values, but have no explanation for these fluctuations. Extreme values are routinely confirmed through repeat testing.

Element	Number of Tests	Reference Range (RR) mcg/kg	Mean value mcg/kg	% Above Reference Range (RR)	Max value mcg/kg
Lead	418	50	58	8.1	35876
Cadmium	407	50	58	7.6	671
Mercury	435	40	10	3.0	12143
<b>Thallium</b>	<b>417</b>	<b>20</b>	<b>4</b>	<b>0.5</b>	<b>61</b>
Tin	406	10	18	9.4	30520
Zirconium	406	50	5	0.2	1563



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## Medical Workshops and Conferences

## ■ International Conferences & Workshops 2017

04/01/2017	<b>MTM Chelation Seminar Nuremberg</b> <b>When, how, how much and how long are chelators needed?</b> Nuremberg, Germany (German)
05/13/2017	<b>MTM Chelation Seminar Cologne</b> <b>When, how, how much and how long are chelators needed?</b> Cologne, Germany (German)

For future workshops and updates, please visit:  
<https://microtraceminerals.com/en/workshops>

## ■ Webinars

03/22/2017	<b>The Neurotoxicity of Metals and Nanoparticles</b> (English)
05/24/2017	<b>Mental and Elemental Toxins. Diagnosis and Treatment Options</b> (English)

For registration and further information, please visit:  
<https://www.edudip.com/academy/e.blaurock-busch>

We appreciate finding the cause of unexpected results. If you receive a report with unexpected results, or have questions, contact us.

Our next newsletter will discuss the evaluation and interpretation of the essential elements before and after chelation. We will also provide you with an update on combination treatments.

All the best

Your

E. Blaurock-Busch and Team