CHROMIUM

• Name of Nutritional Supplement
  o Chromium

• Scientific and Common Names
  o Chromium → Scientific Name
  o Chromium Picolinate (chromium chelated in a form called chromium picolinate, a naturally occurring amino acid metabolite, which is better absorbed than any other forms)
  o Chromium Chloride
  o Chromium Nicotinate
  o Chromium 3
  o Chromium Aspartate
  o Chromium Citrate
  o Glucose Tolerance Factor (GTF)
  o Trivalent Chromium → Dietary Chromium

• Description of Active Ingredients
  o GTF contains a Chromium atom in complex with single molecules of glycine, cysteine, and glutamic acid, and two molecules of nicotinic acid

• Mechanism of Action
  o Chromium works with insulin in assisting cells to take in glucose and release energy.
  o Increases insulin receptor sensitivity and enhances glucose transport into cells to maintain normal blood sugar levels
  o Chromium Picolinate is more easily absorbed than other forms and it may possibly sensitize insulin-sensitive glucoreceptors in the brain, resulting in appetite suppression, activate the sympathetic nervous system to stimulate thermogenesis, and down regulate insulin secretion

• Current Indications and Efficacy
  o Body Building (ineffective), according to “Effects of chromium and resistive training on muscle strength and body composition”, the results indicate that chromium

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supplementation in addition with exercise training, does not provide a significant increase in strength and lean body mass, or a significant reduction in body fat percentage.

- **Athletic Performance Enhancement** (ineffective, as mentioned above)
- **Diabetes Mellitus, type 1 and 2**, according to "Chromium Picolinate Supplementation for Diabetes Mellitus", indicates:
  - May be effective when used orally for glycemic control, at a dose of 200 mcg PO TID
  - Case report indicates that HbA1C declined from 11.3% to 7.9% 3 months after initiation of chromium picolinate
  - Monitoring is required, due to chromium continues to have unknown and unproven benefits and risks

- **Hyperglycemia**
- **Hypoglycemia**, reactive
  - Supplementation with chromium has alleviated symptoms of hypoglycemia
- **Hyperlipidemia** (from Micromedex)
  - May be effective when used orally for reducing serum cholesterol and triglyceride levels
  - No effect on LDL or HDL, however triglycerides were decreased by 17.4% during chromium treatment
- **Dysthmic Disorder** (unavailable information)
- **Chromium intravenously as a supplement in total parenteral nutrition (TPN)**
- **Obesity**, according to a chromium update: examining recent literature 1997-1998, concluded that:
  - Most likely ineffective when used orally for weight reduction
  - It has been reported that chromium reduces body fat, however some studies have shown no effect

### Contraindications, Cautions, and Allergies

- **Impaired Renal Function**
- **Psychiatric Disorders** → using Chromium in this population may possibly cause notable changes in brain chemicals (serotonin, dopamine, norepinephrine), however it is unknown, data is unavailable at this time
- **Behavioral Disorders**
- **Caution using Chromium in Diabetes Mellitus** (monitoring required, risk of hypoglycemia)
- **Hypersensitivity to Chromium** such as:
  - Chromate Allergy
  - Leather Contact Allergy

### Dosage Forms, Recommended Doses, and Duration

- **How supplied**
  - Capsule
  - Tablet
  - Intravenous
  - Solution
Oral; Recommended Dietary Allowance (RDA) for adults is 50 to 100 micrograms (mcg) daily and for pediatrics it is 10 to 200 mcg daily, depending on age

- Diabetes → recommendation is 200 to 1000mcg QD PO in divided doses
- Hyperlipidemia → recommendation is 200mcg PO TID
- Dysthmic Disorder → recommendation is 200mcg PO QD-BID

**Safety and efficacy may not be established, the concentration of active ingredients may vary significantly between products, in other words, take caution when buying OTC supplementation.**

- **Drug Interactions** 1,2,4
  - Antacids → decrease chromium levels
  - Systemic beta blockers (unknown)
  - Systemic corticosteroids → decrease chromium levels
  - Didanosine → decrease chromium levels
  - Histamine₂ blockers → decrease chromium levels
  - Insulin → increase risk of hypoglycemia (additive effects)
  - Proton pump inhibitors → decrease chromium levels
  - NSAIDS (unknown)
  - Vitamin B3 → concomitant use may improve glucose tolerance
  - Vitamin C → increase chromium absorption
  - Zinc → coadministration may decrease absorption of both chromium and zinc
  - Sugar → increase urinary chromium loss

- **Drug Disease Interactions** 1-5
  - Renal Insufficiency
    - Chromium may possibly worsen renal dysfunction
  - Diabetes
    - Chromium may possibly result in lower blood glucose levels, thus monitor for hypoglycemia
  - Behavioral disorders
    - Chromium may alter serotonin, dopamine, and norepinephrine metabolism in the central nervous system, unknown whether increased or decreased

- **Safety Issues** 1,2,4
  - Pregnancy
    - Insufficient data available; avoid using doses above recommended dietary allowance
  - Lactation
    - Possibly safe, use caution with doses above recommended dietary allowance

- **Comments** 2,4,5
  - **Herbs that contain chromium**
    - Catnip
    - Horsetail
    - Licorice
    - Nettle
    - Oat straw
    - Red clover

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- Sarsaparilla
- Wild yam
- Yarrow

Dietary Sources
- Liver
- Fish
- Whole grains
- Milk
- Beer
- Cheese
- Meat
- Brewer's yeast

References:
4.) www.uptodate.com